NC 73

Transportation / Land Use Corridor Plan

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Demographic and Economic Forecasts for the Route 73 Corridor

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December 3, 2003

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I. Summary & Assessment of Corridor Findings

North Carolina Route 73 is a highway extending somewhat over thirty miles from I-85 in Cabarrus County to Lincolnton in Lincoln County. For the most part it is a low-capacity road traversing sparsely developed terrain, but its alignment crosses a portion of the Charlotte region with very high recent growth and still higher growth prospects. Due to concern about the rising usage and future adequacy of Route 73, local public officials and other concerned parties have come together to address the issue, and after long effort have secured funding for a consultant study. The purpose of the study is to promote an upgrading of the roadway, in some appropriate time frame, in a fashion consistent with all relevant community objectives. To some extent this study has become a pilot project in proactive, community-based, multi-jurisdictional transportation planning.

The steering committee for the NC 73 Transportation/Land Use Corridor Study includes representatives of three counties, four cities, three chambers of commerce, four regional planning organizations and the North Carolina DOT. The prime contractor for the study is HNTB Corporation (Charlotte). The four subcontractors are: Tom Sawyer Company, for public involvement; S/K Transportation Consultants, Inc., for access management; the UNCC Center for Transportation Studies, for implementation; and the present economist for socioeconomic forecasting.

The present document describes the derivation of demographic and economic forecasts to support the conceptual design of future Route 73 improvements. The key elements of the proposed roadway design were determined at an engineering session on September 9, 2003, using forecasts delivered to HNTB on September 4. The forecasts came from a modified version of a regional modeling framework that had been developed for other purposes. This framework utilized “top-down” allocation procedures, which had various strengths and weaknesses as discussed later. The economist’s work plan called for incorporating “bottom-up” perspectives if feasible, but this was ruled out by the timing of the Route 73 project relative to other activities. Hence the present text will focus upon top-down forecasting and its outputs (which were modified in only one area).

The corridor designated by HNTB for analysis of Route 73 transportation demand is an oblong-shaped area extending seven to ten miles north-south and about thirty-five miles east-west. It covers the northwestern corner of Cabarrus County, the northern extreme of Mecklenburg County, and roughly the eastern half of Lincoln County. The Mecklenburg portion accounts for less than a third of the corridor’s land area but nearly half of its current population. Development of the corridor has been strongly influenced by the presence of I-77 and frontage on Lake Norman, which divides the portions of the corridor in Mecklenburg and Lincoln counties.

The corridor has been partitioned into seven component areas, numbered from east to west. (This text uses the original numbering specified by a map that HNTB sent to all project participants in the summer of 2003. A less detailed map appears here in Figure 10 of Section VI.) Area 1 is a relatively small slice of northern Cabarrus County that covers parts of Kannapolis and Concord. Area 2 is a large district comprised about equally of land in Cabarrus and Mecklenburg counties. Area 3 contains I-77 and most of Mecklenburg’s frontage on Lake Norman. Area 4 is a sliver of land extending south along the lake and the Catawba River. Areas 5 and 6 comprise most of eastern Lincoln County, and Area 7 is a small zone centering upon Lincolnton. The approximate land areas of these corridor

segments are listed in the table below.

The present summary and explanation of forecasting results will focus only on population, the descriptor of primary concern for conceptual planning, and will only consider data for years ending in zero. (The baseline year for forecasting was 2002.) Further detail will be provided in Section VI.

Table 1 below gives the population forecasts for the Route 73 corridor through 2030. Due to circumstances explained later in this section, most attention is given to the corridor totals rather than the figures for component areas. The table's last two lines describe, in both absolute and percentage terms, the actual change in total corridor population that occurred during 1990-2000 and the changes forecasted to occur over the next three decades.

The expected gains in corridor population are very large, perhaps disconcertingly large. The numbers say that the population of the corridor as a whole will more than double from 2000 to 2020, from about 105,000 persons to 226,000 persons. (The latter figure is almost exactly double the corridor's 2002 population.) By 2030 the population of the Route 73 corridor is expected to be somewhat above 300,000 persons. The extent to which past trends support this forecast is a matter of perspective. On one hand, the corridor's population increased by 60% between 1990 and 2000, whereas its future gains would range down from 48% to 35% per decade according to the forecast. On the other hand, the forecast calls for steadily rising absolute increases, from under 40,000 persons in 1990-2000 to over 75,000 persons in 2020-2030.

Table 1. Summary of Route 73 Corridor Population Forecasts

	Approx. Size in Sq. Miles	Actual Population		Forecasted Population		
		1990	**2000**	**2010**	**2020**	**2030**
Area 1	23	5,323	7,463	9,649	11,725	15,184
Area 2	65	9,136	14,141	24,971	46,044	72,320
Area 3	43	14,629	36,464	59,610	85,543	111,015
Area 4	14	1,857	3,523	5,954	10,047	14,133
Area 5	39	6,855	10,416	15,701	22,245	28,554
Area 6	106	19,601	24,405	30,198	38,295	48,144
Area 7	8	8,340	8,827	9,786	12,172	15,008
Total Corridor	298	65,741	105,239	155,869	226,071	304,357
10-Yr. Change:						
Number			39,498	50,630	70,202	78,286
Percent			60.1%	48.1%	45.0%	34.6%

The rest of this introduction will be devoted primarily to demonstrating that the numbers in Table 1 are plausible. One way to demonstrate a forecast's plausibility is to discuss and defend the underlying methodology. The main part of the present document is being provided for this purpose. However, most readers cannot be expected to pore through such material at the requisite level of detail, so the discussion here will take another tack. This will involve looking at the forecasted magnitudes from a regional perspective and forming some comparisons with data from other sources. An advantage

in this regard is that the figures for the Route 73 corridor are part of a complete set of regional forecasts that can be evaluated at multiple geographic levels.

The Charlotte region addressed by the present forecasting framework includes ten full counties in North Carolina, a small portion of one other North Carolina county, and five counties in South Carolina. (These areas and the sub-county districts that also enter the forecasting process are shown later in Figure 2.) A forecast has been developed for the region as a whole using an economically driven model. It calls for a continuation of rapid population growth, from just under 2 million persons in 2000 to nearly 3.5 million persons in 2030. The first question to be asked is whether this forecast – from which the Route 73 corridor numbers ultimately derive – is realistic.

Table 2 addresses this question by comparing the forecasted regional population levels with the magnitudes that would be obtained simply by extrapolating past ratios of regional population to U.S. population. The first column describes past and future U.S. population (mid-year values in thousands), with the future values consisting of official Census Bureau projections. The table then shows: past regional population; past ratios to U.S. population; future ratios based on straight-line extrapolation of the 1990 and 2000 values; and forecast magnitudes based on the extrapolated ratios. The last two columns then compare these magnitudes with the actual, model-based forecasts for the region.

Table 2 shows that the forecasted population for the region as a whole is just 1.9% higher in 2020, and 4.5% higher in 2030, than the values yielded by extrapolating past relationships between regional and national population. The lower part of Table 2 presents similar computations for the region's ten counties in North Carolina (which contain more than four-fifths of its population). In this case the differences work out at 0% in 2020 and 1% in 2030. Thus the detailed economic forecasting process discussed later has done little to modify the findings obtainable from simple extrapolation.

Other comparisons here make use of population projections from the North Carolina

Table 2. Comparison of Actual and Hypothetical Forecasts for Charlotte Region

	Population, w. Census Projection for U.S.		Ratio, Regional Pop. to U.S. Pop. (000)		Future Regional Pop.		
	U.S. (000)	Region	Actual	Extrap.	Based on Ratio	Actual Forecast	% Difference
Entire Region							
1990	249,623	1,581,866	6.3370				
2000	282,339	1,986,903	7.0373				
2010	309,163			7.7376	2,392,170	2,383,793	-0.4%
2020	336,032			8.4378	2,835,384	2,890,564	1.9%
2030	363,811			9.1381	3,324,546	3,473,294	4.5%
NC Portion*							
1990	249,623	1,283,480	5.1417				
2000	282,339	1,637,001	5.7980				
2010	309,163			6.4543	1,995,437	1,977,749	-0.9%
2020	336,032			7.1106	2,389,402	2,389,289	0.0%
2030	363,811			7.7670	2,825,706	2,854,012	1.0%

* Excluding 50-sq.-mi. part of region in SE Catawba County.

State Data Center (SDC). The State Data Center projects the future population of all North Carolina counties using familiar cohort-survival projection methods. These involve computing birth, death and net migration rates from past data and assuming that similar rates will hold in the future. The SDC projections provide a useful benchmark for evaluating other forecasts because they build upon historical data in an unambiguous and widely accepted manner. What matters for their comparative use is that SDC estimates and other cohort-survival projections do not take into account three factors: 1) the role of economic drivers as possible sources of divergence from past demographic trends; 2) the possibility of interactions among counties (such as spillover of growth from one county to another); and 3) the constraining influence of land availability, i.e., the fact that each county has a fixed amount of land and hence a diminishing supply of opportunities for further development. Comparisons can thus indicate how much impact is being attributed to these factors by other forecasts.

Table 3 compares the SDC projections with the present population forecasts (summed across counties in both cases) for the entire North Carolina portion of the Charlotte region. In an area of this size, the last two factors mentioned above should not matter much. Accordingly, the two sets of estimates are very similar. The numbers generated by the present forecasting framework are slightly below the SDC projections through 2020 and exceed the SDC figure for 2030 by only 1.5%. This finding confirms again that the results offered here are within a reasonable range at the region level.

Significant differences emerge below the region level due to the abovementioned factors, especially land availability and interactions among counties. The upper portion of Table 4 compares the SDC projection with the present forecast for Mecklenburg County alone. The figures provided include ten-year increments as well as percent differences between the estimates. The two sets of predictions for Mecklenburg are also depicted graphically in the upper-left panel of Figure 1 on page 6.

The SDC projection calls for the Mecklenburg population to rise by steadily increasing amounts, as if land availability would not constrain land development to any greater extent in future decades than in 1990-2000. The result is a 2030 population of nearly 1.32 million persons. In contrast, the present forecast recognizes the inevitability that Mecklenburg's growth will taper off, yielding a 2030 forecast of about 1.16 million persons. These figures differ by more than 12%.

It should be noted that land availability constraints tend to apply progressively, rather than allowing an area to grow with abandon until it hits a wall. The mediating mechanism is land value escalation, which deflects greater and greater shares of potential growth away from an area even while there are still large amounts of undeveloped land. For Mecklenburg County, reasonable forecasting procedures could yield a considerably faster

Table 3. Population of Charlotte Region, NC Portion

	SDC Projection	Present Forecast	Percent Difference
1990	1,283,480	1,283,480	
2000	1,637,001	1,637,001	
2010	2,012,275	1,977,749	-1.7%
2020	2,404,790	2,389,289	-0.6%
2030	2,811,388	2,854,012	1.5%

slowdown of population gains than that specified by the present forecast. (A study in 2000 by the present investigator predicted a much more abrupt leveling off of the county's population, though this resulted in part from the release of erroneous population estimates by the Census Bureau before the 2000 census results became available.) In any case, it is clear that the present forecast of Mecklenburg population is more realistic than the SDC projection and may even be on the high side.

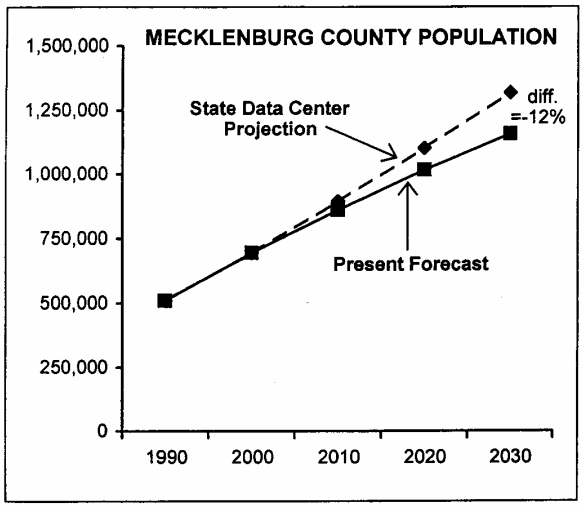
The people that Mecklenburg County can't accommodate will settle elsewhere in the region. This situation is depicted in the lower portion of Table 4 and the upper-right panel of Figure 1. According to the forecasts offered here, the population of the region's other North Carolina counties will rise by progressively greater absolute amounts in future decades (although these counties' annual percentage growth rate will be slightly lower for 2000-2030 than for 1990-2000). The resulting 2030 population is 13.6% above the sum of SDC projections for the given counties.

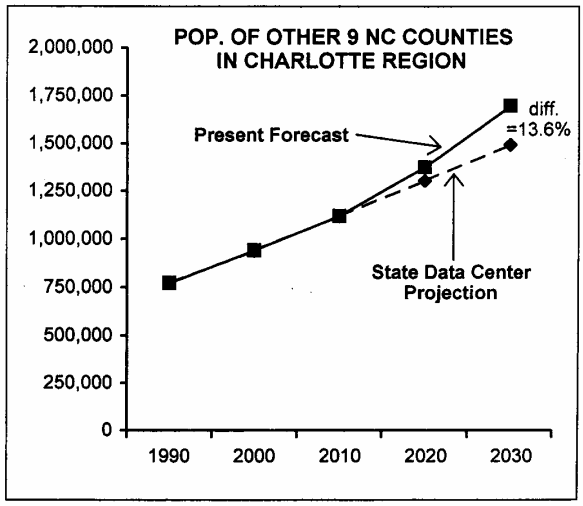
The central and lower panels of Figure 1 examine whether the present forecasts allocate reasonable amounts of growth to suburban areas, given the expected magnitude of population spillover from Mecklenburg. For the northern area consisting of Cabarrus, Iredell and Lincoln counties, the present study predicts a 2030 population 17.2% above the corresponding sum of SDC projections. (Iredell is included in this group because it is subject to largely the same growth forces as the Route 73 corridor even though it lies further north.) The northern area's excess relative to SDC is thus 3.6 percentage points higher than the excess predicted for all North Carolina suburbs combined. This gap is mainly due to the relatively low forecasts that have been obtained here for the western area – Gaston and Cleveland counties – on the basis of economic considerations. For the region's eastern suburbs (Union, Stanley and Anson), the present forecasts exceed the corresponding SDC projections by nearly 20% in aggregate, yielding a gap of around 6 percentage points relative to the suburban average.

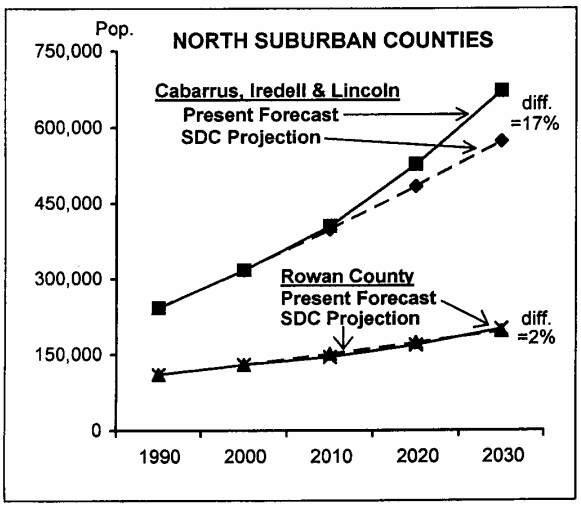
Table 4. Population Comparisons for Major Regional Components

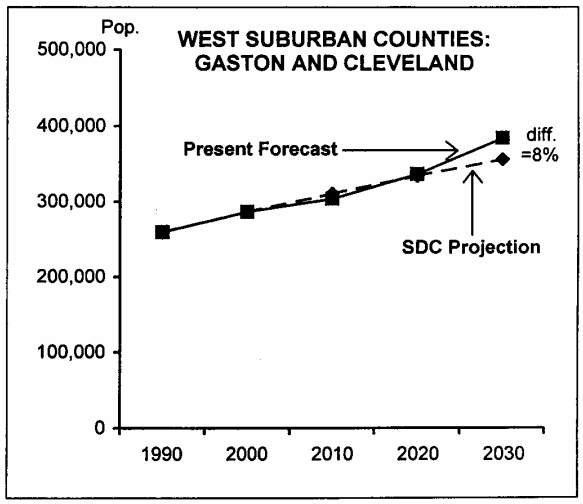
	SDC Projection		Present Forecast		% Difference
	Total	Increment	Total	Increment	(in Totals)
Mecklenburg Co.					
1990	511,433		511,433		
2000	695,454	184,021	695,454	184,021	
2010	894,288	198,834	859,864	164,410	-3.8%
2020	1,102,003	207,715	1,015,638	155,774	-7.8%
2030	1,317,738	215,735	1,157,311	141,674	-12.2%
Rest of Region (NC Portion)					
1990	772,047		772,047		
2000	941,547	169,500	941,547	169,500	
2010	1,117,987	176,440	1,117,885	176,338	0.0%
2020	1,302,787	184,800	1,373,652	255,767	5.4%
2030	1,493,650	190,863	1,696,701	323,049	13.6%

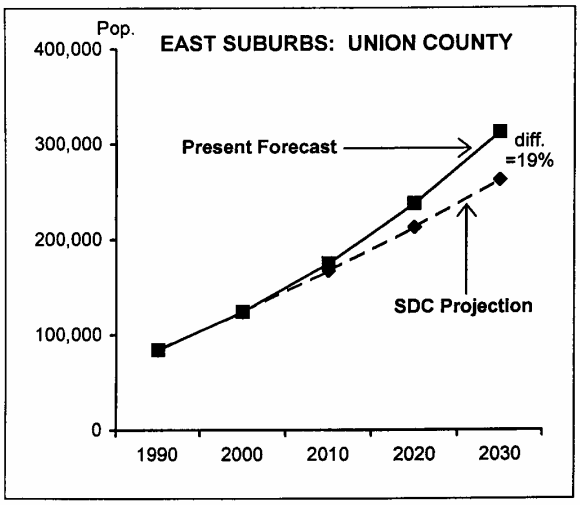
Figure 1. POPULATION FORECASTS FOR COMPONENTS OF THE CHARLOTTE REGION

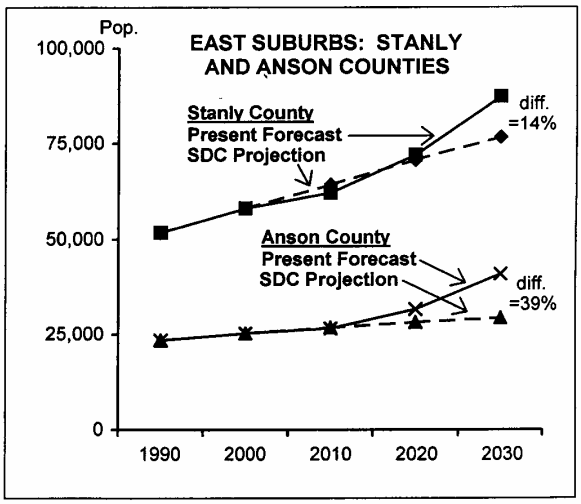












It is noted parenthetically that Figure 1 illustrates the predictive advantages of taking economic influences and spatial interactions into account. The present forecasts for Gaston and Cleveland counties acknowledge the impacts of recent manufacturing losses and likely future losses by falling below the SDC population projections for many years. But areas cannot keep on losing the same factories forever, and economies that are surrounded by growth will sooner or later restructure themselves, so the present forecasts eventually turn upward in a way that cohort-survival projections cannot. Similarly, the forecasts for Stanly and Anson counties follow upwardly concave patterns due to the expectation of rising population spillover from Mecklenburg and Union, a phenomenon that cannot be acknowledged when counties are addressed in isolation.

Figure 2 returns to the question of whether relatively high forecasts are reasonable for the region's northern and eastern suburbs. This figure is a map showing the region's counties plus the county subdivisions – referenced as "districts" – that have served as forecasting units in the modeling framework. (These are indicated crudely with dashed lines.) There are 46 forecasting districts including four outlying districts that consist of whole counties.

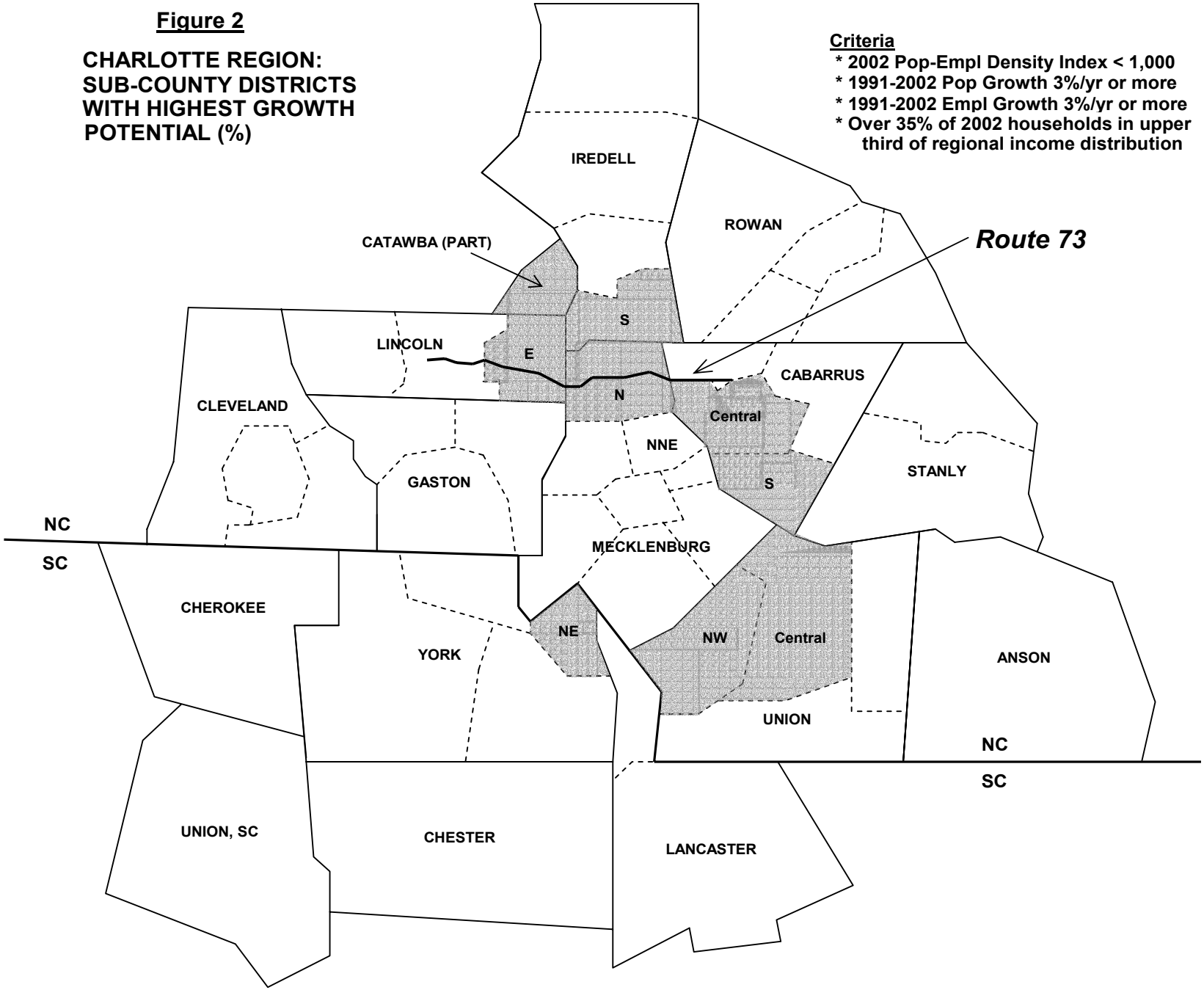
The shaded areas in Figure 2 are the districts that are highest in growth potential on the basis of current indicators. The criteria used to select them are listed in the upper right corner of the figure, and the relevant numbers are presented and explained on page A1 of this document's appendix section. The chosen districts are those favorable for growth in all four of the following respects: ample land still available for development; high recent population growth; high recent employment growth; and upper-income households accounting for a disproportionate share of total households. (Income is an important growth indicator because upper-income households confer status on residential neighborhoods and because a region's wealthier persons tend to be the ones who decide where business establishments will locate.) The choice among districts is relatively clear-cut. There are nine that comply with all four of the selection criteria, while only two of the others comply with more than two criteria.

Six of the region's nine districts that are highest in growth potential form a continuous band of territory north of Charlotte that overlaps substantially with the Route 73 corridor. The alignment of Route 73 crosses or touches three of these six zones. As for the remaining districts with high-growth designations, two are located in Union County and one in York County.

A bellwether for directions of growth in the region has been Mecklenburg County's north-northeast district (labeled "NNE" in Figure 2), which contains Harris Boulevard and its environs. From 1991 to 2002 this area developed at a phenomenal rate, achieving double-digit percentage gains in population and nearly double-digit gains in employment *per year*. (See page A1.) By some measures this district, not downtown Charlotte, now represents the epicenter of regional growth. But the retarding effects of limited land availability are in store for this district, which prevented its selection as an area of high future growth potential. Hence much of the growth pressure now focused there promises to move outward into northwestern Cabarrus and northern Mecklenburg – which is to say, into the Route 73 corridor.

Figure 2

CHARLOTTE REGION: SUB-COUNTY DISTRICTS WITH HIGHEST GROWTH POTENTIAL (%)



All present evidence says that the region has two dominant growth vectors, one pointing north-by-northeast out of downtown Charlotte and one pointing southeast into Union County. (A third vector of somewhat less strength points down I-77 into York County.) Notwithstanding the very large gains forecasted here for Union County, the prospects for the northern vector are arguably more robust due to the presence of two interstate highways and Lake Norman, plus the area's stronger existing complement of high-growth economic activities.

But still, one might ask, what must be assumed to get forecasts for the Route 73 corridor as high as those in Table 1? The long answer consists of the methodological discussion that weighs down the present document. It says, in effect, that the present forecasts have been obtained from a statistically calibrated model that takes into account the location of every activity relative to everything else in the region, measured in both absolute and incremental terms, while factoring in available land and past change in the given activity. But the short answer is that the corridor results offered here can be replicated using only one variable.

Suppose we go back to the SDC county projections and simply allocate their 2000-2030 population changes to smaller areas on the basis of how much land was available for development in 2002. Such computations are presented in a table that appears on appendix page A2. The counties in question are Cabarrus, Mecklenburg and Lincoln, and the allocation units are the portions of each county within the Route 73 corridor (by "area") plus the remainder of the county. Available land is estimated on the basis of total land area and the levels of population and employment already present. The formula that does the estimating is explained on page A2. It incorporates a parameter for which the most appropriate values vary among circumstances, but the crudeness of the formula is not pivotal to the demonstration as shown momentarily. What must be kept in mind about this exercise is that except for the available-land formula, the computations and results have no connection with any aspect of the present forecasting methodology.

The outcome is that, when SDC-projected population growth is allocated to areas inside and outside the Route 73 corridor strictly on the basis of available land, the total corridor population in 2030 works out almost the same as the forecast in Table 1, namely 300,583 persons versus 304,357 persons. The outcomes obtainable with realistic values of the available-land parameter range from 286,688 persons (6% below the present forecast) to 315,500 persons (4% above the forecast). This level of agreement can be interpreted as follows. The preconditions for rapid population gains in the vicinity of Route 73 already exist, embedded in the historical record and hence in the SDC projections. All that the Route 73 corridor needs to provide is land.

The particulars of this exercise can certainly be debated. For example, one can point out that the distance of northern Mecklenburg from downtown Charlotte may cause the land in this area to develop less intensively and/or less rapidly than Mecklenburg's available land at more central locations. On the other hand, one can note that the above exercise fails to acknowledge the strong eastward tilt of prospective growth in Lincoln County, hence understates the corridor's likely population gain in east Lincoln. In any case, when one asks the central question – Where are all the people going to go? – it is hard to avoid concluding that a big share of them will be going to the Route 73 corridor.

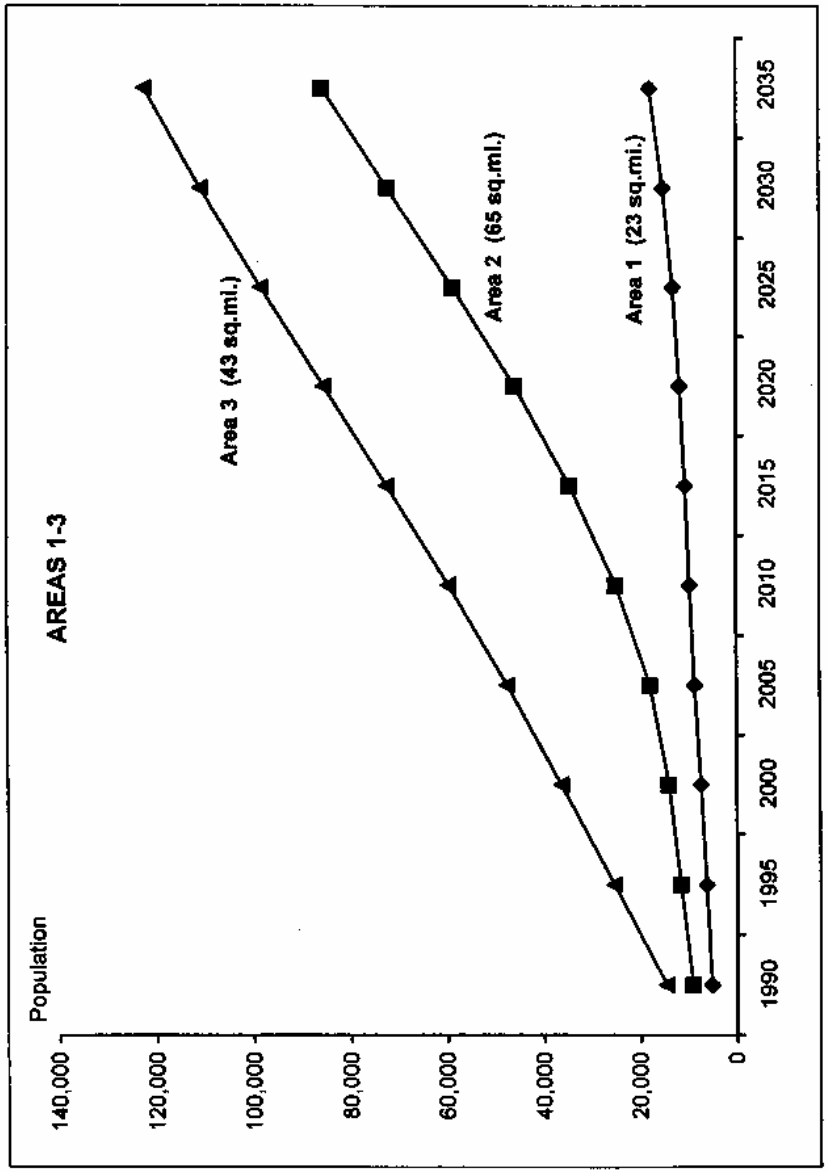
These demonstrations should be adequate to establish the reasonableness of the present

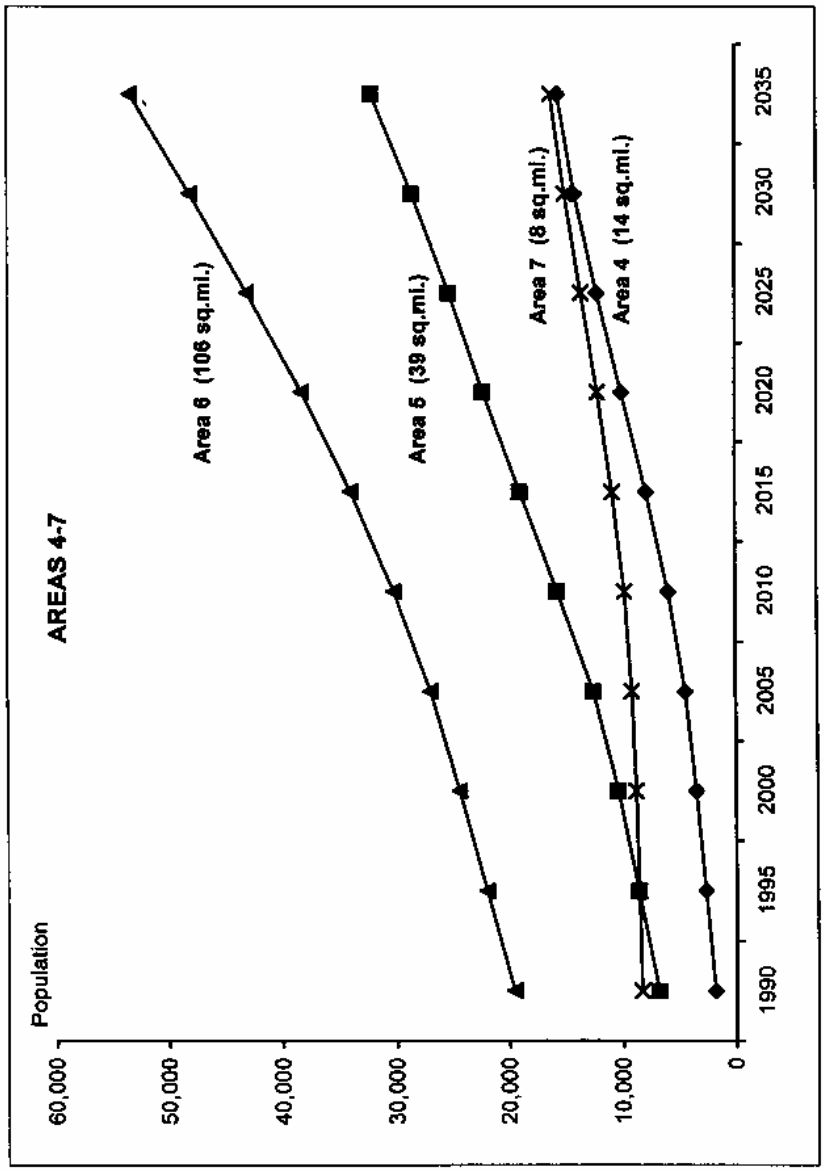
forecast for the Route 73 corridor as a whole. Any rigorous analysis of the region and its dynamics will yield conclusions somewhere in the same ballpark. So the focus now shifts to the seven individual areas within the corridor. The forecasts for these areas have been presented numerically in Table 1 and are depicted graphically in Figure 3 on the next page. The graphical presentations cover five-year rather than ten-year intervals and extend through 2035.

When addressing individual components of the corridor, the present forecasting methods push the envelope of reliability. The forecasts have integrity for what they are, but what they are is an incomplete reflection of the factors that can influence growth. The following remarks will say a word in their defense before describing their weakness.

The forecast for Area 2 – the territory that straddles the Cabarrus-Mecklenburg line – is the case most likely to inspire skepticism. This area's population is predicted to increase during 2000-2030 no less than fivefold: from 14,141 persons to 72,320 persons. Such an increase sounds outlandish until one considers that: A) Area 2 offers 65 square miles of largely virgin territory located in and adjacent to one of the hottest counties in America; B) the populations of two neighboring zones – Area 3 and Mecklenburg's north-northeast district – respectively increased during 1990-2000 by 149% and 228%, which are rates that would yield fivefold increases in just 18 and 14 years; and C) if Area 2 reaches 72,320 inhabitants as predicted, while acquiring a commensurate number of jobs, over two-thirds of its land will still remain undeveloped. (See Figure 4). The idea that a suburban district this size can go from being sparsely developed to one-third developed in a time period longer than a generation is by no means far-fetched.

Figure 3. POPULATION OF ROUTE 73 CORRIDOR BY AREA





The forecast for Area 2 and the less eye-popping numbers for other areas are in fact perfectly reasonable estimates of what the market will try to bring about in the Route 73 corridor. The problem is that growth can reflect determinants other than market demand. There are also "supply-side" factors. These tend to assume greater relative importance as one considers smaller geographic scales, and the subdivisions of the Route 73 corridor are below the size threshold at which they threaten forecast reliability.

Supply-side factors include all the circumstances that determine the amounts of land available at various locations for various kind of development, with given levels of infrastructure support and development suitability. In concept it is possible for a top-down forecasting procedure – i.e., one that allocates predetermined regional totals among smaller areas – to cover supply-side and demand-side influences in a balanced fashion. The present forecasting framework has a demand-side emphasis, however, due to its reliance upon statistical calibration of predictive relationships using large samples of empirical data. This approach rules out detailed consideration of supply-side factors because quantitative expressions of land use policy, infrastructure availability and natural land characteristics cannot feasibly be obtained for large numbers of observations.

The calibrated allocation model takes into account rough estimates of the land in each area that remains available for development at each point in time. Also, because it relies substantially upon extrapolation and its equations are pegged to reproduce 1990-2000 conditions exactly, the framework captures the influence of land use controls and natural land features insofar as they remain unchanged from the recent past. But the framework cannot express the impacts of changes in supply-side factors, such as new land use policies linked to new comprehensive plans, or new infrastructure projects of such scale that they transcend the average rate of infrastructure provision in the past.

The resulting forecasts are objective – which is what they gain from statistical calibration of relationships – but they are objective as demand-side estimates. Changes in supply-side conditions must be factored into them as a follow-on activity (if such changes can be predicted), or else must be accepted as a source of random error.

The corridor's Area 4, for example, might represent a worst case in terms of expected forecast reliability due to its small size and natural characteristics. Much of this 14-square-mile area lies along the Catawba River and reportedly has environmental constraints. If so, a combination of natural deterrents and environmentally based land use controls could turn away as much as half of the growth that the market would otherwise place in this area. The population of Area 4 would then increase from 3,523 persons in 2000 to only 8,828 persons rather than 14,133 persons in 2030.

Area 2 is nearly an opposite extreme (exceeded in this regard only by Area 6). Given that Area 2 has 65 square miles of largely developable land, draconian measures would be required to turn away half of the growth that market forces intend for this zone. Development diversion of such magnitude is not unachievable. In the Washington-Baltimore region, thirty years of extremely stringent land use controls have blocked well over half of the growth that would otherwise have occurred in certain districts of northern Baltimore County and northwestern Montgomery County, both exceeding 100 square miles. (Keeping such areas pristine has the effect of requiring more and more workers to in-commute from Pennsylvania

and West Virginia, but local objectives are served because the extra pollution goes elsewhere.) It is hard to believe that jurisdictions in North Carolina would ever become so restrictive, but big percentage impacts from supply-side measures cannot be ruled out.

Yet still one must ask: Where are all the people going to go? Land development that is diverted from one area will occur somewhere else, and market forces will try to place it as close as possible to the area of diversion. This is why top-down, demand-side forecasts become more reliable as larger areas are considered.

Rather than ending this discussion on a waffling note, there is a felt obligation to find a point at which we can make a stand. This requires moving back up the geographic scale, but not all the way to the corridor as a whole. Given everything known, we feel that definitive statements can be made about the two portions of the Route 73 corridor located east and west of the lake and the river – that is, the Cabarrus-plus-Mecklenburg portion and the Lincoln portion. These composite areas both measure about 150 square miles and are referenced respectively as the East Corridor and the West Corridor.

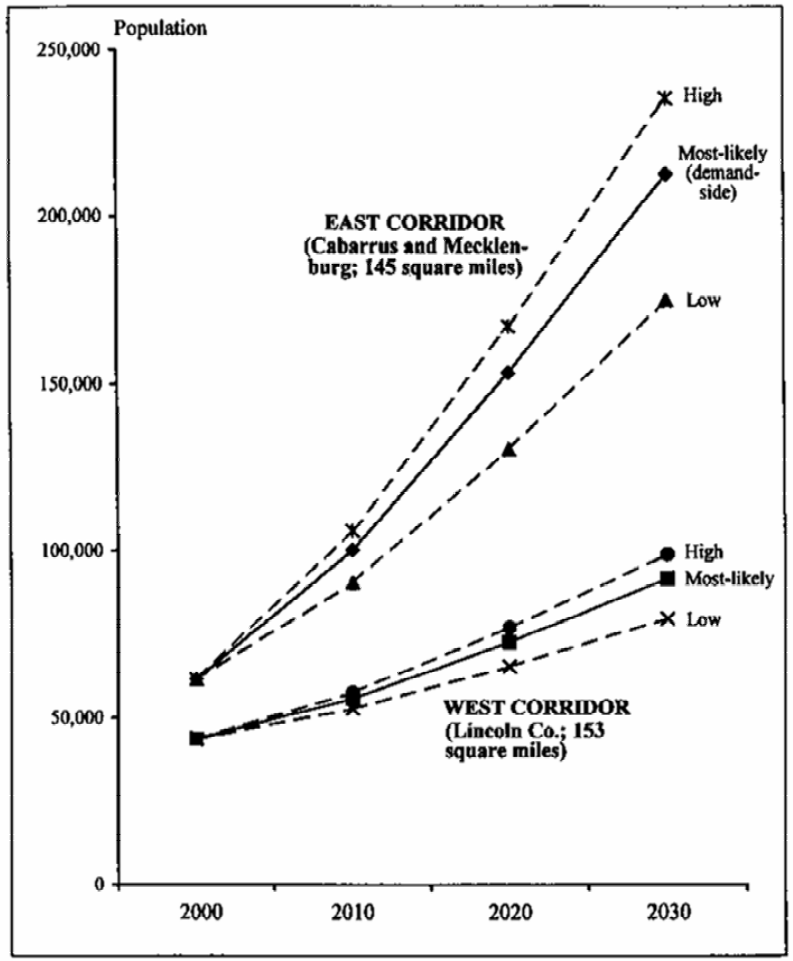
The given assertions are presented in Figure 4 on the next page, where they appear numerically on the left-hand side and graphically on the right. They consist of three sets of numbers for the East Corridor and three for the West Corridor: a most-likely forecast, a low forecast and a high forecast. In each case the first is a sum of the numbers already presented in Table 1. It is called a "most-likely" forecast because demand-side estimates can in fact be considered most likely for districts of this size in a region lacking commitment to large-scale growth management. The low and high forecasts have been computed from the most-likely numbers by subtracting and adding percentages of post-2000 population change. As shown at the bottom of Figure 4, the percentages allow for demand-side forecasting error, for the omission of supply-side factors, and for the strong probability that the foregoing errors won't both be extreme in the same direction. The percentages work out to –25% for the low forecast and +15% for the high forecast. The downside margin is greater than the upside margin because supply-side factors can push growth away from an area more easily than they can attract growth in excess of demand.

On the right-hand side of Figure 4, the most-likely forecasts are plotted with solid lines and the low and high forecasts are plotted using dashed lines. The latter are not meant to convey "probable" ranges, but bet-the-farm ranges. The population of the East Corridor in 2030 *will* be between 174,886 persons and 235,310 persons, while the West Corridor's 2030 population *will* be between 79,691 and 98,914 persons. (Never mind that your economist lamentably won't be around in 2030 to see this happen.)

The next section presents an overview of the forecasting methodology. Readers interested mainly in results might touch base with this section (pages 15-16 and 23-24) and then skip to Section VI for the full set of Route 73 corridor forecasts.

Figure 4. COMPOSITE POPULATION FORECASTS WITH RANGES

	Population 2000	2010	2020	2030	2030 Pop. Per Sq.Mi.
MOST-LIKELY					
East Corridor					
Population	61,591	100,183	153,359	212,651	1,467
Ten-Year Change	30,646	38,592	53,175	59,292	(41% de-
Ten-Year % Chg.	99.0%	62.7%	53.1%	38.7%	veloped)
West Corridor					
Population	43,648	55,685	72,712	91,706	599
Ten-Year Change	8,852	12,037	17,027	18,993	(17% de-
Ten-Year % Chg.	25.4%	27.6%	30.6%	26.1%	veloped)
LOW FORECAST					
East Corridor					
Population	61,591	90,535	130,417	174,886	1,206
Ten-Year Change	30,646	28,944	39,882	44,469	(34% de-
Ten-Year % Chg.	99.0%	47.0%	44.1%	34.1%	veloped)
West Corridor					
Population	43,648	52,676	65,446	79,691	521
Ten-Year Change	8,852	9,028	12,770	14,245	(14% de-
Ten-Year % Chg.	25.4%	20.7%	24.2%	21.8%	veloped)
HIGH FORECAST					
East Corridor					
Population	61,591	105,972	167,124	235,310	1,623
Ten-Year Change	30,646	44,381	61,152	68,186	(45% de-
Ten-Year % Chg.	99.0%	72.1%	57.7%	40.8%	veloped)
West Corridor					
Population	43,648	57,491	77,072	98,914	646
Ten-Year Change	8,852	13,843	19,581	21,842	(18% de-
Ten-Year % Chg.	25.4%	31.7%	34.1%	28.3%	veloped)



Determination of Forecast Ranges

Post-2000 growth is changed by a constant % relative to most-likely forecast.

	Low Fore.	*High Fore.*
Allowance for error in demand-side forecast	*-10%*	*+10%*
Allowance for omission of supply-side factors	*-20%*	*+10%*
Adjustment for unlikelihood of joint extremes	*+5%*	*-5%*
Difference in growth from most-likely forecast	*-25%*	*+15%*

Estimation of "Percent Developed"

Population per square mile is divided by an estimated "full development" density of 3,600 persons per sq.mi., obtained by assuming that 75% of developed land is residential and 75% of this is net residential land, yielding 360 net residential acres per square mile. With 4 housing units per net acre and 2.5 persons per unit, this gives 3,600 persons per sq.mi.

II. Overview of Forecasting Methodology

The forecasting approach applied to the Route 73 corridor was developed by the present investigator in a series of forecasting studies over the past three years. These projects addressed: the Metrolina region (2000); metropolitan Washington (2001); metro Atlanta (2001); the Asheville region (2001-02); the Charlotte region (2002); Henderson and Haywood counties, NC (2003); and the Washington-Baltimore region (2003). Each addressed demographic and economic variables on an integral basis, and each employed a top-down sequence in which forecasts were generated successively for the nation, the target region and one or more sets of component areas within the region. The most demanding technical task, which underwent various refinements from study to study, was the development of a model to accomplish the allocation of growth increments from the region to smaller areas.

The purpose of this section is to summarize the origin of the Route 73 forecasts for anyone who does not require a full methodological discussion. Also, this section is used to make some general observations about forecasting philosophy and interpretation of results (which will not be repeated later). Readers lacking methodological interest but wanting to see detailed results for the Route 73 corridor should read the next page and the last two pages of this section (23 and 24), then proceed to Section VI.

As applied in the present study, the top-down approach has involved five different levels of geography as shown below. The national and regional levels were linked by region-specific predictive relationships rather than a full allocation process. All other progressions from higher to lower levels of geography were allocation steps. The forecasting framework was originally designed so that final forecasts would be obtained by allocating variables directly from the region level to the district level, bypassing counties, but county-level forecasting was reinstated for the reasons noted later.

1) Nation

2) Region (territory centering upon Charlotte, larger than present MSA)

3) Counties (15 counties plus a small portion of another)

4) Districts (46 forecasting units including 42 sub-county areas and four whole counties)

5) Sub-districts (15 forecasting units defined to allow description of the 7 component areas in the Route 73 corridor)

The counties comprising the Charlotte region as presently defined are shown at the top of the next page. This territory substantially exceeds what is now the official Charlotte Metropolitan Statistical Area (MSA), for the reason that it is intended to cover the full extent of metropolitan development thirty years hence. The generous definition has turned out to be strategically important because the allocation procedures have assigned significant amounts of the region's growth after 2020 to the outlying counties. The region includes a 52-square-mile portion of southeastern Catawba County, even though Catawba is part of the Hickory-Morganton-Lenoir MSA, because this served the transportation-related purposes for which the framework was originally developed.

Counties Comprising the Charlotte Region

Charlotte MSA		Counties Outside MSA	
North Carolina	**South Carolina**	**North Carolina**	**South Carolina**
Cabarrus	York	Anson	Cherokee
Gaston		Cleveland	Chester
Lincoln		Iredell	Lancaster
Mecklenburg		Stanly	Union
Rowan		Catawba (part)	
Union			

The 46 districts that constitute the next level of geography have already been shown graphically in Figure 2 (on page 8). The number of districts in each county depends largely on its current level of urban development. Anson County and three of the South Carolina counties are undivided. Two counties are divided into two districts; three have three districts; five have four districts; and Mecklenburg County is divided into eight districts.

The Route 73 corridor project has required the addition of another level of geography because the corridor's seven component areas are all smaller than the 46 districts originally targeted by the forecasting framework. The corridor extends across five of the districts: two in Cabarrus County, one in Mecklenburg, and two in Lincoln. Only the Mecklenburg district is located entirely within the corridor. Furthermore, three of the corridor's component areas overlap district boundaries rather than falling within a single district. This situation has required the creation of 15 forecasting units that could be assembled into the seven corridor areas. These sub-districts are listed below under the names of their parent districts.

The baseline year for the forecasting process is 2002. This choice has helped to capture impacts of the recent economic slump, but required extensive data estimation.

Demographic variables have been estimated by using the Census Bureau's 2002 intercensal population estimates for counties to guide the extrapolation of detailed data from the 1990 and 2000 censuses. Values of industry-specific employment for 2002 have been obtained by using 2002 data from InfoUSA, a proprietary source, to update 2001 figures from the federal data system. Forecasts have been obtained for 11-year intervals from 2002 to 2035. Values of variables for all intervening years ending in 5 or 0 have then been interpolated by fitting third-degree polynomial equations to the 2002-35 data.

Forecasting Philosophy

In all applications, the forecasting approach has had two pivotal features: 1) treatment of the metropolitan region as a single unit for forecasting purposes, with the forecasted values of regional variables held fixed in all subsequent forecasting steps; and 2) reliance upon statistically calibrated equations to

Cabarrus NW	Cabarrus Central	Mecklenburg N	Lincoln East	Lincoln Central
Area 1 (part)	Area 1 (part)	Area 2 (part)	Area 5	Area 6 (part)
Area 2 (part)	Area 2 (part)	Area 3	Area 6 (part)	Area 7
Remainder	Remainder	Area 4	Remainder	Remainder

allocate regional totals (increments) among smaller areas. These features plus data availability issues determine most aspects of the methodology.

The focus upon the region as a unit follows largely from an assumption that long-term demographic trends are economically driven. That is, population and household changes are ultimately determined by what happens to employment. Though it may seem obvious to assume that people will follow jobs, this is not always true outside the U.S. For example, there are parts of Europe where people live in the same places for centuries and governments feel obliged to arrange jobs for them. In such circumstances it might be possible to forecast local population using simple projection methods and then to estimate employment on a derivative basis. But in America, jobs come first. Since a metropolitan economy in the U.S. is functionally integrated, and since many Americans compensate for economic determinism by living a long way from their workplaces, this means that the component areas of a metropolitan region are highly interactive. Hence no part of a metropolis can be forecasted reliably in isolation. Theoretically it might be possible to forecast all regional magnitudes and their spatial distributions simultaneously, but in practice the complexities of the situation make this impossible to do without relying heavily upon subjective judgment. So the best solution is to split the problem into two parts and address them sequentially. This means first treating the region as a unit and then worrying about where its gains of activity will go.

In the subsequent task of allocating regional magnitudes among smaller areas, the use of a statistically calibrated "model" brings advantages of objectivity, rigor and reproducibility of results. Objectivity is no small matter. Without the discipline imposed by formal quantitative methods, the forecasting process tends to become political, in a broad sense if not a narrow sense. People trying to imagine the unimaginable – i.e., what the world will be like decades in the future – can easily be drawn into focusing upon what should occur rather than what is most likely to occur. Urban planners and others with a professional or personal stake in shaping the future are particularly susceptible. (The strong preference of many planners for bottom-up forecasting comes from the flattering notion that they, through the design of land use controls and mass-transit facilities, will be telling future development where to go.) Forecasts can verge into being prescriptive rather than predictive, and while prescriptive forecasts may have their value, the present investigator is not in that business. So the approach described here mandates the use of allocation relationships established through formal analysis of empirical data. Statistical calibration confers advantages of realism as well as objectivity, because the interactions of urban activities over space are so complex and multifaceted that it is very hard to specify the existence, much less the magnitude, of relationships without recourse to historical evidence.

The question then is what geographic areas will serve as observation units for the calibration of predictive relationships. The ideal situation from an aesthetic standpoint is a study design in which all observation units are contained within the target region. A recent Washington-Baltimore project was able to utilize such a design due to the large size of that region. Among the 27 counties and independent cities comprising the Washington-Baltimore CMSA, the more populous counties were subdivided to yield a total of 78 districts. These districts formed the statistical sample for analysis of past data as well as the forecasting units for describing the future. But the intuitive appeal of this study design was purchased at the cost of two

major drawbacks. First, going below the county level to obtain an adequate statistical sample vastly increased the effort required for data assembly. While demographic descriptors were not problematic, obtaining industry employment figures for multiple years required the use of elaborate and error-prone estimation methods because the federal data collection system has never provided much information for areas smaller than counties. And second, even the 78 districts comprised a less-than-optimal statistical sample, though they well exceeded the number required by theoretical considerations. Given the complexity of linkages and the levels of random error encountered in urban modeling, only a triple-digit sample size can assure the development of balanced equations that spread predictive responsibility across an appropriate number of significant variables. In most regions this criterion cannot be met by subdividing counties more finely, because smaller districts become increasingly subject to influence by unique, unpredictable events, so the divisions add more noise than explanatory power.

These considerations have caused all other applications of the present forecasting approach to use statistical samples containing geographic areas outside as well as inside the target region. Using only whole counties (and independent cities) for this purpose has then made it feasible in terms of data collection to analyze samples of more than 150 observations. The allocation model involved in addressing the Route 73 corridor was calibrated to data for 227 counties in 29 separate metropolitan areas. These were the metro areas in the eastern U.S. that most resembled the Charlotte region in terms of present and future population.

Reliance upon external data for model calibration requires an assumption that the dynamics of urban expansion operate in largely the same fashion from place to place. This is not a bold assumption in the United States, where urban commonality has been noted and lamented for decades. (As the folk song said: "I've seen yer towns / They're all the same.") The uniformity assumption does not require that all metropolitan areas exhibit the same spatial patterns at a given point in time, but only that the relationships governing their development on the margin be essentially the same. It need not be true, for example, that most metro areas contain a network of outlying industrial cities like those in the Charlotte region. The statistical sample must only contain enough similar cases to yield equations that, when applied to a context of strong growth emanating from the core, can replicate Charlotte's potential for converting nearby towns into satellite cities. The Washington-Baltimore study provided a valuable demonstration that the relationships found repeatedly in cross-metropolitan analyses, such as the tendency of upper-income households to attract other kinds of growth, are also observed when the analytical focus is restricted to a single region.

From these aspects of the study design – i.e., the downward allocation of predetermined regional forecasts using equations calibrated to large samples of county-level data – follow the main issues discussed in the remainder of this section, such as the allocation model's reflection of demand-side versus supply-side factors and the question of how far down the geographic scale the allocation should extend.

National and Regional Forecasting

The given forecasting approach starts with the estimation of future national employment by industry. Simply adopting a national forecast from an external source might have advantages, but the federal government no longer engages in multi-decade employment forecasting and there are problems with using

proprietary forecasts.

All of the national forecasts prepared to date have extended through 2030. (Regional forecasts for 2035 have been obtained by extrapolation.) The national forecasting task draws upon two sets of data: a ten-year forecast of employment by industry from the Bureau of Labor Statistics (BLS), which is updated every two years, and the Census Bureau's long-term projections of the U.S. population by age and sex. The key assumption is that the national employment three decades from now will be constrained by the number of working-age persons available to staff the economy. The factual basis for this assumption is the rapid aging of the nation's population and the massive retirement of "baby boomers" scheduled to occur after 2010. The premise that 2030 employment will be demographically limited allows a total figure to be established for that year by applying extrapolated employment participation rates to the population projections for age-sex groups. The industry specific employment figures in the BLS forecast are then extrapolated forward, with modifications, and reconciled with the 2030 total to yield a profile of industry-specific national employment through that year.

Table 5 below summarizes the national forecast that underlies the present results for the Route 73 corridor. Gains in the nation's total population are expected to taper off substantially from the 13% rate achieved during the 1990s. The biggest influence on employment, however, will be the fact that well over half of all population growth after 2010 will be supplied by persons aged 65 and above. The number of persons aged 16 through 64 will then be rising by less than 3.5% per decade. So even though employment should increase relative to the population of prime working age, it will decline after 2010 relative to the population as a whole (as shown respectively by the last and next-to-last columns of the table). Based on present estimates, the result will be a drop in the ten-year rate of employment increase from 12.6% in 2000-10 to only 6.7% in 2010 20 and 5.3% in 2020-30.

Forecasts of regional employment and demographics are obtained by forming straightforward linkages between the regional economy and the national economy, under the abovementioned assumption that long-term regional growth is economically driven. The process starts with descriptions of the national economy and regional economy using a 42-industry classification scheme. (The industry descriptors utilized in these tasks and in many later allocation steps actually consist of worker earnings rather than numbers of employees, but only employment is referenced here to avoid confusion.) For each year from 1969 – the start of data availability – through the baseline year, the

Table 5. SUMMARY OF NATIONAL FORECAST

	Population (Midyear)		Total Employment			
	Number (000)	Percent Change	Number (000)	Percent Change	Per Capita	Per Person Aged 16-64
2000	282,339	---	135,208	---	0.479	0.739
2010	309,163	9.5%	152,218	12.6%	0.492	0.751
2020	336,032	8.7%	162,462	6.7%	0.483	0.775
2030	363,811	8.3%	171,003	5.3%	0.47	0.791

employment in each regional industry is split into “basic” and “population-serving” components through the application of an input-output table. Basic employment in each regional industry is then expressed as a ratio to total employment in the corresponding national industry. Simple linear regression is used to establish time trends in these ratios. The time trends are then extrapolated forward through 2030, and the resulting ratio values are applied to future national employment to forecast regional basic employment. Lastly, future population-serving employment is derived from basic employment using the input-output table, and the two industry components are combined for each industry and year to yield overall profiles of the future regional economy.

Demographic forecasts are obtained by finding a regional population profile for each future year that yields a labor force consistent with the expected employment level. This is done via cohort-survival projection methods, which start with the derivation of historical birth, death and net migration rates for the region. Using projected values of these rates, the cohort-survival tableau simulates the transition of the regional population across each future decade. Labor force participation rates are applied to the results, and the net migration rates in the tableau are scaled so that the projected number of employed persons in each year – after allowing for unemployment and net commuting – is equal to the forecast of total employment already established.

The use of input-output analysis to partition the regional economy renders the regional forecasting process somewhat complicated in execution. (There are actually many different input-output tables for different years, and their use involves forward and backward applications of matrix inverses.) But in substance the process is mechanical and does no more than implement an assumption that the past long-term relationships between regional economic drivers and national industries will continue to hold.

The previous section has looked briefly at the relevant regional forecasts from the Charlotte regional forecasting framework. As noted there, the 2030 population of the region as a whole works out 4% higher than the figure that one would obtain simply by projecting forward the past ratios of regional population to national population. For the region’s ten counties in North Carolina, the difference is just 1%, and a similar margin holds for the present forecast versus the sum of cohort-survival projections from the NC State Data Center.

County and District Forecasting

The allocation model responsible for the Route 73 corridor forecasts consisted of 35 equations: three to predict demographic variables and 32 to address employment in different industry groups. The three demographic variables in question were lower-income, middle-income and upper-income households (defined relative to the regional income distribution). As in other applications of the given forecasting approach, households became the leading demographic variables below the region level, while other demographic descriptors such as population were forecasted outside the allocation model using supplementary relationships.

Each equation was calibrated by using multiple regression analysis to “explain” the 1990-2000 changes in the given variable that were observed in the 227 counties comprising the study sample. The explanatory variables tested in each analysis dealt with: changes in all economic and demographic magnitudes during the prior decade; conditions prevailing at the start of the 1990-2000 interval; and

contemporaneous changes in selected variables besides the one under analysis. Most of the independent variables were complex expressions that described conditions outside as well as inside the area to which a value pertained. These were "proximity" measures in which a given change or initial condition would be weighted by an inverse function of distance to the subject area and summed across all areas in the region. An additional complication was that all types of explanatory variables but one were weighted by a function of available land in the subject area (which contained a parameter that was estimated as part of the calibration process). Composite predictors of this nature were needed to express the manner in which the urban development process balances the attractive force of existing activity against the dispersive force of land scarcity.

The dependent variables were arranged in four groups and analyzed in that order, with the same ordering followed when their equations were applied for predictive purposes. The groups were important because variables in a given group were eligible to serve as predictors of contemporaneous changes in the variables addressed later in the sequence. The variables in the first group pertained to economic sectors having a high degree of locational independence within a metro area, such as manufacturing, whereas the last group covered economic sectors with strong local-serving propensities such as retail trade. The household variables were placed in third position and thus could be predicted by some industries and serve as predictors for others.

A best version of each equation was selected for inclusion in the allocation model on the basis of statistical significance and other criteria. The last step in the calibration process consisted of applying the selected equations to "predict" the 1990-2000 changes in variables for all component areas of the study region. The discrepancies between actual and predicted values were then inserted into the predictive framework as local adjustment factors.

Forecasts were obtained by assembling 2002 values of all the relevant variables and applying the model recursively to three time intervals: 2002-13, 2013-24 and 2024-35. In each case the changes predicted for one time interval served as inputs to the next round of forecasting. All of the variables, relationships and procedures were set up so that the model accomplished an exact regional allocation, i.e., so that the final versions of forecasted quantities always summed to the pre-established regional totals.

The strengths of this model-based allocation approach include its objectivity, as already noted, and its ability to capture a wide variety of relationships and spatial interactions. Its weaknesses derive from the severe limits on types of variables that can feasibly be collected for large-sample model calibration. Because whole classes of variables must be omitted, the factors driving the model (other than regional totals) are limited to earlier values of the target variables themselves – i.e., to demographic and economic descriptors – plus functions of distance, land area and density. The most important omissions are factors that typically must be measured at a fine-grained level of detail (and often are hard to quantify in a relevant fashion) such as land use controls, natural land characteristics and availability of infrastructure. Since these factors mostly affect the supply of land suitable for development, and since the factors that allocation models do cover are mostly predictors of development demand, the limitations of such constructs can be summarized by calling them demand-side models.

Calibrated allocation models are nevertheless able to capture some supply-side influences due to two circumstances. First, such models can express the general role of land availability using crude measures that consider total land area (minus large-scale deductions like military bases, wetlands and parks) and existing development density. Second, because the model equations operate partly by extrapolation and are pegged to replicate past conditions in the subject areas, they implicitly cover all supply-side factors to the extent that the future impacts of these factors equal past impacts. For example, the allocation process in the recent Washington-Baltimore study yielded reasonable forecasts even for districts strongly affected by restrictive growth management policies, because these policies had been in place throughout the years consulted for model calibration. But what models of the given type cannot do is capture the influence of future changes in supply-side factors, such as exceptionally large infrastructure projects or shifts toward more or less stringent development controls. They basically assume that the tendency of public actions to restrict or encourage growth will resemble the conditions prevailing in the calibration period (at present meaning the 1990s).

Demand-side factors ordinarily determine the large-scale pattern of development in a region. Widely differing policy environments in Washington-Baltimore have managed to shift the long-term balance of growth between Maryland and Virginia, but supply-side effects on this scale are unknown further south. In North Carolina, county-level forecasts from a calibrated allocation model should ordinarily be reliable, to the extent that any forecast is reliable, with little or no adjustment for omitted supply-side influences. But supply-side factors gain in potential importance at progressively smaller geographic scales, so the question is how far below the county level a model application should extend.
Once an allocation model exists, obvious benefits can be gained by leveraging the rigor of this approach as far as possible. There are no theoretical reasons why equations calibrated to county-level data cannot be applied to smaller areas. (The calibration sample for the Charlotte model included independent cities and some other geographic units that were only a fraction as large as most counties, and the model's heavy reliance upon "proximity" variables as predictors served to assure that the estimated relationships would not presuppose observation units of any particular size.)

Furthermore, demand-side forecasts from an allocation model can serve useful purposes below the geographic scale at which their supply-side omissions become serious, so long as users acknowledge the nature of the forecasts and their prospective need for adjustment.

Another relevant consideration, however, is that reducing an area's size increases the likelihood that its historical data will be dominated by individual events and spurious influences. Such data aberrations can yield forecasts that are unrealistic even as demand-side estimates. So given this consideration along with the supply-side problem, recent studies have adopted a rule that any sub-county area used as a forecasting unit should either exceed 50 square miles in spatial extent or have a current population above 25,000 persons. The 46 districts ultimately selected for use in the Charlotte allocation model all exceeded 52 square miles or 33,000 persons.

County-Level Versus District-Level Allocation

The plan was to generate final forecasts by allocating regional growth directly to the

district level (although a county-level application of the Charlotte model was used in late 2002 to obtain preliminary outputs). County descriptors would then emerge simply as sums of district forecasts. Results obtained from direct region-to-district allocation had passed muster in prior studies and proved favorable again in the 2003 Washington-Baltimore project. However, the Charlotte-area forecasts obtained in the summer of 2003 from direct region-to-district allocation were found unacceptable. The aspect that seemed unrealistic was an excessive northward tilt in the region's long-term growth pattern, both demographic and economic.

The emergence of a region-to-district allocation problem in the Charlotte case probably had to do with the magnitude of regional growth plus the asymmetrical pattern of recent development. The asymmetry is illustrated below in Table 6, which divides the close-in areas around the central Mecklenburg district into three zones and presents values of the four growth indicators used earlier in Figure 2 (on page 8). The North zone leads the West zone and the South & East zone in terms of all four criteria. The margins are small for density (which is inversely related to growth potential) and upper-income households, but very large for the two measures of recent growth. Given this impetus, the model went somewhat overboard in allocating future gains to the North.

The solution was to develop a hybrid forecasting tableau. This approach was based on region-to-county allocation, but it reflected intra-county growth patterns by using sums of district-level variables as inputs to the county forecasts. Most of these variables were land-weighted "proximity" measures, and their nonlinearity caused the substitution to make a substantial difference. (The allocation equations per se were the same in all model applications.) The county level forecasts obtained from this tableau served as controls upon the district forecasts. That is, the final district results consisted of county forecasts allocated to districts in proportion to the independently derived values of district variables. This strategy of embedding a district-level model within a county-level model seemed to impose an appropriate degree of restraint upon the forecasted regional development pattern.

Sub-District Allocation

Given their small sizes, the component areas of the Route 73 corridor were known to be pushing the envelope of reliability for top-down, demand-side forecasting. The economist's consulting agreement stated that bottom-up inputs would be incorporated in the corridor forecasts if permitted by the timing of the project relative to other activities, but that otherwise only top-down numbers would be provided. When the time came for delivery of forecasts to support conceptual design of Route 73 alternatives, the economist had

Table 6. DESCRIPTORS FOR MAJOR ZONES AROUND CENTRAL MECKLENBURG

	West	South & East	North
Land Area (Sq.Mi.)	468	662	441
Growth Indicators:			
Density Index	817	994	804
1991-2002 Pop. Growth	22%	43%	76%
1991-2002 Empl. Growth	24%	29%	87%
Upper-Income HH Share	32%	44%	45%

Area Definitions:
West: Gast E & SW; Meck NW & SW; York N
South & East: Cab S; Meck ENE, E & S; Union NW & Central; York NE
North: Cab C & NW, Ire S; Linc E; Meck N & NNE

seen only a few bottom-up numbers that were months away from reconciliation with top-down forecasts. Hence the results offered here are strictly products of the top-down forecasting sequence, with the one exception noted momentarily.

The above text (page 16) has described the 15 sub-districts required to translate outputs for the region's five relevant districts into forecasts for the seven component areas of the Route 73 corridor. This translation was accomplished by turning the hybrid forecasting tableau just discussed into a three-level framework, with a sub-district model embedded in a district model embedded in a county model. Values of predictors based on the model equations were generated at all three levels, but unlike the relationship between the district and county predictors, there was no feedback from the sub-district level to the district level. The only linkage was a top-down allocation of district results to sub-districts in proportion to the model-based predictions for the latter. The numbers were then summed as appropriate to yield forecasts for the seven corridor areas.

One after-the-fact adjustment of the numbers has occurred in response to inputs received during the review process. The failure of the top-down forecasting procedure to acknowledge the impacts of special infrastructure projects has been judged a critical weakness in eastern Lincoln County, where the upgrading of Route 16 to a freeway will clearly yield "extra" growth increments. To correct for this situation, the population predicted by the top-down model for area 5 in 2035 has been advanced to 2025, and the forecast for Area 6 has been advanced from 2029 to 2025. The forecasts for other years and demographic variables have been raised accordingly. These adjustments – involving 8.794 to 10,898 persons in 2025-2035 – have been compensated by deductions from the forecasts for Union County, NC, which were previously believed to be on the high side. (The deductions were allocated among the four Union districts in proportion to post-2002 growth.) These changes are incorporated in all the figures presented in this report.

Overview of Regional Growth

The Charlotte region as presently defined consists of fifteen counties plus a fraction of one other county. These areas have already been listed in Section II.

Table 6 describes the region's population and gives three measures of 1990-2000 population change: absolute population gain, share of the region's total gain, and compound annual rate of change. Rather than addressing all counties individually, this table presents data only for Mecklenburg County and the region's "inner ring" and "outer ring." (The inner ring is defined as Cabarrus, Gaston, Union and York counties, while the outer ring covers the rest of the region.) The lower portion of the table offers some comparison data for the Atlanta metropolitan area.

Table 6. SUMMARY OF REGIONAL POPULATION GROWTH

	Population		Population Change		Compound Annual Rate of Change
	1990	2000	Number	Share	
Charlotte Region:					
Mecklenburg Co.	511,433	695,454	184,021	45%	3.1%
Inner Ring	489,736	609,719	119,983	30%	2.2%
Outer Ring	580,697	681,730	101,033	25%	1.6%
Total	1,581,866	1,986,903	405,037	100%	2.3%
Atlanta Metro Area, 1970-2000:					
Fulton Co.				9%	1.0%
Inner Ring*				59%	3.4%
Outer Ring**				32%	4.0%
Total				100%	2.9%

* Defined as Clayton, Cobb, DeKalb, Douglas and Gwynnett counties.
** Equals the 14 other counties in the Atlanta MSA as defined since 1980.

As applied in the present study, the top-down approach has involved five different levels of geography as shown below. The national and regional levels were linked by region-specific predictive relationships rather than a full allocation process. All other progressions from higher to lower levels of geography were allocation steps. The forecasting framework was originally designed so that final forecasts would be obtained by allocating variables directly from the region level to the district level, bypassing counties, but county-level forecasting was reinstated for the reasons noted later.

The counties comprising the Charlotte region as presently defined are shown at the top of the next page. This territory substantially exceeds what is now the official Charlotte Metropolitan Statistical Area (MSA), for the reason that it is intended to cover the full extent of metropolitan development thirty years hence. The generous definition has turned out to be strategically important because the allocation procedures have assigned significant amounts of the region's growth after 2020 to the outlying counties. The region includes a 52-square-mile portion of southeastern Catawba County, even though Catawba is part of the

An unusual feature of the Charlotte region is that its central area – referring to both Mecklenburg County and Charlotte per se (which contains over three-fourths of the Mecklenburg population) – has been growing much faster than its suburbs. During the 1990s Mecklenburg County captured 45% of the regional population gain, as compared with 30% and 25% shares for the inner and outer rings, and outpaced the rings in terms of growth rates by 0.9% to 1.5% per year. This was a nearly unique situation in the eastern U.S., equaled only by Wake County in the Raleigh-Durham-Chapel Hill area.

Metropolitan Atlanta – used here as a convenient basis of comparison – has represented an extreme in terms of overall growth, but has exhibited the usual geographic pattern of expansion. This pattern is that a metro area's inner ring captures the largest absolute population gains, while its outer ring achieves the highest percentage growth. Meanwhile its central county lags far behind in both respects. Metro Atlanta followed this pattern throughout the last three decades (described collectively in Table 6). The fact that Fulton County gained population at all was largely due to the county's highly elongated shape, which preserved the extremities for recent development.

The Charlotte region has differed from the norm in having not only a fast-growing central county but also a relatively slow-growing outer ring. During the 1990s, while the region as a whole was exceeding the national population growth rate by over a percentage point per year, the region's outer ring was less than 0.4% above the U.S. rate. In part this finding reflects the inclusion of some presently nonmetropolitan counties in the Charlotte region, but it still represents a significant difference between the study area and many other fast-growing districts such as metro Atlanta.

The archetypical pattern of U.S. urban growth is outward expansion into a thinly populated hinterland, driven by centrifugal forces involving relative land value and land availability. The Charlotte pattern tends instead to involve a coalescence of formerly disjoint communities under the influence of growth forces emanating from the core. Mecklenburg County is surrounded by small towns and cities that have always had their own hinterlands and their own sources of economic support. Urban expansion is now linking these areas to Charlotte and each other, in addition to creating new communities from scratch.

The fourteen counties comprising what we have called metro Atlanta's outer ring had an average of fewer than 25,000 inhabitants in 1970, when the Atlanta area stood roughly where greater Charlotte stands today. In contrast, the Charlotte region's ten outer-ring counties (excluding Catawba) have an average population exceeding 50,000 persons. This difference reflects the presence of more substantial urban centers. Much of greater Charlotte's land development involves accretion around these traditional centers rather than amorphous sprawl of the Atlanta variety. The fact that metro Charlotte is building upon an existing urban network explains the relatively slow growth of its outer ring in two ways. First, the relatively high initial populations of its outlying counties moderate the percentage changes produced by spillover growth from other areas; and second, the overall employment gains achieved by these counties are limited by their traditional dependence on slow-growing industries. The latter fact refers in particular to dependence on the textile industry, which was the largest source of manufacturing jobs for all but two of the Charlotte region's counties in 1990, and all but three in 2000.

The expansion of the Mecklenburg County economy during the 1990s was highlighted

and to a major extent catalyzed by the explosive growth of banking activity in the county, which involved the evolution of NationsBank (now Bank of America) and First Union (now Wachovia) into financial institutions of global stature. On the other hand, the banking sector per se accounted for only a little over 10 percent of the county's 1990-2000 gains in employment and earned income, and 17.5 percent of its gain in "final demand" as defined below. The business services industry created 2.6 times as many new jobs as the banking sector. Banking was also well exceeded in job creation by three composite industry groups (namely trade, finance-insurance-and-real-estate other than banking, and services besides business services). The implication is that Mecklenburg's rapid economic growth promises to resume after the present slump even though the 1990s experience in banking can hardly be repeated. To some extent this continued growth will involve a filling-in of the new economic role pioneered by the bankers – i.e., a further acquisition of accountants, lawyers, consultants and other professionals linked to big-time finance – but it will also reflect myriad other sources of momentum that still operate throughout the county economy.

The two important points here are that: A) the Charlotte region promises to keep growing rapidly; and B) Mecklenburg County will only be able to accommodate so much of this growth. The 1990s situation in which Mecklenburg absorbed the lion's share of regional population and employment gains cannot continue, simply because Mecklenburg has a fixed supply of land. Mecklenburg captured over 45% of the region's additional population during the 1990s, but according to the forecasts described later will only be capturing 33% a dozen years from now and less than 24% after 2025. The corresponding figures for employment change are 69%, 48% and less than 45%. What this means is that suburban development – the integration process mentioned above – will proceed faster in many areas than observers tend to expect from past trends.

Variables Used in Forecasting

An outline of the overall forecasting sequence has been given in Section II. The present introductory discussion is limited to some comments on data inputs.

The variables entering the forecasting process consist of demographic measures from the census and economic variables from those few sources that release data for counties and smaller areas. The latter variables are essentially limited to employment and earnings by industry. Beyond employment and earnings, nearly all statistics available at the county level or below either lack comprehensiveness (as is the case for data from the five-year economic censuses), or address limited subjects (e.g., building permits). The only other variables that come into play are land area and distance measures used in computing proximity variables for sub-regional allocation purposes. Parenthetically, the shortage of small-area economic data is one of the reasons why the process of allocating regional forecasts to smaller areas relies exclusively upon single-equation modeling. The variables like savings, investment, output and financial flows that drive national models are totally missing at the county level. In their absence, the burdens and limitations of simultaneous-equation modeling are unjustifiable.

The key demographic descriptors in the forecasting process are population by age/sex group and households by income. Regional forecasting focuses mainly on population, which is linked to the regional economy via

labor force participation rates. Households become the leading demographic variables in the sub-regional allocation process, with household distributions by income assuming particular importance. The final products of the forecasting sequence include various other quantities that are estimated outside the allocation model using supplementary relationships. Among these are households broken down by numbers of persons and autos per household; housing units classified by occupancy and tenure; and median household income and housing value.

On the economic side, employment and earnings are classified using the SIC industry code, even though all of the relevant federal data sources have now switched to NAICS, because every component of the forecasting framework relies upon historical information as well as data for recent years. Several detailed matrices have been developed to implement NAICS-to-SIC conversions, and various aspects of the methodology have been shaped to minimize errors from that source.

The forecasting sequence uses different numbers of industries at different levels, namely: 62 for national forecasting; 49 for regional forecasting (with a compression to 40 for input-output computations); and 32 industries for sub-regional allocation. The 49-industry classification is a slightly condensed version of the two-digit SIC code and is shown on appendix page A16. The 32-industry grouping differs from it primarily in failing to cover individual two-digit manufacturing industries. (Even though they are not covered by separate model equations, two-digit manufacturing industries are carried through the regional allocation process using industry-mix calculations.) Lastly, the final employment forecasts for sub-county districts are tabulated using an eight-category system relevant for transportation planning.

The definition of employment used throughout the forecasting process and the present report counts each worker only once, at his or her primary job. An area's total employment – i.e., number of at-place jobs – under this definition equals the number of workers living in the area, after any required adjustment for net commuting. This is the concept of employment used by the Bureau of Labor Statistics (BLS) when describing labor force, employment and unemployment magnitudes. Importantly, the one-job-per-worker definition yields employment magnitudes as much as 20% below the employment figures reported by the Bureau of Economic Analysis (BEA) in its Regional Economic Information System, which is the most comprehensive and hence most often-used source of small-area data. The difference comes from the fact that BEA statistics cover part-time as well as full-time employment. Any activity that yields self-employment income or a payroll tax deduction, no matter how small or short-term, is counted by the BEA as a job. Hence, definitional issues must be kept in mind when comparing the present results with employment magnitudes seen elsewhere.

Though employment is the ultimate concern, most forecasting steps in the present approach deal with economic activity denominated in terms of employee earnings (which include wages, salaries, tips and some fringe benefits such as employer contributions to health and retirement plans). The reason is that data from the BEA regional information system are essential for both regional analysis and sub-regional allocation modeling, and the BEA files describe earnings in much more industrial detail than employment. The process thus involves many points at which earnings are converted to employment or vice versa – not all of which will be mentioned – and the conversions relate BEA earnings to BLS employment, not BEA employment.

A further complication is that, despite the reliance upon BLS definitions, most of the employment figures used as input to the forecasting process are actually obtained from other sources (since the BLS does not routinely release county-level information). These sources consist primarily of: 1) the BEA regional information system; 2) County Business Patterns; and 3) InfoUSA. BEA numbers are used mainly for the manufacturing and government sectors, where the conversion factors required to obtain BLS-definition employment are usually close to unity. County Business Patterns (CBP) is a data series offered by the Census Bureau. It covers part-time employment but not self-employed persons, which means that CBP-to-BLS conversion factors can be above or below unity. The great advantage of CBP is its inclusion of establishment-size distributions that are invaluable in getting around disclosure regulations. (Federal law prohibits the release of data that would disclose – or even give hints about – the characteristics of individual establishments. As a result, employment figures for small areas and small industries are very often suppressed. Usable estimates can be obtained, however, from algorithms that squeeze information out of CBP size distributions.) InfoUSA is a proprietary source that reports employment for individual establishments. It has many liabilities, including a capacity for wild errors and a systematic tendency to under-report public employment. InfoUSA statistics are used because they can describe employment for any geographic areas, no matter how small, but the results are always pegged at the county level to numbers from the federal data system. Lastly, occasional use is made of statistics from state Employment Security offices, which can provide very up-to-date descriptions but have the problem of being sample-based.

The most serious data assembly problems involve employment data for sub-county areas in past years. The only historical statistics available from the federal system (not counting the fragmentary descriptions from five-year economic censuses) consist of County Business Patterns data for zip codes. At the zip-code level, CBP only provides total employment plus establishment-size distributions for individual industries, so almost all numbers must be estimated from the size distributions. (This process is not quite as shaky as it sounds, at least for areas with hundreds of establishments, due to the law of large numbers and the frequent ability to pin down the sizes of large establishments through recourse to county-level data.) Ideally, zip-code statistics are used only to estimate percent changes in industry employment over time, which can be applied to recent employment levels based on other sources. The historical descriptions for small areas back-calculated in this fashion are then summed and reconciled with more reliable county profiles. This procedure has been followed in the present investigation.

National Forecast

The process of forecasting national employment by industry has already been described in Section II. A total employment figure was obtained by assuming that the nation's long-term employment growth would be demographically constrained. Then an industry breakdown was derived by extrapolating a ten-year BLS forecast across the rest of the forecast period and reconciling the results with the total already established. Due to the acknowledgement of a demographic constraint and the use of a one-job-per-worker definition of employment, the resulting national employment totals for future years are lower than most projections prepared elsewhere. (See Table 5 on page 19.)

Notwithstanding the expected slowdown in employment growth after 2010, the national employment forecast is optimistic in its expression of faith that the American economy will retain an ability to employ the potential workers available. The numbers used later in the forecasting sequence have incorporated a pessimistic assumption, however, about the effects of the post-2000 economic slump. Economists often treat a recession as a temporary deviation from the long-term growth trend, meaning that it can be ignored in long-term forecasting so long as a recession year or recovery year is not used as the baseline for projections. But the present investigation has credited the recent slump with a permanent loss of growth relative to the national trend passing through 2000. After conversion of the national forecast from employment to earnings, the earnings magnitudes have been adjusted downward to subtract one year's growth from the earnings gain in each industry that would otherwise be expected to occur during 2000-2010.

Partitioning of the Regional Economy

In the approach applied here, regional forecasts are obtained by: 1) quantitatively linking the regional economy to the national economy; 2) projecting the regional-national linkages into the future; 3) applying them to the national forecast; and 4) translating the resulting regional magnitudes into full economic and demographic descriptions. The regional-national linkages are limited to economic variables, except in one area, and do not cover the whole regional economy. The approach basically consists of taking the regional economy apart, estimating future trends in the sectors considered to be its drivers, and re-assembling it to obtain aggregate descriptions. Much of the effort involves the use of input-output analysis to isolate the economic drivers, which are not whole industries as conventionally defined, and to establish their relationships with the rest of the economy.

Input-output models are basically expanded versions of the familiar economic base multiplier model, which says (when applied on the margin) that any independent economic stimulus in an area will have "ripple effects" yielding an overall growth increment larger than the original stimulus. Input-output analysis expresses multiplier effects on an industry-specific basis by using a table of purchase coefficients to trace the individual transactions required to support an industry expansion. In static terms, input-output modeling attributes all economic activity to a set of industry components that are collectively called "final demand." These are generally not whole industries but the estimated shares of industries that bring in revenue from the outside world. The shares assigned to final demand are typically large for manufacturing and other goods-producing activities and small to moderate for most population-serving functions (although such differences are fading in the post-industrial era).

An input-output table for the Charlotte region was obtained in 2000 from BEA, and the same resource has been utilized in the present study. The table is denominated in terms of earnings (which operate as surrogates for the output amounts that would directly describe inter-industry transactions) and has been extensively modified to enforce consistency with information from other sources. The modifications have yielded multiple versions of the table to describe the region at different points in time. This is essential in long-term applications of input-output because many input relationships have changed in the past and can be expected to change further in the future. (As an extreme example, the I-O coefficients expressing industry demands for business services have

increased more than sixfold on average between 1969 and 2002, and will rise another 50% by 2035.) The framework for input-output analysis thus includes ten different versions of the table for years between 1969 and 2002, plus a systematic method for generating future versions. Each version is a square 40-sector matrix covering most but not all of the industries in the 49-group classification referenced above.

Partitioning a regional economy into final demand and other activity can be accomplished by working "backward" through an input-output table (when the table takes the form of a matrix inverse rather than an array of input coefficients). The normal use of such a table is multiplication by a final-demand vector to determine total industry outputs. The table can also be used to infer final demands from outputs, however, by employing iterative procedures to home in on the unique final-demand vector that exactly generates the given outputs. Using a spreadsheet designed for this purpose, the present study has obtained final-demand vectors for all historical years covered by versions of the input-output table, then has estimated final demands for other years by interpolating industry shares. (In this and all subsequent steps, both final demand and output have been denominated in terms of earnings.) After final demands for future years have been estimated via linkages to national industries, conventional "forward" applications of input-output are used to obtain overall descriptions of the future regional economy.

By convention, input-output models treat all government activity as final demand, but in fact most local government functions and some state and federal functions play driven rather than driving roles, to no less an extent than sectors like retail trade. Hence the present study has divided the three levels of government into "endogenous" and "exogenous" components on the basis of various factors. Endogenous government is linked by an empirical relationship to conditions within the region, while exogenous government is treated like a final-demand sector.

In these and all other forecasting steps involving monetary amounts, the amounts are expressed in constant 1999 dollars. Using 1999 as the reference year for inflation adjustment is a convention based on the fact that household income distributions from the population census are expressed in 1999 dollars (because census respondents were asked in April of 2000 to describe the incomes they received in the previous calendar year).

Forecasting of Final Demand

Regional forecasts are obtained by linking final-demand earnings in each regional industry to total U.S. earnings in the same industry, so that future levels of final demand can be estimated from the national economic forecast. By developing estimates of earnings and final demand through 2002, the present study has obtained a thirty-four-year historical record for use in establishing the regional-national relationships, given the 1969 starting date of the BEA data source.

The steps involved in forecasting final demand are as follows. First, the value of final demand in each regional industry and each historical year is expressed as a ratio to total U.S. earnings in the same industry and year. Second, a simple linear time trend is fitted for each industry across the 34-year period of record (or a shorter period; see below). Third, these time trends are extrapolated into the future. Fourth, the ratios indicated by the extrapolated time trends are multiplied times national earnings in the respective industries for the future years covered by the national forecast. And fifth,

the resulting estimates of regional final demand are adjusted for consistency with the baseline values in a manner to be described.

The graphs on pages A3 through A15 in the appendix to this document show the historical values of final demand in the Charlotte region and the time-trend relationships linking these quantities to national earnings. The figures offer 37 sets of graphs pertaining to final demand (including exogenous government) plus one set addressing endogenous government and a final set covering total regional earnings. In each case the left-hand graph describes regional final demand (or other earnings) and the right-hand graph plots the ratios of these figures to the corresponding national earnings. The graphs cover only 37 industries rather than the 40 sectors in the input-output table because three pairs of input-output industries – agriculture and mining plus two pairs of manufacturing industries – have been combined.

The straight lines in the right-hand graphs on pages A3 through A15 are the statistically estimated time trends. The long-term strength of the Charlotte region's economy is readily apparent from the fact that the 34-year time trends for all but one of the 37 industries – textile products manufacturing – are upward-sloping, denoting gains in the region relative to the nation. It must be remembered, however, that the data points describe the portions of industries identified as final demand, not total earnings in the given industries. The explosive uptrends seen for a number of financial and service industries express the rates at which these sectors have become sources of basic support for the regional economy, not their overall rates of growth.

A preliminary forecasting exercise was conducted in late 2002 using versions of these graphs that incorporated less current data. It addressed all industries using time trends for the full 34-year historical period, even though there were cases in which quite different trends would have been obtained by fitting the lines to shorter periods of record. The rationale was a desire to avoid subjective judgments and keep the forecasting process as mechanical as possible, along with a belief that any unreasonable results would cancel out across industries. This strategy was later modified, however, based on a judgment that the resulting forecasts systematically overstated growth prospects in manufacturing. The region's manufacturing sector had shown an overall tendency to gain less rapidly relative to the nation in the late 1980s and the 1990s than in earlier years; and the later patterns were clearly more reflective of what could be expected in the future.

The final forecasts have therefore been based on the use of 20-year time trends – that is, relationships fitted to data for 1983-2002 rather than 1969-2002 – for all but three manufacturing industries. The 20-year trends are the shorter lines that appear in most of the right-hand graphs on pages A3 through A8. For three industries (paper products, printing & publishing, and rubber & plastic products) the 20-year trend lines are virtually indistinguishable from the 34-year trends. In all nine other cases the 20-year trends possess less upward slope than the 34-year trends, or else slope downward rather than upward. The three manufacturing industries for which 34-year trends have been used are textile products, electrical equipment and transportation equipment. For textile products a 20-year trend line would have hit zero when extrapolated to 2030, whereas using 20-year trends in the other two cases would have yielded unrealistically high rates of future growth.

Final demand forecasts for regional industries have been obtained by extrapolating trend

lines across the forecast period and applying the resultant regional-national ratios to industry earnings in the national forecast. This process has included an adjustment step wherein "forecasts" have been obtained from the trend-line equations for 2000 through 2002 as well as later years. The adjustment consisted of raising or lowering the constant term (A-coefficient) in each equation to make the average forecast for 2000 through 2002 equal the actual average value of final demand for those years. Pegging the equations in this fashion took care of situations wherein the trend lines failed to explain the most recent data points in the historical sample. The forecasts for later years were then obtained by using the pegged equations rather than the original equations.

Development of Overall Forecasts

The remaining calculations needed to obtain overall economic and demographic forecasts for the region are simple in concept but not in practice. The basic steps involve: 1) using conventional "forward" applications of input-output to translate the forecasted values of final demand for each future year into descriptions of total earnings by industry; 2) forecasting endogenous government earnings outside the input-output framework (which does not deal with the local-serving aspects of government); 3) converting the resultant economic profiles from earnings to employment using projected values of earnings per employee; and 4) finding the future regional population levels that yield the required total number of workers, given assumptions about net commuting into the region (which is expected to remain very minor).

Three circumstances complicate this process. First, the cohort-survival tableau that yields population projections given an overall level of net migration cannot be solved for employment. That is, it cannot be structured so that simply entering the number of workers required by the economy yields a description of future population by age and sex. Second, the treatment of endogenous government creates a feedback loop from the population forecast to the economic forecast. Thus the economic side cannot be finalized before dealing with demographics. And third, the derivation of earnings forecasts per se is complicated by a need to adjust the input output matrix so that the region's overall economic "multiplier" is held constant. All of these circumstances create situations in which solutions must be found by iteration. In each case a unique solution exists, but it cannot be found by solving the relevant equations analytically. Using iterative methods instead is not problematic since all the individual systems are linear (essentially meaning that the exact solution can be found in three tries), but the process as a whole is protracted because it involves an iteration within an iteration within an iteration.

Starting on the demographic side, cohort-survival modeling is a means of deriving population projections by looking at the transition of each age-sex cohort over time. A "cohort" refers to persons of one sex who occupy a given age bracket at one point in time (e.g., females aged 25 to 29 in 1990) and an age bracket advanced by "t" years at a time "t" years later (e.g., females aged 35 to 39 in 2000). Cohort-survival modeling rests on the truism that the number of persons occupying a cohort at the end of a time interval equals the number at the beginning of the interval plus three components of change: 1) births; 2) deaths (entering negatively); and 3) net migration of cohort members into or out of the geographic area under study. Births only affect the first cohort or cohorts (e.g., persons under age 10 when "t" equals 10), and deaths are mainly relevant for the oldest age groups, leaving net migration as the

principal component of change for persons in most age brackets.

The first step in constructing a cohort-survival tableau for a study area is quantifying the components of change for all age-sex cohorts across some historical interval. The common procedure is to draw upon the census for age-sex distributions of the population in the interval's beginning and ending years. Then births and deaths during the interval are estimated at the necessary level of detail by drawing upon all available sources of vital statistics, and net migration is obtained for each age-sex cohort by subtraction. The present study has executed this procedure for the 1990-2000 interval, using national as well as local data for guidance in allocating births and deaths across age categories. The pattern of net migration thus obtained for the Charlotte region is typical for a fast-growing urban area.

A cohort-survival tableau is converted into a "model" by making assumptions about the components of population change that allow them to be estimated for future years. In the present study, the births and deaths that occurred during the historical interval have been expressed as percentage rates, using average cohort populations in the beginning and ending years as divisors, and the operative assumptions have focused on future trends in these rates. (In the case of births, the divisors have pertained to females of child-bearing age, and the variations among rates have reflected differences in child-bearing propensity across age groups.) All birth and death rates have been projected into the future on the premise that rates will change in the same direction as during 1990-2000, but by annual amounts only half as great. This premise yields a further general decline in death rates and a continuation of the trend toward child-bearing at older ages.

In the case of net migration, the 1990-2000 values for age-sex cohorts have been expressed not as rates but as a percent distribution of total net migration (covering both males and females). The operative assumption is that the same percent distribution will hold in all future intervals. Given a cohort-survival tableau for a future interval that contains the appropriate birth and death rates and an age-sex breakdown of initial population, this treatment of migration means that a total net migration figure is the only input required to obtain a full population projection for the interval's ending year (which will serve as the initial year of the next interval). The only catch is that the solution must be found iteratively, because the linkage of births and deaths to average population across the interval makes them dependent upon quantities yet to be determined.

Endogenous government creates another complication because this sector is demographically driven and hence cannot be forecasted in advance. As already noted, input-output covers all government activity as a source of demand for other industry outputs, but none as an internally determined part of the economy. This arrangement is unrealistic because government – particularly local government – contributes importantly to every area's complement of nonbasic activity. The solution in the present study has been to designate a portion of government as endogenous and link it to the region's total population. As in other cases, the predictive relationship has been estimated on the basis of ratio values. It is shown graphically in the middle section of page A15. This arrangement creates an iterative step in the forecasting process because the endogenous government earnings associated with any given population scenario may, and generally will, yield a level of total employment that is inconsistent with the economic forecast on which the population scenario is based.

Last comes the need to control the regional economic multiplier that is imbedded in the input-output table. The multiplier is defined here (in static terms) as the ratio of total earnings to the sum of final demand and exogenous government earnings. It reflects the general level of interactivity within an area economy, and it can only be determined after-the-fact by generating and examining forecasts. The multiplier has a critical bearing on forecast magnitudes since it determines the overall growth yielded by any given gains in final demand, which means in the present scheme that it can shape the relationship between the regional economy and the national economy. Hence there is a need to avoid imparting any overall bias to the forecasts when modifying the input-output table to obtain versions for different years.

The resolution in the present study was to constrain the matrix modification process so that the implicit multiplier was held constant throughout both the historical period and the forecast period. The constant value (2.5816) was obtained as an average across the historical period in an initial phase of the economic partitioning process. This constant was enforced for individual years by scaling all of the off-diagonal elements of the input-output matrix (and the diagonal elements minus appropriate constants) by parameters that were specific to each industry and year. When creating versions of the table for future years, these parameters were extrapolated over time and imbedded in a routine that reduced the matrix adjustment process to the selection of a single parameter. The catch, again, was that solution values of this parameter had to be found by iterative methods because the input-output system with its adjustment step could not be solved analytically.

The outcome for each forecast year was a process of choosing initial values and then solving successively for population, endogenous government earnings, total earnings and total employment. This yielded another population profile, and the process was iterated until convergence. The loop from earnings back to employment involved the application of earnings-per-employee figures to the provisional earnings forecast and employment participation rates to the provisional population projection, with iteration to reconcile the resultant totals. The employment participation rates used in this process were assumed to change over time in parallel with national rates. The assumptions in both cases were that: the rates for both males and females aged 16 through 20 would hold constant; the rate for males aged 21-64 would decline half as fast as during the 1990-2000 decade; the rate for males aged 65-74 would rise by 10% per decade; and the gaps between male and female rates for both the 21-64 and 65-74 age groups would close at the same pace as during 1990-2000 (causing gains in the female 21-64 rate to exceed declines in the male 21-64 rate).

The final economic forecasting step consisted of expanding the 40 sectors covered by the input-output table back to the 49 industries in the main classification. This was accomplished by analyzing historical data to obtain predictive relationships for industry shares, then extrapolating the relationships forward and applying them to the forecasts for combined industries.

Overview of Regional Results

Table 7 below gives the forecasts of total population and employment thereby obtained for the Charlotte region. A table describing future employment by detailed industry is presented on page A16 of the appendix.

The region is expected to achieve strong gains in population and employment throughout the forecast interval, although it is never expected to equal the growth rates of 2.31% per year for population and 2.32% per year for employment that occurred during the 1990s. Total population is expected to approach 3.5 million persons by 2030 and reach about 3.78 million persons in 2035, up from just below 2 million persons in 2000. Total employment will rise from about 1.08 million jobs in 2000 (and under 1.07 million in 2002) to approximately 1.89 million jobs in 2030 and 2.02 million in 2035.

The average annual rate of employment growth for the current five-year period will be relatively low due to the post-2000 economic slump, but thereafter the region's rates of employment change should stay above 2% per year until late in the next decade. The pace of employment growth will then decline markedly as population aging – which will take hold somewhat later than in the nation as a whole – reduces the share of persons in the age groups with high employment participation. Population change will occur more evenly. The compound rates of population change will vary only between 1.81% and 1.93% per year through 2030, although the region's absolute population gains will steadily increase.

In case the growth forecasted for the Charlotte region seems frightening, Figure 5 on the next page may help to place it in perspective. Greater Charlotte has been and will continue to be a boomtown, but it will never be in a league with the growth leaders of the Sunbelt. This is shown by comparing the Charlotte region's growth trajectory with the population gains achieved by the three most exuberantly expansive metro areas in the southern U.S., namely Atlanta, Dallas and Houston. The left-hand panel of Figure 5 describes the population trends in these three comparison areas from 1970 through 2000, while the right-hand panel plots the Charlotte region's population from 1990 through 2035.

Table 7. FORECASTS OF REGIONAL POPULATION AND EMPLOYMENT

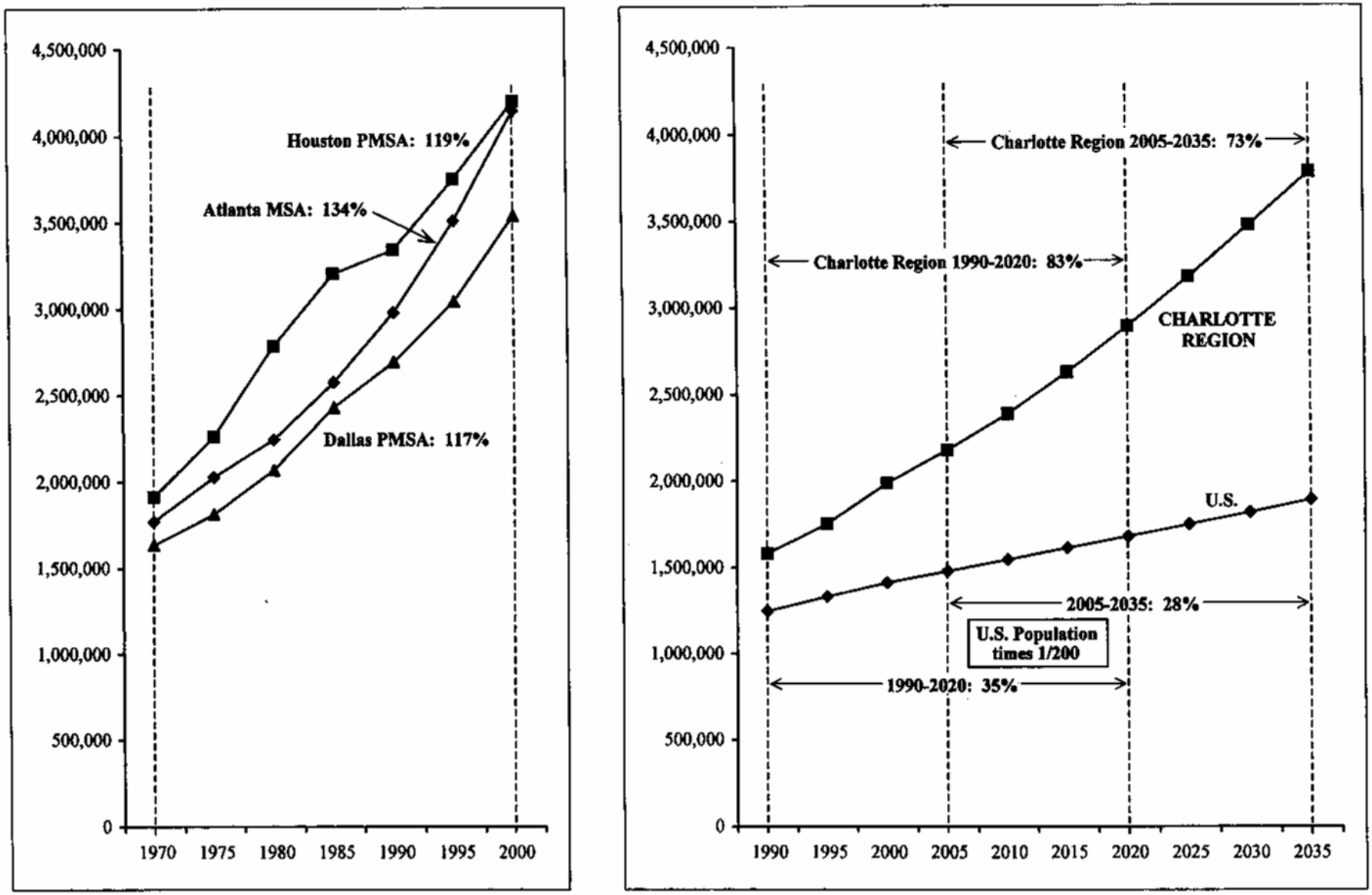
	Population			Employment		
	Forecasted Value	5-Year Change	Annual % Rate	Forecasted Value	5-Year Change	Annual % Rate
2000	1,986,903			1,081,764		
2005	2,179,103	192,200	1.86%	1,157,798	76,034	1.37%
2010	2,385,288	206,185	1.82%	1,289,746	131,948	2.18%
2015	2,624,430	239,141	1.93%	1,440,057	150,311	2.23%
2020	2,889,969	265,540	1.95%	1,593,245	153,188	2.04%
2025	3,175,350	285,380	1.90%	1,743,995	150,750	1.82%
2030	3,474,012	298,662	1.81%	1,886,992	142,997	1.59%
2035	3,779,397	305,386	1.70%	2,016,921	129,929	1.34%

The latter graph also includes the past and projected population of the nation as a whole (divided by 200). Both the horizontal and vertical axes of the two graphs are plotted at the same scales, although the right-hand graph covers more years.

The populations of metropolitan Atlanta, Dallas and Houston all more than doubled between 1970 and 2000. Dallas brought up the rear with a 30-year gain of 117%, while Houston recorded a 119% increase despite the oil crash of the mid-1980s. And comfortably – or uncomfortably – out in front was metro Atlanta with a 30-year population gain of no less than 134%.

Given the present forecast for the Charlotte region and its performance since 1990, the region's highest 30-year percent change in population will be an 83% gain for the period from 1990 to 2020. The 30-year percent changes for the region will then trend downward to 73% for the 2005-2035 interval. Thus, Charlotte will not come within thirty percentage points of the increases posted by the three monsters of the south. In fact, the Charlotte region's peak gain of 83% during 1990-2020 will only be midway between the national growth rate of 33% for that period and Atlanta's 30-year record of 134% for 1070-2000. So the future expansion of the Charlotte region will be robust but by no means unprecedented.

Figure 5. LONG-TERM POPULATION GAINS IN THE CHARLOTTE REGION, AS COMPARED WITH THE UNITED STATES AND THREE OTHER SOUTHERN METRO AREAS



Data Sample and Model Structure
Sections II and III have already described the geographic areas targeted by this investigation, the nature of the top-down forecasting sequence, the data inputs utilized, the development of regional forecasts, and the issues involved in allocating forecasts below the region level. (The strengths and weaknesses of the approach have also gotten some attention in Section I.) The present section addresses the specific methods used to obtain county-level and district-level forecasts and the results obtained in the course of implementing these methods. As noted previously, the principal task has consisted of statistically calibrating a regional allocation model using data for metropolitan counties located outside as well as inside the Charlotte region.

The observation units for the model calibration process were determined by selecting all metropolitan areas (MSAs and CMSAs) in the eastern the U.S. that had three or more counties and one to five million inhabitants. The size limits were chosen to place the Charlotte region – which has two million residents today and will approach four million by 2035 – in the middle of the observed range. The geographic limit, which excluded metro areas west of Kansas City, was chosen to maximize the general relevance of observation units to greater Charlotte. Another factor was that many metropolitan counties in the west were undesirably large in spatial extent and/or had large amounts of undevelopable mountain land (which would have been hard to acknowledge adequately in measures of land availability). Requiring metro areas to have at least three counties was simply a means of maximizing their statistical value, given that the allocation model would operate entirely by forming inter-county comparisons. These criteria yielded a collection of 29 metropolitan areas in a territory bounded roughly by Hartford, Tampa, San Antonio and Minneapolis.

The individual observation units were counties and political jurisdictions equivalent to counties, where the latter included St. Louis and eight independent cities in Virginia. (Richmond-Petersburg and Norfolk-Virginia Beach-Newport News, the two relevant Virginia metros, had some other independent cities that were combined with adjacent counties because BEA statistics were only available on this basis.) The chosen 29 metros contained a total of 227 observation units, hereafter referenced collectively as counties. These included the eight counties in the Charlotte region (other than Catawba) that are not officially metropolitan at present.

The allocation model was structured in such a way that all variables on both sides of an equation summed to zero for each metro area, as discussed below. In the regression analyses this feature caused a loss of one degree of freedom for each metro. Thus the maximum degrees of freedom equaled 227 - 29 = 198 minus the number of independent variables retained in a regression. This number was a maximum rather than a constant because, for reasons noted in the next section, the observations for one or more metro areas were deleted from the sample in nearly half of all analyses. The outcome was that degrees of freedom ranged from 159 to 196 and averaged 189. Given the characteristics of the data explained later, these numbers were not overly generous.

A common practice in small-area forecasting is to focus on changes in variables over time rather than absolute magnitudes, because explaining the operation of growth forces at the margin is easier than accounting for each area's entire development history. The present allocation modeling approach followed this convention and thus was devoted to the prediction of increments. This

meant that the model was calibrated to data for a recent time interval and forecasts were developed recursively by estimating changes over a series of future intervals.

Census data availability necessitated the use of 1990-2000 as the model calibration interval. Since past change was expected to be a strong predictor of current change, the 227-county calibration database included values of all area descriptors for 1980 as well as 1990 and 2000. The study design was then somewhat complicated by the use of a 2002 baseline year and the need to prepare forecasts through 2035. Given the incremental format and the 33-year gap between 2002 and 2035, the choice was to generate forecasts for three successive 11-year intervals: 2002-2013, 2013-2024, and 2024-2035. Hence the overall forecasting process involved time intervals of three different durations, namely ten years for model calibration, eleven years for forecasting, and twelve years (1990-2002) for expressing past-change variables as predictors of 2002-2013 changes.

The forecasting process was recursive in the sense that outputs from one round of forecasting would serve as inputs to the next. For example, the first round consisted of predicting changes in the target variables for the 2002-2013 interval. The results of this exercise were used to compute values of all variables for 2013, which then allowed the prediction of 2013-2024 changes in the second round of forecasting. The 2024 values enabled the third-round estimation of 2024-2035 changes and the computation of county descriptors for 2035.

Formulation of Variables

The functional form used to express the dependent variable in a regression analysis effectively determines the null hypothesis tested by the analysis. For example, if the dependent variable in a county-level economic analysis is employment in the banking industry – not expressed as a change – the null hypothesis is that banking employment equals a constant for all counties, plus some amount of random error. Such a case amounts to a straw-man null hypothesis because it is so easily rejected. The counties in almost any cross-sectional sample will vary a great deal in general scale (ranging in the present sample from Ohio County, Indiana, with 5,623 people to Harris County, Texas, with a population of 3.4 million), and the scale differences will be reflected in essentially all socioeconomic measures. This means that the banking variable just mentioned could be statistically "explained" by any area descriptor ranging from number of household pets to number of corporate scandals. Expressing the dependent variable as a simple absolute quantity stacks the statistical deck in favor of the regression's independent variables, whatever they might be. Avoiding this kind of bias should be the first requirement of cross-sectional analysis, yet the temptation to inflate statistical significance in this manner has conquered generation after generation of regional analysts.

The modeling approach applied here expresses all dependent variables in a functional form that creates a plausible null hypothesis. This hypothesis is that all counties in a metro area change at the same percentage rate. If the metro-area total for some economic or demographic measure increases by P percent over a time interval, the null hypothesis says that for each of the area's component counties, the change in this measure will equal P times the county's initial-year value (plus a normally distributed error term). Independent variables entering the regression equation can only achieve statistical significance by successfully predicting county deviations from

metro-average growth. Along with casting independent variables in a critical light, this formulation has the advantage of yielding tenable equations in cases where no independent variables are found significant, which sometimes happens. Future values of variables in this form are predictable by an allocation model because metro-area totals are available for all descriptors from the regional forecasting process.

The formula incorporating these features is shown below. The symbol X denotes an economic or demographic measure to be predicted by an equation, and the underlined version X stands for the metro-area total of the same measure. In each case there is a subscript indicating whether a value pertains to the initial year or the end year of the interval addressed by the equation. Since the calibration interval is 1990-2000, the initial and end years for dependent variables in regression analyses are always 1990 and 2000, respectively. When the equation is used to generate forecasts, the initial and end years are 2002 and 2013 in the first round, 2013 and 2024 in the second round, et cetera.

Dependent variable expressing relative change in measure X = Xend-year – (Xinitial year * Xend-year / Xinitial-year)

When an equation is used in forecasting, a prediction of the above quantity for a future interval is sufficient to determine a value of Xend-year , because Xinitial-year is known from the previous forecasting round and the regional totals have already been established. Variables computed from the above formula have the characteristic – shared by all independent variables as well, as shown below – that they sum to zero across the observations for each metro area. This means among other things that regressions are always run with no constant term (which would have a value of zero if included).

A quantity computed from the above formula is called a "dev-change" variable because its values reflect deviations from the regional rate of change. In the present approach, all independent variables entering a regression analysis are computed using the four formulas shown below. In two cases they are dev change variables and the formulas are the same as that already stated. The symbols X and X again stand for some economic or demographic measure observed at the county level. (These variables are computed similarly for areas smaller than counties when targeted in forecasting applications.)

Current dev-change. Computed in the same fashion as the dependent variable. Can be used as a predictor only if the given economic or demographic sector appears earlier in the forecasting sequence than the one being addressed by the equation. (See Section III.)
Past dev-change. Computed using the dev-change formula already stated except that "initial-year" refers to the start of the prior interval and "end-year" refers to its end (which is the initial year for the current interval).
Dev-share. The difference between a county's initial-year value of a measure and what the value would be if the county resembled its metro area in terms of the given sector's share of a larger whole. (For example, if the measure is number of households in an income category, the larger whole is total households.) Equals the following expression, where Y stands for the larger whole and metro values are underlined.

Dev-share (X) = Xinitial-year – (Yinitial-year * Xinitial-year / Yinitial-year)

Dev-mean. The difference between a county's initial-year value of a measure and the regional mean of the given measure.

equals the following expression, where N is the number of counties in the metro area.

$$\text{Dev-mean (X)} = \text{Xinitial-year} - (\underline{\text{X}}\text{initial-year} / \text{N})$$

The last two forms are sometimes called "initial" dev-share and dev-change variables because they describe conditions at the beginning of an interval. Two special circumstances apply when an independent variable pertains to the same economic or demographic sector as the one being predicted. First, in economic equations these are the only independent variables that ever refer to detailed industries (as opposed to the three aggregate industry categories mentioned below). And second, these are the only cases in which housing losses and industry-mix effects are deducted from Xinitial-year before further computations occur. The prior subsection has already mentioned that such deductions from Xinitial-year occur in the derivation of certain dependent variables.

Two other complications involve available-land weightings and equation divisors. In all independent variables except the dev-change case just mentioned, X does not actually refer to an economic or demographic measure per se, but to such a measure (or a proximity measure as defined below) times an available-land weighting. The next section describes the purpose of available-land weightings and the manner in which they are derived. These weightings are held constant at initial-year values when multiplying both Xinitial-year and Xend-year. Nevertheless they must be applied before dev-change, dev-share and dev-mean formulas are evaluated because they vary across observations for each metro area. The equation divisors are factors used to divide all variables on both sides of a regression equation in order to reduce heteroscedasticity problems, as is also explained in the next section. They do not affect the computation of independent variables (i.e., can be applied after the above formulas have been evaluted) because they assume a constant value for each metro area in each equation.

Specific Variables

The ultimate outputs of the forecasting process consisted of county or district employment by industry, but as noted in Section III, most intermediate forecasting steps were conducted in terms of worker earnings rather than numbers of employees. The earnings in question included wages, salaries and certain fringe benefits and were always expressed in constant 1999 dollars.

The allocation model addressed 32 industry groups, corresponding to the 49-industry classification used in regional forecasting except that all manufacturing activity were treated as a single industry. Manufacturing was not addressed in detail because obtaining complete county-level manufacturing profiles for all 227 counties would have required inordinate effort and because previous studies have shown that significant allocation equations were hard to obtain for detailed manufacturing industries. Better results were achievable by adjusting manufacturing totals for industry mix when applying the model for allocation purposes.

The 32 industries were grouped into three categories: "industrial" activity, producer services and consumer services. Section III has mentioned the importance of the groupings to the modeling sequence. Except in two cases, independent variables always referenced earnings in whole categories rather than individual industries.

On the demographic side, the allocation model only dealt directly with three variables, namely the numbers of households in three

income groups. Past studies had shown that all other relevant demographic variables could be estimated successfully on a derivative basis given their initial levels plus changes in households by income.

Households were grouped on the basis of relative income rather than absolute income. For each year covered by the model calibration database, all households in each metro area were assigned to three groups of equal size – referenced as the lower-income, middle-income and upper-income groups – on the basis of detailed income tabulations from the census. The household measures for individual counties then consisted of numbers of households in the three groups. Among the 227 geographic units covered by the sample, the city of St. Louis had the lowest 2000 income profile with 55% of all households in the lower-income group, 29% in the middle-income group and only 16% in the upper-income group. Hamilton County, Indiana had the highest profile with group shares equaling 17%, 26% and 57%, respectively. Middle-income households were more evenly spread across counties than the two extreme groups, with 2000 shares varying by only sixteen percentage points (from 26% to 42%).

A last introductory point involves proximity measures. These are predictors embodying the dictum that the three important things in real estate are location, location and location. For real estate entities ranging from a single land parcel to a whole county, what matters is relative location – i.e., where the land is located relative to everything else in the built environment. Relative location can only be expressed via composite variables that consider the entire metropolitan distribution of the influence ("attractor") under consideration and include weightings by distance from the subject area.

In the present study, each proximity variable involved an attractor consisting of households in one of the three income groups or earnings in one of the three industry categories. For a given county, the value of a proximity variable was computed by summing the values of the attractor across all counties in the given metro area, when weighted by an inverse function of distance to the county for which the variable was being measured. The inverse function was the reciprocal of adjusted inter-county distance raised to an exponent of 2 or 2.5. The distances were straight-line distances in miles between county centroids. The formula was as follows.

Proximity measure showing the influence of attractor Z on activities in county j =
Sum across all counties i (including i = j) of:

$$Zi / (Dij + Qj + T)P$$

where:

Zi = The value of the given attractor for county i;
Dij = Distance from county i to county j;
Qj = Intra-county impedance for county j (expressed in miles);
T = Terminal impedance (constant); and
P = An exponent equaling 2 or 2.5.

Intra-county impedance referred to distance of travel within a county. It was estimated using a geometrically based function that varied as the square root of county land area and equaled K at 100 square miles. Terminal impedance, T, was a constant for all observations and expressed the cost of travel regardless of distance. It is most easily understandable as terminal time, i.e., the time required to walk to one's car and so forth, but was expressed as a distance. Prior modeling studies had assigned relatively high values to these parameters – namely K=5 and T=5 – in order to keep each proximity measure from being dominated by the attractor magnitude for county j itself. However, proximity measures with K=3 and T=3 were also tested

in the present study and often retained in regression equations. (This change compensated for self-imposed limitations on other variables that are explained in the next section.) These lower values of K and T always accompanied the higher of the two exponents. Thus each proximity measure entering each regression analysis was always offered in three versions, based on P, K and T values of 2,5,5; 2.5,5,5; and 2.5,3,3.

The distance between each pair of counties was computed on the basis of: difference in latitude; difference in longitude; a constant expressing miles per degree of latitude; and a function expressing miles per degree of longitude as a function of latitude. The computations utilized two sets of latitude and longitude measures. One described the geographic center of a county, while the other described the centroid of the county's households (computed from 1990 census tract data). The distances used in the model calibration process were based on weighted averages in which the geographic center was weighted by one-fourth and the household centroid was weighted by three-fourths. These weightings reflected an assumption that most of the new development "attracted" to a county during 1990-2000 would be located near existing households. In applications of the calibrated model to the study region, however, the weightings were progressively shifted toward the county geographic centers to reflect a probable filling-up process.

The proximity measures were used in the same fashion as other descriptors to compute dev-change, dev-share and dev-mean variables. That is, the generic quantity X referenced in the previous subsection would be an proximity measure obtained from the formula on the previous page times an available-land weighting. A dev-change variable would incorporate proximity measures for both the initial and end years of an interval, whereas dev-share and dev-mean variables would only involve initial-year proximity. Given these functional forms and the three different versions of proximity noted above, each regression analysis tested either nine or twelve different proximity variables – depending upon whether or not current dev-change variables were usable – to examine the influence of each attractor. Proximity variables were only allowed to enter regression equations with positive coefficients.

Allocation Modeling Issues

The original design of the allocation model was shaped by a number of issues involving potential uses of the forecasts. Most of these can be treated briefly here due to reductions in their importance or other circumstances.

The first issue was the possible need to avoid negative numbers in the outputs of allocation modeling, i.e., in the household and employment changes forecasted for future intervals. Negative numbers posed no problem in the allocation process itself because the allocation model would express all variables as deviations around expected or average values. About half of all input and output quantities would be negative, and positive and negative values would be treated in a perfectly symmetrical fashion. The problem would arise if there were a further district-to-TAZ allocation, because such a step would be oriented toward allocating positive changes on the basis of positive influences (e.g., allocating residential land development to areas suitable for development). Negative growth would be awkward to accommodate and could yield counterintuitive results.

A plan was adopted that would use different measures to avoid negative household

changes and negative economic changes. The measures on the economic side did not have to be built into the allocation model and hence were never implemented. On the demographic side, the measures involved shifting the focus of the allocation process from net household changes to gross household changes. Based on an extensive analysis of housing transition over time in the 227 sample counties, relationships were developed to predict the reduction in an area's households due to losses from the housing stock (which average about 0.5% per year across all areas and can exceed 1% in areas with relatively old, low-value housing). Such reductions were netted out of the household changes analyzed in the model calibration process, and the forecasting tableau that later applied the model equations focused similarly on gross household changes rather than net changes. This embellishment made little difference to the forecasted absolute numbers of households, and no use was made of the extra information that it generated because top-down allocations were never conducted below the district level, so no further description is required here.

The second issue involved the ability of the allocation model to reflect public policies. Because of concern that the model would not explicitly reflect most supply-side influences on growth, the available-land weightings included in most predictive variables were designed in such a way that changes in an area's policy regime could be given rough expression via changes in the available-land parameters. The available-land weightings went on to play an important role in the model structure, as discussed below, but their policy aspect was never pursued.

Another issue was whether or not to break down demographic variables by race, which would have allowed the use of race as a predictor in the allocation model. This had been the practice in prior studies, but was a subject of concern. One problem with using race as a predictor was that it often assumed too strong a role. Once thrust into statistical prominence by the existence of racial avoidance behavior, racial variables tended to act as surrogates for growth factors involving density and available land, since black persons traditionally inhabited urban core areas. Another problem was that racial variables created problems of interpretation because the behaviors captured by race-related model parameters could change in the future (having demonstrably done so in the past). As it happened, few large geographic areas in the Charlotte region were extreme in terms of racial mix. Only four of the region's fifteen counties – collectively accounting for less than 8% of its total population – had black population shares under 12% or over 28% in 2000. What this meant for the present study was that including racial variables in the allocation model could not make a great deal of difference to the forecasts regardless of the extent to which the model equations reflected differences elsewhere. Hence race was set aside as a subject of measurement and a potential predictor.

The next question was the need to delete observations from the calibration sample to keep the regression analyses from being overly influenced by individual observations. Numerical dominance of a statistical sample by a few observations can be a big problem in cross-sectional analyses even when the sample size is in the hundreds. The risk of obtaining unreliable results for this reason is elevated by the omission of causal factors (e.g., supply-side influences), but would exist even if the analysis could address all kinds of relationships, because numerical dominance can result from unique events involving a single company. Previous studies had tried to minimize the problem by analyzing large samples, by spreading the predictive burden across many equations, and by weighting

observations in a manner to be described; but they had always stopped short of deleting sample observations. The present study took this additional step.

The following three cases illustrate how severely a cross-sectional sample of socioeconomic data can be dominated. The quantities to which the percentages apply are dev-change variables in which an observation for a county equals its 2000 earnings minus its 1990 earnings times the ratio of 2000 earnings to 1990 earnings for the metro area containing the county. The percentage cited to describe the dominance problem for each industry is the share of the sample's total variation (sum of squares) that is supplied by the most-dominant metro area among the 29 in the sample. The percentages cover entire metro areas, since these are the groups of observations eligible for deletion, but nearly all of the variation involves the individual counties noted.

* "Other" retail trade. For some unknown reason, the 1990s brought a massive shift in the distribution of metro Atlanta's home-supply retailing (e.g., Home Depot) from Fulton and DeKalb counties to Cobb County. Abrupt shifts are uncommon in retail trade except when they involve new regional malls, so the home-supply phenomenon caused metro Atlanta to account for 71% of the sample's total variation in "other" retail trade

* Depository and non-depository institutions (i.e., banks and credit unions). The Richmond area profited during the 1990s from the rapid emergence of Capital One, Inc. as a nationwide financial presence. The growth of Capital One occurred at new office-park locations in Henrico County, which wraps around Richmond, and may have involved some withdrawal of functions from the city. The result was an 8% decline in Richmond's constant-dollar earnings from banking while Henrico County increased by 348%. When expressed in dev-change terms, this pattern caused metro Richmond to account for 50% of all variation in the banking variable across the 227 counties. (Despite even greater banking expansion, metro Charlotte supplied only 12% of the total banking variation.)

* Communication. The leading economic driver for metropolitan Kansas City during the 1990s was the explosive growth of Sprint Corporation. Although the city itself may have had some Sprint offices, the corporate headquarters were located across the river in Johnson County, Kansas. Communications earnings rose by 171% in Jackson County (containing Kansas City) and 1063% in Johnson County. The difference between these rates of change caused metro Kansas City to supply 80% of all variation in the communications variable.

These cases of sample dominance were all caused by rapid growth, with absolute declines playing no role except for banking in Richmond. The key points are that: 1) there is almost no way to explain such extreme occurrences statistically with variables that express what actually happened; and 2) when offered dominant observations like these, a regression will grasp at any numerically useful predictors whether they make sense or not. An available predictor that was high for Cobb, Henrico or Johnson County and low for Fulton, Richmond or Jackson County, without having many other extreme values, might receive great explanatory weight in regressions for the above industries whether or not it had any substantive relevance.

The present study determined that only trimming the sample could deal with this problem adequately. The deletions had to involve entire metropolitan areas to preserve the structure of the model. The rule applied in

selecting metro areas for deletion was that no metro area should supply more than 25% of total variation in a dependent variable. Deletions were unnecessary for household variables because no metro area accounted for more than 11% of total variation in those cases (given the use of divisors as described momentarily). The deletions for economic variables involved 22 metro areas in 15 of the 32 industry groups, as listed in Table 8.

The selection of metro areas for deletion was accomplished simultaneously with the determination of weightings for sample observations. The issue in that regard was the need to balance variation in the sample. A general characteristic of regression analysis is that all variables on both sides of a regression equation can be multiplied by any constant (which can vary across observations) without imparting bias to the coefficient estimates or measures of statistical significance obtained from the regression. Weightings are commonly employed in cross-sectional analyses to deal with the general problem of heteroscedasticity, or unequal error variances. The objective can be described as creating a level playing field so that "small" areas are not rendered irrelevant by "big" areas. The Charlotte modeling effort used weightings to address heteroscedasticity

Table 8. DELETION OF OBSERVATIONS FROM REGRESSION SAMPLES

Industry Group	Metro Areas Deleted and Number of Observations (Counties) Involved	Sample Size
Farming	San Antonio (4)	223
Agricultural serv., forestry & fish.	Raleigh-Durham-Chapel Hill (6)	221
Mining	None	227
Construction	None	227
Manufacturing	Raleigh-Durham-Chapel Hill (6)	221
Transportation, Commun. & Util.:		
Transportation	Cincinnati-Hamilton (12)	215
Communication	Kansas City (11), Raleigh-D-CH (6)	210
Electric, gas & sanitary service	Atlanta (20)	207
Wholesale Trade	None	227
Retail Trade:		
GAFO (dept.-store-type goods)	None	227
Automotive retailing	None	227
Eating & drinking places	None	227
Other retail trade	Atlanta (20)	207
Finance, Insurance & Real Estate:		
Depository & non-depos. inst.	Richmond-Petersburg (10), Nashville (8)	209
Other finance	Indianapolis (9)	218
Insurance carriers	Indianapolis (9)	218
Insurance agents and services	None	227
Real estate	None	227
Services:		
Hotels & other lodging places	None	227
Personal serv. & private h'holds	None	227
Business services	None	227
Auto repair, services & parking	None	227
Miscellaneous repair services	None	227
Amusement & recreation serv.	Cincinnati (12), Louisville (7), Minn. (13)	195
Health services	None	227
Legal services	Tampa-St. Pete. (4), Raleigh-D-CH (6)	217
Educational services	None	227
Social serv., memb. org. & misc.	None	227
Engineering & mgmt. services	Raleigh (6), Norfolk (13), Atlanta (20)	188
Government		
Federal government (civilian)	Columbus (6)	221
State government	Grand Rapids (4)	223
Local government	None	227

problems arising from both area-size differences and special dominance situations like those cited above. The weightings in a given analysis were numbers that held constant across all counties within a metro area.

In the economic equations, the weightings took the form of divisors based on metro sums of 1990 earnings. The metro sum for each industry was expressed as a ratio to the average sum (i.e., to total 1990 earnings for the sample divided by 29, not 227). This ratio, raised to an exponent, became the divisor for the dependent variable and all independent variables in the regression for the given industry. The study design involved using the same exponent value for all industries and determining this value in the process of dealing with numerical dominance. The 25% rule noted above was applied to dependent (dev-change) variables with divisors included, and the chosen exponent was the value that minimized the cross-industry average share of variation supplied by the most-dominant metro after the deletion of extremes. This exponent value turned out to be 0.81. On the demographic side, similar computations for the household variables yielded an exponent value of 0.90. No observations were deleted from the household regressions since no metros came close to the 25% threshold in those cases.

The last issue involved geographic scale. As already described, data limitations mandated the use of counties and equivalent jurisdictions as the observation units for model calibration, but the equations were intended for use in sub-county (i.e., district) forecasting as well as county-level forecasting. The adopted rule was that forecasting units could range in geographic size down to 50 square miles. There was nothing about the model calibration process that limited the application of the resulting relationships to a particular geographic scale, and targeting areas of 50 square miles would not have extrapolated beyond the range of the sample (which included eight areas that small or smaller.) Nevertheless, given that the observation units had a median size exceeding 400 square miles, there was a need to assure that the estimated relationships would be maximally relevant to areas smaller than a typical county.

This need was addressed, along with objectives involving policy inputs, by relying heavily on proximity variables rather than other types of predictors. As already described, a proximity variable consisted of some relevant quantity, such as earnings in an industry group or households in an income category, summed across the entire metro after being weighted by an inverse function of distance from the subarea for which the variable was being computed. The values of proximity variables were heavily influenced by the amount of activity within the subject subarea itself (especially when they involved relatively high exponents and low values of their other two parameters). But the smaller a subarea's geographic size, the closer it would lie to neighboring subareas, and hence the greater contributions they would make to its values of proximity variables. Thus such variables should be largely invariant to the scale of observation units.

Predictive variables that simply described initial conditions, past changes or current changes in an area implicitly reflected its geographic scale, since big areas tended to feature big numbers while small areas featured small numbers. Simple predictors of this nature had worked well enough in previous studies, but the Charlotte project went further in applying relationships to small forecasting units, so extra care was needed to make the relationships scale-invariant. Hence all of the proximity variables entering the calibration process were weighted by

estimates of available land. The only predictors besides proximity variables allowed in the equations were dev-change, dev-share and dev-mean variables for the industry or household sector under analysis, plus dev-share variables for the three household groups (or the two not under analysis). All of the non-proximity variables besides same-sector past dev-change were weighted by available land as well.

Limiting most attention to proximity variables and avoiding racial predictors altogether had the effect of reducing the numbers of explanatory factors found significant in the regressions and retained in the model equations. The final economic equations contained 3.7 independent variables on average, and the final household equations contained an average of 4.7. Past studies using the same approach had yielded averages of 4 to 5 variables in the former case and about 6 in the latter. Restricting eligible predictors and deleting observations also tended to lower R-square values. This was true because extreme observations were often numerically explainable, sometimes to a spectacular extent (though the posited relationships might be ridiculous). The losses of R-square that resulted from setting aside such cases served as a chastening reminder that small-area growth patterns are always a challenge to explain meaningfully.

Incorporation of Available Land

Including a measure of available land in most of the allocation model's predictive variables was intended to provide a crude expression of supply-side limitations on growth and a potential mechanism for registering policy influence (although this mechanism was never utilized). The following paragraphs describe how the measure was derived for the 227 counties in the calibration sample and the areas addressed in forecasting. References to "developable land" and "available land" are understood to mean the following:

Developable land. The portion of a county or other subarea, measured in square miles, that is physically suitable for development in urban land uses, whether or not such uses already exist.

Available land. The developable land in a county or other subarea that remains vacant at a given point in time (or is developed at such low intensity that its conversion to a higher use would be routine).

Technically the Charlotte study lacked data on both developable land and available land, but circumstances allowed total land area to serve adequately as a surrogate for developable land in most of the 227 sample counties. Nearly all eastern metro areas with one to five million inhabitants occupy non-mountainous, maturely eroded landscapes where the required allowances for water bodies and steep slopes are small and predictable. Hence developable land is highly correlated with total land, even though the magnitudes are not identical. The two exceptional cases are Norfolk-Portsmouth and New Orleans, which contain extensive areas too wet for urban use. In the study these areas were identified from maps in the National Wetlands Inventory and subtracted from total county size to yield estimates of developable land.

As for available land, the study had no direct information at all. The only relevant data consisted of demographic and economic variables that could be used to compute density measures. The strategy was therefore to posit a functional form linking available land to density and then to obtain empirical estimates of any parameters involved. This would involve expressing the ratio of available land to developable land as a one-parameter or two-parameter function of

development density. The value or values of parameters in this function would be established prior to the model calibration process and assumed to hold constant for all economic and household sectors (implying that available land was the same for all land uses, although its importance to growth could vary). Absolute amounts of available land would be computed from the ratios yielded by this function. The quantity used to multiply other variables in the allocation model would then consist of available land divided by metro average available land, all taken to an exponent. The exponent would be allowed to assume different values in different equations and would be determined in the model calibration process by iteratively finding the value that maximized R-square. Each exponent would then express the relative importance of land availability to the given economic sector or household group.

The first task was to select a measure of development density, preferably one that reflected both population and employment. The chosen measure was based on the facts that: 1) employment is about half as great as population on average; and 2) about 20% of all urban land is used by sources of employment. These circumstances imply that land consumption per employee equals about half of land consumption per resident (since 0.2/0.5 is half of 0.8/1). Hence the density measure simply equaled population plus employment times one-half. This sum was said to express development density in "population/employment" or "pop/empl" units.

The designation of a functional form for available land followed the principle that a model should have interpretable parameters even if the interpretation rests on a highly idealized scenario. The chosen scenario focused on the tendency of an area to develop at progressively higher marginal densities. After some experimentation with functional forms, the choice was a form based on the assumption that marginal development density varied inversely with the share of developable land still available. Letting D = average density, D' = marginal density, A = available land, L = total developable land, and k = a parameter to be determined, this function and its evaluated integral are as shown in the first two lines below. The third line gives the solution for the available land ratio (A/L) as a function of average density in population/employment units.

$$D' = k/(A/L)$$
$$D = -k*\ln(A/L)$$
$$A/L = \exp(-D/k)$$

Figure 6 on page 52 shows the available land ratios yielded by the above relationship at various density levels, given different values of the parameter k. The graph spans the density levels found in the model calibration sample, which range from 32 population/ employment units per square mile in metropolitan San Antonio (Wilson County) to 8,594 units per square mile in St. Louis. The parameter k determines how fast the available land ratio approaches zero as observed density rises. This functional form can closely replicate the results of assuming linear and quadratic functions for marginal density, but offers the advantages noted above.

The remaining task was to find an appropriate value of k. This was accomplished by running preliminary versions of the allocation model regressions. As noted above, the quantity that multiplied other independent variables in the allocation model was available land divided by metro average available land, all raised to an exponent. The preliminary regressions involved the use of trial-and-error methods to find best-fitting values of both the parameter k and the overall exponent. With the value of k established in this fashion, only the exponent would be allowed to vary in the model calibration process to follow.

The preliminary analyses addressed the three income-based household groups and three aggregate economic sectors, namely "industrial" activity, producer services and consumer services as defined in the next section. The regressions were run with the full sample of 227 observations, using divisors computed as described above. The term involving available land was incorporated in all independent variables except one (the past dev-change variable for the industry or household group under analysis). Three to five independent variables were found significant at better than the 0.5% level in each regression. The values of R-square ranged from 0.50 to 0.86 for economic sectors and from 0.78 to 0.79 for household groups. These findings are summarized in Table 9, which occupies the lower portion of the next page. (Details for independent variables are omitted because these results are supplanted by the final calibration data.)

As shown by the right-hand columns of Table 9, the best-fitting values of the parameter k in the available land function ranged from 1,500 to 7,500, and the best-fitting exponent values ranged from 0.1 to 0.7. The process of finding these values revealed strong, and expected, positive associations between k and the exponent. Entering higher values of k would weaken the relationship of available land to density and thereby let more weight be placed on the relationship (via the exponent) without a loss of R-square. Available land was found to have almost no importance for producer service activity – not surprisingly, since office buildings can trump other land uses in terms of value per acre – and little importance for the industrial sector.

The value of k chosen for general use in estimating available land was 4,000 population/employment units per square mile. This selection gave the most weight to the k-values of 3,500 obtained in two household analyses because experimentation showed that the higher values could each be lowered to 4,000 at a sacrifice of only 0.002 in R-square. Despite later changes that altered the household equations, the k-value of 4,000 was retained throughout the model calibration process and served well by all indications.

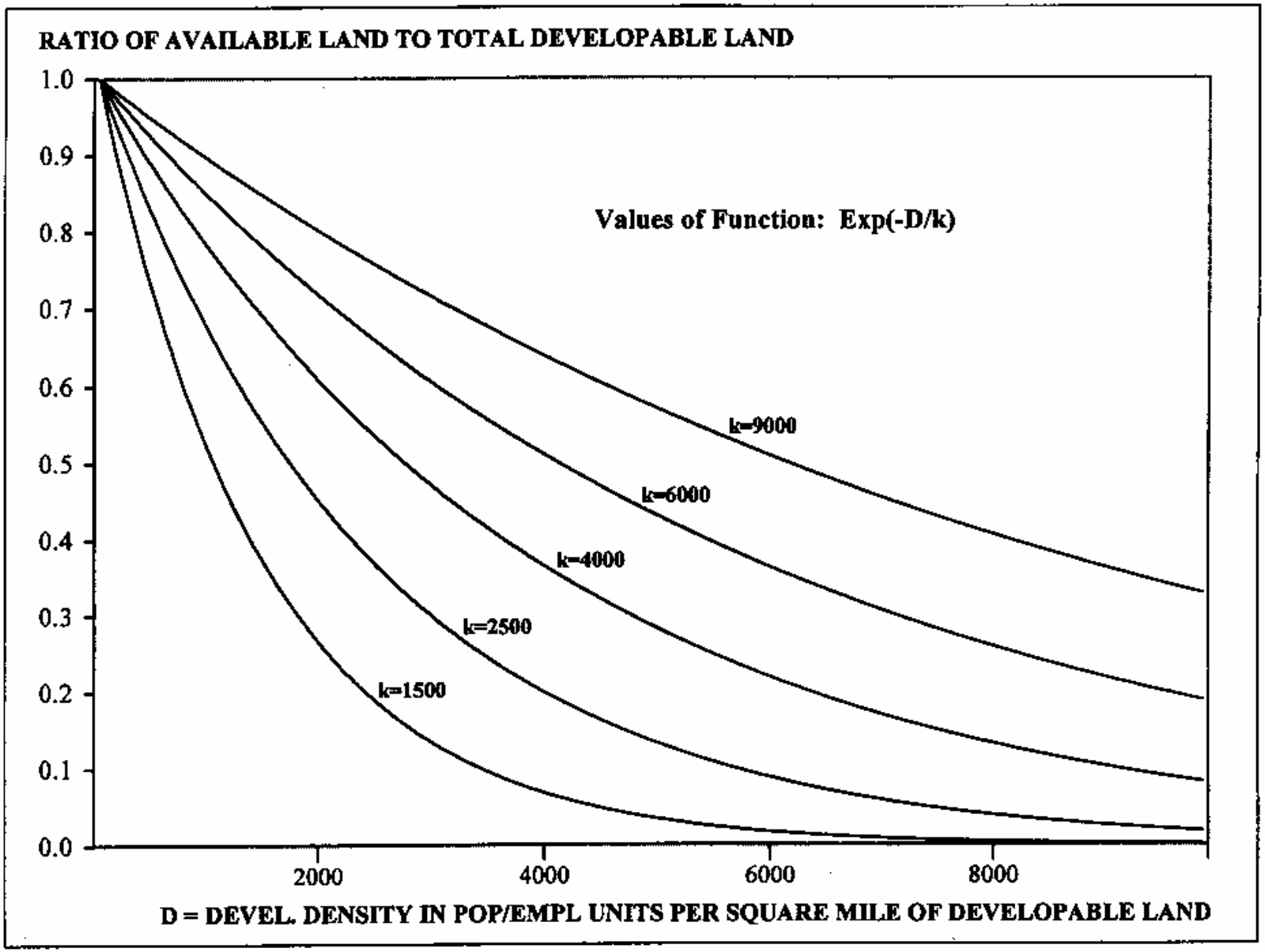
Table 9. SYNTHESIS OF RESULTS FROM PRELIMINARY REGRESSIONS

	R-Square Value for Regression	Number of Significant Independent Variables		Best-Fitting Values of Parameters in Avail. Land Index	
		Including Avail. Land	Other (past dev-change)	k	Exponent
Dependent Variable:					
Industrial Earnings	0.499	3	0	1500	0.25
Producer Service Earnings	0.640	4	0	7000	0.1
Consumer Service Earnings	0.857	4	1	6500	0.65
Lower-Income Households	0.792	2	1	3500	0.7
Middle-Income Households	0.794	4	1	7500	0.6
Upper-Income Households	0.775	3	1	3500	0.6

SCENARIO YIELDING "K" VALUE OF APPROXIMATELY 4,000

Residential development at 2.42 dwelling units per gross acre	= 1,549 d.u.s per square mile
Residential devel. with 20% of land reserved for employment	= 1,239 d.u.s per square mile
Population @ 2.584 persons per d.u. (227-county ave. in 1990)	= 3,202 persons per square mile
Employment @ one job per two residents	= 1,601 jobs per square mile
Population/employment units (sum with empl. half-weighted)	= 4,002 pop/empl units per sq.mi.

Figure 6. ALTERNATIVE VALUES OF AVAILABLE LAND FUNCTION



As shown by the computations in Table 9, a situation where k equals 4,000 is a scenario in which an area's residential development starts at roughly 2.4 occupied dwelling units per gross acre. The marginal density of residential development then rises progressively as more land is used. Based on the formulas stated earlier, the marginal density reaches 10 units per acre when half the area's developable land remains available, and 30 units per acre when only one-sixth remains available. The average densities at these points are about 2,800 and 7,200 population/employment units per square mile.

As thus established, the available land function clearly overestimated how much of an area's land could actually accommodate most land uses, particularly non-residential uses. This fact was not problematic in itself because the allocation model's equations were not sensitive to intra-metropolitan scale effects. For example, suppose that the counties in a three-county metro had available land ratios of 0.8, 0.6 and 0.4 according to the general formula, but their viable sites for, say, manufacturing activity accounted for only 8%, 6% and 4% of developable land. Substituting the latter figures for the former in the manufacturing equation would leave its predictions unchanged, because the term used as a multiplier in the equation's independent variables would contain available land divided by mean developable land for the metro. But entering a different pattern of percentages for a different land use – say, 10%, 10% and 5% for wholesale trade – would change the outputs from the equation for that activity, and likewise a different set of manufacturing percentages based on different zoning policies would also produce a change. The model was thus able to accept and reflect land descriptions quite different from what was available during its calibration.

Modeling Sequence

A precedence ordering of variables is required in any forecasting model that is not a simultaneous-equation system (wherein all values of variables would be mutually determinate). The ordering of variables is accompanied by a restriction of explanatory factors in each equation to variables that appear earlier in the sequence than the one being explained. The best ordering is simply the one that yields the greatest overall predictive accuracy when the model is applied.

Following the practice in earlier studies, the present modeling sequence involves an arrangement of variables into four major groups, namely households and three groups of industries. The latter are referenced as "industrial" activities, producer services and consumer services. This economic grouping reflects functional differences in that most industrial establishments are involved in handling physical goods, while producer service establishments provide intangible products to businesses, and consumer service functions deal directly with consumers. The key factor, however, is that the groups have varying needs for proximity to other activities at a sub-regional scale. Industrial establishments generally have the weakest activity linkages because their main site selection criteria involve infrastructure, natural resources and physical land suitability. Consumer service establishments are the most strongly influenced by other development because their competitive success turns upon access to households.

Locational dependence is relevant for allocation modeling because the least dependent functions should be addressed first in the modeling sequence, when no other current changes are available as predictors. The most dependent functions should come last because their equations can benefit most

from predictors that pertain to current changes. This leads to a sequence in which the model first addresses industrial activities, then producer services and finally consumer services. The remaining question is where to position the household group. Any choice is a compromise, since household location patterns are linked to all economic functions on a mutually determinate basis by virtue of employment as well as patronage relationships. In some past models calibrated for small metro areas, households were placed between the industrial and producer service groups because households contributed more as predictors of producer services than vice versa. The present study positioned households after producer services, however, because testing showed that producer services would enter two of the three household equations.

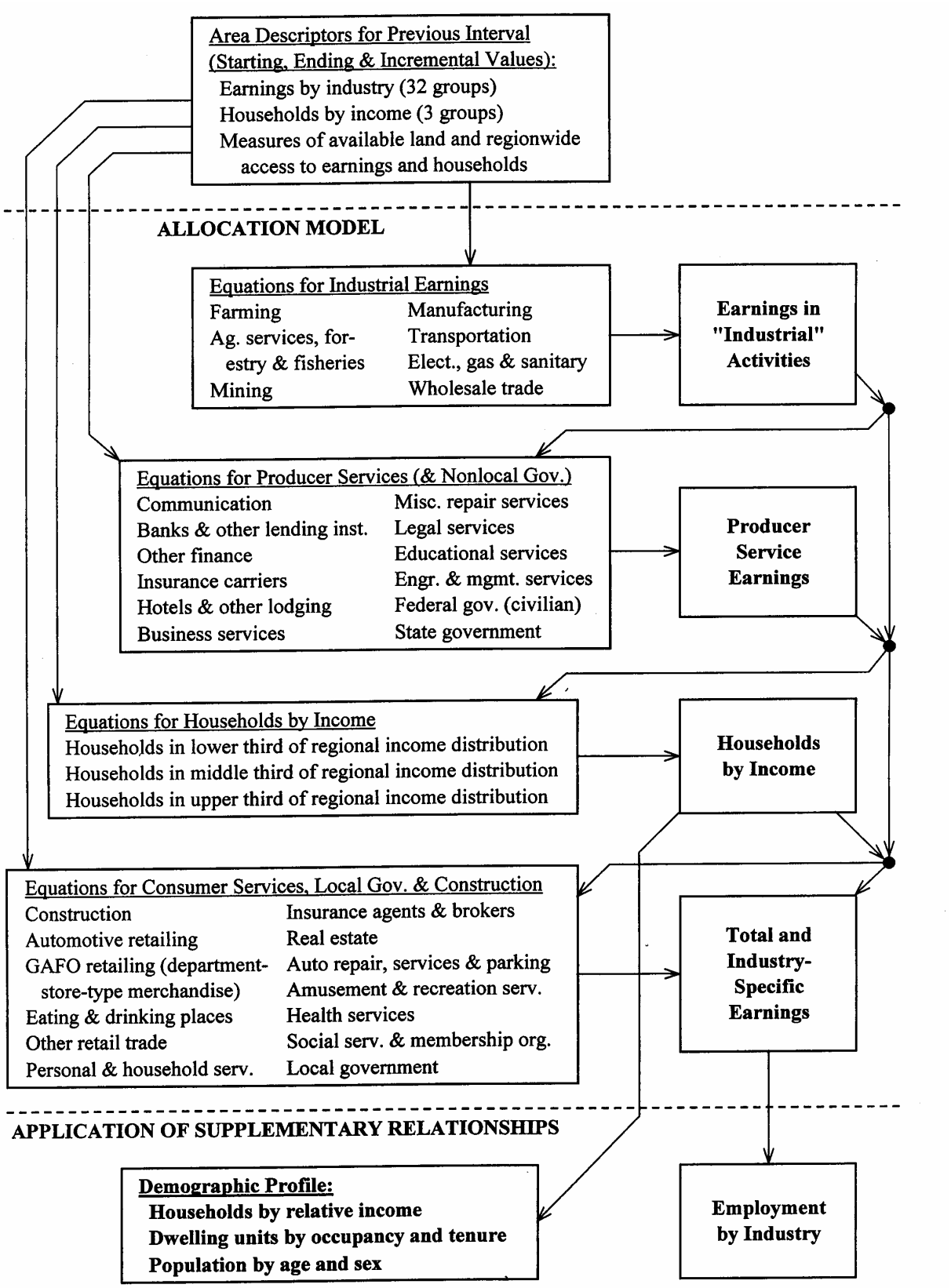
The resultant modeling sequence is depicted graphically in Figure 7 on the next page, which serves to identify the industries contained in the three economic groups. This same ordering of variables was followed in the model calibration process and each round of forecasting for the study area. As noted earlier, the industries in each group were totaled rather than taken individually when computing dev-change, dev-share and dev-mean variables for use as predictors in subsequent equations.

The variables eligible as predictors in each model equation – reflecting the information that would be available in each round of forecasting – consisted of: 1) past changes and initial conditions in the three major economic groups; 2) past changes and initial conditions in the specific industry under analysis (for economic equations); 3) past changes and initial conditions in the three household categories; and 4) current changes in economic and/or household groups already addressed by the modeling sequence.

Constraints and Special Circumstances

The following statements summarize the characteristics of variables in the allocation model, as explained in the preceding subsections. All dependent variables – i.e., variables appearing on the left-hand sides of equations – were expressed in dev-share form (meaning they were "current" dev-share variables relative to the time interval being analyzed or forecasted). Every independent variable was expressed in one of four forms: past dev-change, initial dev-share, initial dev-mean, and current dev-change. Most of the quantities incorporated in these forms were proximity measures equaling distance-weighted sums of attractors. The only predictors that did not incorporate proximity calculations were dev-change, dev-share and dev-mean variables for the industry or household category being analyzed, plus dev-share variables for the three (or two other) household categories. All of the predictors but one – past dev-change for the sector under analysis – were weighted by an index of available land raised to an exponent (with the weighting applied before the conversion to dev-change, dev-share or dev-mean form). And lastly, a divisor based on the metro sum of activity in the given sector was applied to all variables on both sides of each equation. The divisor only affected the calibration process and is not mentioned here in other contexts.

Figure 7. SEQUENCING OF VARIABLES IN MODEL DEVELOPMENT AND APPLICATION



This highly structured format led to the imposition of constraints on the allowable signs of regression coefficients. A constraint meant that a predictor would not be allowed to enter a regression equation with a negative coefficient if its relationship with the dependent variable was intended to be positive, or vice versa, even if it would play a significant role in a statistical sense. The constraints were partly motivated by the inclusion of available-land weightings. In general, the construction of a composite explanatory variable almost always presupposes that the regression coefficient will have one sign or the other, because factors are combined on the assumption that they will all be pulling in a given direction. For example, attraction measures were multiplied by available-land measures in the Charlotte model because both were expected to exert positive influences. Allowing such variables to enter regression equations with negative signs would have negated the logic behind their construction.

The constraints imposed upon regression coefficients are stated and explained below. Because they are special cases, independent variables pertaining to the same industry or household group as the dependent variable are called "same-sector" variables, even if they pertain to households rather than industry groups.

Same-Sector Past Dev-Change: Coefficient Always Positive. Past change in an activity is very often a strong predictor of current change. A negative relationship between past and current change would mean that an industry tends to cycle up and down. Farming seems to be the only case in which this systematically occurs, and farm earnings are unpredictable anyway, so there is little cost in requiring the coefficients for same-sector dev-change variables to be positive.

Same-Sector Initial Dev-Share: Coefficient Always Negative. A same-sector dev-share variable expresses the relative geographic concentration of an activity. A negative coefficient for such a variable says that areas with more than their share of an activity will tend to gain less of it than areas where the activity is initially in short supply. This is the expected pattern. By including same-sector dev-share negatively and same-sector dev-change positively, an equation can describe a situation where growth feeds on itself but is subject to diminishing returns or other countervailing forces. Positive coefficients almost never occur for same-sector dev-share variables, but in any case could not be allowed due to the presence of available-land weightings.

Same-Sector Initial Dev-Mean: Coefficient Always Negative. Dev-mean variables resemble dev-share variables except that they express concentration of activity in absolute rather than relative terms. For example, if a county has a high same-sector dev-mean value for wholesale trade, it exceeds most other counties in its absolute amount of wholesaling, whereas a high dev-share value would mean that wholesaling comprises a relatively large share of its economy whether big or small in absolute terms. Since these variables operate similarly in regressions, negative coefficients have also been required for same-sector dev-mean variables.

Past or Current Dev-Change Proximity Variable: Coefficient Always Positive. Though such situations can be imagined, there is little need to allow for the chance that growth in one activity systematically discourages growth in another. Rich people who don't like looking at mobile homes, for example, can usually adjust by moving into the next valley rather than the next county. Meaningful negative relationships become even less likely when the descriptors of change are proximity variables that express

regionwide gradients of attraction. Hence dev-change variables have always been required to enter with positive coefficients.

Initial Dev-Mean Proximity Variable: Coefficient Always Positive. Dev-mean proximity variables express proximity to static rather than incremental attractors. Positive coefficients have been required for these variables because they include available land and are not designed to express repulsion. Other predictors have been sufficient to capture the forces of urban de-concentration and dispersal.

Initial Dev-Share Variable for a Household Category: Coefficient Always Positive. Household income levels operate in many ways to shape urban growth patterns. In particular, past studies have repeatedly suggested that many kinds of activity – not limited to residential development and consumer services – tend to follow upper-income households. The effects are produced not only by changes in number of households (captured by dev-change proximity variables) but also by the relative proportions of upper-income and lower-income households at each point in time. Hence separate dev-share variables for the three income categories, weighted by available land, have been tested in all regressions. Positive linkages have been required due to the available-land weightings, but negative impacts have been capturable via the assignment of positive coefficients elsewhere, since dev-share variables always sum to a constant for each metro area.

In any given analysis, the same-sector past dev-change variable was the only eligible predictor that did not include a weighting by available land. This was the case because the constraining role of available land should already have been reflected to a large extent in a sector's past growth pattern, making a weighting redundant. Same-sector initial dev-share and dev-mean variables were also special cases because their expected and intended roles involved negative signs. To assure that available land would have a positive influence, the available-land index (i.e., the ratio raised to an exponent) was used as a divisor rather than a multiplier of the quantities entering the dev-share and dev-mean computations.

Regression Results

Finding the best-fitting combination of independent variables in an allocation-model equation is usually not difficult. The process was somewhat simplified in the present case by the restrictions on eligible variables and allowable coefficient signs. The only special twist was the need to find a best-fitting value of the available-land exponent. Since no analytical solution was possible, this had to been done by trial and error on the premise that the "best" exponent was the one that maximized R-square.

Each regression analysis proceeded by entering independent variables one at a time on the basis of correlations with residuals from the previous step. (Technically this approach is not quite as efficient as stepwise regression, which relies on partial-R values, but there are advantages in not automating the process.) The threshold for retention of a variable was 5% significance in a two-tailed test, with a few very minor exceptions, and most predictors were well above this threshold. The median t-statistic for all variables in the final calibrated model was 3.36, denoting slightly better than 0.1% significance with the sample sizes in question.

The analysis spreadsheets were set up so that all variables were recalculated given a change in the assumed value of the available-land exponent. The common procedure was to start each analysis with an exponent value

of 0.5 and get fairly close to the best set of predictors before varying the exponent. Its value would then be progressively shifted in whichever direction served to raise R-square, with periodic checks to see if any variables in the equation were losing significance or if any variables outside the equation were looking more viable as candidates for inclusion. Wholesale substitutions of variables were very rare, even with large changes in the exponent, and the additions and subtractions that did occur were usually identifiable beforehand as borderline cases. An unambiguous local optimum could always be reached without any great difficulty. The numerical stability of the regressions led to confidence that these local optimum solutions were also global optima.

The 35 dependent variables in the allocation model were analyzed following the procedures and guidelines discussed here and in the previous subsection. Then the fitted equations were used to "predict" the 2000 values of all variables in the 227 sample counties, based on 1980 and 1990 data and the metro totals for 2000. Though more or less satisfactory for the sample as a whole, these initial results were unsatisfactory for the Charlotte region. Hence the entire model was recalibrated.

The problem involved the divisors used to minimize heteroscedasticity in the regressions. As discussed above, the original divisor for an industry was the ratio of total metro earnings in that industry to the sample average earnings per metro in that industry, all taken to the 0.81 power. The divisor for a household category was computed similarly with the ratio taken to the 0.90 power. These computations had the convenient feature that divisor values were constant for counties in a metro, meaning that all explanatory variables summed to zero for each metro and hence the regression model did not include a constant term. (Nonzero intercepts are always undesirable in an allocation model.) The weakness was that the divisors dealt with numerical dominance on an inter-metropolitan basis but not an intra-metropolitan basis, which turned out to be serious for the Charlotte region. The solution was to re-run all the regressions using divisors of a type employed in the 2000 Charlotte study. For each industry, the divisor value for a county equaled the geometric mean (i.e., the square root of the product) of the county's 1990 earnings in all industries and the metro average 1990 earnings in the industry under analysis. Thus the alternative divisor adjusted for both the scale of the county economy and the size of the industry in the metro area as a whole. The household-equation divisors were computed similarly using total households in the county and category-specific households in the region (metro). The new divisors were the only changes in regression inputs. The recalibration yielded substantially different coefficients and available-land exponents, frequently accompanied by substitutions of independent variables in the final results.

The original divisors are called "exponential" divisors and the alternative numbers are referenced as "geometric mean" divisors. After the model was recalibrated using the geometric mean form, the two sets of equations were compared on the basis of their ability to predict actual 2000 conditions. For each industry and household category, the equation that best replicated 2000 conditions in the study area was selected for inclusion in the final model. The selections were based strictly on outcomes for the Charlotte region and in some cases involved slight reductions in predictive accuracy for the 227-county sample. Equations based on geometric mean divisors were selected for 19 of the 32 economic sectors. However, equations based on exponential divisors were retained for a majority of the region's largest industries and for all three categories of households.

A general circumstance in allocation modeling is that the more level the playing field – in terms of the extent to which scale differences among observations are offset by heteroscedasticity adjustments – the lower the R-square values obtained in model calibration. Shifting from exponential to geometric mean divisors in the present study lowered R-square in all but four of the 35 regressions, with three-quarters of the changes equaling -0.1 to -0.3. The overall average impact on R-square was –0.123. In about half of all cases there were also reductions in the number of predictors found significant and retained, with the average exceeding half a variable per regression.

The final results of the model calibration process are presented in Table 10 on the next four pages. The upper portion of the table's first part shows the notation used in describing the regression results. The right-hand column lists the independent variables entering the equations, some of which are stated as functional forms because they involve proximity to attractors other than the sectors under analysis. The left-hand column lists the descriptors that serve as arguments of the functions. As described earlier, all of the dependent variables subjected to analysis were current dev-share variables and all of the independent variables besides SDC (past dev-change in the sector under analysis) were weighted by the available land index. Lastly, the first part of the table lists the suffixes used to denote different combinations of parameter values in the proximity variables.

The regression results for each economic sector and household category are listed in a separate box. The figure in parentheses following the name of the sector is the number of observations used in the given regression. (See Table 5 and the surrounding discussion.) The text below the sector name indicates whether the regression involved an exponential or geometric mean divisor and lists the intercept value in the latter case. This part also gives the R-square value obtained and the best-fitting value of the available-land exponent. The columns occupying the remainder of the box then present the regression coefficient, the t-statistic and the significance level for each independent variable. The t-statistics shown here have been recomputed to allow for the loss of 29 degrees of freedom due to the manner in which variables were constructed.

Table 10. REGRESSION RESULTS USED IN ALLOCATION MODEL, PART I

Descriptors Used in Access Variables

IE	Industrial earnings
PE	Producer service earnings (including nonlocal government)
CE	Consumer serv. earnings (incl. local gov't & construction)
TE	Total earnings
LH	Households in lower third of regional income distribution
MH	Households in middle third of regional income distribution
UH	Households in upper third of regional income distribution
TH	Total households

Variables

SDC = Same-sector past dev-change
SDS = Same-sector initial dev-share
SDM = Same-sector initial dev-mean
SDM1 = SDM with avail. land exponent = 1
DS( ) = Dev-share variable for households
PDCA( ) = Past dev-change access variable
CDCA( ) = Current dev-change access var.
DMA( ) = Initial dev-mean access variable

Notation for Parameters in Access Var.s

Suffix p: Exponent = 2, intra-area impedance = 5, terminal impedence = 5
Suffix q: Exponent = 2.5, intra-area impedance = 5, terminal impedence = 5
Suffix r: Exponent = 2.5, intra-area impedance = 3, terminal impedence = 3

Results

Earnings in Farming (223)

Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.00		R-Square = 0.0331	
Independent Var.	Coeff.	t-Statistic	Signif.
SDM	-0.1016	-2.578	1%

Earnings in Ag. Services, Forestry & Fish. (227)

Type of Divisor: Geom. Mean		Intercept = 2.4374	
Avail. Land Exponent = 0.22		R-Square = 0.3992	
Independent Var.	Coeff.	t-Statistic	Signif.
PDCA(UH)r	143.19	2.950	0.5%
SDS	-0.5733	-8.573	<0.01%
SDM	-0.0670	-3.243	0.5%
DS(MH)	0.9566	2.690	1%
DS(UH)	0.5570	3.591	0.05%
PDCA(TE)p	0.9816	2.720	1%

Earnings in Manufacturing (221)

Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.23		R-Square = 0.5451	
Independent Var.	Coeff.	t-Statistic	Signif.
SDM	-0.0491	-7.354	<0.01%
SDC	0.2651	5.208	<0.01%
SDS	-0.1135	-4.459	<0.01%
DS(MH)	14.773	3.056	0.5%
DS(UH)	9.3009	5.886	<0.01%

Earnings in Communication (210)

Type of Divisor: Geom. Mean		Intercept = -6.7985	
Avail. Land Exponent = 0.52		R-Square = 0.1830	
Independent Var.	Coeff.	t-Statistic	Signif.
SDS	-0.1515	-4.654	<0.01%
PDCA(UH)r	258.89	2.127	4%
DS(UH)	0.7067	1.914	6%

Earnings in Mining (227)

Type of Divisor: Geom. Mean		Intercept = -1.9196	
Avail. Land Exponent = 0.35		R-Square = 0.3188	
Independent Var.	Coeff.	t-Statistic	Signif.
SDS	-0.2573	-9.469	<0.01%
PDCA(TH)r	28.887	2.662	1%

Earnings in Construction (227)

Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.63		R-Square = 0.5553	
Independent Var.	Coeff.	t-Statistic	Signif.
CDCA(TH)r	707.49	4.163	<0.01%
PDCA(PE)r	26.280	3.774	0.05%
SDM	-0.0212	-2.775	1%
CDCA(PE)p	15.674	2.604	1%
DS(MH)	4.5147	2.131	4%

Earnings in Transportation (204)

Type of Divisor: Geom. Mean		Intercept = 2.7137	
Avail. Land Exponent = 0.00		R-Square = 0.2185	
Independent Var.	Coeff.	t-Statistic	Signif.
SDS	-0.1732	-5.278	<0.01%
SDC	0.1864	3.657	0.05%
PDCA(CE)q	16.9399	2.165	3%

Earnings in Electric, Gas and Sanitary Services (227)

Type of Divisor: Geom. Mean		Intercept = 1.6105	
Avail. Land Exponent = 1.00		R-Square = 0.1388	
Independent Var.	Coeff.	t-Statistic	Signif.
SDC	0.2269	2.766	1%
SDS	-0.0912	-4.396	<0.01%
PDCA(LH)r	250.83	1.961	5%

Table 10. REGRESSION RESULTS USED IN ALLOCATION MODEL, PART II

Earnings in Wholesale Trade (207)			
Type of Divisor: Geom. Mean		Intercept = 3.9660	
Avail. Land Exponent = 0.24		R-Square = 0.5456	
Independent Var.	Coeff.	t-Statistic	Signif.
SDC	0.5861	8.139	<0.01%
SDS	-0.2913	-7.344	<0.01%
PDCA(TH)r	196.16	2.119	4%
DS(UH)	2.6523	3.328	0.1%

Earnings in GAFO Retailing (Department-Store-Type Goods) (227)			
Type of Divisor: Geom. Mean		Intercept = 5.2046	
Avail. Land Exponent = 0.27		R-Square = 0.4308	
Independent Var.	Coeff.	t-Statistic	Signif.
CDCA(TH)r	170.12	2.289	3%
SDC	0.5120	3.917	0.05%
CDCA(PE)r	15.651	5.132	<0.01%
SDS	-0.2952	-3.299	0.5%

Earnings in Other Retail Trade (207)			
Type of Divisor: Geom. Mean		Intercept = -0.1452	
Avail. Land Exponent = 0.50		R-Square = 0.5038	
Independent Var.	Coeff.	t-Statistic	Signif.
CDCA(TH)r	301.38	9.008	<0.01%
CDCA(PE)r	4.0321	3.534	0.1%
SDS	-0.0643	-1.978	5%

Earnings in Other Finance (218)			
Type of Divisor: Geom. Mean		Intercept = 4.3567	
Avail. Land Exponent = 0.31		R-Square = 0.3970	
Independent Var.	Coeff.	t-Statistic	Signif.
SDS	-0.4929	-8.445	<0.01%
DS(UH)	2.5255	2.773	1%
PDCA(UH)r	375.33	3.758	0.05%
DS(LH)	2.0714	2.060	4%

Earnings in Real Estate (227)			
Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.00		R-Square = 0.6827	
Independent Var.	Coeff.	t-Statistic	Signif.
SDS	-0.6702	-5.868	<0.01%
SDM	-0.0941	-4.624	<0.01%
PDCA(TE)r	1.1080	1.888	6%
CDCA(PE)q	9.8803	2.194	3%
PDCA(UH)q	1058.7	2.633	1%
DS(UH)	0.9238	3.603	0.05%

Earnings in Automotive Retail Trade (227)			
Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.43		R-Square = 0.5992	
Independent Var.	Coeff.	t-Statistic	Signif.
CDCA(TH)r	237.53	7.040	<0.01%
CDCA(PE)r	2.9393	3.350	0.1%
PDCA(LH)r	211.53	2.051	5%
DS(MH)	1.4568	2.764	1%
DSA(PE)q	1.3538	2.616	1%

Earnings in Eating & Drinking Places (227)			
Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.21		R-Square = 0.6749	
Independent Var.	Coeff.	t-Statistic	Signif.
SDS	-0.4379	-9.230	<0.01%
CDCA(PE)r	3.3784	3.488	0.1%
SDM	-0.0269	-2.462	2%
PDCA(UH)r	509.43	5.238	<0.01%
CDCA(UH)r	458.81	5.063	<0.01%
DMA(LH)p	36.076	2.896	0.5%
PDCA(LH)p	347.63	2.859	0.5%

Earnings in Banks & Credit Agencies (209)			
Type of Divisor: Geom. Mean		Intercept = 0.7029	
Avail. Land Exponent = 0.74		R-Square = 0.3465	
Independent Var.	Coeff.	t-Statistic	Signif.
CDCA(IE)r	11.637	5.644	<0.01%
PDCA(PE)r	22.488	3.731	0.05%
DS(UH)	4.9142	3.582	0.05%
DS(LH)	4.3268	2.877	0.5%

Earnings in Insurance Carriers (218)			
Type of Divisor: Geom. Mean		Intercept = -3.2102	
Avail. Land Exponent = 0.00		R-Square = 0.3217	
Independent Var.	Coeff.	t-Statistic	Signif.
SDC	0.3699	4.854	<0.01%
CDCA(IE)r	3.6016	3.880	0.05%
SDS	-0.1302	-2.347	2%
DS(UH)	0.7366	2.687	1%

Earnings by Insurance Agents & Brokers (227)			
Type of Divisor: Geom. Mean		Intercept = 4.2817	
Avail. Land Exponent = 0.50		R-Square = 0.3995	
Independent Var.	Coeff.	t-Statistic	Signif.
SDC	0.2684	3.207	0.5%
CDCA(PE)r	4.1583	4.921	<0.01%
DS(UH)	0.5455	3.183	0.5%

Table 10. REGRESSION RESULTS USED IN ALLOCATION MODEL, PART III

Earnings in Hotels & Motels (227)

Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.24		R-Square = 0.2409	
Independent Var.	Coeff.	t-Statistic	Signif.
SDM	-0.0373	-4.515	<0.01%
PDCA(PE)r	1.5127	2.346	2%
PDCA(CE)r	1.5827	2.587	1%

Earnings in Auto Repair, Automotive Services and Parking (227)

Type of Divisor: Geom. Mean		Intercept = 1.6105	
Avail. Land Exponent = 0.16		R-Square = 0.1388	
Independent Var.	Coeff.	t-Statistic	Signif.
CDCA(TH)r	54.714	3.214	0.5%
PDCA(TE)r	1.6709	4.906	<0.01%
DMA(LH)p	5.4420	3.385	0.1%
PDCA(LH)q	143.09	2.498	2%
SDS	-0.1508	-1.979	5%

Earnings in Amus. & Recr. Services (195)

Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.00		R-Square = 0.1723	
Independent Var.	Coeff.	t-Statistic	Signif.
SDS	-0.5140	-3.990	0.01%
SDC	0.6659	3.074	0.5%
DS(MH)	2.6478	3.091	0.5%
CDCA(UH)p	166.57	1.871	6%

Earnings in Health Services (227)

Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.26		R-Square = 0.6306	
Independent Var.	Coeff.	t-Statistic	Signif.
PDCA(CE)r	39.922	12.382	<0.01%
SDS	-0.3292	-10.162	<0.01%
DS(MH)	5.3090	3.014	0.5%

Earnings in Educational Services (227)

Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.21		R-Square = 0.5473	
Independent Var.	Coeff.	t-Statistic	Signif.
SDS	-0.2097	-8.783	<0.01%
DMA(PE)r	0.1952	2.588	1%
PDCA(UH)p	263.54	4.183	<0.01%
DS(UH)	0.6570	4.503	<0.01%

Earnings in Personal Services and Private Households (215)

Type of Divisor: Geom. Mean		Intercept = 1.6235	
Avail. Land Exponent = 0.15		R-Square = 0.2608	
Independent Var.	Coeff.	t-Statistic	Signif.
CDCA(TH)r	51.615	4.511	<0.01%
DS(UH)	0.4358	4.341	<0.01%

Earnings in Misc. Repair Services (227)

Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.62		R-Square = 0.1666	
Independent Var.	Coeff.	t-Statistic	Signif.
PDCA(IE)r	1.4005	3.967	0.01%
SDS	-0.0741	-2.248	3%
PDCA(LH)r	104.09	2.426	2%

Earnings in Business Services (207)

Type of Divisor: Geom. Mean		Intercept = -6.5940	
Avail. Land Exponent = 0.09		R-Square = 0.2593	
Independent Var.	Coeff.	t-Statistic	Signif.
CDCA(IE)r	9.3372	3.187	0.5%
PDCA(TE)r	5.0508	2.267	3%
SDS	-0.4250	-3.778	0.05%
DS(UH)	3.8031	3.661	0.05%

Earnings in Legal Services (217)

Type of Divisor: Geom. Mean		Intercept = -0.7745	
Avail. Land Exponent = 0.17		R-Square = 0.1213	
Independent Var.	Coeff.	t-Statistic	Signif.
PDCA(UH)r	97.447	3.883	0.05%
SDC	0.1027	1.858	6%

Earnings in Social Services, Membership Organizations & Misc. Services (227)

Type of Divisor: Geom. Mean		Intercept = 2.1284	
Avail. Land Exponent = 0.20		R-Square = 0.4940	
Independent Var.	Coeff.	t-Statistic	Signif.
DMA(MH)p	14.810	3.583	0.05%
SDM	-0.0387	-4.078	0.01%
PDCA(TH)r	71.927	2.069	4%
SDS	-0.3446	-6.850	<0.01%
CDCA(UH)r	151.56	3.223	0.5%
CDCA(PE)r	3.0253	2.932	0.5%
DS(MH)	1.7020	2.875	0.5%

Table 10. REGRESSION RESULTS USED IN ALLOCATION MODEL, PART IV

Earnings in Engineering & Mgmt. Serv. (188)			
Type of Divisor: Geom. Mean		Intercept = 0.8605	
Avail. Land Exponent = 0.38		R-Square = 0.2523	
Independent Var.	Coeff.	t-Statistic	Signif.
SDS	-0.1995	-3.971	0.01%
PDCA(TE)r	3.5521	3.177	0.5%
DS(UH)	1.4048	3.316	0.1%

Earnings in Federal Government (Excluding Military) (221)			
Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.00		R-Square = 0.2662	
Independent Var.	Coeff.	t-Statistic	Signif.
SDS	-0.0967	-5.210	<0.01%
PDCA(CE)r	5.3421	3.160	0.5%

Earnings in State Government (223)			
Type of Divisor: Geom. Mean		Intercept = 1.5296	
Avail. Land Exponent = 0.06		R-Square = 0.1016	
Independent Var.	Coeff.	t-Statistic	Signif.
SDC	0.3363	4.218	<0.01%
SDM	-0.0105	-2.198	3%

Earnings in Local Government (227)			
Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.63		R-Square = 0.7057	
Independent Var.	Coeff.	t-Statistic	Signif.
CDCA(TH)r	1145.9	11.174	<0.01%
SDC	0.3224	3.863	0.05%

Number of Households in Lower Third of Regional Income Distribution (227)			
Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.86		R-Square = 0.7972	
Independent Var.	Coeff.	t-Statistic	Signif.
PDCA(TE)r	0.6829	13.135	<0.01%
SDC	0.2483	6.202	<0.01%
SDS	-0.0387	-6.859	<0.01%
DMA(TH)p	0.6416	2.537	2%

Number of Households in Middle Third of Regional Income Distribution (227)			
Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.85		R-Square = 0.6820	
Independent Var.	Coeff.	t-Statistic	Signif.
SDC	0.4390	5.176	<0.01%
SDM1	-0.0059	-5.611	<0.01%
PDCA(IE)r	0.4229	1.947	6%
SDS	-0.1550	-3.207	0.5%
PDCA(UH)r	52.040	2.193	3%
SDCA(PE)r	0.4933	2.355	2%

Number of Households in Upper Third of Regional Income Distribution (227)			
Type of Divisor: Exponential		No Constant Term	
Avail. Land Exponent = 0.72		R-Square = 0.6902	
Independent Var.	Coeff.	t-Statistic	Signif.
SDC	0.8143	10.555	<0.01%
SDM1	-0.0217	-8.959	<0.01%
SDS	-0.1626	-7.590	<0.01%
SDCA(PE)p	1.5226	4.253	<0.01%

In these regressions, the structured nature of the analysis and the deletions of extreme observations caused R-square to average only 0.373 in the economic regressions and 0.723 in the household regressions. The economic situation was not as bad as the former figure would indicate, however, because the lowest R-square values were obtained for relatively unimportant sectors (e.g., farming). For the six most important industries, accounting for 55% of the Charlotte region's total earnings, the average R-square was 0.540. The earnings-weighted average for all industries was 0.452.

As typically found when calibrating allocation models of this type, the R-square values obtained for consumer service activities were far higher on average than those for industrial and producer service functions. This was to be expected partly because consumer service activities are inherently more predictable, given their orientation toward local customers, and partly because they were addressed last in the modeling sequence and thus could be linked to current changes in the two other economic groups plus households.

V. County & District Results

Population

Section II described the course of events whereby forecasts were obtained for counties and sub-county districts in the Charlotte region. The allocation model was first applied at the county level, but was designed to allocate future changes in demographic and economic variables directly from the region level to the 46 districts into which the region had been divided. The results of direct region-to-district allocation were judged unsatisfactory, however, due to an excessive northward tilt in the region's forecasted growth. Thus there was a retreat to a hybrid approach wherein forecasts were obtained by a region-to-county-to-district allocation, but the county results were shaped by the calculation of key predictors at the district level. All of the results presented here were obtained from this hybrid forecasting tableau.

The complete forecasts of population at five-year intervals for counties and districts are presented on the next two pages. Table 11 below is a county-level summary that focuses upon two measures of population growth: average annual percent change (computed as a compound rate) and annual change per square mile. The latter is a measure of absolute growth that reflects how much new development one would expect to see in any given area. These are the same measures that are mapped later for districts.

Table 11 only covers population changes through 2030, whereas the full forecast compilation in Table 12 extends to 2035. The time intervals addressed by Table 11 are: 1990 to 2002 (the baseline year): 2002 to 2010; and the two decades after 2010.

Table 11. MEASURES OF POPULATION CHANGE FOR COUNTIES

	Annual Percent Change (Compound Rate)				Annual Change Per Square Mile			
	1990-02	2002-10	2010-20	2020-30	90-02	02-10	10-20	20-30
Anson	0.64%	0.61%	1.73%	2.61%	0.3	0.3	0.9	1.7
Cabarrus	2.89%	2.54%	2.72%	2.44%	9.2	10.6	14.4	16.6
Cleveland	1.20%	0.61%	1.17%	1.55%	2.3	1.3	2.7	4.1
Gaston	0.82%	0.49%	0.96%	1.21%	4.2	2.7	5.6	7.9
Iredell	2.80%	2.30%	2.67%	2.56%	5.3	5.6	8.1	10.1
Lincoln	2.32%	2.40%	2.52%	2.29%	4.4	5.8	7.6	8.7
Mecklenburg	3.05%	2.00%	1.68%	1.31%	35.1	29.9	29.5	26.9
Rowan	1.55%	1.10%	1.52%	1.74%	3.7	3.0	4.6	6.2
Stanly	1.04%	0.74%	1.47%	1.97%	1.4	1.1	2.5	3.9
Union	4.19%	3.03%	3.12%	2.76%	7.0	7.3	9.9	11.7
Cherokee	1.53%	1.53%	2.08%	2.32%	1.9	2.2	3.5	4.9
Chester	0.51%	1.15%	2.00%	2.47%	0.3	0.7	1.4	2.2
Lancaster	1.09%	1.23%	1.91%	2.09%	1.1	1.4	2.6	3.5
Union, SC	-0.23%	0.19%	1.21%	2.07%	-0.1	0.1	0.7	1.5
York	2.30%	1.92%	2.19%	2.02%	5.0	5.2	7.1	8.1
Region	2.28%	1.76%	1.93%	1.85%	5.5	5.2	6.8	7.8

Table 12. APRIL 1 POPULATIONS OF COUNTIES AND SUB-COUNTY DISTRICTS: ACTUAL VALUES, ESTIMATES AND FORECASTS – PART I

		1990	2000	2002	2005	2010	2015	2020	2025	2030	2035
Anson	**TOTAL**	23,474	25,275	25,328	25,540	26,596	28,587	31,582	35,646	40,847	47,253
	% Change/Yr		0.7%	0.1%	0.3%	0.8%	1.5%	2.0%	2.5%	2.8%	3.0%
Cabarrus	Central	45,288	66,139	71,325	77,907	90,744	105,266	120,724	136,368	151,450	165,219
Cabarrus	NW	29,306	33,332	34,398	36,125	39,460	43,382	47,911	53,065	58,864	65,326
Cabarrus	South	11,660	17,023	18,378	19,457	21,993	25,270	29,075	33,200	37,432	41,561
Cabarrus	NE	12,681	14,569	15,123	15,898	17,948	20,933	24,841	29,658	35,370	41,964
Cabarrus	**TOTAL**	98,935	131,063	139,224	149,387	170,145	194,852	222,552	252,291	283,115	314,070
	% Change/Yr		2.9%	3.1%	2.4%	2.6%	2.7%	2.7%	2.5%	2.3%	2.1%
Cleveland	SE	26,789	33,394	34,205	34,477	35,811	38,079	41,093	44,661	48,594	52,700
Cleveland	Cent	33,957	33,408	33,407	34,060	35,257	36,732	38,646	41,160	44,436	48,636
Cleveland	NW	23,968	29,485	30,191	30,539	31,646	33,358	35,616	38,361	41,533	45,073
Cleveland	**TOTAL**	84,714	96,287	97,803	99,076	102,714	108,169	115,355	124,182	134,563	146,409
	% Change/Yr		1.3%	0.8%	0.4%	0.7%	1.0%	1.3%	1.5%	1.6%	1.7%
Gaston	E	53,684	58,051	58,867	59,325	60,871	63,323	66,601	70,623	75,308	80,573
Gaston	SW	99,981	108,193	109,676	110,609	113,658	118,277	124,123	130,853	138,124	145,593
Gaston	NW	21,428	24,121	24,585	25,103	26,359	28,084	30,254	32,844	35,830	39,186
Gaston	**TOTAL**	175,093	190,365	193,128	195,037	200,888	209,685	220,979	234,321	249,261	265,352
	% Change/Yr		0.8%	0.7%	0.3%	0.6%	0.9%	1.1%	1.2%	1.2%	1.3%
Iredell	South	23,824	36,995	39,920	43,939	52,032	61,491	71,876	82,752	93,680	104,223
Iredell	S Central	12,476	18,752	20,176	21,892	25,758	30,798	36,918	44,024	52,020	60,813
Iredell	N Central	46,326	53,947	55,756	57,586	61,541	66,535	72,458	79,203	86,661	94,724
Iredell	North	10,305	12,966	13,579	14,273	15,862	17,988	20,646	23,833	27,544	31,775
Iredell	**TOTAL**	92,931	122,660	129,430	137,689	155,192	176,810	201,899	229,812	259,906	291,535
	% Change/Yr		2.8%	2.7%	2.1%	2.4%	2.6%	2.7%	2.6%	2.5%	2.3%
Lincoln	East	11,418	16,141	17,018	19,463	24,436	30,010	35,846	41,603	47,828	54,431
Lincoln	Central	29,037	34,380	35,359	36,777	39,436	42,695	46,556	50,974	55,587	60,399
Lincoln	West	9,864	13,259	13,877	14,638	16,220	18,145	20,360	22,810	25,442	28,201
Lincoln	**TOTAL**	50,319	63,780	66,254	70,878	80,093	90,850	102,763	115,388	128,857	143,030
	% Change/Yr		2.4%	1.9%	2.3%	2.5%	2.6%	2.5%	2.3%	2.2%	2.1%
Mecklenburg	N	22,220	49,447	55,056	64,278	82,881	104,601	128,373	153,132	177,813	201,349
Mecklenburg	NW	38,088	51,752	54,630	57,672	64,001	71,441	79,457	87,517	95,086	101,630
Mecklenburg	NNE	15,437	50,624	57,805	69,646	88,912	106,864	122,662	135,465	144,432	148,722
Mecklenburg	ENE	32,139	43,383	45,652	46,085	48,948	53,753	59,650	65,791	71,325	75,404
Mecklenburg	E	102,000	131,346	137,155	139,334	144,766	152,089	160,893	170,764	181,293	192,066
Mecklenburg	S	141,711	193,447	204,491	220,054	240,771	256,040	267,108	275,220	281,625	287,568
Mecklenburg	SW	29,229	45,903	49,383	52,609	57,417	61,622	65,351	68,728	71,881	74,936
Mecklenburg	Central	130,609	129,552	129,493	130,997	132,168	132,306	132,144	132,416	133,857	137,200
Mecklenburg	**TOTAL**	511,433	695,454	733,665	780,676	859,864	938,716	1,015,638	1,089,034	1,157,311	1,218,875
	% Change/Yr		3.1%	2.7%	2.1%	2.0%	1.8%	1.6%	1.4%	1.2%	1.0%

Table 12. APRIL 1 POPULATIONS OF COUNTIES AND SUB-COUNTY DISTRICTS: ACTUAL VALUES, ESTIMATES AND FORECASTS – PART II

		1990	2000	2002	2005	2010	2015	2020	2025	2030	2035
Rowan	S Cent	29,554	32,313	32,686	33,006	34,070	35,730	37,908	40,526	43,505	46,766
Rowan	N Cent	39,252	43,708	44,363	45,310	46,851	48,533	50,573	53,192	56,606	61,035
Rowan	East	23,225	29,358	30,431	32,247	35,646	39,450	43,588	47,990	52,583	57,297
Rowan	West	18,574	24,961	25,592	26,332	28,688	32,251	36,798	42,104	47,944	54,096
Rowan	**TOTAL**	110,605	130,340	133,072	136,895	145,255	155,964	168,868	183,812	200,639	219,195
	% Change/Yr		1.7%	1.0%	0.9%	1.2%	1.4%	1.6%	1.7%	1.8%	1.8%
Stanly	North	26,734	28,990	29,175	29,700	30,857	32,434	34,515	37,180	40,511	44,590
Stanly	South	25,031	29,110	29,414	29,774	31,294	33,872	37,397	41,761	46,855	52,570
Stanly	**TOTAL**	51,765	58,100	58,589	59,474	62,151	66,306	71,911	78,940	87,366	97,160
	% Change/Yr		1.2%	0.4%	0.5%	0.9%	1.3%	1.6%	1.9%	2.0%	2.1%
Union, NC	NW	25,209	47,296	55,194	62,170	75,440	90,139	105,533	120,904	135,246	147,706
Union, NC	Central	38,389	50,562	54,731	58,422	66,447	76,546	88,407	101,737	116,041	130,912
Union, NC	East	7,105	8,174	8,620	9,074	10,195	11,900	14,346	17,700	22,097	27,685
Union, NC	South	13,508	17,645	19,187	20,354	22,770	25,796	29,457	33,787	38,763	44,388
Union, NC	**TOTAL**	84,211	123,677	137,731	150,019	174,852	204,382	237,743	274,127	312,147	350,691
	% Change/Yr		3.9%	5.5%	2.9%	3.1%	3.2%	3.1%	2.9%	2.6%	2.4%
Catawba	**SE Corner**	5,360	7,451	7,807	8,587	10,213	12,218	14,565	17,221	20,151	23,321
	% Change/Yr		3.3%	2.4%	3.2%	3.5%	3.6%	3.6%	3.4%	3.2%	3.0%
Cherokee	**TOTAL**	44,506	52,537	53,408	55,534	60,291	66,504	74,102	83,013	93,168	104,495
	% Change/Yr		1.7%	0.8%	1.3%	1.7%	2.0%	2.2%	2.3%	2.3%	2.3%
Chester	**TOTAL**	32,170	34,068	34,195	35,077	37,478	41,024	45,692	51,460	58,306	66,209
	% Change/Yr		0.6%	0.2%	0.9%	1.3%	1.8%	2.2%	2.4%	2.5%	2.6%
Lancaster	North	5,500	7,059	7,230	7,755	9,028	10,659	12,488	14,358	16,108	17,580
Lancaster	South	49,016	54,292	54,856	56,107	59,424	64,165	70,194	77,375	85,572	94,650
Lancaster	**TOTAL**	54,516	61,351	62,086	63,862	68,452	74,824	82,682	91,732	101,680	112,230
	% Change/Yr		1.2%	0.6%	0.9%	1.4%	1.8%	2.0%	2.1%	2.1%	2.0%
Union, SC	**TOTAL**	30,337	29,881	29,521	29,424	29,964	31,409	33,787	37,130	41,466	46,828
	% Change/Yr		-0.2%	-0.6%	-0.1%	0.4%	0.9%	1.5%	1.9%	2.2%	2.5%
York	North	15,364	19,213	20,132	20,818	22,079	23,396	24,668	25,795	26,674	27,205
York	NE	17,346	25,358	27,180	29,737	34,905	40,721	46,626	52,062	56,470	59,293
York	SE	74,263	88,029	91,598	96,331	105,695	116,724	129,210	142,946	157,725	173,338
York	West	24,524	32,014	33,793	35,062	38,460	43,288	49,348	56,438	64,359	72,911
York	**TOTAL**	131,497	164,614	172,702	181,949	201,139	224,129	249,852	277,240	305,228	332,747
	% Change/Yr		2.3%	2.4%	1.8%	2.0%	2.2%	2.2%	2.1%	1.9%	1.7%
REGION TOTAL		1,581,866	1,986,903	2,073,940	2,179,103	2,385,288	2,624,430	2,889,969	3,175,350	3,474,012	3,779,397
	% Change/Yr		2.3%	2.2%	1.7%	1.8%	1.9%	1.9%	1.9%	1.8%	1.7%

The percentage rates of population change appearing on the left-hand side of Table 11 can best be summarized by dividing the region's counties into four groups and comparing future growth with past growth in each case. Group I consists of the six outlying counties that are not presently included in the official Charlotte metropolitan area. These six – the region's only counties with 2002 populations below 65,000 – are Anson, Stanly and the four South Carolina counties besides York. The expected pattern for Group I is an acceleration of percentage growth over the course of the forecast period (in some cases following slow growth through 2010), due to the outward spread of suburban and exurban development. The annual rates of population change in Group I counties after 2020 will all be higher – by 0.8% to 2.3% per year – than the actual rates observed during 1990-2002.

Group II consists of the other suburban counties that had 1990-2002 rates of population change below 2% per year, namely Cleveland, Gaston and Rowan. The expected Group II pattern is relatively slow growth through 2010 and faster expansion thereafter, leading to higher growth rates after 2020 than during the historical 1990-2002 period. This pattern will be mild for Rowan but pronounced for Cleveland and Gaston, because the latter counties will need time to overcome manufacturing losses.

Group III covers the remaining suburban counties: Cabarrus, Iredell, Lincoln, Union and York. These counties all adjoin Mecklenburg, and all gained population at rates of 2.3% per year or more during 1990-2002. The expected pattern for Group III is strong population growth throughout the forecast period, albeit with some moderation during 2002-2010. These five counties are expected to capture 46.4% of the region's entire population gain in the 2002-2030 period, with Mecklenburg capturing 30.5% and the eight counties in the other groups capturing 23.1%. Yet none of the annual growth rates for Group III counties in the time intervals covered by Table 11 will be as high as the rates recorded in 1990-2002. Thus the leadership roles of these counties have already been established, and the forecasts do not imply anything unprecedented.

Group IV consists of Mecklenburg County, which during 1990-2002 captured 45% of the region's population gain and was second only to Union County in percentage growth. The forecast says that by about 2015 Mecklenburg County will be gaining population at only half the annual percentage rate observed in the 1990s. Mecklenburg's absolute population gains will also decline throughout the forecast period, although much less abruptly. Given the limits on available land in Mecklenburg, however, a more rapid tapering off of population growth would not be unreasonable and could be obtained from other forecasting models (as was the case in the 2000 Charlotte regional study).

The district population forecasts appearing in Table 12 are more difficult to summarize verbally. Hence the expected patterns are shown graphically in Figure 8 and Figure 9 on the next two pages. Again the subjects are annual percentage growth and average annual gain per square mile. As indicated by the legends in the upper-right corners of the graphs, the values of these variables have been grouped in five categories (with somewhat equal numbers of districts per category) and mapped in such a way that darker shading indicates more population growth.

Figure 8

CHARLOTTE REGION: SUB-COUNTY DISTRICTS CLASSED BY PERCENTAGE RATE OF POP. GROWTH FORECASTED FOR 2002-30

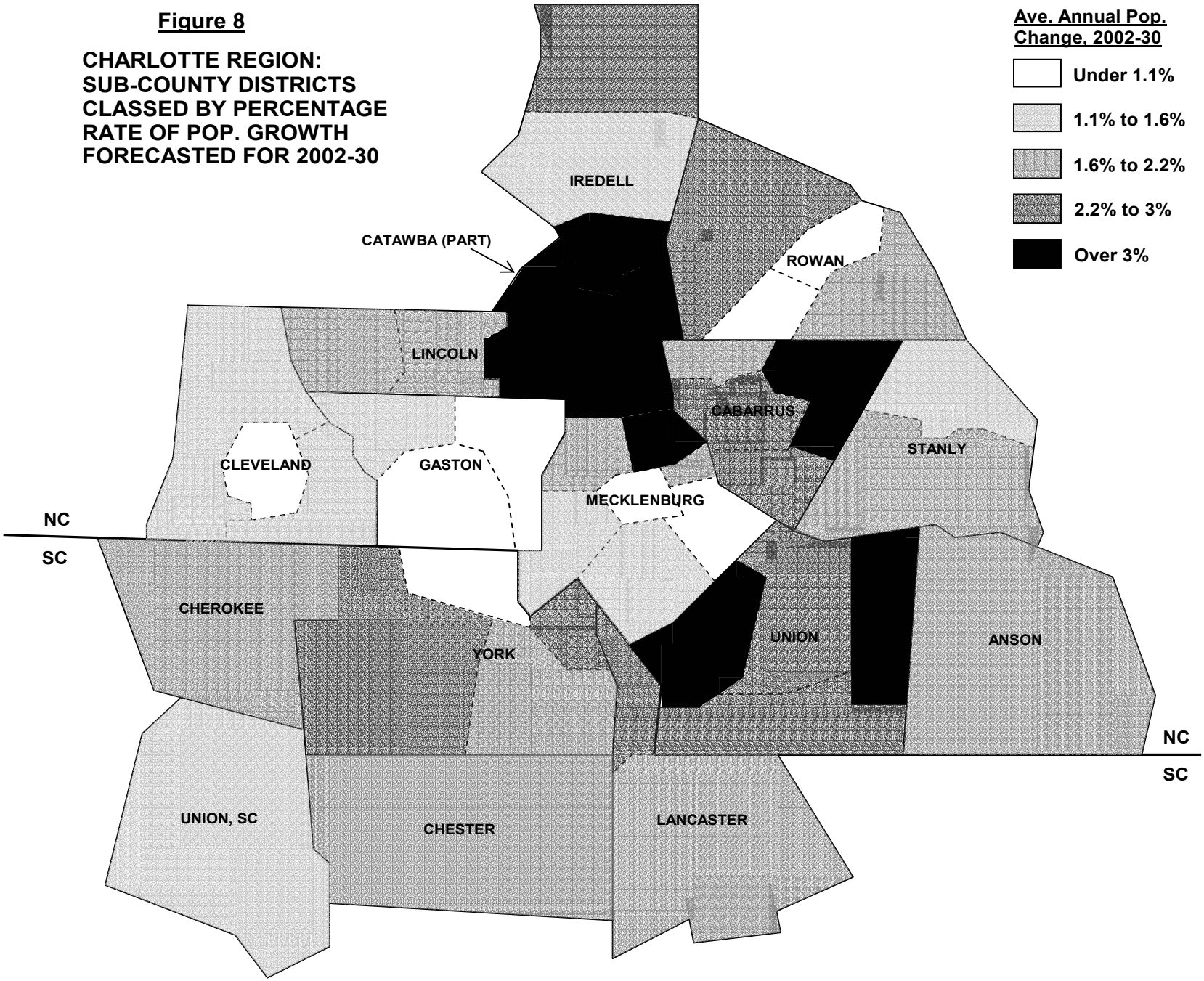
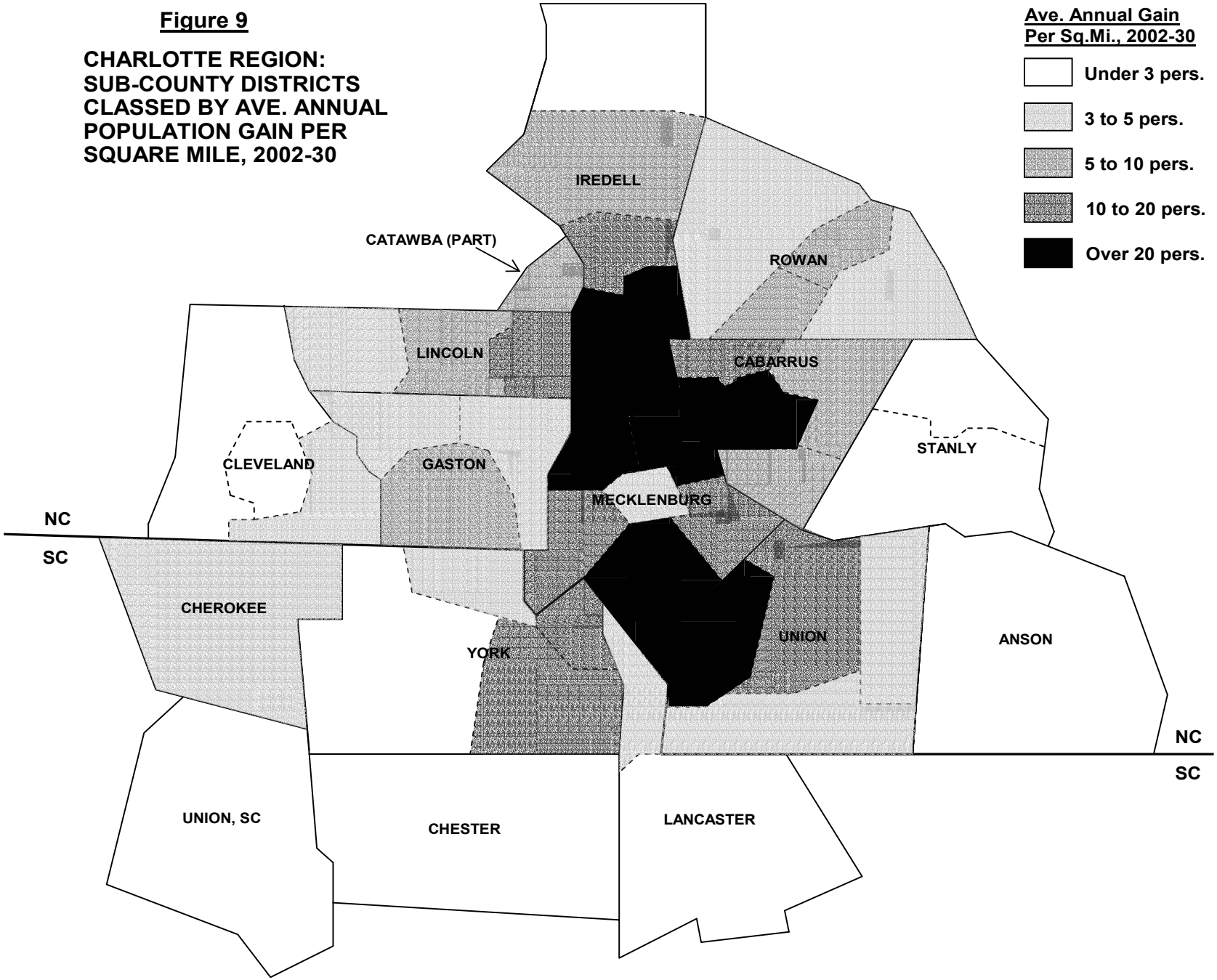


Figure 9

CHARLOTTE REGION: SUB-COUNTY DISTRICTS CLASSED BY AVE. ANNUAL POPULATION GAIN PER SQUARE MILE, 2002-30



The maps showing population growth rates and population change per square miles provide substantially different perspectives on the forecasted pattern of regional development. The depiction of growth rates in Figure 8 gives a somewhat exaggerated view of the extent to which the region's population will be decentralizing, because the rates tend to be low for districts with large existing populations – even though some of them will be growing substantially in absolute terms – and high in outlying districts by virtue of their low existing populations. The former cases are found in southern Mecklenburg County, central Rowan County, and most of Gaston County (though the Gaston areas are slow-growing in absolute as well as relative terms). The leading examples of high percentage growth by virtue of low existing population are southeast Catawba, west Rowan, northeast Cabarrus, east Union and west York.

The most meaningful pattern revealed by Figure 8 is a continuous band of high-growth districts (in the top two categories) extending most – but not all – of the way around the region's urban core, from east Lincoln to northeast York. The cluster of northern districts in the top growth category is particularly impressive. Union County would have a similar cluster if the top-category threshold were 2.7% rather than 3%; but this change would make the northern cluster even larger by bringing in Central Cabarrus.

The map in Figure 9 of absolute population change per square mile is arguably more revealing because it describes how much new development an observer would be likely to see when driving down any given length of road or looking across any given area of land. Figure 9 shows that growth in outlying areas will be quite sparse, albeit high in percentage terms, and that most parts of Mecklenburg County will still be big gainers. Expressing growth on this basis gives the region a contiguous high-gain zone that is elongated in a north-south direction (although bifurcated at the southern end between the I-77 vector and the Union County vector). The concentration of top-category districts in the north is again impressive. However, this group now extends into Cabarrus County but not into Lincoln or central Iredell.

Employment

The forecasts of total employment obtained in this study for districts and counties are presented in Table 13 on the next two pages. (Pages A35-A42 of the appendix offer breakdowns of employment by industry using an eight-category system. These pages follow tabulations of district-level demographic data in A17-A34.)

The forecasted county-level rates of employment change are summarized in Table 14, appearing after the two parts of Table 13. For all counties besides Mecklenburg, the employment growth rates forecasted for the 2002-2010 interval are higher than the rates observed in 1991-2002. Part of the reason is that 2002 employment was depressed by recent job losses, especially in manufacturing, and part is that Mecklenburg is no longer expected to capture an increasing share of the region's jobs. After 2010, employment growth rates are expected to rise further in the six outlying counties identified earlier as Group I, while tapering off in all other counties besides Mecklenburg (and the two with prior growth rates below 1% per year). Meanwhile Mecklenburg's rates of employment growth are expected to decline both in absolute terms and relative to the regional rates.

Table 13. EMPLOYMENT IN COUNTIES AND SUB-COUNTY DISTRICTS: ACTUAL VALUES AND FORECASTS – PART I

		1991	2002	2010	2015	2020	2025	2030	2035
Anson	**TOTAL**	8,887	8,622	9,616	10,583	11,786	13,204	14,812	16,588
	% Change/Yr		-0.3%	1.4%	1.9%	2.2%	2.3%	2.3%	2.3%
Cabarrus	Central	23,492	40,540	55,966	65,279	74,041	82,001	88,912	94,522
Cabarrus	NW	13,679	14,122	16,322	18,325	20,634	23,100	25,577	27,916
Cabarrus	South	2,770	4,038	6,379	8,086	9,866	11,628	13,277	14,720
Cabarrus	NE	2,265	2,783	3,898	4,941	6,192	7,603	9,125	10,711
Cabarrus	**TOTAL**	42,205	61,483	82,565	96,631	110,733	124,333	136,891	147,868
	% Change/Yr		3.5%	3.8%	3.2%	2.8%	2.3%	1.9%	1.6%
Cleveland	SE	11,826	11,425	12,167	12,645	13,145	13,673	14,238	14,848
Cleveland	Cent	16,930	18,961	20,314	21,356	22,501	23,709	24,940	26,154
Cleveland	NW	7,700	6,957	7,394	7,640	7,887	8,151	8,452	8,807
Cleveland	**TOTAL**	36,456	37,343	39,875	41,642	43,533	45,534	47,631	49,809
	% Change/Yr		0.2%	0.8%	0.9%	0.9%	0.9%	0.9%	0.9%
Gaston	E	25,952	21,255	21,611	22,078	22,660	23,295	23,925	24,486
Gaston	SW	44,456	46,480	50,679	53,643	56,683	59,643	62,368	64,701
Gaston	NW	6,074	4,980	5,240	5,357	5,474	5,618	5,818	6,101
Gaston	**TOTAL**	76,482	72,716	77,529	81,078	84,817	88,557	92,110	95,288
	% Change/Yr		-0.5%	0.8%	0.9%	0.9%	0.9%	0.8%	0.7%
Iredell	South	10,993	16,468	24,035	29,515	35,255	40,987	46,446	51,367
Iredell	S Central	3,172	4,245	6,569	8,639	11,072	13,774	16,652	19,613
Iredell	N Central	27,420	33,068	40,507	45,011	49,297	53,277	56,864	59,970
Iredell	North	2,446	3,570	4,351	4,923	5,557	6,253	7,008	7,823
Iredell	**TOTAL**	44,031	57,352	75,463	88,088	101,180	114,291	126,972	138,774
	% Change/Yr		2.4%	3.5%	3.1%	2.8%	2.5%	2.1%	1.8%
Lincoln	East	3,999	5,512	8,378	10,747	13,393	16,178	18,960	21,600
Lincoln	Central	12,885	14,999	17,453	19,241	21,114	22,984	24,760	26,351
Lincoln	West	1,603	1,862	2,265	2,555	2,894	3,298	3,783	4,367
Lincoln	**TOTAL**	18,487	22,373	28,096	32,542	37,401	42,459	47,503	52,318
	% Change/Yr		1.7%	2.9%	3.0%	2.8%	2.6%	2.3%	1.9%
Mecklenburg	N	13,348	27,542	40,334	49,361	58,830	68,445	77,912	86,937
Mecklenburg	NW	22,697	30,954	37,059	40,679	44,121	47,364	50,387	53,169
Mecklenburg	NNE	19,126	53,918	78,899	94,991	110,799	125,778	139,384	151,073
Mecklenburg	ENE	16,757	20,419	25,224	28,832	32,600	36,273	39,598	42,321
Mecklenburg	E	34,959	41,691	45,988	48,777	51,511	54,079	56,368	58,266
Mecklenburg	S	88,506	112,394	132,515	145,048	157,108	168,325	178,332	186,761
Mecklenburg	SW	46,319	74,989	90,824	98,975	105,739	111,078	114,957	117,338
Mecklenburg	Central	158,797	194,935	218,847	235,481	252,929	270,787	288,652	306,118
Mecklenburg	**TOTAL**	400,510	556,842	669,691	742,145	813,636	882,129	945,591	1,001,984
	% Change/Yr		3.0%	2.3%	2.1%	1.9%	1.6%	1.4%	1.2%

Table 13. EMPLOYMENT IN COUNTIES AND SUB-COUNTY DISTRICTS: ACTUAL VALUES AND FORECASTS – PART II

		1991	2002	2010	2015	2020	2025	2030	2035
Rowan	S Cent	5,916	7,820	8,676	9,220	9,804	10,456	11,204	12,075
Rowan	N Cent	30,802	32,235	34,704	36,298	37,912	39,533	41,147	42,738
Rowan	East	4,531	6,222	7,808	8,707	9,554	10,366	11,162	11,959
Rowan	West	4,101	6,204	8,688	10,368	12,134	13,977	15,888	17,858
Rowan	**TOTAL**	45,349	52,480	59,877	64,592	69,404	74,333	79,401	84,629
	% Change/Yr		1.3%	1.7%	1.5%	1.4%	1.4%	1.3%	1.3%
Stanly	North	13,110	13,478	14,603	15,505	16,542	17,699	18,960	20,311
Stanly	South	8,175	7,373	8,280	9,127	10,152	11,323	12,607	13,973
Stanly	**TOTAL**	21,285	20,851	22,882	24,632	26,694	29,022	31,567	34,283
	% Change/Yr		-0.2%	1.2%	1.5%	1.6%	1.7%	1.7%	1.7%
Union, NC	NW	11,204	15,882	25,110	31,764	38,649	45,390	51,613	56,941
Union, NC	Central	19,319	27,375	37,001	43,531	50,139	56,561	62,531	67,787
Union, NC	East	3,250	3,215	3,921	4,735	5,804	7,101	8,598	10,269
Union, NC	South	1,501	1,686	2,464	3,145	3,941	4,819	5,752	6,707
Union, NC	**TOTAL**	35,274	48,158	68,496	83,175	98,533	113,871	128,494	141,704
	% Change/Yr		2.9%	4.5%	4.0%	3.4%	2.9%	2.4%	2.0%
Catawba	**SE Corner**	977	1,367	2,005	2,549	3,183	3,886	4,640	5,424
	% Change/Yr		3.1%	4.9%	4.9%	4.5%	4.1%	3.6%	3.2%
Cherokee	**TOTAL**	19,676	22,817	26,146	28,672	31,475	34,498	37,685	40,980
	% Change/Yr		1.4%	1.7%	1.9%	1.9%	1.9%	1.8%	1.7%
Chester	**TOTAL**	13,026	12,320	13,863	15,305	17,052	19,054	21,260	23,619
	% Change/Yr		-0.5%	1.5%	2.0%	2.2%	2.2%	2.2%	2.1%
Lancaster	North	1,583	1,957	2,755	3,422	4,117	4,756	5,255	5,530
Lancaster	South	17,554	18,524	21,648	24,288	27,144	29,956	32,465	34,409
Lancaster	**TOTAL**	19,138	20,482	24,403	27,709	31,260	34,712	37,720	39,939
	% Change/Yr		0.6%	2.2%	2.6%	2.4%	2.1%	1.7%	1.2%
Union, SC	**TOTAL**	9,847	9,194	9,504	10,106	11,012	12,212	13,698	15,460
	% Change/Yr		-0.6%	0.4%	1.2%	1.7%	2.1%	2.3%	2.5%
York	North	5,445	6,199	7,390	8,059	8,656	9,168	9,583	9,889
York	NE	5,993	9,676	14,086	16,856	19,376	21,430	22,799	23,268
York	SE	32,684	39,193	47,348	53,414	59,785	66,093	71,971	77,052
York	West	7,629	9,034	10,911	12,278	13,728	15,209	16,665	18,043
York	**TOTAL**	51,750	64,102	79,735	90,607	101,545	111,899	121,018	128,252
	% Change/Yr		2.0%	2.8%	2.6%	2.3%	2.0%	1.6%	1.2%
REGION TOTAL		843,380	1,068,501	1,289,746	1,440,057	1,593,245	1,743,995	1,886,992	2,016,921
	% Change/Yr		2.2%	2.4%	2.2%	2.0%	1.8%	1.6%	1.3%

Table 14. DESCRIPTORS OF FORECASTED EMPLOYMENT FOR COUNTIES

	Annual Percent Change in Employment				Ratio of Employment Per Capita to Regional Employment Per Cap.			
	1991-02	2002-10	2010-20	2020-30	2002	2010	2020	2030
Anson	-0.27%	1.37%	2.06%	2.31%	0.66	0.67	0.68	0.67
Cabarrus	3.48%	3.75%	2.98%	2.14%	0.86	0.90	0.90	0.89
Cleveland	0.22%	0.82%	0.88%	0.90%	0.74	0.72	0.68	0.65
Gaston	-0.46%	0.80%	0.90%	0.83%	0.73	0.71	0.70	0.68
Iredell	2.43%	3.49%	2.98%	2.30%	0.86	0.90	0.91	0.90
Lincoln	1.75%	2.89%	2.90%	2.42%	0.66	0.65	0.66	0.68
Mecklenburg	3.04%	2.33%	1.97%	1.51%	1.47	1.44	1.45	1.50
Rowan	1.34%	1.66%	1.49%	1.35%	0.77	0.76	0.75	0.73
Stanly	-0.19%	1.17%	1.55%	1.69%	0.69	0.68	0.67	0.67
Union	2.87%	4.50%	3.70%	2.69%	0.68	0.72	0.75	0.76
Cherokee	1.36%	1.72%	1.87%	1.82%	0.83	0.80	0.77	0.74
Chester	-0.51%	1.49%	2.09%	2.23%	0.70	0.68	0.68	0.67
Lancaster	0.62%	2.21%	2.51%	1.90%	0.64	0.66	0.69	0.68
Union, SC	-0.62%	0.42%	1.48%	2.21%	0.60	0.59	0.59	0.61
York	1.96%	2.77%	2.45%	1.77%	0.72	0.73	0.74	0.73
Region	2.17%	2.38%	2.14%	1.71%	1.00	1.00	1.00	1.00

The right-hand side of Table 14 looks at employment per capita, expressed as a ratio to regional employment per capita. For all of the past and future years in question, the only values above unity are those for Mecklenburg County, reflecting Mecklenburg's enduring role as the region's principal economic engine. The ratios for other counties express the extent to which they have functioned and will function as employment centers, as opposed to bedroom communities.

The employment-per-capita ratios for the six outlying counties in Group I will tend to decline below their 2002 values, or else hold at low levels, and none will exceed 0.7 except the declining values for Cherokee County. Thus the Group I counties will be integrated into the urban complex as bedroom suburbs, at least initially. Declines will also prevail for the three counties in Group II – Cleveland, Gaston and Rowan – due to economic restraints in the first two of these cases and the outlying location of Rowan.

Within Group III, which covers the five fast-growing counties adjacent to Mecklenburg, there is a difference that helps to explain the overall growth pattern forecasted for the region. The two southern counties in this group – Union and York – are historically low in employment per capita. Despite very fast job gains in Union, the future ratios in these cases are not expected to exceed 0.76. On the north side, low ratios will prevail in Lincoln County, but Cabarrus and Iredell already have employment-per-capita ratios of 0.86, and future values of around 0.9 are expected in these cases. Thus the northern zone will play a more prominent economic role than the south, especially if the former is defined to include north Mecklenburg. This fact is an important underlying cause of the expected northward tilt in regional development.

VI. Route 73 Corridor Results

The introductory section has already discussed the findings for the Route 73 Corridor in general terms. The present section gives the results in more detail and looks at the corridor's share of prospective growth in the relevant NCDOT planning divisions – thereby weighing in on the need for Route 73 improvements relative to other projects.

Regarding the detail provided here for the seven component areas of the corridor, the remarks in the first two sections about relative forecast reliability must be kept in mind. The smaller the areas under consideration, the more serious become the omissions of supply-side factors – especially those related to public policy – in the present variety of top-down forecasting. For land units of any size, demand-side forecasts convey important information and have value as starting points for supply-side adjustments, so it would have been fully legitimate to highlight the component-area forecasts and use them as the basis for establishing forecast ranges. However, the ranges for the smaller areas under consideration would have been very wide. Therefore we have retreated to a two-way partitioning of the corridor in order to stand firm on the ranges shown in Figure 4.

Population, Households and Employment
Table 15 on the next page presents the forecasts of population, households and total employment obtained for the Route 73 corridor and its component areas. (More detailed tables are provided later.) Figure 10 on the second following page shows the boundaries of the component areas and describes their expected population growth using the same measures employed at the district level in Figures 8 and 9.

Section I has already summarized the results for population. Any review of these and other forecasts should start with an acknowledgement of the gains already achieved in the corridor. Annual rates of change are presented in four columns on the right-hand side of Table 15, with the first column describing recent growth and the other columns addressing future years through 2030. In a majority of cases the rates of population growth during 1990-2000 were strikingly high: 9.6% per year in Area 3, 6.6% per year in Area 4, and 4.3% to 4.5% in areas 2 and 5. The corresponding figures for households were as high or higher. On the employment side, the annual gains during 1991-2002 were around 7% in areas 2 and 3, 4.8% in Area 4, and around 3% in areas 1 and 5. Against this background, the prediction of very rapid development over the next three decades should not be surprising.

Future demographic and economic gains are expected to follow a geographic pattern that is already discernable. The epicenter of development will be the right-central portion of the corridor where it is crossed by I-77 (in Area 3). Growth will spread east and west from there, eventually reaching rates above 2% per year throughout the corridor while abating in percentage terms near the center. In Cabarrus County, regional growth forces will progressively overwhelm the negative effects of manufacturing losses in Kannapolis and Concord, while in Lincoln County a major growth impetus will result from the upgrading of Route 16 to a freeway.

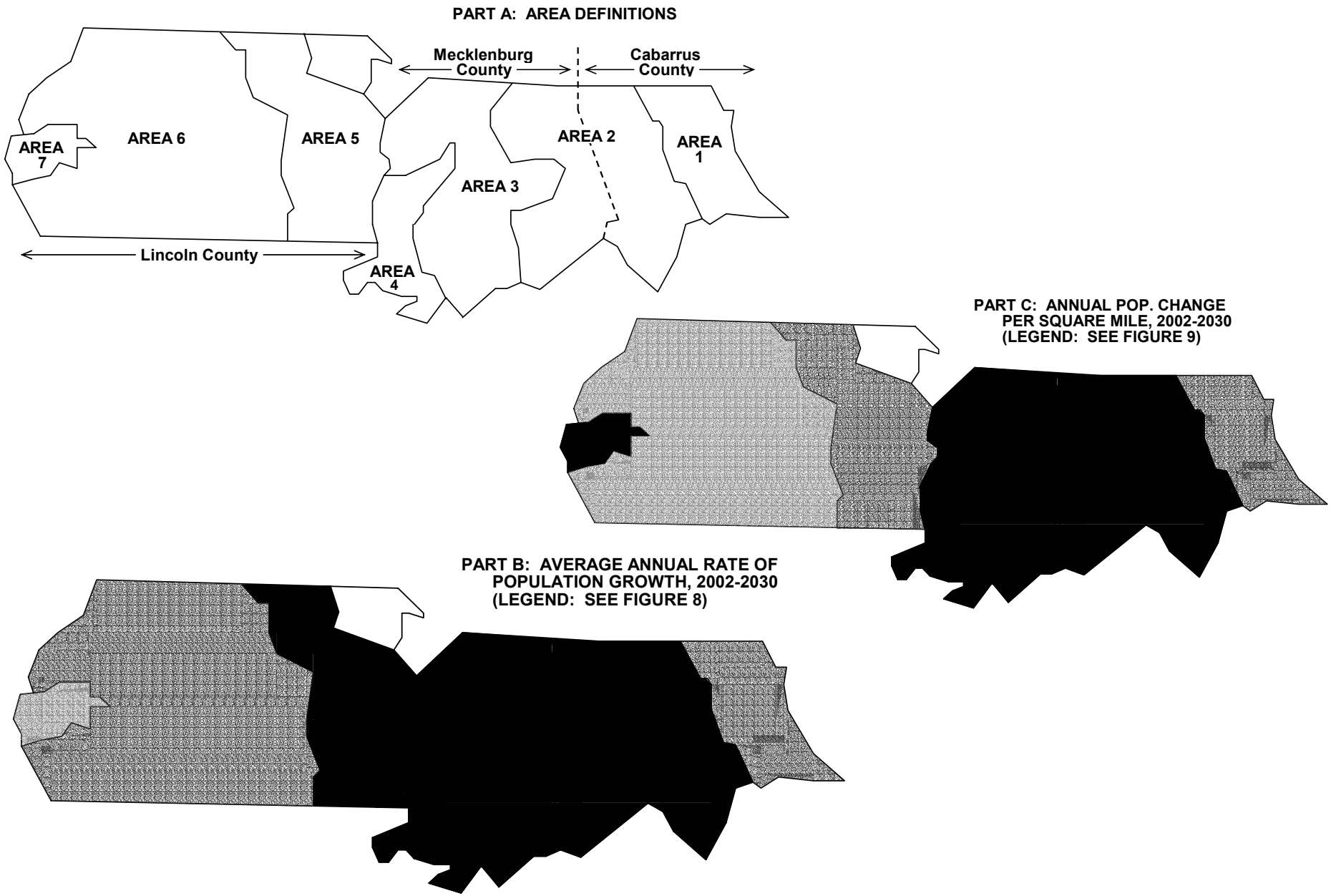
Table 15. SUMMARY OF FORECASTS, ROUTE 73 CORRIDOR

POPULATION	Number of Persons									Annual Compound Rate of Change			
	1990	2000	2002	2010	2015	2020	2025	2030	2035	90-00	00-10	10-20	20-30
Area 1	5,323	7,463	7,977	9,649	10,607	11,725	13,188	15,184	17,900	3.4%	2.6%	2.0%	2.6%
Area 2	9,136	14,141	15,215	24,971	34,545	46,044	58,843	72,320	85,849	4.5%	5.9%	6.3%	4.6%
Area 3	14,629	36,464	40,913	59,610	72,412	85,543	98,558	111,015	122,471	9.6%	5.0%	3.7%	2.6%
Area 4	1,857	3,523	3,864	5,954	7,891	10,047	12,202	14,133	15,618	6.6%	5.4%	5.4%	3.5%
Area 5	6,855	10,416	11,029	15,701	18,997	22,245	25,237	28,554	32,149	4.3%	4.2%	3.5%	2.5%
Area 6	19,601	24,405	25,275	30,198	33,959	38,295	43,123	48,144	53,413	2.2%	2.2%	2.4%	2.3%
Area 7	8,340	8,827	8,902	9,786	10,858	12,172	13,599	15,008	16,269	0.6%	1.0%	2.2%	2.1%
Corridor	65,741	105,239	113,175	155,869	189,269	226,071	264,750	304,357	343,669	4.8%	4.0%	3.8%	3.0%

HOUSEHOLDS	Number of Households									Annual Compound Rate of Change			
	1990	2000	2002	2010	2015	2020	2025	2030	2035	90-00	00-10	10-20	20-30
Area 1	1,956	2,788	2,993	3,554	3,903	4,325	4,884	5,641	6,659	3.6%	2.5%	2.0%	2.7%
Area 2	2,729	4,502	4,891	8,355	11,789	15,932	20,564	25,460	30,401	5.1%	6.4%	6.7%	4.8%
Area 3	5,595	14,024	15,766	23,376	28,446	33,596	38,693	43,601	48,186	9.6%	5.2%	3.7%	2.6%
Area 4	785	1,665	1,848	2,893	3,838	4,884	5,929	6,869	7,603	7.8%	5.7%	5.4%	3.5%
Area 5	2,594	4,029	4,279	6,063	7,347	8,625	9,811	11,126	12,548	4.5%	4.2%	3.6%	2.6%
Area 6	7,108	9,039	9,398	11,223	12,646	14,299	16,145	18,067	20,080	2.4%	2.2%	2.5%	2.4%
Area 7	3,286	3,399	3,415	3,739	4,156	4,669	5,224	5,763	6,231	0.3%	1.0%	2.2%	2.1%
Corridor	24,053	39,446	42,589	59,203	72,123	86,331	101,248	116,527	131,706	5.1%	4.1%	3.8%	3.0%

EMPLOYMENT	Number of Jobs								Annual Compound Rate of Change			
	1991	2002	2010	2015	2020	2025	2030	2035	91-02	02-10	10-20	20-30
Area 1	2,974	4,148	5,953	7,424	9,045	10,737	12,436	14,042	3.1%	4.6%	4.3%	3.2%
Area 2	3,383	7,019	11,949	16,293	21,083	25,898	30,326	33,933	6.9%	6.9%	5.8%	3.7%
Area 3	10,578	22,452	30,814	35,852	40,751	45,540	50,240	54,864	7.1%	4.0%	2.8%	2.1%
Area 4	1,217	2,028	3,637	5,144	6,869	8,677	10,433	12,003	4.8%	7.6%	6.6%	4.3%
Area 5	3,729	5,008	7,533	9,400	11,387	13,389	15,300	17,032	2.7%	5.2%	4.2%	3.0%
Area 6	4,619	5,385	6,198	7,038	8,080	9,274	10,562	11,904	1.4%	1.8%	2.7%	2.7%
Area 7	6,222	7,221	8,824	9,979	11,170	12,323	13,327	14,166	1.4%	2.5%	2.4%	1.8%
Corridor	32,723	53,261	74,908	91,131	108,385	125,839	142,624	157,943	4.5%	4.4%	3.8%	2.8%

Figure 10. GROWTH DESCRIPTORS FOR THE ROUTE 73 CORRIDOR



Corridor Versus Non-Corridor Trends in NCDOT Divisions

The Route 73 corridor spans two of the geographic divisions used by the North Carolina Department of Transportation in planning and prioritizing transportation projects, namely Division 10 and Division 12. Table 16 gives forecasts of population and employment for the portions of these divisions located inside and outside the corridor. The present study has yielded all of the numbers shown except those for Alexander and Catawba counties. In these cases the table incorporates population projections from the State Data Center and employment forecasts linked to population.

Table 16 contends that the Route 73 corridor will account for disproportionate shares of future growth in both of the relevant NCDOT divisions. The portions of the corridor located in Division 10 contained only 6.6% of its total population in 2002, but will capture an estimated 18.4% of its population gain between 2002 and 2030. (The growth range established for the East Corridor in Figure 4 of Section 1 yields lower and upper limits of 14.0% and 20.4%.) In terms of employment, the Route 73 corridor accounted for 5.4% of the Division 10 total in 2002 but will supply 12.1% of the 2002-2030 gain.

Table 16. FORECASTED POPULATION IN NCDOT DIVISIONS, BY COUNTY

	Population (April 1)			Employment		
	2002	2030	Change	2002	2030	Change
DIVISION 10						
Entire Division						
Anson County	25,328	40,847	15,519	8,622	14,812	6,190
Cabarrus County	139,224	283,115	143,892	61,483	136,891	75,408
Mecklenburg County	733,665	1,157,311	423,646	556,842	945,591	388,749
Stanly County	58,589	87,366	28,777	20,851	31,567	10,716
Union County	137,731	312,147	174,416	48,158	128,494	80,336
Total	1,094,536	1,880,787	786,250	695,956	1,257,355	561,399
Outside Rt. 73 Corridor						
Cabarrus County	126,311	246,768	120,457	53,379	111,250	57,871
Mecklenburg County	678,609	981,008	302,399	529,300	867,796	338,497
Rest of Div. (same)	221,648	440,360	218,712	77,631	174,873	97,243
Total	1,026,568	1,668,135	641,568	660,309	1,153,920	493,611
Inside Rt. 73 Corridor						
Cabarrus County	12,913	36,347	23,435	8,104	25,641	17,537
Mecklenburg County	55,056	176,304	121,248	27,542	77,794	50,252
Total	67,969	212,651	144,683	35,647	103,435	67,788
Share of Division	**6.6%**		**18.4%**	**5.4%**		**12.1%**
DIVISION 12						
Entire Division						
Alexander County*	34,311	51,679	17,368	12,935	19,483	6,548
Catawba County*	146,134	214,315	68,181	97,623	143,171	45,548
Cleveland County	97,803	134,563	36,760	37,343	47,631	10,288
Gaston County	193,128	249,261	56,134	72,716	92,110	19,394
Iredell County	129,430	259,906	130,476	57,352	126,972	69,620
Lincoln County	66,254	128,857	62,603	22,373	47,503	25,130
Total	667,060	1,038,581	371,522	300,342	476,870	176,528
Outside Rt. 73 Corridor						
Lincoln County	21,048	37,151	16,104	4,759	8,314	3,555
Rest of Div. (same)	600,806	909,724	308,919	277,969	429,367	151,398
Total	621,853	946,876	325,022	282,728	437,680	154,952
Inside Rt. 73 Corridor						
Lincoln County	45,206	91,706	46,499	17,614	39,189	21,575
Share of Division	**6.8%**		**12.5%**	**5.9%**		**12.2%**

* Population forecast from SDC. Employment forecast based on pop. and current BEA empl.

In Division 12, the Lincoln County of the Route 73 corridor contained only 6.8% of the division's population in 2002, yet is expected to capture 12.5% of its 2002-2030 population increase. (The range in this case extends from 9.6% to 14.2%.) Equally disproportionate growth is expected for employment, where the corridor share of the Division 12 total in 2002 was 5.4% and the corridor's expected capture of divisional growth during 2002-2030 is 12.1%. These figures argue strongly that improving Route 73 should receive high priority in NCDOT plans for both Division 10 and Division 12.

Detailed Results

Tables 17 through 23 on the next seven pages present more detailed data for individual areas of the Route 73 corridor. The upper portion of each table gives a breakdown of past and future households by relative income. The figures here refer to the positions of households within the regional income distribution. This has been divided into three equal groupings so that the classifications become: "upper third," "middle third" and "lower third."

The lower portion of each table gives a breakdown of each area's employment into 32 industry groups. A point of interest in this case is the ongoing shift of economic activity away from manufacturing. For the corridor as a whole, the manufacturing sector supplied 24% of all jobs in 1991 and 15% in 2002. By 2030 the manufacturing share of corridor employment will be down to 8%. Meanwhile, the service sector rose from a 23% share of employment in 1991 to a 26% share in 2002, and by 2030 will account for 34% of the corridor's jobs.

Table 17. AREA 1 FORECAST

HOUSEHOLDS BY POSITION IN REGIONAL INCOME DISTRIBUTION

	1990	2000	2005	2010	2015	2020	2025	2030	2035
Lower Third	440	580	661	730	796	869	960	1,078	1,234
Middle Third	532	940	1,222	1,466	1,651	1,802	1,946	2,108	2,315
Upper Third	985	1,268	1,333	1,358	1,456	1,654	1,978	2,454	3,109
Total Households	1,956	2,788	3,216	3,554	3,903	4,325	4,884	5,641	6,659

EMPLOYMENT BY INDUSTRY

	1991	2002	2010	2015	2020	2025	2030	2035
Farming	24	21	21	22	23	23	24	24
Agricultural serv., forestry & fish.	2	7	12	16	21	27	36	47
Mining	0	1	1	1	1	1	0	0
Construction	210	379	586	736	895	1,054	1,207	1,347
Manufacturing	1,246	1,061	1,207	1,274	1,326	1,365	1,399	1,425
Transportation, commun. & utilities:								
Transportation	341	809	1,152	1,337	1,496	1,632	1,744	1,830
Communication	3	9	15	22	32	44	58	75
Utilities	3	13	29	45	61	73	78	71
Wholesale trade	193	554	658	674	670	663	669	701
Retail trade:								
Food and lumber/hdwr./garden	12	13	42	70	103	137	171	201
GAFO (dept.-store type goods)	11	17	63	162	299	459	628	793
Automotive retailing	57	113	146	177	209	239	262	272
Eating & drinking places	83	120	235	385	574	785	1,003	1,213
Finance, insurance & real estate:								
Banks and credit agencies	9	9	26	42	60	79	98	115
Other finance	0	0	1	5	14	30	54	89
Insurance carriers	0	0	1	1	1	3	5	9
Insurance agents and services	2	4	19	32	47	62	77	91
Real estate	12	29	52	74	102	136	178	227
Services:								
Hotels & other lodging places	8	12	17	32	52	75	98	120
Personal services	3	6	12	22	35	50	65	80
Business services	56	129	341	545	782	1,035	1,289	1,525
Auto repair, services & parking	41	60	121	164	206	245	277	298
Miscellaneous repair services	46	28	27	27	28	29	30	30
Amusement & recreation serv.	100	83	124	165	213	265	316	362
Health services	10	23	61	128	225	350	504	683
Legal services	0	0	0	0	0	0	0	0
Educational services	3	1	2	3	4	6	8	11
Social serv., memb. org. & misc.	109	169	354	490	631	769	895	1,002
Engineering & mgmt. services	3	14	65	113	167	224	281	332
Government:								
Federal government (civilian)	0	0	0	0	0	0	0	0
State government	133	153	167	179	192	204	214	221
Local government	252	310	396	480	575	673	766	846
Total	2,974	4,148	5,953	7,424	9,045	10,737	12,436	14,042

Table 18. AREA 2 FORECAST

HOUSEHOLDS BY POSITION IN REGIONAL INCOME DISTRIBUTION

	1990	2000	2005	2010	2015	2020	2025	2030	2035
Lower Third	613	917	1,047	1,222	1,441	1,719	2,075	2,526	3,089
Middle Third	883	1,117	1,386	2,133	3,267	4,691	6,309	8,025	9,745
Upper Third	1,234	2,468	3,420	4,999	7,081	9,522	12,179	14,909	17,567
Total Households	2,729	4,502	5,853	8,355	11,789	15,932	20,564	25,460	30,401

EMPLOYMENT BY INDUSTRY

	1991	2002	2010	2015	2020	2025	2030	2035
Farming	79	68	67	67	67	67	66	65
Agricultural serv., forestry & fish.	30	110	163	229	305	376	429	451
Mining	5	8	11	13	14	16	17	19
Construction	113	302	545	841	1,195	1,564	1,906	2,178
Manufacturing	175	204	289	346	410	481	562	654
Transportation, commun. & utilities:								
Transportation	33	67	136	225	341	477	625	779
Communication	22	67	111	154	205	256	305	345
Utilities	22	55	76	89	105	125	151	183
Wholesale trade	149	419	640	864	1,134	1,435	1,752	2,069
Retail trade:								
Food and lumber/hdwr./garden	38	68	200	334	483	628	751	832
GAFO (dept.-store type goods)	734	1,547	2,272	2,645	2,949	3,179	3,331	3,400
Automotive retailing	46	138	362	508	649	780	892	980
Eating & drinking places	321	767	1,197	1,664	2,187	2,688	3,088	3,309
Finance, insurance & real estate:								
Banks and credit agencies	19	25	62	131	227	344	476	615
Other finance	1	8	54	90	131	179	234	296
Insurance carriers	0	0	0	1	1	2	4	7
Insurance agents and services	6	17	60	95	134	175	216	256
Real estate	39	121	207	296	396	491	568	611
Services:								
Hotels & other lodging places	7	29	91	176	280	390	494	579
Personal services	28	51	107	151	198	242	281	311
Business services	39	159	770	1,259	1,805	2,389	2,993	3,595
Auto repair, services & parking	18	35	67	103	153	217	298	397
Miscellaneous repair services	8	14	27	35	42	49	55	59
Amusement & recreation serv.	355	786	952	1,023	1,073	1,108	1,133	1,153
Health services	254	294	721	1,125	1,598	2,116	2,659	3,194
Legal services	1	3	7	13	20	29	40	51
Educational services	354	739	954	1,070	1,177	1,281	1,388	1,502
Social serv., memb. org. & misc.	178	274	575	809	1,059	1,308	1,541	1,740
Engineering & mgmt. services	39	166	341	462	590	723	861	1,003
Government:								
Federal government (civilian)	8	10	21	29	39	51	66	85
State government	0	0	18	310	676	999	1,161	1,044
Local government	262	470	844	1,136	1,440	1,731	1,984	2,173
Total	3,383	7,019	11,949	16,293	21,083	25,898	30,326	33,933

Table 19. AREA 3 FORECAST

HOUSEHOLDS BY POSITION IN REGIONAL INCOME DISTRIBUTION

	1990	2000	2005	2010	2015	2020	2025	2030	2035
Lower Third	1,304	2,225	2,562	3,129	3,861	4,782	5,919	7,297	8,943
Middle Third	1,511	3,395	4,710	6,315	7,902	9,529	11,254	13,135	15,230
Upper Third	2,780	8,404	11,248	13,931	16,683	19,285	21,520	23,168	24,013
Total Households	5,595	14,024	18,520	23,376	28,446	33,596	38,693	43,601	48,186

EMPLOYMENT BY INDUSTRY

	1991	2002	2010	2015	2020	2025	2030	2035
Farming	76	65	62	61	60	59	57	54
Agricultural serv., forestry & fish.	72	300	429	488	532	563	583	594
Mining	9	14	19	22	25	30	34	39
Construction	604	1,910	2,789	3,208	3,554	3,857	4,142	4,435
Manufacturing	1,241	1,517	2,014	2,337	2,670	3,009	3,348	3,689
Transportation, commun. & utilities:								
Transportation	573	916	1,263	1,479	1,682	1,861	2,007	2,108
Communication	67	186	310	391	473	554	631	703
Utilities	42	53	110	157	209	265	322	378
Wholesale trade	846	2,178	3,124	3,587	3,949	4,207	4,360	4,408
Retail trade:								
Food and lumber/hdwr./garden	174	690	1,072	1,244	1,381	1,499	1,611	1,732
GAFO (dept.-store type goods)	248	952	1,324	1,503	1,659	1,805	1,958	2,130
Automotive retailing	133	645	746	821	900	979	1,053	1,121
Eating & drinking places	1,633	2,726	3,628	3,970	4,216	4,429	4,670	5,002
Finance, insurance & real estate:								
Banks and credit agencies	153	662	1,104	1,390	1,668	1,925	2,150	2,329
Other finance	70	495	508	541	583	628	668	698
Insurance carriers	5	12	29	76	153	263	406	585
Insurance agents and services	31	116	164	200	238	276	313	347
Real estate	242	526	610	657	700	737	767	791
Services:								
Hotels & other lodging places	188	338	543	647	738	820	897	974
Personal services	192	336	414	468	523	573	617	649
Business services	368	1,522	2,029	2,598	3,305	4,102	4,947	5,792
Auto repair, services & parking	104	209	350	442	532	616	691	753
Miscellaneous repair services	15	26	33	38	43	49	54	58
Amusement & recreation serv.	325	987	1,252	1,373	1,470	1,549	1,620	1,690
Health services	1,028	1,118	1,755	2,182	2,638	3,133	3,683	4,287
Legal services	36	86	147	176	200	222	245	270
Educational services	112	236	346	456	584	720	853	974
Social serv., memb. org. & misc.	714	1,014	1,224	1,379	1,549	1,733	1,929	2,136
Engineering & mgmt. services	156	519	738	915	1,112	1,323	1,540	1,754
Government:								
Federal government (civilian)	83	90	151	187	222	254	285	313
State government	0	0	0	0	0	0	0	0
Local government	1,041	2,008	2,530	2,860	3,185	3,500	3,798	4,072
Total	10,578	22,452	30,814	35,852	40,751	45,540	50,240	54,864

Table 20. AREA 4 FORECAST

HOUSEHOLDS BY POSITION IN REGIONAL INCOME DISTRIBUTION

	1990	2000	2005	2010	2015	2020	2025	2030	2035
Lower Third	133	210	238	291	359	445	551	679	832
Middle Third	184	360	447	714	1,132	1,632	2,147	2,610	2,952
Upper Third	468	1,096	1,466	1,888	2,347	2,807	3,231	3,580	3,818
Total Households	785	1,665	2,152	2,893	3,838	4,884	5,929	6,869	7,603

EMPLOYMENT BY INDUSTRY

	1991	2002	2010	2015	2020	2025	2030	2035
Farming	25	21	22	22	22	23	23	23
Agricultural serv., forestry & fish.	1	3	6	9	13	18	26	36
Mining	0	0	0	0	0	0	0	0
Construction	29	91	169	257	367	491	620	748
Manufacturing	25	31	44	53	64	75	88	102
Transportation, commun. & utilities:								
Transportation	14	22	48	76	116	172	244	337
Communication	3	7	12	16	21	28	37	50
Utilities	701	881	1,036	1,072	1,073	1,052	1,017	982
Wholesale trade	19	48	103	212	360	533	717	897
Retail trade:								
Food and lumber/hdwr./garden	1	4	9	39	81	130	179	221
GAFO (dept.-store type goods)	8	31	87	190	321	464	599	708
Automotive retailing	1	5	8	48	102	160	209	240
Eating & drinking places	41	68	213	449	737	1,024	1,262	1,399
Finance, insurance & real estate:								
Banks and credit agencies	7	29	92	149	213	280	342	395
Other finance	3	25	76	100	118	133	145	155
Insurance carriers	0	0	0	0	0	0	0	0
Insurance agents and services	3	12	30	45	62	79	97	113
Real estate	9	19	33	46	64	90	125	172
Services:								
Hotels & other lodging places	0	0	0	0	0	0	0	0
Personal services	3	5	9	15	24	37	53	73
Business services	22	93	461	722	996	1,279	1,564	1,844
Auto repair, services & parking	1	3	6	9	15	22	32	46
Miscellaneous repair services	0	0	0	0	0	0	0	0
Amusement & recreation serv.	50	151	262	333	399	458	504	534
Health services	5	5	14	20	33	59	102	169
Legal services	2	5	10	20	31	43	55	65
Educational services	82	172	257	327	401	475	541	594
Social serv., memb. org. & misc.	59	84	169	279	411	547	671	763
Engineering & mgmt. services	11	36	124	183	244	307	372	437
Government:								
Federal government (civilian)	5	6	10	13	17	22	28	36
State government	0	0	1	2	3	5	7	10
Local government	88	169	325	440	558	673	774	855
Total	1,217	2,028	3,637	5,144	6,869	8,677	10,433	12,003

Table 21. AREA 5 FORECAST

HOUSEHOLDS BY POSITION IN REGIONAL INCOME DISTRIBUTION

	1990	2000	2005	2010	2015	2020	2025	2030	2035
Lower Third	556	989	1,244	1,609	2,053	2,541	3,041	3,615	4,256
Middle Third	856	1,226	1,424	1,751	2,169	2,628	3,077	3,559	4,045
Upper Third	1,182	1,814	2,220	2,703	3,125	3,455	3,693	3,952	4,247
Total Households	2,594	4,029	4,888	6,063	7,347	8,625	9,811	11,126	12,548

EMPLOYMENT BY INDUSTRY

	1991	2002	2010	2015	2020	2025	2030	2035
Farming	43	37	38	39	41	42	42	43
Agricultural serv., forestry & fish.	38	67	114	138	156	167	169	163
Mining	6	24	25	25	25	25	26	25
Construction	153	498	790	933	1,054	1,159	1,257	1,354
Manufacturing	1,495	1,173	1,405	1,557	1,712	1,859	2,001	2,122
Transportation, commun. & utilities:								
Transportation	146	168	240	305	376	448	514	569
Communication	24	13	26	38	54	72	93	115
Utilities	0	10	22	30	38	47	56	67
Wholesale trade	148	233	365	481	609	740	863	968
Retail trade:								
Food and lumber/hdwr./garden	239	244	361	423	478	529	576	622
GAFO (dept.-store type goods)	131	148	314	440	569	688	784	844
Automotive retailing	118	170	265	325	383	438	487	530
Eating & drinking places	326	346	674	922	1,186	1,449	1,694	1,905
Finance, insurance & real estate:								
Banks and credit agencies	91	86	220	309	400	492	583	670
Other finance	0	3	24	40	58	74	87	96
Insurance carriers	11	6	7	6	5	6	8	11
Insurance agents and services	6	6	20	31	41	50	56	60
Real estate	31	84	165	217	266	309	341	359
Services:								
Hotels & other lodging places	0	0	0	0	0	0	0	0
Personal services	40	28	45	57	70	82	93	101
Business services	127	885	1,143	1,290	1,431	1,571	1,712	1,860
Auto repair, services & parking	23	57	95	129	166	202	235	262
Miscellaneous repair services	3	5	9	12	14	16	19	21
Amusement & recreation serv.	81	79	86	110	145	189	239	294
Health services	33	115	276	518	838	1,205	1,575	1,932
Legal services	4	4	8	12	15	19	23	28
Educational services	6	8	12	17	27	43	68	103
Social serv., memb. org. & misc.	109	141	288	375	458	533	601	660
Engineering & mgmt. services	6	18	52	95	148	205	261	311
Government:								
Federal government (civilian)	16	17	29	44	65	89	112	135
State government	0	0	2	2	1	1	1	0
Local government	275	332	412	480	557	639	722	803
Total	3,729	5,008	7,533	9,400	11,387	13,389	15,300	17,032

Table 22. AREA 6 FORECAST

HOUSEHOLDS BY POSITION IN REGIONAL INCOME DISTRIBUTION

	1990	2000	2005	2010	2015	2020	2025	2030	2035
Lower Third	2,356	3,197	3,617	4,110	4,694	5,357	6,069	6,771	7,454
Middle Third	2,702	3,518	3,939	4,402	4,880	5,367	5,843	6,262	6,630
Upper Third	2,050	2,324	2,463	2,711	3,072	3,575	4,233	5,035	5,996
Total Households	7,108	9,039	10,020	11,223	12,646	14,299	16,145	18,067	20,080

EMPLOYMENT BY INDUSTRY

	1991	2002	2010	2015	2020	2025	2030	2035
Farming	99	84	86	88	91	93	94	93
Agricultural serv., forestry & fish.	27	31	35	45	60	78	98	120
Mining	4	11	11	11	11	11	10	10
Construction	156	289	395	512	655	815	980	1,139
Manufacturing	2,418	2,655	2,816	2,840	2,810	2,729	2,599	2,430
Transportation, commun. & utilities:								
Transportation	54	97	153	194	242	298	362	436
Communication	6	3	1	1	1	1	1	1
Utilities	0	0	0	0	1	2	4	7
Wholesale trade	130	187	219	235	252	274	303	344
Retail trade:								
Food and lumber/hdwr./garden	98	90	117	151	194	244	297	350
GAFO (dept.-store type goods)	283	288	389	485	601	731	869	1,010
Automotive retailing	77	97	112	136	169	205	243	279
Eating & drinking places	143	193	240	292	361	444	541	650
Finance, insurance & real estate:								
Banks and credit agencies	79	54	38	30	24	20	18	19
Other finance	0	1	1	3	9	18	31	50
Insurance carriers	4	1	0	0	0	0	0	0
Insurance agents and services	4	7	14	18	22	27	35	46
Real estate	18	36	48	60	75	92	111	132
Services:								
Hotels & other lodging places	4	5	14	23	41	76	132	216
Personal services	68	50	64	79	97	117	136	153
Business services	31	194	200	257	344	450	567	684
Auto repair, services & parking	13	25	35	41	49	61	77	98
Miscellaneous repair services	7	10	17	19	20	20	20	20
Amusement & recreation serv.	72	60	89	137	201	271	343	408
Health services	13	24	27	41	82	166	304	507
Legal services	0	0	0	0	0	0	0	0
Educational services	30	31	29	29	32	41	57	81
Social serv., memb. org. & misc.	165	150	249	340	445	557	670	777
Engineering & mgmt. services	9	18	17	17	22	35	59	96
Government:								
Federal government (civilian)	22	24	30	35	42	49	57	65
State government	0	0	3	79	177	269	326	319
Local government	586	669	752	841	953	1,081	1,219	1,363
Total	4,619	5,385	6,198	7,038	8,080	9,274	10,562	11,904

Table 23. AREA 7 FORECAST

HOUSEHOLDS BY POSITION IN REGIONAL INCOME DISTRIBUTION

	1990	2000	2005	2010	2015	2020	2025	2030	2035
Lower Third	1,361	1,570	1,683	1,808	1,940	2,072	2,199	2,315	2,412
Middle Third	1,073	1,091	1,079	1,115	1,215	1,366	1,557	1,775	2,010
Upper Third	852	738	714	816	1,001	1,231	1,468	1,673	1,809
Total Households	3,286	3,399	3,476	3,739	4,156	4,669	5,224	5,763	6,231

EMPLOYMENT BY INDUSTRY

	1991	2002	2010	2015	2020	2025	2030	2035
Farming	7	6	6	7	7	8	8	8
Agricultural serv., forestry & fish.	16	17	23	34	47	61	73	82
Mining	2	6	6	6	5	5	5	5
Construction	157	251	326	363	393	419	439	456
Manufacturing	1,338	1,468	1,554	1,569	1,557	1,521	1,459	1,383
Transportation, commun. & utilities:								
Transportation	25	48	75	101	133	169	206	245
Communication	75	31	42	47	52	60	70	86
Utilities	3	49	77	92	105	117	129	140
Wholesale trade	110	158	280	386	499	606	693	751
Retail trade:								
Food and lumber/hdwr./garden	261	239	305	343	379	410	434	453
GAFO (dept.-store type goods)	279	283	405	496	589	677	749	800
Automotive retailing	173	218	235	252	270	286	294	294
Eating & drinking places	355	481	608	713	817	903	953	952
Finance, insurance & real estate:								
Banks and credit agencies	156	106	110	113	114	115	112	109
Other finance	0	9	15	18	21	23	25	28
Insurance carriers	0	0	0	0	0	0	0	0
Insurance agents and services	44	30	35	36	38	42	49	62
Real estate	31	62	84	103	123	143	163	180
Services:								
Hotels & other lodging places	20	24	68	95	132	186	264	373
Personal services	275	139	119	112	108	106	106	106
Business services	41	206	306	377	464	575	717	896
Auto repair, services & parking	60	108	131	152	174	195	211	219
Miscellaneous repair services	9	11	15	17	18	19	19	18
Amusement & recreation serv.	43	31	34	52	79	114	154	199
Health services	534	1,016	1,347	1,591	1,835	2,051	2,193	2,266
Legal services	49	38	48	52	57	62	68	75
Educational services	2	2	2	2	2	3	5	9
Social serv., memb. org. & misc.	467	391	528	600	660	708	743	764
Engineering & mgmt. services	11	23	75	108	142	176	210	243
Government:								
Federal government (civilian)	49	53	67	78	91	103	113	123
State government	319	226	228	240	255	271	285	292
Local government	1,314	1,490	1,669	1,825	2,003	2,190	2,375	2,549
Total	6,222	7,221	8,824	9,979	11,170	12,323	13,327	14,166

Appendices

Backup data for Figure 3 ……..... A1
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District forecasts: total population …….…. A17
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District forecasts: employment by trans.-relevant industry ….. A35-A42

SELECTION OF DISTRICTS IN THE CHARLOTTE REGION WITH HIGH FUTURE GROWTH POTENTIAL

County	District	Index of Pop./Empl. Density*	Annual Compound Rate of Change, 1991-2002		% of Households in Top 1/3 of Regional Income Distribution	Compliance with Criteria for Probable High Growth, in Same Order (See **)			
			Population	Employment					
Anson	Total	**56**	0.7%	-0.3%	16.9%	●			
Cabarrus	Central	**977**	**3.9%**	**5.1%**	**35.5%**	●	●	●	●
Cabarrus	NW	**797**	1.4%	0.3%	27.3%	●			
Cabarrus	South	**232**	**3.9%**	**3.5%**	**54.1%**	●	●	●	●
Cabarrus	NE	**126**	1.5%	1.9%	**38.5%**	●			●
Cleveland	SE	**339**	2.0%	-0.3%	23.0%	●			
Cleveland	Cent	**558**	-0.1%	1.0%	21.4%	●			
Cleveland	NW	**125**	1.9%	-0.9%	20.1%	●			
Gaston	E	**578**	0.8%	-1.8%	29.8%	●			
Gaston	SW	**955**	0.8%	0.4%	27.0%	●			
Gaston	NW	**279**	1.1%	-1.8%	24.9%	●			
Iredell	South	**581**	**4.4%**	**3.7%**	**42.3%**	●	●	●	●
Iredell	S Central	**263**	**4.1%**	2.7%	32.6%	●	●		
Iredell	N Central	**362**	1.6%	1.7%	24.1%	●			
Iredell	North	**74**	2.3%	**3.5%**	24.9%	●		●	
Lincoln	East	**252**	**3.3%**	**3.0%**	**40.8%**	●	●	●	●
Lincoln	Central	**418**	1.6%	1.4%	24.0%	●			
Lincoln	West	**126**	2.8%	1.4%	23.7%	●			
Mecklenburg	N	**761**	**7.6%**	**6.8%**	**62.3%**	●	●	●	●
Mecklenburg	NW	1,152	**3.1%**	2.9%	34.0%		●		
Mecklenburg	NNE	1,970	**11.0%**	**9.9%**	**53.2%**		●	●	●
Mecklenburg	ENE	2,351	**3.0%**	1.8%	30.7%		●		
Mecklenburg	E	1,834	2.5%	1.6%	31.6%				
Mecklenburg	S	2,580	**3.1%**	2.2%	**53.8%**		●		●
Mecklenburg	SW	1,154	**4.4%**	**4.5%**	**39.8%**		●	●	●
Mecklenburg	Central	4,848	-0.1%	1.9%	25.4%				
Rowan	S Cent	**651**	0.9%	2.6%	22.7%	●			
Rowan	N Cent	**961**	1.0%	0.4%	23.0%	●			
Rowan	East	**214**	2.9%	2.9%	26.0%	●			
Rowan	West	**117**	1.9%	**3.8%**	30.5%	●		●	
Stanly	North	**252**	0.7%	0.3%	22.4%	●			
Stanly	South	**131**	1.3%	-0.9%	25.2%	●			
Union	NW	**497**	**6.9%**	**3.2%**	**50.5%**	●	●	●	●
Union	Central	**376**	**3.1%**	**3.2%**	**36.3%**	●	●	●	●
Union	East	**82**	1.7%	-0.1%	27.3%	●			
Union	South	**98**	**3.1%**	1.1%	31.6%	●	●		
Catawba	SE Corner	**160**	**3.1%**	**3.1%**	**36.8%**	●	●	●	●
Cherokee	Total	**165**	1.5%	1.4%	19.2%	●			
Chester	Total	**70**	0.5%	-0.5%	20.0%	●			
Lancaster	North	**124**	2.2%	1.9%	29.5%	●			
Lancaster	South	**133**	0.9%	0.5%	18.9%	●			
Union, SC	Total	**66**	-0.3%	-0.6%	16.7%	●			
York	North	**319**	2.3%	1.2%	**36.9%**	●			●
York	NE	**591**	**3.8%**	**4.5%**	**47.0%**	●	●	●	●
York	SE	**585**	1.8%	1.7%	31.2%	●			
York	West	**105**	2.7%	1.5%	27.8%	●			

* The index of population and employment density is computed as: (P+E/2)/L, where L is land area in square miles.

** The criteria for probable high future growth (in percentage terms) are: population/employment density index is below 1000; past population growth was 3% per year or above; past employment growth was 3% per year or above; and over 35% of all households occupy the top third of the regional income distribution.

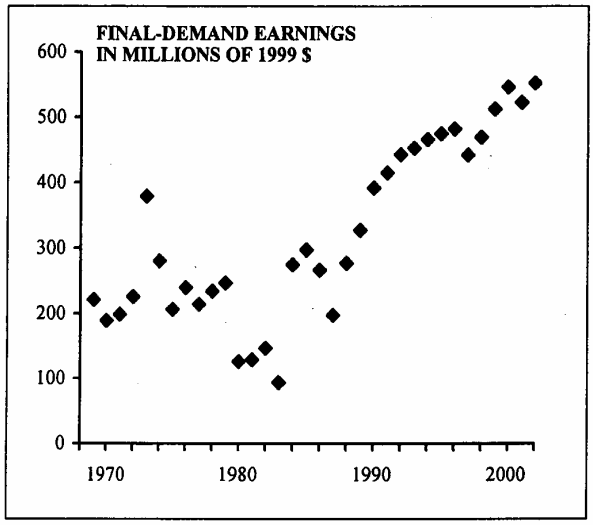
ALTERNATIVE FORECAST OF ROUTE 73 CORRIDOR POPULATION BASED ON AVAILABLE LAND AND SDC PROJECTIONS

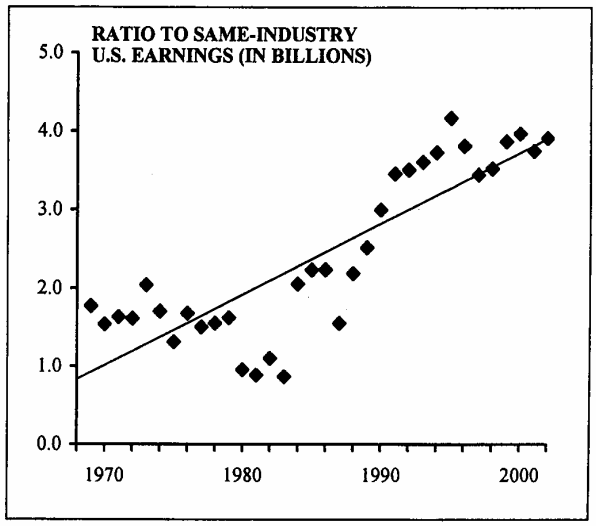
	Population 2002	Employment 2002	Land Area in Square Miles: Total	Land Area in Square Miles: Est. Available Land*	Land Area in Square Miles: % of County Avail. Land	Population: Actual 2000	Population: 2030, SDC Projection	Alloc. of SDC Projection of 2000-30 Chg.	Resulting 2030 Pop. Forecast	Present 2030 Pop. Forecast
Cabarrus										
Area 1	7,977	4,148	23.0	19.9	6.4%	7,463		7,351	14,814	
Area 2 (part)	4,935	3,956	31.0	28.8	9.2%	4,681		10,641	15,322	
Rest of co.	126,311	53,379	311.0	263.9	84.4%	118,919		97,585	216,504	
Total	139,224	61,483	365.0	312.6	100.0%	131,063	246,640	115,577	246,640	
Mecklenburg										
Area 2 (part)	10,280	3,063	34.0	30.3	10.7%	9,460		66,403	75,863	
Area 3	40,913	22,452	43.0	28.7	10.1%	36,464		62,941	99,405	
Area 4	3,864	2,028	14.0	12.5	4.4%	3,523		27,333	30,856	
Rest of co.	678,609	529,300	436.4	212.3	74.8%	646,007		465,607	1,111,614	
Total	733,665	556,842	527.4	283.8	100.0%	695,454	1,317,738	622,284	1,317,738	
Lincoln										
Area 5	11,029	5,008	39.0	34.7	12.7%	10,416		5,260	15,676	
Area 6	25,275	5,385	106.0	97.1	35.4%	24,405		14,697	39,102	
Area 7	8,902	7,221	8.0	4.7	1.7%	8,827		719	9,546	
Rest of co.	21,048	4,759	145.6	138.0	50.3%	20,132		20,895	41,027	
Total	66,254	22,373	298.6	274.6	100.0%	63,780	105,351	41,571	105,351	
Rt. 73 Corridor										
Area 1						7,463			14,814	15,184
Area 2						14,141			91,184	72,320
Area 3						36,464			99,405	111,015
Area 4						3,523			30,856	14,133
Area 5						10,416			15,676	28,554
Area 6						24,405			39,102	48,144
Area 7						8,827			9,546	15,008
Total Corridor						105,239			**300,583**	**304,357**

* The share of land available for development is estimated as: Exp(-(P+E/2)/LK)), where P is population, E is employment, L is total land area and K is a parameter. (Values of P and E for 2002 are used here because the small-area employment data obtained in the study pertained to 2002.) This formula has been employed in various forecasting projects with K-values ranging from 2400 to 4000. High values are more realistic at high existing development densities, whereas low values are more realistic at low densities. The above computations are based on an intermediate K-value of 3000. Other values in the realistic range would have yielded alternative forecasts as follows: 286,688 when K=4000; 292,518 when K=3500; and 315,500 when K=2400.

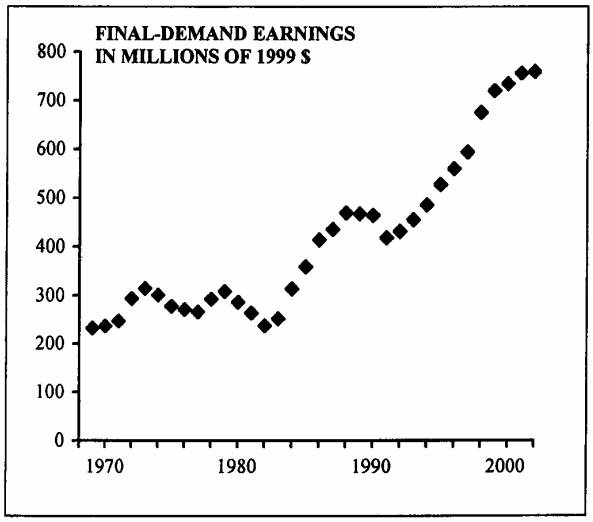
Relationships Between Regional Final Demand and National Earnings -- Part 1

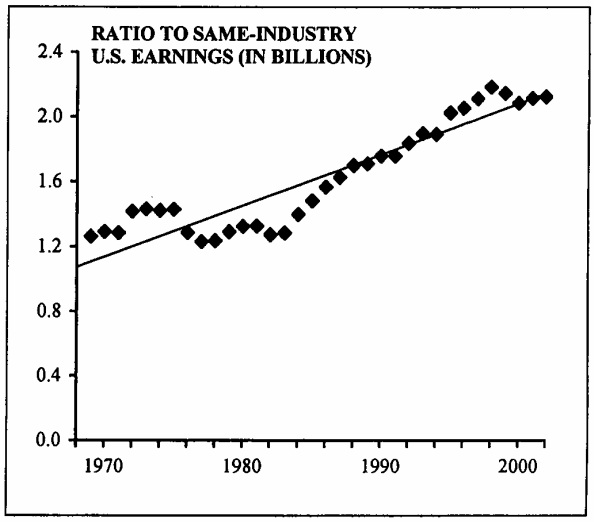
FARMING, AG. SERVICES, FORESTRY, FISHING & MINING



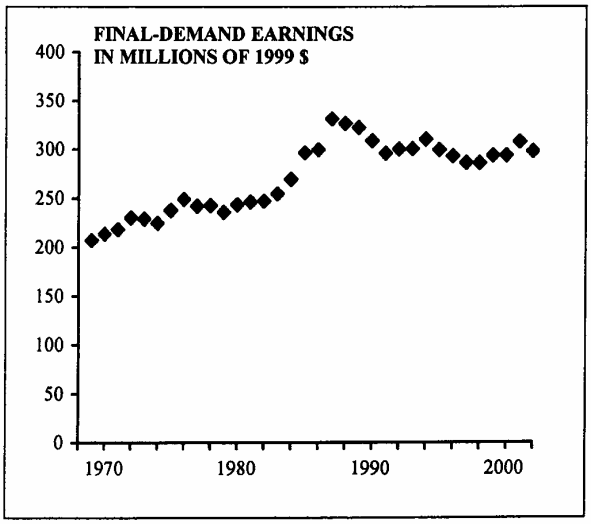


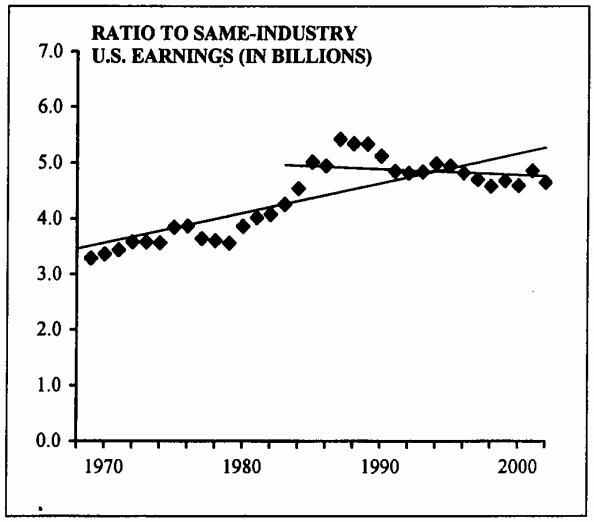
CONSTRUCTION





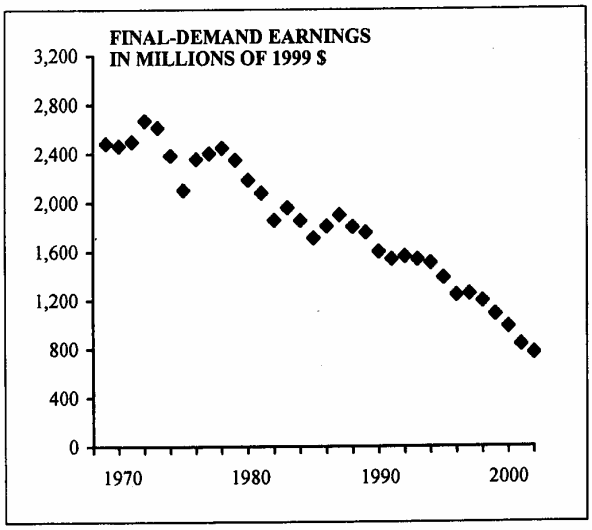
FOOD AND KINDRED PRODUCTS MANUFACTURING

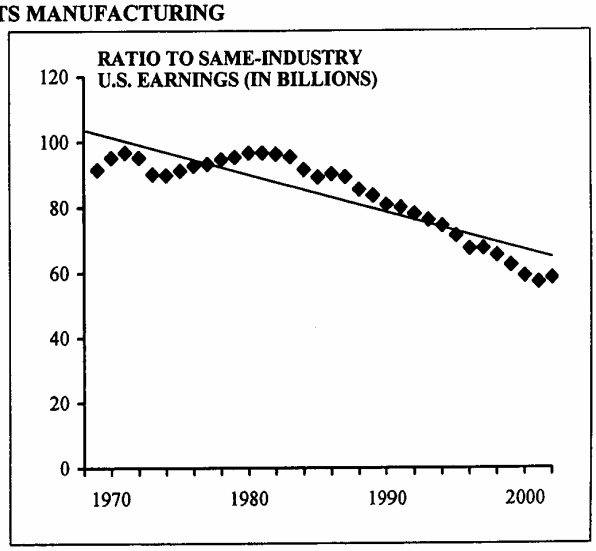




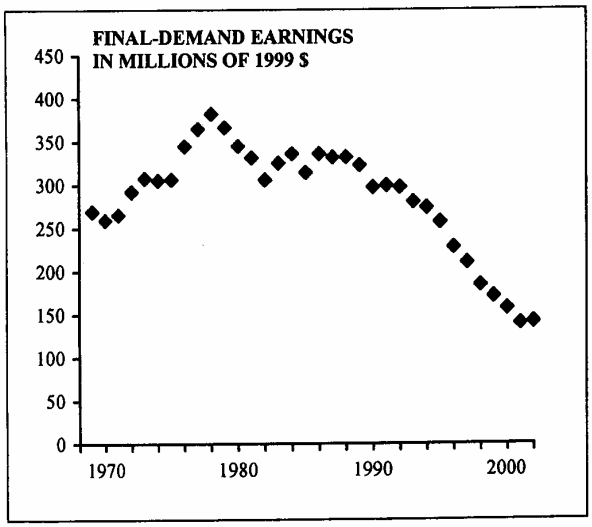
Relationships Between Regional Final Demand and National Earnings -- Part 2

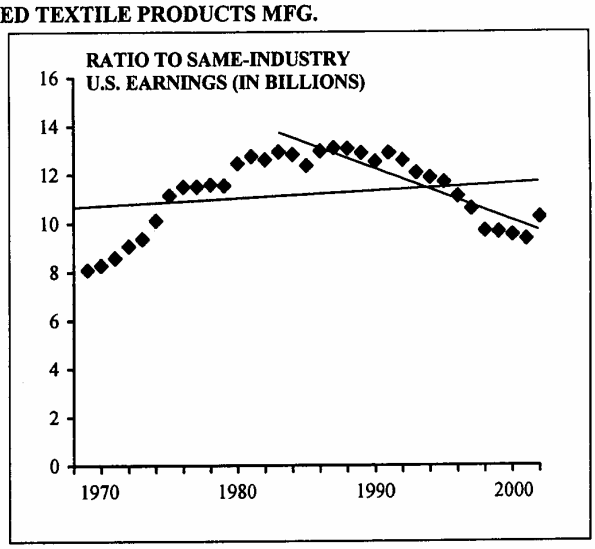
TEXTILE MILL PRODUCTS MANUFACTURING



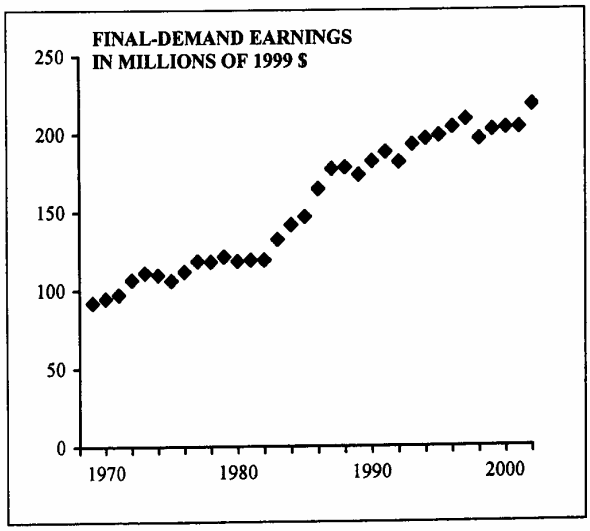


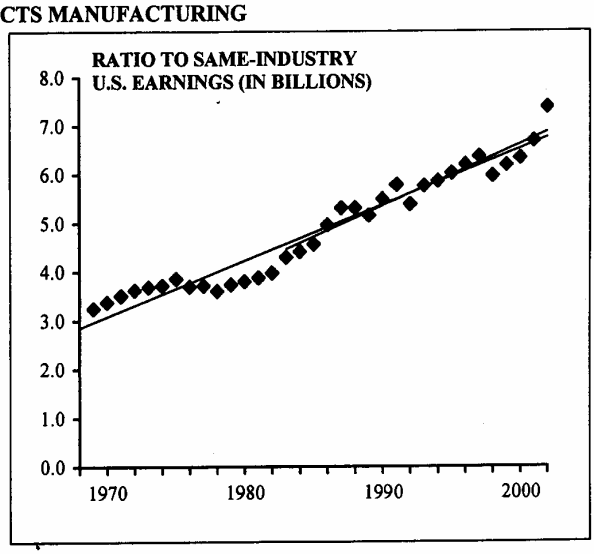
APPAREL AND OTHER FABRICATED TEXTILE PRODUCTS MFG.





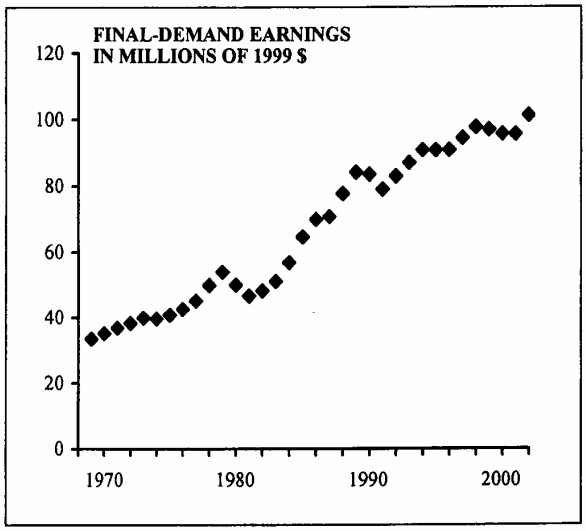
PAPER AND PAPER PRODUCTS MANUFACTURING

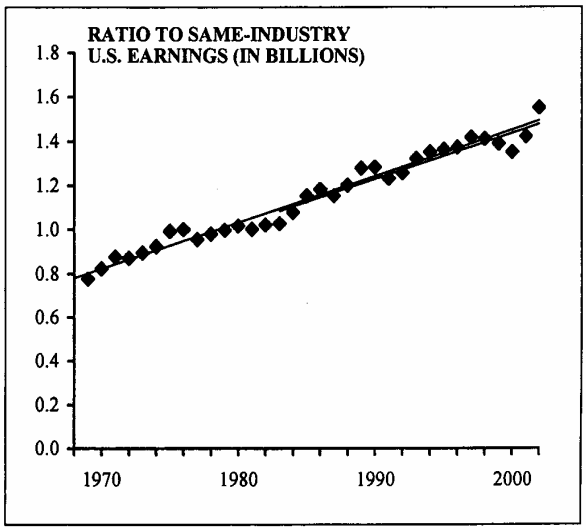




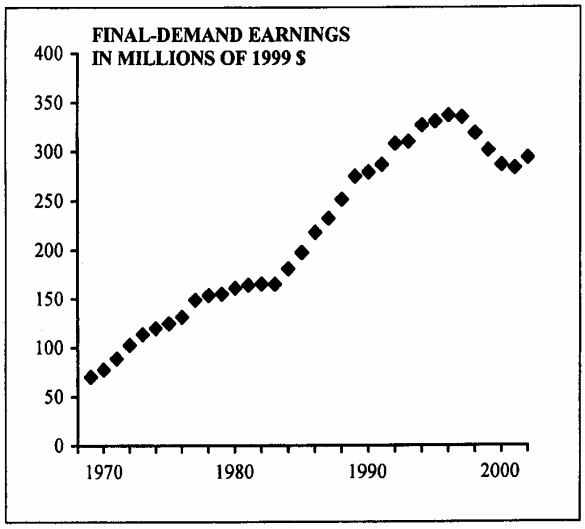
Relationships Between Regional Final Demand and National Earnings -- Part 3

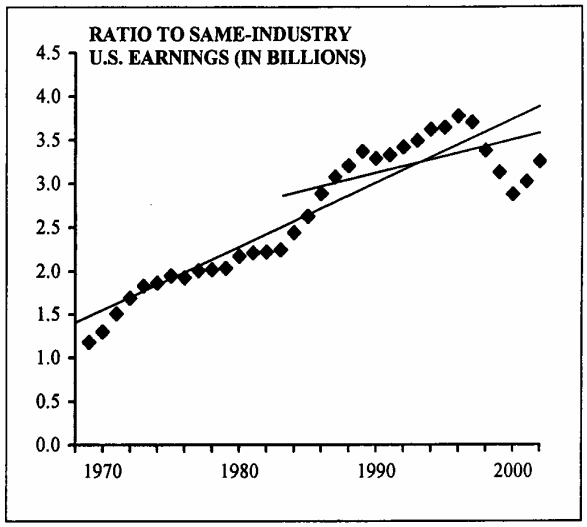
PRINTING AND PUBLISHING



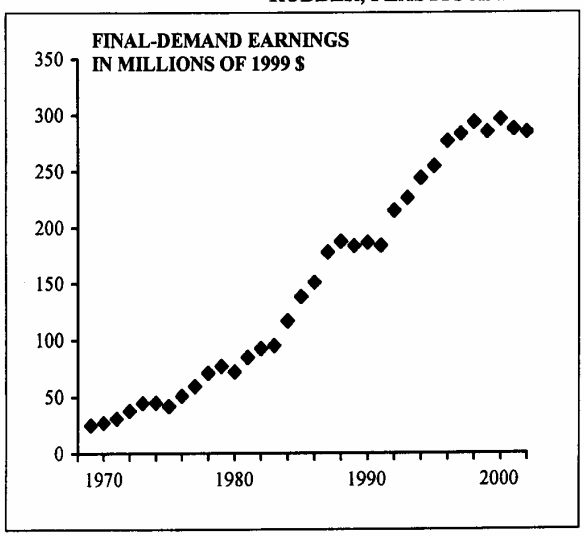


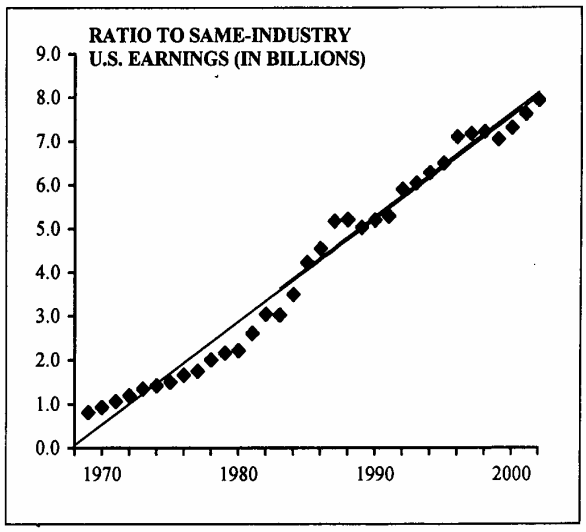
CHEMICALS AND PETROLEUM & COAL PRODUCTS MFG.





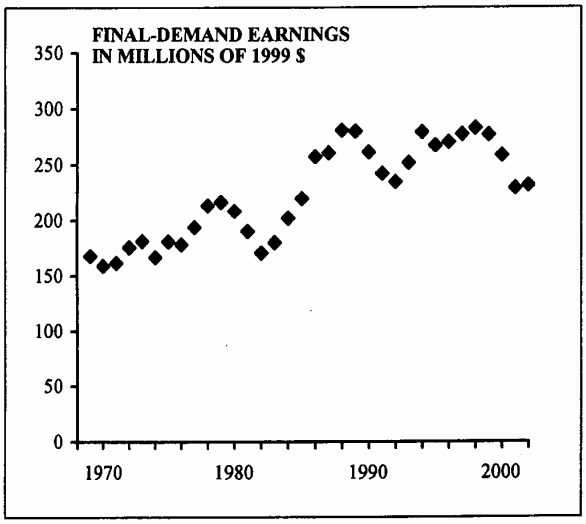
RUBBER, PLASTIC AND LEATHER PRODUCTS MANUFACTURING

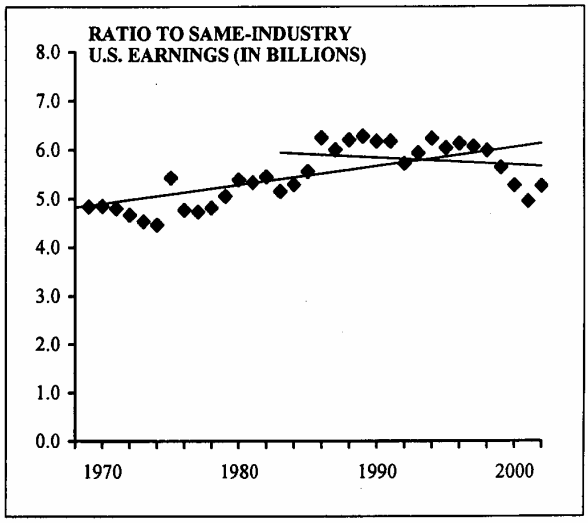




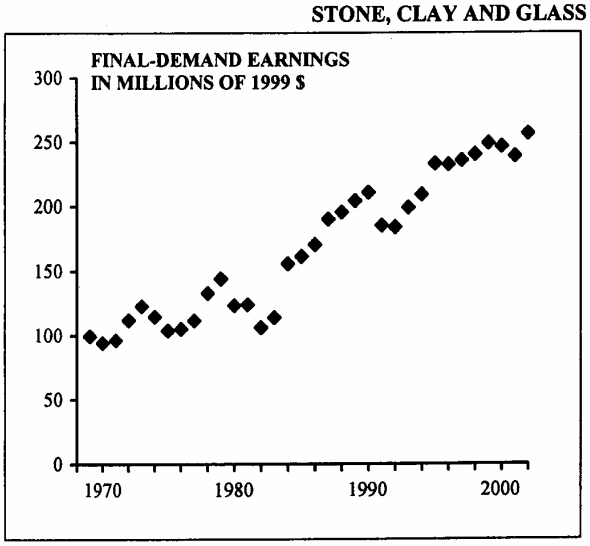
Relationships Between Regional Final Demand and National Earnings -- Part 4

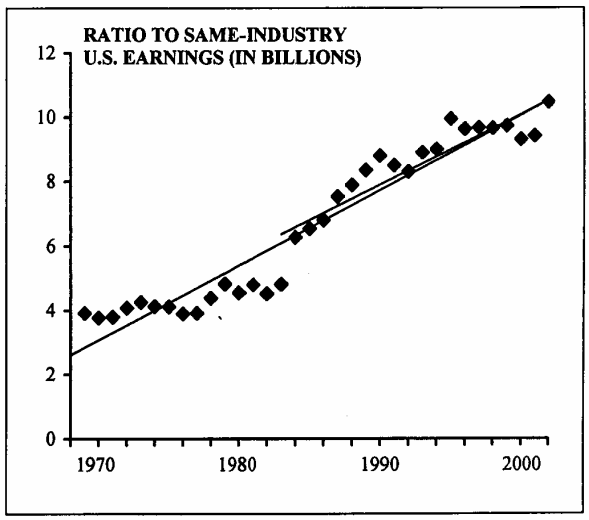
FURNITURE AND OTHER LUMBER & WOOD PRODUCTS MFG.



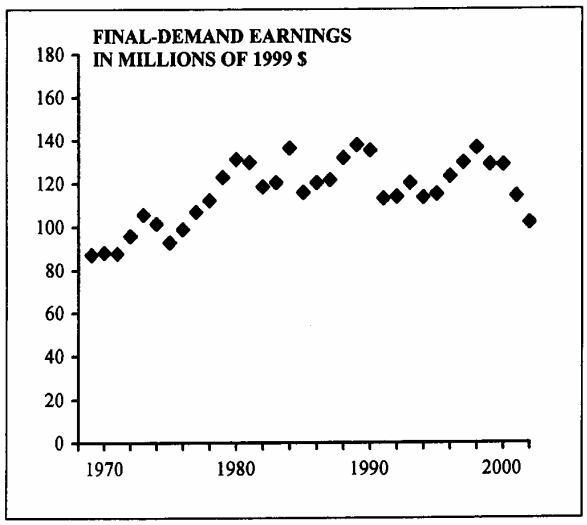


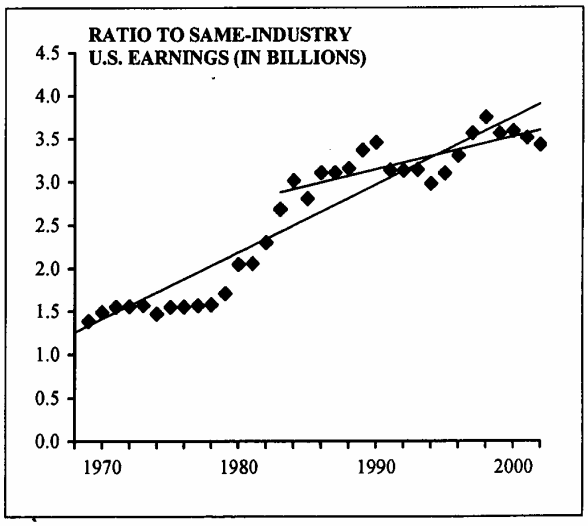
STONE, CLAY AND GLASS PRODUCTS MANUFACTURING





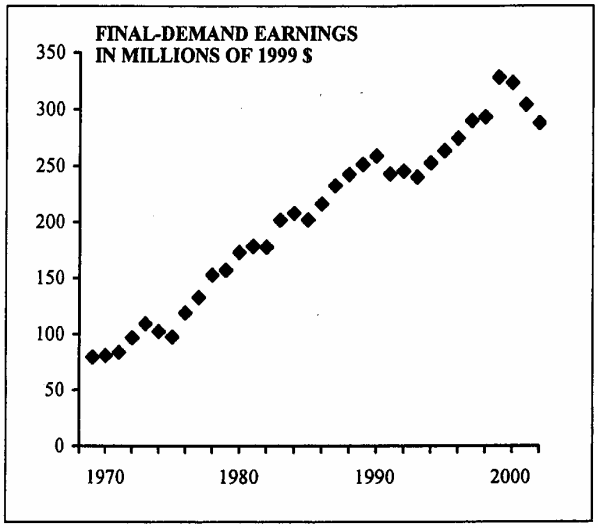
PRIMARY METAL PRODUCTS MANUFACTURING

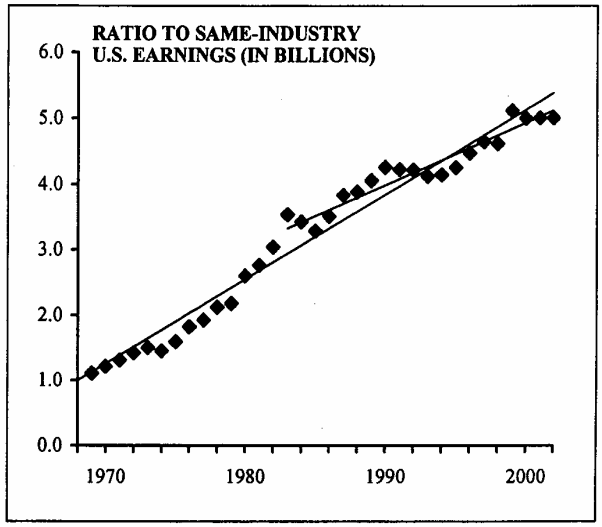




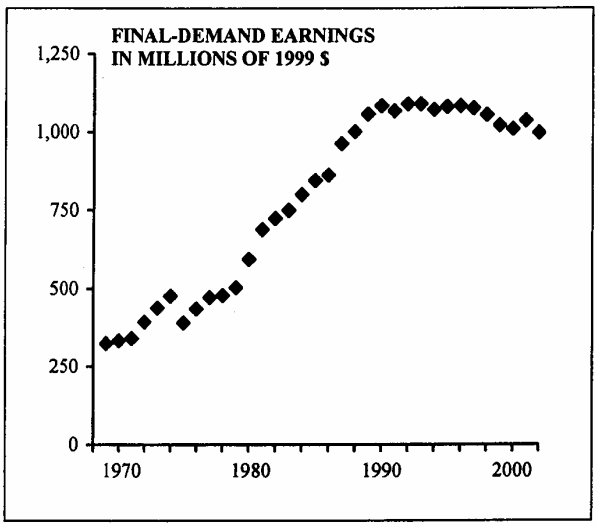
Relationships Between Regional Final Demand and National Earnings -- Part 5

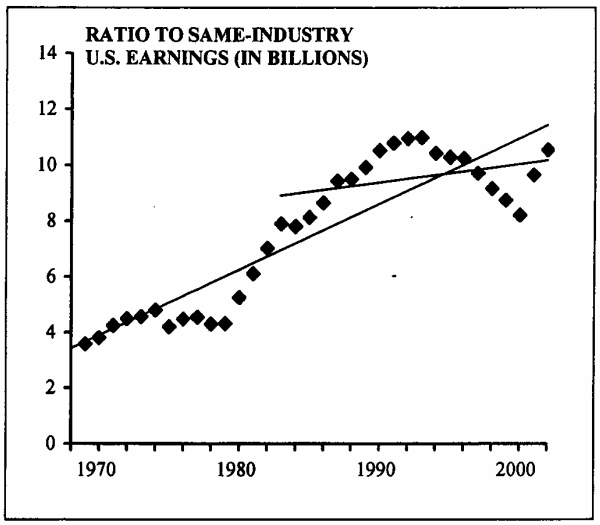
FABRICATED METAL PRODUCTS MANUFACTURING



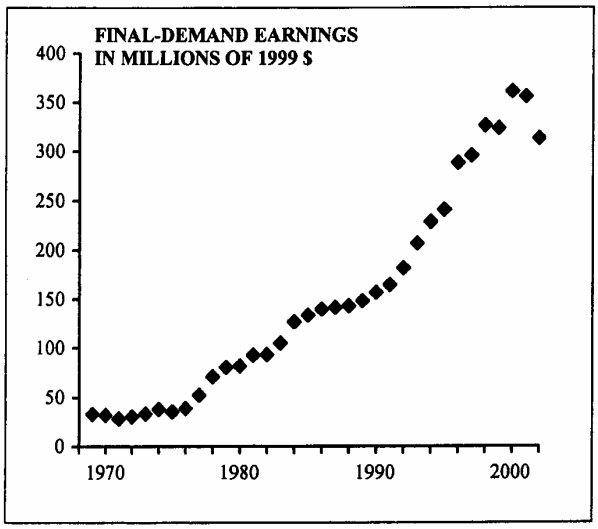


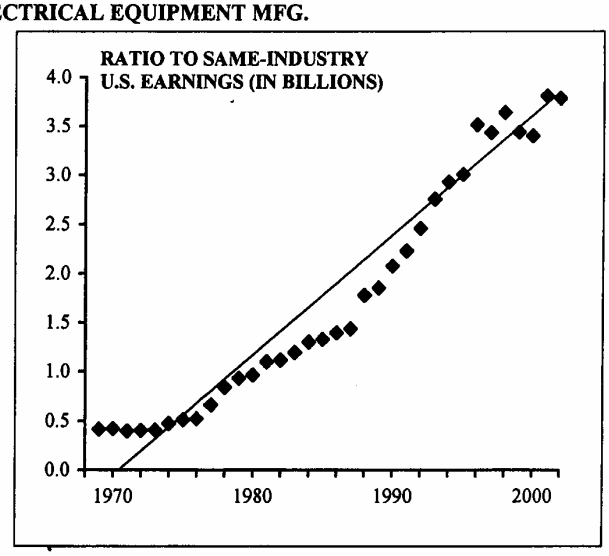
INDUSTRIAL MACHINERY MANUFACTURING





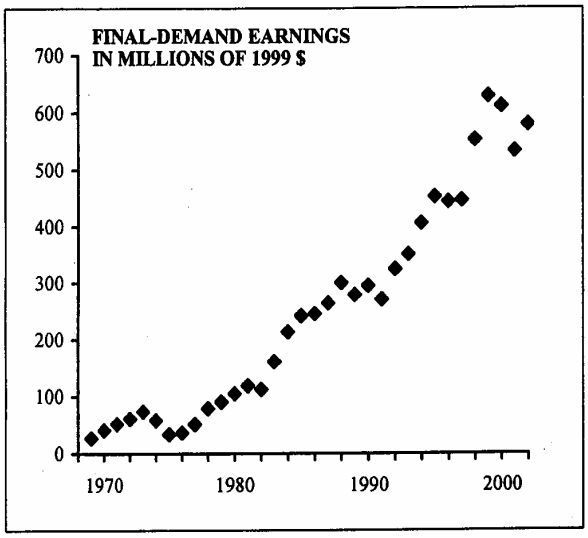
ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT MFG.

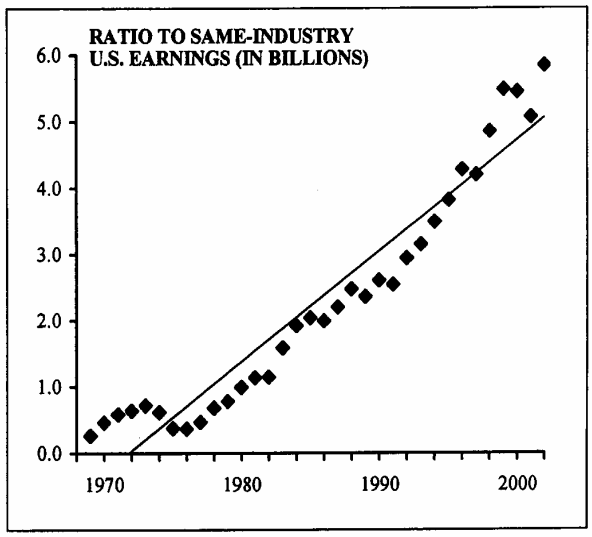




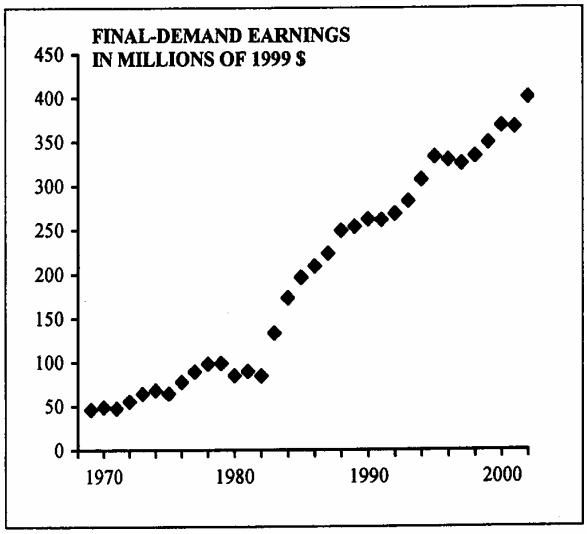
Relationships Between Regional Final Demand and National Earnings -- Part 6

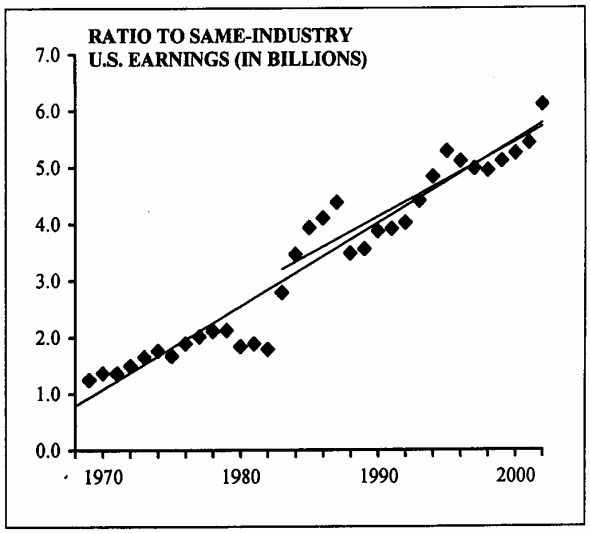
TRANSPORTATION EQUIPMENT MANUFACTURING



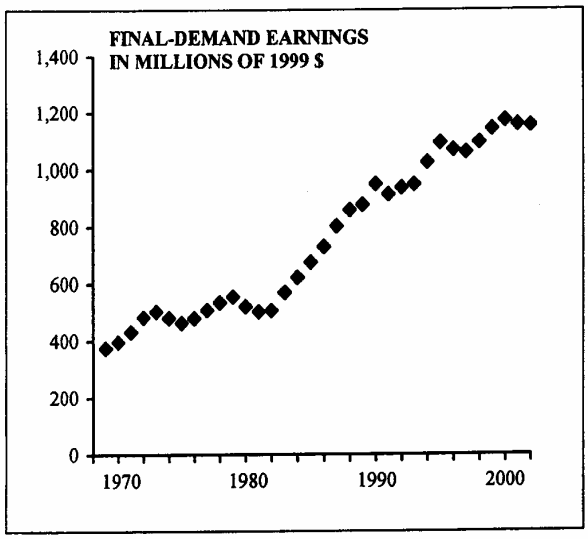


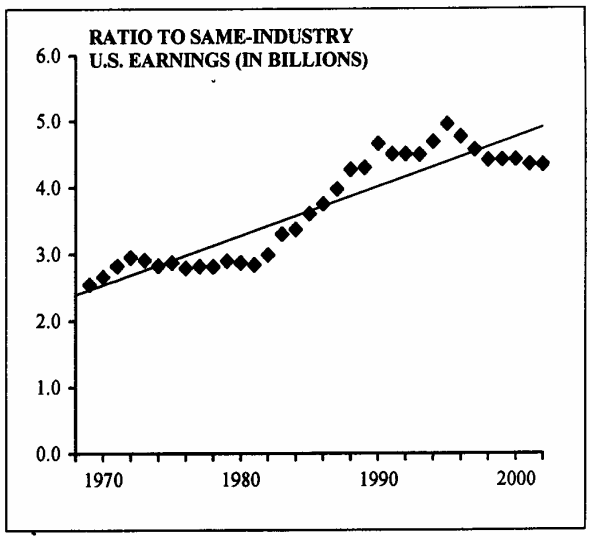
INSTRUMENTS AND MISCELLANEOUS PRODUCTS MFG.





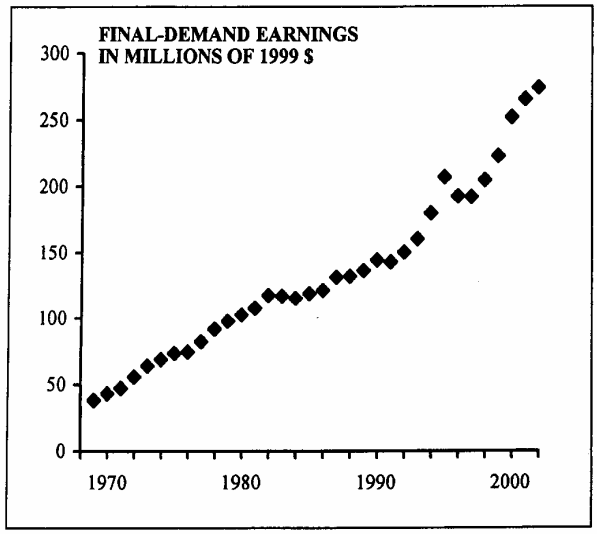
TRANSPORTATION AND TRANSPORTATION SERVICES

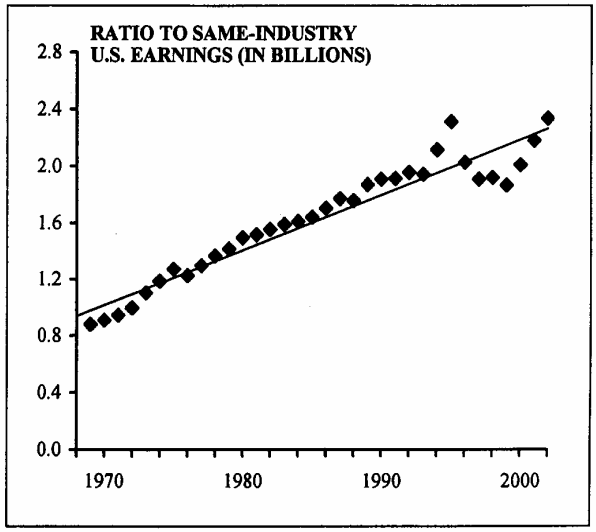




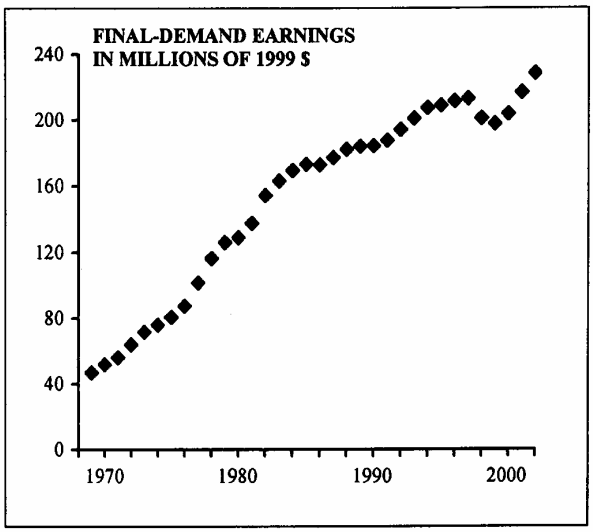
Relationships Between Regional Final Demand and National Earnings -- Part 7

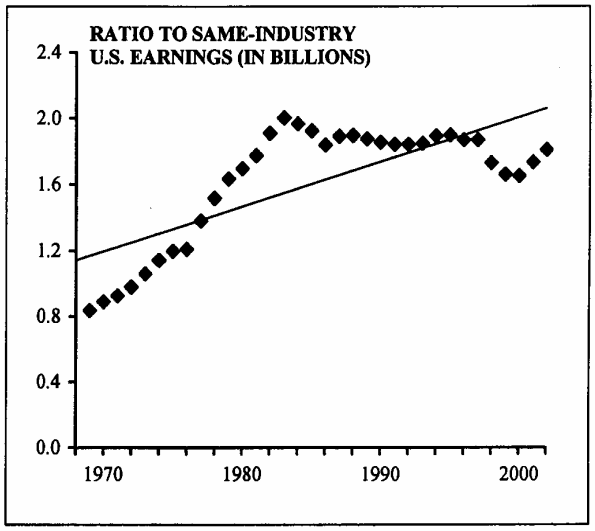
COMMUNICATIONS



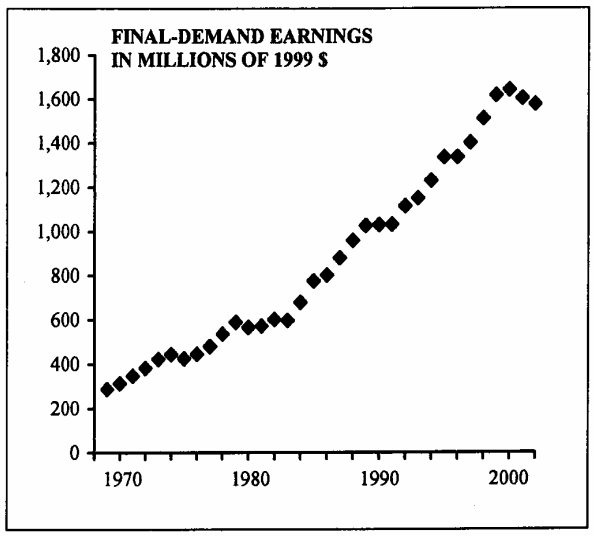


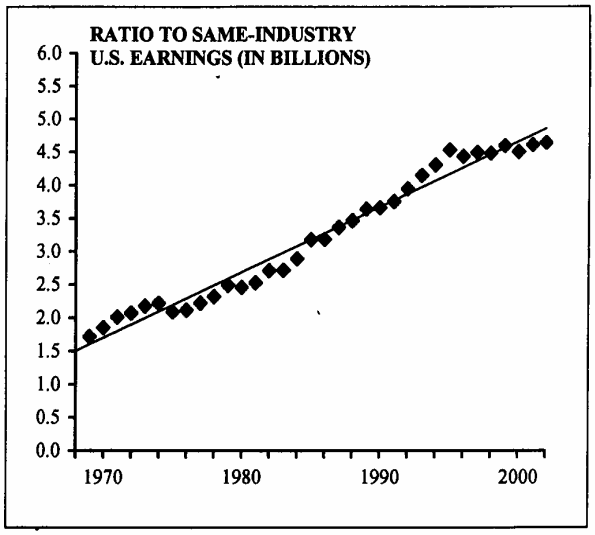
ELECTRIC, GAS AND SANITARY SERVICES



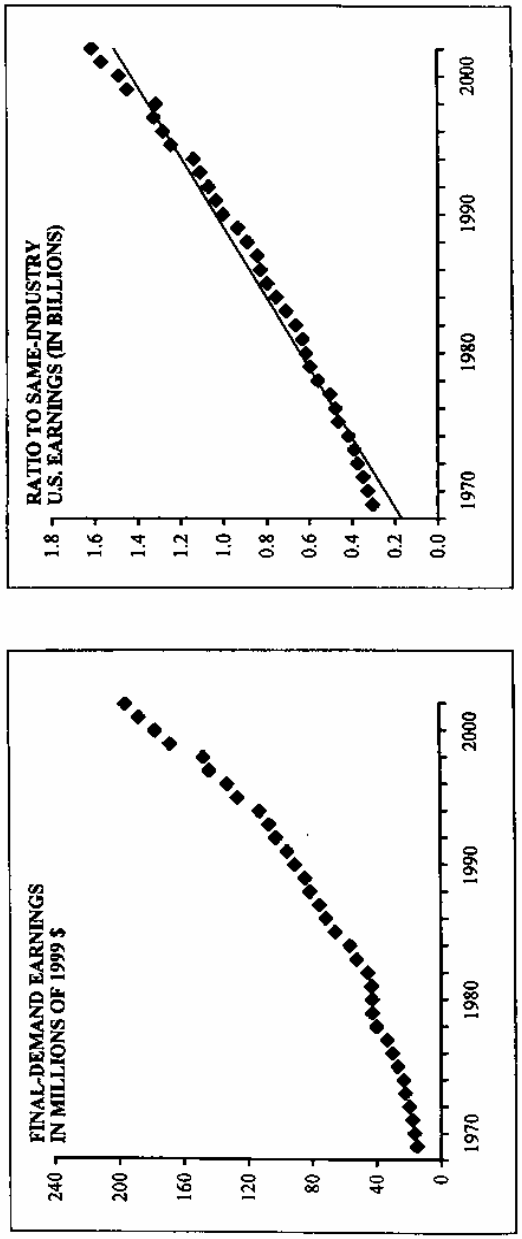


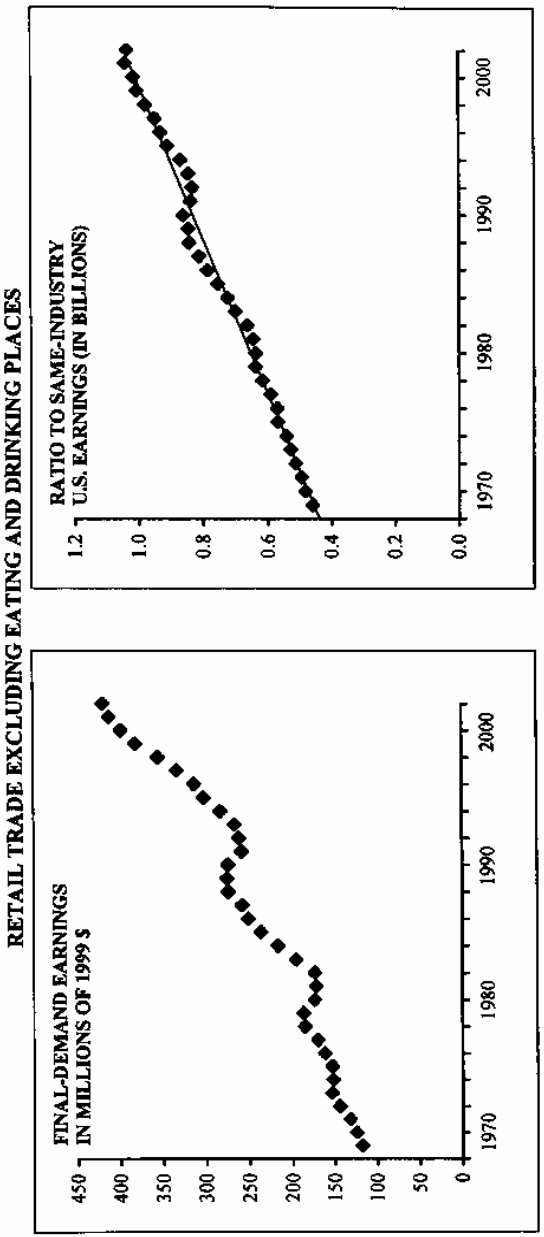
WHOLESALE TRADE

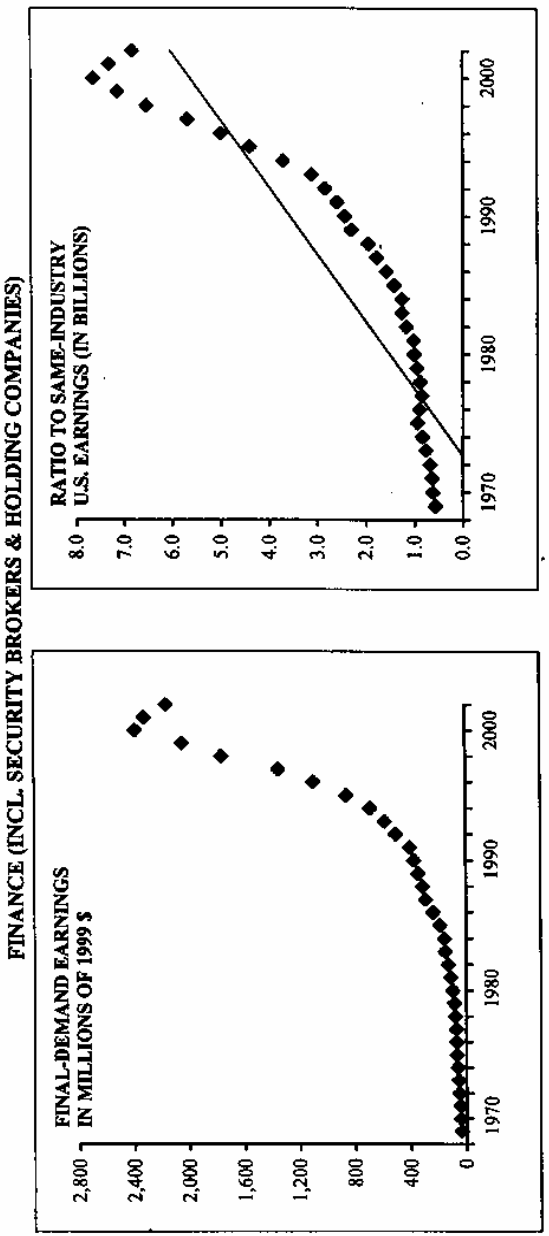




Relationships Between Regional Final Demand and National Earnings -- Part 8

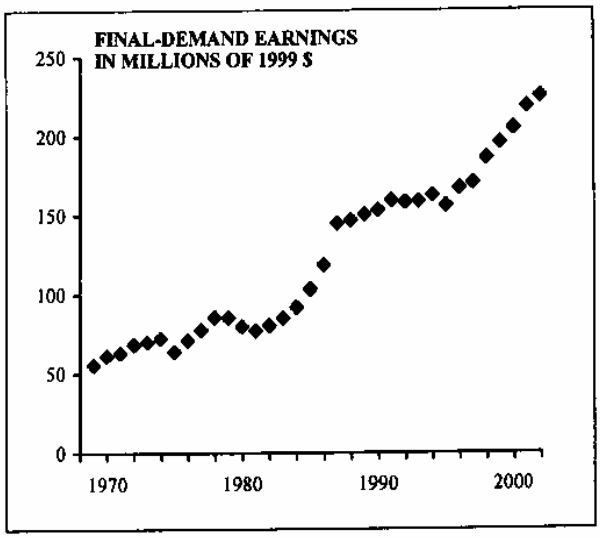


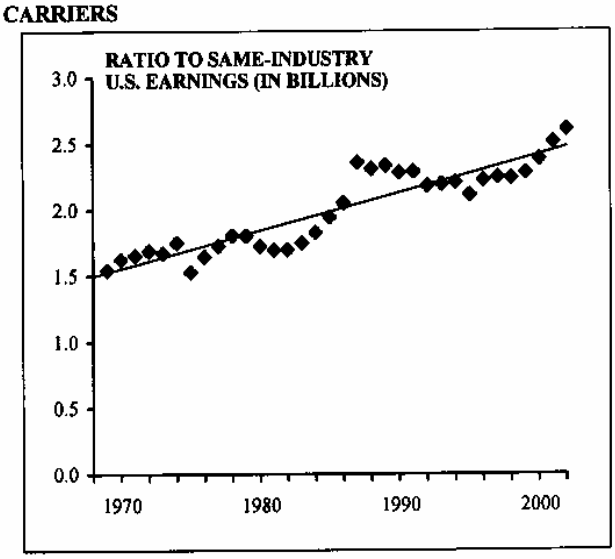




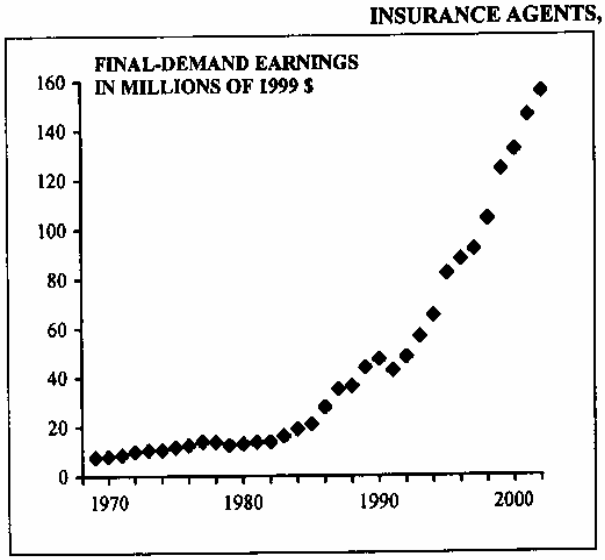
Relationships Between Regional Final Demand and National Earnings -- Part 9

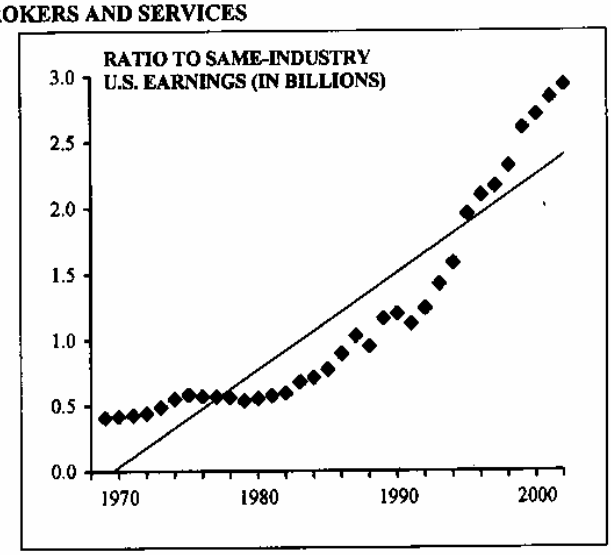
INSURANCE CARRIERS



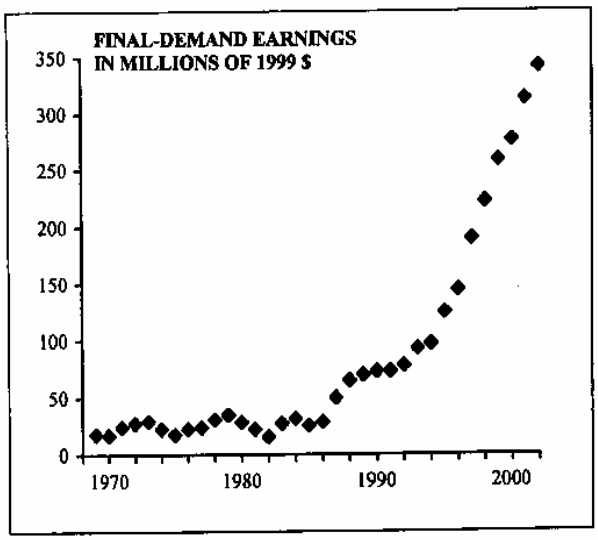


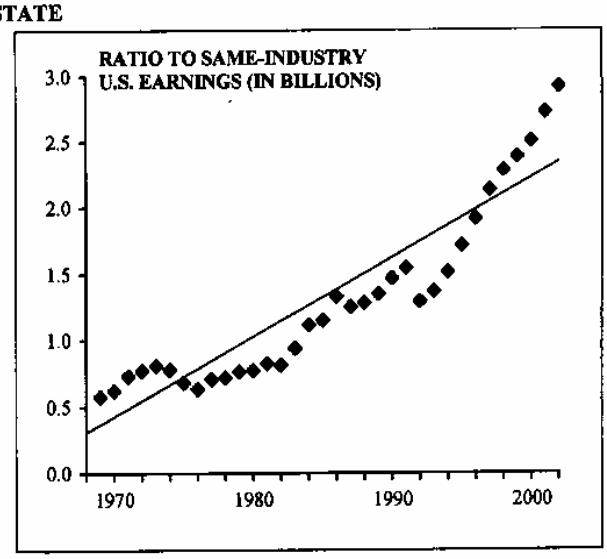
INSURANCE AGENTS, BROKERS AND SERVICES





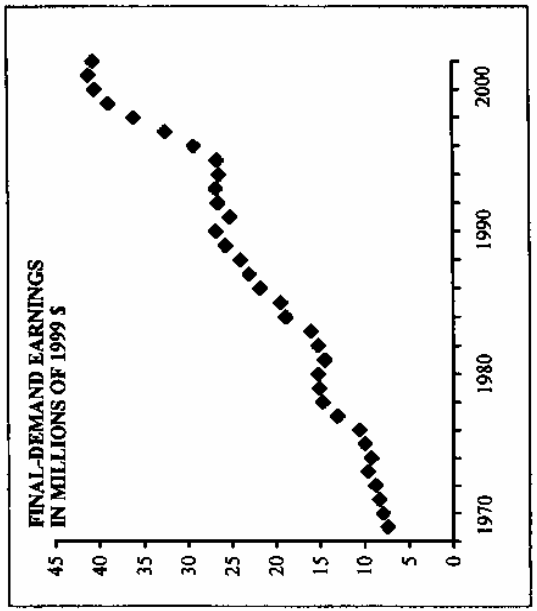
REAL ESTATE

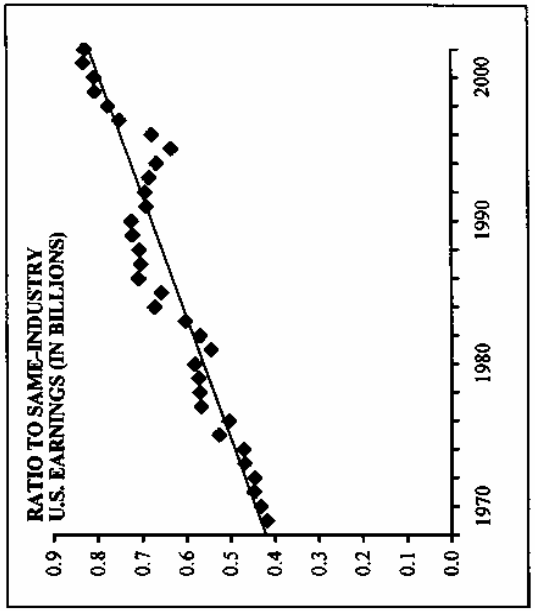




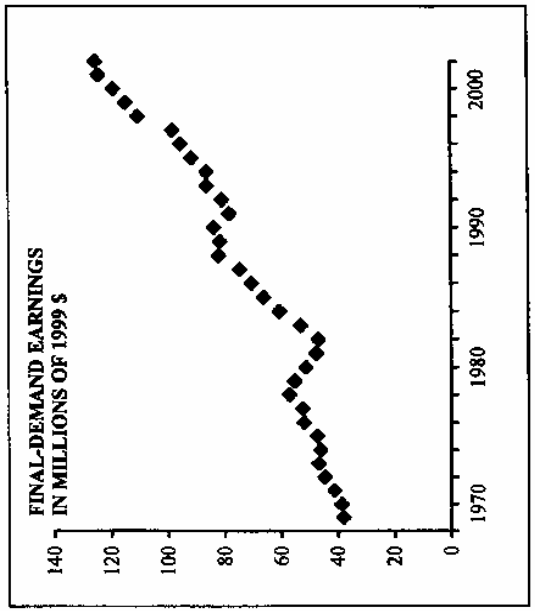
Relationships Between Regional Final Demand and National Earnings -- Part 10

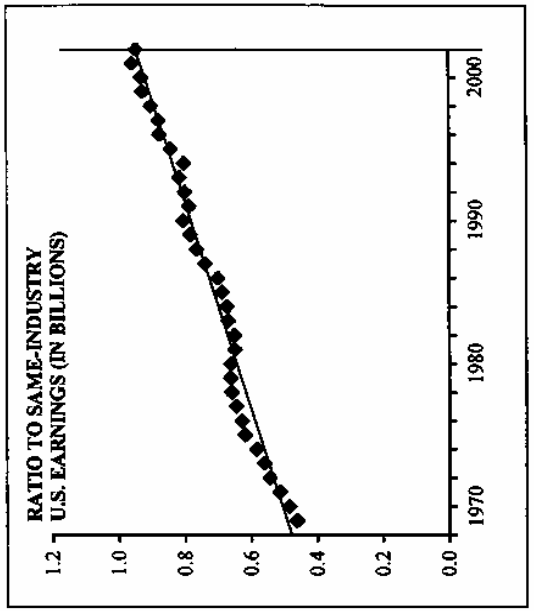
HOTEL AND MOTEL ACCOMMODATIONS



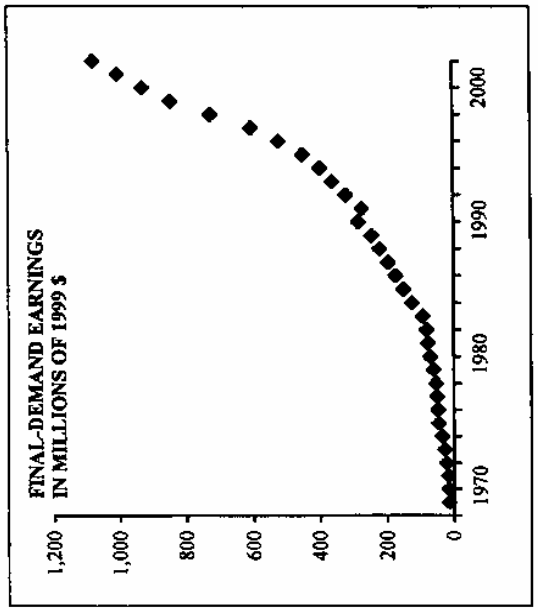


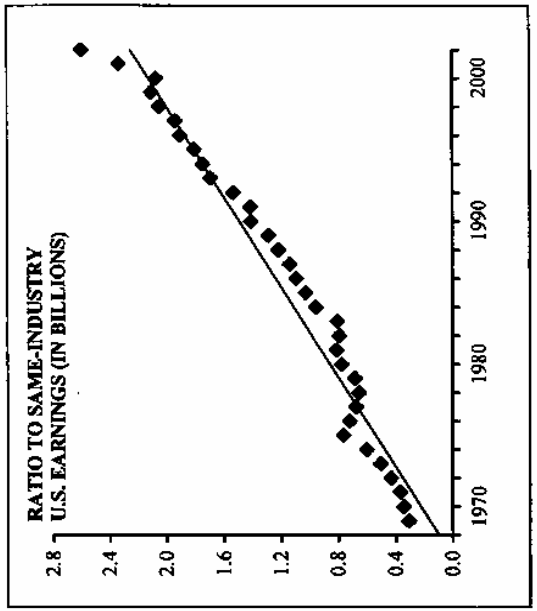
PERSONAL AND REPAIR SERVICES





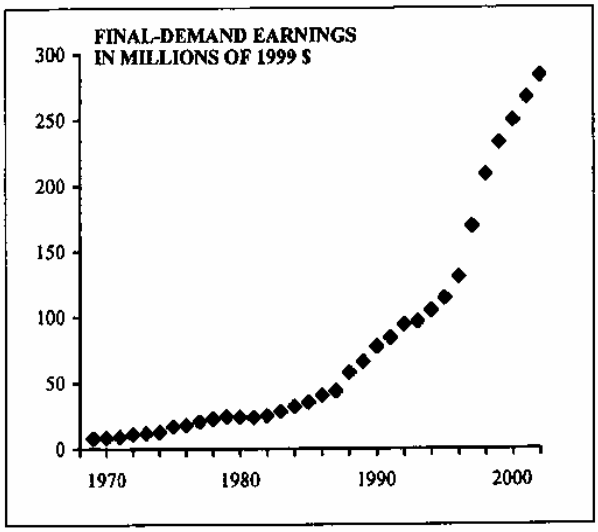
BUSINESS SERVICES

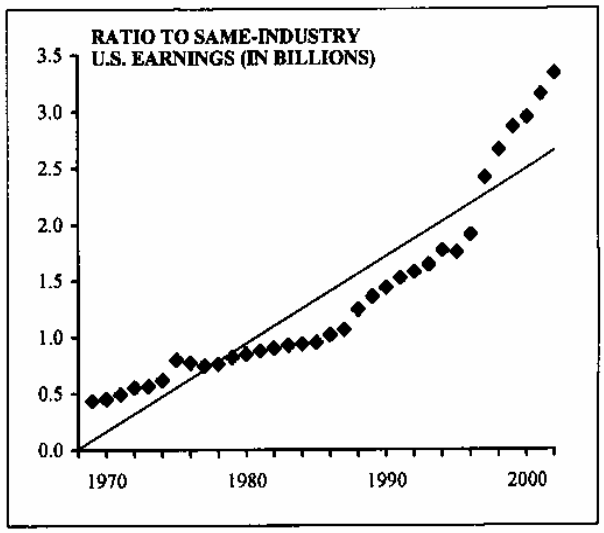




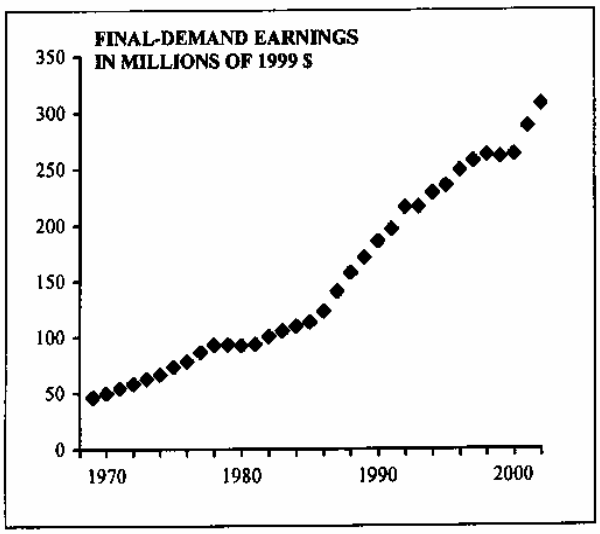
Relationships Between Regional Final Demand and National Earnings -- Part 11

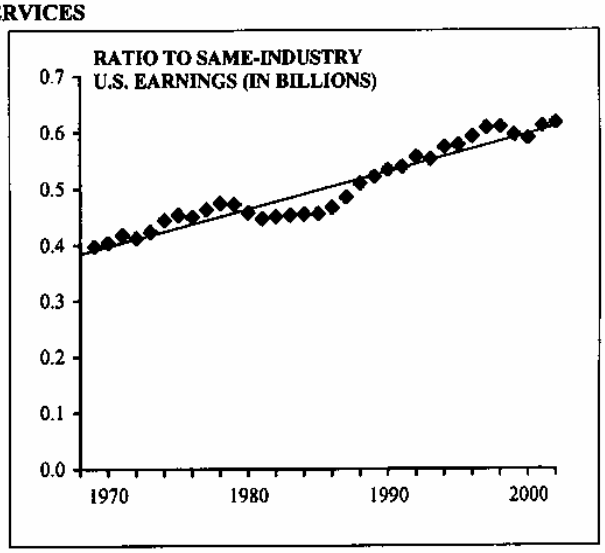
AMUSEMENT AND RECREATION SERVICES



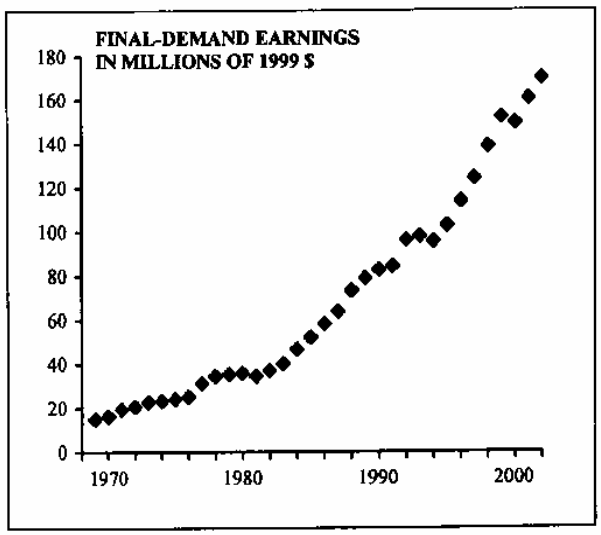


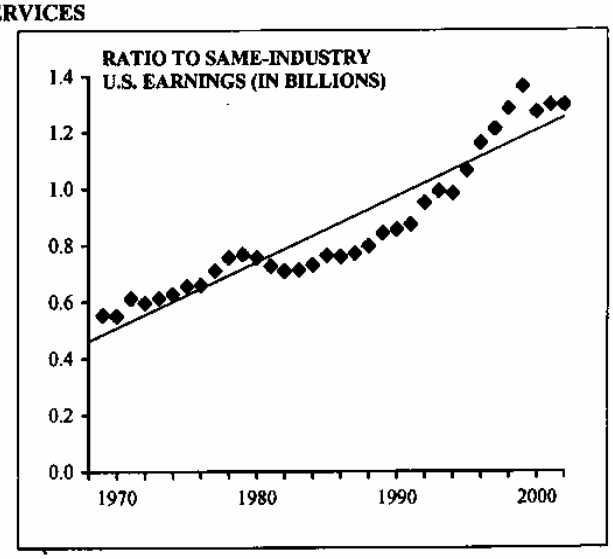
HEALTH SERVICES



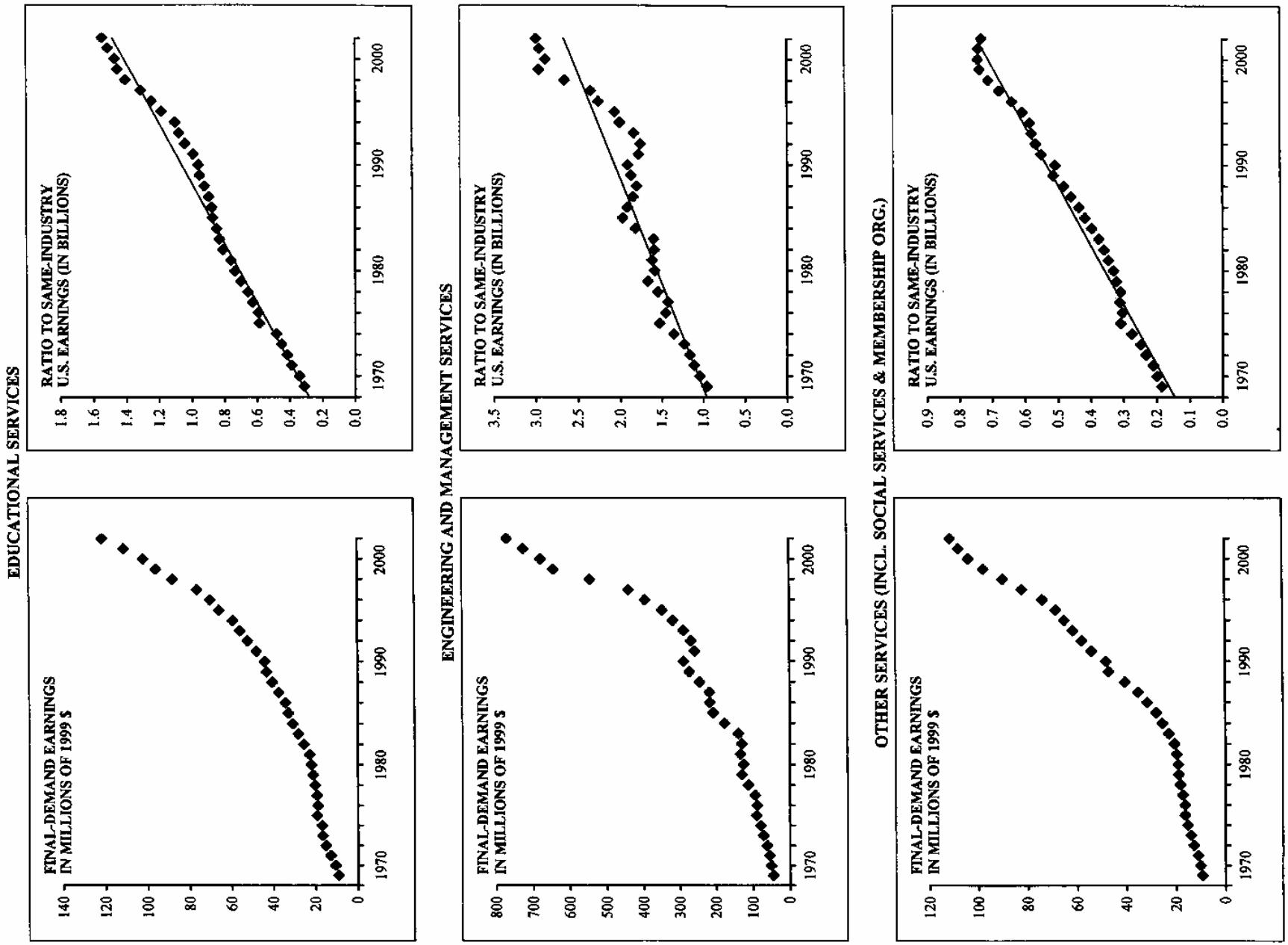


LEGAL SERVICES



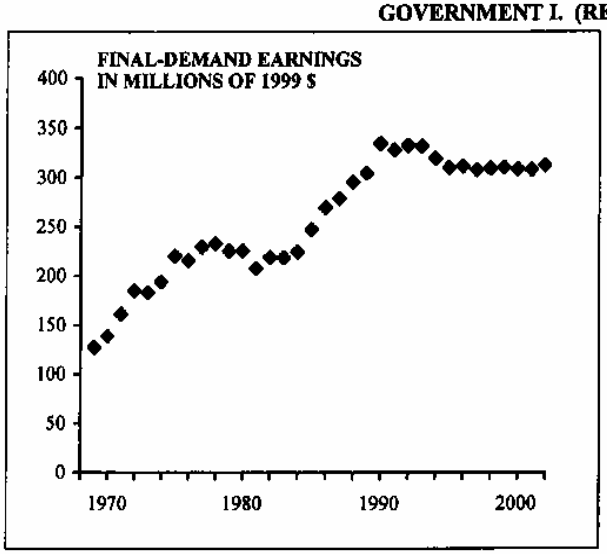


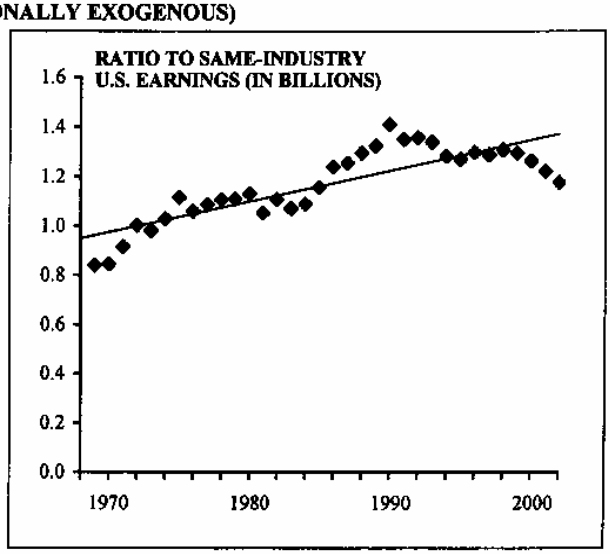
Relationships Between Regional Final Demand and National Earnings -- Part 12



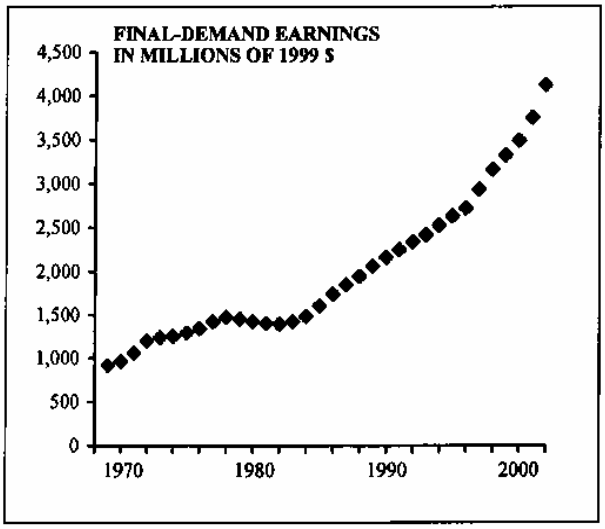
Relationships Between Regional Final Demand and National Earnings -- Part 13

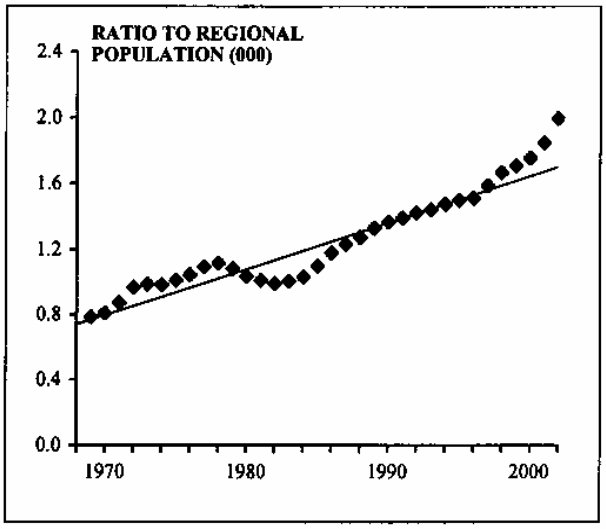
GOVERNMENT I. (REGIONALLY EXOGENOUS)



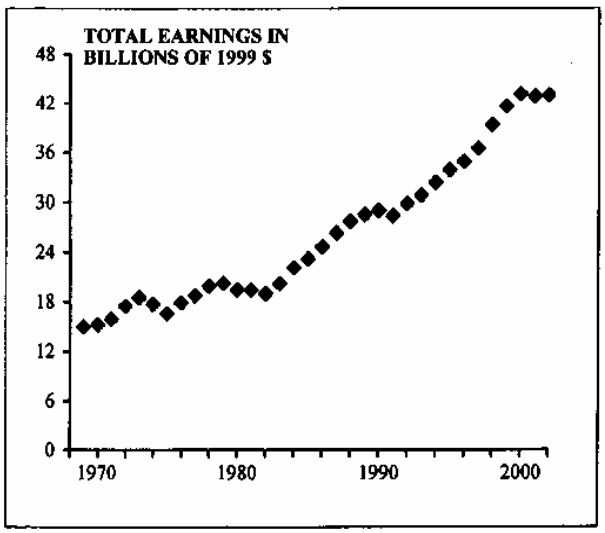


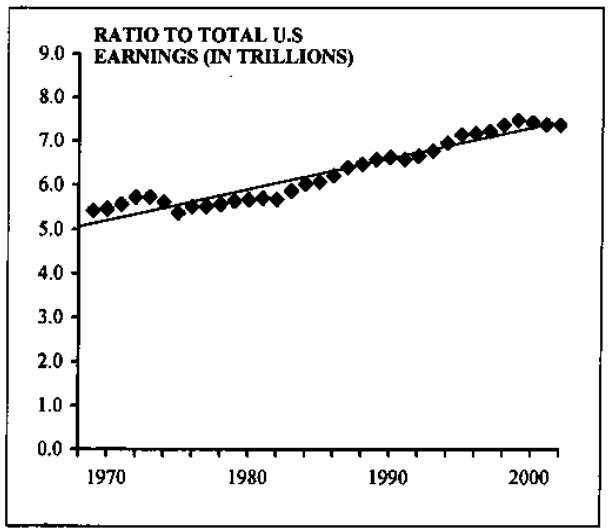
GOVERNMENT II. (REGIONALLY ENDOGENOUS)





TOTAL CIVILIAN EARNINGS





FORECASTED CHARLOTTE REGION EMPLOYMENT BY INDUSTRY

	2000	2005	2010	2015	2020	2025	2030	2035
Farming	6,698	6,612	6,607	6,723	6,864	6,813	6,768	6,737
Agricultural serv., forestry & fish.	7,980	8,865	9,726	10,930	12,121	13,265	14,300	15,170
Mining	962	1,029	1,086	1,160	1,221	1,270	1,303	1,317
Construction	67,253	75,689	84,750	94,300	103,138	111,592	119,718	127,601
Manufacturing:								
Food and kindred products	12,907	13,338	13,200	13,388	13,416	13,344	13,178	12,921
Textile mill products	43,222	30,172	24,393	18,854	15,617	12,344	9,089	5,854
Apparel and other textile prod.	10,250	8,543	7,507	6,546	5,769	4,893	4,022	3,160
Paper and allied products	7,002	6,851	7,820	8,278	8,634	8,902	9,070	9,125
Printing and publishing	10,700	11,359	13,320	14,519	15,498	16,345	17,106	17,825
Chemicals and petro./coal prod.	10,155	10,078	10,082	10,383	10,682	10,963	11,169	11,243
Rubber, plastic & leather prod.	12,971	14,617	17,335	19,801	22,183	24,531	26,848	29,143
Lumber/wood pr. and furniture	11,606	11,279	11,765	12,262	12,733	13,126	13,345	13,295
Stone, clay & glass products	8,718	9,098	10,279	11,241	12,111	12,883	13,518	13,975
Primary metal industries	6,096	5,594	5,466	5,395	5,418	5,212	5,011	4,820
Fabricated metal products	14,106	14,213	16,087	17,749	19,410	20,971	22,284	23,202
Industrial machinery and equip.	17,226	16,927	18,915	20,054	21,046	21,915	22,619	23,116
Electronic & other electric eq.	13,573	12,722	16,650	18,975	21,328	23,581	25,558	27,092
Motor vehicles and equipment	11,521	11,831	14,911	17,196	19,498	21,756	23,866	25,733
Other transportation equipment	781	893	1,109	1,286	1,456	1,623	1,788	1,953
Instruments and related prod.	3,422	3,529	3,767	4,131	4,501	4,841	5,103	5,240
Miscellaneous manufacturing	5,961	6,488	7,698	8,508	9,199	9,828	10,424	11,021
Transportation, Commun. & Util.:								
Transportation	45,476	47,801	55,334	62,489	69,795	77,073	83,977	90,191
Communication	15,512	16,775	18,480	20,786	23,145	25,460	27,579	29,357
Utilities	10,605	11,150	12,723	13,893	14,939	15,900	16,774	17,561
Wholesale Trade	68,525	71,280	79,359	88,021	96,740	105,115	112,495	118,256
Retail Trade:								
Food and lumber/hdwr./garden	36,338	37,129	42,987	47,909	52,824	57,566	61,836	65,352
GAFO (dept.-store type goods)	63,165	66,843	74,673	82,444	89,904	96,925	103,135	108,185
Gasoline service stations	5,367	5,520	5,952	6,551	7,168	7,749	8,225	8,524
Other automotive retailing	14,332	14,747	15,893	17,494	19,141	20,694	21,963	22,763
Eating & drinking places	60,691	66,441	73,693	83,527	93,665	103,759	113,241	121,587
Finance, Insurance & Real Estate:								
Depository institutions (banks)	39,128	42,948	47,629	54,021	60,425	66,484	71,702	75,603
Other finance	13,442	14,843	16,862	19,968	23,425	27,043	30,591	33,858
Insurance carriers	13,427	14,572	15,910	17,286	18,491	19,569	20,506	21,293
Insurance agents and services	5,659	6,097	6,735	7,495	8,244	8,960	9,603	10,132
Real estate	11,101	12,196	13,331	15,075	16,868	18,631	20,245	21,597
Services:								
Hotels & other lodging places	9,219	9,202	10,281	11,396	12,569	13,702	14,669	15,342
Personal serv. & private h'holds	9,692	10,331	11,233	12,218	13,123	13,946	14,649	15,194
Business services	69,677	82,284	95,413	114,992	136,392	159,019	182,052	204,791
Auto repair, services & parking	10,115	11,259	12,797	14,607	16,445	18,287	20,074	21,752
Miscellaneous repair services	2,939	3,005	3,059	3,190	3,299	3,376	3,403	3,360
Amusement & recreation serv.	17,893	20,201	24,035	28,425	33,084	37,907	42,729	47,407
Health services	63,123	74,455	85,928	98,739	111,381	124,296	137,678	151,780
Legal services	5,611	6,519	7,926	9,184	10,416	11,668	12,964	14,336
Educational services	11,823	13,741	15,482	17,826	20,190	22,560	24,879	27,099
Social serv., memb. org. & misc.	45,079	49,615	55,791	63,665	71,866	80,205	88,333	95,935
Engineering & mgmt. services	23,407	25,906	30,729	35,784	41,038	46,396	51,678	56,730
Government								
Federal government (civilian)	9,358	9,616	10,987	11,925	12,758	13,509	14,164	14,711
State government	18,622	19,941	21,013	22,595	24,008	25,244	26,224	26,870
Local government	99,327	113,652	123,042	136,873	150,059	162,956	175,535	187,810
Total	1,081,764	1,157,798	1,289,746	1,440,057	1,593,245	1,743,995	1,886,992	2,016,921

POPULATION		2000	2002	2005	2010	2015	2020	2025	2030	2035
County										
Anson		25,275	25,328	25,540	26,596	28,587	31,582	35,646	40,847	47,253
Cabarrus		131,063	139,224	149,387	170,145	194,852	222,552	252,291	283,115	314,070
Cleveland		96,287	97,803	99,076	102,714	108,169	115,355	124,182	134,563	146,409
Gaston		190,365	193,128	195,037	200,888	209,685	220,979	234,321	249,261	265,352
Iredell		122,660	129,430	137,689	155,192	176,810	201,899	229,812	259,906	291,535
Lincoln		63,780	66,254	70,878	80,093	90,850	102,763	115,388	128,857	143,030
Mecklenburg		695,454	733,665	780,676	859,864	938,716	1,015,638	1,089,034	1,157,311	1,218,875
Rowan		130,340	133,072	136,895	145,255	155,964	168,868	183,812	200,639	219,195
Stanly		58,100	58,589	59,474	62,151	66,306	71,911	78,940	87,366	97,160
Union, NC		123,677	137,731	150,019	174,852	204,382	237,743	274,127	312,147	350,691
Cherokee		52,537	53,408	55,534	60,291	66,504	74,102	83,013	93,168	104,495
Chester		34,068	34,195	35,077	37,478	41,024	45,692	51,460	58,306	66,209
Lancaster		61,351	62,086	63,862	68,452	74,824	82,682	91,732	101,680	112,230
Union, SC		29,881	29,521	29,424	29,964	31,409	33,787	37,130	41,466	46,828
York		164,614	172,702	181,949	201,139	224,129	249,852	277,240	305,228	332,747
District										
Anson		25,275	25,328	25,540	26,596	28,587	31,582	35,646	40,847	47,253
Cabarrus	Central	66,139	71,325	77,907	90,744	105,266	120,724	136,368	151,450	165,219
Cabarrus	NW	33,332	34,398	36,125	39,460	43,382	47,911	53,065	58,864	65,326
Cabarrus	South	17,023	18,378	19,457	21,993	25,270	29,075	33,200	37,432	41,561
Cabarrus	NE	14,569	15,123	15,898	17,948	20,933	24,841	29,658	35,370	41,964
Cleveland	SE	33,394	34,205	34,477	35,811	38,079	41,093	44,661	48,594	52,700
Cleveland	Cent	33,408	33,407	34,060	35,257	36,732	38,646	41,160	44,436	48,636
Cleveland	NW	29,485	30,191	30,539	31,646	33,358	35,616	38,361	41,533	45,073
Gaston	E	58,051	58,867	59,325	60,871	63,323	66,601	70,623	75,308	80,573
Gaston	SW	108,193	109,676	110,609	113,658	118,277	124,123	130,853	138,124	145,593
Gaston	NW	24,121	24,585	25,103	26,359	28,084	30,254	32,844	35,830	39,186
Iredell	South	36,995	39,920	43,939	52,032	61,491	71,876	82,752	93,680	104,223
Iredell	S Cent	18,752	20,176	21,892	25,758	30,798	36,918	44,024	52,020	60,813
Iredell	N Cent	53,947	55,756	57,586	61,541	66,535	72,458	79,203	86,661	94,724
Iredell	North	12,966	13,579	14,273	15,862	17,988	20,646	23,833	27,544	31,775
Lincoln	East	16,141	17,018	19,463	24,436	30,010	35,846	41,603	47,828	54,431
Lincoln	Central	34,380	35,359	36,777	39,436	42,695	46,556	50,974	55,587	60,399
Lincoln	West	13,259	13,877	14,638	16,220	18,145	20,360	22,810	25,442	28,201
Mecklenburg	N	49,447	55,056	64,278	82,881	104,601	128,373	153,132	177,813	201,349
Mecklenburg	NW	51,752	54,630	57,672	64,001	71,441	79,457	87,517	95,086	101,630
Mecklenburg	NNE	50,624	57,805	69,646	88,912	106,864	122,662	135,465	144,432	148,722
Mecklenburg	ENE	43,383	45,652	46,085	48,948	53,753	59,650	65,791	71,325	75,404
Mecklenburg	E	131,346	137,155	139,334	144,766	152,089	160,893	170,764	181,293	192,066
Mecklenburg	S	193,447	204,491	220,054	240,771	256,040	267,108	275,220	281,625	287,568
Mecklenburg	SW	45,903	49,383	52,609	57,417	61,622	65,351	68,728	71,881	74,936
Mecklenburg	Central	129,552	129,493	130,997	132,168	132,306	132,144	132,416	133,857	137,200
Rowan	S Cent	32,313	32,686	33,006	34,070	35,730	37,908	40,526	43,505	46,766
Rowan	N Cent	43,708	44,363	45,310	46,851	48,533	50,573	53,192	56,606	61,035
Rowan	East	29,358	30,431	32,247	35,646	39,450	43,588	47,990	52,583	57,297
Rowan	West	24,961	25,592	26,332	28,688	32,251	36,798	42,104	47,944	54,096
Stanly	North	28,990	29,175	29,700	30,857	32,434	34,515	37,180	40,511	44,590
Stanly	South	29,110	29,414	29,774	31,294	33,872	37,397	41,761	46,855	52,570
Union, NC	NW	47,296	55,194	62,170	75,440	90,139	105,533	120,904	135,246	147,706
Union, NC	Central	50,562	54,731	58,422	66,447	76,546	88,407	101,737	116,041	130,912
Union, NC	East	8,174	8,620	9,074	10,195	11,900	14,346	17,700	22,097	27,685
Union, NC	South	17,645	19,187	20,354	22,770	25,796	29,457	33,787	38,763	44,388
Catawba	SE part	7,451	7,807	8,587	10,213	12,218	14,565	17,221	20,151	23,321
Cherokee		52,537	53,408	55,534	60,291	66,504	74,102	83,013	93,168	104,495
Chester		34,068	34,195	35,077	37,478	41,024	45,692	51,460	58,306	66,209
Lancaster	North	7,059	7,230	7,755	9,028	10,659	12,488	14,358	16,108	17,580
Lancaster	South	54,292	54,856	56,107	59,424	64,165	70,194	77,375	85,572	94,650
Union, SC		29,881	29,521	29,424	29,964	31,409	33,787	37,130	41,466	46,828
York	North	19,213	20,132	20,818	22,079	23,396	24,668	25,795	26,674	27,205
York	NE	25,358	27,180	29,737	34,905	40,721	46,626	52,062	56,470	59,293
York	SE	88,029	91,598	96,331	105,695	116,724	129,210	142,946	157,725	173,338
York	West	32,014	33,793	35,062	38,460	43,288	49,348	56,438	64,359	72,911
Total Region		1,986,903	2,073,940	2,179,103	2,385,288	2,624,430	2,889,969	3,175,350	3,474,012	3,779,397

District Forecasts – Household and GQ Population

HH POP		Population in Households									Population in Group Quarters								
		2000	2002	2005	2010	2015	2020	2025	2030	2035	2000	2002	2005	2010	2015	2020	2025	2030	2035
Anson		23,848	23,847	24,027	25,002	26,873	29,700	33,545	38,469	44,531	1,427	1,481	1,513	1,594	1,714	1,881	2,100	2,378	2,722
Cabar	Central	64,670	69,805	76,210	88,722	102,884	117,949	133,172	147,807	161,108	1,469	1,519	1,697	2,022	2,383	2,775	3,196	3,642	4,111
Cabar	NW	32,950	33,988	35,691	38,971	42,820	47,255	52,296	57,961	64,271	382	410	433	488	563	656	770	903	1,055
Cabar	South	16,950	18,296	19,366	21,883	25,136	28,914	33,006	37,203	41,292	73	82	91	110	134	161	193	229	269
Cabar	NE	14,324	14,867	15,621	17,619	20,533	24,355	29,073	34,679	41,160	245	256	277	329	400	486	584	691	803
Cleve	SE	33,101	33,884	34,139	35,435	37,654	40,606	44,101	47,949	51,959	293	321	338	376	425	487	560	645	741
Cleve	Cent	32,562	32,510	33,129	34,251	35,634	37,443	39,847	43,014	47,111	846	897	931	1,006	1,098	1,203	1,313	1,422	1,525
Cleve	NW	28,144	28,773	29,076	30,091	31,691	33,821	36,422	39,437	42,809	1,341	1,418	1,463	1,555	1,667	1,795	1,939	2,096	2,264
Gast	E	57,149	57,949	58,379	59,843	62,180	65,317	69,183	73,708	78,818	902	918	946	1,027	1,144	1,285	1,440	1,600	1,755
Gast	SW	106,300	107,677	108,531	111,390	115,757	121,304	127,699	134,613	141,717	1,893	1,999	2,078	2,268	2,520	2,820	3,154	3,511	3,876
Gast	NW	23,825	24,253	24,752	25,968	27,643	29,750	32,264	35,159	38,410	296	332	351	390	441	504	580	671	776
Iredell	South	36,615	39,513	43,482	51,470	60,797	71,027	81,726	92,458	102,789	380	406	456	562	694	849	1,026	1,222	1,434
Iredell	S Cent	18,648	20,069	21,773	25,611	30,615	36,690	43,739	51,668	60,382	104	107	119	146	183	229	285	352	431
Iredell	N Cent	52,946	54,638	56,404	60,219	65,027	70,721	77,193	84,335	92,040	1,001	1,118	1,181	1,322	1,508	1,737	2,010	2,326	2,684
Iredell	North	12,868	13,480	14,166	15,737	17,839	20,467	23,616	27,281	31,457	98	98	107	125	149	179	217	263	318
Linc	East	16,043	16,907	19,341	24,288	29,828	35,623	41,331	47,498	54,036	98	111	122	148	182	224	273	330	395
Linc	Central	33,613	34,531	35,901	38,454	41,575	45,269	49,492	53,883	58,449	767	828	876	982	1,120	1,287	1,482	1,704	1,950
Linc	West	13,233	13,849	14,609	16,185	18,104	20,312	22,753	25,374	28,122	26	27	30	35	41	48	57	68	79
Meck	N	47,185	52,699	61,546	79,411	100,289	123,159	146,998	170,782	193,490	2,262	2,357	2,732	3,470	4,312	5,214	6,134	7,030	7,859
Meck	NW	50,829	53,539	56,494	62,662	69,928	77,766	85,650	93,053	99,450	923	1,091	1,178	1,339	1,513	1,691	1,867	2,033	2,180
Meck	NNE	50,231	57,339	69,096	88,226	106,054	121,744	134,463	143,376	147,648	393	466	550	686	810	918	1,002	1,056	1,074
Meck	ENE	40,036	42,331	42,634	45,207	49,657	55,166	60,917	66,091	69,872	3,347	3,322	3,451	3,740	4,096	4,484	4,875	5,234	5,531
Meck	E	129,845	135,546	137,628	142,870	149,967	158,507	168,078	178,265	188,657	1,501	1,609	1,706	1,895	2,121	2,385	2,687	3,028	3,409
Meck	S	191,535	202,370	217,756	238,160	253,102	263,838	271,625	277,717	283,371	1,912	2,120	2,298	2,612	2,938	3,269	3,595	3,907	4,197
Meck	SW	45,533	48,959	52,134	56,860	60,985	64,633	67,926	70,989	73,944	370	423	475	557	637	718	802	893	992
Meck	Central	124,848	124,697	126,023	126,989	127,009	126,782	127,005	128,380	131,603	4,704	4,796	4,975	5,179	5,296	5,362	5,411	5,477	5,596
Row	S Cent	31,328	31,665	31,941	32,931	34,513	36,609	39,140	42,027	45,192	985	1,022	1,065	1,139	1,217	1,299	1,386	1,478	1,575
Row	N Cent	40,312	40,800	41,723	43,206	44,802	46,721	49,172	52,366	56,511	3,396	3,563	3,588	3,645	3,731	3,853	4,020	4,240	4,524
Row	East	29,150	30,210	32,005	35,365	39,122	43,205	47,544	52,066	56,701	208	221	241	281	328	383	446	517	597
Row	West	24,854	25,467	26,197	28,531	32,064	36,572	41,832	47,618	53,707	107	125	135	157	188	226	272	326	389
Stanly	North	27,311	27,427	27,901	28,962	30,428	32,376	34,883	38,028	41,886	1,679	1,748	1,799	1,895	2,007	2,139	2,296	2,483	2,704
Stanly	South	29,001	29,303	29,658	31,165	33,723	37,223	41,556	46,613	52,283	109	110	116	130	149	174	205	242	286
Union	NW	47,290	55,188	62,163	75,431	90,128	105,519	120,887	135,227	147,683	6	6	7	9	11	14	17	20	23
Union	Central	49,016	53,164	56,704	64,394	74,066	85,420	98,177	111,858	126,067	1,546	1,567	1,718	2,053	2,480	2,987	3,559	4,183	4,844
Union	East	8,078	8,524	8,973	10,077	11,755	14,161	17,464	21,797	27,307	96	96	101	118	145	185	236	301	379
Union	South	17,627	19,172	20,337	22,751	25,774	29,429	33,753	38,722	44,340	18	15	16	19	23	28	33	40	49
Cataw	SE part	7,451	7,807	8,587	10,213	12,218	14,565	17,221	20,151	23,321	0	0	0	0	0	0	0	0	0
Chero		51,808	52,632	54,708	59,347	65,410	72,838	81,574	91,560	102,736	729	775	826	944	1,094	1,263	1,439	1,608	1,759
Chest		33,752	33,839	34,701	37,055	40,535	45,117	50,776	57,490	65,234	316	356	376	423	489	575	684	816	975
Lanc	North	7,049	7,220	7,745	9,015	10,642	12,468	14,334	16,080	17,547	10	10	11	13	16	20	24	28	33
Lanc	South	52,318	52,765	53,913	57,023	61,515	67,261	74,131	81,995	90,724	1,974	2,091	2,194	2,401	2,650	2,933	3,244	3,577	3,926
Union, SC		29,455	29,055	28,949	29,450	30,828	33,122	36,368	40,603	45,864	426	466	474	514	580	665	762	864	963
York	North	19,169	20,079	20,763	22,017	23,326	24,590	25,707	26,577	27,099	44	53	56	62	70	79	88	97	106
York	NE	25,292	27,113	29,663	34,815	40,610	46,492	51,904	56,289	59,090	66	66	74	91	111	134	158	181	203
York	SE	84,576	88,128	92,598	101,486	111,994	123,919	137,060	151,212	166,175	3,453	3,470	3,733	4,210	4,730	5,291	5,886	6,512	7,164
York	West	31,370	33,054	34,255	37,518	42,187	48,062	54,945	62,636	70,937	644	739	807	942	1,102	1,286	1,493	1,723	1,974
Total Region		1,944,038	2,028,930	2,131,394	2,332,277	2,565,221	2,823,790	3,101,550	3,392,065	3,688,901	42,865	45,010	47,710	53,011	59,209	66,179	73,799	81,946	90,496

District Forecasts – Population by Age (2000)

AGE 2000		Total	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Anson		25,275	1,641	1,850	1,828	1,670	1,555	1,659	1,834	1,911	1,920	1,717	1,696	1,329	1,024	901	912	807	570	451
Cabar	Central	66,139	5,078	5,062	4,588	4,298	4,121	5,558	5,627	5,708	5,363	4,350	3,980	3,105	2,307	1,957	1,746	1,481	987	823
Cabar	NW	33,332	2,268	2,285	2,229	2,021	2,098	2,437	2,532	2,766	2,549	2,125	2,072	1,640	1,337	1,232	1,245	1,116	778	602
Cabar	South	17,023	1,083	1,433	1,431	1,084	667	813	1,243	1,635	1,762	1,504	1,273	926	691	504	372	277	208	117
Cabar	NE	14,569	854	1,015	1,061	1,006	655	895	1,146	1,300	1,229	1,216	1,046	817	610	591	455	322	197	154
Cleve	SE	33,394	2,420	2,672	2,547	2,010	1,865	2,349	2,511	2,790	2,568	2,426	2,227	1,860	1,368	1,144	975	765	513	384
Cleve	Cent	33,408	2,118	2,462	2,387	1,979	1,803	2,081	2,226	2,365	2,452	2,371	2,268	1,831	1,572	1,425	1,355	1,147	852	714
Cleve	NW	29,485	1,882	2,037	2,040	2,269	2,247	1,844	2,099	2,293	2,154	2,044	1,971	1,662	1,252	1,129	985	721	479	377
Gast	E	58,051	3,612	3,957	4,018	3,686	3,299	4,213	4,333	4,869	4,904	4,383	4,072	3,043	2,458	2,252	1,825	1,470	920	737
Gast	SW	108,193	7,436	7,783	7,577	6,740	6,650	8,337	8,363	8,478	8,178	7,731	7,350	5,467	4,348	4,050	3,654	2,939	1,712	1,400
Gast	NW	24,121	1,631	1,764	1,714	1,393	1,314	1,751	1,856	1,998	1,816	1,711	1,729	1,342	1,076	899	748	675	378	326
Iredell	South	36,995	2,626	2,960	2,863	2,097	1,731	2,276	2,826	3,608	3,365	2,715	2,426	1,895	1,477	1,243	1,103	832	518	434
Iredell	S Cent	18,752	1,274	1,471	1,322	1,073	963	1,330	1,569	1,711	1,598	1,437	1,222	1,029	810	678	540	368	205	152
Iredell	N Cent	53,947	3,670	3,929	3,730	3,391	3,149	3,892	3,850	4,222	4,178	3,714	3,470	2,885	2,368	2,085	1,909	1,591	1,061	853
Iredell	North	12,966	871	978	907	799	747	952	920	1,110	970	971	926	667	570	459	376	333	229	181
Linc	East	16,141	1,008	1,229	1,169	958	673	1,092	1,271	1,566	1,467	1,293	1,197	941	705	522	482	287	176	105
Linc	Central	34,380	2,192	2,423	2,463	2,157	2,039	2,414	2,675	2,769	2,608	2,458	2,243	1,973	1,491	1,316	1,099	927	627	506
Linc	West	13,259	875	1,019	951	863	744	985	1,097	1,170	1,108	983	920	714	527	401	357	265	158	122
Meck	N	49,447	4,003	3,743	3,229	3,007	2,854	3,483	4,775	5,098	4,656	3,816	3,248	2,248	1,502	1,149	888	702	508	538
Meck	NW	51,752	3,755	3,951	3,851	3,239	2,934	4,092	4,588	4,923	4,475	3,581	3,107	2,352	1,868	1,661	1,412	1,041	549	373
Meck	NNE	50,624	4,531	3,988	3,316	2,446	3,562	6,371	5,957	5,262	4,355	3,285	2,522	1,609	982	789	600	485	322	242
Meck	ENE	43,383	2,811	2,816	2,631	4,790	7,499	4,513	3,461	3,287	2,859	2,475	2,051	1,373	1,011	662	483	354	184	123
Meck	E	131,346	9,947	9,713	9,134	8,244	9,759	13,151	12,770	12,279	10,726	8,627	7,476	5,244	3,864	3,164	2,639	2,131	1,194	1,284
Meck	S	193,447	13,055	13,697	13,476	10,734	9,648	15,754	16,381	17,797	17,585	15,514	14,036	9,635	6,296	5,354	4,864	4,282	2,828	2,511
Meck	SW	45,903	3,701	3,623	3,291	2,824	3,216	4,787	4,912	4,442	3,819	3,178	2,601	1,833	1,198	873	696	492	249	168
Meck	Central	129,552	8,947	9,161	8,269	8,207	9,983	13,194	12,078	11,153	9,820	8,565	7,109	5,141	3,995	3,562	3,561	3,149	2,037	1,621
Row	S Cent	32,313	2,047	2,232	2,212	2,034	2,003	2,281	2,411	2,735	2,461	2,118	2,141	1,666	1,450	1,211	1,149	958	665	539
Row	N Cent	43,708	2,860	2,867	2,844	3,008	3,501	2,955	2,870	3,006	3,108	2,836	2,631	2,005	1,725	1,657	1,752	1,680	1,236	1,167
Row	East	29,358	1,934	2,097	2,290	1,983	1,547	1,882	2,170	2,569	2,511	2,276	1,991	1,571	1,133	1,087	899	736	420	262
Row	West	24,961	1,725	1,894	2,028	1,629	1,333	1,615	1,857	2,232	2,115	1,806	1,589	1,327	1,024	840	765	566	342	274
Stanly	North	28,990	1,834	2,098	2,140	1,963	1,806	1,851	2,013	2,217	2,081	1,965	1,840	1,471	1,174	1,132	1,129	1,026	717	533
Stanly	South	29,110	1,790	2,077	2,194	1,907	1,568	1,895	2,092	2,446	2,278	2,068	2,059	1,632	1,376	1,191	981	728	481	347
Union	NW	47,296	4,139	4,279	3,963	2,858	1,871	2,962	4,369	5,237	4,476	3,518	3,020	2,194	1,449	1,140	796	535	307	183
Union	Central	50,562	4,188	3,842	3,470	3,522	3,965	4,151	4,249	4,163	3,731	3,038	2,867	2,365	1,866	1,552	1,331	1,000	627	635
Union	East	8,174	547	626	621	549	439	531	585	657	656	637	511	444	336	291	237	205	167	135
Union	South	17,645	1,166	1,356	1,541	1,187	760	1,033	1,286	1,513	1,469	1,378	1,216	953	780	659	506	429	251	162
Cataw	SE part	7,451	418	456	516	367	355	452	525	632	692	623	638	552	372	277	226	192	101	57
Chero		52,537	3,758	3,865	3,808	3,604	3,281	3,831	3,860	3,974	3,871	3,757	3,489	2,767	2,155	1,863	1,707	1,354	872	721
Chest		34,068	2,294	2,585	2,745	2,473	1,941	2,177	2,296	2,577	2,571	2,519	2,250	1,889	1,434	1,272	1,091	946	562	446
Lanc	North	7,059	473	511	521	465	315	511	548	650	622	530	528	421	297	242	148	147	84	46
Lanc	South	54,292	3,528	4,043	3,961	3,696	3,354	3,870	3,985	4,206	4,170	3,887	3,602	2,847	2,397	2,036	1,708	1,393	903	706
Union, SC		29,881	1,894	2,005	2,008	1,948	1,710	1,840	1,999	2,192	2,317	2,124	2,088	1,617	1,469	1,349	1,141	1,034	641	505
York	North	19,213	1,147	1,399	1,431	1,275	847	1,172	1,390	1,585	1,634	1,531	1,427	1,191	884	797	664	464	256	119
York	NE	25,358	1,693	2,141	2,223	1,688	882	1,289	1,912	2,446	2,307	2,035	1,856	1,415	1,005	771	654	511	335	195
York	SE	88,029	6,041	6,309	6,382	6,765	7,067	6,472	6,701	7,061	6,804	6,199	5,603	4,169	3,179	2,655	2,248	1,956	1,266	1,152
York	West	32,014	2,263	2,537	2,587	2,297	1,867	2,178	2,521	2,894	2,757	2,298	2,011	1,520	1,255	975	801	572	375	306
Total Region		1,986,903	139,028	146,240	141,507	128,203	126,187	155,171	162,539	171,502	161,115	141,333	127,595	96,577	73,467	62,999	55,214	45,391	29,047	23,788

District Forecasts –Population by Age (2005)

AGE 2005		Total	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Anson		25,540	1,605	1,786	1,829	1,697	1,640	1,573	1,715	1,909	1,970	1,834	1,802	1,434	1,179	925	800	733	607	503
Cabar	Central	77,907	5,631	5,653	5,654	5,341	5,049	5,964	5,909	6,767	6,503	5,603	5,102	3,887	3,238	2,311	1,666	1,405	1,136	1,089
Cabar	NW	36,125	2,348	2,376	2,474	2,330	2,400	2,399	2,455	2,909	2,844	2,563	2,454	1,908	1,707	1,306	1,072	985	851	745
Cabar	South	19,457	1,239	1,502	1,523	1,370	893	815	1,252	1,640	1,818	1,788	1,531	1,270	1,025	655	428	304	234	170
Cabar	NE	15,898	941	1,063	1,116	1,099	799	894	1,105	1,325	1,334	1,382	1,185	1,001	807	638	429	346	238	196
Cleve	SE	34,477	2,289	2,532	2,600	2,279	2,079	2,193	2,255	2,655	2,610	2,681	2,453	2,114	1,718	1,308	930	733	575	474
Cleve	Cent	34,060	2,075	2,374	2,404	2,154	1,985	1,936	2,035	2,380	2,499	2,544	2,437	2,028	1,820	1,448	1,192	1,036	903	810
Cleve	NW	30,539	1,856	2,008	2,099	2,246	2,379	1,766	1,942	2,230	2,232	2,282	2,178	1,861	1,576	1,251	904	708	558	464
Gast	E	59,325	3,541	3,794	3,991	3,777	3,607	3,931	3,874	4,699	4,829	4,799	4,468	3,535	3,103	2,341	1,686	1,438	1,027	883
Gast	SW	110,609	7,076	7,371	7,662	7,042	7,142	7,788	7,494	8,507	8,433	8,479	8,041	6,277	5,508	4,194	3,204	2,755	1,956	1,678
Gast	NW	25,103	1,599	1,703	1,752	1,536	1,468	1,648	1,689	1,994	1,916	1,925	1,884	1,483	1,352	987	717	631	426	394
Iredell	South	43,939	3,040	3,356	3,382	2,789	2,257	2,386	2,988	3,931	3,888	3,543	3,107	2,512	2,078	1,502	1,086	863	648	584
Iredell	S Cent	21,892	1,449	1,625	1,554	1,370	1,206	1,381	1,600	1,900	1,867	1,781	1,516	1,316	1,067	807	556	415	270	211
Iredell	N Cent	57,586	3,649	3,933	4,026	3,730	3,576	3,759	3,588	4,416	4,490	4,305	4,029	3,412	2,950	2,277	1,732	1,497	1,180	1,038
Iredell	North	14,273	909	1,008	999	916	867	944	893	1,164	1,095	1,138	1,047	844	756	516	378	323	249	225
Linc	East	19,463	1,186	1,395	1,369	1,234	910	1,178	1,348	1,737	1,698	1,656	1,494	1,247	1,041	711	525	324	251	161
Linc	Central	36,777	2,172	2,417	2,569	2,367	2,294	2,335	2,497	2,861	2,833	2,831	2,607	2,308	1,901	1,508	1,069	888	700	621
Linc	West	14,638	900	1,036	1,031	980	867	986	1,054	1,222	1,207	1,165	1,078	889	736	506	366	261	194	161
Meck	N	64,278	5,117	4,819	4,522	4,184	3,955	4,055	5,650	6,329	5,980	5,279	4,365	3,158	2,457	1,496	915	696	584	716
Meck	NW	57,672	3,942	4,081	4,207	3,868	3,605	4,169	4,467	5,026	4,878	4,468	3,896	2,991	2,522	1,829	1,342	1,099	741	541
Meck	NNE	69,646	5,872	5,345	5,068	4,163	4,913	7,887	7,216	7,512	6,366	4,992	3,873	2,458	1,625	851	466	374	312	351
Meck	ENE	46,085	2,831	2,819	2,816	4,137	7,294	4,640	3,603	3,635	3,250	2,968	2,613	1,851	1,426	818	558	401	232	194
Meck	E	139,334	9,289	9,225	9,721	9,297	10,794	12,694	11,385	11,763	11,243	10,521	9,275	6,988	5,674	3,692	2,578	2,149	1,474	1,573
Meck	S	220,054	14,197	14,534	14,879	13,671	12,649	15,932	15,882	18,613	18,646	18,684	16,653	13,069	10,661	6,905	4,548	4,016	3,279	3,237
Meck	SW	52,609	3,748	3,717	3,817	3,533	3,842	4,968	4,710	4,698	4,407	4,076	3,418	2,608	1,951	1,198	751	548	343	276
Meck	Central	130,997	8,167	8,356	8,414	8,637	10,504	12,219	10,371	10,582	10,055	9,742	8,452	6,609	5,311	3,736	2,966	2,719	2,206	1,950
Row	S Cent	33,006	1,988	2,135	2,262	2,179	2,200	2,140	2,177	2,610	2,534	2,387	2,339	1,840	1,727	1,248	1,028	873	713	627
Row	N Cent	45,310	2,773	2,797	3,033	3,139	3,747	2,802	2,688	3,194	3,301	3,195	3,039	2,418	2,173	1,636	1,415	1,381	1,262	1,318
Row	East	32,247	2,046	2,168	2,441	2,247	1,893	1,882	2,096	2,625	2,676	2,658	2,333	1,952	1,576	1,208	833	733	507	372
Row	West	26,332	1,724	1,863	2,089	1,811	1,540	1,567	1,743	2,185	2,191	2,063	1,821	1,529	1,265	930	714	555	402	340
Stanly	North	29,700	1,770	2,024	2,159	2,066	1,938	1,750	1,858	2,224	2,173	2,168	2,043	1,665	1,444	1,165	965	905	759	627
Stanly	South	29,774	1,748	2,016	2,195	2,002	1,701	1,795	1,930	2,389	2,323	2,258	2,207	1,773	1,617	1,233	919	721	537	411
Union	NW	62,170	5,258	5,278	5,303	4,304	2,779	3,395	5,078	6,166	5,770	5,074	4,214	3,154	2,517	1,671	925	607	380	297
Union	Central	58,422	4,492	4,187	4,255	4,037	4,541	4,374	4,430	4,905	4,544	3,875	3,652	2,801	2,497	1,885	1,353	1,031	767	796
Union	East	9,074	602	652	667	617	520	535	585	722	723	729	611	544	435	345	238	203	178	164
Union	South	20,354	1,363	1,473	1,633	1,397	991	1,067	1,313	1,670	1,663	1,659	1,472	1,231	1,088	800	546	447	306	235
Cataw	SE part	8,587	506	529	570	469	449	452	545	708	750	731	717	616	522	379	243	190	126	85
Chero		55,534	3,783	3,837	4,006	3,885	3,649	3,736	3,672	4,094	4,111	4,197	3,915	3,187	2,729	2,052	1,565	1,260	988	868
Chest		35,077	2,292	2,511	2,743	2,564	2,117	2,097	2,164	2,567	2,641	2,730	2,464	2,092	1,712	1,357	1,001	877	622	527
Lanc	North	7,755	502	538	558	518	386	516	539	679	669	620	595	476	401	291	164	147	92	65
Lanc	South	56,107	3,456	3,914	3,979	3,862	3,657	3,704	3,709	4,283	4,346	4,263	3,959	3,216	2,877	2,149	1,590	1,314	993	837
Union, SC		29,424	2,622	3,203	2,614	1,742	426	2,907	3,890	3,135	3,267	1,490	1,277	-85	-750	889	959	1,251	571	15
York	North	20,818	1,198	1,392	1,469	1,476	1,065	1,130	1,264	1,587	1,695	1,748	1,613	1,402	1,204	921	631	488	341	196
York	NE	29,737	1,954	2,327	2,448	2,194	1,233	1,344	1,961	2,585	2,622	2,557	2,261	1,829	1,510	1,013	690	510	406	291
York	SE	96,331	6,156	6,473	6,957	7,286	7,696	6,538	6,554	7,584	7,584	7,310	6,645	5,254	4,385	3,039	2,192	1,833	1,425	1,418
York	West	35,062	2,296	2,550	2,752	2,633	2,165	2,186	2,405	2,908	2,956	2,770	2,447	1,946	1,660	1,119	828	594	452	394
Total Region		2,179,103	145,198	151,697	155,609	146,175	143,669	156,359	159,574	181,226	177,427	167,507	150,582	117,898	97,777	71,045	51,663	43,566	33,003	29,128

District Forecasts – Population by Age (2010)

AGE 2010		Total	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Anson		26,596	1,568	1,717	1,775	1,815	1,817	1,553	1,631	1,859	1,918	1,956	1,978	1,736	1,542	1,150	830	641	590	521
Cabar	Central	90,744	6,388	6,540	6,740	6,486	5,849	6,914	6,772	7,857	7,394	6,527	6,027	4,606	3,959	2,832	1,993	1,484	1,169	1,207
Cabar	NW	39,460	2,513	2,594	2,733	2,705	2,658	2,571	2,608	3,055	3,039	2,875	2,761	2,160	1,988	1,475	1,147	948	836	793
Cabar	South	21,993	1,443	1,647	1,607	1,680	1,098	891	1,384	1,641	1,791	1,957	1,722	1,594	1,288	853	593	369	235	201
Cabar	NE	17,948	1,110	1,197	1,185	1,248	982	987	1,173	1,353	1,412	1,509	1,318	1,246	1,024	758	521	432	270	223
Cleve	SE	35,811	2,199	2,479	2,631	2,617	2,254	2,202	2,169	2,465	2,515	2,773	2,582	2,353	1,984	1,594	1,123	785	582	505
Cleve	Cent	35,257	2,078	2,357	2,397	2,487	2,211	1,897	1,949	2,384	2,409	2,595	2,560	2,301	2,055	1,609	1,299	996	859	814
Cleve	NW	31,646	1,883	2,066	2,137	2,230	2,426	1,835	1,960	2,148	2,200	2,360	2,275	2,012	1,779	1,453	1,042	775	579	485
Gast	E	60,871	3,566	3,778	3,909	3,902	3,830	3,952	3,712	4,457	4,473	4,913	4,682	4,011	3,595	2,600	1,965	1,578	1,034	914
Gast	SW	113,658	6,834	7,197	7,659	7,438	7,441	7,815	7,165	8,460	8,265	8,700	8,406	7,069	6,433	4,641	3,502	2,868	2,023	1,743
Gast	NW	26,359	1,608	1,706	1,776	1,722	1,600	1,671	1,651	1,970	1,933	2,035	1,963	1,611	1,572	1,163	874	654	435	413
Iredell	South	52,032	3,617	3,976	3,949	3,607	2,778	2,731	3,476	4,281	4,291	4,227	3,720	3,148	2,588	1,899	1,351	1,005	724	664
Iredell	S Cent	25,758	1,709	1,891	1,818	1,738	1,452	1,571	1,799	2,115	2,092	2,055	1,784	1,622	1,281	1,018	723	525	318	248
Iredell	N Cent	61,541	3,731	4,112	4,299	4,110	3,896	3,938	3,645	4,591	4,594	4,612	4,407	3,873	3,320	2,621	1,972	1,569	1,176	1,076
Iredell	North	15,862	984	1,093	1,100	1,063	977	1,022	952	1,222	1,188	1,248	1,132	1,031	911	618	482	352	245	242
Linc	East	24,436	1,494	1,719	1,649	1,652	1,220	1,431	1,620	1,980	1,940	2,047	1,837	1,656	1,431	1,043	748	425	328	215
Linc	Central	39,436	2,209	2,515	2,652	2,610	2,485	2,447	2,535	2,939	2,931	3,026	2,864	2,609	2,191	1,816	1,307	947	701	651
Linc	West	16,220	955	1,103	1,110	1,117	972	1,075	1,109	1,272	1,254	1,281	1,195	1,060	909	658	470	287	213	180
Meck	N	82,881	6,680	6,406	6,090	5,680	5,168	5,157	7,339	7,827	7,308	6,678	5,501	4,192	3,421	2,029	1,198	777	610	819
Meck	NW	64,001	4,246	4,392	4,529	4,544	4,171	4,599	4,751	5,088	5,046	5,065	4,512	3,571	2,994	2,113	1,598	1,286	861	636
Meck	NNE	88,912	7,359	6,917	6,755	5,890	6,062	10,032	9,113	9,690	8,044	6,319	5,006	3,226	2,128	959	439	302	266	407
Meck	ENE	48,948	2,930	2,942	2,975	3,452	6,779	5,166	4,089	3,971	3,492	3,261	3,058	2,295	1,739	1,030	774	497	257	239
Meck	E	144,766	9,042	9,207	10,010	10,021	11,131	13,245	11,300	11,318	11,101	11,136	10,057	7,979	6,489	4,223	3,052	2,359	1,527	1,569
Meck	S	240,771	15,460	15,761	15,844	16,018	14,574	17,273	16,818	19,156	18,670	19,950	17,910	15,401	13,268	8,477	5,280	4,215	3,320	3,376
Meck	SW	57,417	3,860	3,910	4,146	4,041	4,153	5,438	4,923	4,838	4,628	4,450	3,834	3,086	2,343	1,487	944	640	378	317
Meck	Central	132,168	7,720	8,006	8,424	8,989	10,536	12,317	9,823	10,023	9,765	10,020	9,104	7,596	5,955	4,063	3,120	2,638	2,123	1,948
Row	S Cent	34,070	1,967	2,100	2,304	2,408	2,395	2,147	2,069	2,393	2,484	2,576	2,481	2,033	1,964	1,394	1,156	866	689	642
Row	N Cent	46,851	2,769	2,853	3,188	3,281	3,850	2,888	2,760	3,359	3,330	3,313	3,274	2,746	2,426	1,711	1,427	1,247	1,156	1,272
Row	East	35,646	2,242	2,355	2,590	2,567	2,222	2,054	2,220	2,672	2,727	2,896	2,598	2,336	1,952	1,427	974	821	550	442
Row	West	28,688	1,786	1,918	2,161	2,132	1,815	1,662	1,766	2,083	2,173	2,296	2,085	1,813	1,532	1,159	858	620	447	384
Stanly	North	30,857	1,728	2,016	2,156	2,241	2,055	1,777	1,830	2,211	2,178	2,285	2,225	1,911	1,720	1,307	1,003	840	718	655
Stanly	South	31,294	1,729	2,017	2,154	2,228	1,897	1,810	1,848	2,228	2,232	2,416	2,345	2,004	1,941	1,445	1,138	836	568	457
Union	NW	75,440	6,398	6,383	6,447	5,606	3,483	4,055	6,167	6,950	6,647	6,097	5,056	3,903	3,257	2,230	1,261	738	404	355
Union	Central	66,447	4,918	4,708	5,007	4,569	4,946	4,950	5,005	5,618	5,139	4,433	4,246	3,151	2,922	2,327	1,682	1,169	820	838
Union	East	10,195	691	717	718	707	601	589	643	800	768	787	701	650	518	436	299	224	172	174
Union	South	22,770	1,577	1,637	1,700	1,590	1,163	1,178	1,448	1,802	1,761	1,797	1,628	1,441	1,275	968	706	509	323	267
Cataw	SE part	10,213	650	662	640	618	563	500	636	813	790	821	786	687	685	554	340	214	145	110
Chero		60,291	3,955	4,001	4,256	4,342	4,048	3,982	3,805	4,242	4,220	4,488	4,311	3,721	3,335	2,503	1,825	1,292	1,034	933
Chest		37,478	2,394	2,516	2,683	2,793	2,398	2,198	2,184	2,509	2,583	2,888	2,747	2,462	2,125	1,690	1,194	878	649	587
Lanc	North	9,028	575	620	616	617	496	587	592	724	707	721	672	556	542	405	250	170	93	86
Lanc	South	59,424	3,459	3,910	3,945	4,179	4,009	3,834	3,682	4,375	4,356	4,500	4,302	3,747	3,406	2,529	1,911	1,378	1,005	898
Union, SC		29,964	1,761	1,782	1,907	1,989	1,947	1,631	1,632	2,030	2,167	2,253	2,245	1,927	1,866	1,431	1,156	985	661	595
York	North	22,079	1,268	1,442	1,484	1,639	1,200	1,182	1,269	1,579	1,669	1,804	1,683	1,529	1,364	1,066	741	555	376	231
York	NE	34,905	2,326	2,661	2,690	2,806	1,599	1,534	2,222	2,736	2,859	2,974	2,611	2,262	1,970	1,366	914	573	444	358
York	SE	105,695	6,474	6,960	7,529	7,906	8,098	7,198	7,037	8,123	8,067	7,994	7,442	6,310	5,353	3,662	2,691	1,914	1,441	1,494
York	West	38,460	2,402	2,681	2,905	3,017	2,410	2,388	2,511	2,903	3,023	3,080	2,793	2,359	1,963	1,349	1,068	690	486	431
Total Region		2,385,288	154,253	161,167	166,980	166,098	159,717	167,874	166,794	188,110	183,571	183,994	168,429	140,592	120,306	85,139	60,943	45,869	33,839	31,615

District Forecasts –Population by Age (2015)

AGE 2015		Total	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Anson		28,587	1,660	1,800	1,778	1,815	1,939	1,755	1,818	1,916	1,855	1,976	2,071	1,979	1,844	1,479	1,109	717	556	520
Cabar	Central	105,266	7,113	7,389	7,477	7,197	6,688	8,523	8,023	8,412	7,656	7,352	7,014	6,042	5,331	3,878	2,956	1,808	1,146	1,261
Cabar	NW	43,382	2,685	2,803	2,864	2,842	2,889	3,000	2,960	3,143	2,990	3,030	3,012	2,658	2,492	1,879	1,530	1,029	769	806
Cabar	South	25,270	1,622	1,808	1,734	1,801	1,306	1,139	1,648	1,763	1,796	2,025	1,867	1,924	1,640	1,292	925	494	266	219
Cabar	NE	20,933	1,312	1,394	1,328	1,372	1,161	1,227	1,423	1,532	1,476	1,600	1,466	1,496	1,278	1,069	764	504	281	250
Cleve	SE	38,079	2,260	2,546	2,590	2,609	2,396	2,483	2,353	2,488	2,375	2,740	2,674	2,677	2,344	2,023	1,482	928	587	521
Cleve	Cent	36,732	2,108	2,387	2,352	2,457	2,326	2,109	2,103	2,323	2,233	2,550	2,610	2,550	2,366	1,994	1,608	1,055	800	800
Cleve	NW	33,358	1,931	2,131	2,124	2,210	2,484	2,049	2,124	2,139	2,069	2,329	2,342	2,276	2,077	1,782	1,344	879	569	499
Gast	E	63,323	3,604	3,812	3,808	3,796	3,962	4,282	3,912	4,352	4,112	4,793	4,735	4,481	4,190	3,287	2,567	1,698	1,009	923
Gast	SW	118,277	6,866	7,242	7,412	7,224	7,652	8,492	7,546	8,262	7,658	8,609	8,612	7,947	7,524	5,852	4,617	3,080	1,923	1,760
Gast	NW	28,084	1,666	1,763	1,767	1,719	1,702	1,868	1,791	1,977	1,836	2,051	2,045	1,860	1,839	1,431	1,164	743	442	421
Iredell	South	61,491	4,124	4,557	4,441	4,076	3,315	3,481	4,228	4,662	4,468	4,682	4,295	4,177	3,481	2,768	2,004	1,258	749	723
Iredell	S Cent	30,798	2,023	2,229	2,094	1,979	1,727	1,991	2,205	2,395	2,237	2,296	2,083	2,076	1,686	1,453	1,020	663	354	285
Iredell	N Cent	66,535	3,899	4,331	4,367	4,181	4,174	4,480	4,049	4,646	4,422	4,750	4,698	4,559	4,048	3,388	2,559	1,759	1,130	1,095
Iredell	North	17,988	1,096	1,216	1,181	1,134	1,092	1,217	1,124	1,315	1,211	1,324	1,246	1,250	1,109	872	684	412	253	252
Linc	East	30,010	1,795	2,052	1,911	1,909	1,522	1,859	2,041	2,279	2,096	2,310	2,153	2,176	1,909	1,554	1,180	617	389	259
Linc	Central	42,695	2,305	2,642	2,656	2,647	2,655	2,783	2,783	2,977	2,819	3,095	3,060	3,049	2,678	2,333	1,730	1,111	706	666
Linc	West	18,145	1,029	1,188	1,152	1,161	1,073	1,265	1,252	1,332	1,238	1,341	1,301	1,282	1,135	911	688	374	231	191
Meck	N	104,601	8,062	7,918	7,571	7,048	6,558	7,004	9,419	8,949	8,150	8,002	6,860	6,021	4,906	3,249	2,290	1,126	619	849
Meck	NW	71,441	4,548	4,707	4,696	4,753	4,717	5,453	5,341	5,291	4,939	5,323	4,964	4,522	3,934	2,926	2,250	1,472	893	712
Meck	NNE	106,864	8,016	7,850	7,877	7,108	7,245	12,612	10,539	9,972	8,383	7,798	6,537	5,208	3,626	1,914	1,147	473	186	374
Meck	ENE	53,753	3,158	3,181	3,084	3,438	6,717	5,862	4,662	4,182	3,526	3,491	3,384	2,818	2,351	1,560	1,153	627	305	254
Meck	E	152,089	9,011	9,245	9,646	9,809	11,500	14,443	11,674	11,113	10,263	11,119	10,529	9,541	8,174	5,850	4,347	2,717	1,547	1,562
Meck	S	256,040	15,282	15,755	15,642	16,103	16,132	19,330	17,670	17,926	16,783	19,657	18,437	18,157	16,195	12,233	8,975	5,335	3,136	3,292
Meck	SW	61,622	3,829	3,932	4,067	4,047	4,418	6,088	5,087	4,688	4,289	4,556	4,170	3,865	3,123	2,262	1,553	886	425	340
Meck	Central	132,306	10,768	10,883	13,262	14,444	12,181	9,493	10,545	14,810	17,609	13,840	9,749	1,514	-2,553	-6,676	-4,516	1,222	3,134	2,597
Row	S Cent	35,730	2,005	2,135	2,274	2,376	2,515	2,379	2,211	2,370	2,318	2,550	2,550	2,355	2,296	1,712	1,465	927	654	639
Row	N Cent	48,533	2,760	2,873	3,126	3,214	3,909	3,178	2,976	3,230	3,091	3,313	3,384	3,114	2,902	2,188	1,809	1,252	1,005	1,206
Row	East	39,450	2,396	2,520	2,683	2,672	2,506	2,438	2,523	2,749	2,648	2,967	2,787	2,782	2,433	1,951	1,422	944	544	483
Row	West	32,251	1,976	2,101	2,254	2,236	2,061	2,007	2,065	2,260	2,176	2,387	2,264	2,192	1,937	1,548	1,174	739	461	414
Stanly	North	32,434	1,757	2,055	2,107	2,215	2,133	1,992	1,984	2,188	2,046	2,278	2,309	2,173	2,053	1,645	1,302	892	654	650
Stanly	South	33,872	1,841	2,140	2,166	2,264	2,044	2,077	2,067	2,313	2,156	2,433	2,450	2,313	2,294	1,807	1,497	939	585	485
Union	NW	90,139	7,127	7,177	7,341	6,422	4,325	5,302	7,329	7,326	6,884	6,865	6,059	5,539	4,626	3,429	2,324	1,200	483	384
Union	Central	76,546	5,486	5,321	5,511	4,985	5,451	6,008	5,928	6,061	5,348	4,980	4,926	4,068	3,881	3,015	2,353	1,471	871	881
Union	East	11,900	814	830	805	774	695	728	795	903	814	852	792	776	667	602	416	276	178	184
Union	South	25,796	1,749	1,797	1,819	1,698	1,351	1,428	1,693	1,894	1,769	1,894	1,793	1,733	1,591	1,325	1,000	621	352	291
Cataw	SE part	12,218	783	802	751	726	682	629	805	910	838	900	873	834	839	704	529	317	169	126
Chero		66,504	4,270	4,310	4,414	4,490	4,413	4,653	4,364	4,441	4,157	4,626	4,633	4,344	4,085	3,282	2,520	1,510	1,027	965
Chest		41,024	2,584	2,678	2,736	2,841	2,618	2,573	2,515	2,634	2,525	2,924	2,911	2,823	2,589	2,186	1,610	1,018	652	609
Lanc	North	10,659	670	724	681	685	598	732	729	817	740	785	750	696	685	534	397	231	110	95
Lanc	South	64,165	3,650	4,104	3,943	4,203	4,305	4,373	4,113	4,487	4,210	4,578	4,537	4,306	4,087	3,263	2,529	1,552	1,006	922
Union, SC		31,409	1,821	1,829	1,884	1,953	2,035	1,796	1,770	2,039	2,048	2,225	2,292	2,130	2,138	1,741	1,428	1,036	640	604
York	North	23,396	1,289	1,459	1,467	1,631	1,313	1,351	1,358	1,532	1,537	1,772	1,727	1,735	1,597	1,337	1,008	645	381	259
York	NE	40,721	2,608	2,950	2,926	3,080	1,971	2,010	2,648	2,926	2,907	3,196	2,939	2,895	2,550	1,971	1,472	792	483	396
York	SE	116,724	6,887	7,473	7,772	8,202	8,560	8,444	7,953	8,398	7,953	8,387	8,121	7,603	6,746	5,098	3,897	2,258	1,458	1,516
York	West	43,288	2,626	2,918	3,024	3,171	2,677	2,889	2,886	3,115	3,024	3,240	3,071	2,908	2,529	1,908	1,490	824	527	459
Total Region		2,624,430	166,871	174,957	178,566	178,719	175,690	191,272	187,036	197,437	187,679	195,793	183,082	163,427	141,248	103,808	78,771	52,430	34,645	32,998

District Forecasts – Population by Age (2020)

AGE 2020		Total	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Anson		31,582	1,904	2,036	1,937	1,925	2,160	2,015	2,180	2,197	2,047	2,093	2,178	2,085	1,940	1,600	1,291	833	608	551
Cabar	Central	120,724	8,183	8,580	8,713	8,233	7,615	9,978	9,562	9,616	8,822	8,420	7,899	6,858	5,885	4,145	3,426	2,137	1,283	1,370
Cabar	NW	47,911	3,017	3,173	3,210	3,132	3,186	3,415	3,463	3,500	3,312	3,306	3,243	2,918	2,644	1,926	1,680	1,117	807	860
Cabar	South	29,075	1,918	2,087	2,009	2,034	1,569	1,403	2,017	2,059	2,040	2,180	2,009	2,089	1,772	1,518	1,137	640	344	252
Cabar	NE	24,841	1,650	1,726	1,617	1,610	1,413	1,512	1,806	1,906	1,767	1,782	1,635	1,640	1,381	1,225	928	598	343	299
Cleve	SE	41,093	2,479	2,781	2,744	2,748	2,629	2,802	2,697	2,755	2,532	2,812	2,759	2,783	2,401	2,119	1,663	1,120	696	573
Cleve	Cent	38,646	2,275	2,563	2,485	2,558	2,521	2,341	2,393	2,467	2,325	2,602	2,643	2,572	2,353	2,033	1,694	1,136	859	830
Cleve	NW	35,616	2,111	2,339	2,280	2,309	2,608	2,288	2,431	2,331	2,193	2,386	2,399	2,349	2,098	1,799	1,476	1,018	654	548
Gast	E	66,601	3,880	4,081	3,990	3,878	4,219	4,635	4,351	4,637	4,232	4,843	4,748	4,570	4,235	3,434	2,859	1,867	1,150	992
Gast	SW	124,123	7,305	7,695	7,679	7,348	8,053	9,164	8,333	8,773	7,958	8,841	8,751	8,118	7,585	6,042	5,128	3,355	2,115	1,882
Gast	NW	30,254	1,837	1,932	1,895	1,809	1,862	2,077	2,039	2,169	1,970	2,156	2,121	1,956	1,854	1,441	1,302	856	523	454
Iredell	South	71,876	4,876	5,396	5,274	4,771	3,937	4,212	5,184	5,447	5,209	5,326	4,844	4,823	3,875	3,117	2,348	1,531	885	821
Iredell	S Cent	36,918	2,506	2,746	2,578	2,367	2,080	2,447	2,772	2,936	2,706	2,666	2,404	2,376	1,878	1,649	1,182	828	453	344
Iredell	N Cent	72,458	4,313	4,814	4,774	4,483	4,569	5,025	4,682	5,119	4,810	5,093	4,973	4,849	4,223	3,544	2,771	1,986	1,256	1,176
Iredell	North	20,646	1,297	1,433	1,373	1,282	1,253	1,434	1,383	1,550	1,405	1,469	1,368	1,375	1,161	989	803	488	305	280
Linc	East	35,846	2,204	2,499	2,314	2,261	1,868	2,283	2,569	2,772	2,499	2,645	2,440	2,492	2,107	1,784	1,447	833	512	318
Linc	Central	46,556	2,551	2,935	2,864	2,831	2,905	3,131	3,192	3,289	3,065	3,298	3,253	3,228	2,808	2,436	1,912	1,310	827	721
Linc	West	20,360	1,172	1,347	1,286	1,272	1,207	1,457	1,465	1,517	1,384	1,460	1,404	1,393	1,206	1,004	811	475	287	214
Meck	N	128,373	9,877	9,845	9,616	8,788	8,082	8,777	11,895	10,793	9,987	9,620	8,149	7,274	5,664	3,849	3,039	1,493	713	912
Meck	NW	79,457	5,086	5,253	5,181	5,184	5,350	6,230	6,139	5,923	5,422	5,761	5,355	5,028	4,290	3,170	2,537	1,665	1,057	826
Meck	NNE	122,662	8,814	8,865	9,212	8,356	8,244	14,403	11,931	10,775	9,471	9,199	7,676	6,340	4,348	2,356	1,563	616	137	355
Meck	ENE	59,650	3,579	3,604	3,416	3,563	6,674	6,521	5,493	4,766	4,005	3,868	3,696	3,100	2,671	1,841	1,383	780	408	283
Meck	E	160,893	9,422	9,720	9,877	10,010	12,062	15,485	12,504	11,786	10,576	11,457	10,883	10,261	8,754	6,468	5,054	3,136	1,809	1,630
Meck	S	267,108	15,823	16,401	16,422	16,830	17,470	20,495	18,823	18,285	17,191	20,038	18,613	18,512	16,146	12,816	10,316	6,153	3,398	3,374
Meck	SW	65,351	3,957	4,101	4,231	4,205	4,683	6,509	5,364	4,878	4,454	4,768	4,388	4,147	3,336	2,501	1,831	1,100	522	374
Meck	Central	132,144	7,206	7,524	7,581	8,063	10,308	12,887	9,731	9,174	8,315	9,395	9,062	8,686	7,398	5,790	4,366	2,894	1,926	1,839
Row	S Cent	37,908	2,172	2,299	2,415	2,464	2,717	2,629	2,487	2,561	2,428	2,618	2,603	2,493	2,318	1,726	1,578	1,009	718	671
Row	N Cent	50,573	2,895	3,041	3,280	3,294	4,033	3,452	3,346	3,353	3,210	3,431	3,458	3,190	2,972	2,271	1,921	1,256	981	1,189
Row	East	43,588	2,688	2,822	2,974	2,917	2,850	2,803	2,943	3,062	2,899	3,149	2,952	2,960	2,558	2,106	1,652	1,078	621	553
Row	West	36,798	2,327	2,444	2,543	2,484	2,404	2,397	2,523	2,688	2,478	2,592	2,454	2,409	2,107	1,684	1,344	890	554	476
Stanly	North	34,515	1,898	2,221	2,211	2,304	2,271	2,231	2,267	2,362	2,163	2,361	2,385	2,254	2,121	1,703	1,436	963	681	681
Stanly	South	37,397	2,111	2,435	2,365	2,449	2,288	2,401	2,460	2,659	2,372	2,566	2,562	2,454	2,361	1,874	1,687	1,086	712	554
Union	NW	105,533	8,182	8,282	8,711	7,526	5,219	6,428	8,716	8,248	7,935	7,848	6,962	6,582	5,262	3,919	2,984	1,665	634	431
Union	Central	88,407	6,392	6,260	6,459	5,680	6,076	7,057	7,171	7,062	6,259	5,766	5,610	4,646	4,317	3,135	2,677	1,809	1,060	970
Union	East	14,346	1,037	1,035	991	913	839	906	1,043	1,136	996	978	908	854	752	689	493	351	214	209
Union	South	29,457	2,054	2,081	2,094	1,916	1,599	1,697	2,052	2,170	2,012	2,083	1,966	1,884	1,700	1,458	1,160	754	443	337
Cataw	SE part	14,565	985	1,009	939	894	834	768	1,036	1,108	1,009	1,030	967	914	880	727	653	438	223	153
Chero		74,102	4,892	4,914	4,939	4,907	4,929	5,369	5,215	5,081	4,643	4,971	4,957	4,595	4,293	3,493	2,884	1,778	1,185	1,056
Chest		45,692	2,990	3,043	3,026	3,065	2,955	3,010	3,057	3,049	2,811	3,094	3,087	2,958	2,737	2,328	1,837	1,204	765	674
Lanc	North	12,488	813	877	803	796	722	879	909	990	872	885	826	775	731	564	490	299	147	111
Lanc	South	70,194	4,105	4,576	4,250	4,465	4,756	4,963	4,827	5,044	4,614	4,862	4,771	4,506	4,232	3,446	2,819	1,778	1,176	1,004
Union, SC		33,787	2,050	2,031	2,026	2,025	2,229	2,029	2,089	2,283	2,194	2,292	2,339	2,178	2,154	1,792	1,556	1,126	733	661
York	North	24,668	1,379	1,550	1,556	1,707	1,447	1,493	1,497	1,615	1,601	1,810	1,755	1,762	1,584	1,337	1,098	736	442	300
York	NE	46,626	3,020	3,377	3,360	3,499	2,373	2,449	3,167	3,350	3,306	3,524	3,226	3,225	2,734	2,177	1,778	1,014	592	453
York	SE	129,210	7,698	8,403	8,582	8,920	9,183	9,644	9,255	9,397	8,830	9,110	8,743	8,185	7,179	5,602	4,529	2,640	1,697	1,614
York	West	49,348	3,045	3,360	3,394	3,520	3,045	3,440	3,458	3,650	3,430	3,554	3,361	3,242	2,784	2,166	1,723	991	663	519
Total Region		2,889,969	181,977	191,538	191,476	187,593	191,298	218,972	213,918	212,290	195,756	206,007	194,788	183,887	159,789	124,791	100,244	62,831	38,120	34,694

District Forecasts –Population by Age (2025)

AGE 2025		Total	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Anson		35,646	2,214	2,346	2,180	2,164	2,392	2,246	2,572	2,593	2,352	2,269	2,314	2,251	2,113	1,814	1,532	995	705	594
Cabar	Central	136,368	9,021	9,538	9,644	9,274	8,395	11,294	10,784	10,805	9,830	9,269	8,561	7,921	6,804	5,142	4,348	2,623	1,619	1,497
Cabar	NW	53,065	3,347	3,533	3,523	3,475	3,445	3,783	3,916	3,953	3,671	3,546	3,419	3,204	2,915	2,267	2,010	1,271	894	894
Cabar	South	33,200	2,190	2,365	2,284	2,304	1,813	1,613	2,367	2,395	2,330	2,342	2,153	2,245	1,935	1,779	1,395	888	488	313
Cabar	NE	29,658	2,024	2,112	1,978	1,952	1,674	1,800	2,247	2,347	2,139	2,028	1,832	1,823	1,556	1,436	1,130	774	449	357
Cleve	SE	44,661	2,720	3,039	2,932	2,969	2,828	3,047	3,006	3,092	2,776	2,923	2,835	2,904	2,545	2,359	1,916	1,310	818	643
Cleve	Cent	41,160	2,455	2,755	2,628	2,719	2,668	2,501	2,640	2,719	2,498	2,665	2,676	2,669	2,455	2,195	1,887	1,269	912	851
Cleve	NW	38,361	2,303	2,551	2,441	2,491	2,726	2,459	2,686	2,595	2,387	2,467	2,452	2,449	2,210	1,982	1,676	1,143	742	601
Gast	E	70,623	4,160	4,362	4,193	4,098	4,408	4,856	4,710	5,042	4,499	4,927	4,771	4,697	4,391	3,753	3,242	2,135	1,319	1,060
Gast	SW	130,853	7,730	8,128	7,951	7,691	8,325	9,563	8,912	9,442	8,394	9,011	8,786	8,416	7,915	6,597	5,798	3,804	2,404	1,985
Gast	NW	32,844	2,016	2,114	2,037	1,957	1,995	2,236	2,266	2,417	2,149	2,261	2,188	2,075	1,968	1,614	1,479	959	616	497
Iredell	South	82,752	5,504	6,126	5,982	5,487	4,504	4,838	6,011	6,254	5,932	5,883	5,312	5,499	4,450	3,929	2,982	1,989	1,129	940
Iredell	S Cent	44,024	2,997	3,290	3,094	2,848	2,433	2,900	3,359	3,536	3,223	3,066	2,725	2,762	2,198	2,026	1,484	1,071	581	428
Iredell	N Cent	79,203	4,729	5,283	5,148	4,888	4,895	5,446	5,225	5,716	5,267	5,386	5,170	5,235	4,576	4,029	3,244	2,303	1,406	1,254
Iredell	North	23,833	1,519	1,675	1,585	1,486	1,411	1,640	1,649	1,836	1,639	1,633	1,494	1,535	1,292	1,172	946	623	383	315
Linc	East	41,603	2,552	2,897	2,680	2,633	2,166	2,626	3,037	3,244	2,899	2,937	2,681	2,799	2,364	2,151	1,763	1,084	683	409
Linc	Central	50,974	2,808	3,229	3,079	3,089	3,116	3,392	3,551	3,684	3,360	3,481	3,394	3,467	3,057	2,751	2,247	1,524	955	789
Linc	West	22,810	1,312	1,506	1,417	1,415	1,326	1,616	1,657	1,727	1,547	1,573	1,493	1,526	1,328	1,174	973	599	370	252
Meck	N	153,132	11,303	11,442	11,287	10,560	9,578	10,540	14,043	12,533	11,622	11,046	9,365	8,849	6,928	5,303	4,151	2,265	1,260	1,058
Meck	NW	87,517	5,511	5,694	5,552	5,643	5,872	6,853	6,769	6,556	5,900	6,091	5,592	5,448	4,741	3,846	3,165	2,044	1,289	954
Meck	NNE	135,465	8,935	9,166	9,529	9,039	8,912	15,768	12,334	11,362	9,868	9,835	8,283	7,844	5,698	3,904	2,696	1,301	553	440
Meck	ENE	65,791	3,930	3,971	3,734	3,908	6,669	7,069	6,041	5,276	4,453	4,211	3,915	3,464	3,031	2,230	1,834	1,087	601	367
Meck	E	170,764	9,942	10,238	10,104	10,447	12,511	16,294	13,166	12,711	11,094	11,688	10,955	10,691	9,358	7,545	6,131	3,860	2,258	1,772
Meck	S	275,220	15,905	16,525	16,339	17,106	18,224	20,939	19,249	18,990	17,443	19,526	18,109	18,722	16,513	14,268	11,800	7,606	4,429	3,526
Meck	SW	68,728	4,051	4,202	4,229	4,316	4,840	6,787	5,483	5,150	4,565	4,803	4,401	4,354	3,633	2,979	2,282	1,442	745	465
Meck	Central	132,416	7,209	7,526	7,473	8,035	10,270	13,036	9,790	9,107	8,107	9,231	8,974	8,778	7,519	6,004	4,669	3,018	1,881	1,788
Row	S Cent	40,526	2,344	2,472	2,556	2,621	2,875	2,808	2,720	2,816	2,604	2,696	2,638	2,599	2,434	1,946	1,786	1,122	790	699
Row	N Cent	53,192	3,056	3,211	3,396	3,444	4,137	3,635	3,611	3,617	3,384	3,497	3,479	3,336	3,131	2,486	2,193	1,410	1,016	1,153
Row	East	47,990	2,948	3,096	3,226	3,199	3,141	3,088	3,305	3,430	3,186	3,305	3,075	3,151	2,764	2,407	1,966	1,311	768	624
Row	West	42,104	2,690	2,815	2,884	2,835	2,737	2,750	2,986	3,155	2,858	2,843	2,642	2,626	2,334	1,982	1,650	1,088	676	552
Stanly	North	37,180	2,068	2,410	2,342	2,465	2,394	2,408	2,513	2,626	2,346	2,449	2,443	2,368	2,261	1,887	1,661	1,092	744	701
Stanly	South	41,761	2,409	2,767	2,629	2,743	2,516	2,678	2,850	3,075	2,686	2,752	2,695	2,621	2,537	2,122	1,956	1,250	844	631
Union	NW	120,904	8,966	9,113	9,583	8,446	6,050	7,404	9,769	9,294	8,820	8,517	7,648	7,597	6,277	5,278	4,019	2,360	1,140	623
Union	Central	101,737	7,276	7,172	7,323	6,531	6,668	8,065	8,305	8,171	7,181	6,506	6,197	5,442	5,068	3,856	3,396	2,135	1,334	1,113
Union	East	17,700	1,331	1,316	1,248	1,134	1,004	1,109	1,365	1,470	1,260	1,151	1,045	977	879	815	629	454	269	245
Union	South	33,787	2,372	2,390	2,386	2,188	1,835	1,935	2,421	2,543	2,313	2,274	2,131	2,083	1,905	1,704	1,402	939	564	402
Cataw	SE part	17,221	1,179	1,219	1,145	1,096	986	896	1,275	1,325	1,208	1,172	1,079	1,043	973	835	768	512	309	200
Chero		83,013	5,537	5,554	5,503	5,495	5,411	6,016	6,025	5,858	5,262	5,355	5,260	4,965	4,696	3,949	3,417	2,124	1,419	1,167
Chest		51,460	3,433	3,470	3,397	3,438	3,280	3,398	3,599	3,570	3,224	3,332	3,277	3,159	2,982	2,612	2,188	1,434	914	754
Lanc	North	14,358	924	1,006	922	929	838	1,005	1,066	1,130	1,002	987	901	873	808	667	588	359	213	140
Lanc	South	77,375	4,580	5,083	4,631	4,899	5,163	5,450	5,487	5,713	5,127	5,171	4,981	4,821	4,562	3,857	3,283	2,092	1,375	1,102
Union, SC		37,130	2,320	2,286	2,235	2,226	2,413	2,209	2,404	2,621	2,450	2,425	2,426	2,292	2,284	1,968	1,769	1,268	818	715
York	North	25,795	1,428	1,603	1,601	1,772	1,528	1,563	1,579	1,721	1,667	1,804	1,737	1,796	1,629	1,447	1,225	829	518	347
York	NE	52,062	3,263	3,657	3,667	3,865	2,725	2,783	3,533	3,707	3,632	3,751	3,431	3,537	3,027	2,631	2,164	1,323	817	548
York	SE	142,946	8,492	9,291	9,319	9,828	9,744	10,665	10,329	10,579	9,758	9,744	9,216	8,934	7,912	6,505	5,460	3,300	2,115	1,757
York	West	56,438	3,501	3,846	3,810	3,992	3,404	3,953	4,024	4,279	3,924	3,901	3,628	3,573	3,122	2,609	2,146	1,281	837	606
Total Region		3,175,350	198,506	209,390	206,829	205,139	206,244	238,958	236,637	235,783	213,838	217,732	203,777	199,420	175,077	145,809	120,445	76,668	46,972	38,126

District Forecasts – Population by Age (2030)

AGE 2030		Total	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Anson		40,847	2,597	2,723	2,521	2,459	2,669	2,439	3,001	3,219	2,922	2,541	2,455	2,367	2,271	2,042	1,735	1,233	954	698
Cabar	Central	151,450	9,789	10,397	10,664	10,243	9,095	12,125	11,709	12,385	11,451	10,261	9,101	8,656	7,518	5,995	4,979	3,160	2,193	1,729
Cabar	NW	58,864	3,701	3,909	3,920	3,845	3,711	4,036	4,323	4,631	4,333	3,884	3,571	3,396	3,139	2,597	2,250	1,477	1,140	1,002
Cabar	South	37,432	2,458	2,633	2,596	2,572	2,051	1,764	2,668	2,838	2,787	2,554	2,275	2,321	2,051	2,009	1,574	1,166	713	400
Cabar	NE	35,370	2,455	2,551	2,432	2,349	1,970	2,061	2,708	2,971	2,736	2,359	2,040	1,965	1,718	1,652	1,294	1,003	651	455
Cleve	SE	48,594	2,973	3,302	3,180	3,202	3,028	3,193	3,273	3,597	3,240	3,104	2,885	2,924	2,636	2,571	2,073	1,555	1,088	770
Cleve	Cent	44,436	2,676	2,982	2,851	2,915	2,837	2,595	2,887	3,174	2,914	2,803	2,680	2,680	2,513	2,350	2,007	1,479	1,144	951
Cleve	NW	41,533	2,514	2,777	2,662	2,692	2,844	2,553	2,912	3,014	2,785	2,613	2,482	2,466	2,278	2,147	1,797	1,319	970	711
Gast	E	75,308	4,466	4,658	4,490	4,338	4,598	4,907	5,007	5,738	5,139	5,128	4,740	4,656	4,451	4,038	3,477	2,509	1,742	1,226
Gast	SW	138,124	8,153	8,540	8,355	8,033	8,566	9,603	9,318	10,568	9,454	9,374	8,719	8,415	8,062	7,050	6,158	4,395	3,110	2,252
Gast	NW	35,830	2,213	2,307	2,229	2,119	2,134	2,324	2,468	2,808	2,511	2,429	2,237	2,129	2,046	1,775	1,585	1,104	827	586
Iredell	South	93,680	6,106	6,814	6,768	6,183	5,043	5,274	6,694	7,316	7,054	6,552	5,717	5,970	4,911	4,658	3,436	2,501	1,552	1,131
Iredell	S Cent	52,020	3,533	3,876	3,716	3,376	2,813	3,287	3,931	4,363	4,034	3,577	3,051	3,084	2,497	2,402	1,728	1,374	821	557
Iredell	N Cent	86,661	5,166	5,762	5,630	5,316	5,221	5,684	5,692	6,620	6,143	5,817	5,323	5,455	4,840	4,474	3,560	2,718	1,804	1,439
Iredell	North	27,544	1,769	1,944	1,854	1,716	1,585	1,809	1,916	2,248	2,031	1,857	1,621	1,659	1,408	1,357	1,051	799	540	381
Linc	East	47,828	2,916	3,306	3,111	3,024	2,473	2,888	3,467	3,892	3,532	3,312	2,909	3,024	2,579	2,498	1,993	1,385	979	538
Linc	Central	55,587	3,064	3,514	3,342	3,344	3,309	3,520	3,841	4,263	3,908	3,732	3,486	3,575	3,231	3,024	2,464	1,796	1,252	922
Linc	West	25,442	1,457	1,667	1,578	1,563	1,445	1,722	1,823	2,026	1,831	1,726	1,570	1,610	1,424	1,330	1,086	749	521	314
Meck	N	177,813	12,671	12,954	13,097	12,286	11,007	11,880	15,847	14,777	14,030	12,676	10,466	10,089	8,010	6,637	5,008	3,093	2,002	1,282
Meck	NW	95,086	5,887	6,072	5,973	6,055	6,328	7,178	7,206	7,413	6,737	6,515	5,753	5,649	5,049	4,402	3,570	2,452	1,704	1,143
Meck	NNE	144,432	9,001	9,340	9,875	9,505	9,348	16,223	12,389	12,189	10,730	10,457	8,642	8,663	6,529	4,924	3,355	1,813	919	529
Meck	ENE	71,325	4,238	4,285	4,074	4,213	6,638	7,312	6,411	5,952	5,151	4,606	4,077	3,677	3,287	2,539	2,138	1,393	865	469
Meck	E	181,293	10,466	10,736	10,498	10,890	12,928	16,519	13,570	14,257	12,438	12,183	10,920	10,758	9,769	8,539	6,906	4,745	3,106	2,064
Meck	S	281,625	15,920	16,537	16,482	17,284	18,735	20,570	19,193	20,260	18,711	19,474	17,541	18,284	16,440	15,155	12,345	8,941	5,869	3,886
Meck	SW	71,881	4,130	4,277	4,290	4,413	4,967	6,802	5,478	5,618	4,976	4,933	4,374	4,400	3,826	3,369	2,575	1,801	1,067	584
Meck	Central	133,857	7,168	7,418	7,259	7,841	9,932	12,286	9,429	9,982	8,777	8,975	8,236	8,295	7,599	6,767	5,413	3,943	2,586	1,950
Row	S Cent	43,505	2,527	2,649	2,752	2,789	3,034	2,891	2,916	3,228	2,991	2,838	2,644	2,616	2,498	2,151	1,907	1,281	1,005	786
Row	N Cent	56,606	3,247	3,405	3,596	3,624	4,240	3,706	3,854	4,129	3,872	3,656	3,456	3,381	3,243	2,703	2,394	1,652	1,245	1,204
Row	East	52,583	3,206	3,361	3,532	3,481	3,423	3,261	3,601	3,956	3,706	3,533	3,166	3,231	2,907	2,668	2,172	1,589	1,044	745
Row	West	47,944	3,077	3,202	3,297	3,209	3,085	3,023	3,418	3,804	3,476	3,175	2,815	2,762	2,521	2,265	1,881	1,335	921	678
Stanly	North	40,511	2,269	2,626	2,538	2,656	2,528	2,522	2,751	3,075	2,751	2,611	2,482	2,411	2,370	2,070	1,828	1,285	953	785
Stanly	South	46,855	2,744	3,131	2,974	3,073	2,764	2,885	3,229	3,695	3,247	3,025	2,815	2,709	2,671	2,361	2,142	1,476	1,140	772
Union	NW	135,246	9,660	9,831	10,520	9,276	6,792	8,033	10,529	10,637	10,220	9,304	8,209	8,274	7,071	6,435	4,748	3,068	1,790	849
Union	Central	116,041	8,188	8,100	8,347	7,417	7,260	8,816	9,315	9,701	8,668	7,429	6,754	6,089	5,738	4,541	3,953	2,539	1,836	1,350
Union	East	22,097	1,707	1,672	1,601	1,416	1,212	1,322	1,746	1,975	1,704	1,402	1,208	1,095	1,018	956	761	602	387	313
Union	South	38,763	2,724	2,727	2,752	2,492	2,092	2,125	2,782	3,082	2,823	2,539	2,294	2,228	2,086	1,946	1,588	1,178	795	509
Cataw	SE part	20,151	1,385	1,441	1,388	1,314	1,146	999	1,505	1,620	1,512	1,351	1,188	1,144	1,048	935	845	607	454	268
Chero		93,168	6,246	6,244	6,224	6,145	5,925	6,500	6,796	7,001	6,348	5,904	5,542	5,191	5,028	4,379	3,804	2,579	1,925	1,387
Chest		58,306	3,941	3,950	3,887	3,868	3,643	3,712	4,149	4,349	3,951	3,683	3,461	3,270	3,189	2,887	2,460	1,747	1,247	911
Lanc	North	16,108	1,024	1,120	1,045	1,050	941	1,085	1,189	1,307	1,188	1,100	961	932	860	749	646	425	308	178
Lanc	South	85,572	5,100	5,623	5,131	5,374	5,593	5,775	6,100	6,725	6,083	5,629	5,158	4,989	4,812	4,236	3,599	2,509	1,834	1,301
Union, SC		41,466	2,656	2,594	2,537	2,475	2,631	2,339	2,744	3,180	2,968	2,647	2,503	2,339	2,382	2,146	1,920	1,488	1,074	845
York	North	26,674	1,460	1,635	1,654	1,817	1,583	1,563	1,610	1,867	1,819	1,831	1,705	1,763	1,627	1,505	1,257	921	651	407
York	NE	56,470	3,446	3,860	3,959	4,148	2,995	2,953	3,753	4,132	4,116	3,999	3,561	3,671	3,193	2,947	2,357	1,604	1,115	661
York	SE	157,725	9,308	10,182	10,241	10,768	10,287	11,329	11,232	12,301	11,440	10,621	9,616	9,397	8,493	7,333	6,119	4,100	2,910	2,047
York	West	64,359	3,992	4,361	4,328	4,503	3,781	4,360	4,554	5,167	4,756	4,368	3,881	3,802	3,414	3,045	2,482	1,641	1,170	752
Total Region		3,474,012	215,397	226,998	225,752	222,673	220,230	249,750	254,932	271,051	247,994	234,085	210,292	207,459	186,249	164,558	134,420	93,532	63,922	44,717

District Forecasts –Population by Age (2035)

AGE 2035		Total	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Anson		47,253	3,046	3,152	2,991	2,816	2,994	2,530	3,404	4,149	3,878	2,961	2,611	2,405	2,405	2,256	1,826	1,539	1,400	890
Cabar	Central	165,219	10,428	11,076	11,823	11,124	9,692	12,149	12,114	14,437	13,922	11,542	9,533	8,904	7,956	6,571	5,086	3,697	3,057	2,108
Cabar	NW	65,326	4,067	4,285	4,440	4,252	3,987	4,080	4,612	5,606	5,432	4,393	3,718	3,456	3,304	2,878	2,314	1,724	1,569	1,210
Cabar	South	41,561	2,699	2,863	2,952	2,828	2,270	1,800	2,853	3,408	3,473	2,846	2,376	2,288	2,107	2,165	1,600	1,455	1,050	527
Cabar	NE	41,964	2,927	3,021	3,005	2,798	2,296	2,225	3,119	3,843	3,673	2,824	2,260	2,034	1,854	1,842	1,360	1,280	989	614
Cleve	SE	52,700	3,215	3,541	3,500	3,440	3,222	3,159	3,426	4,296	3,995	3,396	2,918	2,821	2,663	2,711	2,056	1,830	1,530	979
Cleve	Cent	48,636	2,938	3,238	3,187	3,160	3,039	2,574	3,095	3,897	3,676	3,063	2,671	2,591	2,529	2,478	1,997	1,762	1,583	1,156
Cleve	NW	45,073	2,729	2,999	2,957	2,911	2,961	2,513	3,054	3,622	3,455	2,858	2,500	2,383	2,297	2,264	1,780	1,530	1,360	901
Gast	E	80,573	4,778	4,941	4,905	4,602	4,789	4,703	5,159	6,778	6,263	5,512	4,677	4,425	4,413	4,235	3,447	2,958	2,465	1,523
Gast	SW	145,593	8,533	8,875	8,924	8,376	8,773	9,124	9,403	12,202	11,293	10,049	8,600	8,061	8,013	7,300	6,006	5,054	4,275	2,730
Gast	NW	39,186	2,416	2,497	2,485	2,297	2,277	2,291	2,601	3,377	3,121	2,695	2,278	2,098	2,081	1,899	1,570	1,279	1,184	741
Iredell	South	104,223	6,641	7,400	7,665	6,845	5,533	5,365	7,088	8,698	8,749	7,429	6,065	6,133	5,212	5,196	3,546	3,031	2,200	1,427
Iredell	S Cent	60,813	4,090	4,470	4,478	3,949	3,211	3,498	4,394	5,492	5,288	4,268	3,384	3,284	2,749	2,730	1,830	1,725	1,213	759
Iredell	N Cent	94,724	5,600	6,217	6,259	5,771	5,546	5,617	5,982	7,907	7,597	6,477	5,454	5,451	5,000	4,810	3,587	3,198	2,482	1,770
Iredell	North	31,775	2,038	2,225	2,197	1,975	1,773	1,889	2,139	2,830	2,656	2,176	1,754	1,722	1,501	1,521	1,076	1,009	801	493
Linc	East	54,431	3,279	3,701	3,633	3,433	2,784	2,987	3,782	4,770	4,514	3,827	3,130	3,118	2,735	2,780	2,052	1,722	1,449	734
Linc	Central	60,399	3,309	3,772	3,679	3,606	3,490	3,448	3,999	5,077	4,811	4,113	3,550	3,523	3,325	3,215	2,475	2,108	1,749	1,149
Linc	West	28,201	1,599	1,817	1,778	1,718	1,563	1,731	1,928	2,439	2,285	1,947	1,641	1,624	1,486	1,450	1,107	917	761	410
Meck	N	201,349	13,886	14,252	15,110	13,918	12,308	12,392	16,938	17,657	17,578	14,706	11,436	10,748	8,796	7,664	5,324	3,937	3,073	1,626
Meck	NW	101,630	6,178	6,341	6,463	6,411	6,694	7,035	7,319	8,520	8,037	7,115	5,858	5,564	5,177	4,738	3,588	2,844	2,323	1,424
Meck	NNE	148,722	9,007	9,360	10,295	9,755	9,540	15,457	11,980	13,267	12,152	11,193	8,772	8,619	6,739	5,250	3,337	2,103	1,266	631
Meck	ENE	75,404	4,447	4,480	4,422	4,444	6,598	7,064	6,453	6,765	6,136	5,078	4,175	3,660	3,387	2,687	2,158	1,647	1,207	598
Meck	E	192,066	10,953	11,157	11,113	11,355	13,318	15,871	13,535	16,519	14,823	13,109	10,840	10,390	9,956	9,292	7,077	5,728	4,464	2,564
Meck	S	287,568	15,853	16,410	16,931	17,455	19,141	19,143	18,511	22,347	21,335	20,057	16,933	17,136	15,986	15,530	11,817	10,312	8,094	4,575
Meck	SW	74,936	4,190	4,320	4,437	4,515	5,080	6,459	5,303	6,337	5,771	5,232	4,331	4,264	3,922	3,646	2,626	2,181	1,558	764
Meck	Central	137,200	7,044	7,128	6,799	7,396	9,141	10,322	8,456	12,251	10,673	8,496	6,555	7,091	7,709	8,355	6,683	6,123	4,556	2,420
Row	S Cent	46,766	2,710	2,816	3,018	2,969	3,193	2,822	3,022	3,828	3,654	3,084	2,636	2,526	2,507	2,307	1,879	1,469	1,376	951
Row	N Cent	61,035	3,475	3,624	3,917	3,854	4,356	3,608	4,036	4,973	4,799	3,974	3,413	3,309	3,315	2,905	2,453	1,983	1,688	1,354
Row	East	57,297	3,448	3,595	3,915	3,766	3,695	3,247	3,769	4,683	4,547	3,884	3,239	3,171	2,976	2,851	2,188	1,896	1,486	942
Row	West	54,096	3,458	3,570	3,798	3,597	3,431	3,122	3,733	4,675	4,432	3,635	2,976	2,778	2,647	2,485	1,948	1,613	1,318	879
Stanly	North	44,590	2,498	2,861	2,825	2,886	2,680	2,521	2,940	3,766	3,468	2,891	2,516	2,366	2,445	2,230	1,874	1,534	1,336	954
Stanly	South	52,570	3,097	3,502	3,417	3,436	3,024	2,943	3,524	4,569	4,154	3,431	2,929	2,688	2,751	2,552	2,161	1,746	1,641	1,006
Union	NW	147,706	10,203	10,358	11,559	9,994	7,403	8,083	10,795	12,330	12,321	10,330	8,643	8,456	7,551	7,209	4,914	3,735	2,676	1,146
Union	Central	130,912	9,080	8,976	9,586	8,331	7,839	9,059	10,001	11,774	10,976	8,664	7,286	6,458	6,267	5,096	4,155	2,991	2,640	1,732
Union	East	27,685	2,165	2,098	2,084	1,769	1,464	1,498	2,145	2,724	2,434	1,771	1,403	1,188	1,162	1,100	851	796	599	432
Union	South	44,388	3,099	3,074	3,220	2,828	2,370	2,209	3,075	3,842	3,644	2,923	2,460	2,287	2,232	2,151	1,651	1,461	1,180	683
Cataw	SE part	23,321	1,594	1,659	1,677	1,545	1,310	1,046	1,687	2,017	1,973	1,590	1,295	1,195	1,099	1,009	852	716	685	371
Chero		104,495	6,991	6,945	7,155	6,864	6,468	6,653	7,390	8,621	8,108	6,720	5,821	5,214	5,265	4,721	3,895	3,120	2,778	1,765
Chest		66,209	4,497	4,458	4,529	4,357	4,042	3,849	4,614	5,465	5,137	4,213	3,651	3,258	3,344	3,113	2,551	2,130	1,819	1,180
Lanc	North	17,580	1,100	1,203	1,171	1,150	1,022	1,084	1,244	1,520	1,450	1,235	1,004	936	880	792	636	486	438	228
Lanc	South	94,650	5,638	6,159	5,783	5,893	6,038	5,798	6,541	8,168	7,652	6,325	5,322	4,957	4,964	4,523	3,634	3,002	2,608	1,645
Union, SC		46,828	3,044	2,941	2,955	2,773	2,881	2,363	3,050	4,019	3,852	3,003	2,580	2,298	2,442	2,295	1,941	1,773	1,535	1,083
York	North	27,205	1,469	1,636	1,721	1,842	1,608	1,468	1,566	2,047	2,067	1,911	1,673	1,658	1,580	1,491	1,164	991	829	485
York	NE	59,293	3,538	3,947	4,228	4,322	3,148	2,873	3,745	4,611	4,789	4,302	3,613	3,571	3,202	3,047	2,259	1,811	1,486	804
York	SE	173,338	10,106	11,016	11,418	11,753	10,811	11,367	11,766	14,712	14,179	11,915	9,978	9,463	8,879	7,969	6,259	5,004	4,199	2,547
York	West	72,911	4,493	4,867	4,975	5,049	4,167	4,529	4,946	6,384	6,070	5,026	4,126	3,875	3,635	3,410	2,609	2,053	1,713	986
Total Region		3,779,397	231,590	242,845	249,377	240,127	232,967	245,570	264,234	321,219	304,294	258,189	214,588	205,446	192,449	178,720	137,197	113,000	91,689	55,895

District Forecasts – Households and Housing Units

HH & HU		Number of Households									Total Number of Housing Units								
		2000	2002	2005	2010	2015	2020	2025	2030	2035	2000	2002	2005	2010	2015	2020	2025	2030	2035
Anson		9,204	9,259	9,345	9,761	10,534	11,688	13,245	15,228	17,660	10,221	10,265	10,337	10,754	11,560	12,776	14,420	16,513	19,073
Cabar	Central	24,737	26,743	29,245	34,134	39,675	45,585	51,581	57,378	62,692	26,531	28,682	31,366	36,609	42,552	48,891	55,321	61,539	67,239
Cabar	NW	13,302	13,749	14,140	15,154	16,573	18,342	20,404	22,703	25,183	14,242	14,721	15,139	16,225	17,745	19,638	21,846	24,307	26,962
Cabar	South	6,079	6,578	7,178	8,345	9,685	11,158	12,723	14,339	15,965	6,372	6,895	7,524	8,747	10,152	11,696	13,336	15,030	16,735
Cabar	NE	5,401	5,632	5,962	6,776	7,923	9,407	11,231	13,400	15,917	5,703	5,947	6,295	7,155	8,366	9,933	11,859	14,149	16,807
Cleve	SE	12,647	12,990	13,286	14,022	15,027	16,263	17,691	19,272	20,969	13,607	13,976	14,295	15,086	16,168	17,497	19,034	20,735	22,561
Cleve	Cent	13,419	13,432	13,463	13,716	14,231	15,020	16,094	17,465	19,146	14,782	14,780	14,789	15,024	15,545	16,360	17,481	18,916	20,677
Cleve	NW	10,980	11,273	11,459	11,949	12,652	13,555	14,643	15,901	17,317	11,928	12,242	12,438	12,959	13,710	14,676	15,840	17,188	18,702
Gast	E	22,779	23,188	23,293	23,857	24,857	26,238	27,943	29,918	32,107	24,039	24,470	24,582	25,176	26,232	27,689	29,489	31,573	33,883
Gast	SW	41,849	42,505	42,965	44,310	46,266	48,701	51,483	54,481	57,563	44,829	45,532	46,024	47,465	49,560	52,169	55,149	58,360	61,662
Gast	NW	9,308	9,501	9,754	10,310	11,035	11,924	12,976	14,186	15,553	9,974	10,181	10,451	11,048	11,825	12,778	13,904	15,201	16,666
Iredell	South	14,232	15,368	16,945	20,106	23,789	27,831	32,068	36,335	40,470	15,969	17,216	18,936	22,376	26,366	30,718	35,247	39,772	44,112
Iredell	S Cent	7,171	7,737	8,449	10,001	11,984	14,371	17,135	20,247	23,681	8,076	8,697	9,472	11,160	13,311	15,888	18,854	22,174	25,812
Iredell	N Cent	20,994	21,711	22,307	23,742	25,664	27,998	30,665	33,590	36,697	22,403	23,168	23,804	25,335	27,387	29,877	32,723	35,845	39,160
Iredell	North	4,963	5,209	5,510	6,163	7,010	8,054	9,299	10,749	12,407	5,470	5,735	6,055	6,753	7,659	8,775	10,102	11,643	13,400
Linc	East	6,169	6,538	7,449	9,334	11,478	13,748	16,003	18,452	21,054	6,744	7,142	8,129	10,168	12,483	14,925	17,344	19,963	22,739
Linc	Central	12,909	13,285	13,815	14,833	16,101	17,611	19,336	21,132	22,989	13,691	14,089	14,651	15,732	17,076	18,678	20,508	22,412	24,381
Linc	West	4,963	5,210	5,548	6,212	6,992	7,874	8,844	9,890	10,998	5,282	5,545	5,904	6,612	7,441	8,380	9,412	10,526	11,705
Meck	N	18,468	20,666	24,365	31,641	40,000	49,091	58,561	68,057	77,226	20,291	22,672	26,670	34,504	43,457	53,132	63,141	73,100	82,631
Meck	NW	19,475	20,560	22,154	25,069	28,199	31,417	34,598	37,615	40,344	20,626	21,775	23,463	26,551	29,865	33,274	36,642	39,838	42,728
Meck	NNE	20,048	23,029	27,657	35,241	42,369	48,699	53,890	57,601	59,492	21,588	24,798	29,781	37,948	45,623	52,440	58,030	62,026	64,061
Meck	ENE	14,520	15,344	16,176	17,942	20,032	22,275	24,497	26,527	28,192	15,569	16,452	17,345	19,238	21,479	23,884	26,267	28,443	30,229
Meck	E	50,621	52,785	54,397	57,370	60,684	64,321	68,261	72,486	76,976	53,172	55,445	57,138	60,261	63,743	67,563	71,701	76,139	80,855
Meck	S	79,182	83,934	89,060	96,328	102,195	106,882	110,612	113,608	116,092	84,469	89,538	95,007	102,760	109,018	114,018	117,997	121,193	123,843
Meck	SW	17,012	18,341	20,176	22,673	24,612	26,158	27,474	28,724	30,074	18,188	19,609	21,570	24,240	26,314	27,966	29,373	30,710	32,153
Meck	Central	54,090	54,070	53,038	51,910	51,443	51,541	52,110	53,056	54,284	58,877	58,829	57,667	56,378	55,808	55,852	56,406	57,365	58,627
Row	S Cent	12,354	12,500	12,676	13,162	13,865	14,763	15,831	17,046	18,383	13,177	13,332	13,521	14,039	14,789	15,747	16,886	18,182	19,608
Row	N Cent	16,903	17,138	17,164	17,442	18,012	18,873	20,023	21,459	23,180	18,415	18,662	18,676	18,955	19,550	20,459	21,678	23,205	25,035
Row	East	11,363	11,855	12,650	14,092	15,666	17,357	19,149	21,027	22,975	12,502	13,030	13,882	15,423	17,101	18,896	20,792	22,770	24,813
Row	West	9,320	9,582	10,114	11,300	12,826	14,654	16,745	19,061	21,565	9,886	10,164	10,729	11,987	13,605	15,544	17,762	20,219	22,874
Stanly	North	11,021	11,072	11,180	11,540	12,132	12,963	14,039	15,367	16,954	12,214	12,252	12,345	12,696	13,299	14,157	15,276	16,659	18,311
Stanly	South	11,202	11,360	11,609	12,336	13,432	14,874	16,637	18,698	21,032	12,368	12,527	12,777	13,535	14,692	16,218	18,083	20,258	22,714
Union	NW	16,416	19,218	21,822	26,709	32,070	37,671	43,282	48,561	53,229	17,263	20,209	22,939	28,063	33,690	39,573	45,471	51,022	55,930
Union	Central	17,596	19,085	20,304	23,026	26,511	30,643	35,315	40,343	45,574	18,532	20,101	21,380	24,238	27,900	32,247	37,164	42,456	47,963
Union	East	3,016	3,194	3,298	3,638	4,222	5,094	6,302	7,881	9,869	3,215	3,405	3,516	3,876	4,497	5,426	6,712	8,394	10,512
Union	South	6,362	6,939	7,317	8,149	9,233	10,568	12,160	13,988	16,045	6,685	7,292	7,688	8,559	9,695	11,097	12,768	14,688	16,847
Cataw	SE part	3,036	3,191	3,502	4,163	4,990	5,966	7,075	8,302	9,632	3,892	4,061	4,408	5,145	6,051	7,096	8,251	9,491	10,788
Chero		20,495	20,879	21,714	23,599	26,074	29,111	32,681	36,755	41,305	22,400	22,804	23,692	25,705	28,353	31,601	35,416	39,763	44,609
Chest		12,880	12,961	13,311	14,262	15,662	17,499	19,762	22,440	25,522	14,374	14,438	14,787	15,770	17,237	19,169	21,546	24,351	27,563
Lanc	North	2,652	2,727	2,975	3,517	4,175	4,898	5,632	6,326	6,926	2,785	2,864	3,124	3,693	4,385	5,143	5,914	6,643	7,274
Lanc	South	20,526	20,813	21,255	22,512	24,364	26,747	29,601	32,860	36,463	22,177	22,486	22,963	24,320	26,319	28,892	31,972	35,491	39,380
Union, SC		12,087	11,966	11,938	12,179	12,792	13,791	15,188	16,997	19,231	13,351	13,201	13,144	13,367	13,995	15,040	16,510	18,417	20,769
York	North	7,407	7,770	7,995	8,456	8,976	9,505	9,990	10,379	10,619	8,100	8,490	8,728	9,214	9,764	10,321	10,828	11,229	11,468
York	NE	9,544	10,223	11,239	13,265	15,528	17,826	19,953	21,707	22,883	10,477	11,212	12,309	14,494	16,928	19,387	21,651	23,499	24,714
York	SE	32,718	34,221	35,711	38,953	43,020	47,772	53,067	58,765	64,726	35,289	36,910	38,518	42,014	46,401	51,526	57,237	63,383	69,812
York	West	11,382	12,016	12,734	14,261	16,185	18,483	21,132	24,112	27,400	12,195	12,875	13,643	15,280	17,341	19,803	22,642	25,835	29,358
Total Region		762,802	797,346	837,643	917,459	1010748	1114807	1226931	1344417	1464559	821,940	858,718	901,601	986,640	1086037	1196810	1315987	1440613	1567746

District Forecasts –Households and Housing Units

HU TYPE		Single-Family Housing Units (including attached)									Multi-Family Housing Units (excluding mobile homes, RVs, etc.)								
		2000	2002	2005	2010	2015	2020	2025	2030	2035	2000	2002	2005	2010	2015	2020	2025	2030	2035
Anson		7,148	7,115	7,069	7,188	7,735	8,557	9,857	11,516	13,564	563	565	560	573	565	569	584	603	620
Cabar	Central	19,351	20,997	23,088	27,178	31,478	36,038	40,321	44,345	47,899	4,123	4,550	5,210	6,470	8,207	10,218	12,567	15,098	17,719
Cabar	NW	10,797	11,208	11,601	12,567	13,879	15,510	17,267	19,227	21,344	2,083	2,165	2,267	2,486	2,807	3,203	3,737	4,352	5,043
Cabar	South	5,401	5,804	6,268	7,167	8,182	9,270	10,417	11,568	12,688	50	80	157	298	471	688	931	1,214	1,536
Cabar	NE	4,340	4,500	4,724	5,300	6,142	7,228	8,649	10,341	12,311	141	162	197	271	370	503	677	899	1,176
Cleve	SE	8,984	9,232	9,448	9,982	10,899	12,013	13,417	14,998	16,733	898	944	1,004	1,124	1,266	1,436	1,630	1,850	2,093
Cleve	Cent	10,994	10,958	10,913	10,999	11,476	12,178	13,312	14,729	16,454	2,333	2,350	2,345	2,394	2,476	2,604	2,751	2,942	3,178
Cleve	NW	7,971	8,107	8,125	8,271	8,652	9,155	10,002	10,984	12,094	349	377	419	493	570	662	754	860	983
Gast	E	18,489	18,783	18,813	19,185	19,874	20,857	22,184	23,722	25,425	2,213	2,278	2,349	2,495	2,733	3,025	3,391	3,812	4,286
Gast	SW	33,503	33,977	34,267	35,179	36,627	38,444	40,694	43,120	45,619	8,013	8,201	8,386	8,806	9,390	10,090	10,928	11,840	12,801
Gast	NW	7,030	7,162	7,330	7,725	8,398	9,216	10,290	11,536	12,961	565	594	632	711	800	906	1,028	1,170	1,332
Iredell	South	12,341	13,375	14,829	17,762	20,693	23,835	26,953	29,965	32,740	1,889	2,065	2,331	2,864	3,672	4,624	5,818	7,143	8,564
Iredell	S Cent	5,853	6,335	6,951	8,283	10,067	12,240	14,693	17,477	20,573	172	219	309	491	732	1,049	1,473	2,000	2,641
Iredell	N Cent	16,250	16,761	17,152	18,134	19,636	21,458	23,968	26,765	29,799	2,709	2,817	2,951	3,218	3,500	3,841	4,231	4,662	5,122
Iredell	North	3,344	3,502	3,693	4,109	4,761	5,571	6,598	7,817	9,242	27	35	51	79	117	165	233	319	425
Linc	East	4,742	5,037	5,759	7,228	8,902	10,677	12,431	14,336	16,360	288	328	414	600	851	1,155	1,515	1,942	2,438
Linc	Central	9,468	9,727	10,088	10,799	11,868	13,141	14,792	16,564	18,453	1,376	1,434	1,519	1,682	1,879	2,114	2,386	2,679	2,992
Linc	West	3,373	3,544	3,778	4,247	4,900	5,654	6,547	7,541	8,631	139	156	182	235	291	358	433	518	614
Meck	N	15,478	17,407	20,676	27,179	33,726	40,616	46,900	52,715	57,799	4,056	4,509	5,219	6,606	8,999	11,833	15,599	19,839	24,438
Meck	NW	17,027	17,843	19,014	21,116	23,492	25,883	28,120	30,155	31,896	2,704	3,035	3,563	4,584	5,592	6,716	7,906	9,151	10,409
Meck	NNE	14,518	16,665	19,994	25,435	28,854	31,183	32,362	32,297	30,989	6,464	7,478	9,189	12,054	16,333	20,890	25,328	29,436	32,843
Meck	ENE	8,600	9,090	9,587	10,641	11,948	13,361	14,452	15,388	16,076	5,954	6,318	6,821	7,774	8,788	9,891	11,240	12,563	13,768
Meck	E	35,211	36,401	37,032	38,192	39,853	41,662	43,864	46,208	48,675	16,864	17,792	19,041	21,045	22,889	24,928	26,955	29,154	31,524
Meck	S	56,773	59,476	62,005	65,064	67,228	68,432	69,249	69,510	69,381	27,238	29,406	32,576	37,332	41,458	45,297	48,487	51,453	54,267
Meck	SW	11,760	12,705	14,018	15,833	17,193	18,278	19,169	20,012	20,921	5,441	5,889	6,550	7,469	8,193	8,797	9,331	9,852	10,415
Meck	Central	32,405	32,355	31,681	30,925	30,189	29,789	29,196	28,789	28,500	26,047	25,992	25,589	25,100	25,305	25,784	26,961	28,357	29,939
Row	S Cent	9,894	10,013	10,159	10,552	11,257	12,136	13,227	14,472	15,855	632	677	742	868	1,037	1,234	1,475	1,751	2,065
Row	N Cent	12,576	12,751	12,770	12,991	13,534	14,304	15,382	16,707	18,285	4,252	4,296	4,310	4,377	4,522	4,740	5,022	5,376	5,800
Row	East	8,399	8,716	9,225	10,138	11,279	12,506	13,990	15,571	17,240	489	547	639	817	1,000	1,209	1,421	1,654	1,911
Row	West	6,384	6,539	6,865	7,587	8,572	9,748	11,274	12,987	14,867	180	211	265	373	515	695	900	1,145	1,433
Stanly	North	9,365	9,395	9,466	9,737	10,362	11,205	12,372	13,801	15,508	1,409	1,418	1,414	1,443	1,481	1,543	1,626	1,731	1,857
Stanly	South	9,429	9,525	9,676	10,181	11,026	12,143	13,591	15,284	17,201	183	202	232	292	383	497	643	820	1,031
Union	NW	16,068	18,553	20,705	24,637	28,883	33,077	37,227	40,901	43,892	110	243	762	1,700	2,765	4,100	5,570	7,212	8,957
Union	Central	14,221	15,611	16,900	19,714	22,834	26,543	30,473	34,666	38,994	2,509	2,639	2,803	3,078	3,589	4,194	5,047	6,010	7,065
Union	East	2,535	2,681	2,763	3,044	3,571	4,354	5,404	6,778	8,513	90	94	100	112	133	164	239	344	488
Union	South	5,218	5,674	5,963	6,535	7,345	8,334	9,547	10,933	12,484	128	156	204	290	381	497	631	793	986
Cataw	SE part	2,697	2,801	3,022	3,489	4,119	4,849	5,737	6,712	7,759	130	148	178	243	330	438	566	715	887
Chero		13,573	13,849	14,438	15,752	18,121	21,028	24,728	29,067	34,072	2,404	2,452	2,495	2,655	2,821	3,024	3,287	3,575	3,882
Chest		9,549	9,508	9,610	10,022	10,988	12,257	14,107	16,316	18,890	929	938	940	985	1,024	1,079	1,160	1,251	1,348
Lanc	North	1,679	1,721	1,869	2,192	2,752	3,402	4,063	4,732	5,366	8	15	41	86	130	186	247	314	385
Lanc	South	15,942	15,995	16,079	16,575	17,704	19,179	21,586	24,364	27,479	1,897	1,939	1,979	2,112	2,276	2,487	2,711	2,963	3,236
Union, SC		9,046	8,910	8,821	8,884	9,297	9,987	11,149	12,644	14,493	1,111	1,105	1,082	1,089	1,076	1,088	1,101	1,124	1,149
York	North	5,497	5,751	5,894	6,191	6,580	6,976	7,388	7,734	7,973	532	566	615	693	773	857	930	995	1,049
York	NE	7,856	8,458	9,370	11,198	12,975	14,742	16,233	17,368	18,003	1,358	1,472	1,640	1,983	2,476	3,019	3,606	4,169	4,653
York	SE	24,746	25,905	27,068	29,588	32,953	36,899	41,371	46,236	51,390	6,627	6,865	7,149	7,706	8,506	9,440	10,651	11,976	13,391
York	West	7,207	7,563	7,942	8,760	10,020	11,532	13,651	16,108	18,910	641	692	768	916	1,063	1,241	1,444	1,676	1,937
Total Region		573,032	597,986	626,509	683,454	750,822	825,443	908,203	995,006	1084301	148,318	156,413	168,188	189,073	214,536	243,079	275,150	309,305	344,672

District Forecasts – Households by Number of Persons

HH SIZE 1		One-Person Households									Two-Person Households								
		2000	2002	2005	2010	2015	2020	2025	2030	2035	2000	2002	2005	2010	2015	2020	2025	2030	2035
Anson		2,294	2,328	2,382	2,515	2,745	3,079	3,521	4,076	4,750	2,994	3,014	3,046	3,184	3,439	3,819	4,331	4,983	5,781
Cabar	Central	5,493	5,965	6,566	7,731	9,058	10,484	11,948	13,388	14,744	8,396	9,080	9,933	11,601	13,491	15,508	17,556	19,539	21,360
Cabar	NW	3,418	3,455	3,435	3,467	3,734	4,172	4,721	5,321	5,908	4,587	4,735	4,857	5,184	5,664	6,272	6,985	7,779	8,629
Cabar	South	927	1,072	1,291	1,691	2,042	2,366	2,687	3,027	3,410	2,053	2,230	2,443	2,858	3,325	3,832	4,368	4,923	5,485
Cabar	NE	956	1,019	1,114	1,308	1,550	1,848	2,207	2,636	3,141	1,934	2,019	2,141	2,437	2,852	3,387	4,044	4,825	5,732
Cleve	SE	2,681	2,827	3,006	3,351	3,687	4,034	4,409	4,832	5,321	4,265	4,388	4,499	4,765	5,116	5,541	6,030	6,572	7,157
Cleve	Cent	3,721	3,670	3,598	3,520	3,624	3,873	4,230	4,657	5,117	4,654	4,653	4,655	4,728	4,903	5,180	5,558	6,038	6,620
Cleve	NW	2,361	2,458	2,552	2,729	2,940	3,190	3,479	3,813	4,194	3,902	4,010	4,081	4,262	4,518	4,844	5,236	5,689	6,200
Gast	E	5,285	5,387	5,422	5,537	5,821	6,240	6,760	7,347	7,969	8,026	8,171	8,209	8,406	8,763	9,260	9,873	10,581	11,363
Gast	SW	9,932	10,158	10,376	10,860	11,502	12,269	13,129	14,048	14,994	14,230	14,460	14,627	15,101	15,783	16,630	17,596	18,636	19,705
Gast	NW	2,017	2,084	2,178	2,363	2,575	2,819	3,101	3,425	3,796	3,174	3,242	3,332	3,528	3,781	4,089	4,453	4,871	5,344
Iredell	South	3,111	3,372	3,739	4,474	5,325	6,260	7,247	8,256	9,253	4,987	5,387	5,941	7,053	8,348	9,770	11,260	12,763	14,221
Iredell	S Cent	1,365	1,495	1,669	2,024	2,447	2,942	3,509	4,152	4,870	2,691	2,906	3,177	3,765	4,513	5,413	6,454	7,627	8,922
Iredell	N Cent	5,244	5,406	5,528	5,830	6,322	6,960	7,701	8,500	9,314	7,173	7,416	7,617	8,102	8,760	9,562	10,481	11,488	12,553
Iredell	North	1,039	1,104	1,190	1,364	1,569	1,812	2,097	2,429	2,813	1,749	1,837	1,945	2,179	2,480	2,851	3,292	3,806	4,393
Linc	East	1,123	1,194	1,367	1,698	2,098	2,542	2,999	3,503	4,043	2,431	2,577	2,937	3,678	4,525	5,422	6,315	7,286	8,318
Linc	Central	2,841	2,933	3,063	3,320	3,656	4,064	4,529	5,010	5,498	4,331	4,458	4,637	4,982	5,413	5,927	6,514	7,125	7,756
Linc	West	967	1,036	1,136	1,323	1,522	1,737	1,969	2,223	2,501	1,649	1,733	1,849	2,075	2,339	2,636	2,963	3,316	3,690
Meck	N	4,025	4,577	5,525	7,332	9,300	11,391	13,563	15,778	17,995	6,690	7,494	8,847	11,504	14,546	17,850	21,291	24,745	28,087
Meck	NW	4,454	4,845	5,455	6,543	7,523	8,423	9,273	10,101	10,937	6,392	6,765	7,311	8,310	9,363	10,436	11,492	12,497	13,414
Meck	NNE	5,176	5,965	7,200	9,120	10,969	12,654	14,081	15,154	15,780	6,650	7,641	9,180	11,692	14,057	16,162	17,893	19,135	19,776
Meck	ENE	3,349	3,746	4,289	5,347	6,202	6,910	7,530	8,118	8,732	4,161	4,423	4,693	5,267	5,904	6,567	7,215	7,809	8,310
Meck	E	12,991	13,758	14,509	15,962	17,219	18,380	19,546	20,818	22,295	16,282	17,001	17,552	18,578	19,686	20,879	22,162	23,540	25,017
Meck	S	21,854	22,899	23,876	25,027	26,419	27,894	29,298	30,474	31,267	27,674	29,311	31,058	33,516	35,544	37,200	38,540	39,620	40,499
Meck	SW	3,937	4,434	5,202	6,339	7,092	7,590	7,959	8,330	8,830	5,385	5,830	6,442	7,290	7,935	8,438	8,862	9,266	9,712
Meck	Central	19,601	19,182	18,212	16,806	16,329	16,491	17,003	17,572	17,908	16,588	16,544	16,160	15,710	15,534	15,577	15,784	16,098	16,463
Row	S Cent	2,943	3,002	3,080	3,268	3,495	3,763	4,070	4,417	4,802	4,273	4,326	4,391	4,566	4,815	5,131	5,505	5,931	6,400
Row	N Cent	5,203	5,183	5,054	4,902	5,009	5,313	5,751	6,260	6,779	5,602	5,672	5,666	5,734	5,916	6,205	6,595	7,078	7,647
Row	East	2,364	2,517	2,769	3,172	3,585	4,015	4,467	4,947	5,463	4,071	4,253	4,546	5,072	5,645	6,258	6,907	7,589	8,297
Row	West	1,914	2,054	2,309	2,800	3,274	3,758	4,282	4,875	5,564	3,066	3,162	3,350	3,764	4,282	4,893	5,591	6,364	7,205
Stanly	North	2,959	2,950	2,944	2,992	3,152	3,407	3,742	4,141	4,589	3,749	3,764	3,797	3,915	4,116	4,402	4,773	5,229	5,771
Stanly	South	2,388	2,468	2,593	2,860	3,177	3,553	3,998	4,520	5,129	4,028	4,090	4,186	4,459	4,861	5,387	6,028	6,777	7,627
Union	NW	2,137	2,587	3,069	3,969	4,915	5,885	6,865	7,825	8,742	5,542	6,497	7,379	9,034	10,849	12,748	14,659	16,459	18,057
Union	Central	3,521	3,804	4,023	4,541	5,252	6,126	7,134	8,234	9,389	5,838	6,331	6,727	7,616	8,762	10,129	11,680	13,350	15,087
Union	East	619	638	635	650	739	900	1,131	1,428	1,788	1,041	1,101	1,133	1,243	1,439	1,736	2,149	2,688	3,365
Union	South	1,062	1,151	1,203	1,314	1,493	1,733	2,027	2,365	2,736	2,247	2,450	2,580	2,867	3,246	3,716	4,278	4,924	5,649
Cataw	SE part	626	658	724	860	1,037	1,252	1,501	1,779	2,081	1,261	1,325	1,455	1,729	2,073	2,480	2,942	3,455	4,010
Chero		5,119	5,235	5,477	5,985	6,660	7,491	8,468	9,578	10,811	6,796	6,925	7,205	7,834	8,660	9,674	10,866	12,226	13,745
Chest		3,110	3,150	3,267	3,536	3,928	4,438	5,063	5,797	6,637	4,086	4,113	4,228	4,533	4,983	5,572	6,298	7,157	8,144
Lanc	North	527	560	641	800	968	1,140	1,312	1,480	1,638	884	911	996	1,181	1,404	1,648	1,895	2,129	2,333
Lanc	South	4,977	5,077	5,232	5,564	6,080	6,757	7,568	8,490	9,499	6,749	6,847	6,997	7,413	8,028	8,822	9,772	10,856	12,054
Union, SC		3,273	3,257	3,274	3,366	3,566	3,879	4,305	4,846	5,505	3,970	3,932	3,925	4,007	4,212	4,544	5,008	5,607	6,346
York	North	1,491	1,556	1,588	1,663	1,779	1,916	2,054	2,173	2,250	2,809	2,945	3,029	3,202	3,401	3,604	3,792	3,944	4,037
York	NE	1,950	2,102	2,333	2,812	3,336	3,867	4,370	4,808	5,143	3,253	3,486	3,835	4,532	5,309	6,098	6,830	7,436	7,846
York	SE	7,408	7,716	8,001	8,583	9,506	10,688	12,051	13,513	14,996	11,041	11,545	12,042	13,121	14,494	16,108	17,911	19,851	21,875
York	West	2,157	2,369	2,661	3,229	3,780	4,349	4,975	5,693	6,541	3,643	3,857	4,100	4,617	5,251	6,000	6,861	7,830	8,905
Total Region		185,911	194,404	204,758	224,447	248,003	274,655	303,631	334,157	365,462	256,999	268,857	282,735	310,194	342,330	378,207	416,887	457,433	498,907

District Forecasts –Households by Number of Persons

HH SIZE 2		Three-Person Households									Households Containing Four or More Persons								
		2000	2002	2005	2010	2015	2020	2025	2030	2035	2000	2002	2005	2010	2015	2020	2025	2030	2035
Anson		1,702	1,706	1,713	1,782	1,914	2,114	2,387	2,736	3,167	2,214	2,210	2,204	2,281	2,436	2,676	3,006	3,433	3,962
Cabar	Central	4,572	4,936	5,386	6,267	7,265	8,326	9,398	10,427	11,361	6,276	6,763	7,360	8,535	9,861	11,267	12,679	14,023	15,227
Cabar	NW	2,380	2,482	2,584	2,828	3,109	3,430	3,794	4,203	4,660	2,917	3,078	3,264	3,674	4,067	4,468	4,904	5,401	5,986
Cabar	South	1,301	1,389	1,483	1,673	1,920	2,208	2,521	2,842	3,153	1,799	1,887	1,962	2,123	2,398	2,751	3,147	3,547	3,917
Cabar	NE	1,106	1,148	1,206	1,359	1,584	1,878	2,242	2,674	3,174	1,404	1,445	1,501	1,672	1,937	2,294	2,738	3,264	3,869
Cleve	SE	2,516	2,564	2,591	2,687	2,853	3,076	3,340	3,631	3,934	3,186	3,210	3,190	3,219	3,370	3,612	3,912	4,238	4,558
Cleve	Cent	2,309	2,327	2,354	2,439	2,539	2,666	2,834	3,057	3,348	2,735	2,782	2,855	3,029	3,165	3,301	3,472	3,712	4,060
Cleve	NW	2,194	2,243	2,266	2,344	2,468	2,633	2,836	3,070	3,332	2,523	2,562	2,561	2,614	2,726	2,888	3,092	3,329	3,591
Gast	E	4,507	4,586	4,604	4,720	4,904	5,150	5,454	5,810	6,212	4,961	5,044	5,058	5,194	5,368	5,588	5,857	6,180	6,563
Gast	SW	8,099	8,207	8,266	8,481	8,811	9,230	9,714	10,237	10,774	9,588	9,680	9,696	9,868	10,170	10,572	11,045	11,561	12,090
Gast	NW	1,956	1,989	2,032	2,132	2,269	2,442	2,649	2,887	3,154	2,161	2,185	2,211	2,288	2,410	2,574	2,774	3,003	3,259
Iredell	South	2,544	2,744	3,020	3,573	4,219	4,928	5,669	6,412	7,126	3,589	3,865	4,245	5,006	5,897	6,874	7,891	8,905	9,871
Iredell	S Cent	1,376	1,479	1,606	1,887	2,256	2,703	3,222	3,806	4,448	1,738	1,857	1,998	2,325	2,768	3,313	3,949	4,662	5,441
Iredell	N Cent	3,883	4,020	4,138	4,419	4,771	5,187	5,660	6,182	6,746	4,695	4,869	5,024	5,391	5,811	6,288	6,823	7,421	8,085
Iredell	North	948	991	1,043	1,157	1,311	1,504	1,736	2,005	2,312	1,227	1,276	1,332	1,463	1,649	1,887	2,175	2,510	2,889
Linc	East	1,126	1,192	1,356	1,703	2,092	2,498	2,897	3,328	3,785	1,489	1,575	1,789	2,254	2,763	3,286	3,792	4,335	4,909
Linc	Central	2,520	2,591	2,690	2,880	3,112	3,386	3,700	4,026	4,367	3,217	3,304	3,424	3,651	3,920	4,234	4,593	4,970	5,368
Linc	West	1,096	1,145	1,210	1,341	1,500	1,683	1,886	2,103	2,331	1,251	1,296	1,353	1,473	1,630	1,817	2,026	2,248	2,477
Meck	N	3,186	3,546	4,146	5,342	6,745	8,284	9,889	11,488	13,012	4,567	5,050	5,847	7,463	9,409	11,566	13,818	16,046	18,132
Meck	NW	3,825	3,999	4,244	4,699	5,240	5,827	6,418	6,972	7,449	4,803	4,951	5,144	5,517	6,072	6,731	7,415	8,045	8,544
Meck	NNE	3,555	4,078	4,887	6,243	7,504	8,612	9,509	10,136	10,433	4,667	5,345	6,390	8,187	9,838	11,270	12,408	13,176	13,502
Meck	ENE	2,802	2,902	2,961	3,115	3,412	3,790	4,188	4,545	4,800	4,208	4,273	4,232	4,213	4,514	5,008	5,565	6,055	6,350
Meck	E	9,117	9,447	9,642	9,984	10,466	11,057	11,723	12,431	13,149	12,231	12,578	12,693	12,846	13,314	14,005	14,830	15,697	16,515
Meck	S	12,241	13,048	13,958	15,311	16,279	16,955	17,431	17,800	18,155	17,413	18,677	20,168	22,474	23,953	24,833	25,343	25,712	26,170
Meck	SW	3,152	3,344	3,586	3,890	4,162	4,409	4,634	4,843	5,039	4,538	4,733	4,946	5,154	5,423	5,721	6,018	6,285	6,492
Meck	Central	7,736	7,854	7,879	8,008	8,030	8,007	8,000	8,070	8,277	10,164	10,490	10,787	11,387	11,550	11,465	11,324	11,317	11,637
Row	S Cent	2,266	2,286	2,309	2,378	2,491	2,641	2,822	3,029	3,256	2,872	2,886	2,897	2,950	3,064	3,229	3,434	3,669	3,924
Row	N Cent	2,673	2,736	2,778	2,889	2,998	3,123	3,281	3,490	3,765	3,425	3,547	3,666	3,917	4,089	4,232	4,395	4,631	4,989
Row	East	2,221	2,304	2,436	2,690	2,975	3,285	3,614	3,957	4,308	2,706	2,781	2,900	3,158	3,461	3,800	4,161	4,534	4,906
Row	West	1,841	1,869	1,935	2,101	2,359	2,690	3,078	3,503	3,950	2,499	2,497	2,521	2,635	2,912	3,312	3,795	4,319	4,846
Stanly	North	1,932	1,947	1,976	2,053	2,157	2,293	2,469	2,690	2,962	2,381	2,411	2,463	2,580	2,708	2,861	3,056	3,308	3,633
Stanly	South	2,042	2,059	2,084	2,186	2,363	2,607	2,910	3,263	3,658	2,743	2,743	2,745	2,831	3,031	3,327	3,701	4,138	4,618
Union	NW	3,354	3,903	4,398	5,327	6,358	7,439	8,519	9,525	10,397	5,383	6,230	6,977	8,378	9,949	11,599	13,240	14,752	16,032
Union	Central	3,298	3,581	3,817	4,336	4,987	5,748	6,603	7,518	8,469	4,939	5,369	5,737	6,532	7,509	8,640	9,898	11,240	12,629
Union	East	558	595	622	700	817	983	1,212	1,512	1,894	798	859	908	1,045	1,227	1,475	1,810	2,253	2,823
Union	South	1,240	1,355	1,432	1,603	1,815	2,071	2,373	2,721	3,115	1,813	1,983	2,102	2,366	2,679	3,049	3,481	3,978	4,544
Cataw	SE part	580	609	668	794	950	1,133	1,339	1,567	1,813	570	598	655	780	929	1,101	1,293	1,502	1,729
Chero		3,880	3,947	4,096	4,442	4,895	5,450	6,102	6,848	7,683	4,701	4,772	4,936	5,338	5,859	6,495	7,244	8,102	9,067
Chest		2,460	2,470	2,528	2,698	2,951	3,283	3,693	4,180	4,741	3,224	3,227	3,289	3,494	3,800	4,205	4,708	5,307	6,000
Lanc	North	532	542	583	678	800	937	1,077	1,208	1,318	710	715	755	857	1,003	1,172	1,347	1,508	1,637
Lanc	South	3,950	3,997	4,069	4,304	4,642	5,074	5,590	6,181	6,838	4,850	4,892	4,957	5,232	5,613	6,096	6,671	7,332	8,072
Union, SC		2,403	2,375	2,362	2,403	2,515	2,702	2,967	3,313	3,742	2,441	2,403	2,376	2,403	2,499	2,666	2,909	3,231	3,638
York	North	1,355	1,423	1,468	1,557	1,649	1,738	1,815	1,875	1,911	1,753	1,845	1,909	2,034	2,147	2,247	2,328	2,387	2,420
York	NE	1,744	1,864	2,044	2,396	2,793	3,196	3,567	3,866	4,055	2,597	2,771	3,028	3,525	4,090	4,664	5,186	5,598	5,839
York	SE	6,162	6,454	6,749	7,401	8,167	9,032	9,985	11,011	12,098	8,107	8,507	8,919	9,848	10,854	11,943	13,120	14,390	15,757
York	West	2,304	2,407	2,509	2,741	3,079	3,507	4,009	4,570	5,174	3,278	3,383	3,463	3,674	4,075	4,626	5,287	6,019	6,782
Total Region		138,543	144,681	151,713	165,943	182,497	200,919	220,755	241,548	262,844	181,350	189,405	198,437	216,876	237,918	261,026	285,659	311,279	337,346

District Forecasts – Households by Number of Vehicles

AUTOS 1

		Households with No Vehicles Available									Households with One Vehicle Available								
		2000	2002	2005	2010	2015	2020	2025	2030	2035	2000	2002	2005	2010	2015	2020	2025	2030	2035
Anson		1,047	1,014	940	834	760	710	675	650	630	3,044	3,076	3,083	3,118	3,178	3,254	3,329	3,378	3,377
Cabar	Central	1,547	1,567	1,551	1,532	1,505	1,460	1,395	1,311	1,212	7,164	7,760	8,559	10,135	11,925	13,806	15,638	17,266	18,530
Cabar	NW	1,131	1,096	1,024	932	864	809	761	715	669	4,422	4,561	4,666	4,924	5,266	5,665	6,098	6,543	6,981
Cabar	South	88	88	87	85	83	80	77	73	68	1,241	1,291	1,348	1,463	1,595	1,731	1,860	1,971	2,053
Cabar	NE	205	200	191	182	179	179	179	180	180	1,069	1,094	1,127	1,212	1,325	1,453	1,583	1,699	1,784
Cleve	SE	816	791	734	657	597	546	501	460	421	3,686	3,823	3,901	4,069	4,265	4,463	4,636	4,756	4,792
Cleve	Cent	1,634	1,587	1,519	1,404	1,280	1,151	1,047	961	888	4,341	4,384	4,458	4,597	4,759	4,932	5,098	5,248	5,366
Cleve	NW	597	576	531	471	423	383	350	320	293	2,949	3,075	3,148	3,300	3,477	3,661	3,826	3,945	3,985
Gast	E	1,257	1,199	1,091	948	837	749	674	610	552	6,943	7,051	7,031	7,120	7,326	7,605	7,910	8,190	8,391
Gast	SW	3,413	3,285	3,017	2,649	2,351	2,100	1,882	1,685	1,505	14,267	14,541	14,689	15,109	15,682	16,324	16,949	17,465	17,780
Gast	NW	372	356	331	296	267	243	223	205	188	2,768	2,840	2,900	3,006	3,112	3,207	3,275	3,302	3,270
Iredell	South	716	722	720	722	723	716	697	668	629	3,702	3,927	4,265	4,990	5,875	6,864	7,886	8,855	9,667
Iredell	S Cent	285	287	283	283	285	288	290	288	284	1,695	1,823	1,950	2,225	2,561	2,940	3,341	3,747	4,135
Iredell	N Cent	1,497	1,471	1,380	1,251	1,149	1,063	985	910	837	6,873	7,173	7,442	7,987	8,609	9,251	9,847	10,328	10,621
Iredell	North	231	226	216	203	193	186	180	174	169	1,110	1,147	1,170	1,214	1,258	1,289	1,296	1,266	1,186
Linc	East	175	173	178	187	194	196	192	187	180	1,420	1,491	1,657	1,999	2,373	2,744	3,079	3,404	3,695
Linc	Central	895	864	816	745	686	635	589	543	497	3,517	3,640	3,810	4,101	4,409	4,714	4,986	5,161	5,214
Linc	West	237	233	224	211	200	189	178	167	156	989	1,031	1,074	1,142	1,198	1,229	1,223	1,166	1,045
Meck	N	522	543	577	631	670	690	691	674	643	4,858	5,207	6,071	7,799	9,806	12,005	14,295	16,558	18,663
Meck	NW	1,021	1,012	988	947	902	850	792	727	659	6,629	7,074	7,681	8,736	9,793	10,792	11,672	12,371	12,858
Meck	NNE	577	616	657	689	683	723	741	701	609	6,521	7,472	9,321	12,623	16,038	19,304	22,186	24,425	25,752
Meck	ENE	1,085	1,114	1,080	1,021	962	900	833	759	681	5,220	5,619	5,976	6,738	7,645	8,627	9,609	10,511	11,252
Meck	E	2,854	2,893	2,766	2,531	2,266	2,030	1,821	1,634	1,468	18,865	20,003	20,896	22,492	24,184	25,898	27,576	29,156	30,566
Meck	S	2,759	2,726	2,598	2,357	2,103	1,855	1,622	1,410	1,220	26,157	27,962	30,216	33,293	35,552	37,071	37,955	38,324	38,305
Meck	SW	944	953	947	900	827	745	663	588	523	6,029	6,487	7,286	8,352	9,119	9,647	10,012	10,296	10,579
Meck	Central	9,089	8,739	8,151	7,316	6,627	6,046	5,548	5,111	4,724	24,796	24,604	24,182	23,718	23,538	23,617	23,927	24,442	25,132
Row	S Cent	716	679	625	550	490	440	398	361	328	3,515	3,560	3,598	3,673	3,757	3,836	3,901	3,937	3,934
Row	N Cent	1,853	1,804	1,683	1,493	1,315	1,171	1,054	956	872	6,591	6,701	6,713	6,798	6,956	7,160	7,395	7,637	7,864
Row	East	551	538	520	491	462	433	403	373	343	2,894	3,029	3,227	3,572	3,918	4,242	4,517	4,712	4,795
Row	West	428	411	393	371	356	343	331	317	303	2,295	2,338	2,442	2,675	2,965	3,288	3,619	3,930	4,188
Stanly	North	812	765	701	614	546	492	448	412	382	3,487	3,501	3,516	3,544	3,575	3,605	3,625	3,623	3,584
Stanly	South	505	479	443	397	364	339	319	301	284	2,533	2,556	2,547	2,576	2,642	2,722	2,792	2,826	2,799
Union	NW	361	394	405	420	425	420	405	383	353	2,989	3,429	3,794	4,485	5,219	5,927	6,536	6,955	7,102
Union	Central	1,191	1,208	1,159	1,111	1,081	1,056	1,028	992	946	5,338	5,691	5,877	6,362	7,008	7,752	8,532	9,264	9,867
Union	East	177	175	162	149	145	147	152	160	168	749	787	774	768	780	803	827	846	856
Union	South	243	247	234	219	209	201	195	189	182	1,386	1,490	1,527	1,613	1,717	1,825	1,921	1,985	1,996
Cataw	SE part	135	132	131	131	133	134	134	132	129	672	685	749	875	1,018	1,168	1,314	1,447	1,558
Chero		2,083	2,037	1,939	1,794	1,681	1,588	1,504	1,424	1,346	6,838	7,010	7,274	7,787	8,350	8,916	9,433	9,844	10,091
Chest		1,387	1,336	1,247	1,135	1,054	993	944	901	860	4,236	4,272	4,357	4,546	4,779	5,030	5,266	5,452	5,553
Lanc	North	130	125	124	123	123	121	117	110	101	730	761	817	926	1,034	1,123	1,177	1,190	1,157
Lanc	South	1,954	1,902	1,806	1,650	1,521	1,418	1,329	1,246	1,166	6,101	6,243	6,437	6,889	7,453	8,073	8,686	9,217	9,585
Union, SC		1,536	1,472	1,373	1,203	1,072	976	904	849	805	3,930	3,903	3,875	3,863	3,876	3,902	3,925	3,920	3,857
York	North	541	532	497	446	401	359	319	279	240	1,830	1,926	1,973	2,059	2,135	2,176	2,160	2,065	1,878
York	NE	424	424	421	420	415	402	381	350	312	2,670	2,807	3,027	3,488	4,009	4,527	4,972	5,274	5,365
York	SE	2,375	2,330	2,206	2,044	1,915	1,802	1,694	1,586	1,475	10,276	10,788	11,247	12,206	13,348	14,593	15,859	17,056	18,092
York	West	848	839	807	766	735	709	684	657	628	2,974	3,149	3,327	3,672	4,059	4,456	4,826	5,125	5,306
Total Region		53,240	52,161	49,472	45,511	42,058	39,068	36,328	33,693	31,110	242,308	252,787	265,006	287,839	312,462	337,218	360,378	380,077	394,406

District Forecasts –Households by Number of Vehicles

AUTOS 2

		Households with Two Vehicles Available									Households with Three or More Vehicles Available								
		2000	2002	2005	2010	2015	2020	2025	2030	2035	2000	2002	2005	2010	2015	2020	2025	2030	2035
Anson		3,094	3,177	3,342	3,759	4,372	5,216	6,326	7,742	9,503	2,019	1,991	1,981	2,050	2,223	2,509	2,916	3,458	4,150
Cabar	Central	11,051	12,176	13,639	16,495	19,790	23,422	27,287	31,277	35,281	4,975	5,241	5,495	5,971	6,455	6,897	7,261	7,523	7,669
Cabar	NW	5,253	5,554	5,906	6,679	7,686	8,922	10,377	12,034	13,869	2,497	2,538	2,544	2,619	2,758	2,946	3,168	3,411	3,663
Cabar	South	2,788	3,087	3,466	4,205	5,069	6,042	7,105	8,238	9,417	1,962	2,112	2,278	2,592	2,939	3,305	3,681	4,057	4,427
Cabar	NE	2,288	2,438	2,661	3,177	3,891	4,823	5,995	7,426	9,136	1,839	1,900	1,983	2,206	2,529	2,951	3,473	4,094	4,816
Cleve	SE	5,098	5,315	5,588	6,168	6,907	7,803	8,853	10,049	11,381	3,047	3,062	3,063	3,128	3,259	3,450	3,700	4,008	4,375
Cleve	Cent	5,042	5,119	5,235	5,563	6,067	6,754	7,629	8,719	10,050	2,402	2,341	2,251	2,152	2,125	2,183	2,319	2,538	2,841
Cleve	NW	4,520	4,698	4,886	5,287	5,809	6,460	7,246	8,178	9,265	2,914	2,924	2,894	2,891	2,943	3,051	3,221	3,459	3,774
Gast	E	9,780	10,131	10,440	11,119	12,011	13,120	14,445	15,982	17,725	4,799	4,808	4,731	4,670	4,682	4,764	4,914	5,136	5,439
Gast	SW	16,427	16,985	17,679	19,083	20,791	22,787	25,046	27,534	30,208	7,742	7,694	7,580	7,469	7,442	7,490	7,607	7,797	8,070
Gast	NW	4,118	4,258	4,472	4,912	5,465	6,139	6,944	7,889	8,983	2,050	2,047	2,051	2,096	2,191	2,335	2,534	2,790	3,112
Iredell	South	6,622	7,306	8,286	10,246	12,562	15,170	17,997	20,967	23,998	3,192	3,413	3,675	4,148	4,629	5,081	5,487	5,846	6,176
Iredell	S Cent	3,159	3,469	3,899	4,830	6,037	7,528	9,309	11,383	13,749	2,032	2,157	2,316	2,664	3,102	3,615	4,194	4,829	5,513
Iredell	N Cent	7,758	8,156	8,606	9,577	10,824	12,347	14,143	16,204	18,518	4,866	4,911	4,879	4,926	5,083	5,338	5,691	6,148	6,721
Iredell	North	2,146	2,302	2,517	2,970	3,552	4,278	5,161	6,213	7,448	1,476	1,534	1,607	1,776	2,006	2,301	2,662	3,096	3,605
Linc	East	2,670	2,882	3,383	4,433	5,675	7,051	8,491	10,107	11,887	1,904	1,992	2,232	2,715	3,236	3,756	4,241	4,754	5,293
Linc	Central	5,122	5,368	5,731	6,427	7,281	8,309	9,516	10,846	12,303	3,376	3,413	3,457	3,561	3,725	3,952	4,244	4,581	4,974
Linc	West	2,038	2,184	2,401	2,831	3,347	3,951	4,644	5,425	6,291	1,699	1,762	1,850	2,029	2,247	2,504	2,798	3,132	3,506
Meck	N	9,612	11,015	13,295	17,880	23,274	29,285	35,709	42,340	48,969	3,476	3,901	4,421	5,331	6,250	7,111	7,866	8,485	8,950
Meck	NW	7,886	8,428	9,299	10,965	12,864	14,951	17,154	19,378	21,551	3,940	4,046	4,185	4,421	4,640	4,824	4,980	5,139	5,276
Meck	NNE	10,340	12,043	14,400	18,138	21,499	24,321	26,547	28,116	28,945	2,610	2,897	3,279	3,790	4,148	4,350	4,416	4,359	4,186
Meck	ENE	5,114	5,441	5,911	6,871	7,999	9,226	10,478	11,671	12,721	3,101	3,170	3,209	3,312	3,426	3,521	3,578	3,585	3,538
Meck	E	21,208	22,124	23,068	24,818	26,817	29,073	31,631	34,540	37,857	7,694	7,765	7,667	7,529	7,418	7,320	7,233	7,155	7,085
Meck	S	37,768	40,411	43,277	47,707	51,768	55,524	59,035	62,358	65,559	12,498	12,836	12,969	12,972	12,771	12,431	12,000	11,515	11,008
Meck	SW	7,257	7,979	8,868	10,206	11,415	12,543	13,638	14,752	15,947	2,782	2,922	3,075	3,214	3,250	3,222	3,161	3,089	3,025
Meck	Central	15,654	16,207	16,467	17,022	17,725	18,563	19,514	20,545	21,615	4,552	4,520	4,238	3,854	3,553	3,315	3,121	2,957	2,813
Row	S Cent	5,268	5,421	5,638	6,108	6,712	7,450	8,317	9,309	10,417	2,855	2,840	2,816	2,831	2,907	3,037	3,216	3,439	3,704
Row	N Cent	5,711	5,915	6,135	6,603	7,217	7,985	8,929	10,068	11,426	2,748	2,717	2,633	2,547	2,525	2,557	2,644	2,798	3,018
Row	East	4,580	4,863	5,331	6,197	7,172	8,260	9,466	10,795	12,250	3,338	3,425	3,572	3,832	4,115	4,422	4,763	5,147	5,586
Row	West	3,808	3,996	4,340	5,071	6,001	7,130	8,455	9,971	11,673	2,789	2,836	2,939	3,183	3,505	3,893	4,340	4,843	5,401
Stanly	North	4,222	4,330	4,511	4,910	5,443	6,126	6,978	8,016	9,257	2,500	2,476	2,452	2,473	2,569	2,740	2,988	3,317	3,731
Stanly	South	4,506	4,659	4,918	5,503	6,292	7,296	8,523	9,981	11,673	3,658	3,666	3,701	3,860	4,135	4,518	5,004	5,590	6,276
Union	NW	8,751	10,425	12,126	15,376	19,051	23,025	27,163	31,244	35,067	4,315	4,971	5,497	6,428	7,376	8,299	9,177	9,980	10,706
Union	Central	6,977	7,780	8,619	10,382	12,601	15,265	18,353	21,798	25,538	4,091	4,407	4,649	5,172	5,821	6,570	7,402	8,289	9,223
Union	East	1,314	1,420	1,522	1,787	2,201	2,805	3,641	4,746	6,160	777	812	840	933	1,095	1,340	1,682	2,129	2,685
Union	South	2,683	2,994	3,259	3,816	4,529	5,413	6,485	7,749	9,214	2,050	2,208	2,296	2,501	2,778	3,129	3,559	4,065	4,652
Cataw	SE part	1,279	1,380	1,555	1,931	2,414	3,004	3,701	4,504	5,409	950	994	1,067	1,226	1,425	1,660	1,925	2,219	2,537
Chero		7,409	7,684	8,281	9,553	11,189	13,218	15,664	18,550	21,893	4,165	4,148	4,220	4,465	4,853	5,389	6,079	6,936	7,974
Chest		4,597	4,723	5,047	5,777	6,766	8,038	9,617	11,525	13,779	2,660	2,630	2,660	2,805	3,063	3,438	3,935	4,563	5,330
Lanc	North	1,065	1,110	1,251	1,562	1,957	2,416	2,912	3,417	3,892	727	731	783	906	1,061	1,238	1,425	1,609	1,776
Lanc	South	7,933	8,170	8,559	9,476	10,724	12,303	14,223	16,493	19,117	4,538	4,498	4,453	4,497	4,666	4,954	5,363	5,903	6,596
Union, SC		4,106	4,146	4,293	4,697	5,300	6,128	7,214	8,592	10,296	2,515	2,445	2,397	2,416	2,545	2,785	3,145	3,637	4,272
York	North	3,140	3,355	3,551	3,925	4,345	4,792	5,243	5,670	6,040	1,896	1,956	1,975	2,026	2,095	2,177	2,269	2,365	2,461
York	NE	4,383	4,798	5,431	6,692	8,135	9,657	11,141	12,463	13,488	2,067	2,194	2,360	2,665	2,969	3,240	3,459	3,620	3,719
York	SE	13,536	14,415	15,475	17,650	20,328	23,490	27,105	31,133	35,525	6,531	6,688	6,783	7,053	7,429	7,886	8,409	8,991	9,633
York	West	4,830	5,196	5,661	6,633	7,864	9,366	11,154	13,240	15,635	2,730	2,832	2,940	3,190	3,527	3,951	4,468	5,091	5,832
Total Region		313,912	335,030	362,222	415,016	476,740	546,776	624,506	709,177	799,925	153,342	157,369	160,943	169,093	179,488	191,746	205,719	221,469	239,117

District Forecasts – Median Household Income

HH INCOME		Median Household Income in Constant 1999 Dollars								
		2000	2002	2005	2010	2015	2020	2025	2030	2035
County										
Anson		29,849	30,413	32,151	36,110	41,275	47,502	54,649	62,573	71,132
Cabarrus		46,140	47,793	50,200	54,387	58,817	63,520	68,523	73,856	79,548
Cleveland		35,283	35,607	36,569	38,710	41,562	45,173	49,589	54,858	61,027
Gaston		39,482	40,287	41,771	44,432	47,412	50,807	54,712	59,224	64,437
Iredell		41,920	43,172	45,292	49,071	53,196	57,712	62,664	68,097	74,054
Lincoln		41,421	42,471	44,347	47,848	51,845	56,372	61,460	67,142	73,451
Mecklenburg		50,579	52,092	54,178	57,796	61,561	65,434	69,379	73,357	77,330
Rowan		37,494	38,403	40,025	43,032	46,470	50,399	54,880	59,972	65,736
Stanly		36,898	37,909	39,904	43,770	48,296	53,465	59,258	65,658	72,647
Union, NC		50,638	52,854	56,069	61,401	66,759	72,213	77,832	83,683	89,837
Cherokee		33,787	34,272	35,798	38,987	42,974	47,751	53,307	59,632	66,717
Chester		32,425	33,137	34,894	38,522	42,987	48,241	54,240	60,939	68,290
Lancaster		34,688	35,066	36,070	38,232	41,037	44,520	48,718	53,667	59,401
Union, SC		31,441	32,081	33,667	37,254	41,950	47,673	54,343	61,877	70,195
York		44,539	45,634	47,575	51,026	54,776	58,862	63,319	68,184	73,492
District										
Anson		29,849	30,413	32,151	36,110	41,275	47,502	54,649	62,573	71,132
Cabarrus	Central	46,888	48,453	50,691	54,558	58,642	62,997	67,674	72,728	78,212
Cabarrus	NW	38,133	39,409	41,553	45,623	50,255	55,382	60,936	66,848	73,050
Cabarrus	South	61,186	63,632	66,674	71,683	76,648	81,607	86,598	91,657	96,824
Cabarrus	NE	49,957	51,540	53,926	58,288	63,114	68,388	74,091	80,205	86,713
Cleveland	SE	37,701	38,173	39,610	42,456	45,897	49,970	54,710	60,154	66,339
Cleveland	Cent	32,974	33,271	33,769	35,447	38,170	41,921	46,683	52,439	59,171
Cleveland	NW	36,367	36,542	37,504	39,374	41,707	44,655	48,369	52,999	58,699
Gaston	E	42,328	43,368	45,014	47,787	50,720	53,956	57,638	61,907	66,907
Gaston	SW	39,465	40,231	41,697	44,329	47,262	50,577	54,352	58,666	63,599
Gaston	NW	38,777	39,364	40,878	43,970	47,803	52,410	57,826	64,084	71,219
Iredell	South	51,368	53,500	56,378	60,975	65,439	69,905	74,509	79,386	84,670
Iredell	S Cent	44,367	45,579	48,038	52,444	57,224	62,373	67,881	73,742	79,948
Iredell	N Cent	37,539	37,975	38,895	40,873	43,479	46,797	50,908	55,895	61,842
Iredell	North	37,851	39,340	42,043	47,064	52,701	58,919	65,687	72,970	80,737
Lincoln	East	51,825	53,190	55,784	60,121	64,533	69,085	73,843	78,871	84,237
Lincoln	Central	37,699	38,470	39,698	42,179	45,269	49,047	53,591	58,980	65,291
Lincoln	West	41,046	42,276	44,523	48,749	53,615	59,170	65,461	72,535	80,441
Mecklenburg	N	74,662	78,225	81,763	87,881	94,221	100,725	107,330	113,975	120,601
Mecklenburg	NW	46,616	47,332	48,936	52,314	56,438	61,155	66,313	71,758	77,337
Mecklenburg	NNE	61,443	64,450	67,744	72,714	77,015	80,627	83,530	85,703	87,126
Mecklenburg	ENE	43,653	44,254	45,623	48,945	53,201	57,964	62,809	67,309	71,039
Mecklenburg	E	46,883	47,050	47,462	48,504	50,048	52,163	54,920	58,386	62,632
Mecklenburg	S	69,394	70,985	73,263	77,086	80,982	84,994	89,169	93,551	98,187
Mecklenburg	SW	50,077	51,606	52,355	54,319	57,021	60,281	63,916	67,744	71,585
Mecklenburg	Central	38,644	39,951	42,096	45,595	49,038	52,474	55,950	59,515	63,215
Rowan	S Cent	36,959	37,860	39,412	42,632	46,601	51,268	56,581	62,489	68,941
Rowan	N Cent	34,166	34,894	36,375	39,135	42,347	46,115	50,542	55,731	61,785
Rowan	East	40,412	41,220	42,732	45,424	48,441	51,913	55,969	60,738	66,350
Rowan	West	41,228	42,498	44,283	47,400	50,758	54,429	58,486	63,001	68,046
Stanly	North	33,724	34,628	36,244	39,698	44,056	49,268	55,281	62,044	69,505
Stanly	South	39,750	40,843	43,164	47,342	51,939	56,986	62,517	68,564	75,161
Union, NC	NW	63,909	66,366	69,460	74,756	80,237	85,914	91,798	97,900	104,232
Union, NC	Central	45,481	47,494	50,685	55,947	61,213	66,572	72,113	77,922	84,089
Union, NC	East	42,521	43,716	47,368	54,171	61,668	69,623	77,800	85,965	93,882
Union, NC	South	45,527	46,980	49,440	53,785	58,483	63,591	69,163	75,256	81,925
Catawba	SE part	46,694	48,837	50,538	53,869	57,789	62,262	67,251	72,720	78,633
Cherokee		33,787	34,272	35,798	38,987	42,974	47,751	53,307	59,632	66,717
Chester		32,425	33,137	34,894	38,522	42,987	48,241	54,240	60,939	68,290
Lancaster	North	43,133	43,377	45,409	49,660	54,831	60,738	67,196	74,022	81,030
Lancaster	South	34,145	34,545	35,385	37,145	39,453	42,421	46,161	50,784	56,404
Union, SC		31,441	32,081	33,667	37,254	41,950	47,673	54,343	61,877	70,195
York	North	50,687	51,645	53,403	56,542	60,089	64,210	69,073	74,843	81,689
York	NE	55,964	58,126	61,134	66,051	70,862	75,585	80,238	84,839	89,405
York	SE	43,255	44,183	45,951	49,168	52,752	56,734	61,145	66,016	71,379
York	West	40,096	40,905	42,431	45,372	48,864	52,971	57,756	63,285	69,620

District Forecasts –Average Value of Owned Housing Units

HU VALUE		Average Value of All Owner-Occupied Dwelling Units in Constant 1999 Dollars								
		2000	2002	2005	2010	2015	2020	2025	2030	2035
County										
Anson		80,524	81,897	86,730	98,055	113,072	131,327	152,368	175,738	200,986
Cabarrus		129,408	134,130	140,958	152,815	165,336	178,605	192,704	207,714	223,718
Cleveland		93,605	94,107	96,325	101,622	109,040	118,715	130,788	145,396	162,677
Gaston		102,118	103,987	107,619	114,161	121,563	130,114	140,102	151,816	165,543
Iredell		140,836	145,046	152,135	164,766	178,542	193,610	210,113	228,199	248,013
Lincoln		117,740	120,666	125,977	135,944	147,389	160,408	175,096	191,550	209,864
Mecklenburg		183,507	189,005	196,718	210,139	224,179	238,734	253,699	268,970	284,442
Rowan		107,174	109,710	114,307	122,871	132,719	144,035	157,001	171,800	188,615
Stanly		102,513	105,286	110,920	121,942	134,950	149,880	166,668	185,252	205,568
Union, NC		153,625	160,416	170,252	186,539	202,877	219,480	236,559	254,329	273,001
Cherokee		80,237	80,982	84,556	92,414	102,611	115,101	129,841	146,787	165,892
Chester		72,770	74,130	78,277	87,247	98,650	112,330	128,125	145,880	165,433
Lancaster		85,613	86,100	88,158	93,011	99,731	108,416	119,168	132,084	147,267
Union, SC		70,224	71,373	75,010	83,895	96,073	111,273	129,226	149,661	172,307
York		130,116	133,261	138,900	148,926	159,831	171,721	184,704	198,888	214,380
District										
Anson		80,524	81,897	86,730	98,055	113,072	131,327	152,368	175,738	200,986
Cabarrus	Central	129,245	133,615	139,795	150,440	161,653	173,588	186,405	200,258	215,306
Cabarrus	NW	110,160	113,878	120,155	132,132	145,811	160,975	177,405	194,884	213,193
Cabarrus	South	156,704	163,310	171,192	183,971	196,389	208,545	220,537	232,463	244,423
Cabarrus	NE	135,228	139,543	146,017	157,910	171,123	185,589	201,240	218,009	235,827
Cleveland	SE	93,079	93,802	97,126	103,958	112,494	122,834	135,078	149,327	165,681
Cleveland	Cent	100,474	101,319	102,746	107,767	116,044	127,523	142,147	159,863	180,615
Cleveland	NW	87,257	86,998	88,757	92,394	97,311	103,968	112,824	124,340	138,975
Gaston	E	107,107	109,595	113,550	120,114	127,017	134,691	143,570	154,085	166,669
Gaston	SW	101,471	103,200	106,750	113,148	120,351	128,594	138,112	149,141	161,917
Gaston	NW	93,006	93,986	97,388	104,704	114,158	125,842	139,845	156,258	175,173
Iredell	South	197,209	204,984	215,710	233,132	250,369	267,866	286,066	305,412	326,349
Iredell	S Cent	143,348	147,276	155,187	169,351	184,719	201,269	218,980	237,830	257,797
Iredell	N Cent	110,192	111,336	113,867	119,447	126,947	136,623	148,731	163,525	181,261
Iredell	North	99,219	103,298	110,856	124,976	140,899	158,511	177,699	198,347	220,343
Lincoln	East	166,287	170,680	178,991	192,906	207,080	221,720	237,034	253,228	270,511
Lincoln	Central	97,980	99,785	102,686	108,782	116,658	126,549	138,689	153,314	170,657
Lincoln	West	101,058	104,078	109,823	120,769	133,546	148,289	165,132	184,209	205,653
Mecklenburg	N	249,826	261,470	273,304	293,795	315,087	336,999	359,348	381,954	404,633
Mecklenburg	NW	124,102	125,682	129,674	138,428	149,381	162,040	175,915	190,513	205,342
Mecklenburg	NNE	160,592	169,050	177,868	190,782	201,396	209,629	215,400	218,627	219,229
Mecklenburg	ENE	114,948	116,173	119,433	128,026	139,404	152,220	165,127	176,779	185,829
Mecklenburg	E	126,849	126,763	127,112	128,707	131,746	136,437	142,985	151,597	162,479
Mecklenburg	S	240,547	246,230	254,457	268,361	282,638	297,444	312,931	329,255	346,570
Mecklenburg	SW	139,784	144,059	145,597	150,325	157,258	165,817	175,424	185,499	195,465
Mecklenburg	Central	182,983	188,949	198,588	214,703	231,041	247,787	265,124	283,236	302,306
Rowan	S Cent	91,167	93,247	96,949	104,989	115,217	127,458	141,540	157,289	174,532
Rowan	N Cent	109,506	111,861	116,617	125,466	135,751	147,795	161,922	178,456	197,721
Rowan	East	111,990	114,079	118,129	125,345	133,487	142,952	154,137	167,439	183,255
Rowan	West	118,153	121,800	126,873	135,722	145,255	155,692	167,256	180,166	194,643
Stanly	North	98,410	101,021	105,745	115,962	128,968	144,596	162,682	183,059	205,561
Stanly	South	105,958	108,821	115,216	126,761	139,496	153,515	168,908	185,771	204,196
Union, NC	NW	182,033	189,178	198,015	213,095	228,636	244,664	261,204	278,280	295,920
Union, NC	Central	135,119	141,205	150,855	166,726	182,564	198,643	215,234	232,609	251,040
Union, NC	East	114,145	117,313	127,856	147,584	169,363	192,444	216,080	239,522	262,025
Union, NC	South	135,349	139,681	147,046	160,052	174,118	189,416	206,116	224,388	244,402
Catawba	SE part	178,061	185,735	192,560	205,641	220,771	237,854	256,793	277,491	299,852
Cherokee		80,237	80,982	84,556	92,414	102,611	115,101	129,841	146,787	165,892
Chester		72,770	74,130	78,277	87,247	98,650	112,330	128,125	145,880	165,433
Lancaster	North	114,764	114,911	120,318	131,940	146,315	162,855	180,969	200,070	219,567
Lancaster	South	81,345	81,824	83,248	86,629	91,561	98,383	107,431	119,042	133,554
Union, SC		70,224	71,373	75,010	83,895	96,073	111,273	129,226	149,661	172,307
York	North	158,155	161,137	166,612	176,393	187,447	200,296	215,462	233,468	254,837
York	NE	161,468	167,821	176,593	190,844	204,674	218,131	231,265	244,122	256,753
York	SE	121,840	124,334	129,228	138,169	148,171	159,324	171,719	185,446	200,596
York	West	105,125	107,040	110,858	118,365	127,468	138,354	151,214	166,237	183,611

District Forecasts – Employment by Transp.-relevant Industry (2002)

EMPL 2002		MIWTCU	HWY	RTL	BANK	LOSVC	HISRV	SCH	OFFGOV	TOTAL
County										
Anson		4,134	369	772	61	361	445	828	1,650	8,622
Cabarrus		24,333	4,340	8,768	530	3,991	9,259	3,487	6,776	61,483
Cleveland		16,093	2,312	4,421	406	1,954	5,640	3,429	3,088	37,343
Gaston		30,269	5,208	9,153	840	5,366	10,933	5,039	5,908	72,716
Iredell		23,585	3,649	7,319	559	3,973	10,172	3,762	4,332	57,352
Lincoln		10,786	1,170	2,220	222	2,066	2,316	1,667	1,926	22,373
Mecklenburg		185,124	30,639	49,848	33,708	93,415	80,411	28,091	55,606	556,842
Rowan		21,018	2,951	7,094	497	3,402	9,546	4,351	3,621	52,480
Stanly		8,656	1,594	2,624	273	1,037	3,062	1,789	1,816	20,851
Union, NC		24,960	2,331	5,030	378	3,096	4,723	4,074	3,565	48,158
Cherokee		12,331	1,548	2,582	181	1,131	2,002	1,430	1,612	22,817
Chester		6,400	511	1,027	73	357	1,141	1,164	1,647	12,320
Lancaster		8,474	1,144	2,468	299	1,273	2,638	1,362	2,823	20,482
Union, SC		3,841	439	1,018	138	446	947	951	1,412	9,194
York		24,719	5,009	7,779	729	6,556	8,715	4,682	5,914	64,102
District										
Anson		4,134	369	772	61	361	445	828	1,650	8,622
Cabarrus	Central	14,973	3,100	6,645	388	2,405	6,925	2,020	4,085	40,540
Cabarrus	NW	5,886	1,058	1,420	86	952	1,747	1,024	1,950	14,122
Cabarrus	South	2,092	125	497	38	367	354	128	436	4,038
Cabarrus	NE	1,383	57	206	19	267	233	315	304	2,783
Cleveland	SE	6,719	687	1,015	56	520	1,108	859	461	11,425
Cleveland	Cent	5,200	1,415	2,907	326	1,133	4,151	1,328	2,500	18,961
Cleveland	NW	4,175	209	498	24	302	382	1,242	127	6,957
Gaston	E	13,292	1,057	1,635	203	1,091	1,647	1,766	564	21,255
Gaston	SW	14,807	3,795	6,952	558	3,719	8,577	2,955	5,117	46,480
Gaston	NW	2,170	355	565	79	556	709	318	227	4,980
Iredell	South	5,916	1,400	2,579	168	1,153	3,236	1,152	864	16,468
Iredell	S Cent	2,087	420	421	13	230	484	439	151	4,245
Iredell	N Cent	13,254	1,715	3,996	367	2,529	6,220	1,773	3,214	33,068
Iredell	North	2,328	113	322	11	61	231	399	104	3,570
Lincoln	East	2,432	363	572	80	1,142	421	363	138	5,512
Lincoln	Central	7,528	726	1,408	142	832	1,840	938	1,586	14,999
Lincoln	West	826	81	240	0	92	54	366	203	1,862
Mecklenburg	N	8,938	2,915	2,454	156	3,830	4,656	2,446	2,148	27,542
Mecklenburg	NW	18,745	1,455	1,844	66	2,798	2,457	1,410	2,179	30,954
Mecklenburg	NNE	22,197	2,480	3,234	10,553	5,727	3,359	1,571	4,798	53,918
Mecklenburg	ENE	4,971	1,179	2,030	83	1,915	3,380	5,987	873	20,419
Mecklenburg	E	9,168	2,996	8,704	205	7,244	7,400	3,207	2,767	41,691
Mecklenburg	S	28,538	9,098	16,260	833	20,685	18,706	6,211	12,062	112,394
Mecklenburg	SW	36,807	2,195	5,566	551	16,737	4,172	1,132	7,828	74,989
Mecklenburg	Central	55,760	8,322	9,757	21,260	34,478	36,281	6,128	22,950	194,935
Rowan	S Cent	3,259	430	1,081	69	813	848	965	356	7,820
Rowan	N Cent	9,000	2,260	5,374	368	1,818	7,918	2,490	3,007	32,235
Rowan	East	4,036	190	463	43	405	420	520	144	6,222
Rowan	West	4,724	71	176	17	367	361	375	114	6,204
Stanly	North	5,085	912	1,328	175	685	2,500	1,105	1,688	13,478
Stanly	South	3,571	682	1,296	97	352	562	684	128	7,373
Union, NC	NW	9,628	558	1,496	74	1,471	825	1,496	335	15,882
Union, NC	Central	12,435	1,565	3,171	259	1,458	3,638	1,813	3,036	27,375
Union, NC	East	2,048	166	243	45	68	185	328	131	3,215
Union, NC	South	849	42	120	0	99	75	438	63	1,686
Catawba	SE part	572	132	253	18	88	163	85	56	1,367
Cherokee		12,331	1,548	2,582	181	1,131	2,002	1,430	1,612	22,817
Chester		6,400	511	1,027	73	357	1,141	1,164	1,647	12,320
Lancaster	North	1,041	17	24	0	544	68	112	151	1,957
Lancaster	South	7,433	1,127	2,444	299	729	2,570	1,250	2,672	18,524
Union, SC		3,841	439	1,018	138	446	947	951	1,412	9,194
York	North	3,078	560	560	96	544	377	739	245	6,199
York	NE	5,484	728	1,027	42	773	929	259	435	9,676
York	SE	12,394	3,412	5,177	497	4,937	6,716	2,893	3,167	39,193
York	West	3,763	308	1,015	94	302	693	791	2,068	9,034
Total		405,298	63,345	112,375	38,914	128,514	152,110	66,192	101,752	1,068,501

District Forecasts –Employment by Transp.-relevant Industry (2005)

EMPL 2005		MIWTCU	HWY	RTL	BANK	LOSVC	HISRV	SCH	OFFGOV	TOTAL
County										
Anson		4,237	342	814	65	374	471	846	1,761	8,911
Cabarrus		26,507	4,914	10,122	617	4,838	10,859	3,826	7,394	69,076
Cleveland		16,486	2,196	4,604	379	2,054	5,988	3,438	3,101	38,247
Gaston		30,267	5,204	9,680	855	5,722	11,614	5,044	5,971	74,358
Iredell		25,886	4,170	8,259	598	4,526	11,420	4,155	4,738	63,752
Lincoln		11,543	1,355	2,508	260	2,275	2,565	1,741	2,028	24,276
Mecklenburg		199,154	32,473	52,972	35,882	102,091	87,783	29,748	58,206	598,309
Rowan		22,673	2,889	7,363	462	3,640	10,020	4,424	3,766	55,237
Stanly		8,711	1,587	2,770	267	1,104	3,341	1,807	1,905	21,493
Union, NC		27,437	3,160	5,996	417	3,758	5,584	4,732	4,107	55,191
Cherokee		12,873	1,538	2,807	178	1,202	2,245	1,445	1,663	23,951
Chester		6,543	489	1,081	72	374	1,265	1,217	1,737	12,778
Lancaster		8,714	1,219	2,769	300	1,364	2,833	1,468	3,021	21,686
Union, SC		3,744	418	1,043	137	432	1,034	957	1,450	9,214
York		27,058	5,332	8,628	787	7,234	9,263	4,989	6,290	69,580
District										
Anson		4,237	342	814	65	374	471	846	1,761	8,911
Cabarrus	Central	16,748	3,477	7,624	456	3,031	8,272	2,253	4,490	46,350
Cabarrus	NW	5,822	1,165	1,617	84	1,005	1,924	1,082	2,073	14,772
Cabarrus	South	2,412	204	626	57	488	406	149	500	4,841
Cabarrus	NE	1,525	68	255	20	314	258	341	331	3,112
Cleveland	SE	6,913	657	1,051	53	547	1,154	866	460	11,701
Cleveland	Cent	5,293	1,339	3,029	303	1,182	4,408	1,347	2,515	19,415
Cleveland	NW	4,280	200	524	23	325	427	1,226	126	7,131
Gaston	E	13,138	1,063	1,716	215	1,085	1,770	1,763	569	21,320
Gaston	SW	14,935	3,780	7,367	556	4,049	9,121	2,962	5,175	47,945
Gaston	NW	2,195	360	597	84	588	723	319	227	5,093
Iredell	South	6,684	1,694	2,993	196	1,412	3,783	1,298	1,019	19,079
Iredell	S Cent	2,380	513	526	18	266	567	504	182	4,956
Iredell	N Cent	14,349	1,845	4,375	374	2,776	6,802	1,925	3,427	35,874
Iredell	North	2,472	118	364	10	72	267	428	110	3,843
Lincoln	East	2,776	475	704	126	1,269	486	405	184	6,425
Lincoln	Central	7,865	787	1,537	134	906	2,019	961	1,634	15,843
Lincoln	West	902	93	267	0	100	60	375	210	2,007
Mecklenburg	N	10,335	3,324	2,913	197	4,625	5,527	2,755	2,366	32,042
Mecklenburg	NW	19,862	1,544	2,028	87	3,142	2,825	1,492	2,304	33,284
Mecklenburg	NNE	25,418	3,129	3,972	11,532	7,082	4,486	1,820	5,627	63,067
Mecklenburg	ENE	5,291	1,308	2,226	94	2,252	3,657	6,234	969	22,030
Mecklenburg	E	9,686	2,991	8,918	221	7,775	7,643	3,282	2,741	43,256
Mecklenburg	S	30,723	9,302	16,988	906	22,638	20,392	6,550	12,377	119,875
Mecklenburg	SW	40,092	2,359	5,878	613	18,114	4,894	1,231	8,142	81,322
Mecklenburg	Central	57,748	8,516	10,049	22,232	36,463	38,359	6,384	23,681	203,432
Rowan	S Cent	3,403	411	1,116	64	873	948	970	359	8,145
Rowan	N Cent	9,317	2,233	5,555	338	1,871	8,191	2,514	3,128	33,146
Rowan	East	4,471	186	501	40	449	489	550	156	6,842
Rowan	West	5,483	59	192	20	448	391	390	122	7,105
Stanly	North	5,016	906	1,391	170	737	2,749	1,117	1,765	13,851
Stanly	South	3,695	681	1,379	96	367	592	690	140	7,642
Union, NC	NW	10,993	956	1,916	105	1,840	950	1,844	459	19,063
Union, NC	Central	13,388	1,953	3,647	272	1,750	4,345	2,031	3,428	30,813
Union, NC	East	2,131	189	275	40	55	198	355	145	3,388
Union, NC	South	925	62	157	0	114	90	502	75	1,927
Catawba	SE part	635	153	299	28	103	190	96	65	1,568
Cherokee		12,873	1,538	2,807	178	1,202	2,245	1,445	1,663	23,951
Chester		6,543	489	1,081	72	374	1,265	1,217	1,737	12,778
Lancaster	North	1,164	27	37	-1	611	58	144	160	2,201
Lancaster	South	7,550	1,192	2,731	301	752	2,776	1,324	2,860	19,485
Union, SC		3,744	418	1,043	137	432	1,034	957	1,450	9,214
York	North	3,337	581	605	113	548	441	773	263	6,661
York	NE	6,317	858	1,208	56	1,011	1,012	304	517	11,283
York	SE	13,378	3,576	5,690	526	5,360	7,054	3,061	3,308	41,954
York	West	4,026	317	1,125	91	314	756	852	2,202	9,683
Total		432,468	67,439	121,715	41,304	141,089	166,475	69,934	107,203	1,147,628

District Forecasts – Employment by Transp.-relevant Industry (2010)

EMPL 2010		MIWTCU	HWY	RTL	BANK	LOSVC	HISRV	SCH	OFFGOV	TOTAL
County										
Anson		4,450	332	901	76	432	562	897	1,966	9,616
Cabarrus		30,172	5,961	12,326	833	6,634	13,545	4,483	8,612	82,565
Cleveland		17,006	2,131	4,903	342	2,311	6,507	3,478	3,196	39,875
Gaston		30,422	5,242	10,444	900	6,569	12,699	5,086	6,165	77,529
Iredell		29,591	5,143	9,968	700	5,791	13,738	4,954	5,578	75,463
Lincoln		12,790	1,720	3,092	327	2,756	3,234	1,918	2,260	28,096
Mecklenburg		220,934	36,167	57,914	40,371	118,593	99,856	32,786	63,070	669,691
Rowan		25,114	2,953	7,790	420	4,222	10,755	4,593	4,029	59,877
Stanly		8,907	1,639	3,019	271	1,299	3,789	1,871	2,086	22,882
Union, NC		31,873	4,491	7,753	543	5,301	7,471	5,920	5,143	68,496
Cherokee		13,801	1,591	3,153	176	1,416	2,702	1,497	1,809	26,146
Chester		6,919	491	1,198	75	448	1,486	1,326	1,921	13,863
Lancaster		9,174	1,449	3,299	330	1,637	3,389	1,711	3,415	24,403
Union, SC		3,768	375	1,081	135	439	1,181	983	1,543	9,504
York		30,996	5,921	10,044	923	8,704	10,540	5,561	7,045	79,735
District										
Anson		4,450	332	901	76	432	562	897	1,966	9,616
Cabarrus	Central	19,540	4,133	9,142	600	4,272	10,329	2,689	5,260	55,966
Cabarrus	NW	5,855	1,373	1,964	90	1,196	2,306	1,205	2,334	16,322
Cabarrus	South	2,971	342	853	105	745	558	188	619	6,379
Cabarrus	NE	1,806	114	366	38	422	352	402	399	3,898
Cleveland	SE	7,171	639	1,117	48	609	1,225	884	474	12,167
Cleveland	Cent	5,408	1,298	3,225	273	1,342	4,781	1,395	2,592	20,314
Cleveland	NW	4,428	194	561	21	360	501	1,199	130	7,394
Gaston	E	12,977	1,069	1,834	226	1,178	1,977	1,759	592	21,611
Gaston	SW	15,211	3,811	7,973	587	4,765	9,979	3,007	5,346	50,679
Gaston	NW	2,234	363	637	88	627	743	321	227	5,240
Iredell	South	8,071	2,213	3,745	261	2,020	4,812	1,594	1,320	24,035
Iredell	S Cent	2,949	701	761	36	396	821	647	260	6,569
Iredell	N Cent	15,883	2,100	5,019	394	3,267	7,758	2,219	3,867	40,507
Iredell	North	2,688	129	444	10	108	347	494	131	4,351
Lincoln	East	3,413	699	980	206	1,564	745	497	272	8,378
Lincoln	Central	8,345	916	1,797	121	1,081	2,416	1,019	1,760	17,453
Lincoln	West	1,033	104	315	0	111	73	402	227	2,265
Mecklenburg	N	12,712	4,112	3,750	272	6,278	7,053	3,333	2,824	40,334
Mecklenburg	NW	21,452	1,769	2,327	104	3,796	3,405	1,652	2,554	37,059
Mecklenburg	NNE	30,469	4,205	5,141	13,406	9,814	6,670	2,262	6,933	78,899
Mecklenburg	ENE	5,901	1,576	2,570	123	2,937	4,250	6,699	1,169	25,224
Mecklenburg	E	10,592	3,032	9,269	241	8,661	8,011	3,434	2,749	45,988
Mecklenburg	S	34,540	9,701	17,988	1,044	26,340	22,774	7,110	13,018	132,515
Mecklenburg	SW	44,511	2,676	6,266	687	20,567	6,139	1,381	8,597	90,824
Mecklenburg	Central	60,757	9,096	10,604	24,495	40,199	41,555	6,916	25,225	218,847
Rowan	S Cent	3,596	420	1,168	59	982	1,081	990	380	8,676
Rowan	N Cent	9,783	2,274	5,817	286	2,059	8,584	2,581	3,320	34,704
Rowan	East	5,100	190	562	34	543	607	596	176	7,808
Rowan	West	6,635	70	244	41	637	482	426	153	8,688
Stanly	North	4,961	931	1,501	174	866	3,105	1,151	1,914	14,603
Stanly	South	3,946	708	1,519	98	433	684	720	172	8,280
Union, NC	NW	13,415	1,583	2,659	172	2,655	1,458	2,461	707	25,110
Union, NC	Central	15,018	2,565	4,504	331	2,394	5,613	2,416	4,160	37,001
Union, NC	East	2,341	242	353	39	79	271	420	176	3,921
Union, NC	South	1,099	101	237	1	174	129	623	101	2,464
Catawba	SE part	754	201	397	45	142	257	121	88	2,005
Cherokee		13,801	1,591	3,153	176	1,416	2,702	1,497	1,809	26,146
Chester		6,919	491	1,198	75	448	1,486	1,326	1,921	13,863
Lancaster	North	1,404	67	60	0	760	78	196	190	2,755
Lancaster	South	7,771	1,381	3,238	330	876	3,311	1,515	3,226	21,648
Union, SC		3,768	375	1,081	135	439	1,181	983	1,543	9,504
York	North	3,733	615	670	136	609	510	830	288	7,390
York	NE	7,603	1,078	1,517	93	1,491	1,257	377	668	14,086
York	SE	15,163	3,885	6,550	603	6,230	7,902	3,391	3,624	47,348
York	West	4,497	343	1,307	91	374	871	964	2,465	10,911
Total		476,671	75,807	137,283	46,468	166,694	191,710	77,186	117,928	1,289,746

District Forecasts –Employment by Transp.-relevant Industry (2015)

EMPL 2015		MIWTCU	HWY	RTL	BANK	LOSVC	HISRV	SCH	OFFGOV	TOTAL
County										
Anson		4,712	363	1,012	91	539	703	971	2,193	10,583
Cabarrus		33,826	7,062	14,394	1,112	8,824	16,203	5,219	9,990	96,631
Cleveland		17,388	2,201	5,193	315	2,665	6,961	3,551	3,368	41,642
Gaston		30,717	5,336	11,069	963	7,662	13,723	5,166	6,442	81,078
Iredell		33,130	6,192	11,783	840	7,426	16,265	5,884	6,568	88,088
Lincoln		13,998	2,140	3,766	398	3,378	4,153	2,154	2,555	32,542
Mecklenburg		240,662	40,391	62,519	45,556	136,857	111,819	36,020	68,320	742,145
Rowan		27,208	3,193	8,205	392	5,005	11,461	4,815	4,313	64,592
Stanly		9,223	1,757	3,276	293	1,589	4,220	1,975	2,299	24,632
Union, NC		36,558	5,733	9,608	731	7,310	9,772	7,169	6,295	83,175
Cherokee		14,742	1,721	3,471	179	1,740	3,216	1,583	2,021	28,672
Chester		7,444	536	1,343	83	577	1,724	1,457	2,141	15,305
Lancaster		9,690	1,761	3,830	385	2,032	4,143	2,008	3,859	27,709
Union, SC		3,995	337	1,121	134	487	1,337	1,028	1,667	10,106
York		34,855	6,532	11,402	1,094	10,500	12,148	6,173	7,904	90,607
District										
Anson		4,712	363	1,012	91	539	703	971	2,193	10,583
Cabarrus	Central	22,111	4,789	10,483	770	5,704	12,155	3,162	6,104	65,279
Cabarrus	NW	6,034	1,603	2,320	106	1,497	2,772	1,348	2,645	18,325
Cabarrus	South	3,546	483	1,085	165	1,057	772	229	748	8,086
Cabarrus	NE	2,135	187	507	71	565	504	480	492	4,941
Cleveland	SE	7,355	657	1,189	44	692	1,292	911	505	12,645
Cleveland	Cent	5,488	1,345	3,411	251	1,582	5,094	1,463	2,723	21,356
Cleveland	NW	4,544	200	593	20	391	575	1,177	140	7,640
Gaston	E	12,898	1,076	1,933	226	1,373	2,185	1,758	629	22,078
Gaston	SW	15,543	3,897	8,472	649	5,637	10,776	3,084	5,585	53,643
Gaston	NW	2,276	362	664	88	652	762	324	228	5,357
Iredell	South	9,549	2,739	4,538	345	2,812	5,937	1,935	1,661	29,515
Iredell	S Cent	3,602	922	1,054	67	611	1,196	825	364	8,639
Iredell	N Cent	17,101	2,386	5,658	420	3,839	8,681	2,546	4,380	45,011
Iredell	North	2,879	145	533	9	164	451	578	163	4,923
Lincoln	East	4,109	956	1,308	290	1,944	1,154	615	372	10,747
Lincoln	Central	8,720	1,074	2,092	108	1,310	2,906	1,100	1,932	19,241
Lincoln	West	1,170	110	367	0	124	94	439	251	2,555
Mecklenburg	N	15,114	4,988	4,645	354	8,267	8,658	3,960	3,376	49,361
Mecklenburg	NW	22,734	2,061	2,614	105	4,534	3,958	1,831	2,843	40,679
Mecklenburg	NNE	35,091	5,236	6,227	15,464	12,990	9,147	2,714	8,122	94,991
Mecklenburg	ENE	6,576	1,880	2,920	163	3,741	4,961	7,190	1,401	28,832
Mecklenburg	E	11,514	3,118	9,601	252	9,527	8,348	3,609	2,807	48,777
Mecklenburg	S	38,437	10,141	18,753	1,191	30,398	24,740	7,653	13,736	145,048
Mecklenburg	SW	47,735	3,033	6,518	724	23,069	7,419	1,515	8,962	98,975
Mecklenburg	Central	63,459	9,934	11,241	27,304	44,332	44,589	7,548	27,074	235,481
Rowan	S Cent	3,745	471	1,215	57	1,103	1,190	1,023	416	9,220
Rowan	N Cent	10,178	2,399	6,043	231	2,355	8,913	2,677	3,501	36,298
Rowan	East	5,618	208	623	28	662	734	639	195	8,707
Rowan	West	7,667	115	324	75	885	623	476	201	10,368
Stanly	North	4,975	992	1,617	188	1,044	3,401	1,203	2,084	15,505
Stanly	South	4,247	765	1,659	105	546	819	771	216	9,127
Union, NC	NW	15,943	2,150	3,417	254	3,674	2,244	3,090	992	31,764
Union, NC	Central	16,663	3,123	5,395	427	3,208	6,945	2,817	4,953	43,531
Union, NC	East	2,632	313	461	49	155	399	508	217	4,735
Union, NC	South	1,319	147	335	1	273	184	754	133	3,145
Catawba	SE part	889	265	517	63	198	348	151	119	2,549
Cherokee		14,742	1,721	3,471	179	1,740	3,216	1,583	2,021	28,672
Chester		7,444	536	1,343	83	577	1,724	1,457	2,141	15,305
Lancaster	North	1,670	124	83	2	940	128	245	230	3,422
Lancaster	South	8,020	1,637	3,747	384	1,092	4,015	1,764	3,629	24,288
Union, SC		3,995	337	1,121	134	487	1,337	1,028	1,667	10,106
York	North	4,085	645	722	150	719	544	884	310	8,059
York	NE	8,729	1,285	1,810	142	2,037	1,585	444	824	16,856
York	SE	17,052	4,221	7,384	703	7,264	9,020	3,761	4,009	53,414
York	West	4,989	381	1,485	99	480	998	1,084	2,761	12,278
Total		519,037	85,520	152,508	52,630	196,790	218,194	85,322	130,056	1,440,057

District Forecasts – Employment by Transp.-relevant Industry (2020)

EMPL 2020		MIWTCU	HWY	RTL	BANK	LOSVC	HISRV	SCH	OFFGOV	TOTAL
County										
Anson		5,020	431	1,145	111	692	887	1,065	2,435	11,786
Cabarrus		37,394	8,147	16,244	1,428	11,309	18,777	5,992	11,442	110,733
Cleveland		17,671	2,379	5,474	295	3,098	7,364	3,656	3,597	43,533
Gaston		31,089	5,483	11,560	1,034	8,916	14,687	5,276	6,771	84,817
Iredell		36,500	7,256	13,620	1,009	9,361	18,897	6,889	7,648	101,180
Lincoln		15,144	2,599	4,490	472	4,112	5,251	2,437	2,896	37,401
Mecklenburg		258,285	44,837	66,779	50,992	155,970	123,855	39,280	73,637	813,636
Rowan		29,009	3,569	8,628	373	5,954	12,182	5,082	4,607	69,404
Stanly		9,646	1,927	3,540	328	1,964	4,636	2,116	2,537	26,694
Union, NC		41,338	6,854	11,457	961	9,692	12,316	8,413	7,501	98,533
Cherokee		15,678	1,918	3,770	185	2,161	3,776	1,702	2,287	31,475
Chester		8,089	621	1,514	95	760	1,978	1,605	2,389	17,052
Lancaster		10,235	2,103	4,323	453	2,515	4,992	2,326	4,314	31,260
Union, SC		4,392	320	1,169	136	579	1,505	1,091	1,819	11,012
York		38,484	7,119	12,631	1,279	12,506	13,940	6,785	8,802	101,545
District										
Anson		5,020	431	1,145	111	692	887	1,065	2,435	11,786
Cabarrus	Central	24,444	5,405	11,604	948	7,266	13,752	3,649	6,972	74,041
Cabarrus	NW	6,323	1,838	2,666	130	1,892	3,296	1,503	2,986	20,634
Cabarrus	South	4,121	620	1,308	233	1,409	1,026	270	879	9,866
Cabarrus	NE	2,505	284	666	117	742	703	570	605	6,192
Cleveland	SE	7,478	706	1,265	39	797	1,362	948	551	13,145
Cleveland	Cent	5,556	1,458	3,584	238	1,878	5,354	1,543	2,891	22,501
Cleveland	NW	4,637	215	624	18	423	649	1,166	155	7,887
Gaston	E	12,861	1,093	2,016	217	1,640	2,395	1,762	676	22,660
Gaston	SW	15,903	4,024	8,861	732	6,604	11,512	3,186	5,861	56,683
Gaston	NW	2,325	366	682	85	672	780	328	234	5,474
Iredell	South	11,067	3,242	5,333	440	3,749	7,098	2,299	2,026	35,255
Iredell	S Cent	4,324	1,163	1,389	111	903	1,668	1,026	488	11,072
Iredell	N Cent	18,056	2,683	6,268	449	4,469	9,555	2,889	4,930	49,297
Iredell	North	3,053	168	631	9	241	576	675	205	5,557
Lincoln	East	4,840	1,228	1,665	377	2,385	1,668	753	477	13,393
Lincoln	Central	8,988	1,253	2,401	95	1,581	3,458	1,199	2,138	21,114
Lincoln	West	1,315	118	423	0	146	125	485	281	2,894
Mecklenburg	N	17,501	5,895	5,564	439	10,506	10,327	4,608	3,990	58,830
Mecklenburg	NW	23,748	2,389	2,884	95	5,332	4,505	2,018	3,149	44,121
Mecklenburg	NNE	39,246	6,180	7,223	17,575	16,444	11,814	3,151	9,166	110,799
Mecklenburg	ENE	7,285	2,182	3,256	209	4,622	5,736	7,663	1,647	32,600
Mecklenburg	E	12,410	3,235	9,902	253	10,344	8,674	3,797	2,896	51,511
Mecklenburg	S	42,252	10,583	19,324	1,335	34,573	26,428	8,164	14,450	157,108
Mecklenburg	SW	49,907	3,412	6,667	723	25,450	8,710	1,638	9,232	105,739
Mecklenburg	Central	65,936	10,961	11,960	30,363	48,699	47,660	8,242	29,108	252,929
Rowan	S Cent	3,864	556	1,263	58	1,239	1,297	1,065	463	9,804
Rowan	N Cent	10,511	2,581	6,249	178	2,736	9,193	2,798	3,666	37,912
Rowan	East	6,034	241	686	22	799	876	681	215	9,554
Rowan	West	8,601	192	429	115	1,180	816	538	264	12,134
Stanly	North	5,055	1,081	1,739	210	1,264	3,653	1,273	2,268	16,542
Stanly	South	4,591	846	1,802	118	700	983	843	269	10,152
Union, NC	NW	18,491	2,637	4,147	342	4,844	3,196	3,696	1,297	38,649
Union, NC	Central	18,279	3,616	6,271	545	4,163	8,285	3,216	5,764	50,139
Union, NC	East	2,996	402	596	72	282	577	612	269	5,804
Union, NC	South	1,572	199	443	2	404	257	890	172	3,941
Catawba	SE part	1,036	341	653	82	269	459	185	158	3,183
Cherokee		15,678	1,918	3,770	185	2,161	3,776	1,702	2,287	31,475
Chester		8,089	621	1,514	95	760	1,978	1,605	2,389	17,052
Lancaster	North	1,939	187	103	5	1,135	188	286	275	4,117
Lancaster	South	8,296	1,916	4,219	449	1,379	4,805	2,040	4,040	27,144
Union, SC		4,392	320	1,169	136	579	1,505	1,091	1,819	11,012
York	North	4,393	668	760	156	860	557	932	330	8,656
York	NE	9,653	1,457	2,063	192	2,603	1,940	500	967	19,376
York	SE	18,956	4,561	8,154	813	8,415	10,310	4,145	4,430	59,785
York	West	5,481	432	1,653	117	628	1,134	1,207	3,075	13,728
Total		559,011	95,903	166,996	59,236	229,857	245,502	93,901	142,840	1,593,245

District Forecasts –Employment by Transp.-relevant Industry (2025)

EMPL 2025		MIWTCU	HWY	RTL	BANK	LOSVC	HISRV	SCH	OFFGOV	TOTAL
County										
Anson		5,368	536	1,301	137	892	1,104	1,179	2,687	13,204
Cabarrus		40,801	9,145	17,794	1,751	13,989	21,211	6,760	12,883	124,333
Cleveland		17,890	2,635	5,746	281	3,590	7,731	3,794	3,868	45,534
Gaston		31,473	5,682	11,921	1,104	10,248	15,596	5,413	7,120	88,557
Iredell		39,697	8,275	15,397	1,198	11,524	21,531	7,913	8,756	114,291
Lincoln		16,204	3,080	5,219	548	4,931	6,451	2,758	3,267	42,459
Mecklenburg		273,750	49,198	70,688	56,233	175,019	136,147	42,393	78,701	882,129
Rowan		30,575	4,040	9,079	357	7,033	12,961	5,387	4,902	74,333
Stanly		10,167	2,133	3,811	376	2,412	5,041	2,292	2,790	29,022
Union, NC		46,060	7,825	13,197	1,214	12,354	14,928	9,591	8,702	113,871
Cherokee		16,588	2,172	4,059	197	2,666	4,372	1,852	2,592	34,498
Chester		8,826	742	1,709	113	995	2,245	1,769	2,656	19,054
Lancaster		10,782	2,419	4,735	520	3,050	5,836	2,627	4,743	34,712
Union, SC		4,926	338	1,234	141	715	1,693	1,172	1,992	12,212
York		41,733	7,635	13,663	1,458	14,607	15,772	7,357	9,675	111,899
District										
Anson		5,368	536	1,301	137	892	1,104	1,179	2,687	13,204
Cabarrus	Central	26,527	5,942	12,462	1,117	8,892	15,122	4,125	7,813	82,001
Cabarrus	NW	6,688	2,064	2,985	160	2,362	3,850	1,657	3,335	23,100
Cabarrus	South	4,679	743	1,510	301	1,784	1,297	310	1,004	11,628
Cabarrus	NE	2,906	396	837	173	950	941	668	731	7,603
Cleveland	SE	7,549	782	1,345	34	923	1,437	994	609	13,673
Cleveland	Cent	5,631	1,617	3,742	230	2,207	5,569	1,630	3,082	23,709
Cleveland	NW	4,710	237	658	16	460	724	1,170	177	8,151
Gaston	E	12,824	1,125	2,086	203	1,951	2,605	1,774	728	23,295
Gaston	SW	16,263	4,178	9,139	821	7,605	12,189	3,304	6,144	59,643
Gaston	NW	2,386	380	695	80	693	802	335	248	5,618
Iredell	South	12,576	3,693	6,090	542	4,788	8,234	2,666	2,398	40,987
Iredell	S Cent	5,100	1,413	1,749	170	1,267	2,213	1,239	624	13,774
Iredell	N Cent	18,804	2,969	6,825	477	5,132	10,363	3,226	5,481	53,277
Iredell	North	3,218	200	733	8	337	721	782	254	6,253
Lincoln	East	5,585	1,498	2,031	465	2,865	2,243	906	584	16,178
Lincoln	Central	9,149	1,445	2,703	83	1,884	4,040	1,315	2,367	22,984
Lincoln	West	1,469	137	485	0	183	168	538	317	3,298
Mecklenburg	N	19,830	6,781	6,474	524	12,911	12,046	5,246	4,634	68,445
Mecklenburg	NW	24,534	2,722	3,136	81	6,169	5,067	2,203	3,454	47,364
Mecklenburg	NNE	42,894	6,994	8,121	19,603	20,010	14,569	3,547	10,040	125,778
Mecklenburg	ENE	7,992	2,446	3,558	255	5,540	6,524	8,072	1,886	36,273
Mecklenburg	E	13,235	3,365	10,158	245	11,083	9,006	3,987	3,001	54,079
Mecklenburg	S	45,824	10,989	19,739	1,467	38,627	27,973	8,626	15,080	168,325
Mecklenburg	SW	51,171	3,795	6,743	685	27,539	9,993	1,751	9,402	111,078
Mecklenburg	Central	68,271	12,107	12,758	33,374	53,140	50,971	8,961	31,206	270,787
Rowan	S Cent	3,969	664	1,319	58	1,392	1,420	1,117	517	10,456
Rowan	N Cent	10,789	2,790	6,452	130	3,181	9,441	2,936	3,814	39,533
Rowan	East	6,358	290	754	17	949	1,038	726	235	10,366
Rowan	West	9,458	296	554	152	1,511	1,062	608	336	13,977
Stanly	North	5,194	1,189	1,863	237	1,521	3,877	1,358	2,460	17,699
Stanly	South	4,972	944	1,948	139	891	1,165	933	330	11,323
Union, NC	NW	20,970	3,028	4,805	431	6,112	4,202	4,241	1,602	45,390
Union, NC	Central	19,822	4,032	7,083	672	5,225	9,580	3,597	6,550	56,561
Union, NC	East	3,419	508	753	108	456	797	727	332	7,101
Union, NC	South	1,848	257	557	4	561	349	1,025	218	4,819
Catawba	SE part	1,195	426	799	103	353	587	222	202	3,886
Cherokee		16,588	2,172	4,059	197	2,666	4,372	1,852	2,592	34,498
Chester		8,826	742	1,709	113	995	2,245	1,769	2,656	19,054
Lancaster	North	2,187	243	119	7	1,329	239	315	316	4,756
Lancaster	South	8,595	2,175	4,616	513	1,721	5,597	2,312	4,426	29,956
Union, SC		4,926	338	1,234	141	715	1,693	1,172	1,992	12,212
York	North	4,659	681	785	154	1,009	560	971	349	9,168
York	NE	10,338	1,575	2,249	237	3,147	2,264	540	1,080	21,430
York	SE	20,788	4,884	8,822	919	9,635	11,674	4,517	4,854	66,093
York	West	5,948	495	1,807	148	815	1,275	1,329	3,392	15,209
Total		596,033	106,281	180,352	65,731	264,377	273,207	102,479	155,535	1,743,995

District Forecasts – Employment by Transp.-relevant Industry (2030)

EMPL 2030		MIWTCU	HWY	RTL	BANK	LOSVC	HISRV	SCH	OFFGOV	TOTAL
County										
Anson		5,753	674	1,479	169	1,138	1,347	1,310	2,943	14,812
Cabarrus		43,972	9,987	18,962	2,052	16,764	23,448	7,479	14,228	136,891
Cleveland		18,084	2,944	6,008	272	4,123	8,075	3,963	4,163	47,631
Gaston		31,804	5,932	12,158	1,162	11,575	16,452	5,569	7,458	92,110
Iredell		42,716	9,189	17,030	1,397	13,846	24,062	8,901	9,830	126,972
Lincoln		17,153	3,566	5,912	626	5,807	7,681	3,107	3,651	47,503
Mecklenburg		287,005	53,164	74,239	60,832	193,091	148,878	45,189	83,193	945,591
Rowan		31,959	4,567	9,576	337	8,207	13,845	5,724	5,186	79,401
Stanly		10,772	2,359	4,089	433	2,922	5,440	2,501	3,052	31,567
Union, NC		50,569	8,614	14,727	1,472	15,201	17,437	10,638	9,835	128,494
Cherokee		17,452	2,474	4,347	214	3,244	4,994	2,034	2,925	37,685
Chester		9,624	896	1,924	135	1,280	2,525	1,943	2,933	21,260
Lancaster		11,305	2,654	5,029	573	3,602	6,571	2,879	5,107	37,720
Union, SC		5,565	408	1,321	150	898	1,904	1,271	2,181	13,698
York		44,452	8,035	14,429	1,611	16,686	17,499	7,848	10,459	121,018
District										
Anson		5,753	674	1,479	169	1,138	1,347	1,310	2,943	14,812
Cabarrus	Central	28,345	6,360	13,016	1,261	10,521	16,268	4,566	8,576	88,912
Cabarrus	NW	7,095	2,261	3,259	193	2,890	4,408	1,800	3,671	25,577
Cabarrus	South	5,201	845	1,679	365	2,164	1,563	346	1,115	13,277
Cabarrus	NE	3,331	520	1,008	234	1,189	1,209	768	866	9,125
Cleveland	SE	7,578	882	1,427	29	1,071	1,524	1,049	677	14,238
Cleveland	Cent	5,734	1,800	3,883	228	2,545	5,749	1,719	3,281	24,940
Cleveland	NW	4,771	262	698	15	506	801	1,194	204	8,452
Gaston	E	12,747	1,180	2,146	184	2,274	2,817	1,796	781	23,925
Gaston	SW	16,594	4,342	9,305	905	8,581	12,808	3,428	6,404	62,368
Gaston	NW	2,462	410	707	73	721	827	345	273	5,818
Iredell	South	14,025	4,061	6,767	644	5,891	9,287	3,012	2,760	46,446
Iredell	S Cent	5,913	1,659	2,117	243	1,696	2,804	1,455	765	16,652
Iredell	N Cent	19,399	3,226	7,307	501	5,806	11,089	3,540	5,997	56,864
Iredell	North	3,380	242	838	8	453	883	895	308	7,008
Lincoln	East	6,320	1,751	2,383	555	3,359	2,835	1,070	687	18,960
Lincoln	Central	9,199	1,642	2,977	71	2,205	4,619	1,442	2,605	24,760
Lincoln	West	1,633	174	552	0	243	227	595	360	3,783
Mecklenburg	N	22,061	7,590	7,340	606	15,397	13,799	5,844	5,276	77,912
Mecklenburg	NW	25,130	3,028	3,365	68	7,022	5,662	2,375	3,737	50,387
Mecklenburg	NNE	45,998	7,634	8,915	21,416	23,520	17,308	3,875	10,718	139,384
Mecklenburg	ENE	8,664	2,634	3,809	296	6,453	7,270	8,372	2,100	39,598
Mecklenburg	E	13,945	3,493	10,356	225	11,716	9,360	4,170	3,103	56,368
Mecklenburg	S	48,992	11,321	20,039	1,573	42,323	29,513	9,026	15,546	178,332
Mecklenburg	SW	51,669	4,164	6,780	608	29,166	11,246	1,858	9,466	114,957
Mecklenburg	Central	70,545	13,300	13,635	36,041	57,494	54,719	9,669	33,248	288,652
Rowan	S Cent	4,074	786	1,389	59	1,564	1,582	1,177	573	11,204
Rowan	N Cent	11,022	3,000	6,665	90	3,669	9,673	3,087	3,941	41,147
Rowan	East	6,601	356	828	12	1,106	1,228	774	257	11,162
Rowan	West	10,262	425	694	177	1,867	1,362	686	415	15,888
Stanly	North	5,388	1,305	1,990	264	1,809	4,087	1,460	2,656	18,960
Stanly	South	5,384	1,054	2,098	169	1,114	1,352	1,040	396	12,607
Union, NC	NW	23,294	3,302	5,348	512	7,425	5,152	4,690	1,890	51,613
Union, NC	Central	21,248	4,358	7,780	794	6,363	10,773	3,946	7,268	62,531
Union, NC	East	3,893	631	928	159	676	1,053	850	408	8,598
Union, NC	South	2,133	322	671	7	737	459	1,152	269	5,752
Catawba	SE part	1,362	517	950	126	447	728	258	251	4,640
Cherokee		17,452	2,474	4,347	214	3,244	4,994	2,034	2,925	37,685
Chester		9,624	896	1,924	135	1,280	2,525	1,943	2,933	21,260
Lancaster	North	2,391	281	130	9	1,504	261	330	349	5,255
Lancaster	South	8,914	2,373	4,899	564	2,098	6,310	2,549	4,758	32,465
Union, SC		5,565	408	1,321	150	898	1,904	1,271	2,181	13,698
York	North	4,884	681	794	144	1,148	567	997	368	9,583
York	NE	10,741	1,618	2,343	267	3,624	2,500	558	1,147	22,799
York	SE	22,458	5,166	9,350	1,008	10,878	13,012	4,850	5,248	71,971
York	West	6,368	569	1,941	193	1,036	1,419	1,443	3,696	16,665
Total		629,547	115,980	192,180	71,562	298,830	300,885	110,614	167,394	1,886,992

District Forecasts –Employment by Transp.-relevant Industry (2035)

EMPL 2035		MIWTCU	HWY	RTL	BANK	LOSVC	HISRV	SCH	OFFGOV	TOTAL
County										
Anson		6,170	843	1,679	208	1,428	1,606	1,456	3,197	16,588
Cabarrus		46,833	10,602	19,665	2,304	19,534	25,430	8,109	15,391	147,868
Cleveland		18,290	3,276	6,262	265	4,678	8,411	4,164	4,463	49,809
Gaston		32,017	6,232	12,275	1,200	12,814	17,259	5,739	7,754	95,288
Iredell		45,555	9,935	18,437	1,597	16,256	26,389	9,797	10,808	138,774
Lincoln		17,969	4,041	6,526	705	6,710	8,865	3,473	4,031	52,318
Mecklenburg		297,994	56,428	77,425	64,345	209,271	162,230	47,496	86,794	1,001,984
Rowan		33,219	5,111	10,140	309	9,440	14,876	6,084	5,450	84,629
Stanly		11,449	2,591	4,373	498	3,486	5,834	2,740	3,313	34,283
Union, NC		54,710	9,192	15,944	1,715	18,140	19,670	11,492	10,842	141,704
Cherokee		18,253	2,815	4,645	235	3,881	5,632	2,247	3,273	40,980
Chester		10,455	1,077	2,159	163	1,614	2,815	2,125	3,211	23,619
Lancaster		11,779	2,753	5,162	598	4,137	7,097	3,044	5,369	39,939
Union, SC		6,273	544	1,439	163	1,129	2,145	1,387	2,381	15,460
York		46,491	8,271	14,858	1,720	18,629	18,974	8,220	11,089	128,252
District										
Anson		6,170	843	1,679	208	1,428	1,606	1,456	3,197	16,588
Cabarrus	Central	29,883	6,619	13,221	1,362	12,089	17,191	4,947	9,210	94,522
Cabarrus	NW	7,508	2,415	3,470	227	3,456	4,943	1,922	3,975	27,916
Cabarrus	South	5,670	920	1,801	418	2,533	1,800	375	1,203	14,720
Cabarrus	NE	3,772	648	1,172	297	1,456	1,496	866	1,003	10,711
Cleveland	SE	7,578	1,001	1,510	25	1,241	1,627	1,115	753	14,848
Cleveland	Cent	5,887	1,987	4,004	228	2,871	5,902	1,805	3,472	26,154
Cleveland	NW	4,826	288	748	13	566	883	1,244	239	8,807
Gaston	E	12,588	1,265	2,197	164	2,580	3,030	1,830	832	24,486
Gaston	SW	16,870	4,503	9,355	971	9,470	13,371	3,551	6,611	64,701
Gaston	NW	2,558	464	722	65	764	858	359	311	6,101
Iredell	South	15,364	4,316	7,325	740	7,014	10,195	3,316	3,097	51,367
Iredell	S Cent	6,748	1,890	2,476	331	2,185	3,418	1,662	904	19,613
Iredell	N Cent	19,896	3,432	7,691	518	6,468	11,715	3,810	6,441	59,970
Iredell	North	3,548	298	944	8	589	1,061	1,009	367	7,823
Lincoln	East	7,022	1,968	2,700	645	3,844	3,399	1,239	782	21,600
Lincoln	Central	9,138	1,836	3,201	59	2,535	5,163	1,579	2,840	26,351
Lincoln	West	1,809	237	625	0	331	303	654	408	4,367
Mecklenburg	N	24,152	8,268	8,130	681	17,878	15,573	6,371	5,885	86,937
Mecklenburg	NW	25,577	3,278	3,570	63	7,868	6,312	2,524	3,979	53,169
Mecklenburg	NNE	48,520	8,057	9,597	22,879	26,806	19,930	4,111	11,173	151,073
Mecklenburg	ENE	9,267	2,710	3,987	328	7,321	7,921	8,519	2,269	42,321
Mecklenburg	E	14,497	3,602	10,483	193	12,215	9,756	4,334	3,185	58,266
Mecklenburg	S	51,595	11,541	20,263	1,642	45,423	31,184	9,347	15,768	186,761
Mecklenburg	SW	51,545	4,500	6,809	494	30,161	12,447	1,963	9,420	117,338
Mecklenburg	Central	72,842	14,473	14,588	38,066	61,600	59,107	10,327	35,115	306,118
Rowan	S Cent	4,194	912	1,478	58	1,759	1,803	1,243	628	12,075
Rowan	N Cent	11,218	3,183	6,907	60	4,178	9,903	3,244	4,045	42,738
Rowan	East	6,771	441	910	9	1,266	1,452	828	281	11,959
Rowan	West	11,035	575	846	182	2,237	1,717	769	496	17,858
Stanly	North	5,630	1,423	2,118	289	2,122	4,301	1,578	2,850	20,311
Stanly	South	5,819	1,168	2,255	209	1,363	1,532	1,162	464	13,973
Union, NC	NW	25,375	3,443	5,732	579	8,730	5,934	5,006	2,143	56,941
Union, NC	Central	22,513	4,584	8,314	897	7,547	11,809	4,246	7,876	67,787
Union, NC	East	4,407	771	1,120	226	938	1,336	976	496	10,269
Union, NC	South	2,415	394	778	13	925	591	1,264	328	6,707
Catawba	SE part	1,537	612	1,099	152	550	878	292	304	5,424
Cherokee		18,253	2,815	4,645	235	3,881	5,632	2,247	3,273	40,980
Chester		10,455	1,077	2,159	163	1,614	2,815	2,125	3,211	23,619
Lancaster	North	2,529	288	133	8	1,645	236	326	365	5,530
Lancaster	South	9,250	2,465	5,029	590	2,492	6,860	2,719	5,004	34,409
Union, SC		6,273	544	1,439	163	1,129	2,145	1,387	2,381	15,460
York	North	5,068	665	789	125	1,257	592	1,005	389	9,889
York	NE	10,825	1,566	2,319	274	3,991	2,593	550	1,151	23,268
York	SE	23,880	5,386	9,700	1,067	12,095	14,227	5,119	5,578	77,052
York	West	6,718	655	2,050	253	1,287	1,562	1,545	3,971	18,043
Total		658,995	124,324	202,087	76,176	331,696	328,109	117,865	177,670	2,016,921

Traffic Forecast

Comparison of Forecast 2025 Traffic Volumes & Capacity Recommended Sections – OPTION 1

Study Segment	Scenario	Highway Sections					Arterial Sections				
		Description	2025 Volume	2025 Capacity	V/C Ratio	Estimated LOS	Description	2025 Volume	2025 Capacity	V/C Ratio	Estimated LOS
1	Linked Centers						4 lane suburban arterial	14000	27500	0.51	A
2	Linked Centers	4 lane highway	16000 - 18000	47000	0.34 - 0.38	A	4 lane suburban arterial	14000 - 18000	24500	0.57 - 0.73	B
3	Linked Centers	4 lane highway	18000 - 30000	47000	0.38 - 0.64	B	4 lane suburban arterial	20000	24500	0.82	D
4	Linked Centers	4 lane highway	29000	51000	0.57	B	6 lane suburban arterial	36000 - 45000	41500	0.87 - 1.08	E
5	Linked Centers	6 lane highway	45000	76000	0.59	B					
6	Linked Centers	6 lane highway	42000 - 50000	76000	0.55 - 0.66	B	6 lane suburban arterial	42000	41500	1.01	E
7	Linked Centers	4 lane highway	32000	51000	0.63	B	8 lane urban arterial	40000 - 56000	53000	0.75 - 1.06	E
8a	Linked Centers	4 lane highway	30000 - 38000	51000	0.59 - 0.75	C	6 lane suburban arterial	30000 - 38000	38000	0.79 - 1.00	D
8b	Linked Centers	4 lane highway	28000 - 30000	47000	0.60 - 0.64	B	6 lane suburban arterial	28000 - 30000	38000	0.74 - 0.79	C
9	Linked Centers	4 lane highway	30000	51000	0.59	B	6 lane suburban arterial	39000	41500	0.94	E

Comparison of Forecast 2025 Traffic Volumes & Capacity
Recommended Sections – OPTION 2

Study Segment	Scenario	Highway Sections					Arterial Sections				
		Description	2025 Volume	2025 Capacity	V/C Ratio	Estimated LOS	Description	2025 Volume	2025 Capacity	V/C Ratio	Estimated LOS
1	Thruway	4 lane highway	14000	51000	0.27	*A*					
2	Thruway	4 lane highway	16000 - 18000	47000	0.34 - 0.38	*A*					
3	Thruway	4 lane highway	18000 - 30000	47000	0.38 -0.64	*B*					
4	Parallel Network	2 lane highway	14500	16400	0.88	*D*	2 lane suburban arterial	12000 - 14500	14000	0.85 - 1.04	*E*
							4 lane suburban arterial	20000	27500	0.73	*C*
5	Thruway	6 lane highway	45000	76000	0.59	*B*					
6	Parallel Network	6 lane highway	42000 - 50000	76000	0.55 - 0.66	*B*	4 lane suburban arterial	15000 - 21000	27500	0.55 - 0.76	*C*
7	Parallel Network						6 lane urban arterial	27000 - 35000	38000	0.71 - 0.92	*D*
							4 lane urban arterial	9000 - 20500	26000	0.35 - 0.80	*C*
							2 lane suburban arterial	6000 - 12000	14000	0.43 - 0.86	*D*
8a	Thruway	4 lane highway	30000 - 38000	51000	0.59 - 0.75	*C*					
8b	Thruway	4 lane highway	28000 - 30000	47000	0.60 - 0.64	*B*					
9	Parallel Network	4 lane highway	20000	51000	0.39	*A*	6 lane suburban arterial	30000-35000	41500	0.72 - 84	*C*
							2 lane suburban arterial	10000	14000	0.71	*C*

Traffic Legend

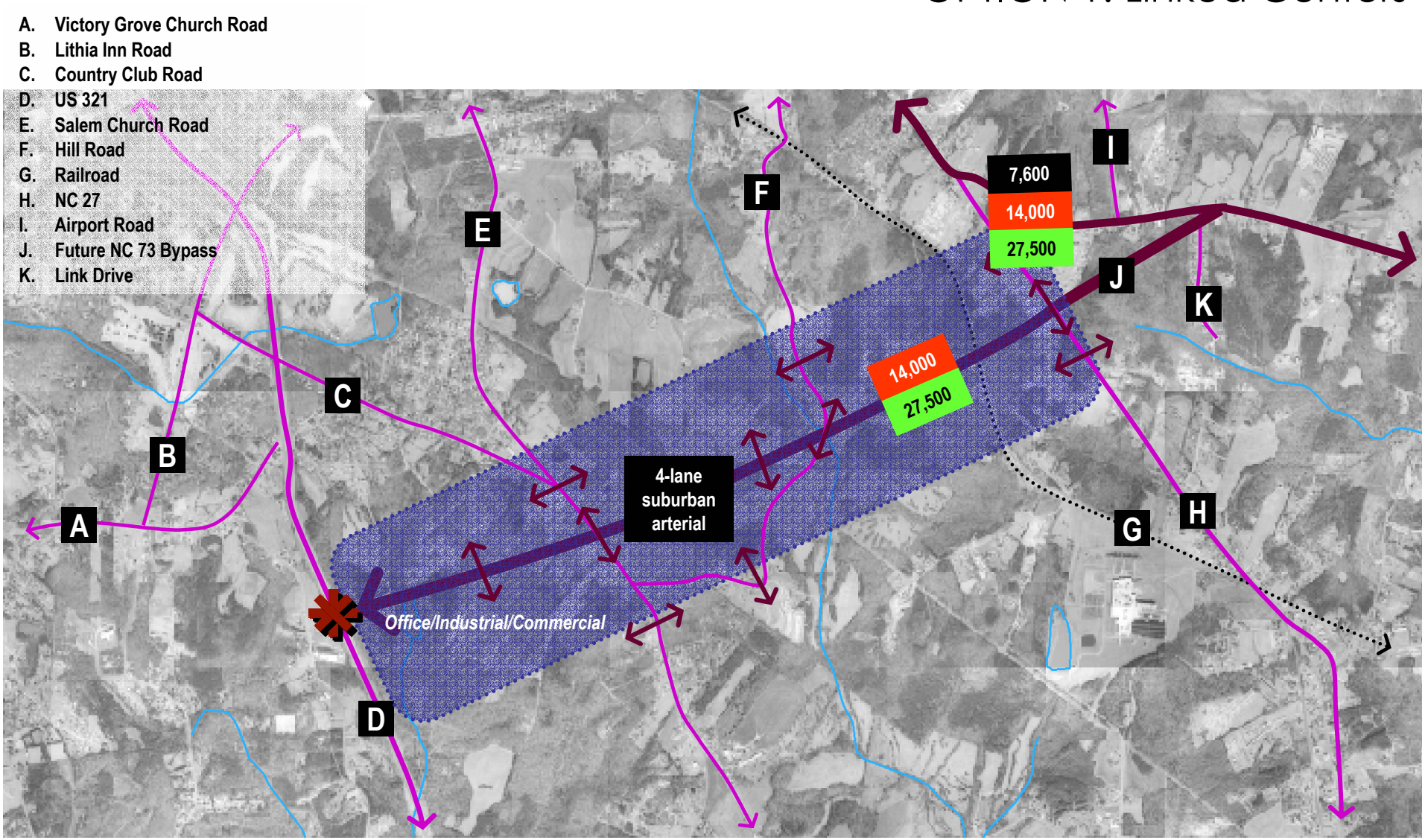
6,400 **Existing Traffic**

18,000 **Projected 2025 Traffic**

30,000 **Capacity** per Highway Capacity Manual

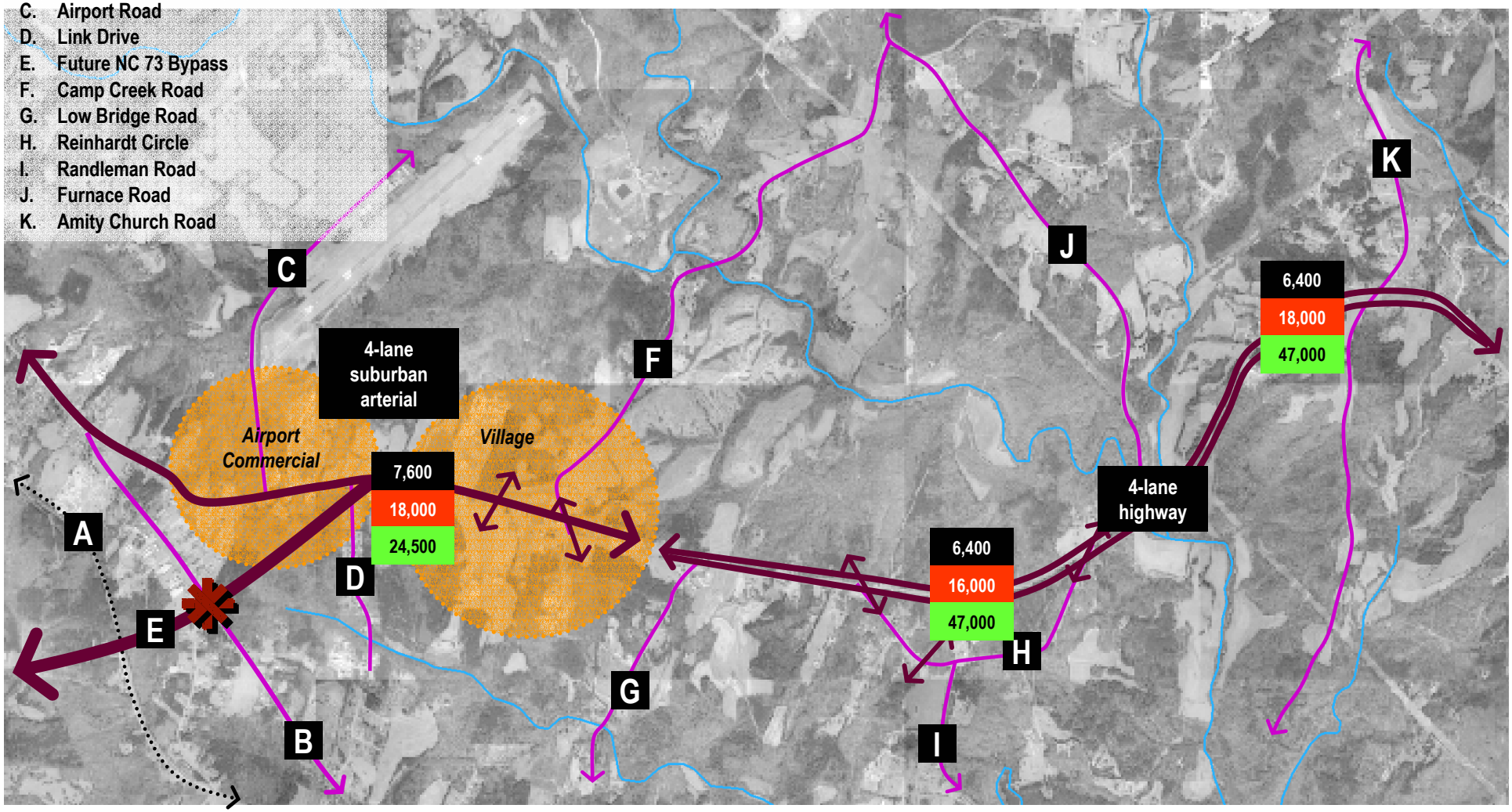
4-lane suburban arterial with median **Facility** per Highway Capacity Manual

Segment 1: US 321 to Link Drive – OPTION 1: Linked Centers

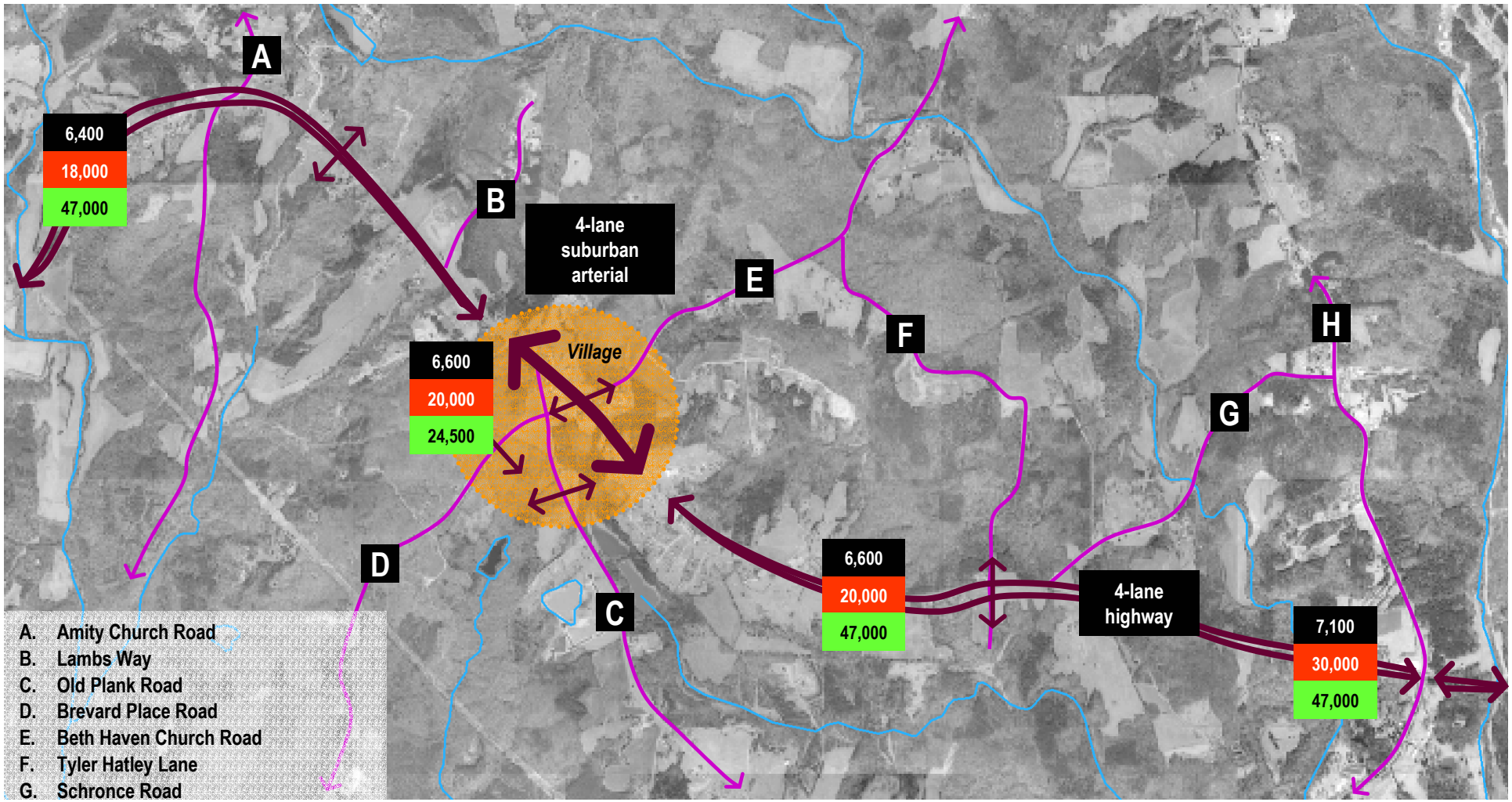


Segment 2: Link Drive to Reed Creek – OPTION 1: Linked Centers

A. Railroad
B. NC 27
C. Airport Road
D. Link Drive
E. Future NC 73 Bypass
F. Camp Creek Road
G. Low Bridge Road
H. Reinhardt Circle
I. Randleman Road
J. Furnace Road
K. Amity Church Road



Segment 3: Reed Creek to Killian Creek – OPTION 1: Linked Centers

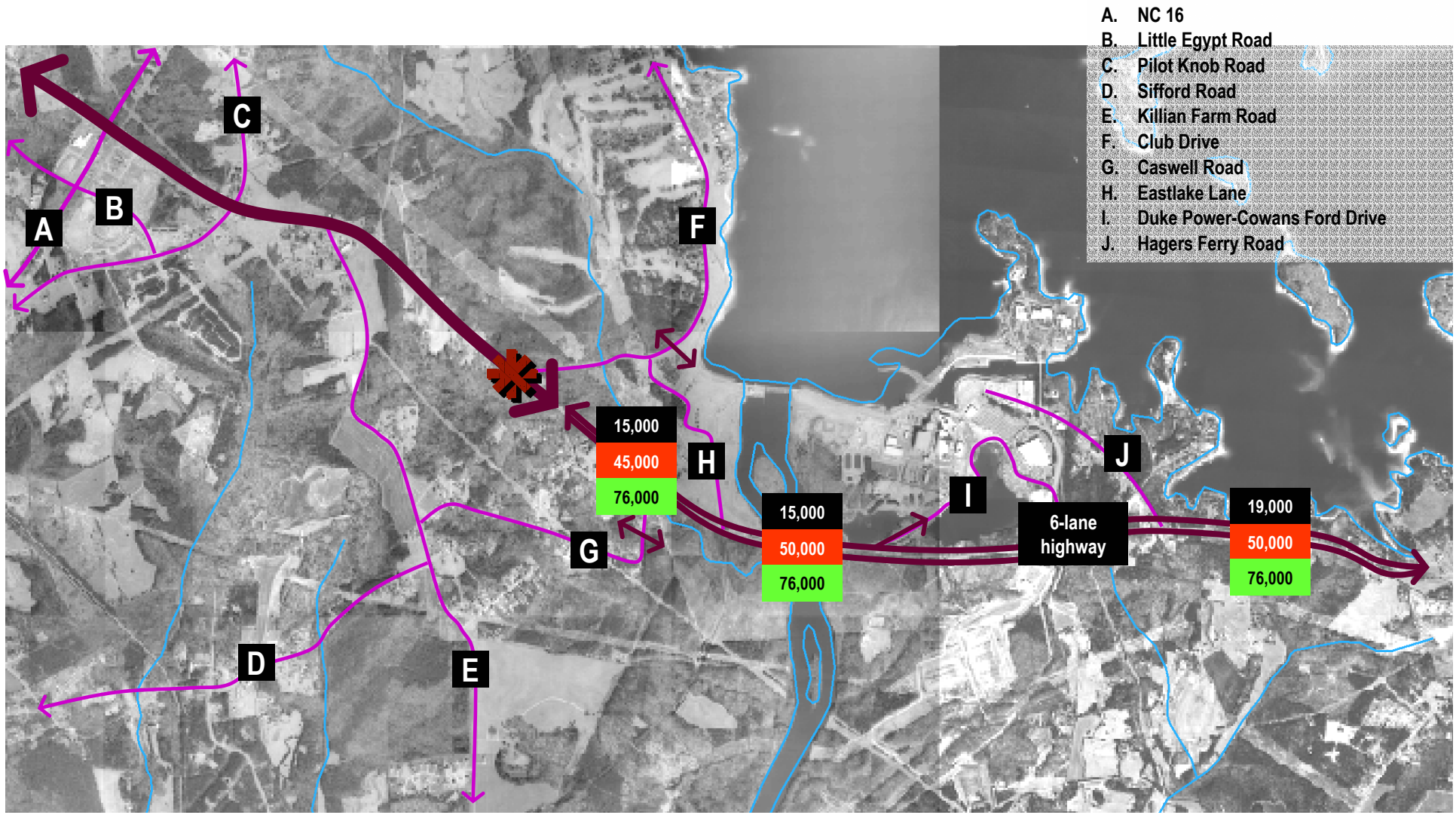


A. Amity Church Road
B. Lambs Way
C. Old Plank Road
D. Brevard Place Road
E. Beth Haven Church Road
F. Tyler Hatley Lane
G. Schronce Road
H. Ingleside Farm Road

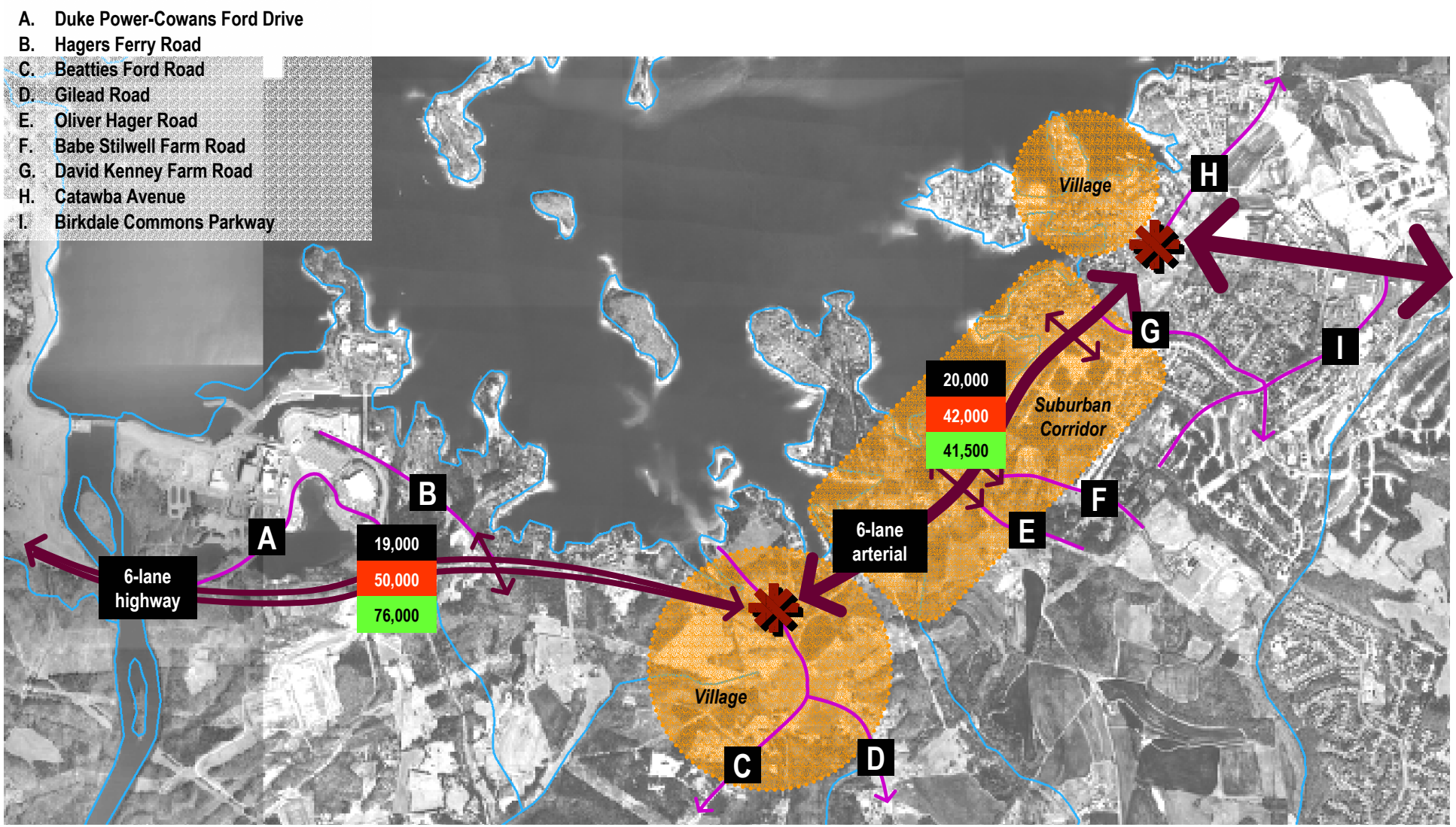
Segment 4: Killian Creek to Duke Power Lines – OPTION 1: Linked Centers

A. Ingleside Farm Road
B. Little Egypt Road
C. Railroad
D. Future NC 16
E. NC 16
F. Forest Oak Drive
G. Pilot Knob Road
H. Hagers Ferry Road
I. Killian Farm Road
J. Club Drive
K. Caswell Road
L. Sifford Road
M. Eastlake Lane

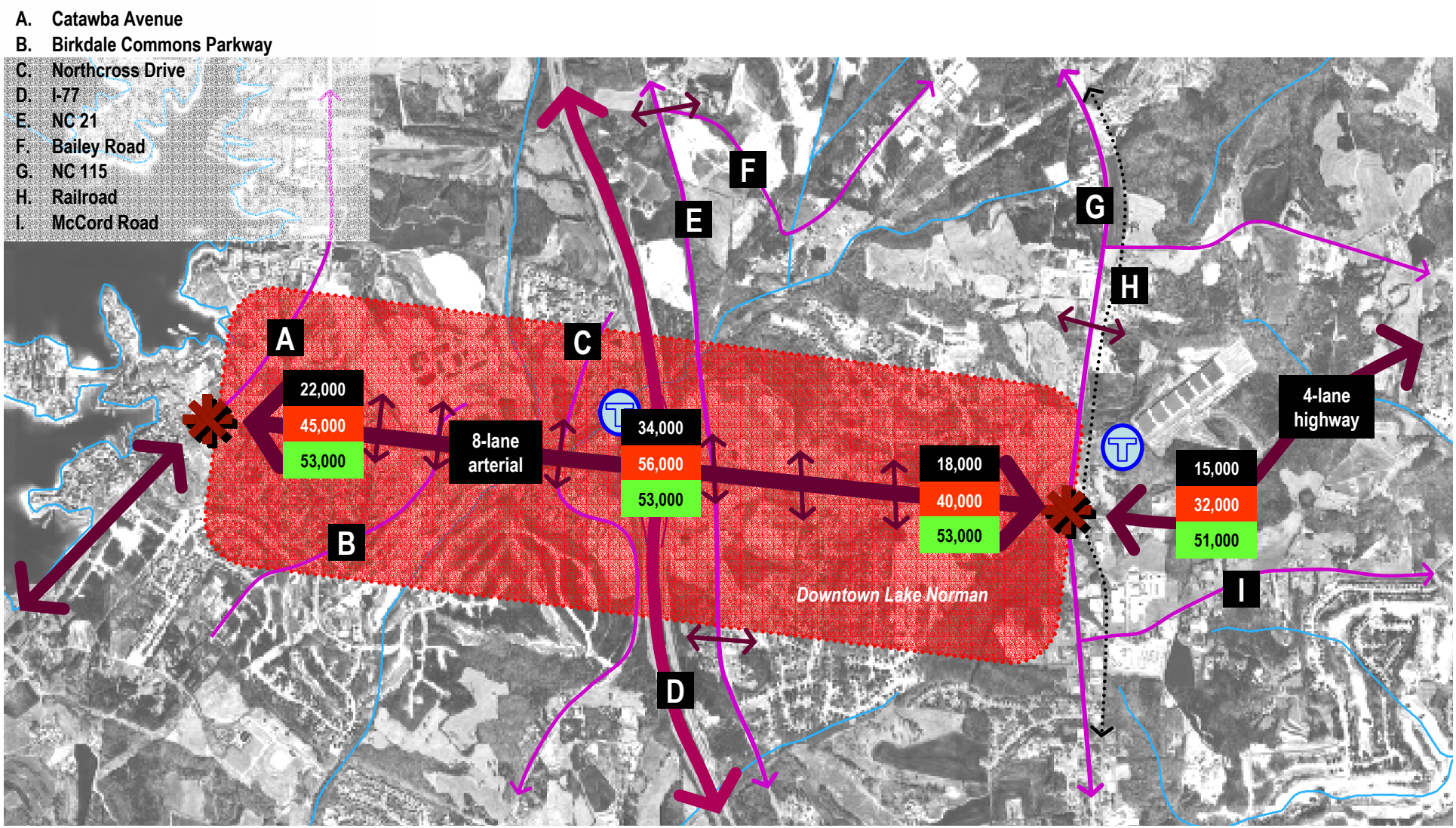
Segment 5: Duke Power Lines to Huntersville Town Limits – OPTION 1: Linked Centers



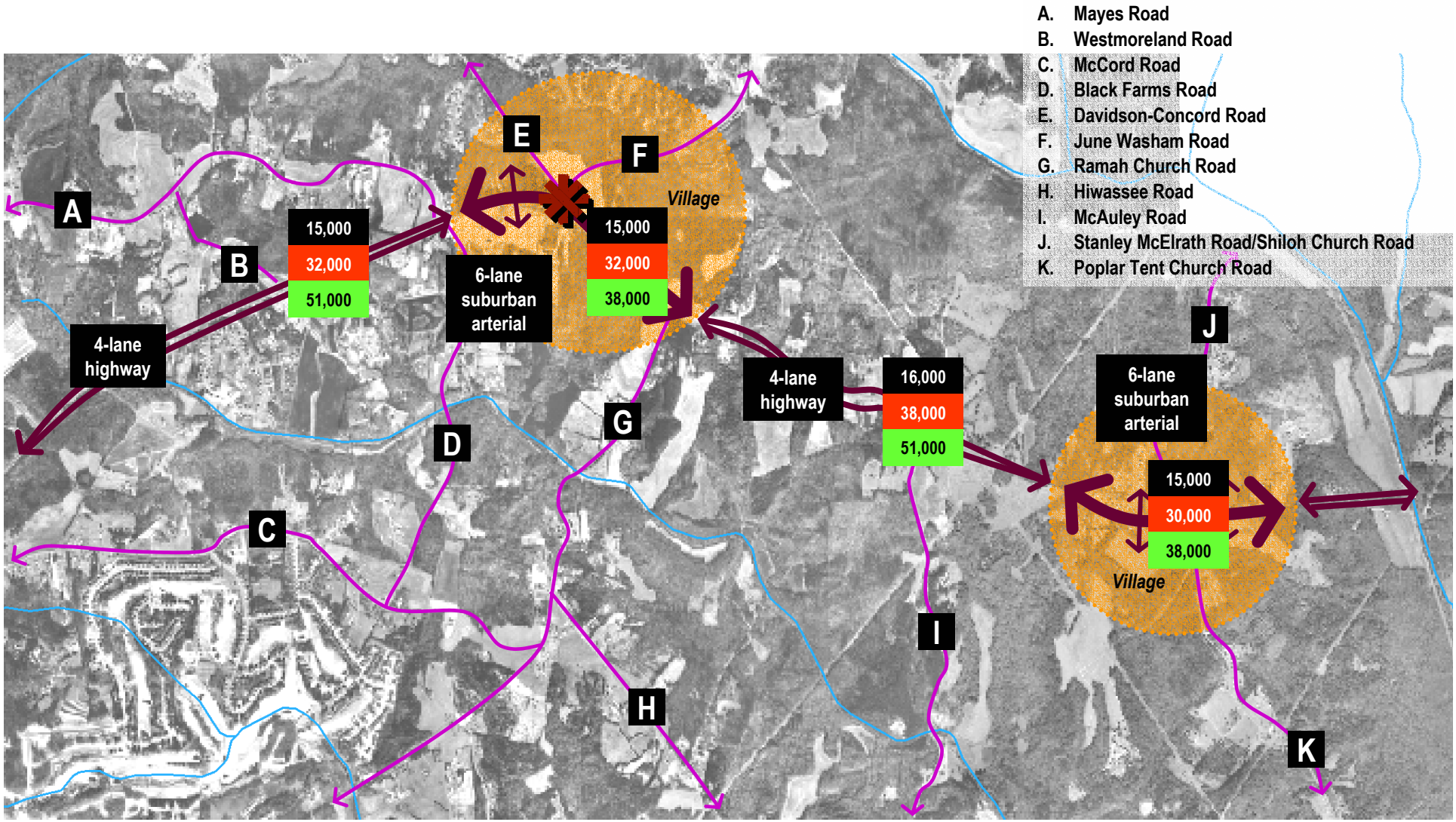
Segment 6: Huntersville Town Limits to Catawba Avenue – OPTION 1: Linked Centers



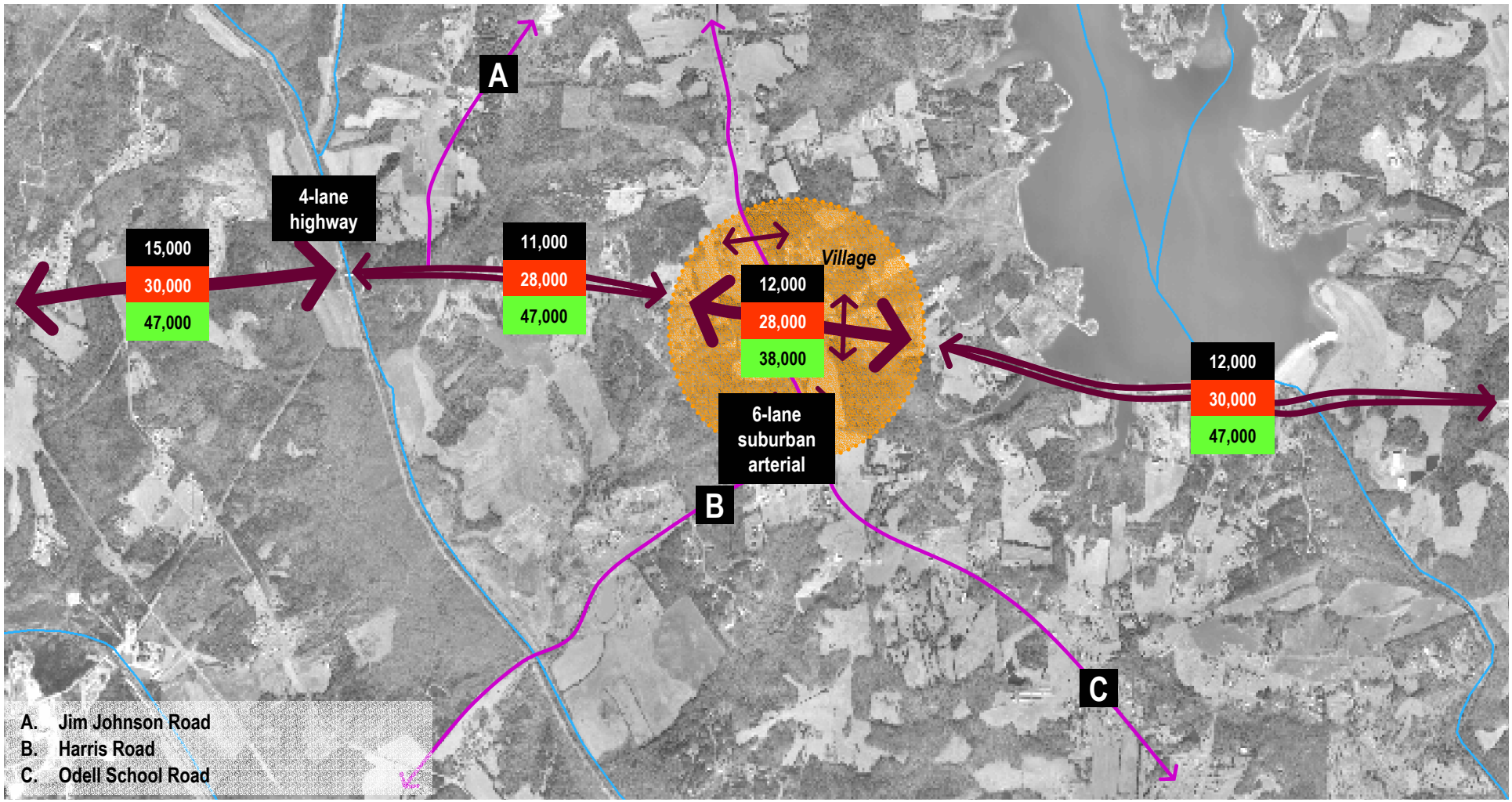
Segment 7: Catawba Avenue to Ramah Creek – OPTION 1: Linked Centers



Segment 8a: Ramah Creek to West Branch of Rocky River – OPTION 1: Linked Centers

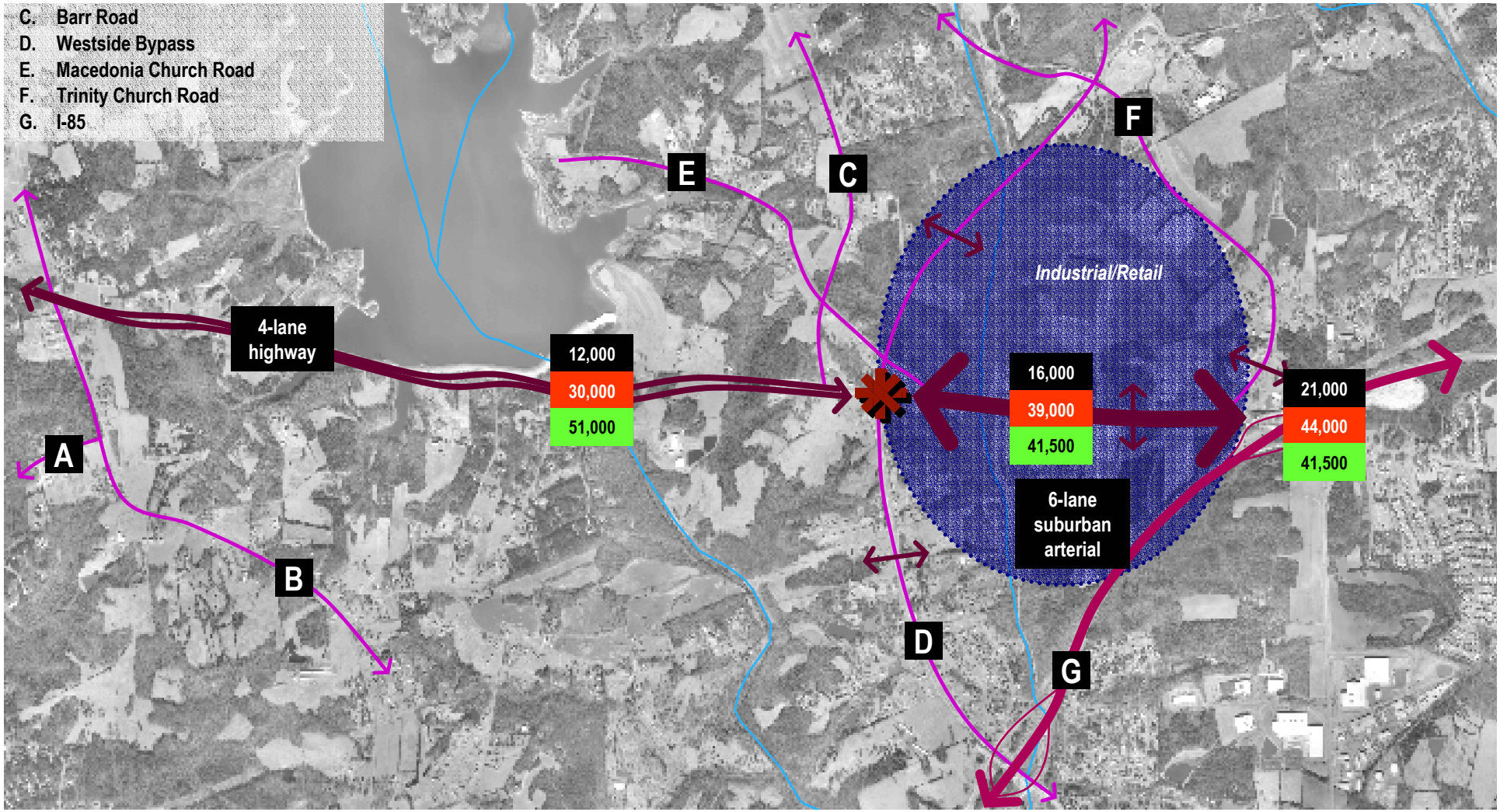


Segment 8b: West Branch of Rocky River to Coddle Creek Reservoir – OPTION 1: Linked Centers

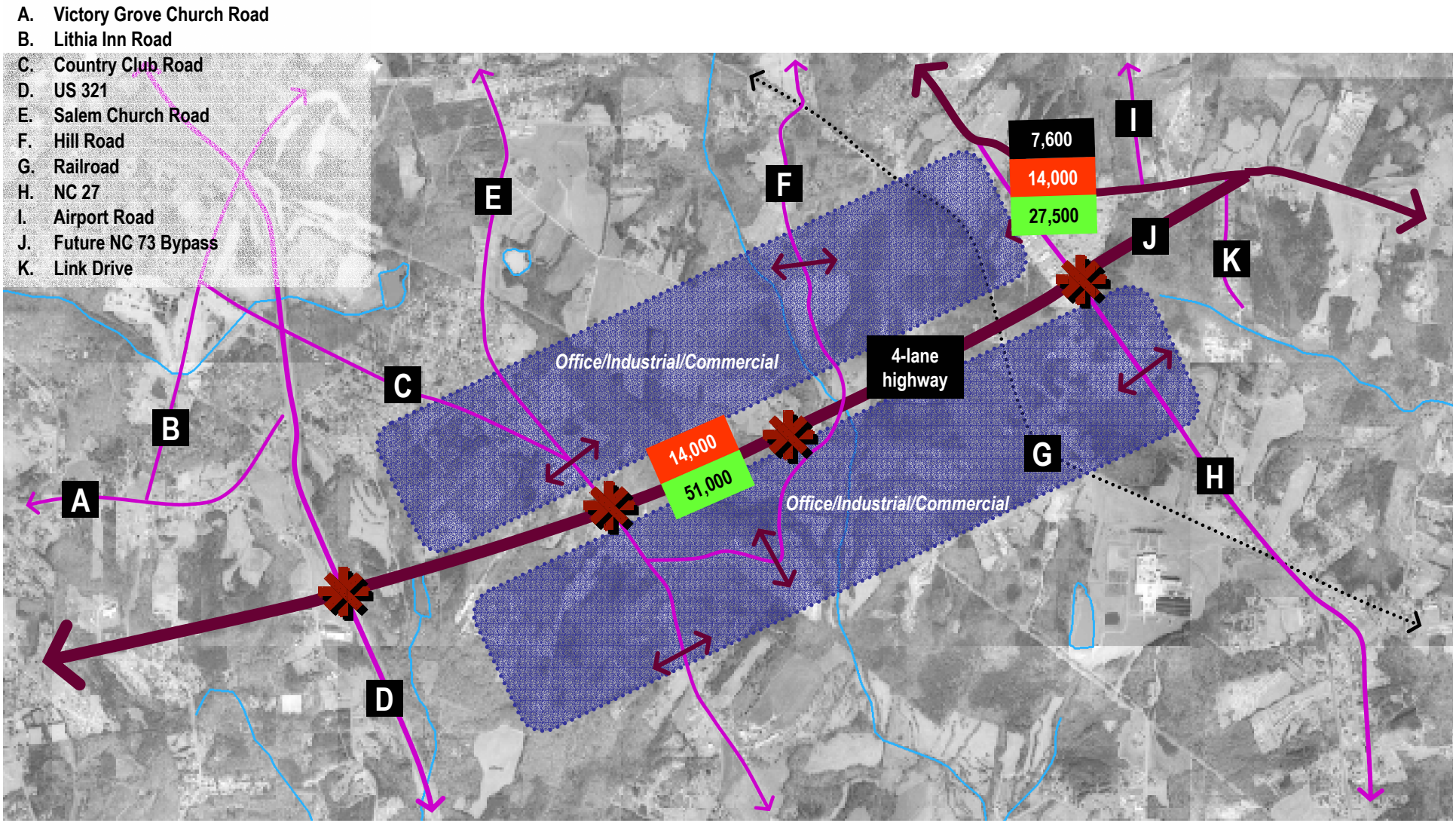


Segment 9: Coddle Creek Reservoir to I-85 – OPTION 1: Linked Centers

A. Harris Road
B. Odell School Road
C. Barr Road
D. Westside Bypass
E. Macedonia Church Road
F. Trinity Church Road
G. I-85

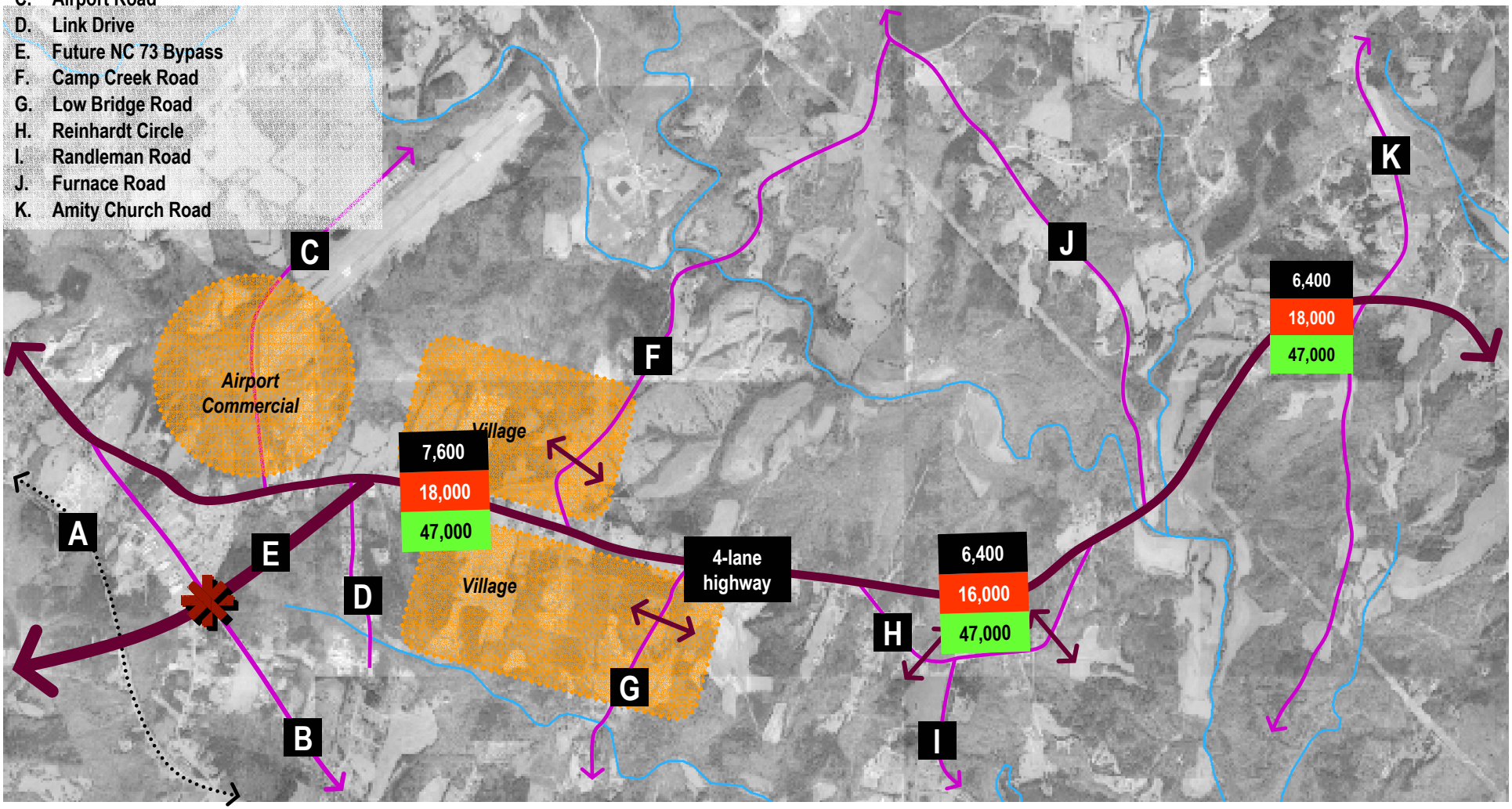


Segment 1: US 321to Link Drive – OPTION 2: Thruway

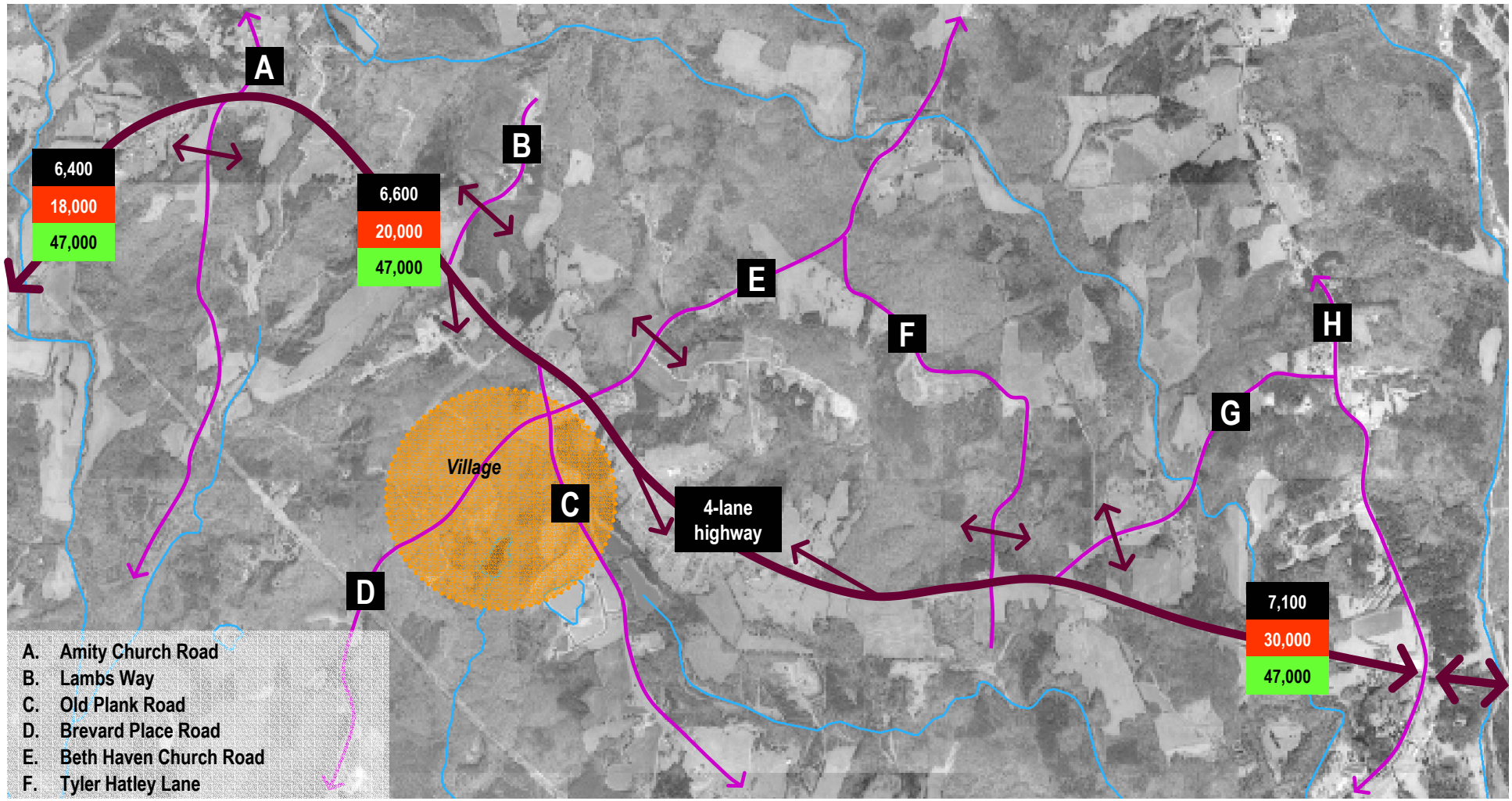


Segment 2: Link Drive to Reed Creek – OPTION 2: Thruway

A. Railroad
B. NC 27
C. Airport Road
D. Link Drive
E. Future NC 73 Bypass
F. Camp Creek Road
G. Low Bridge Road
H. Reinhardt Circle
I. Randleman Road
J. Furnace Road
K. Amity Church Road

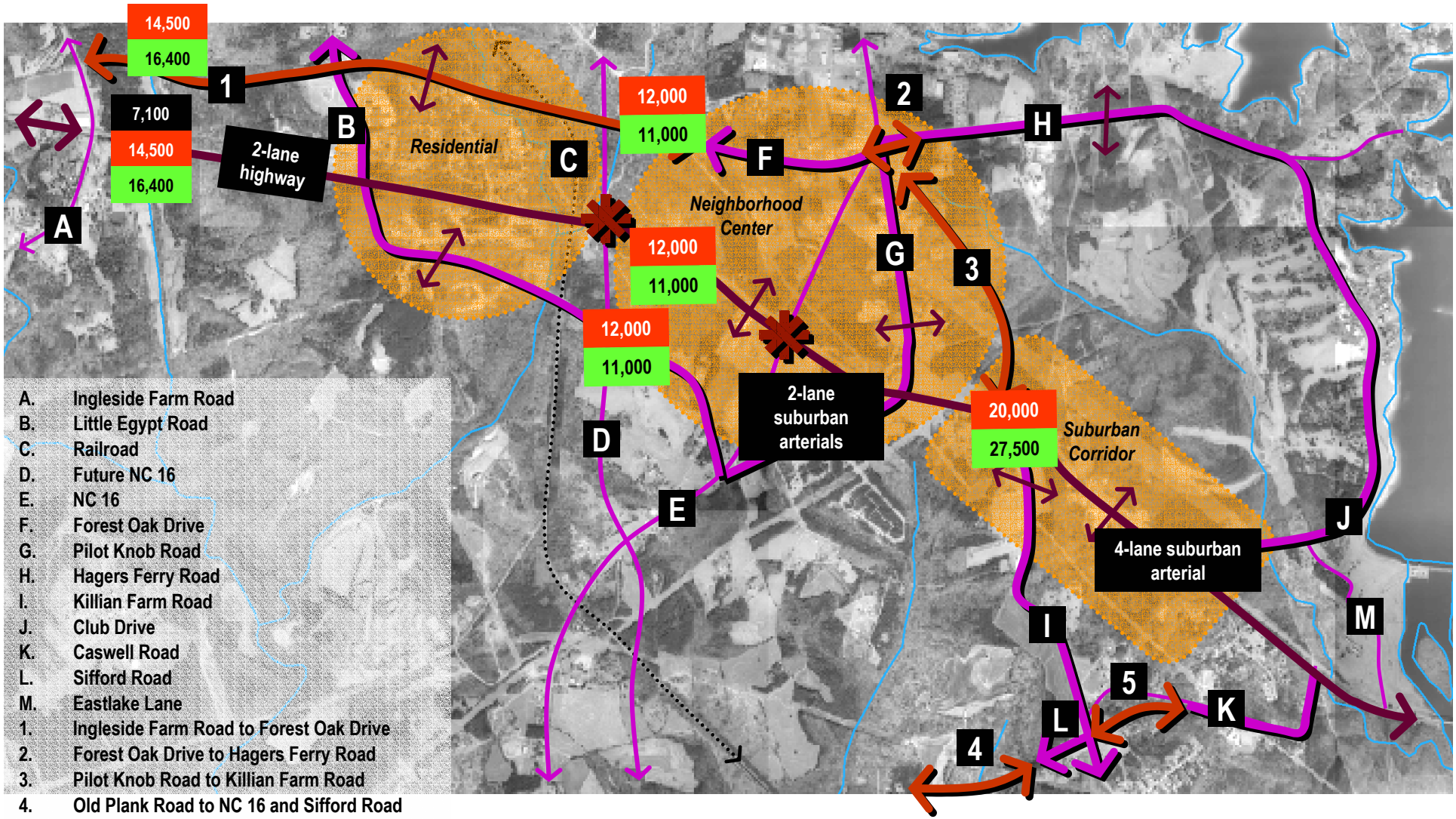


Segment 3: Reed Creek to Killian Creek – OPTION 2: Thruway

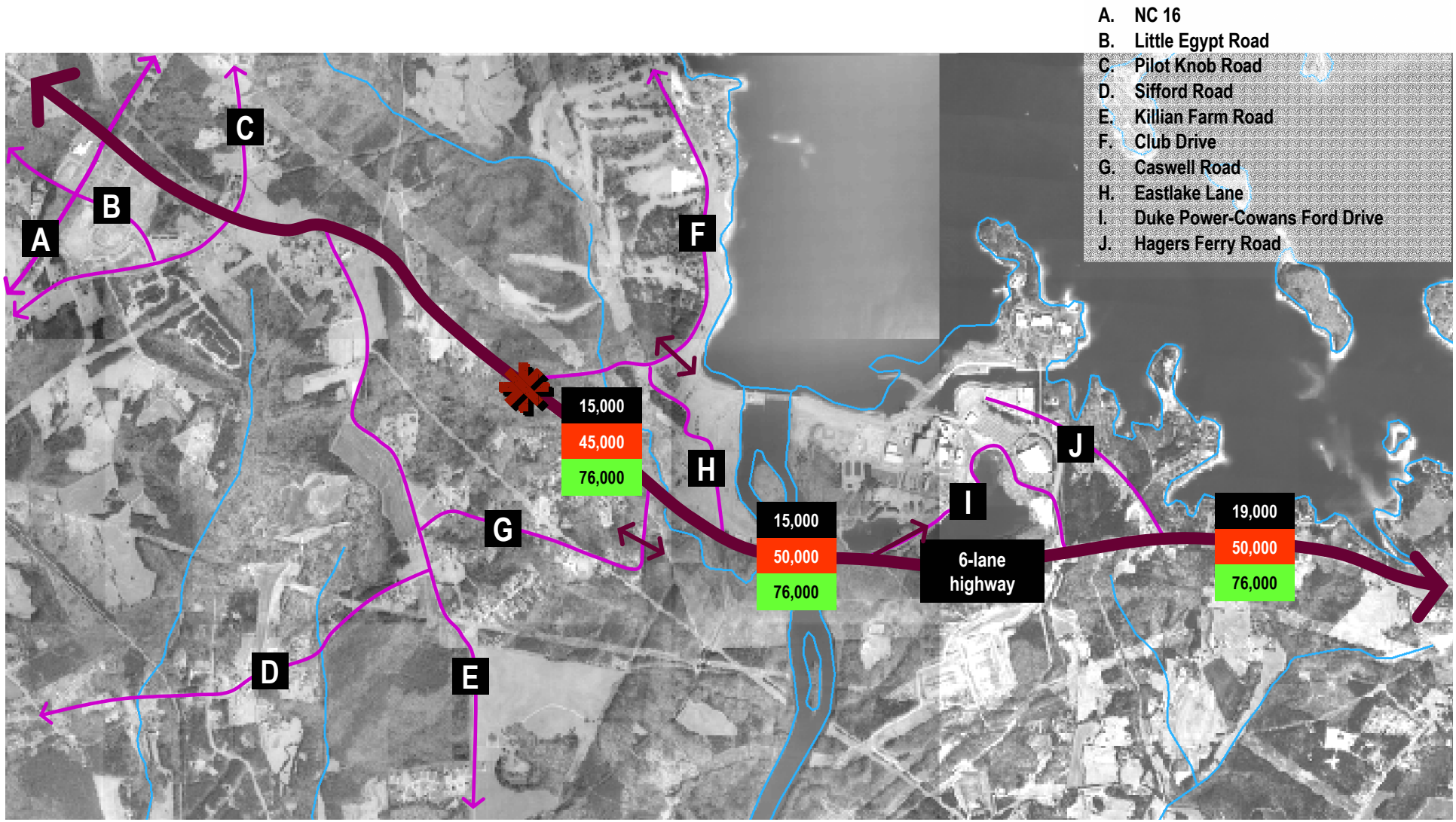


A. Amity Church Road
B. Lambs Way
C. Old Plank Road
D. Brevard Place Road
E. Beth Haven Church Road
F. Tyler Hatley Lane
G. Schronce Road
H. Ingleside Farm Road

Segment 4: Killian Creek to Duke Power Lines – OPTION 2: Thruway

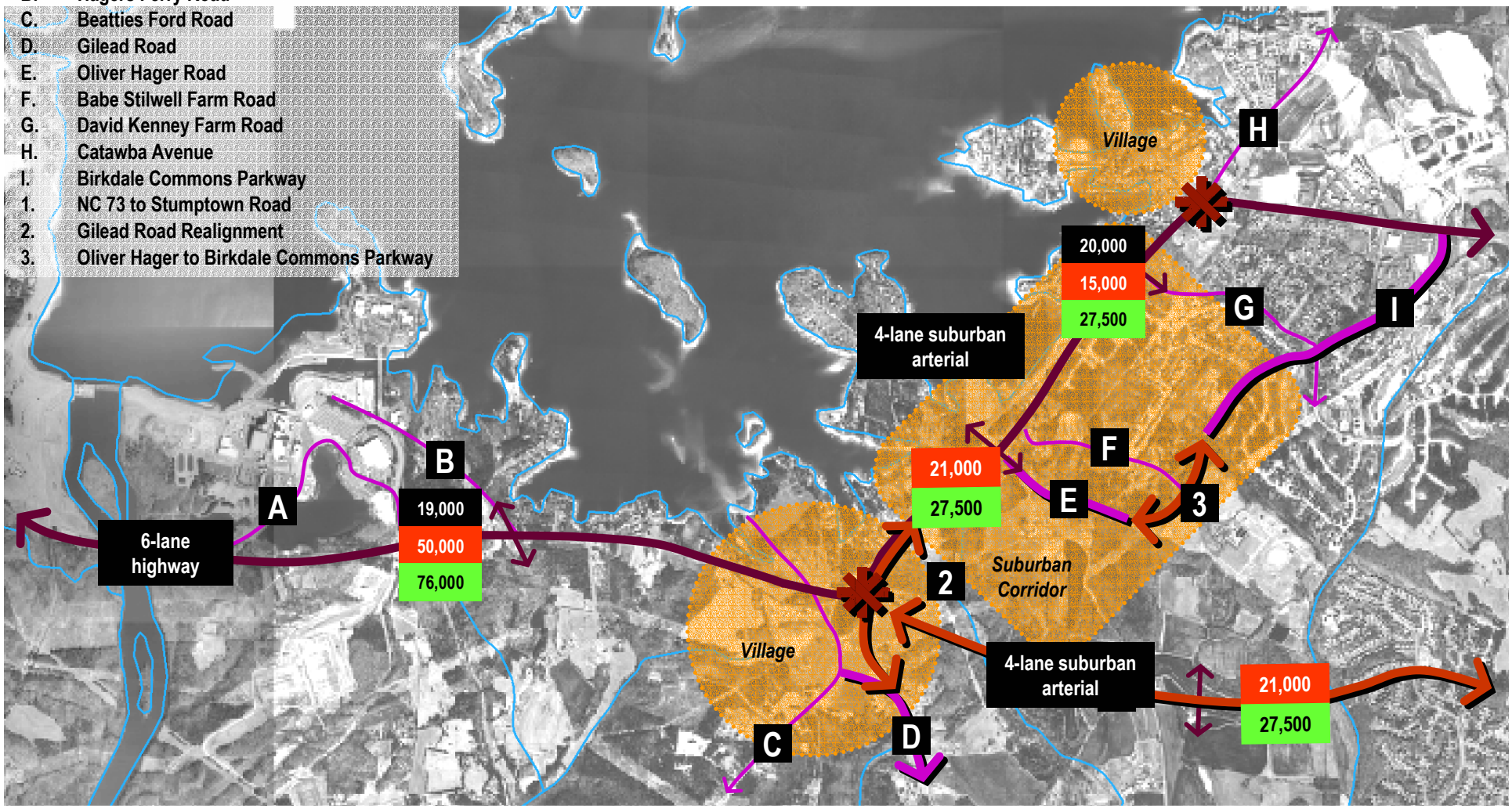


Segment 5: Duke Power Lines to Huntersville Town Limits – OPTION 2: Thruway



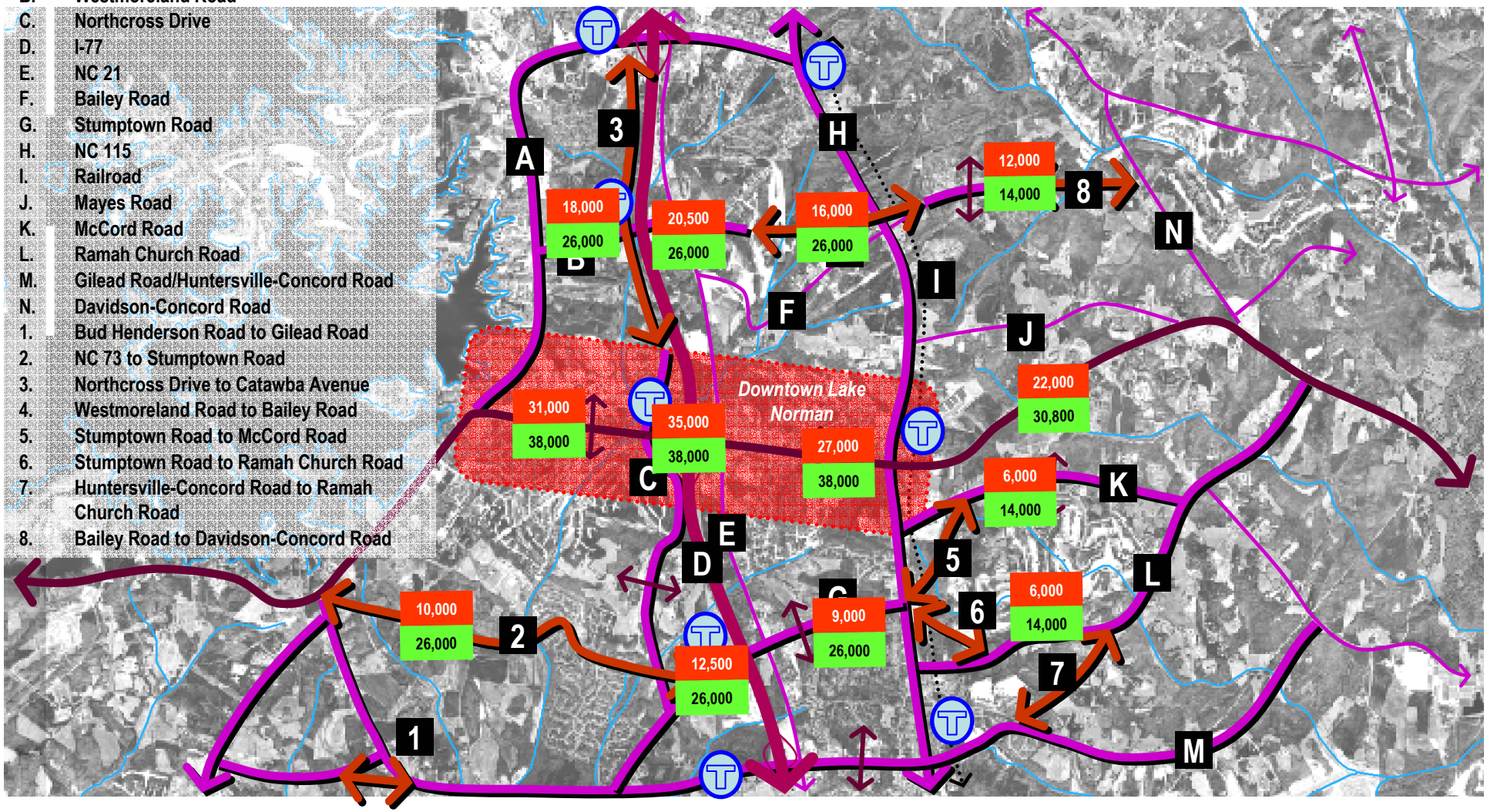
Segment 6: Huntersville Town Limits to Catawba Avenue – OPTION 2: Thruway

A. Duke Power-Cowans Ford Drive
B. Hagers Ferry Road
C. Beatties Ford Road
D. Gilead Road
E. Oliver Hager Road
F. Babe Stilwell Farm Road
G. David Kenney Farm Road
H. Catawba Avenue
I. Birkdale Commons Parkway
1. NC 73 to Stumptown Road
2. Gilead Road Realignment
3. Oliver Hager to Birkdale Commons Parkway

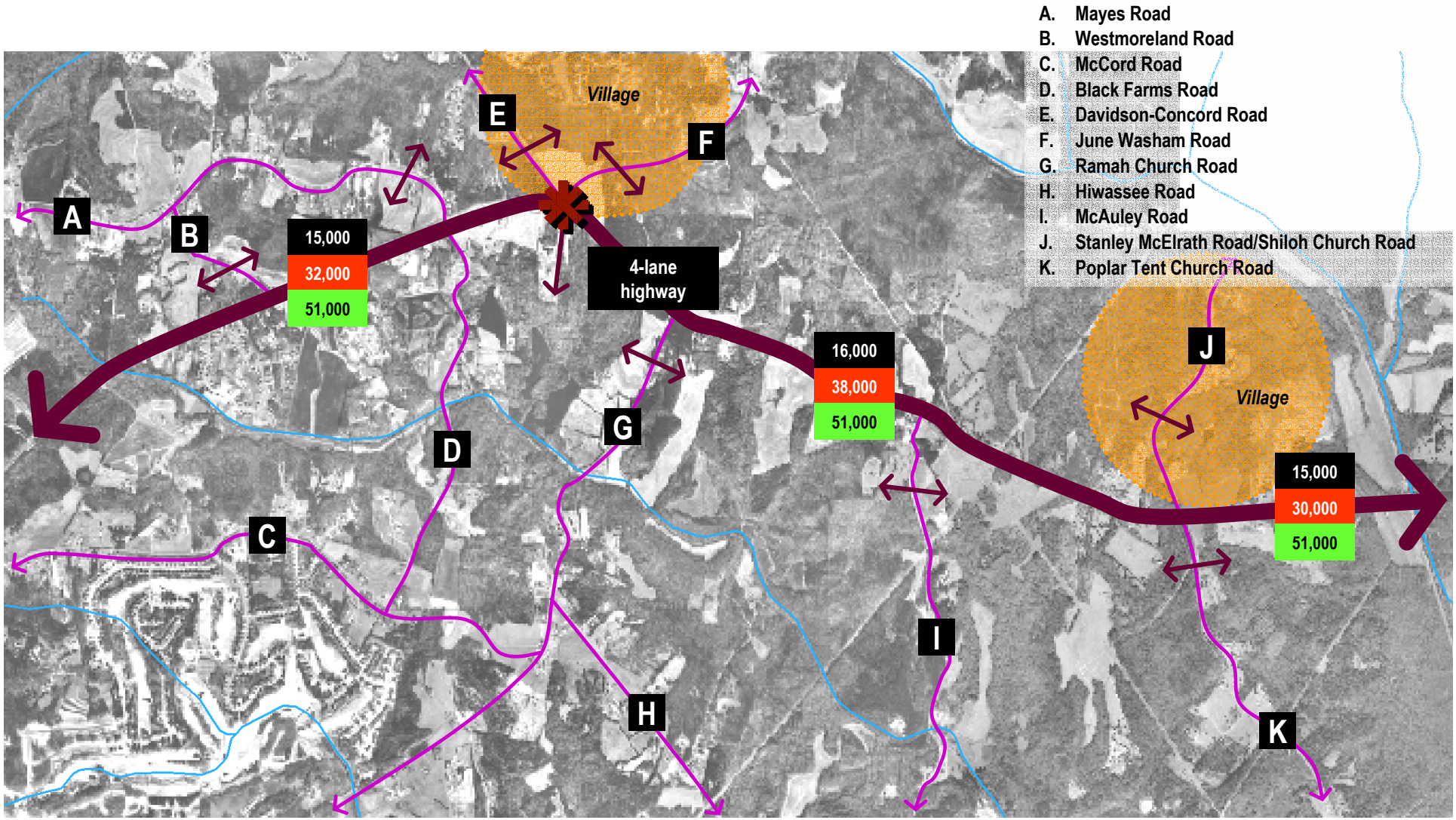


Segment 7: Catawba Avenue to Ramah Creek – OPTION 2: Thruway

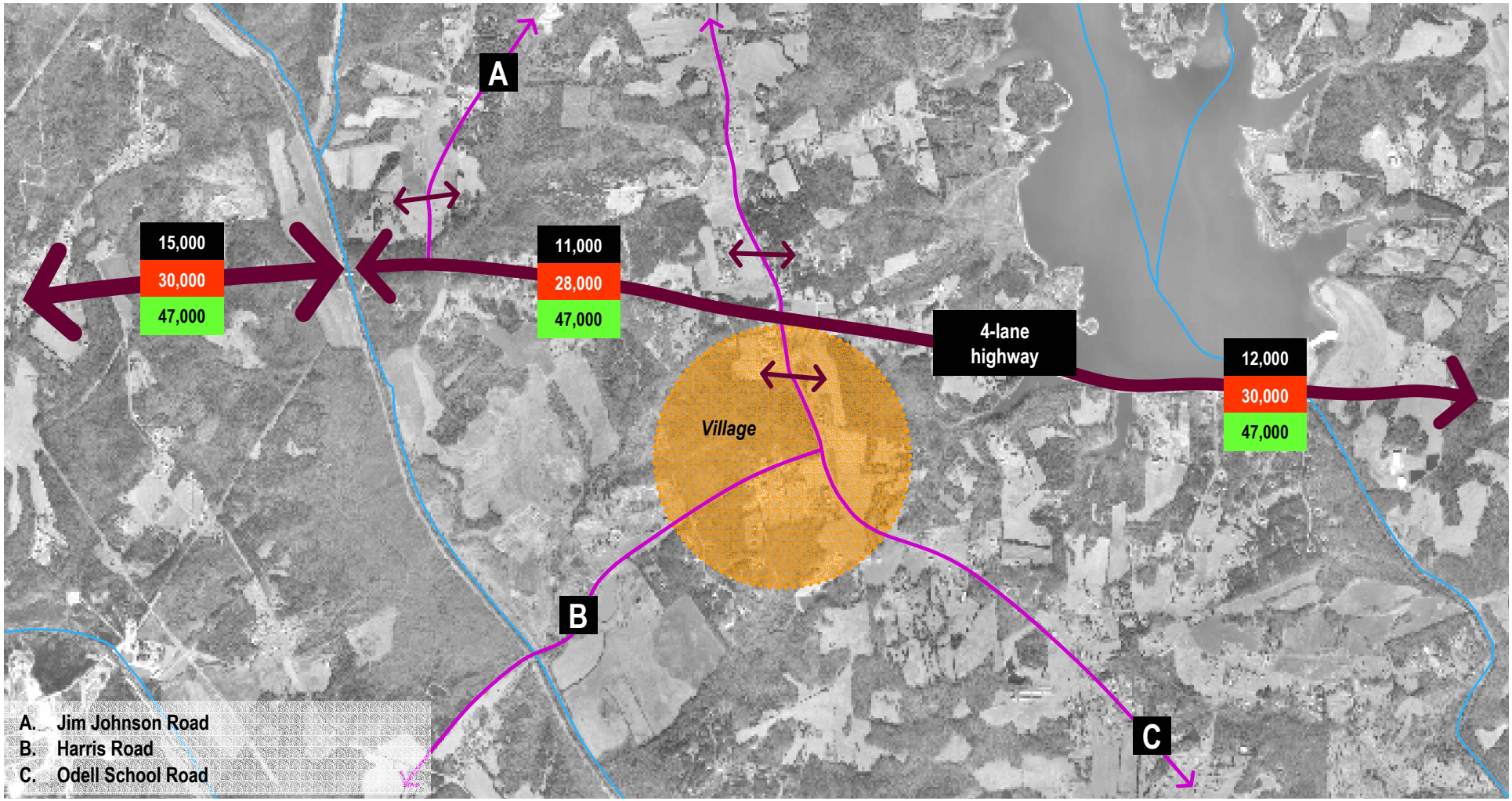
A. Catawba Avenue
B. Westmoreland Road
C. Northcross Drive
D. I-77
E. NC 21
F. Bailey Road
G. Stumptown Road
H. NC 115
I. Railroad
J. Mayes Road
K. McCord Road
L. Ramah Church Road
M. Gilead Road/Huntersville-Concord Road
N. Davidson-Concord Road
1. Bud Henderson Road to Gilead Road
2. NC 73 to Stumptown Road
3. Northcross Drive to Catawba Avenue
4. Westmoreland Road to Bailey Road
5. Stumptown Road to McCord Road
6. Stumptown Road to Ramah Church Road
7. Huntersville-Concord Road to Ramah Church Road
8. Bailey Road to Davidson-Concord Road



Segment 8a: Ramah Creek to West Branch of Rocky River – OPTION 2: Thruway

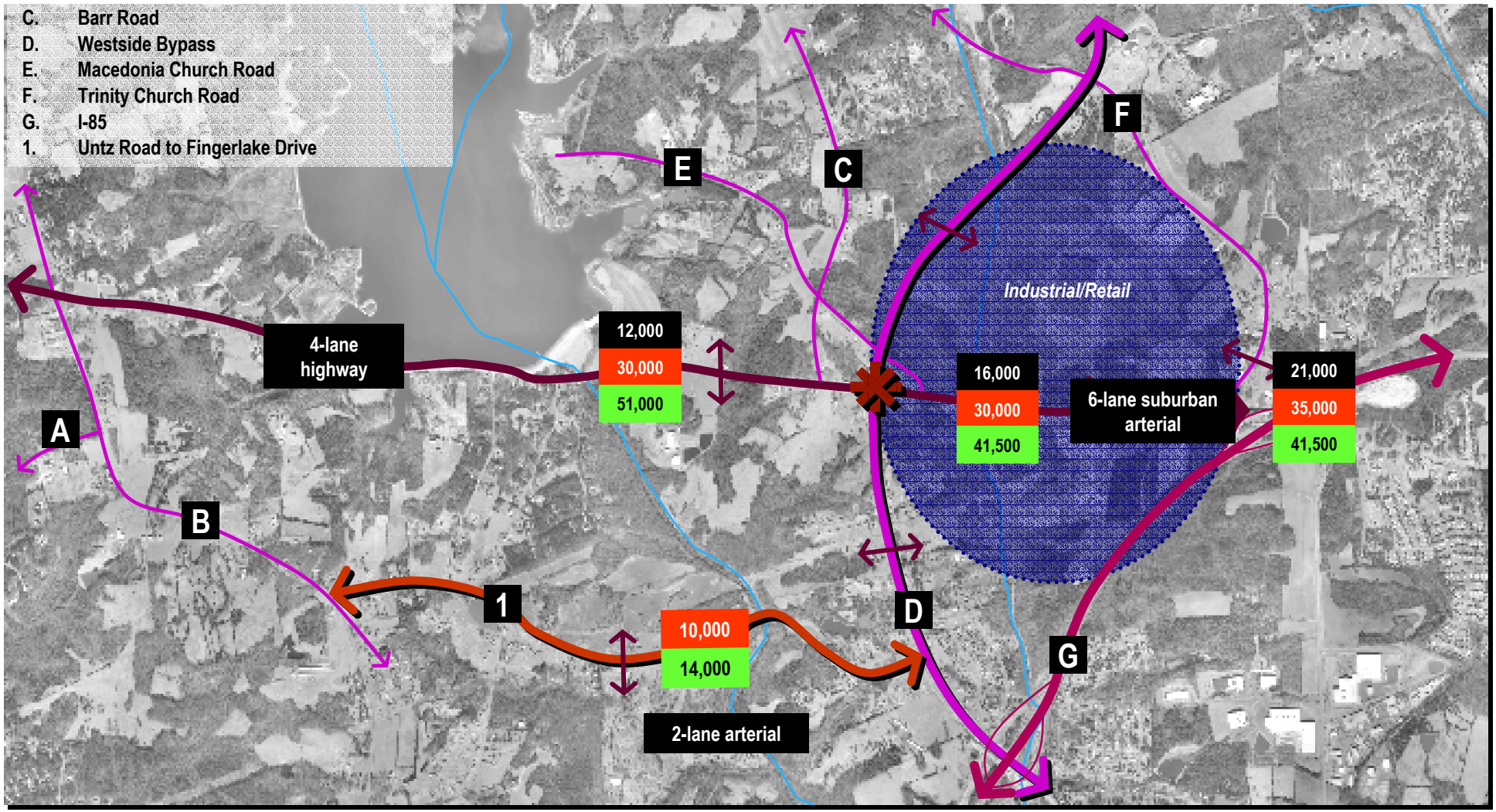


Segment 8b: West Branch of Rocky River to Coddle Creek Reservoir – OPTION 2: Thruway

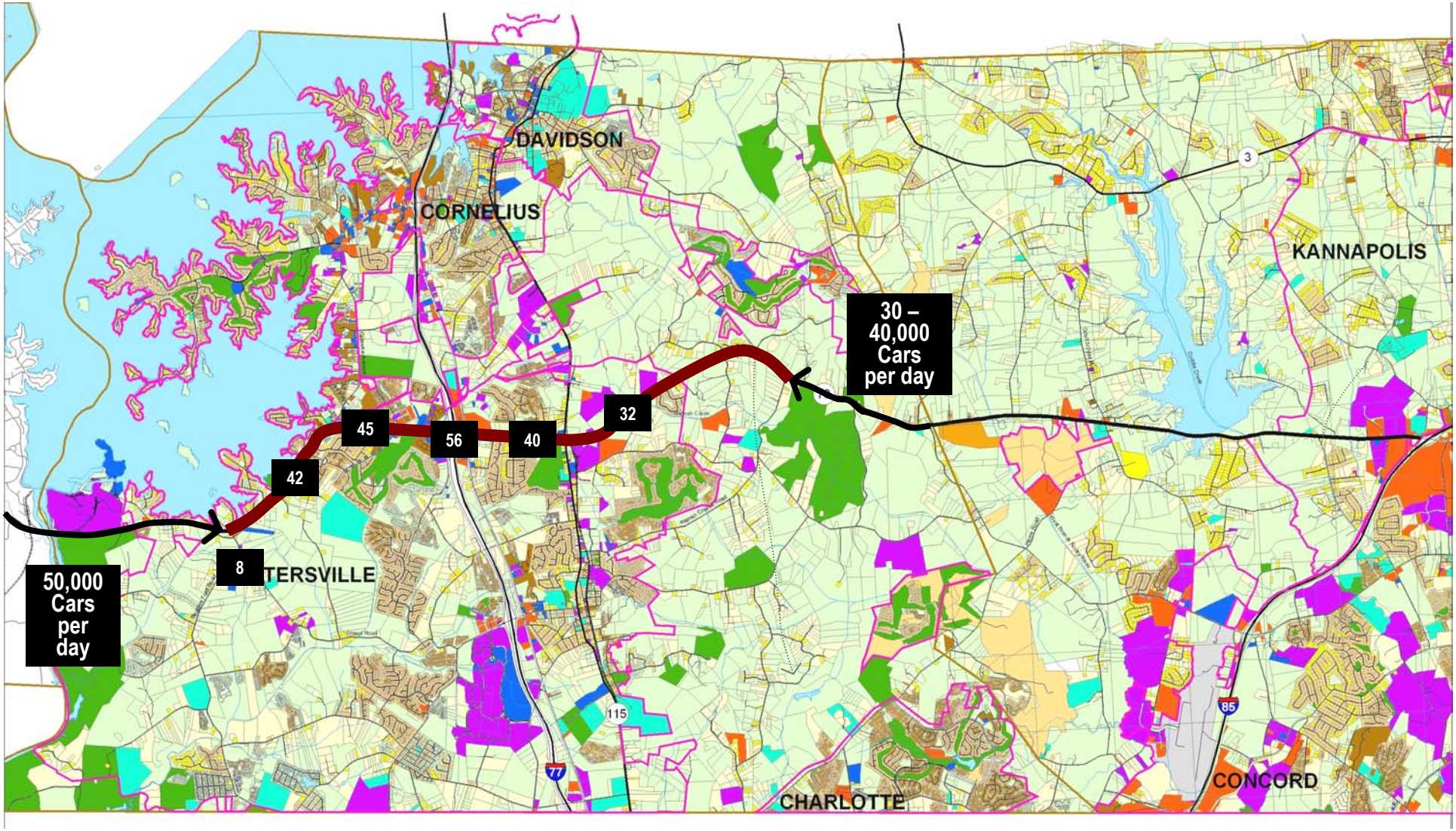


Segment 9: Coddle Creek Reservoir to I-85 – OPTION 2: Thruway

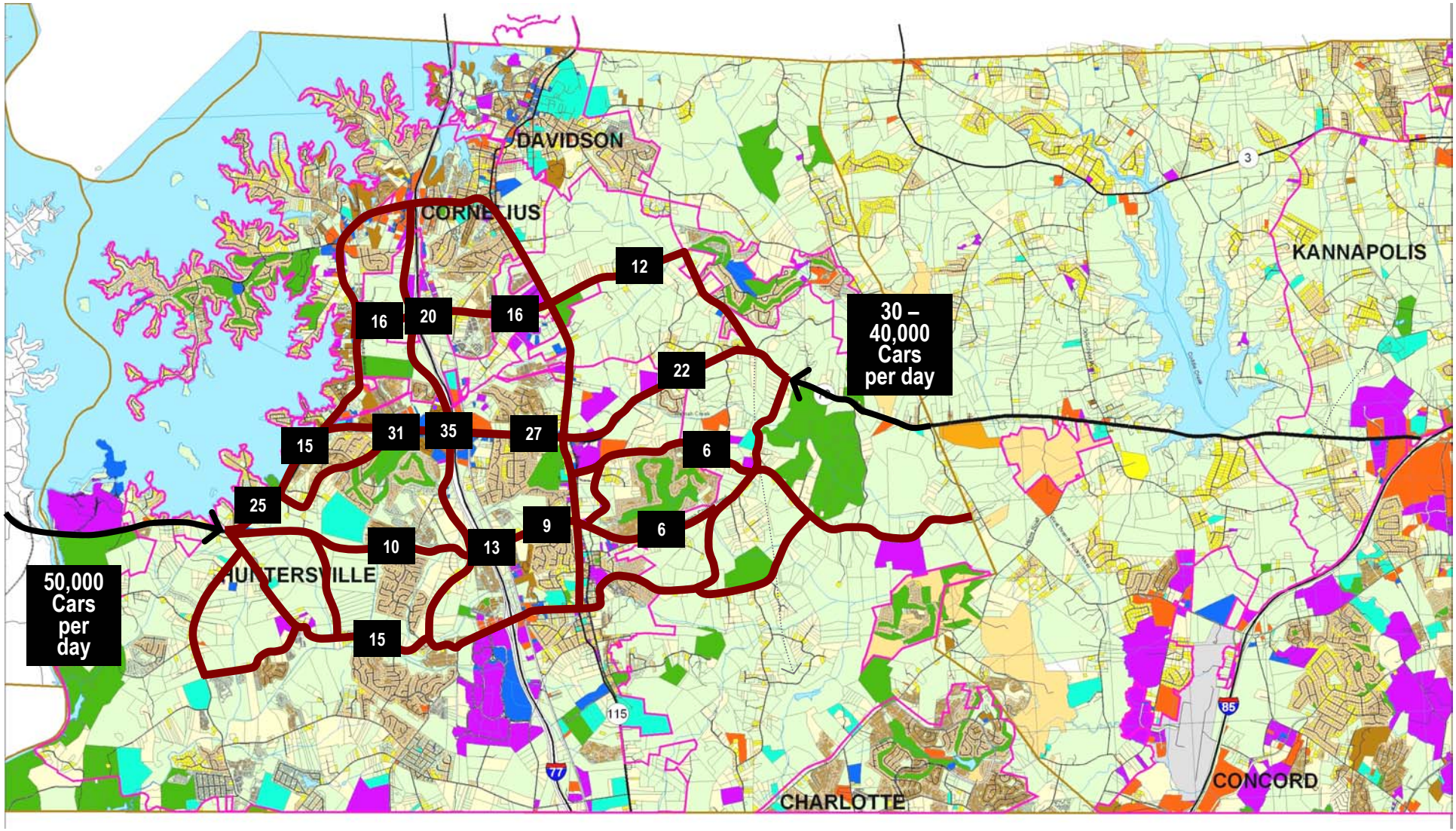
A. Harris Road
B. Odell School Road
C. Barr Road
D. Westside Bypass
E. Macedonia Church Road
F. Trinity Church Road
G. I-85
1. Untz Road to Fingerlake Drive



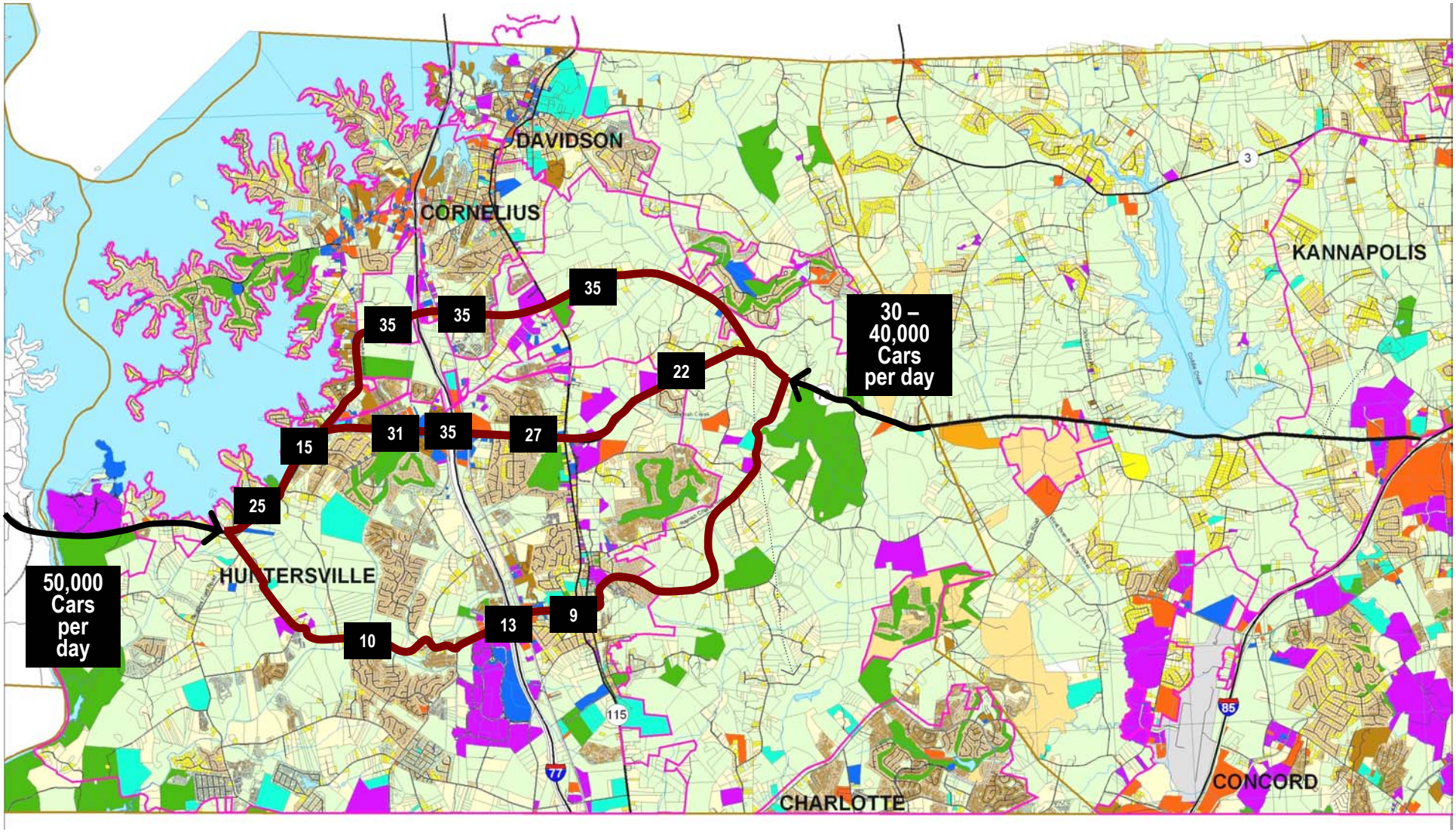
All NC 73 Traffic Goes to Sam Furr Road – Huntersville Options



Area Network – Huntersville Options



Limited Network – Huntersville Options

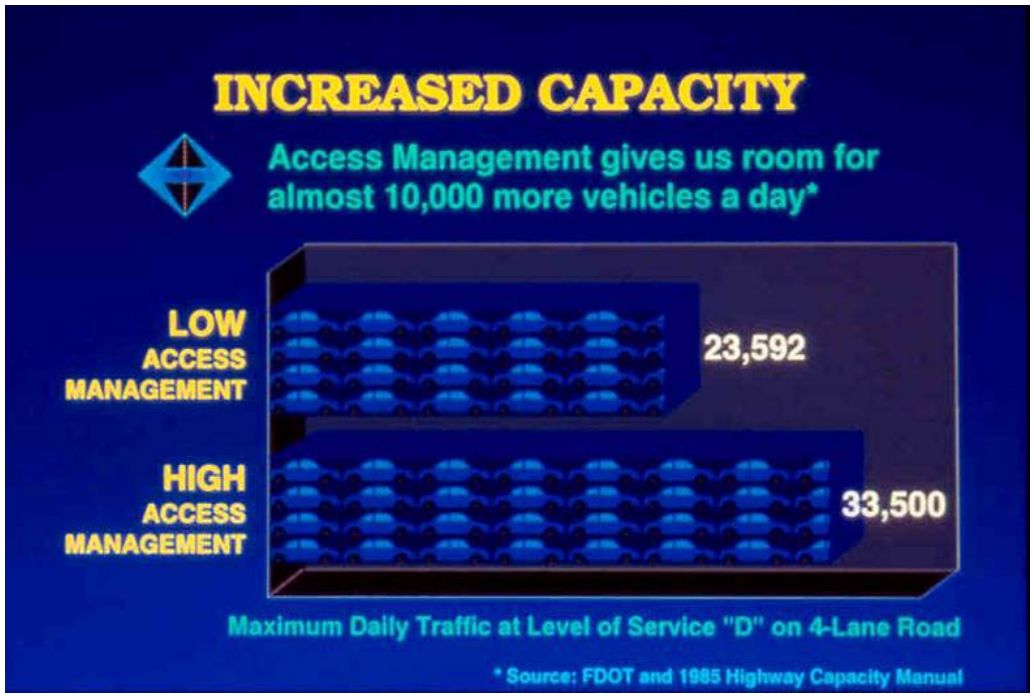


Access Management for the NC Route 73 Corridor

Access Management is a strategy that seeks to balance access to land development while simultaneously preserving the safe and efficient flow of traffic on the roadway system. It addresses the basic questions – when and where access should be located and how it should be designed. It is the systematic control of the location, spacing, design, and operation of traffic signals, local street locations, and driveway connections to a roadway.
In broad context, it is resource management, since it is a way to anticipate and prevent safety problems and congestion.

Benefits of Access Management
Benefits of the efficient management of roadway access include the following:

* **Safety** – Access Management contributes to fewer and less severe traffic accidents by requiring longer driveway and median opening spacing thereby reducing conflicts between vehicles and other traffic.
* **Efficiency** – Access Management contributes to a more efficient traffic circulation system by fewer but better designed access points and, in urban areas, better signal spacing and operation. Stop-and-go traffic is reduced and roadway capacity is increases and preserved.
* **Capacity** – Effective Access Management can increase the carrying capacity of a roadway by as much as 40%. For NC 73, this can mean that a four lane road may be sufficient, when a six lane road might have been required without Access Management.
* **Aesthetics** – Landscaping at the margin of the roadway and in the median of divided roadways makes for a more attractive corridor, as well as good visual notification of driveways and median openings.



Access Management Techniques
A variety of access management, location and design practices and techniques can be used to improve the safety and operations of the roadway. The Access Management system for NC 73 Corridor incorporates all of these, to some degree. Access Management techniques can be grouped into six general categories. However, some techniques may fit into more than one category.

A. Limit the Number of Conflict Points: This group of techniques recognizes that drivers make more mistakes and collisions increase when drivers are presented with complex situations. Conversely, simplifying the driving task will contribute to improved traffic operations and fewer collisions. This is accomplished by limiting the number and type of conflicts between vehicles, vehicles and pedestrians, and vehicles and bicycles.

B. Separate Conflict Areas: These access management techniques provide sufficient time for drivers to address one potential conflict problem before facing another. This simplifies the driving task and contributes to improved operations and safety.

C. Remove Turning Vehicles from the Through Traffic Lanes: These techniques reduce the severity and duration of conflicts between turning vehicles and following through vehicles.

D. Reduce the Number of Turning Movements: The provision of cross-circulation between adjacent properties and the provision of service roads allows intersite movement without re-entry to the abutting major roadway.

E. Improve Traffic Operations on the Roadway: This group of techniques is primarily of a policy nature. They are intended to preserve the functional integrity of the roadway. Thus, while a given technique may apply to a range of collector and major roadways, higher standards are commonly applied to the higher categories of roads.

F. Improve Traffic Operations on the Access Intersection: These techniques allow drivers to maneuver to and from the major roadway more efficiently and safely. They also permit the safer accommodation of pedestrians and bicyclists.

Access Location and Design
Access management involves the efficient and safe location, spacing and design of all points of access, be they public roadways or private driveways.

Considerations in establishing access spacing requirements include the following:

A. Signalized Intersection Spacing: Long uniform signalized intersection spacings on major roadways facilitate the use of signal timing plans which can respond to both peak and off-peak traffic conditions. Long and uniform spacings improve the progress of traffic flow through the signal system. Capacity is increased, fuel consumption and emissions are decreased, and traffic safety is improved.

B. Unsignalized Intersection Spacing: The location and design of unsignalized intersections affects the ability of a driver to safely and easily enter and exit a site. If not properly placed, exiting drivers may be unable to see oncoming vehicles and motorists on the roadway may not have adequate time to stop.

The elements of access design include:

A. Nontraversable Medians: Wide nontraversable medians separate opposing through traffic and provide shelter for vehicles making left turns from or to a street. They also provide refuge for pedestrians and bicyclists attempting to cross the street. Consequently, crash rates on major roadways with nontraversable medians have been found to be substantially lower than on undivided roadways or roadways with continuous two-way left-turn lanes. The spacing and design of median openings is important to the safe and efficient operation of the roadway. Safety benefits are reduced where median openings are too close together. In rural areas, median openings commonly will permit all movements. However, when providing a median opening on the fringe of an urban area, it is important to consider the potential for future signalization. A full median opening that is located where signalization will interfere with efficient traffic progression may need to be closed or reconstructed as a directional opening. When development has already occurred and an existing roadway is reconstructed with a nontraversable median, left turns and crossing maneuvers are moved to other locations. Many of these maneuvers may be converted to a right turn followed by a U-turn or a U-turn followed by a right turn. If a nontraversable median exists, or is to be constructed, provisions have to be made to accommodate the redirected left turn. This can be accomplished by either a change in travel patterns or by providing sufficient space to accommodate the U-turn maneuver at a nearby intersection. Directional median openings (i.e. openings that prohibit cross traffic and allow only left turn egress from one or both approaches) are an efficient and safe technique for providing partial access instead of right-in, right-out only.

B. Auxiliary Lanes: Left and right turn lanes minimize the conflict between turning vehicles and following through traffic by providing storage space where drivers can wait to complete the turn maneuver. This will result in smoother traffic flow, increased capacity, and greatly increased safety. Capacity is increased by eliminating excessively long gaps between through vehicles passing through an intersection. From a safety standpoint, it is recommended that separate left turn lanes be provided at all median openings on divided roadways. Research has shown that providing a left turn bay at a signalized intersection reduced the crash rate by 40 to 45 percent and providing a left turn bay at an unsignalized intersection reduced the crash rate by 90 percent. The peak hour volumes per lane in urban areas can approach capacity and even a small number of left-turning vehicles will produce high delays and a high probability of conflicts with following through vehicles. Right turn lanes also increase capacity and safety. However, they frequently require additional right-of-way on the approach to an intersection.

C. Cross and Joint Access: Cross and joint access provides internal circulation between adjacent parcels and consolidates access to serve two properties instead of just one. Cross access allows vehicles to circulate between adjacent businesses without having to re-enter the arterial. This allows intensive development of a corridor, while maintaining traffic operations and safe and convenient access to businesses. Property owners unable to meet driveway spacing standards should, whenever feasible, be required to provide for cross and joint access easements. Flexibility is needed on an administrative level to work with the unique circumstances of each development site.

D. Bypasses: If suitable alignments are available, a bypass route offers the opportunity to obtain wide right-of-way, control access and provide access at locations that enforce efficient traffic operation. The existing roadway and the adjacent land uses would not be disturbed within the limits of a bypass.

E. Secondary Road Systems: A supporting system of roadways with reasonable continuity can accommodate traffic between "local" areas and minimize unnecessary trips on NC 73. This system, or network, can separate local and regional traffic.

F. Frontage Roads: Frontage or service roads provide increased access to developments and protect the main highway from frequent access demands. However, they complicate intersections between the arterial and cross streets and, unless carefully designed and selectively applied in both new designs and in retrofit situations, they may prove counterproductive.

G. Reverse Frontage: An alternate to an adjacent frontage road is a reverse frontage road. This technique locates the frontage, or service road, one land parcel away from the arterial. All land access is provided by the service road. The road can be a separate entity or be part of the local street system. Land uses between the arterial and the "reverse frontage road" can range from residential to office to retail. Where major activity centers front along an arterial roadway, frontage roads should be incorporated into the site's internal circulation system. Access to the thoroughfare is provided at locations which can be designed to more safely handle traffic.

Access management is primarily a land use and traffic management issue. It calls for land use controls and incentives that are keyed to the development policies of the community and the capabilities of the transportation system. The challenge is not merely how to provide and locate driveways, but how to transform our roadside environments into attractive, accessible and equally viable areas in the years ahead. Significant safety benefits are achievable in access management by implementing criteria related to nontraversable median design and allowable spacing of openings.

Access management is essential if we are to preserve the capacity and safety of our road system and provide efficient access to the properties that lie along it. It is also essential to develop and maintain political support for access management programs. A review of contemporary practice indicates that each setting is different, both physically and politically. Access management standards, therefore, will vary from place to place, with each setting adapting the basic principles to its particular needs.

Access Management Criteria
Access Management is the process of balancing the competing needs of traffic movement and land access. It is the systematic control of the location, spacing, design, and operation of traffic signals, local street locations, and driveway connections to a roadway. It also involves roadway design applications such as median treatments and auxiliary lanes.

A. Access Spacing
Each new access point introduces conflicts and friction into the traffic stream. With more conflicts comes a higher potential for crashes, and the resulting friction translates into longer travel times and greater delay. To address these issues, access management programs establish minimum requirements for access spacing. These requirements should set forth considerations in establishing access spacing criteria and determining the appropriate spacing for the following:

* Signalized access connections and street spacing,
* Unsignalized access connections,
* Corner clearance, and
* Median opening spacing.

1. Traffic Signal Spacing
Select a long uniform signal spacing interval and a procedure for deviating from the established interval when necessary or appropriate. A long, uniform signal spacing will allow for efficient traffic progression with a combination of cycle lengths and progression speeds to accommodate peak and off-peak traffic conditions and increases in traffic volume over time. Recommended traffic signal spacing for the NC 73 Corridor is as follows:

* Principal Arterial 2640 feet
* Minor Arterial-Rural 2640 feet
* Minor Arterial-Urban 1320 feet
* Collector 1320 feet

Segment plans for the NC Route 73 Corridor indicate both existing and potential traffic signal locations in the corridor. The remaining public or private points of access are recommended to remain unsignalized.

The variables involved in the planning, design and operation of signalized arterial roadways are reflected in the relationship between speed, cycle length and signal spacing. The objective is to balance these three elements to yield maximum progression bandwidths in both travel directions. Table A-1 (Spacing as a Function of Speeds and Cycle Lengths) and

Table A-1
Spacing of Signalized Intersections for Various Progression Speeds and Cycle Lengths

Cycle Length (sec.)	Speed (mph)						
	Signal Spacing in Feet[1]						
	25	30	35	40	45	50	55
60	1100	1320	1540	1760	1980	2200	2430
70	1280	1540	1800	2050	2310	2500	2820
80	1470	1760	2050	2350	2640	2930	3220
90	1630	1980	2310	2640	2970	3300	3630
120	2200	2640	3080	3520	3960	4400	4840
150	2750	3300	3850	4400	4950	5500	6050

[1]Distances rounded to nearest 10 ft.

A-2 (Progression Speed as a Function of Signal Spacing and Cycle Length) indicate optimal traffic progression efficiency.

When a signalized intersection deviates from the selected uniform interval, an increase in the percentage of the cycle length devoted to the major arterial – with a comparable decrease in green time for the intersecting street – can preserve progression efficiency. With short cycle lengths (i.e., 60 seconds), each one percent deviation in intersection spacing requires an increase in green time for the major street of one percent of the cycle length to maintain progression, and a decrease in green time for the minor street of one percent. However, at long cycles (120 seconds) green to the major street, and red to the minor street, must be increased by two percent of the cycle length for each one percent deviation. This becomes a critical issue when considering arterial-to-arterial street spacing.

The deviations procedures should include the following criteria: 1) Identification of the segment length to be used in the analysis together with the location of existing and future signal locations; such identification to be made by the agency having jurisdiction for the roadway on a case-by-case basis, 2) The combinations of spacing, progression speed, cycle lengths, and minimum progression band widths to be obtained for various weekday and weekend peak and off-peak periods, 3) The analysis procedures/model to be used, and 4) Qualifications of the person performing the analysis.

Table A-2

Progression Speed in mph as a Function of Signal Spacing and Cycle Length

Cycle Length (sec.)	Spacing in Miles (feet)			
	One Eighth (660 ft.)	One Fourth (1,320 ft.)	One Third (1,760 ft.)	One Half (2,640 ft.)
	Progression speed in mph			
60	15	30	40	60
70	13	26	34	51
80	11	22	30	45
90	10	20	27	40
100	9	18	24	36
110	8	16	22	33
120	7.5	15	20	30

2. Unsignalized Access Connection Spacing

Access connection spacing standards establish the minimum distance between public streets or private driveways along major thoroughfares. These standards help to reduce the potential for collisions, as travelers enter or exit the roadway. They also encourage the sharing of access for small parcels, and can improve community character by reducing the number of driveways and providing more area for pedestrians and landscaping. The location of driveways affects the ability of drivers to safely enter or exit a site. Driveway design standards assure that driveways have an adequate design so vehicles can safely and efficiently enter and leave a site.

Access connections should be spaced such that their functional areas do not overlap so that they operate independently of each other. At a minimum this distance will consist of the distance traveled during a perception-reaction time plus the deceleration-distance plus any queue storage.

The spacing on a major thoroughfare should be at least twice the deceleration distance. This will allow for right-turn deceleration lanes with normal pavement edge along at least 50% of the roadway segment. Where development had already occurred and reasonable alternative access is not available or cannot be provided, a continuous right-turn lane may be appropriate.

The selection and application of access spacing criteria should consider the following:

* Higher standards should apply to higher class roadways;
* Higher classification of roadways typically have higher speeds than roadways of a lower classification;
* Higher classification of roadways tend to carry higher volumes than roadways of lower classification;
* Spacings for suburban/urban roadways should be based on off-peak period speed;
* The interference to through traffic increases as volume increases. A very small number of turning vehicles interfere with a very large number of through vehicles on high-speed, high-volume suburban/urban roadways – especially during peak periods. A single vehicle turning from a through lane will totally disrupt platooned flow and traffic progression; and
* Roadways with speeds ≥ 45 mph are typically more critical than those with speeds ≤ 40 mph.

Suggested guidelines for unsignalized access spacing is as follows:

Table A-3

Suggested Guidelines for Access Spacing on Rural Roads, Spacing in Feet

Functional Class of Roadway	Undivided Roadway	Divided Roadway		
		All Movements	Right In/Out	Directional Opening[1]
Principal Arterial	2640	2640	990	1320
Minor Arterial	1500	1320	660	660
Collector	660	Not Applicable, Medians typically not used		
Local Road	600			

[1]Typically designed for left-turns from the major roadway or left-turns and u-turns.

Table A-4

Suggested Guidelines for Access Spacing on Suburban Roads, Spacing in Feet

Functional Class of Roadway	Undivided Roadway	Divided Roadway		
		All Movements	Right In/Out	Directional Opening[1]
Principal Arterial	2640	2640	1320	1320
Minor Arterial	990	1320	330	660
Collector	330	Not Applicable, Medians typically not used		
Local Road	100			

[1]Typically designed for left-turns from the major roadway or left-turns and u-turns.

3. Corner Clearance

Setting driveways and connections away from intersections reduces the number of conflicts and provides more time and space for vehicles to turn or merge safely across lanes. This spacing between intersections and driveways is known as corner clearance which is a special case of access spacing. Adequate corner clearance can also be assured by establishing a larger minimum lot size for corner lots. The permitting agency may include conditions on the access connection permit in terms of volume (vehicles per hour and/or vehicles per day), type of vehicle, and movement (i.e., right-in/right-out only). In addition to these conditions, municipalities and counties can regulate the type and intensity of land use per se (e.g., residential, neighborhood commercial, general commercial, etc.). Additionally, local governments may adopt site plan approval and development requirements. This can be used to regulate building location, on-site circulation and parking – in addition to access location and design – in order to minimize problems at corner properties.

Local ordinances and NCDOT Administrative Rule should specify: 1) "Subdivision of a parcel shall not result in a justification for additional direct access. The subdivision shall provide a circulation system that provides direct access to the various parcels created by the subdivision", 2) "Parcels under single ownership shall be considered a single property for the purpose of access", and 3) "Parcels under separate ownership assembled for a unified development shall be considered as a single property for the purposes of access."

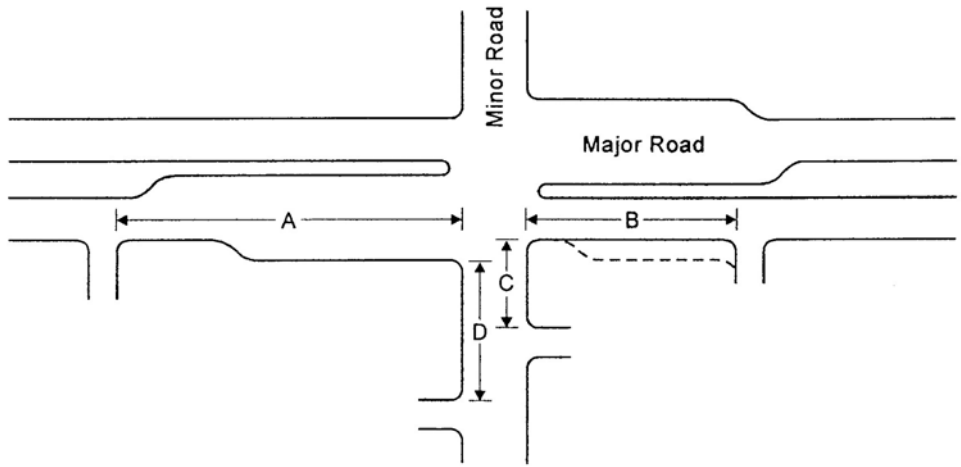
From a planning perspective, two actions should be encouraged; both require a proactive approach to corner clearances:

* Establishing the desirable location of access points before property is subdivided or developed, and
* Establishing minimum requirements for property frontages in zoning and subdivision regulations.

The following principles should guide corner clearance and driveway planning:

* Ideally, no driveways to corner properties should be permitted off of major highways. This requires safe and convenient alternative access and reasonable internal site circulation. Access to corner properties at the intersection of a major roadway and a minor roadway should be permitted to the minor crossroad only. When the frontage is limited, the access should be placed at or within 10 feet of the property line most distant from the intersection.
* Where this is not possible, major highways should have physical (restrictive) medians to preclude left turns. Each corner parcel should have one driveway per roadway that is placed as far from the intersections as possible.
* Along undivided major highways, it is desirable to eliminate left-turn ingress and egress at driveways within the "influence area" of an intersection. This may entail providing short sections of a median divider and/or adopting a driveway design that discourages or prevents left-turn maneuvers.

Intersection corner clearance indicated in Figure A-1.



Clearance	Requirement
A – Upstream on the major roadway	Distance traveled during perception-reaction time, plus deceleration/maneuver distance, plus queue storage.
B – Downstream on the major roadway	Separation of the intersection from entering and exiting maneuvers at a driveway. Separation should equal or exceed the upstream functional dimensions of driveway. Absolute minimum separation should not be less than the stopping sight distance.
C – Approach side on the minor roadway	Queuing.
D – Departure side on the minor roadway	Separation of the intersection from entering and exiting maneuvers at the driveway. (Figure A-2)

Intersection Corner Clearance

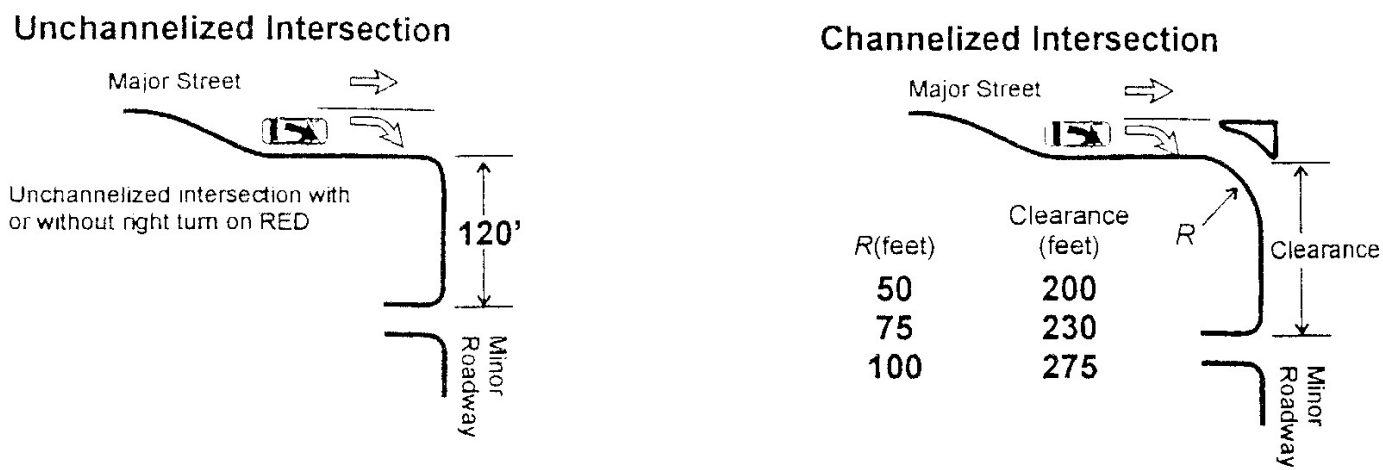
Source: *Transportation and Land Development*, 2002 [2]

Figure A-1

Figure A-2 illustrates the affect of intersection channelization on corner clearance.

4. Median Opening Spacing
In rural areas, full median openings (an opening that permits all movements – crossing left-turns from the roadway and left-turns onto the roadway) are commonly permitted. However, when providing a median opening in the NC 73 Corridor, it is important to consider the potential for future signalization. A full median opening that is located where signalization will interfere with efficient traffic progression may need to be closed or reconstructed as a directional opening. The Colorado Access Code addresses the issue of median openings on major roadways as follows: "The standard for the spacing of all intersecting public ways and other accesses that will be full movement are, or may become, signalized, is one-half mile intervals …"

Directional median openings that allow specific movements only have fewer conflict points than full median openings and are safer. Replacing full median openings with directional openings has been found to substantially reduce crash rates and to be acceptable to stakeholder groups [3]. The policy of the Florida Department of Transportation is for all unsignalized median openings to be for left-turn/U-turns. Existing full median openings are converted to left-turn/U-turns. Existing full median openings are converted to left-turn/U-turn during reconstruction projects, as well as resurfacing projects where possible.



Minimum Corner Clearance on the Minor Roadway
Source: *Transportation and Land Development*, 2002 [2]
Figure A-2

Unsignalized directional openings between signalized intersections provide convenient access to abutting properties and reduce U-turns and left-turns at signalized intersections. The following guidelines have been proposed for the provision of unsignalized directional median openings [1].

1. The median is of sufficient width to enable the design as a directional opening.
2. The left-turn bays at the adjacent signalized intersection are of greater importance than a midblock opening. A midblock opening must not compromise the design or operations of a signalized intersection. The steps in assessing the potential for a midblock opening are:

* Determine the length of the turn bay at each signalized intersection for both peak and off-peak conditions;
* Ascertain the length available for a midblock opening;
* Determine the length(s) of the proposed midblock left-turn/U-turn bays. The length for deceleration plus storage of the left-turning vehicles for both peak and off-peak traffic conditions is determined. The longer of the two is used as the minimum turn bay length at the signalized intersections as well as for the proposed midblock opening; and
* If the length available is longer than the length needed, a midblock opening can be provided without compromising the function of the signalized intersections.

Suggested spacing guidelines for median openings are listed in Table A-5.

Overlapping separators (see Figure A-3) are an essential feature of a directional median opening designed to accommodate left turns and to actively discourage other movements.

A minimum separator width (face-to-face of curbs) of 3 ft. is used by the Florida Department of Transportation which makes extensive use of this type of median opening. With a 14 ft. turn lane, this requires a median 20 ft. wide. A separator width of at least 6 ft., a 26 ft. median, is desirable in order to enhance visibility of the separators and improve aesthetics.

These median openings can be signalized such that left-turn traffic lanes (green arrow for left turns/U-turns) can be coordinated

Table A-5

Median Opening Spacing in Feet

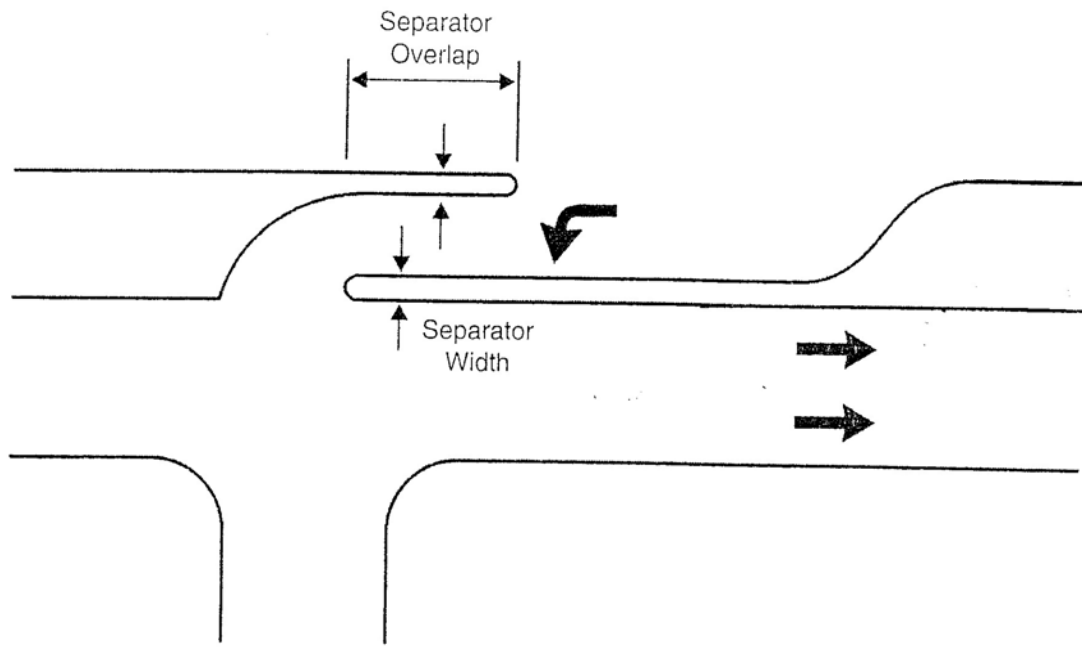
Roadway Classification	In Current and Projected Urban Areas	In Rural Areas
Principal Arterial	1,320 to 2,640 feet 1,320 to 660 feet (directional)	2,640 feet (full) when posted speed is over 45 mph 1,320 feet (full) when posted speed is under 45 mph
Minor Arterial	1,320 feet (full) 660 feet (directional)	1,320 feet (full) at all speeds
Collector	Medians generally not used	Medians generally not used

and do not conflict with traffic progression on the major roadway. Only "stragglers" between platoons will be affected; these vehicles would otherwise be stopped at the next downstream signalized intersection.

B. Median Width

Medians should be as wide as feasible but of a dimension that is in balance with other design components of the roadway cross section. The general range of median widths is from a minimum of 4 ft. for the "narrow barrier" up to 40 ft. or more which permits each roadway to be independently designed.

The minimum median width depends on the intended function (separate opposing traffic stream, provide refuge for pedestrians, provide space for a dual left-turn bay,



Separator Overlap at an Unsignalized Median Opening for Left Turns

Figure A-3

construct a directional median opening, and so on). Recommended minimum median widths are given in Table A-6.

Construction of a nontraversable median will affect left turns and may require the provision of opportunities for U-turns – especially for trucks and other large vehicles. If U-turns are to be permitted the combination of median width and pavement width should be sufficient to accommodate the turn of the design vehicle. U-turn areas should be designed in accordance with the policies established by the American Association of State Highways and Transportation Officials (AASHTO) [4].

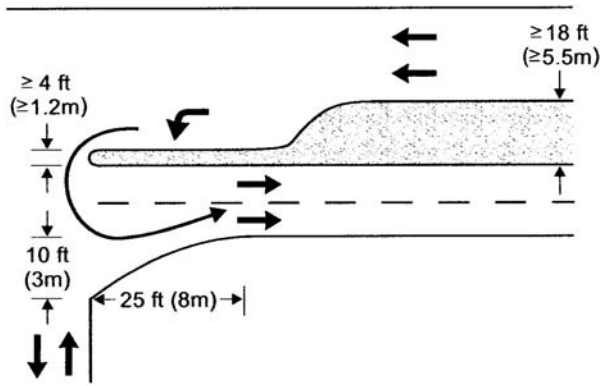
If the combined width is insufficient to accommodate the design vehicle the pavement edge can be flared or widened for a short distance. Figure A-4 illustrates examples of widened pavement.

Table A-6
Median Widths

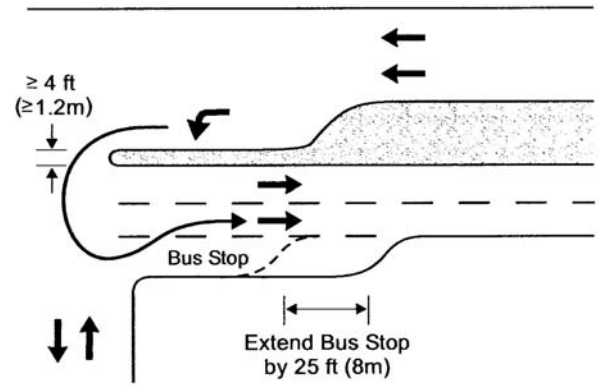
Median Function	Minimum Width Feet (metres)	Desirable Width Feet (metres)
Separation of Opposing Traffic Streams	4 (1.2)	10 (3.1)
Pedestrian Refuge and Room for Signs and Appurtenances	6 (1.8)	14 (4.3)
Storage of Left-Turning Vehicles:		
Single Left-Turn Bay	14 (4.8)	18 (5.5)
Dual Left-Turn Bay	25 (7.6)	30 (9.1)
Protection for Passenger Vehicles Crossing or Turning Left onto the Mainlane	25 (7.6)	30 (9.1)
Design Directional Openings for Selected Ingress or Egress Movements Only	18 (5.5)	30 (9.1)

Source: *Transportation and Land Development,* 2nd ed. [2]

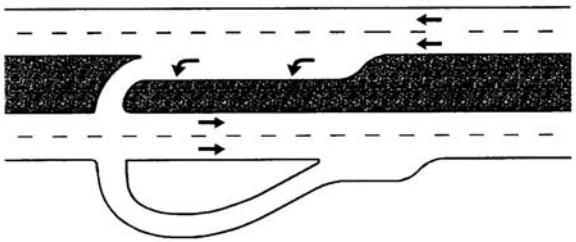
Schematic of a "Flare" to Facilitate a U-Turn by a Passenger Car on a Four-Lane Divided Roadway Having (a) Curb and Gutter, and (b) Curb and Bus Stop
Figure A-4



Flare to Allow Design
P-Vehicle to Make U-Turn on 4-Lane
Divided Roadway Having Curb and Gutter



Design for P-Vehicle
U-Turn on 4-Lane Divided Roadway
at a Bus Stop



Schematic Illustration of a "Bulb-Out" for U-Turns by Large Vehicles
Figure A-5

U-turns by large vehicles can be provided by a "turn-out" illustrated in Figure A-5. The U-turn can be signalized, if necessary, without interference with traffic progression because only one direction of traffic is affected.

C. Auxiliary Lanes

The importance of auxiliary lanes can be summarized as follows:

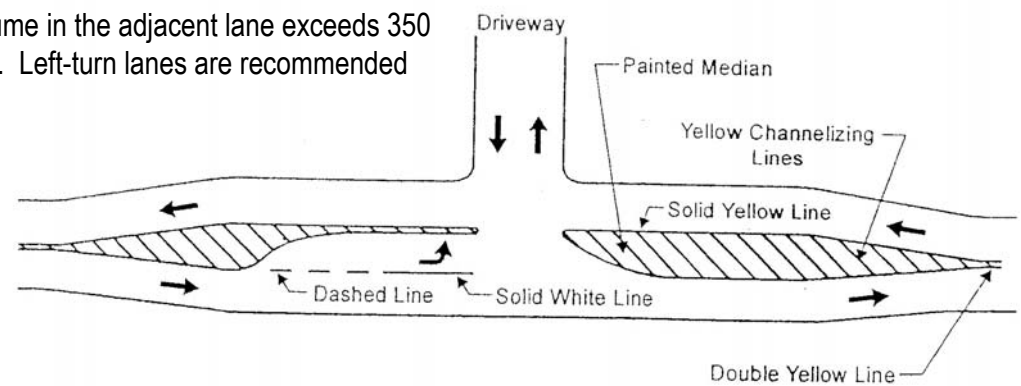
* High-speed differentials produce high crash rate potentials
* All traditional driveway designs result in a high-speed differential
* Turn lanes are the only means of limiting the speed differential between turning vehicles and through traffic

Auxiliary lanes for left-turns and right-turns improve safety, increase capacity, reduce delay, save fuel, and reduce vehicle emissions. They allow turning vehicles to leave the through traffic lanes, thereby minimizing interference with through traffic plus providing storage for vehicles waiting to complete the turn maneuver. Capacity is increased by eliminating excessively long gaps between through vehicles passing through an intersection. In absence of turn lanes, vehicles in the platoon following a turning vehicle are "kicked out" of the progression band of a traffic signal system timed for efficient traffic progression. Hence, in addition to efficient signal timing, auxiliary lanes are essential for obtaining traffic progression through a signal system.

The need for auxiliary lanes (left-turn and right-turn) has been found to be more related to the volume of traffic on the roadway than the turn volume. Right-turn lanes are recommended when the total volume in the adjacent lane exceeds 350 vph. Left-turn lanes are recommended when the sum of opposing volume and advancing volume in the left-lane exceeds 350 vph. From a safety factor it is recommended that left-turn lanes be provided at all median openings or divided roadways.

On undivided roadways it is recommended that isolated left-turn lanes be provided on two-and four-lane roads where through and left-turning volumes create or will create an operational safety problem.

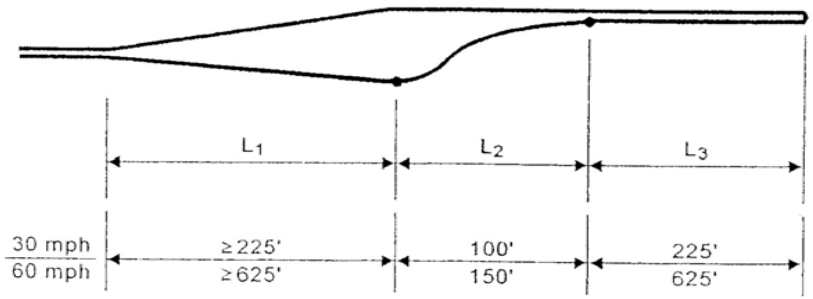
The peak hour volumes per lane in urban areas can approach capacity and even a small number of left-turning vehicles will produce high delays and a high probability of conflicts with following through vehicles. A schematic of an isolated left-turn lane is presented in Figure A-6.



Isolated Left-Turn Lane
Figure A-6

Table A-7			
Isolated Left-Turn Lane Design Elements			
Roadway Speed (mph)	L_1 Transition Taper Length (ft)	L_2 Bay Taper Length (ft)	L_3 Full Width Left-Turn Lane Length (ft)*
30	≥225	100	≥225
40	≥375	100	≥325
50	≥525	150	≥475
60	≥675	150	≥625

*Includes 50 ft. of storage



Design guidelines for isolated left-turn lanes include:

* Length
* The full width turn-lane must have a minimum length sufficient to accommodate storage of turning vehicles
* Painted channelization is preferred on high-speed roads
* Retroreflectorized pavement markers are often used to supplement the painted channelization to improve nighttime visibility
* The shoulder should be retained whenever possible – especially on higher-speed (≥ 45 mph) roadways

D. Driveway Design

Driveway geometrics must be suitable to accommodate the selected design vehicle. It is recommended that the design vehicle be the largest vehicle that will use the driveway at least once per day. AASHTO states that "Driveways are, in effect, at-grade intersections and should be designed consistent with the intended use."

Driveway design elements include:

* Width
* Return Radius
* Driveway Throat Length
* Approach Angle

Driveway widths and return radius are interrelated, i.e., as the radius is increased the driveway throat width can be decreased. The reverse is also true.

A common practice is to specify minimum and maximum return radii in one table and to specify minimum and maximum throat width in a different table. A better practice is a specific combination return radii and throat width be designated for different conditions of operation. Different designs are needed for the following:

One-way Operation

* Passenger car and sport utility vehicles (SUV's)
* Single unit truck
* Large vehicle (WB-67, motor home, etc.)

Two-way Operation

* Simultaneous exit and entry by passenger cars
* A single unit truck must wait to enter when an exiting passenger car is present in the driveway throat
* Simultaneous exit and entry by single unit trucks
* Simultaneous entry and exit by WB-67, motor home or other large vehicles

1. Driveway Throat Widths

No driveway should have a width less than 20 feet. Driveways of greater than 54 feet should be strongly discouraged unless they contain a raised median to separate traffic lanes. Driveways that serve one-way traffic should be from 20 to 30 feet wide. Driveway widths should be measured from the face-of-curb to the face-of-curb at the point of tangency. Any medians contained in the driveway are above and beyond the minimum widths in the table. Minimum acceptable and maximum acceptable widths for various levels of traffic and directions of access are shown in Table A-8.

The basic driveway widths assume adequate curb return radii. Table A-9 presents equivalent radii and throat width for a passenger car.

Table A-8

Basic Driveway Widths

Driveway Traffic Category	Average Daily Traffic Using Driveway	Peak Hour Traffic Using Driveway	With Two-Way Access		With One-Way Access	
			Minimum Width	Maximum Width	Minimum Width	Maximum Width
Residential	0-100	0-10	20 feet	30 feet	NA	NA
Low Volume Commercial/Industrial	< 1500	< 150	28 feet**	42 feet***	20 feet*	20 feet*
Medium Volume Commercial/Industrial	1500 – 4,000	150-400	42 feet***	54 feet****	20 feet*	30 feet**
High Volume Commercial/Industrial	>4000	>400	42 feet***	To be Determine Through a Traffic Study	Generally Not Applicable	Generally Not Applicable

*One-lane driveways
**Driveway striped for two lanes
***Driveway striped for three lanes
****Driveway striped for four lanes

Table A-9

Recommended Passenger Car Design for Two-Way Driveways

	One Lane In and One Lane Out		One Lane In and Two Lanes Out	
	Radius (ft.)	Throat Width (ft.)	Radius (ft.)	Throat Width (ft.)
No Bike Lane, desirable	20	28	20	40
No Bike Lane, minimum	15	28	15	40
Bike Lane, desirable	15	28	15	40
Bike Lane, minimum	10	28	10	40

2. Driveway Throat Lengths
The driveway throat must be of sufficient length to enable the intersection at the access connection and abutting highway, and the on-site circulation to function without interference with each other. Drivers entering the site should first clear the intersection of the highway and access connection before encountering the intersection of the access connection and on-site circulation.

The throat length and cross-section are interrelated; the wider the cross-section, the longer the exit throat length needs to be. This relationship results from the one fact that the weaving, which must occur, becomes more complex and requires a larger length as the number of exit lanes increases. Also, the need to achieve very high exit flow rates becomes more important as the exit volume increases. Therefore, signalized connections should be of sufficient length so that exiting vehicles are of a minimum, constant headway when crossing the curb lane. Table A-10 presents recommended throat length at signalized access drives.

It is recommended that two-way unsignalized access driveways have a throat length of least 50 ft. This will permit an entering vehicle to clear the curb line, or edge of pavement, when continuation of the entry maneuver is blocked by an unparking vehicle. It will also increase the exit capacity in comparison to a shorter throat length. One-way driveways need to have sufficient throat length to make DO NOT ENTER and WRONG WAY signs meaningful. A minimum throat length of 75 ft. is recommended for one-way driveways.

3. Driveway Profile
The vertical alignment of a driveway must provide a smooth transition between the driveway and the roadway to which access is provided – especially in absence of a right-turn bay. In all cases, the profile must be sufficient to provide adequate vertical clearance between the driveway surface and the vehicle.

Table A-10

Minimum Driveway Throat Length at Signalized Access Drives

Number of Egress Lanes	Minimum Throat Length (feet)
2	75
3	200
4	300

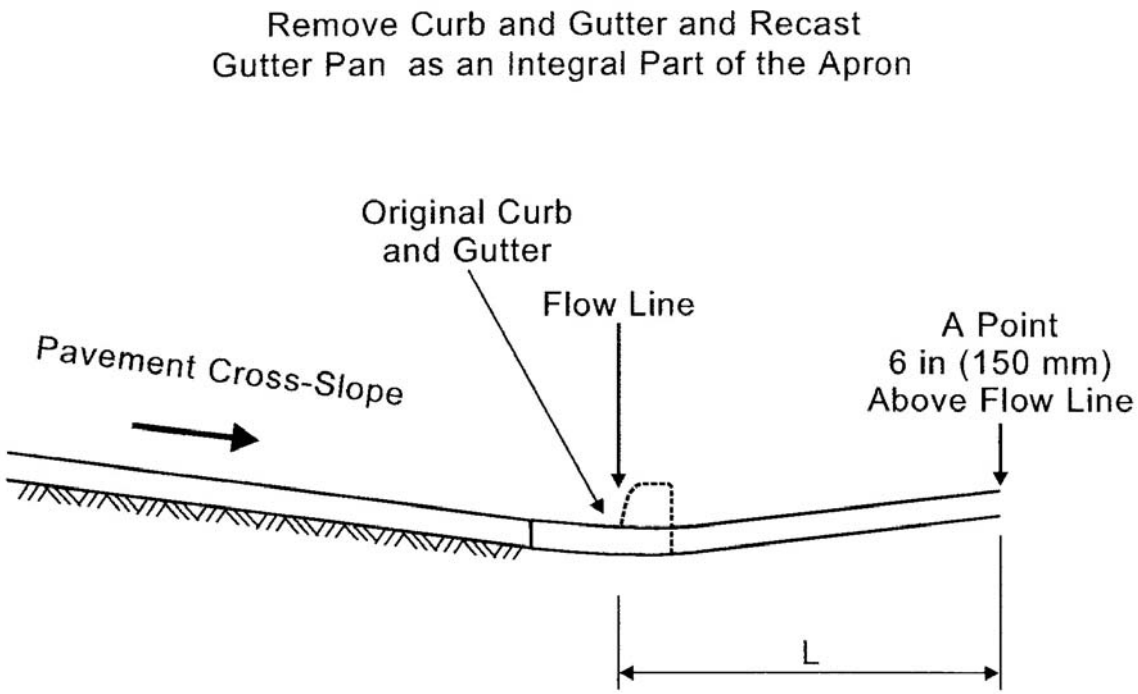
A long standing criterion has been that that maximum change in grade without a vertical curve should be 3%. With the apron lengths shown in Figure A-7, normal construction practice will provide an appropriate profile. On roadways having a curb and gutter, the entire curb and gutter section should be removed and replaced as an integral part of the driveway apron. This provides structural integrity and helps prevent water seeping through the joint between the gutter and apron. Maximum driveway grades within a distance of twice the apron length or edge of pavement or uncurbed roadways should not exceed 5% on driveways intersecting major arterials, 8% on minor arterials and major collectors, and 15% on minor collectors and local roads.

A transition curve needs to be designed into the driveway profile when there is a large change in grade. Figure A-8 illustrates profiles and provides suggested length for transition curves.

Parabolic or circular curves may be used for driveway profiles. It is suggested that the maximum grade on moderate to high volume access connections (public streets and non-residential driveways) be limited to a maximum grade of 10%. It is suggested

that the maximum grade of very low volume driveways (serving no more than two residences) not exceed 20%.

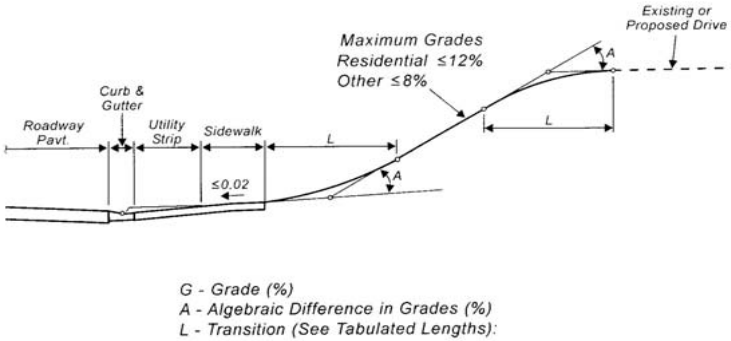
Shoulder slopes commonly vary from 4% (1/2 in./ft.) to 6% (3/4 in./ft.). The shoulder slope should be maintained for the full width, including return radii, of the driveway.



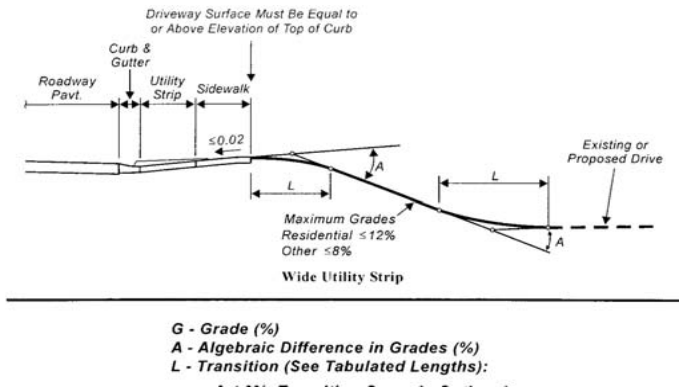
Suggested Apron Length	
Street Class	Apron Length, L (feet)
Major Arterial	≥20
Commercial Collector	15
Residential Collector	10-15
Local Residential	10

Figure A-7

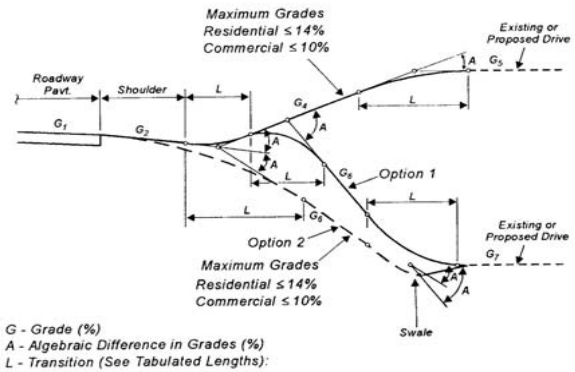
Urban, Driveway on an Upgrade



Urban, Driveway on a Downgrade



Rural Profiles



Minimum Length of Design Vertical Curve		
Change in Grade A	**Length of Curve, L (feet)**	
6%	10	10
8%	15	12
10%	20	15
15%	30	20
20%	40	30

Driveway Profiles
Figure A-8

E. Site Planning

A distinction should be made between site planning (a detailed analysis of a specific proposed development) and urban transportation planning (evaluation of transportation-land use alternatives). Site planning integrates the building, site circulation and parking, and access to the public roadway system. Transportation planning incorporates the entire roadway system that serves both the associated land uses and the overall traveling public.

1. Interested Parties

Local government, counties, state highway agencies, developers and the general public have common as well as diverse interests regarding site planning.

Local governments have very broad powers to manage urban developments. Site plan review and approval is one of the major tools available to municipalities and counties to protect the public's health, safety and welfare. An appropriately written ordinance can provide for a site plan review and approval process requiring that the development conform in all respects to the approved site plan. Any departure from the approved plan would require re-submittal and approval of a revised or new site plan.

The authority of state highway agencies is very limited in comparison with local governments. The basis for requiring a site plan as part of an application for an approach road connection is that the potential safety and operational characteristics of a proposed access cannot be evaluated in isolated from the on-site circulation system. The primary state DOT interest is:

* Will the location of proposed access have a significant detrimental effect on traffic operation and safety along the state highway?
* If the development might generate sufficient traffic volumes to meet traffic signal installation warrants, will the access be located so that efficient traffic progression can be maintained along the state highway?
* Will on-site circulation, access capacity, or other features cause a potential safety or operational problem on the abutting state highway?

The developer's interest in a good site plan are, or at least should be, extensive. While ensuring a successful development is of primary concern, it is important to note that a developer has extensive potential liability in the event of injury or death. An increasing amount of litigation is being directed toward developers and the consultants involved with the site layout. Therefore, the developer's interests cover an extensive range of issues and questions, including but not limited to the following:

* Will the adjacent roadway system adequately support the proposed development?
* Will the access and internal site circulation adequately accommodate the amount and type of traffic to make the development ' successful?
* Can the site access and circulation design be modified in response to changing conditions on the abutting roadway network?
* Is the site circulation system easy for drivers to quickly understand?

2. Site Access Location and Design

Poor site access and circulation design is detrimental to both the public investment in the highway system and the private investment in the developed property adjacent to the highway. Site plan review by a traffic engineer competent in site access and circulation design can uncover problems in the planning stage when they can be resolved. Problems discovered after the development has occurred may be mitigated only at considerable cost. Moreover, a developer owner and consultant involved

with a site development which has circulation problems resulting in a death or injury have a very high risk for lost claims.

Access location, building location and site circulation and parking are highly related. The building footprint and location have a major influence on parking and site circulation and in turn on the access location. Conversely, identification of a specific access location will materially affect how the site may be laid out – especially for small sites.

Access drives located within the functional area of an intersection will interfere with the operation of the intersection and create safety problems. Moreover, the complexity of overlapping conflict areas will interfere with site traffic. Customers attempting to exit the driveways commonly experience difficulty and inconvenience which deters their returning to the site, especially if they have the opportunity to satisfy their desires at a more convenient location.

3. Shared Access and Interparcel Circulation
Adjacent properties abutting major roadways should be encouraged to share a common approach road connection. This will reduce the number of conflict points and separate the conflict areas. The longer spacing between approach road connections will also facilitate the provision of right-turn deceleration bays. The smoother traffic flow on the abutting street will help reduce vehicular crashes and increase egress capacity.

Joint access and interparcel circulation can be readily implemented in the subdivision approval process. In this regard it is essential that local agencies develop policies and practices pertaining to joint access requirements and design. Close cooperation between local and state agencies is needed in developing these joint access requirements as well as in their implementation.

Once subdivision has already occurred, adjacent property owners may be encouraged to share a common access where it can be shown that customer convenience and safety can be improved. Reconstruction which adds a nontraversable median or median opening modifications also offer opportunities for encouraging joint access agreements.

4. Site Plan Review
The site plan should show all details necessary to fully define how the site is to be developed. This should include the basic geometry of the site access, circulation, parking and building footprint. Also included should be a detailed drawing of access, circulation and parking elements.

The location, geometrics and traffic control of all intersections within 1/2 mile on highways of statewide and regional importance and 1/4 mile on district level highways should be described and illustrated.

It is suggested that municipal and county ordinances require that the developed site fully comply with the approved site plan prior to issuance of the certificate(s) of occupancy.

5. Traffic Impact Analysis
A traffic impact analysis (TIA), also sometimes called a Traffic Impact Study (TIS), is a specialized study of the impact a certain type and size of development will have on the surrounding transportation system. Depending on the type and size of development, the TIA can range from a cursory inspection of the site, the projected traffic volumes and the adjacent streets to a full-blown alternatives analysis that includes

adjacent streets, regional thoroughfares and transit systems.

The TIA is most effective when it is an integral part of the development impact review process. It specifically concerns the generation, distribution and assignment of traffic to and from a proposed development. The purpose of a TIA is to determine what impact that site-generated traffic will have on the existing and proposed roadway network and what impact the existing and projected traffic on the roadway system will have on the proposed development.

The purpose of the traffic impact analysis and site plan review is to assess the effects that a particular development will have on the surrounding transportation network, to determine what provisions are needed for safe and efficient site access and traffic flow and to address other related issues. The study report should document the purpose, procedures, assumptions, findings, conclusions, and recommendations of the study. There are three common uses for these reports. The first is to provide developers or designers with recommendations regarding site selection, site transportation planning and traffic impacts. The second is to assist public agencies in reviewing the attributes of proposed developments in conjunction with requests for annexation, land subdivision, zoning changes, building permits, or other development reviews. The third is to establish or negotiate mitigation requirements where off-site impacts require improvements beyond those otherwise needed. In recent years, such reports also have been used by public agencies as the basis of levying impact fees or assessing developer contributions to roadway facility improvements.

F. Why Manage Access?

New and improved major roadways lead to convenient movement and increased traffic volumes. The increased activity is accompanied by an increase in the number of driveways. This results in an increase in the number and severity of conflicts, an increase in traffic crashes, and a decline in the quality of traffic service. This, in turn, generates the demand for additional improvements or the need for a bypass.

With a notable exception of freeways, urban arterials and highways in the developing urban fringe commonly experience a deterioration in their ability to accommodate traffic in a safe and efficient manner as travel demand increases. This problem results from the requirement that the facility must serve the conflicting functions of providing for land access and through traffic movements.

Traffic engineers have long recognized that the elimination of unexpected events, simplification of conflicts areas, and the separation of decision points simplify the driving task. Since Access Management reduces the complexity of traffic conflicts as well as increases the spacing of events to which the driver must respond, it will result in improved traffic operations and reduced crash frequency.

G. References

1. *Access Management Manual*, TRB Committee on Access Management, Transportation Research Board, National Research Council, 2003.
2. V. G. Stover &F. J. Koepke, *Transportation and Land Development*, Institute of Transportation Engineers, 2002.
3. S/K Transportation Consultants, “Access Management, Location & Design” Participant Notebook for NHI Course No.133078, National Highway Institute, Federal Highway Administration.
4. *A Policy on the Geometric Design of Highways & Streets*, American Association of State Highway & Transportation Officials, 2001.

Review of Access Management Requirements of Government Agencies within the Route 73 Corridor

OVERVIEW
The various local jurisdictions in the Route 73 Corridor have different street development criteria and access spacing standards. Review of zoning and subdivision regulations and unified development codes reveals that these ordinances do not include provisions for corridor preservation.

Various long range transportation plans and local codes make general goal statements such as: increasing the connectivity of the street system, minimize travel times and distances, improve traffic flow, improve traffic safety and improve the visual quality of roadways.

Access management provisions are absent from some codes and where provided are often inappropriate for a major thoroughfare such as NC 73.

The procedures and techniques that might be applied to implement a Route 73 Corridor Plan might be grouped into the following two categories:
1. Right-of-way preservation strategies to protect the right-of-way, coordinate funding between the NCDOT and local governments, and coordinate the public investment with private development.
2. Access management techniques to achieve safe and efficient circulation on NC 73 and within the Route 73 Corridor.

The following are comments based on a review of relative development regulations of the governmental agencies with the NC 73 Corridor.

North Carolina DOT
<u>Policy on Street and Driveway Access to North Carolina Highways – July 2003</u>
1. (p. 27) Sketch shows the concept of upstream functional distance. A table gives distance traveled for various speeds and perception-reaction times. *[Needed are: (a) deceleration distance for various speeds, (b) procedures for determining left-turn and right-turn storage, (c) process for determination of the design distance, and (d) downstream functional distances.]*

2. (p. 35) Introduces the issues of radius at driveway-street connections. *[Does not recognize that radius and throat width are related. Combinations of radius and throat width need to be developed/provided for simultaneous exit/entry of passenger vehicles only, simultaneous exit/entry by passenger vehicles and trucks, and simultaneous exit/entry by trucks. Typical designs for multiple lane driveways are also needed. Also needed: driveway throat lengths for various throat widths (number of entry/exit lanes).]*

3. (p. 41) Provides guidance for minimum separation of driveways on opposite sides of a roadway without a nontraversable median. *[Offset distances are reasonable minimums.]*

4. (p. 42) Specifies driveway grade profiles. *[Criteria provides for a good profile where a shoulder is present. A 1/2-inch per foot cross-slope is 4.17%; maximum ADA sidewalk slope is 2% -- 1/4-inch per foot.]*

5. (p. 43) Requires removal of entire curb and gutter of curb cuts. *[An excellent practice.]*

6. (p. 43) Maximum change in grade between pavement cross-slope and driveway apron slope is 5% without a designed vertical curve. *[An excellent practice.]*

7. (p. 46) Figure illustrating turn lanes. *[A right-turn taper only is not effective. The illustration for "Full Left or Right-turn Lanes" is confusing relative to left-turns; suggest arrows showing the movements be added.]*

8. (pp. 50-51) Driveway width and return radii are dealt with separately. Specifies a 36 ft. maximum width (p. 50); a 20 ft. minimum radius and a 50 ft. maximum radius (p. 51. *[This does not recognize that the throat width and radius are interrelated. Combinations of radius and width for simultaneous exit/entry by passenger vehicles only, passenger vehicle exit and truck entry, etc. need to be developed/provided. Also 36 ft. max. does not provide for suitable design for moderate to high volume driveways – albeit, the case-by-case exception may permit such designs.]*

9. (pg. 51) 1000 ft. minimum separation between centerlines of full movement driveways on major thoroughfares. *[Reasonable for NC 73 but consecutive left-turn lanes may require a longer separation.]*

10. (pg. 52) Desirable corner clearance is 100 ft., minimum is 50 ft. *[Corner clearance should be addressed as an access spacing problem. Upstream corner clearance on NC 73 will need to be much longer to avoid a driveway within the length of an auxiliary lane – much less avoiding a driveway within the upstream functional distance. There are no criteria for downstream corner clearance.]*

11. (p. 80) Warrant for Turn Lanes
(a) The figure on pg. 80 identifies warrants for left-turn and right-turns. *[The figure was developed by Harmelink for left-turn warrants on four-lane roadways. It is not applicable to left-turns on two-lane roadways nor to right-turns in any case. Recent research has shown that the gap size and time to execute a left-turn are considerably longer than Harmelink used. Therefore, the probability of a conflict between a left-turning vehicle and a following through vehicles is much higher than Harmelink assumed; or, a turn lane will be warranted at much lower volumes and the storage length, S, will be much longer than given in the figure.]*

(b) The figure on pg. 54 and pg. 87 illustrates auxiliary lanes for left-turns and right-turns. *[The figure shows a taper plus storage. This type of design results in excessive deceleration in the through traffic lane (a safety hazard) and is inconsistent with the design concept shown in the figure on pg. 35. Values consistent with the figure on pg. 35 need to be developed/provided.]*

Cabarrus County
<u>Subdivision Regulations</u>
1. (p. 28) No lots may have direct access to a major thoroughfare or principal arterial. Lots must be served by an internal road system or marginal access. *[An excellent requirement.]*
2. (p. 29) Provides for mitigation *[5% reduction in lot size when right-of-way dedication is required.]*
3. (p. 30) Requires any subdivision in excess of 50 lots or generate an ADT > 500 vpd to construct turn lanes to NCDOT specifications. *[An ADT of 500 vpd might be expected to be about 50 vehicles during the peak traffic hour. This will result in serious interference on a high speed, high volume thoroughfare such as NC 73.]*

City of Concord

Unified Development Ordinance

(p. 10-3) States "that an interconnected street system is necessary" and references Traditional Neighborhood Development Street Design Guidelines, Institute of Transportation Engineers,\June 1997. *[Cross-street that intersect a roadway at short spacing intervals is not appropriate on a major thoroughfare such as NC 73.]*

2. (p. 10-6) Driveway separation standard

Street Class	Minimum Driveway Spacing	Minimum Corner Clearance
thoroughfare	400 ft.	250 ft.
collector	120 ft.	120 ft.
local	40 ft.	60 ft.

Exempts single-family and duplex developments on individual lots from the standards *[A corner clearance less than the minimum spacing is not rationale. Right-turn deceleration/storage lanes on a major roadway such as Route 73 will need to be longer than 400 ft.]*

3. (pp. D-5, D-6) Driveway widths

land use	driveway width		flare/radius	
	min	max	min	max
single family	12	32	1	3
multi-family	24	36	10	30
commercial/industrial				
two-way	24	36	5	10
one-way	15	20	5	10
private street	24	48	30	30
street type driveway	24	36	10	30

[A 36 ft. max. width for a 2-way commercial/industrial and 10 ft. max. flare/radius is marginally adequate for simultaneous exit/enter (one lane in/one lane out) for passenger vehicles and is entirely inadequate for trucks. Also, a 36 ft. max and a 10 ft. max radius will not allow for an appropriate design with two exit lanes and one entering lane. Minimum radius needs to be ∃15 ft. A 36 ft. max. width for street type driveways does not allow for multi-lane driveways.]

4. (p. D-6) Medians and islands

(a) 6 ft. median width, 50 ft. minimum length. *[Reasonable min. width; excellent min. length.]*

(b) For street type driveways with a median or island, the combined width of pavement of the separated driveway segments shall not exceed 48 ft. *[A 48 ft. maximum will allow for a minimal design of two-lanes in and two-lanes out with radii ∃20 ft.; it will not permit a design of two lanes in and three lanes out that is often appropriate for very large traffic generators.]*

5. (p. D-7) Permits driveway approach to encroach upon the radius at street intersections having the radius of 60 ft. or more. [*This permits encroachment where long curb radii are needed at channelized intersections.]*

6. (p. D-8) Various conditions are stated as to when turn lanes are required. *[These conditions might provide a basis for requiring turn lanes at most, if not all, access connections to a roadway such as NC 73.]*

7. (p. D-18) Shows 15 ft. minimum width for separator island for a street-type driveway with a median. *[A wide separation can confuse drivers and their interpreting the access as two 2-way driveways; 15 ft. (preferably 12 ft.) should be a maximum width. Suggested minimum width ∃6 ft.]*

Town of Cornelius

Land Development Code

1. Encourages a network of interconnecting streets (p. 7-1) [Does not address interconnections between adjacent parcels.]
2. (a) Curb radii shall be designed to reduce pedestrian crossing time (p. 7-4).
(b) Two-way driveways shall not exceed 24 ft.; 12 ft. for one-way drive (pp. 7-14 & 7-15), except as required by North Carolina DOT [A 24 ft. wide driveway will not provide for simultaneous exit/entry by passenger vehicles unless the return radius is at least 20 ft. The "except as required by NCDOT" permits suitable designs having direct access to Route 73; but may result in inadequately designed driveways on the supporting circulation system.]
(c) There is no statement as to driveway throat length.

3. Edge of sidewalk is shown at the right-of-way line (pp. 7-8 through 7-12). [Makes sidewalk maintenance difficult without obtaining a temporary easement. A 1 ft. offset from the right-of-way line is recommended.]

Town of Davidson

Planning Ordinance

1. Section 3.2 provides for the establishment of overlay districts.

2. Section 6.4 provides for right-of-way reservation for thoroughfares on the official comprehensive plan map.

3. Section 10.1 E: Two-lane driveways not to exceed 24 ft., one-lane driveways not to exceed 12 ft. *[These widths essentially preclude reasonable design of two-way driveways on major roadways. A 24 ft. width is marginal/minimum for simultaneous exit/entry by passenger vehicles only if the curb return radius is 20 ft.]*

4. Section 11.2.7: Maximum block length is 600 ft. *[Application of this maximum block length may result in access connections that are inappropriately short for Route 73.]*

Town of Huntersville

Subdivision Ordinance

Provides a functional hierarch of roadways (p. 7) together with a minimum right-of-way for each (p. 30) and requirements for dedication of right-of-way by the developer pp. 48-50.

p. 50, Section 8.115 Responsibility for State Roads

"No dedication or reservation of right-of-way for a new street or highway within a corridor for a street or highway on a plan established and adopted pursuant to N.C.G.S. 136-66.2 for a street or highway that is included in the Department of Transportation's "Transportation Improvement Program" will be required by the provisions of this ordinance unless and until the town manager has determined and certified in writing (1) that the dedication or reservation does not result in the deprivation of a reasonable use of the original tract and (2) that the dedication or reservation is either reasonably related to the traffic generated by the proposed subdivision or use of the land remaining in the original tract, or the impact of the dedication or reservation is mitigated by measures provided in this Ordinance. For these purposes the term "original tract" will mean all contiguous land

owned by the applicant. The ability of the applicant to transfer density credits attributable to the dedicated right-of-way to contiguous land owned by the applicant is deemed to be a measure which mitigates the impact of the dedication or reservation."

pp. 48-49, Access to New Class III Streets (Major Arterials and Commercial Arterials) or extensions limited to public streets or specifically approved street-type entrances.

[No statements as to access connection spacing or driveway design.]

City Kannapolis

Unified Development Ordinance

1. (p. 6-27) Allows subdivision of 5 lots with direct access to a thoroughfare. Subdivision with more than 5 lots must be served by an internal public street. *[The 5 lot exception can result in numerous driveways to a major thoroughfare such as Route 73.]*

2. (p. 6-28) A buffer yard is required to separate residential lots from a major thoroughfare.

3. (p. 8-4)
(a) Maximum driveway widths: 20 ft. for one-way driveways, 36 ft. for two-way. A median shall be considered in calculation of maximum width. *[Maximum width of 36 ft. is adequate for a two-way drive – one lane in and one lane out with a median; 36 ft. is not adequate for one-lane in and two lanes out or for multiple lanes in/out with a median.]*
(b) Minimum width refers to a table that does not exit.
(c) There is no statement as to driveway

4. p. 10-6 Access Management

Driveway Separation Standards

Street Class	Separation	Corner Clearance
thoroughfare	400 ft.	250 ft.
collector	120	120
local	40	60

[Corner clearance is a special case of access spacing; a corner clearance less than spacing standard is not rationale; 400 ft. spacing is inadequate on a thoroughfare with speed ∃35 mph. Turn lanes on a major thoroughfare will be longer than 400 ft.]

5. Section 15 establishes two corridor protection overlay districts that cover permitted uses, off-street parking and loading, signs, building design and site plan submission. Driveway spacings and design are the same as given elsewhere in the code.

Lincoln County

Subdivision Ordinance

1. (p. 57-58) Subdivision abutting a principal arterial shall provide a collector road (frontage road) parallel to the arterial or provide reverse frontage with no access to the arterial. Planning Board may require frontage road or reverse frontage on a major collector. *[Reverse frontage is an excellent method of providing access to property abutting a major roadway.]*

2. (p. 59) Minimum sidewalk width of 4 ft. *[Sidewalk width needs to be ∃5 ft. to meet ADA requirements]*

Public Involvement Plan

Strategies and Tactics

1. Include and reach all those with a direct interest in, or potential to be impacted by the outcome of the plan.

* Review existing GIS data (initially compiled by Tom Sawyer Company) and contacts from Community Design Workshops to identify a targeted Stakeholder Mailing List for the public within ½ mile of the Study Corridor.
* Contact Towns to retrieve contact information for local Homeowner's Associations and business organizations to create a mailing list

2. Encourage participation of the public by providing involvement opportunities throughout the life of the plan.

* Hold Corridor Plan Regional Meetings in each County (March 23-25) to review the draft plan
* Conduct small group breakout sessions to engage participants in Corridor Plan Regional Meetings
* Distribute questionnaire to determine what the public knows, how they feel, etc.

3. Inform the public of meetings and other plan-related events.

* Continue initial contacts with major media in the area and maintain a media list for coverage of public involvement events (include Diane Whitaker and Mary Newsome at the Charlotte Observer)
* Mail/Email meeting notices to committee members, local governments, city leaders, etc. at least one week in advance
* Request posting of the notices on city websites for public viewing
* Redesign postcards to be more informative
* Mail postcards to a more targeted group informing the general public of the upcoming public meetings
* Submit news release to area print and broadcast media to inform the public of the upcoming meetings
* Create and post flyers in relevant communities to increase awareness of the project and to promote involvement in the Corridor Plan Regional Meetings (i.e. libraries, shopping centers, convenience stores, neighborhoods, etc.)
* Create public email list from sign in sheets and contacts provided by Steering Committee members
* Create and distribute via email a monthly newsletter with project updates (January issue will provide an opportunity for public feedback by including a questionnaire/survey on land use issues)
* Ask Steering Committee members to suggest speaking opportunities for key planners at selected civic events

4. Educate the public of their role as community citizens and leaders in the planning and decision-making processes.

* Greet guests and be available to answer questions at each public meeting or event
* Maintain a sign-in sheet collecting contact information such as email addresses
* Submit Community Design Workshop and Corridor Plan Regional Meeting synopses and handouts in .pdf version to be posted on city websites for public review (also distribute to local libraries, local governments, and city leaders)

5. Advance the NC 73 Corridor Study as a transportation plan that will enhance the quality of life for the individual communities.

* Create and submit a backgrounder or feature story to local print media to educate the public on the importance of and need for the plan, as well as possible long-term impacts, and how the public can become involved in the planning and decision-making process
    * January – showcase preferred scenario
    * March – report on status up to and prior to Corridor Plan Regional Meetings
    * May – emphasize upcoming presentations to elected officials

Evaluation

* Once the public involvement plan has been implemented, it is important to evaluate the effectiveness of each public involvement technique. This will ensure that funds were spent to achieve desired results, will illuminate techniques that were more effective than others, and will provide a way to improve future public involvement processes. The following are sample ways to evaluate the effectiveness of the public involvement plan:
* Distribute a survey at the beginning of every public meeting or event to determine which techniques were most effective in informing the public, and provide an opportunity for suggestions (i.e. what percentage saw a flyer, ad, news article, memo, heard a radio ad, etc.)
* Collect articles published in area print media
* Keep a record of those in attendance at public meetings and workshops (take into consideration time and location of meetings)

Comments from Public Workshop (10-2003)

Lincoln County

US 321 to Link Drive:

* Some want bypass turnaround to easily exit if entered by mistake
* Some want bypass to remain a 4 lane restricted road to keep traffic flowing
* Want grass median in center of bypass
* Suggestion to use old NC 73 as business route and the new NC 73 as a truck route, but there was some concern for safety
* Some do not like the bypass at all

Link Drive to Reed Creek & Reed Creek to Killian Creek:

* Like thruway concept
* Want speed limit at 55mph
* Safety concern for tractor and farm equipment traveling on the road
* Concern with right of way and property rights once project has begun
* Want 2 lane and some 4 lane areas
* Access management needs to be considered
* Concern for bikes and sidewalks near Link Drive
* Suggestion to get right of way and sewer at same time to save money and inconvenience to property owners

Additional Comments:

* Like 55 mph speed limit west of Furnace Road and 45 mph east of Furnace Road
* Bicycle lanes and sidewalks would be attractive
* Like thruway --- moves traffic quicker, but concern about safety for farm vehicles
* Concerns about right of way acquisition and property rights
* Some want to keep 2 lane and some like 4 lane with median
* Interest in straightening NC 73 near Amity Church Road
* Population estimates are conservative so access management will be important
* Concern about taking property rights and condemnation --- how much right of way?
* Acquire land for sewer and water right of way at same time
* Make speed limit as fast as possible --- 45 mph is too slow
* Need some sort of access management
* Like to see road remain 2 lanes

Killian Creek to Duke Power Lines:

Group 1:

* Prefers a combination of network and linked centers
* Not sure if they want 4 or 6 lanes
* Want it to be bike and pedestrian-friendly

Group 2:

* Prefers network to preserve right of way for property owners
* Concerned about accidents
* Feel that traffic will quickly overwhelm NC 16 and NC 73
* Truck traffic is a major concern
* Want more street lights
* Some feel there is a lack of Denver community to participate in this project
* There is currently no networking to help divert traffic
* Want future coordination with developers

Additional Comments:

* Support for upgrading Hagers Ferry Road
* Would prefer a 2 lane road between NC 16 and Club Drive and a 4 lane road from Club Drive east to the river

Duke Power Lines to Huntersville Town Limits:

* Prefers the thruway concept
* Some concern about right of way for property owners
* Some want to make Sam Furr Road to Catawba Avenue 6 lanes (with a minimum of 4 lanes) divided by 20' median to allow directional crossovers
* Want to maximize access management

General Comments:

* NC 73 will not be able to handle projected traffic --- look at bypasses instead
* Development/developers need to help fund project
* Anticipate an even worse case scenario for population/traffic growth – projections possibly too conservative
* Concern that widening NC 73 will take over too many houses --- would it be more reasonable to build a network road around NC 73?
* Need better evacuation routes in case of disasters with the Nuclear Plant
* Some interest in transit to reduce traffic

Mecklenburg County

Duke Power Lines to Huntersville Town Limits:

* Preferred the thruway concept – want traffic efficiently channeled in and out of neighborhoods --- takes development off of NC 73
* Want 45 mph speed limit
* Do not want sidewalks
* Possible parallel access roads that perform properly as opposed to multiple driveways along NC 73
* Want proper placement of signals --- we do not want to see red lights BUT, how do we access the road without red lights?
* Want 4 lanes with a median
* Want frontage road on south side of NC 73
* Red light needed at Beatties Ford Road
* Want bikeways
* Plan for bus transit, but not a replica of Shelby on US 74

Huntersville Town Limits to Catawba Avenue:

Group 1:

* Like thruway/network --- like idea of feeder roads
* Liked idea of bikeway with buffer between road and bikeway
* Like sidewalk idea (maybe one thruway for pedestrian and bikes)
* Need convenient pedestrian crossways at Sam Furr Road and Catawba Avenue
* Too many signals now (should not be spaced any closer than every ½ mile)
* Need left and right turn lanes
* Want landscaping in medians
* Want additional transit stops at Gilead and NC 73 to help reduce traffic --- take eastbound traffic off at Gilead

Group 2:

* There are too many driveways on NC 73 – need dividers for legal U-turns
* Would have to realign Gilead if diverting traffic from NC 73
* Need more left turn lanes for better subdivision and development access

Additional Comments:

* Want network road that runs from NC 73 and
* Catawba Avenue to NC 73 east of 115 (parallel and south of West Moreland)
* Want Stumptown Road connector (possibly linked at Ramah Church Road)
* Want network connections at neighborhoods north of Sam Furr Road to connect to 21 and 115
* Truck traffic could shift to I-485 when it is opened
* Need aggressive access management around David Kenney Farm Road at NC 73 and Catawba Avenue
* May be good idea to make Gilead Road extend further west than Beatties Ford Road and intersect with NC 73 closer to the river

Catawba Avenue to Ramah Creek:

Group 1:

* Want network plan --- want high volumes of traffic diverted from NC 73
* Want good signage to go north or south
* Sprawl will occur if choosing network concept - once secondary roads are improved, more development will occur
* Want bike lanes and pedestrian access in some areas

* Want better access management in developed areas
* Want interchange at West Moreland
* Want restricted left turns with medians on NC 73

Group 2:
* Network concept preferred --- 4 lanes with turning lanes
* If the road is widened to 6 lanes, more houses will be taken
* Know that change on NC 73 is inevitable
* Removal of walls and berms is of concern
* Concern about noise levels and beautification
* Want berms and nice front entrances to developments fixed or replaced after the construction is complete --- want Homeowners Associations compensated for loss
* Main concern is access management
* Timing of signals at NC 115 is an issue --- turn red sooner causing traffic stalls (there are also 3 lights within 200 yards of each other)
* Would be nice to have pedestrian and bike crossways
* Want a connection between the Hamptons and Caldwell developments to avoid NC 73 by routing some traffic onto NC 115
* Want sidewalk between Hampton Ridge and Northcross
* Want curb with 18 foot medians
* Want 45 mph speed limit

Group 3:
* Network concept preferred --- 2 roads east and west
* Heavy truck traffic is a major issue --- hoping I-485 will absorb this traffic
* If NC 73 is 8 lanes, the widening will take over the first row of houses for many subdivisions
* Speed limit should be 35 mph through area because of neighborhoods
* Want 4 lanes with left turn lanes and legal U-turns
* Do not want medians because right of way absorbs sound, pollution, etc.
* Pedestrian friendly community so they want sidewalks to travel to shops and the library that are near many developments
* All signals should be timed so you do not get stopped at each one
* Need stacking lanes on I-77 and NC 73 exit ramp
* Want interconnectivity between developments and subdivisions
* Want buffering on outside by homes (i.e. sound barriers)
* Want good access management
* It takes less than 5 minutes to get to interstate from 3 neighborhoods

Ramah Creek to West Branch of Rocky River:
Group 1:
* Want parkway --- some like linked centers, some like network
* Speed should be 45 mph
* Liked linked centers because community still linked to highway
* Want road to relate to community that is already there
* Want road to be sensitive to the community in regards to the number of lanes that may be required to widen NC 73
* Widening NC 73 is too intrusive --- property owners do not want to be limited for having property adjacent to the highway
* Want all lanes to be closer together through node areas
* Want limited access within the developments

Group 2:
* Favored network/thruway concept
* Want quick access to areas
* There was anonymity on necessary access management
* Maintain existing alignment --- character of property adjacent to NC 73 is pretty and will be disrupted with widening
* Want 4 lanes at least 12 feet lanes but not excessively wide
* Want swell curb with storm drainage --- not squared curbs

* There was concern about land use issues regardless of the scenario chosen
* There may be some value in having a satellite center with its own set of roads
* Want planted medians and bikeways on hardened shoulders
* Want sidewalks along park areas with pedestrian crossways

Group 3:
* If 1 center turn lanes not enough, then 4 lanes for more capacity
* Concern of taking too much land
* How are the roads going to look and how can the buildings relate to the road?
* Concern about congestion
* Do not want to pay for everyone else's open space
* Left turn lanes into nodes
* No medians
* Town nodes slow traffic
* Road is currently dangerous (slow traffic to 45 mph)
* Linked center with network with fewer nodes

Additional Comments:
* Liverpool and Shops on the Green are good examples of off-site directional signs to support business being off of the corridor
* Coordinate curb cuts with the Department of Transportation
* Think Taconic or Saw Mill in New York, or Rock Creek in D.C.
* Controlling access is critical to maintaining useful roads
* Do not need main street in this area (already one in Huntersville)
* Want to preserve the artery
* 2 lanes if possible, if network will disperse enough traffic
* Could need 6 lanes
* There is a National Register home near Shiloh Church Road at NC 73
* Across the street on the south side of NC 73 is the Bradford Store
* About ¼ mile to the west is the Rocky River Baptist Church that dates back to 1834
* Need access to I-485 from Davidson/Concord Road
* All believed access management was important regardless of scenario chosen
* Want limited access to NC 73 with driveway spacing being every ½ mile to 1 mile
* Concern about land use controls required under the network approach

General Comments:
* Worst part of traffic is through-truck traffic --- do not want to accommodate trucks, but instead, want to accommodate the people who live in the area
* Thruway does not have to look like Harris Boulevard --- there are other nice thruways throughout the country
* What will happen with the Sub Station if the road is widened?
* Dangerous intersection between NC 73 and Davidson/Concord Road (want a signal of slower speed limit through area)
* What is the timeframe for the road being improved?
* Does the fact that NC 73 is an evacuation route for the nuclear station, not make this project a priority?
* Needs to be a signal at Beatties Ford Road and NC 73 --- there is no left turn lane and it backs up traffic

The following comments were made at the Lincoln County Public Meeting:
* Huntersville Town Limits to Catawba Avenue:
* There is a bad intersection at Sam Furr Road and Catawba Avenue (1 turn lane is sufficient?)
* Make Sam Furr Road around Birkdale to 115 a 6 lane road with directional crossovers
* Maximize access management immediately
* Specify full build-out right of way and build as necessary
* Fix bottlenecks

Cabarrus County

Ramah Creek and West Branch Rocky River:

* Liked the idea of grass medians in rural areas
* Need left turn lanes in urban/neighborhood centers
* Want to limit signal lights to major intersections
* Liked linked centers for urban areas and network for rural areas
* Want it to be pedestrian-friendly at neighborhood centers

West Branch Rocky River to Coddle Creek Reservoir:

* Want rural areas to stay as rural as possible
* Want to make sure there is better coordination with new development --- require developers to improve road before development is complete
* Preferred the network concept in rural areas, but fear that secondary roads will not be fixed quick enough to handle traffic diversions
* Need to fix secondary roads before NC 73 (i.e. Harris and Poplar Tent)
* Want a bypass on secondary roads for biker safety
* Existing problems with pedestrian crossings
* Liked village concept to accommodate pedestrians
* Need better lighting and shoulders to accommodate pulling to the side of the road
* Want to slow development/growth to improve roads first
* Concern about existing turning problems --- need more turn lanes
* Curious as to how much right of way on NC 73 will be needed to accommodate the widening
* Want network roads to be 2 lane divided with turn lanes
* Odell School Road backs up for 2 miles north of NC 73 (need turn lanes)
* Deed says right of way is 60 feet (for property on NC 73 just east of Odell School Road)
* Bridge on dam across reservoir has culverts and would be difficult to widen
* Road salt issue?
* How will airport expansion affect traffic from NC 73?

Coddle Creek Reservoir to I-85:

* Curious as to how much development/traffic can be handled through dam area
* There are a high number of driveways that need access to the road --- possible solution group driveways?
* There are lots of vehicle accidents --- the speed limit should be 55 mph or lower
* Preferred network concept
* NC 73 was just widened 4 feet on each side (just last week)
* Not safe for bikers
* Want to keep NC 73 2 lanes from LaForest Lane to the west side Bypass
* Like idea of using Untz Road as a network road
* Safety is a big issue --- farm vehicles and animals use road

Comments from Public Workshop (03-2004)

Lincoln County

NC 73 Bypass Segment:

* Think money will be better spent on a new NC 73 --- can later improve older NC 73 for access to towns
* Concerned about parking area in front of business at Link Drive on NC 73 --- should look at widening to the north side of NC 73
* Concerned about losing house on NC 73 --- houses are only 60' off of the roadway
* Suggested bypass to run from just west of the railroad tracks across NC 27and Low Bridge Road, further east (continuing south of the proposed NC 73 bypass)
* Add marker/symbol for cemetery between Oakwood Circle and Link Drive
* With the proposed unsignalized right turn intersection at Link Drive, there is concern about not being able to turn left out of the subdivision

Ironton Segment (Alternative A):

* Like this alternative better
* Try to avoid Century Farm across from Reinhardt Circle
* Houses and development are on the right side of NC 73, in between beginning and end of Reinhardt Circle
* Suggested to run Alternative A from NC 27 to Alternative B past Leepers Creek --- to be considered in environmental/preliminary engineering phase
* There is a zoning question regarding the industrial land use on the left side of NC 73 across from Reinhardt Circle
* The land between Furnace Road and NC 73 is subdivided into 27 lots
* Comment made that the vacant area on the right side of NC 73 across from Amity Church Road is being sold for residential
* Suggested to include historic site on left side of NC 73 between Lambs Way and Beth Haven Church Road
* Add a marker/symbol for historic site across from proposed unsignalized right turn intersection at Reinhardt Circle
* Worried about protecting area around Beth Haven Church Road and NC 73 (3 historic sites in the area)
* Lower speed limits cause more congestion. Is the new speed trap area designed to promote the need for this new highway? The new highway is a good idea, but people need to get to work in the meantime.
* Why not run the road along the power lines?

Ironton Segment (Alternative B):

* Like this route better --- want a bypass of entire length
* Too many proposed signalized intersections between Reinhardt Circle and connection to NC 73 (someone else mentioned that these should not be changed)
* Disruption of farm land between Old Plank Road and NC 73
* What about farming operations? Impact?
* Suggested realignment to continue straight from Old Plank Road until farm land is bypassed
* Should bring Alternative B road further south to begin at Reinhardt Circle and connect past Leepers Creek
* Concern about impacts to Sharon Baptist Church to the east of Rudisill Lane on the left side of NC 73 (heading east)
* Re-route Alternative B at Old Plank Road to connect past the high school (it would go behind Ingleside Home and Magnolia Grove)
* Re-route Alternative B just northeast of Old Plank Road (at the creek) to connect at Schronce Road
* A comment was made to emphasize the small body of water between Old Plank Road and NC 73 (just northwest of the creek)

Anderson Creek Segment:

* Possible extension of bypass through Old Plank Road connecting to NC 73 at Schronce Road (someone else argued the opposite)
* Concern about what the speed limit will be
* Suggestion to identify the fishing ponds between Old Plank Road and NC 73
* Like the interchange at North/South Ingleside Farm Road and NC 73
* Bypass should be routed to the east of the high school
* Suggested bypass to run parallel with Old Plank Road south of NC 73 (until it turns southeast), crossing South Ingleside Farm Road and connecting with NC 73 at Little Egypt Road
* Suggested bypass to run north of Old Plank Road over the creek and southeast, crossing South Ingleside Farm Road and connecting with NC 73 at Little Egypt Road

West Lake Norman Segment:

* Avoid schools at Little Egypt Road --- possible alternative would be re-routing NC 73 south of existing NC 73 and the schools at the signalized intersection west of the schools, connecting with Little Egypt Road at Hunters Bluff
* Comment that there are 3 schools in the area --- too many kids have died at East Lincoln High School; 4 lanes most likely will only add to that problem
* Suggested alternate route from Little Egypt Road (south of NC 73), across Sifford Road and Killian Farm Road, connecting at NC 73 just west of the railroad tracks
* Requested a study on Route 16 North
* Potential routes to bypass: 1) running from NC 73 west of Killian Creek south of commercial and employment center, industrial and vacant land use, connecting at NC 73 at railroad tracks (but don't go too far south), 2) running from NC 73 west of Killian Creek through commercial and employment center and south of Little Egypt Road, Sifford Road and Killian Farm Road to connect at NC 73 at the railroad tracks
* Comment that it would be very expensive to widen Pilot Knob Road from NC 73 to Old NC 16
* Possible unsignalized intersection with left turn lane needed on NC 73, just west of Club Drive
* The potential signalized intersection with left turn lane on NC 73 at Club Drive will be overburdened
* Are there going to be sound buffer walls to minimize impact to the neighborhoods from the noise of the new roads? Look at I-485 --- they are all around the areas with dense housing/residential.
* What about protecting Johnson Creek which runs down into Mountain Island Lake? Also, some of the land (light brown) has Catawba Lands Conservancy protection (i.e. Killian property)
* I don't agree with the connection at Club Drive. It would seem much more prudent to connect at some point closer to the railroad track at McGuire Nuclear Plant to access traffic at Killian Farm, Caswell, and Sifford Roads. In addition, running NC 73 traffic through Old Hwy. 16 intersection seems impossible. That portion should be re-routed.
* Golf course off of Club Drive should be marked/identified
* Turn 2-lane bridge over Catawba River into 3 lanes
* This section, in addition to the continuing section at 16 and 73, is not an easy change to make as you have it now. Hwy. 16 was re-routed. It would seem this section should be as well.

<u>Mecklenburg County</u>

Ramah Creek Segment:

* Should be a 4 lane rural boulevard between Ramah Creek and Mayes Road on NC 73
* Should be a 4 lane rural, suburban, or urban boulevard (determing as part of area plan) between Mayes Road and just east of the Shearer Road extension
* Should be a 4 lane rural boulevard just east of the Shearer Road extension and just east of

McAuley Road

* Have either the connector road from NC 73 to Ramah Church Road, or Ramah Church Road from NC 73, but not both
* Likes the suggestion of no more entrances on NC 73 at the future low density residential area east of the Shearer Road extension
* There is a gas main within the proposed future low density residential area east of the Shearer Road extension
* For the natural landscape buffer on NC 73 between the Shearer Road extension and McAuley Road, offset it to be 24' wide --- coordinate with utilities before they put it in
* The future low density residential area on NC 73 east of the Shearer Road extension will be a 500-700 d.u. development --- should additional signalized intersections be considered here? Possibly close the existing access point and move east to become new signalized intersection
* A highly intensive district park use (i.e. recreation center, soccer fields, etc.) planned for area between Ramah Church Road and the unsignalized right turn intersection on NC 73 --- concerned about left turn access on NC 73 --- need access to Ramah Church Road as well

Catawba Road Segment:

* Consider a light or directional crossover between the unsignalized right turn intersection and the potential signalized intersection with left turn lane
* Either re-route Beatties Ford Road through the future low density residential area between McGuire Nuclear Station Road and Hager Road, or re-route Beatties Ford Road further south --- divert traffic away from nuclear plant --- concern about security
* Utilize directional crossovers on NC 73 between Hagers Ferry Road and Cramur Drive
* Concern about traffic being closer to medium single family property and not being able to turn left at the unsignalized right turn intersections to the left of NC 73, past Blythe Park

Gilead Road Segment:

* Possibly 6 lanes between McCoy Road and Reese Boulevard on Gilead Road?
* Steven's Ridge development has 500 units (high density) to the east of Gilead Road, north of Bud Henderson Road (Gilead Ridge development right across street)
* The southwestern side of Gilead Road is currently curbed --- the eastern side of Gilead Road is currently rural with no curb
* Possible Cook Farm talks with county about park (north of Hugh Torance Parkway and east of Ervin Cook Road)
* Gilead Road has been realigned to cross the Vance Road extension and connect with Bud Henderson Road
* Ultimate signal location at Vance/Gilead/Bud Henderson --- reconfigure intersection to N/S and E/W standard 4 leg
* Need to add a marker for Torrence House historic site to the north of Gilead Road between McDowell and Torrence Creeks
* Proposed straighter alignment between multi-family and medium single family residential areas on Gilead Road (southeast of Ranson Road)
* Need to add a marker for the school in the vacant land use area to the east of Ranson Road

Ramah Church Road Segment:

* Comment that it's not a large scale plan for the Stumptown Road extension to Ramah Church Road
* Sam Furr Segment:
* There is an existing unsignalized intersection directly to the west of Birkdale Commons Parkway --- keep left turn in (3 others agreed)
* Who is planning the grade separation at NC 73/115/railroad tracks?
* Need directional crossovers
* After starting construction, please complete in a timely manner
* Be aware of all the homes backing on the highway (southeast of Northcross Center)
* Connecting streets need to be opened before Sam Furr construction begins
* Communities want the proposed 4 lane urban boulevard between US 21 and just

past NC 115 to minimize impact on existing homeowners
* Should the section between US 21 and just past NC 115 be 6 lanes instead of 4 lanes?
* Consider completely eliminating the proposed middle unsignalized right turn intersection to the east of Northcross Center --- has public local support (19-20 houses) --- can use other entrances/exits

Westmoreland Road Segment:
* The dotted line representing "other roads not part of NC 73 Plan" connecting Westmoreland Road to Northcross Drive should be included as a solid line, meaning it is part of the NC 73 Plan
* New interchange would be counterproductive
* Need more roads that cross I-77 without an interchange

Sam Furr: I-77/US21 Alternative A Segment:
* Good attempt at creative thinking, but this option has much too great of an impact on a very large number of homeowners
* Does the intersection on NC 73 on the east side of I-77 (heading east) have to be there?
* The NC 73 corridor plan road running along the east side of Northcross Center to US 21/Statesville Road near the medium single family residential area is not very residential-friendly
* Comment that this alternative is a bad one

Sam Furr: I-77/US 21 Alternative B Segment:
* The lights between US 21/Statesville Road and Northcross Center on NC 73 are too close

Sam Furr: I-77/US 21 Alternative C Segment:
* This option appears to have the best possible traffic flow, while at the same time minimizing the impact to home/land owners, and allowing for future traffic volume growth

Sam Furr: I-77/US 21 Alternative D Segment:
* Like it --- nice and simple
* This alternative is best

Cabarrus County
* Rocky River Segment:
* Possible median needed heading east on NC 73 right at the needed mixed use village area plan (approaching the unsignalized intersection with left turn lane)
* Developers of Moss Creek have bond or financial guarantee for signal on NC 73 approaching your recommended unsignalized intersection with left turn lane --- is this necessary? Take a look at it. They have multiple access points on Harris Road and Odell School Road.
* Concern about mailboxes
* Concern about night trucking along NC 73
* Concern that the right-of-way for the recommended rural parkway is too wide
* Noise study is needed in this area
* There are approximately 5,300 homes in this area

Coddle Creek Segment:
* Concern about amount of right-of-way needed across the reservoir
* There is no median on NC 73 between Kannapolis; it is too far to get to next median break (between Laforest Way and Riding Trail Lane)
* Possibly switch the unsignalized right turn intersection at Laforest Way with the signalized intersection with left turn lane at Riding Trail Lane
* Right-of-way between Laforest Way and Riding Trail Lane is approximately 35 feet from centerline to property line
* Concern with where consolidated driveway would be between Laforest Way and Riding Trail Lane
* Preference for alternate alignment of Untz Road extension to Kannapolis Parkway (which will coordinate with Goodman Road bridge)

* Request to not get too close to the I-85 interchange when extending Untz Road to Kannapolis Parkway
* Liked the proposed Untz Road extension to Kannapolis Parkway, but suggested that it end across from Corl Road (like the original)
* Want to keep signalized intersections at least ½ mile from the I-85 interchange (I-485 study --- ask Tim Gibbs or Bill Finger)
* Suggestion for a road connecting Cessna Road to the business development east of Coddle Creek on NC 73 (through Untz Road)

West Kannapolis Segment:

* Consider moving the signalized intersection with left turn lane on NC 73 west of I-85 interchange further west
* Be careful with signalized intersections at Untz Road and Kannapolis Parkway and NC 73 and I-85 --- to close to interchanges