Research Report
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KENTUCKY TRANSPORTATION CENTER

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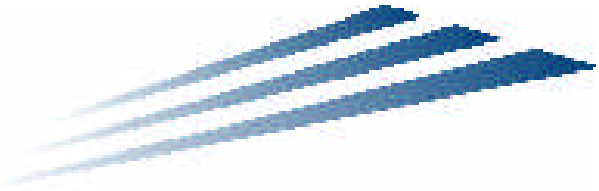
THE IMPACT OF A NEW BYPASS ROUTE ON THE LOCAL ECONOMY AND QUALITY OF LIFE



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The Impact of a New Bypass Route on the Local Economy and Quality of Life

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EXECUTIVE SUMMARY

Highway improvements such as bypass construction typically are motivated by a desire to improve the flow and safety of travel. But, given the importance of travel, transportation improvement projects often can affect the local economy and quality of life. This study assesses these potential impacts. The study was conducted by the University of Kentucky Center for Business and Economic Research, as part of a subcontract with the Kentucky Transportation Center. The study is one component of a larger Kentucky Transportation Center study entitled *Planning Decisions Related to Bypass Construction, Life-Cycle Costs of Access Control, and Safety Impacts of Rural Road Construction*, which is being conducted for the Kentucky Transportation Cabinet.

The main findings of the study are as follows:

- Estimates using Kentucky data found limited evidence that the opening of bypass routes influences county growth. The opening of a bypass route was found to reduce aggregate retail sales, but was not found to affect retail employment, employment overall, or population. This finding was consistent with previous literature on the impact of bypasses.

- However, it was found that, given the decision to build a bypass, the bypass would be more likely to encourage total employment growth if the bypass had partial access control and the bypass is located closer to the community's central business district.

- The size of the community receiving a bypass was not found to influence total employment growth.

- While it might not have a major effect on the size of the local economy, a new bypass was found to reallocate economic activity within a local area. For example, the average vacancy rate in the downtown area of communities with a bypass was 18.4% versus 10.9% in similar communities without a bypass.

- Retail businesses were found to account for a much larger share of businesses on a bypass (57.4%) than in a downtown area (31.1%). Further, retail businesses were less common in the downtown area of communities with a bypass than in communities with no bypass.

- The reallocation of retail activity from downtown out to a bypass results from the location of new businesses on the bypass, rather than the relocation of existing downtown businesses to the bypass. Only 7.6% of businesses located on the 8 bypass areas studied were previously located in the downtown area.

- Surveys of a group of 6 to 8 businesspeople, media representatives, and government officials in 8 bypass communities revealed a general satisfaction with a bypass. Most respondents were pleased with the improved flow of traffic, and believed that the bypass promoted growth in the community.

- Even the majority of local downtown business owners who were contacted believed either that the bypass had helped or that it had no significant effect for retail and service industries throughout the community, although they were more negative regarding the effect on retail downtown.

- Some who were interviewed were concerned that the severity of traffic accidents in the community had increased since construction of the bypass, while others were concerned that water-runoff had increased, or that industrial pollution had increased due to industry that located on the bypass. Bypass construction also occurred largely by displacing existing farmland.

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CHAPTER I
INTRODUCTION

This study assesses the potential impact of bypass construction on the local economy and quality of life. The study was conducted by the University of Kentucky Center for Business and Economic Research, as part of a subcontract with the Kentucky Transportation Center. The study is one component of a larger Kentucky Transportation Center study entitled *Planning Decisions Related to Bypass Construction, Life-Cycle Costs of Access Control, and Safety Impacts of Rural Road Construction*, which is being conducted for the Kentucky Transportation Cabinet.

The influence of a bypass on the local economy and quality of life has been of interest to local residents in communities slated to receive a highway bypass. A highway bypass provides an alternative route for vehicles traveling through a city besides traveling through the downtown area. As such, a bypass has the potential to reduce traffic within the city or town, including in the downtown area, while also providing through-travelers a faster route. At the same time, a bypass has the potential to influence the rate of growth of the local economy, influence the distribution of economic activity between downtown areas and new development areas along the bypass route, and to influence quality-of-life. These sorts of economic impacts are the examined in this study.

The first section of this study examines whether a new bypass typically would have an impact on the aggregate level of economic activity within a community. This can include any net increase in manufacturing activity along with any net growth in commercial activities such as retail or service business. The effect of a bypass on growth is measured first through a review of the economic literature on this subject. The second approach is direct estimation of the impact using data from Kentucky communities and counties that have received highway bypasses over the last few decades.

The second section of the report examines how a bypass influences the allocation of economic activity within a community. The bypass itself may become a prime business location site. As such, the bypass could draw some existing downtown businesses to locate on the bypass, or the bypass may simply capture a substantial share of new business entrants to the community. In either case, the net result could be a decreased demand for business location in the downtown area. Such decreased demand could result in higher vacancy rates for downtown businesses or in a different type of business mix in the downtown. For example, a downtown area may become far less retail-oriented if the bypass attracts retail establishments but does not prove to be as attractive a location for professional service firms such as attorneys and insurance agents, or for financial institutions, or government. We will examine communities that have received a bypass in order to assess how each bypass influenced downtown vacancy rates, the allocation of business location between the downtown and bypass area, and whether downtown businesses frequently move out to a bypass location. These assessments will be made in part by comparing the downtown areas of 8 communities

that received a bypass with the downtown areas of 8 other similar Kentucky communities with no bypass.

The third section of the report examines how a bypass influences the quality-of-life within a community. Quality-of-life includes economic impacts but also considers other factors of community life such as land use, pollution, community satisfaction, and community change. The primary approach was to survey a group of 6 to 8 persons from each of the 8 bypass communities that were the focus of the study. Each person interviewed was asked to comment on how the bypass affected overall quality-of-life, traffic patterns, land use, downtown business, and building quality. We also compared Census data on socio-economic factors for bypass communities both before and after construction in order to examine how the bypass influenced the community. We also examined how the bypass affected land use in the sense of whether or not the bypass opened new land for development, and whether its construction required the taking of existing homes or farmland.

CHAPTER II
THE EFFECT OF A BYPASS ON AGGREGATE ECONOMIC GROWTH

Bypasses are often built to relieve traffic congestion, and in this respect they are usually quite successful. For example, Yeh, Gannon, and Leong (1998) found that small communities (under 2,000 population) experienced average traffic reductions of 72% on the main route through downtown after a bypass route was opened. Likewise, Burress (1996) estimated that the average value of timesavings attributable to reduced levels of congestion in Kansas is approximately $1 million per bypass per year (in 1994 dollars).

Public involvement activities on bypass projects find that residents in bypassed communities are concerned about how the bypass might affect their local economy. Business or community leaders may worry that the bypass will draw money away from their city, hurting local trade and employment in the process. A bypass, on the other hand, could open up additional land for commercial development or factory location, which could encourage economic growth in the local economy. Improved transportation throughout the community also could encourage residential development in surrounding areas.

These varying arguments suggest that the impact of a bypass on the size and growth rate of a local economy is unclear. Empirical study is needed to assess whether factors suggesting that a bypass could lead to faster economic growth are any more or less important than factors suggesting a bypass could lead to slower growth. This Chapter of the report examines this issue. Below we examine whether there is any net growth in economic activity (as measured by employment, sales, and population) due to the opening of a bypass. This can include any net increase in manufacturing activity along with any net growth in commercial activities such as retail or service business. The effect of a bypass on growth is measured first through a review of the economic literature on this subject, which includes both academic studies as well as reports from the Departments of Transportation in other states. The second approach is direct estimation of the impact using data from Kentucky counties that have received highway bypasses over the last few decades. Combined, the two approaches offer the advantage of a comprehensive review of similar work by researchers from throughout the country, and an opportunity to examine data from bypass development within the Commonwealth of Kentucky.

LITERATURE REVIEW

Before beginning our own research, we conducted a literature review of recent studies that addressed this issue. We sought to answer the following questions based on this review: What are the effects of bypasses on employment and sales in the aggregate? Do these effects vary across different sectors of the economy? Do some communities benefit while others suffer harm from the construction of a bypass? If so, why? Finally, how satisfied are we with the results given in these studies? Does a need for further research remain? We looked primarily at eight studies that dealt directly with these

issues. Most of these studies examined evidence from a single state, including Iowa, Kansas, Minnesota, Texas, and Wisconsin. Two of these papers were themselves literature reviews of other contemporary research. The dates for these studies range from as early as 1965 through 2000, although seven of the eight have been written since 1989 (Anderson, et al., 1993; Buffington and Burke, 1989; Burress, 1996; Gannon and Leong, 1998; Horwood, Zellner, and Ludwig, 1965; Snyder and Associates, 1999; Srinivasan and Kockelman, 2000; Yeh, Gannon, and Leong, 1998).

GENERAL FINDINGS

The general consensus of the literature was that bypass construction has either no significant effects or perhaps small business impacts for the bypassed community. The best-designed study was Anderson, et al. (1993), which found mild yet statistically significant declines in retail growth rates following the construction of a bypass. Two studies reported that bypass construction generally produced long-run increases both in local employment and trade (Buffington and Burke, 1989; Snyder and Associates, 1999). Buffington and Burke measured total county employment, total manufacturing employment (for the affected city), and total county real wages for study counties against similar control counties. They found positive and statistically significant gains in study counties for all three measures. Worth noting is that they were studying a broad class of "highway improvements," including bypasses, loops, and radials. When the data set was restricted only to bypasses, of which there were 40, increased growth was present for all three variables but only the growth in total county employment was considered statistically significant. Snyder and Associates performed a literature review and a case study in Iowa, concluding that bypasses typically had some small long-run economic benefits for the host towns, due primarily to increased growth in primary industries and the associated spin-off gains for retailing and services industries.

Two other studies found bypasses to have no significant impact overall on their local economies (Burress, 1996; Yeh, Gannon, and Leong, 1998). Burress' study measured changes in total employment, total payroll, and business startups and failures at the city level, as well as retail sales (taxable sales) at the county level. He found no statistically significant change in the any of these measures in the long-run, and concluded that in the most extreme negative cases, bypass construction leads to no more than a 10% decrease in total payroll and employment, although more often the effect is near zero (or slightly positive). He suspected that the majority of towns actually experience some long-run growth as a result of bypass construction, which he attributed to an encouragement of the basic industries. Similarly, although Yeh, Gannon, and Leong found bypass communities usually to exhibit higher growth rates in total population, total employment, and retail trade, none of these increases were statistically significant.

BYPASS EFFECTS ON RETAIL/SERVICE INDUSTRIES

Seven of the eight studies specifically looked at the effects of bypass construction on retail sales in the host community. Of these, five found that overall retail sales were not affected, even in the short-run, by the construction of a bypass (Burress, 1996; Horwood, Zellner, and Ludwig, 1965; Otto and Anderson, 1993; Snyder and Associates, 1999; Yeh, Gannon, and Leong, 1998). Burress concluded with 95% confidence that retail sales experience no more than a short-run 2-3% decline, although the actual effect is probably mildly positive. Two tests did find statistically significant declines in retail performance following the construction of a bypass (Anderson, et al, 1993; Srinivasan and Kockelman, 2000). In fact, Anderson estimated that limited-access bypasses in particular led to a 20% decrease in total retail sales for a small city, although there was no statistically significant corresponding decrease in services. Srinivasan and Kockelman found a similar decrease in total retail sales for cities of all sizes, although the size of the decline fell somewhat in cities with more traffic (per capita) on the bypass route. Srinivasan and Kockelman also found no decrease in services sales. Significantly, the results of Anderson, et al.'s study may be considered particularly accurate, because this was the only study to adequately control for growth rate differences in the pre-bypass period (see methodological considerations, below).

Although the presence or absence of a bypass is likely to have a relatively small effect on a county's overall economic performance, it *is* possible for certain industries to suffer. Every study that specifically examined "travel-oriented" retail industries found that these sectors experienced relative declines as a result of the bypass, at least in the short-run (Anderson, et al; Burress; Horwood, Zellner, and Ludwig; Otto and Anderson; Snyder and Associates). The exact definition of "travel-oriented" industries changed somewhat from study to study, but was theoretically defined as industries that are dependent on through traffic for a large portion of their business. This category typically included establishments such as gas stations, restaurants, bars, and hotels/motels. These declines were generally considered to be quite small, and in Otto and Anderson's study were not even statistically significant. Only in the case of Anderson, et al. and Srinivasan and Kockelman were they slightly larger. Anderson et al. reported that bypasses led to 15% decreases in gasoline sales in smaller cities, as well as a 10-15% decrease in restaurant sales. Srinivasan and Kockelman reported that bypasses lead to 15-20% decreases in restaurant sales, and 25% to 55% decreases in gasoline sales. On the other hand, Burress estimated 10% or more annual payroll growth increases in *non*-travel-oriented retail sectors, which would help to offset these losses.

Otto and Anderson found that, where present, travel-related industry declines were especially pronounced along the bypassed route or the "old highway." The vast majority of these declines are generally believed to be short-run adjustment costs. For example, in the few years after a bypass is constructed, businesses may shut down along the bypassed route, only to be replaced (or to relocate) later along the bypass itself. Although Yeh, Gannon and Leong did not find persuasive evidence of this phenomenon in their Wisconsin data, Buffington and Burke did observe heavy relocation of this type in Texas. While recognizing that most declines are likely to be short-run adjustment

costs, Burress noted that it *is* still possible that some towns could suffer a permanent loss due to the construction of a bypass.

Of the five studies which looked at the long-term effects of bypass construction on retail sales, three concluded that no long-term decreases in growth rates were caused by the bypasses, even in the specific travel-related sectors (Burress; Snyder and Associates; Yeh, Gannon, and Leong). Burress estimated that the long-run effects to total retail sales are around 1%, at most. The only exceptions to this are Anderson, et al. and Srinivasan and Kockelman, which found statistically significant declines in the retail sales of bypass towns.

BYPASS EFFECTS ON MANUFACTURING / BASIC INDUSTRIES

The largest gains in local economic growth following the construction of a bypass appear to result from an encouragement of basic industries, such as manufacturing (Buffington and Burke; Burress; Snyder and Associates). Buffington and Burke specifically studied manufacturing growth in cities with "highway improvements" (bypasses, loops, or radials), finding positive, statistically significant growth rate increases over control cities. Burress hypothesized that basic-industry firms respond to the improved transportation infrastructure, and that the growth in these industries then has a secondary positive impact on local retailing and services. Snyder and Associates accepted this theory, which would also help to explain the longer-run timeframe necessary to detect significant employment and retail growth after bypass construction.

GROWTH DIFFERENTIALS BY SIZE

Several studies noticed significant differences in the post-bypass performance of towns by population, with towns of fewer than three to four thousand inhabitants generally experiencing less benefit (or even some decline) following the construction of a bypass (Horwood, Zellner, and Ludwig; Yeh, Gannon and Leong). This effect can be explained by the high proportion of travel-related businesses (dependent on tourist or other through traffic) in many of these communities. Following this same logic, Pashek (1965) argues that dividing these towns by population may disguise the central issue, which is "the extent to which the bypassed city serves as a market … for the surrounding area." Yeh, Gannon, and Leong reach the same conclusion in that smaller communities may suffer, not *because* they are smaller, but because they lack the economic diversity to be considered a "destination." It should be acknowledged, however, that even in the case of smaller towns, various idiosyncratic "background effects" will likely play a substantially greater role in determining the economic performance than will the presence or absence of a bypass (Anderson, et al.; Burress).

Anderson, et al. were alone in finding the opposite result. They found that, while the negative effects of a highway bypass on retail sales had about the same significance for large and small communities, larger cities actually suffer greater losses in service

sector receipts than smaller cities. (Smaller cities suffered no statistically significant losses in service receipts following the construction of a bypass). It is important to remember, moreover, that this study was the only one to compare the pre- and post-construction growth rates of bypass and control cities, which lends a degree of theoretical reliability to its results that the other studies may lack.

METHODOLOGICAL CONSIDERATIONS

While some of the studies have employed fairly sophisticated methodologies in reaching their conclusions, two shortcomings justify current research into the effects of bypasses: a lack of methodological consistency and a lack of adequate controls for pre-bypass growth rates.

There is a general lack of methodological uniformity among the various studies. This lack of uniformity makes it difficult to formulate any general hypotheses from cross-study comparisons, and equally difficult to observe any trends. For example, three of the studies used data from Texas for their research*: Buffington and Burke* (1989), *Anderson, et al*. (1993), and *Srinivasan and Kockelman* (2000). Despite this similarity, these studies came to strikingly different conclusions. Buffington and Burke reported the most substantial benefits from bypass construction of any of the studies, while Anderson, et al. and Srinivasan and Kockelman found the most significantly negative effects. This variance is the result of a lack of general methodological standards. Buffington and Burke's results likely contained an upward bias, in that they restricted their sample to towns of over 4,000 population. Other studies have found that towns under approximately 5,000 reap the least benefit from bypass construction. Similarly, Anderson et al. and Srinivasan and Kockelman's studies may have been unduly negative because only data from retail and service sector businesses were considered. Several studies have concluded that the majority of the local benefits of bypass construction are likely to accrue to primary industries such as manufacturing, while travel-oriented retail and service sectors are likely to suffer the most harm (or benefit the least). As these types of inconsistency appear in the data across many of the different studies, they point to the need for more generally applied methodological uniformity. Such consistency would serve to improve the reliability of the results.

The second methodological problem is that most past studies have not addressed the issue of the pre-bypass growth rate. While most studies compared bypass-area performances against control counties (usually chosen as having similar populations, traffic volumes, and/or distances to major cities), only Anderson, et al. appeared to adequately test growth rates in the pre-bypass period. In other words, other studies did not *necessarily* select cities with similar growth rates as control cities. The implications of this are potentially very significant. It is possible, for example, that bypasses are generally built around cities that are growing substantially faster than average. The *slightly* faster growth rates generally seen after bypass construction would then be interpreted not as a small improvement, but actually as a significant slowdown. Likewise, if bypasses are generally constructed around cities with slower than average

growth, then slightly faster than average growth in the post-bypass period would indicate very substantial improvements, rather than only moderate gains.

In fact, there may be good reason to believe that bypasses are built in towns that are growing at faster than average rates. As Yeh, Gannon, and Leong pointed out, "most bypass communities had significant economic growth occurring before the bypass was constructed. This growth was one of the reasons the bypass was needed" (pg. 8). Indeed, Anderson, et al. was the only study to fully control for this pre-bypass growth rate, and these researchers found more significant negative results for retail sales than did any of the other studies.

JUSTIFICATIONS FOR RESEARCH

One significant justification for our current research into the effects of bypass construction is that no previous studies have focused their research efforts on the state of Kentucky. It is worthwhile and interesting to investigate whether or not Kentucky counties adhere to any general trends that may be observed in other states. Secondly, this report considers growth rates in the pre-bypass period. This adjustment will make it possible to better isolate and predict the effects of bypass construction on local employment and industry, both in Kentucky and in general.

ANALYSIS USING KENTUCKY DATA

The approach for this portion of the study was to examine communities and counties where a new bypass was constructed during the last few decades to determine how the economic growth rate changed in these areas before and after each bypass was built. Did the bypass counties tend to grow more quickly or slowly in the years after the bypass was completed and opened? In each case, the growth rates in bypass counties were compared with growth rates in a "matched" county, that is, another similar Kentucky county. This comparison allowed a measure of whether the bypass tended to increase (or decrease) county growth relative to a similar county without a bypass. The comparison also accounted for the fact that each bypass was built during different years, so that observed differences did not simply account from the fact that bypasses tended to be built and opened just before or after particularly fast (or slow) growth periods for the state and national economy. In other words, comparison with other "matched" Kentucky counties accounted for the business cycle effect.

Finally, we also compared growth rates in bypass and matched counties in the years before the bypass was built. This provided a test for whether there is a tendency to build bypasses in faster (or slower) growing counties. If this occurred, similar findings of faster (or slower) growth after the bypass was built should not be interpreted to mean that bypasses lead to faster growth in county economies. Many of the previous studies that

were examined failed to test for this sort of pre-bypass growth. Our study did test for this, and did not find that employment or population growth was either faster or slower in bypass counties than in "matched" counties before bypasses were built.

The method for examining Kentucky bypass counties is discussed in more detail below. First, however, we discuss how the bypass counties were identified. We then discuss how "matched" counties were selected for each Kentucky bypass county. We then present our results as to how bypasses influence growth in Kentucky counties.

IDENTIFYING BYPASS COUNTIES

Staffs in the 12 districts of the Kentucky Transportation Cabinet were surveyed in order to identify a set of bypasses that were built in Kentucky over the last three decades. A survey was sent out to each district asking them to describe any bypasses that were built, the year each was built, and the characteristics of each bypass in terms of number of lanes and access limitation. In some cases, the research team was aware that a bypass or bypasses had been built in a particular region. In these cases we listed each bypass, and then asked regional staff to simply list when each bypass was built, along with the other relevant characteristics of each bypass. We placed follow-up calls to many of the regions that did not respond immediately to encourage participation.

We received responses from 10 of the 12 Kentucky Transportation Cabinet districts. These responses contained references to 27 counties that had received a bypass or bypasses during the last three decades. We were able to use 21 of these counties in our study. The counties are listed in Table 1. The remaining counties needed to be dropped from consideration for a variety of reasons: 1) one bypass was a county highway for which we had incomplete access control information; 2) some bypasses were constructed over the same mile-markers at several different periods so it was difficult to select a before and after period; 3) construction dates could not be determined for some bypass routes; and 4) some bypasses were built in the last few years, and county economic data is only available with a two year lag, so not enough data was available to study how these bypass routes affected local economies.

IDENTIFYING MATCHED COUNTIES

Once the bypass counties were identified, it was necessary to select for each the Kentucky county that was the closest match for comparison purposes. We began with the subset of counties in the 10 districts. We then selected those counties that did not contain a bypass, and removed 6 counties for which we had received some information about a bypass. We utilized a Mahanalovitz matrix approach for identifying the Kentucky county which was most closely matched to each bypass county.

The Mahanalovitz matrix approach was adopted in order to find control counties for comparison with counties that received a bypass. The matrix was used to find other

Kentucky counties that were the closest "twins" with the bypass counties, at least across a number of important economic characteristics such as size, importance of mining, and retail activity, to name a few. While it was not possible to find exact twins among the limited sample of Kentucky counties, the Mahanalovitz matrix approach was used to find the county that was the closest match.

The matrix approach measures similarity among counties based on the concept of aggregate economic "distance". This is a composite measure based on the similarity (or distance) between the counties for key economic measures. The distance between each bypass county and each other non-bypass county is measured for each of 5 key economic measures: distance to the nearest large town, population, share of employment in mining, share of employment in manufacturing, and retail capture. So, for example, one "distance" measure would be the difference between the share of employment in mining in a bypass county and the share in each other county. The share manufacturing and share mining variables were included to differentiate counties that were manufacturing-oriented from those that were mining-oriented and those that were service-oriented. There have been significant differences in the growth rates of these three groups in the last few decades. The growth rates of mining counties in particular have lagged the other two groups, while some manufacturing-oriented counties have grown very rapidly. The other three variables influence the ability of a county to be a retail trade and service center (population, distance to the nearest large town), or are a measure of the strength of the retail sector (retail capture). The retail capture measures compares actual retail employment in a county relative to the level of retail employment that would be expected given population and per capita income levels in the county. A retail capture value of above one indicates that the county captures more retail employment than would be expected based on its population, and that the county is therefore a retail trade center.

Once distances are calculated, a weighted average is taken to estimate an aggregate measure of "distance." This weighted average adjusts for the fact that some economic measures such as share of the economy in mining have more variability than other measures (some counties in Kentucky have a lot of coal mining, many counties have none). "Distance" for measures with relatively little variability is weighted more heavily.

The Mahanalovitz matrix was used to calculate the closest matches for each of the 21 bypass counties. In a handful of cases where the same county was the best match for more than one bypass county, it was matched with the county to which it had the shortest "distance." Finally, we also examined a map for each "matched" county we identified to make sure that there wasn't a bypass around the County Seat that was simply not reported to us, or a road that was not officially a bypass, but was like a bypass in that it provided a highway route around the center of town. Barren, Muhlenburg, and Meade County were eliminated as matched counties due to the presence of such bypass-like routes. The bypass counties and their closest twin are listed in Table 1, and illustrated in Figure 1.

RESULTS

We compared employment growth rates between the counties that had received a bypass and their closest matched county in Kentucky. First, we compared growth rates in the pairs of counties in the 5 years before the bypass highway was built. This was done to ensure that there was no significant difference in the growth rates of bypass counties and their matched counties before the bypass was built. It is important to ensure that there is no pre-bypass difference since this could represent a difference in the long-term growth rate of bypass and matched counties not related to the bypass. If present, this long-run trend would likely continue after the bypass is built, making it difficult to differentiate between the effect of the bypass on growth and this long-term difference in trend growth rates. Naturally, it is important to be able to isolate the impact of the bypass alone on growth, which, unfortunately, was not done in much of the previous research on the economic impact of bypasses, as was cited above in the literature review. Isolating the bypass impact was the purpose of identifying matched counties using the Mahanalovitz matrix approach.

Also, when evaluating the results below, it is important to recall that a modest sample of only 21 counties with bypass routes was available for examination in this study. Statistically significant findings are always less likely when only a small sample is available. But, any statistically significant findings remain valid even if the sample size is small.

BYPASS OPENINGS AND TOTAL EMPLOYMENT GROWTH

Table 2 shows total employment growth rate data for bypass counties and matched counties for the five years before the bypass was built, as well as in the years after each bypass was built. Data on average annual growth rates for the five years before each bypass was built is presented in the first column of Table 2. Results indicate that there was a similar growth rate in total employment for bypass and matched counties. The annual growth rate was -0.57% less on average for bypass counties in the 5 years before the bypass routes were built but this difference is not statistically significant. A finding that there was no statistically significant difference means there is no reason to conclude that there is any difference in total employment growth rates in the years before the bypass was built, even if the measured average growth rate was slightly less in bypass counties. This is because the observed difference was small enough that it could have occurred due to random chance rather than a true difference between the counties.

Table 2 also illustrates growth rates in the 5 years after the bypass opened. Results indicate that total employment growth was also somewhat slower in the bypass counties in the years after the bypass was built. On average, annual growth was 0.27% less in the first 5 years after the bypass was built. This difference, however, is not statistically significant either, and in any case was similar to the difference in growth found before bypass construction. Finally, note that analysis is limited to the 5 years after each bypass was built. This was done because about one-third of the bypasses opened in the mid-1990s. Thus there were only a few years of data available after each of these bypasses

were built, so it was natural to focus on growth for all counties in the first years after each bypass was opened.

GROWTH BEFORE THE BYPASS: OTHER MEASURES

A similar pattern is revealed for key industrial sectors of the economy such as the retail sector, the services sector, and the manufacturing sector. Table 3 shows the difference in the growth rates between county pairs for the key industrial sectors 5-years before the bypass was built as well as in the years after the bypass opened. In the years before the bypass was built, the growth rates in the bypass counties are lower for population and employment in most industries, which is consistent with the findings for total employment growth. Also consistent with what was found for total employment, however, is the fact that there are no statistically significant differences between industry employment growth rates for bypass and matched counties.

The exception to this finding was retail sales. Retail sales growth was higher in bypass counties in the years before the bypass was built. The difference also was statistically significant. The finding of such a statistically significant difference means that for retail sales we cannot simply observe the growth rate after the bypass was opened to determine if the bypass had an effect. Instead, we must focus on the difference in the relative growth rate after the bypass was opened versus before the bypass was built. As a result, Table 3 also contains a column with these after versus before comparisons. Such information is needed for evaluating the impact of a bypass route on retail sales. It is not necessary for evaluating the impact of a bypass route on other employment and population measures, but is still included.

GROWTH AFTER THE BYPASS: OTHER MEASURES

As for the years after the bypasses were opened, no difference was found between the growth rates for retail employment in bypass counties and matched pair counties. There is a similar finding for services industries. Services grew somewhat more slowly in the years after the bypass was opened, but the difference in growth rates between bypass counties and matched counties was not statistically significant.

The manufacturing industry grew about 1% per year slower in bypass counties after the bypasses were opened compared to matched counties. This difference, however, was not statistically significant. The estimate also did not deviate much from the slower estimated growth for bypass counties in the five years before the bypass was built. The finance, insurance, and real estate (FIRE) industry grew roughly 0.5% more slowly in bypass counties after each bypass opened, but this difference was not statistically significant.

As for population, the population growth rate does not differ much between bypass and matched counties either before or after the bypass. Growth in the bypass

counties is modestly slower in all cases, but the estimated differences were not statistically significant.

AFTER VERSUS BEFORE COMPARISONS

Annual growth rates in the years after the bypass opened did not differ in terms of statistical significance between bypass and matched counties without a bypass. There were several measures, however, which experienced large swings before and after the bypass opened. For example, the rate of retail sales growth was more than 1% faster each year in bypass counties compared to matched counties before the bypass was built, but nearly 1.5% slower in the years after the bypass opened. Both differences also were statistically significant. There was a similar development in the Finance, Insurance, and Real Estate Industry, and a large swing in the Services industry, although the findings were not statistically significant. Still, the large swings that were observed raise the question of whether there is any statistically significant difference in the after versus before relative growth rates. While such a comparison is not necessary for services and finance as it is for the case of retail sales, it could be conducted for the employment measures in any case. Given the large swings in relative growth observed for some sectors, such a test could find a statistically significant change in relative growth rates (the difference in growth after the bypass minus the difference in growth before the bypass).

As is illustrated in the last column of Table 3, the only statistically significant change in the relative growth of bypass and matched communities upon opening of the bypass occurred in terms of retail sales. In particular, there was less than a 5% chance that the change from 1.26% faster annual growth in bypass counties in the years before the bypass to 1.43% slower growth after the bypass opened was a random event. This result suggests that opening of the bypass may have had a negative impact on retail sales growth in bypass communities. Any difference, however, was not reflected in employment in either the retail industry or any other industry, or for population. Changes in the after versus before employment growth rates were not statistically significant.

BYPASS CHARACTERISTICS AND GROWTH

These findings of no change in relative job growth rates were for all 21 bypass routes on average. Yet, the 21 bypass routes differed over a number of potentially important measures such as: access control, the size of the community being bypassed, and the distance of the bypass from the downtown area. The failure to find any impact from a new bypass on employment growth could have arisen from a failure to account for these bypass characteristics. To test this possibility, we regressed the change in relative growth rates of bypass and matched communities on three variables. These three variables were: population for the bypassed community in the 2000 Census, distance in meters from the bypass to each community's central business district, and whether or not the bypass had partial access control. In most cases, these factors did not influence the

previous finding that bypass routes do not appear to impact employment or population growth in communities. Results from the regression analysis for total employment and retail sales are presented in Table 4 since these were the two most interesting cases.

Results from the retail sales equation confirm the previous finding that opening a bypass reduces retail sales growth in bypass counties relative to matched counties on average. This basic finding, however, does not appear to vary with bypass characteristics such as access control, distance of the bypass from downtown, or the size of the bypassed city.

Results from the total employment equation indicate that the impact of a bypass on total employment growth may differ based on the level of access control on the bypass and the distance of the bypass from the community's central business district. The relative increase in total employment growth is significantly greater after opening a bypass with partial access control than after opening a bypass without access control. At the same time, bypass routes built far from the central business district are associated with slower growth in total employment compared to bypasses built closer to downtown.

Do these results necessarily imply that building a bypass with partial access control or a bypass near downtown will cause total employment to grow faster in the area? No, these results simply imply that given that a bypass is being built, there may be faster total employment growth in the area if the bypass is built with partial access control, and built nearer to downtown.

We did directly address this same question by examining only those bypass routes with partial access control (15 of 21) and only those with built within one-half mile (11 of 21) of the central business district of a community. The opening of a partial access bypass route did not lead to a statistically significant increase in the relative total employment growth of bypass communities versus matched communities, nor did opening a bypass within one-half mile of the central business district. In these tests, however, the sample sizes were even smaller than in previous analysis where there was a sample of 21. Estimates using such small sample sizes are less likely to identify a significant difference, so it is possible that the size of the sample may have affected this finding.

CONCLUSION

The general consensus from the review of the literature was that bypass construction has either no effect or perhaps a modest effect on the economy of a bypassed community. While some studies did find a positive effect on total employment, the best-designed study in the literature (Anderson, et al., 1993) found a negative impact on retail sales. Loss of economic activity also was found to be more likely in smaller communities. There were, however, some methodological concerns with much of the existing literature on the impact of bypass routes on growth. Therefore, we directly

estimated the economic impact of bypass routes on growth in Kentucky counties with communities that received a bypass.

The direct estimation of bypass impacts using Kentucky data found limited evidence that the opening of bypass roads influences community growth. The opening of a bypass route was found to reduce aggregate retail sales, but was not found to affect retail employment. We also found that, given the decision to build a bypass, the bypass would be more likely to encourage total employment growth if the bypass had partial access control and the bypass was located closer to the community's central business district. The size of the community receiving a bypass was not found to influence total employment growth. The opening of bypass routes was not found to influence population growth or employment growth in individual sub-sectors of the economy such as manufacturing, retail, services, or finance.

All of these results should be considered in light of the small sample of 21 bypass routes available for examination in this study. Statistically significant findings are always less likely when only a small sample is available, so it is perhaps not surprising that we found few cases where the opening of a bypass had a significant impact on the economy. Still, our results were consistent with previous literature in that we did not find a large and widespread impact on the economy after opening a bypass. But, we did find a negative impact on retail sales, which was consistent with the findings in Anderson, et al. (1993), the best designed of the studies in the literature.

CHAPTER III
ALLOCATION OF BUSINESS ACTIVITY

Whatever its impact on economic growth, a bypass also may impact the allocation of commercial activity within a community. The bypass itself may become a prime business location site. As such, the bypass could draw some existing downtown businesses to locate on the bypass, or the bypass may simply capture a substantial share of new business locations in the community. In either case, the net result could be a decreased demand for business location in the downtown area. Such decreased demand could result in higher vacancy rates for downtown businesses or in a different type of business mix downtown. For example, a downtown area may become far less retail-oriented if the bypass attracts retail establishments but does not prove to be as attractive a location for professional service firms such as attorneys and insurance agents, or for financial institutions, or government.

There are reasons to believe, however, that a bypass may not have a dramatic impact on the level and kinds of business activity in the downtown area. Housing surrounds many downtown areas. This would leave little room for expansion of the downtown area with or without a bypass. The bypass also typically would not be the only alternative business location within a town. Even highways that run through a rural town will offer potential business locations besides downtown along their routes. As these routes pass through the edge or outskirts of downtown, the routes may pass the types of large lots that are sought by some types of businesses looking to locate or expand within the community. These locations may be especially appealing if housing that leaves little room either for major expansions or for businesses requiring large lots or buildings surrounds the downtown area.

There is also reason to believe that a bypass route would not necessarily affect vacancy rates in the downtown area, even if the bypass were a significant additional competitor for business location. Vacancy rates may not be affected since development at a bypass location may take many years to reach significant levels. This would mean that the downtown area would have a number of years to adjust to increased competition from the bypass, leaving time to attract new tenants, refurbish buildings, and the like.

We conducted a number of visits to downtown areas within Kentucky in order to examine how bypass routes influence the allocation of business activity in communities. For comparison purposes, we visited 8 communities where a bypass has been built in the last few decades. These 8 bypass communities were representative in terms of size, recent economic growth, and geographic location within the state. These 8 communities were among the 21 examined previously in this report. We also visited communities in each of "matched" counties for the 8 bypass counties. This allowed comparison between the downtown areas in bypass communities and in matched communities. The 8 bypass communities and 8 matched communities are listed and pictured in Figure 2. Maps of the 8 bypass communities are included as Appendix B.

We made 3 specific comparisons between the downtown areas of bypass and matched communities, and also between businesses on the bypass and businesses in the downtown area of the 8 bypass communities. First, we examined the number of vacant commercial properties in the downtown areas of case study counties and compared that number of vacancies with the number in the downtown of matched communities that do not have a bypass. Second, we examined the level of sprawl of commercial activity out to the bypass area. This was done by examining the proportion of different types of commercial activity (grocery, variety store, clothing store, banks, doctor's offices, and other services) that are located at the bypass rather than downtown. Third, we examined the nature of the relocation of commercial activity out to the bypass area, that is, the degree to which businesses move from the downtown areas to the bypass, or the degree to which new businesses locate at the bypass and compete with downtown businesses.

Below, we will discuss the findings for these three types of indicators. We also will discuss how downtown building vacancy and commercial relocation vary for different types of communities. In particular, we discuss the extent to which these factors vary with the size of community, the community growth rate, or the geographic location within the state. When examining the results below, it is important to note that this analysis will be based on a limited number of case studies, and not drawn from a random sample. Thus, while it will be possible to discuss general trends in the results, it may be difficult to draw statistical inferences, although statistically significant differences are found in some cases.

VACANCY RATES

The first step is to compare the vacancy rates in the downtown area of bypass communities with the vacancy rates in the downtown area of "matched" communities where there is no bypass. This vacancy rate was obtained during visits to downtown areas

Vacant buildings are visible in downtown Auburn, where a bypass was built in the early 1990s.

by observing how many of the business storefronts were empty in the downtown area. The measure used was vacancies on the street level, and did not examine vacancies on occupied spaces in order to calculate a vacancy rate. The vacancy rate was simply the number of vacant storefronts divided by the total number of storefronts (which is the number of vacant storefronts plus the number of occupied storefronts). Note that this approach does not consider the relative size of the vacant and occupied storefronts in terms of square footage. Such detailed data would have been difficult to calculate during our visits to communities, and might be expected to average out across all of the storefronts we examine in each town.

Table 5 contains the results of this vacancy rate analysis. Aggregate data is presented for all 8 case study communities (and matched communities), as well as for subsets based on community size, recent economic growth, geographic location within the state, and age of the bypass. Results indicate that the vacancy rate is substantially greater in the downtown areas of the 8 bypass communities than in the matched communities. The average in bypass communities was a vacancy rate of 18.4% versus 10.9% in matched communities. The vacancy rate was 69% higher in bypass communities, which is a large difference. In fact, this is a statistically significant difference in the sense that there is less than a 5% chance that such a difference could arise randomly rather than reflect that vacancy rates are higher in communities with a bypass. Therefore, the evidence collected from the 8 matched pairs of communities suggests that vacancy rates are higher in bypass communities.

Downtown Hyden, a community that does not currently have a bypass, has continued to prosper, with a large share of its downtown buildings occupied and well maintained.

This same pattern of higher vacancy rates in bypass communities compared to matched communities holds for all of the various categories of bypass communities that we have identified. A similar difference is observed for small communities with fewer than 3,000 residents and large communities with more than 3,000 residents. The recent growth rate of the county economy also does not appear to influence the impact of the bypass on downtown vacancy rates. The impact of a bypass on vacancy rates was a bit higher in the Western Kentucky bypass communities we visited, but this difference was not great enough to be statistically significant. That means that any differences could have easily arisen simply due to random chance. The difference in vacancy rates between bypass and matched communities appears to fall over time since it is lower for older bypasses than for newer bypasses. This result might be expected since the downtown areas of bypass communities would have more opportunity over time to adjust to increased competition from bypass locations by lowering rents, refurbishing buildings, and other strategies. The difference observed in Table 5 between newer and older bypasses however could have arisen due to random chance rather than an actual difference in the bypass impact over time. A larger sample of bypass communities probably would need to be visited in order to provide a more definitive finding on this subject.

BUSINESS MIX

Vacancy rates are one key measure of the health of a downtown business district, and are an indicator that is influenced by the presence of a bypass. Another measure of interest is whether and how the presence of a bypass may affect the mix of businesses in the downtown area. Do the types of businesses located on a bypass differ in any systematic way from businesses in the downtown area? If the answer is yes, this may suggest that a bypass provides strong competition for the downtown area for certain types of businesses, but less strong competition for others. Another way to address this same question is to compare the types of downtown businesses in communities with a bypass versus matched communities without a bypass. A difference in business mix should appear here as well if the bypass is having a particularly large effect on the location of certain types of businesses downtown.

To address this question, we will calculate a measure of the business mix in the downtown area, as well as on the bypass, for each of the same 8 pairs of communities examined during the vacancy rate analysis. The business mix will be calculated by examining the number and share of businesses within 5 broad categories: retail (including restaurants), professional services, personal services, government, and other. Professional services refer to the offices of health care professionals, bank locations, financial services, accountants, lawyers, realtors, insurers, and the like. Personal services refer to hair care, recreation, lodging, social service organizations, and auto care, to give some prominent examples. As with the vacancy rate, one shortfall of the approach of simply counting the number of businesses is that the size of businesses can vary in terms of employment and/or floor space, so simple counts could be misleading. Such size

differences may not be large on average, however, when looking across all businesses in the downtown or bypass.

Table 6 compares the business mix on the bypass and in the downtown area for the 8 pairs of bypass and matched communities that were studied. Results for all 8 bypass communities indicate that retail accounts for a much larger share of businesses on the bypass than downtown. Retail on average accounted for nearly three-fifths of all businesses on the 8 bypasses but only about one-third of all businesses in downtown areas. Professional services businesses accounted for a much larger share of businesses in downtown areas than on the bypass, by a margin of 26% to 11%. The share of personal services and government services are both also roughly twice as great in downtown areas as on the bypasses. These findings suggest that bypass areas appear to be an extremely attractive alternative site for retail businesses within communities, but may not be as an attractive an alternative compared to downtown for either professional or personal service businesses. The same is true of government, although this last result is not surprising since the City Hall and related buildings are often located downtown. There also were many county government buildings in the downtown area of the bypass communities since many of the bypass communities were County Seats. The large value for the "Other" category for the bypass was primarily due to the location of factories on some of the bypasses that were examined.

The bypass in Hazard has attracted a great deal of retail activity, most of which is new to the community. The *Peebles* store, visible here to the right, is one of the few that moved from downtown.

Table 6 also contains data on the distribution of businesses in communities that received a bypass more recently versus communities with an older bypass. There is little difference in terms of retail location between older and newer bypasses. Bypass areas are much more retail-oriented than downtown areas in both communities with a more recent

bypass and those with an older bypass. One interesting difference is the importance of the "Other" category in communities with a more recent bypass. This "Other" category is composed primarily of factories. The finding suggests that factories may be more likely to be among the first types of businesses to locate at the bypass, due to reduced travel costs. Results did not vary much with community size, the recent jobs growth rate in the community, or whether the bypass community was located in Western Kentucky or Eastern Kentucky. Accordingly, these results are not included in the table.

Table 7 compares the business mix in the downtown area of bypass communities and the downtown area of matched communities without a bypass. Aggregate results across all 8 bypass and matched community pairs indicate that retail businesses account for a smaller share of businesses in the downtown area of communities with a bypass than in matched communities without a bypass. The share of retail businesses is about 7% greater in matched communities without a bypass. This result provides further evidence that a bypass may draw retail activity away from downtown areas.

DO BUSINESSES MOVE?

Case study data presented above from 8 pairs of bypass and matched communities suggest that businesses along the bypass are concentrated in the retail industry, which includes both stores and restaurants. Communities with a bypass also on average had a smaller share of retail businesses in the downtown business mix. These findings suggest that a bypass leads, over time, to relatively less retail activity in a downtown area and a concentration of retail businesses along the bypass. One question that naturally arises given these patterns is: does the location of retail businesses along the bypass result from downtown businesses moving to the bypass, or a less direct process, such as new business location on the bypass, and, perhaps, the closing of businesses in the downtown area?

To address this question, we contacted community members in our 8 bypass communities and asked whether any of the businesses located on the bypass were previously located downtown. We then calculated what percentage of bypass businesses were new locations or movements from the downtown area. These percentages are presented in Table 8 below, along with some data on what percent of moved businesses were in the retail industry. The finding was that just a small percentage of bypass businesses originated downtown. The average across all 8 bypass communities was that 7.6% of all bypass businesses were previously located downtown before moving to the bypass. In no community did more than one-quarter of bypass businesses move there from downtown. Relocation to the bypass was not particularly likely for retail businesses. Retail businesses accounted for only 13.7% of relocations to the bypass versus 57% of all bypass businesses and 31% of all businesses in the central business district of bypass communities.

Most bypass businesses were new locations in the community. On average in the 8 case study communities, more than 90% of bypass businesses were new locations to the area. The land adjacent to a bypass may become a competing business location for

downtown spaces, but bypasses appear to primarily compete for businesses newly locating in the community rather than drawing existing downtown businesses out to the bypass.

These findings varied somewhat by type of community. The share of moved businesses tended to be higher for smaller communities with fewer than 3,000 residents. This could occur because there may be fewer alternative business locations to choose from in smaller towns, that is, fewer alternative business clusters besides the downtown area (or a bypass). Further, in a smaller downtown, there may be fewer sites suitable for demolition and new development, making relocation to the bypass more likely when a business wishes to expand. The share of moved businesses also tended to be higher in communities with older bypasses. This suggests that businesses may have more time to move in these communities. However, when considering both of these results, recall the small number of case studies examined, which it makes it difficult to draw definitive conclusions, particularly with these subgroups which may contain only 3 to 5 bypass communities.

CONCLUSION

The finding of the above analysis of 8 pairs of bypass and matched communities was that the location of a bypass appears to influence the allocation of business activity within a community. In several cases, statistically significant differences were identified, despite the small sample of communities studied. One finding was that the average vacancy rate in the downtown area of bypass communities was 18.4% versus 10.9% in similar communities without a bypass. This statistically significant difference suggests that vacancy rates are higher in bypass communities. A bypass also was found to influence the business mix in a downtown area. Retail businesses were found to account for a much larger share of businesses on a bypass than in a downtown area. Retail on average accounted for nearly three-fifths of all businesses on the bypass but only about one-third of all businesses in downtown areas. Retail accounted for 31% of businesses in the downtown area of communities with a bypass but 38% of businesses in the downtown area of communities without a bypass, although this difference was not statistically significant. Still, these findings suggest that a bypass over time provides especially strong competition for the downtown area as a retail location, and in particular may draw retail activity away from downtown. This process, however, typically does not involve the same businesses relocating from downtown to the bypass. Rather, it involves a concentration of new business locations on the bypass. Only 7.6% of businesses located on bypass routes were previously located in the downtown area.

CHAPTER IV
COMMUNITY ATTITUDES TOWARD BYPASS CONSTRUCTION

In addition to our analysis of the statistical economic data, we sought insight into the effects of bypass construction as evaluated by the residents of the bypassed communities. We also sought to learn from local residents how the bypass influenced community development, including factors such as traffic congestion, pollution, and building stock. This information was gathered through a series of telephone interviews with citizens in eight different bypass counties throughout Kentucky. The same set of questions was asked to between 6 to 8 individuals in each of these communities. We typically contacted business owners, political leaders, and media representatives in each of these communities by telephone. Nearly all persons that were contacted agreed to participate. Naturally, the limited number of persons that were contacted and their affiliation with government, business, or the media means that the responses gathered should not be taken to result from a large, random sample of the population. However, the responses are from a group of individuals who are responsible for considering how public policy influences the community as a whole, and from the businesspeople that may be directly affected by how the bypass impacts the local economy.

Survey cities were distributed geographically across the state, and their populations varied from just under 1300 to over 7700 (in 1990). Similarly, these cities have relatively high diversity in the number of years since bypass construction, ranging from a low of only three to a high of over twenty.

The benefit of the survey approach was that it allowed us to probe for costs and benefits of bypass construction that may not have been fully measured in other economic data, such as perceived quality-of-life changes or environmental effects related to the bypass. The majority of government officials, media representatives and businesspeople interviewed were very pleased with the changes that the bypasses brought to their communities. Commonly cited benefits included reduced traffic congestion, expanded opportunities for growth, and increased land usage and property values. Among those who opposed the bypass, the primary reason was usually a belief that the bypass had hurt local business, although concerns over environmental damage and increased numbers of severe traffic accidents were also heard. Summaries of the responses from each town have been included as Appendix A.

OVERALL IMPACT OF BYPASS CONSTRUCTION

Overall, most government officials, media representatives, and businesspeople that were contacted were very satisfied with their community's bypass. Many reported that the quality of life in their community had "greatly improved," or that they were "very satisfied" with the results of the bypass. Out of 54 respondents throughout the state, 37 indicated that they were generally satisfied with the overall improvements brought on by the bypass. Only three respondents felt that, overall, the bypass had done harm to the

community, while 14 felt that the bypass had not made any significant differences in either direction.

By far the most common benefit noted was reduced traffic congestion, especially the reductions in through truck traffic. Other benefits included an increase in the number and variety of businesses in town, as well as an increase in the amount of land under development. Those who cited drawbacks to the bypasses most often mentioned that some downtown businesses had been hurt. Citizens from several communities also mentioned an increased number of traffic accidents since the construction of the bypass.

BYPASS EFFECTS ON RETAIL INDUSTRIES

Figure 3 depicts the responses of government officials, media representatives, and businesspeople in the communities concerning the effects of the bypass in percentile form. Few felt that the bypass had harmed the retail and service business in the overall community. Only about 13% of respondents indicated that it had, in their opinion, harmed this sector. The rest were fairly evenly split between those who believed that the bypass brought significant benefits to retail businesses and those who believed that it had made no significant differences (at 41% and 46%, respectively).

Opinion was less confident concerning the effects that the bypasses have had specifically on *downtown* retail and service businesses. The majority, 52%, felt that the bypass had brought no significant changes to downtown retail and service business. The difference, however, is that 37% believed that the bypass had probably hurt downtown retail business, while only the remaining 11% felt that the bypass had actually helped retail businesses in the downtown area.

BUSINESS OPINIONS ON BYPASS CONSTRUCTION

Figure 4 is similar to Figure 3, except that the sample is restricted only to business owners. Most of the businessmen and women interviewed in the study owned businesses located downtown, along the bypassed route. The exceptions of this were two businesses that had moved out to the bypass area after the construction of the bypass, and one business that had opened on the bypass after its construction. When the sample of respondents was restricted only to businesspersons, opinions were somewhat less optimistic. Almost half answered that the bypass had brought little significant change to retail and service conditions in the town as a whole. The other 50% were evenly distributed on either side of this mean, with about 25% indicating that the bypass had helped retail business and about 25% indicating that the bypass had hurt retail and service business throughout the community.

When asked about bypass effects on *downtown* retail and service businesses, however, not one businessman or woman suggested that the bypass had been a boon to downtown retail business. In fact, 60% of interviewed businesspeople believed that the

bypass had hurt retail and service businesses in the downtown area. The other 40% responded that the bypass had made no significant difference for downtown retail and service business.

BYPASS EFFECTS BY TOWN SIZE

As the mean town population among survey cities was just over 4,000 in 1990, it was useful to compare community attitudes in towns above and below this average. No clear distinction emerges between the two. While government officials and businesspeople from smaller communities tended overall to be less positively inclined toward the bypass, the differences were not substantial.

Figures 5 and 6 contain data on perceptions toward bypass effects on local businesses from small and large communities, respectively, depicted in percentile form. When evaluating bypass effects on retail and service businesses in the community as a whole, government officials, media representatives and businesspeople in smaller communities were 7% more likely to describe the bypass as harmful to business. The only difference between the two came in that respondents in larger communities were 29% more likely to see the bypass as helpful to business overall, while respondents in smaller cities were 22% more inclined to see the bypass as having had no significant effects.

A similar tendency was found when government and media officials and businesspeople were asked about bypass effects on businesses in the downtown area. Respondents from smaller communities were 5% more likely to have a negative view of the bypass, but they were 16% more likely to say that the bypass had made no significant impact on retail and service business in the downtown area. Similarly, respondents from larger towns were 21% more likely to claim that the bypass had brought significant benefits to downtown retail and service businesses. Thus, the officials and businesspeople that were contacted on the whole felt that bypass construction is more likely to bring significant *benefits* to the businesses in larger communities than the businesses of smaller towns.

BYPASS EFFECTS ON THE BUILDING STOCK

One concern that many communities express about bypass construction is that it will lead to deterioration of the building stock in the downtown area. Some worry that as consumers and businesses relocate to the bypass area, the downtown area will fall into disrepair and the number of vacancies will increase. Indeed, the data presented earlier suggests a higher downtown vacancy rate in bypass towns than in similar non-bypass communities. About 23% of the government officials, media representatives, and businesspeople who were interviewed believed that the bypass had led to some negative impacts on their downtown building stock, but the majority of these described the problem as relatively minor, noting that “a few more vacant buildings” were in the

downtown area. Much more common was the observation that the downtown area was now dominated by professional office space instead of retail and service businesses, a shift which many regarded neither as positive or negative. 66% of the respondents believed that the bypass had no effect on the building stock in the downtown area of their community.

The community of Cadiz, Kentucky, stood out because of the relatively high number of respondents who believed that the building stock in the downtown area had actually improved since the construction of the bypass. Many respondents cited the state-funded "Renaissance" grants as the main reason for these improvements. These grants, given to the city after the construction of its bypass, were intended specifically for use in the renovation of the downtown area in an effort to attract tourists and shoppers. Most government officials, media representatives, and businesspeople contacted in Cadiz seem to be pleased with the results of the project.

BYPASS IMPACTS ON LAND USAGE

One possible benefit of a bypass is an increased level of land use in a community following its construction, and the individuals that we spoke with largely attested to this fact. The government and media officials and businesspeople from every community spoke of the increased amount of land that either had been developed or was under development. Although a minority of respondents opposed this growth for cultural reasons, nearly everyone conceded that the bypass had opened the town up for growth. Respondents in bypass towns across the state reported a general agricultural to commercial shift in land use, particularly around the bypass itself. Naturally, this expanded usage brings higher property values along with it, which can dramatically increase the real wealth of landowners in the towns. For example, one property developer was delighted by the large increases he observed in property values throughout his community in the few years following the construction of the bypass.

In nearly every community that we surveyed, several homes were taken down to make way for the bypass. Surprisingly, however, none of the respondents that we spoke with seemed upset by this, and none mentioned any significant problems that it caused in their communities. In several cities, such as Cadiz and Flemingsburg, there was some initial controversy surrounding remuneration for purchased property, but these issues were apparently resolved to the satisfaction of all concerned parties.

BYPASS EFFECTS OF TRAFFIC CONGESTION

As mentioned earlier, by far the most popular benefit that officials and businesspeople saw in the bypass was the significant reductions in traffic congestion. Respondents in every community noted that the bypass had significantly reduced through traffic, and most were especially pleased by the reductions in through truck-traffic. Many

regarded this as a significant quality of life improvement for their community, and several noted that reduced travel times allowed the community to "stay more connected."

Naturally, reductions in traffic congestion were most concentrated in the downtown area along the old highway route. One County Road Supervisor described reductions in traffic congestion of "well over 60%." While many downtown businesses felt that they were hurt by the reductions in through traffic, a few noted that reduced traffic volumes made it easier for some residents of their community to reach them.

Officials and businesspeople in several communities expressed concern over an increased number of serious traffic accidents since the construction of the bypass. These accidents were attributed to a variety of causes, from "poorly planned intersections along the bypass" to "increased travel speeds on the bypass compared with the old downtown highway" to "increased travel speeds downtown" since reduced levels of congestion allow for greater speed. Several communities have remedied these problems through installation of traffic lights, etc., but it is something that residents wished planners had properly accounted for *before* the traffic accidents had occurred.

BYPASS EFFECTS ON ENVIRONMENT

Officials and businesspeople did not frequently mention environmental harm as a major problem for bypassed cities in Kentucky; about 75% of respondents believed that the bypass had made no real difference to the environment of their local community. The other 25% were split nearly evenly between those who expressed concerns (~11%) and those who saw the bypass as an asset to the environment (~15%).

Among those who felt that the bypass had harmed the environment in their community, the most common problem was an increase in the level of water runoff from the asphalt surface of the bypass itself. The other major problem that was cited was an increase in the level of pollution from the increased number of industries that had moved in since the bypass was constructed. A small number of respondents mentioned concerns of industrial overcrowding, especially as the cities' public services were not equipped to handle them.

While those who perceived environmental damage were distributed fairly evenly across the state, an abnormally large portion of those who felt that the bypass actually helped the local environment were clustered in the city of Cadiz, Kentucky. Furthermore, officials and businesspeople in Cadiz who mentioned environmental impacts unanimously cited perceived improvements in local air quality from the reduced levels of through traffic as the main environmental benefit of the bypass. In fact, just over 60% of the respondents from Cadiz specifically mentioned this improvement, compared to about 15% of respondents in all other towns who mentioned *any* environmental impacts, whether positive or negative.

PUBLIC INVOLVEMENT AND COMMUNITY CONCERNS

Every community in the survey held a series of town meetings to discuss concerns surrounding the construction of the bypass. Only a few of the government officials, media representatives, or businesspeople that were contacted remember the community having contentious issues to discuss at these meetings.

In several communities these meetings did accomplish significant goals. As mentioned earlier, a few towns addressed the issue of compensation for land and property taken during the construction of the bypass. In Russellville, the route of the bypass was even changed "several times" due to community concerns over the originally planned path.

CONCLUSIONS

Overall, government officials, media representatives, and businesspeople in bypass communities throughout the state seem largely pleased with their bypasses. Many viewed the bypasses as engines of growth for their communities, and most believe that the bypass has helped improve the quality-of-life in their community. Even the majority of local downtown businesspeople who were contacted supported the construction of the bypass in their towns. 75% of business respondents believed that the bypass had either helped or had no significant effect for retail and service industries throughout the community, although 60% of those same respondents believed that the bypass had hurt retail businesses downtown. A large percentage also welcomed the other benefits that the bypass brought along with it, especially decreased through traffic and increased land use and property values.

Most officials and businesspeople did not feel that the bypass has had any effect on their local environment, although some did report concern over increased levels of water-runoff and increased industrial pollution from industries that located at the bypass. Others were concerned that the severity of traffic accidents in the community had increased since the construction of the bypass, but they believed that effective road planning could help prevent these accidents in the future.

CENSUS DATA FOR SELECTED BYPASS COMMUNITIES

Every ten years, the Census Bureau in its decennial census collects a wealth of a data on the economic health of individual communities throughout the nation, including such measures as local populations, poverty rates, unemployment rates, labor-force participation rates, and education levels. In order to examine the effects that a bypass can have on these indexes in an area, we again focused on our 8 case study bypass

communities. Along with this bypass city, we examined our matched city that was similar in many aspects, but in which no bypass was constructed. We then compared Census data for each of the city and county pairings from the Census before the bypass was built and the Census following the bypass' completion. Naturally, we were not able to make 'after' comparisons for bypasses built during the 1990s, so they were not considered in this analysis. The small and nonrandom sample makes statistical inference difficult, but trend comparisons can still be made. In comparing the 'before' data, we looked for differences that may have helped to explain which cities receive bypasses. In comparing the 'after' data, we looked for differences that the bypasses might have brought to the communities in which they were built. Table 9 contains the results of these comparisons. Missing fields correspond to cities that were either too small to be included in the Census data, or for which no after data was available.

Bypass and matched towns were very similar before bypass construction in each of the measures we examined. The largest differences between the two was that bypass towns were, on average, more populous by about 200 persons (about 6% more populous), and also were situated in counties that were more populous by about 4000 persons (about 25% more populous). Also, the poverty rates in towns that were to receive bypasses was 19%, on average, compared to 23% for towns in which no bypass was built. These differences are minor, especially in light of the small sample size being considered. In unemployment rates and labor-force participation rates, the average for bypass towns was within one percentage point of the average for the non-bypass towns. Education levels were nearly equal. This suggests that, while bypasses may be somewhat more likely in larger communities with slightly lower poverty rates, bypass communities closely resemble matched communities in economic characteristics at the time of bypass construction.

After bypass construction, bypass communities still closely mirrored their matches. On average, the population and poverty rates grew more rapidly in bypass towns than in non-bypass towns, but the growth rates of individual communities varied greatly within each category. The largest change was in poverty rates, where bypass towns had poverty rates that were, on average, 5% higher than they had been before construction. In contrast, the average poverty rate among matched communities was only 1% higher. At the county level, the poverty rate both in bypass and match communities was just 1% higher after construction than before. Unemployment rates, labor-force participation rates, and education levels again closely resembled each other.

In the sample that we examined, a bypass appears to have little, if any, effect on the population, unemployment rates, poverty rates, labor-force participation rates, or education levels of a town, at least in the few years immediately following its construction. Perhaps, given a longer timeframe, these measures would begin to diverge for bypass and non-bypass towns. Nevertheless, it seems that none of these indicators will be affected very dramatically, if at all, in the few years following the construction of the bypass, with the possible exception of city-wide poverty rates.

LAND USE BEFORE BYPASS CONSTRUCTION

In the eight communities of Auburn, Cadiz, Corbin, Flemingsburg, Franklin, Hardinsburg, Hazard, and Stanford, city officials were asked to discuss the ways in which bypass land had been used before the time of construction. The purpose of this was to assess what types of land are commonly cleared for bypass construction, as well as to further examine the costs of a local bypass. While several towns had unique situations, three types of land were generally identifiable in the responses: residential, agricultural, and undeveloped.

Six of the eight bypasses ran through areas that were previously primarily agricultural farmland. This farmland still surrounds large areas of many bypasses, while other farmland near the bypass has been sold and commercialized.

The only two towns for which the bypass did not pass mainly through farmland were Auburn and Hazard. In both of these cases, the bypass cut through land that was entirely undeveloped and out of use. In Hazard, a portion of the bypass did traverse land that had been a mining and residential development years prior, but it had long since fallen into disuse. One interesting characteristic of the Hazard bypass is that it actually made possible the development of some otherwise unsuitable land. The bypass was cut from the side of a hill, and the waste material involved in the digging was used to raise the elevation of 'Jack Lot Hollow' and 'Gorman Hollow,' which now boast new residential developments.

Three of the bypasses ran through plots that contained non-agricultural developments. In Cadiz the bypass cut through the center of a local golf course. The golf course is still in operation. In the other two cases, the bypass was built partly through residential areas.

CHAPTER V
CONCLUSIONS

This study has provided a detailed analysis of the impact that opening a new bypass can have on the economy and quality-of-life in the community it bypasses. This study focused on three key ways in which a bypass road can impact a community. First, we examined whether a new bypass influences the rate of growth in the local economy. Second, we examined whether a new bypass changed the allocation of economic activity within the community. Lastly, we examined several aspects of how a bypass could affect community quality of life.

- In terms of the effect of a bypass on growth, the general consensus from the review of literature was that bypass construction has either no effect or perhaps a modest effect on the economy of the community bypassed. While some studies did find a positive effect on total employment, the best designed study in the literature found a negative impact on retail sales.

- The direct estimation of bypass impacts using Kentucky data found limited evidence that the opening of bypass roads influences county growth. The opening of a bypass route was found to reduce aggregate retail sales, but was not found to affect retail employment, total employment, or population.

- We also found that, given the decision to build a bypass, the bypass would be more likely to encourage total employment growth if the bypass had partial access control and the bypass is located closer to the community's central business district.

- The size of the community receiving a bypass was not found to influence total employment growth.

- All of these results from direct estimation using Kentucky bypass data should be considered in light of the modest sample of 21 bypass routes available for examination in this study. Statistically significant findings are always less likely when only a small sample is available. Still, our results were consistent with previous literature in that we did not find a large and widespread impact on the economy after opening a bypass. But, we did find a negative impact on retail sales, which was consistent with the findings in Anderson, et al. (1993), the best designed of the studies in the literature.

- A more detailed analysis of 8 selected communities with bypasses resulted in additional findings. Analysis that was carried out for 8 communities that have received a new bypass found that the average vacancy rate in the downtown area of bypass communities was 18.4% versus 10.9% in similar communities with no bypass. This was a large and statistically significant difference suggesting that vacancy rates are higher in bypass communities.

- A bypass also was found to influence the business mix in a downtown area. Retail businesses were found to account for a much larger share of businesses on the bypass (57%) than in the downtown area (31%). Retail businesses accounted for 38% of downtown businesses in communities without a bypass. These results suggest that a bypass over time provides especially strong competition for the downtown area as a retail location.

- The growth of business activity on the bypass typically does not involve businesses relocating from downtown to the bypass. Rather, it involves a concentration of new business locations on the bypass. Only 7.6% of businesses located on the 8 bypass areas studied were previously located in the downtown area.

- We also directly contacted government officials, media representatives and businesspeople in these 8 bypass communities to ask questions about how the bypass influenced community quality-of-life. This provided insight on how members of these groups perceived the bypass' impact, although responses from a small and specialized sample of this type should not be taken as definitive. Overall, many of the 6 to 8 persons contacted in each county believed that the bypass promoted growth and improved quality of life.

- Even the majority of local downtown business owners who were contacted believed either that the bypass had helped or that it had no significant effect for retail and service industries throughout the community, although they were more negative regarding the effect on retail downtown.

- Some who were interviewed were concerned that the severity of traffic accidents in the community had increased since construction of the bypass, while others were concerned that water-runoff had increased, or that industrial pollution had increased due to industry that located on the bypass. Bypass construction also occurred largely by displacing existing farmland.

In summary, this study identified a number of ways in which the opening of a bypass route influences the economy and quality of life in communities. The findings of this study, however, tended to be on a very aggregate level. For example, we estimated that the aggregate downtown vacancy rate tended to be higher in communities with a bypass than without a bypass. But, we were not able to address more subtle questions, such as does the higher vacancy rate in bypass communities persist over time, or does it eventually diminish and disappear?

We were not able to address these more subtle questions with more precise estimates primarily due to limitations in sample size. In particular, limitations on the number of bypass routes in Kentucky available for study (21), or the fact that time and expense limited the researchers to visiting only 8 pairs of bypass and matched counties. This suggests that further research on the impact of bypass routes should include visits to

more pairs of bypass and matched counties, perhaps all 21 pairs. Similarly, the survey of officials and businesspeople in communities that have received a bypass could be expanded to include more bypass communities, or perhaps, more respondents in each bypass community. A final option would be to attempt to increase the total number of bypass routes under study to more than 21. This should be possible with the passage of time as more bypass routes are built. Another option would be to also collect data on bypass routes in states adjacent to Kentucky.

REFERENCES

1. Anderson, et al., 1993. "Economic Impact of Highway Bypasses" in *Transportation Research Record 1395*. Transportation Research Board, Washington, D.C., pp. 144-152.

2. Buffington, Jesse L., and Dock Burke, 1989. *Employment and Income Impacts of Highway Expenditures on Bypass, Loop and Radial Highway Improvements.* Texas Transportation Institute, Texas A&M University System, prepared for the Texas State Department of Highways and Public Transportation.

3. Burress, David, 1996. *Impacts of Highway Bypasses on Kansas Towns*. Prepared for the Kansas Department of Transportation (October).

4. Horwood, Edgar M., Carl A. Zellner, and Richard L. Ludwig, 1965. *Community Consequences of Highway Improvement*. National Cooperative Highway Research Program Report Number 18.

5. Otto, Daniel, and Connie Anderson, 1993. *The Economic Impacts of Rural Bypasses: Iowa and Minnesota Case Studies*. Prepared for the Center for Transportation Studies (June).

6. Pashek, R. D., and E. M. Horwood, 1965. "Community Consequences of Highway Improvement" in *Highway Research Record 96*, HRB, National Research Council, Washington, D.C.

7. Snyder and Associates, 1999. *1999 Primary Road Bypass Study of Selected Iowa Communities*. Prepared for the Iowa Department of Transportation (November).

8. Srinivasan, S., and K. Kockelman, 2000. *The Impacts of Bypasses on Small- And Medium-Sized Communities: An Econometric Analysis.* Presented at the National Transportation Board meetings on January 7-11, 2001 in Washington, D.C.

9. Yeh, Daniel, Matt Gannon, and Dennis Leong, 1998. *The Economic Impacts of Highway Bypasses on Communities*. Wisconsin Department of Transportation (January).

Table 1. Bypass Counties and the Closest Matched County

Bypass County	Matched County
Bell	Wolfe
Breathitt	Magoffin
Breckenridge	*Marion*
Casey	Monroe
Fleming	*Grant*
Harlan	Hopkins
Knox	*Carter*
Larue	Bracken
Laurel	Grayson
Lincoln	*Morgan*
Logan	*Shelby*
Nelson	Harrison
Perry	*Leslie*
Rockcastle	Edmonson
Rowan	Calloway
Russell	Metcalfe
Simpson	*Carroll*
Trigg	*Hart*
Warren	McCracken
Washington	McLean
Wayne	Adair

**Case Study counties are in Italics.*

Table 2. A Comparison of Growth Rates in Total Employment for Bypass and Matched Counties Before and After the Bypass Was Built

	Annual Average Growth Rates	
	Years Before Bypass Built	Years After Bypass Built
Group	5-Years	Up to 5 Years
Bypass Counties	2.48%	1.53%
Matched Counties	3.05%	1.81%
Difference	-0.57%	-0.27%
Statistically Significant Difference	No	No

Table 3. Difference in Annual Average Growth Rates Before and After The Bypass For Population, Employment in Key Industries, and Retail Sales

	Difference in Annual Average Growth Rates		
Industry	Years Before Bypass Built 5 Years	Years After Bypass Opened Up to 5 Years	After vs. Before
Population	-0.24%	-0.19%	0.05%
Retail Sales (1996 $)	1.26%**	-1.43%***	-2.69%***
Retail Trade Jobs	-0.22%	0.15%	0.37%
Services Jobs	-1.51%	-0.12%	1.39%
Finance, Insurance, & Real Estate (FIRE) Jobs	0.86%	-0.51%	-1.37%
Manufacturing Jobs	-0.99%	-1.57%	-0.58%

* Statistically significant with 15% confidence.
** Statistically significant with 10% confidence.
*** Statistically significant with 5% confidence.

Table 4. Regression of the Change in Relative Growth Rates of Bypass and Matched Counties From After Versus Before Each Bypass Was Opened
Total County Employment and Retail Sales Growth

	Annual Growth	
	Total Employment	Retail Sales (1996$)
Intercept	-.00075	-.037*
	(.011)	(.023)
Population of City	-.032	.72
(x 1,000,000)	(.58)	(1.21)
Distance to Bypass	-.000012*	-.0000040
(Meters)	(.0000074)	(.000015)
Partial Access Control	.024**	.013
(Yes vs. No)	(.014)	(.028)

* Statistically significant with 15% confidence.
** Statistically significant with 10% confidence.
*** Statistically significant with 5% confidence.

Table 5. Downtown Vacancy Rate on Street Level - Bypass Communities versus Matched Communities

	Estimated Vacancy Rate		
Comparison Group	Bypass Community	Matched Community	Difference
All 8 Case Studies	18.4%	10.9%	7.6%
Bypass Community Size			
Less than 3,000	18.7%	10.3%	8.4%
More than 3,000	18.1%	11.8%	6.2%
Recent Jobs Growth 1993-1998			
Less than 2%	17.1%	9.6%	7.4%
6% to 9%	19.7%	11.9%	7.8%
More than 9%	18.0%	10.7%	7.4%
Location in State			
Eastern Kentucky	16.7%	10.6%	6.1%
Western Kentucky	20.2%	11.2%	9.0%
Age of Bypass			
Fewer than 10 Years	18.6%	10.1%	8.6%
10 or More Years	18.1%	12.3%	5.8%

Table 6. Business Mix on Street Level - The Bypass versus the Downtown Area

Comparison Group/Industry	Share of Businesses (%) Bypass	Downtown	Difference (Bypass less Downtown)
All 8 Case Studies			
Retail	57.4%	31.1%	26.3%
Professional Services	11.1%	26.3%	-15.2%
Personal Services	10.4%	20.2%	-9.8%
Government	6.9%	13.6%	-6.7%
Other	14.2%	8.7%	5.5%
Bypass Open for Less than 10 Years			
Retail	53.6%	28.3%	25.3%
Professional Services	8.0%	27.5%	-19.5%
Personal Services	12.3%	19.9%	-7.6%
Government	7.6%	15.1%	-7.5%
Other	18.6%	9.3%	9.3%
Bypass Open for More than 10 Years			
Retail	63.7%	35.8%	27.9%
Professional Services	16.4%	24.4%	-8.0%
Personal Services	7.2%	20.8%	-13.6%
Government	5.7%	11.2%	-5.5%
Other	7.0%	7.8%	-0.8%

Table 7. Business Mix on Street Level – The Downtown of Bypass versus Matched Communities

Comparison Group/Industry	Share of Businesses (%) Bypass	Matched	Difference (Bypass less Matched)
All 8 Case Studies			
Retail	31.1%	38.1%	-7.0%
Professional Services	26.3%	23.5%	2.8%
Personal Services	20.2%	19.8%	0.4%
Government	13.6%	11.2%	2.4%
Other	8.7%	7.4%	1.3%

Table 8. Share of Bypass Business that Moved from Downtown to Bypass and Share of Moved Businesses that are in Retail Industries

Comparison Group	Share of Businesses (%) Moved from Downtown	Share of Moved Businesses in Retail Industry
All 8 Case Studies	7.6%	13.7%
Bypass Community Size		
Less than 3,000	10.4%	15.2%
More than 3,000	3.0%	11.1%
Age of Bypass		
Fewer than 10 Years	5.7%	6.7%
10 or More Years	10.8%	25.4%

Table 9. Census Data for Case Study Bypass Counties

	Poplulation Before	Poplulation After	Median Age Before	Median Age After	Unemployment Rate - Before	Unemployment Rate - After	Poverty Rate Before	Poverty Rate After	Labor Force Participation Rate - Before	Labor Force Participation Rate - After	Education Level - Before		Education Level - After	
											HS Degree	College Degree	HS Degree	College Degree
City														
Cadiz	2,148		41.9											
Auburn	1,273		39.0											
Hardinsburg	2,211	1,906	34.8	35.5										
Franklin	7,738	7,607	32.0	35.5	9.9%	9.5%	17.8%	19.6%	63.3%	59.4%	49.4%	8.7%	55.3%	7.4%
Hazard	5,377	5,416	30.6	33.9	8.2%	11.7%	17.4%	29.0%	53.3%	50.5%	58.4%	12.3%	54.4%	10.8%
Corbin	7,419		38.0		7.1%		22.6%		50.7%		59.8%	12.8%		
Flemingsburg	2,835	3,071	34.5	38.4	6.1%	4.6%	14.4%	22.3%	56.8%	56.4%	46.3%	10.2%	57.1%	12.6%
Stanford	2,686		39.6		5.5%		22.6%		56.3%		63.7%	10.0%		
Control Cities														
Munfordville	1,556		39.0				30.6%		49.2%		46.2%	9.0%		
Shelbyville	6,238		33.1		4.1%		26.6%		66.9%		57.7%	13.3%		
Lebanon	6,590	5,695	29.5	34.8	8.3%	9.0%	23.5%	31.7%	56.9%	54.2%	47.9%	8.5%	52.4%	6.3%
Carrollton	3,967	3,715	33.9	37.6	7.0%	10.0%	13.7%	22.1%	58.6%	57.7%	47.2%	11.8%	60.2%	13.6%
Hyden		375								41.1%			62.0%	15.4%
Grayson	3,510		30.3		8.9%		26.4%	26.4%	52.1%		60.3%	13.1%		
Williamstown	2,505	3,023	32.4	34.2	3.1%	4.3%	13.2%	17.2%	55.4%	57.9%	49.8%	8.5%	60.3%	12.4%
West Liberty	1,887		36.1		8.7%		29.1%		39.6%		56.4%	12.5%		
County														
Trigg (Cadiz)	10,361		39.7		6.3%		18.0%		57.0%		58.9%	11.4%		
Logan (Auburn)	24,416		34.8		6.1%		15.6%		62.5%		57.7%	8.1%		
Breckinridge (Hardinsburg)	16,861	16,312	30.7	35.4	9.8%	9.9%	23.2%	23.2%	52.5%	55.6%	42.1%	5.7%	56.7%	6.3%
Simpson (Franklin)	14,673	15,145	30.8	33.7	6.6%	7.2%	15.1%	15.5%	62.9%	65.8%	49.8%	7.6%	58.9%	8.8%
Perry (Hazard)	33,763	30,283	26.7	31.7	14.8%	13.2%	25.6%	32.1%	42.6%	46.8%	37.3%	6.0%	47.6%	6.7%
Whitley/Knox (Corbin)	31,501		32.2		13.5%		35.8%		48.5%		50.0%	9.7%		
Fleming (Flemingsburg)	12,323	12,292	31.2	34.8	10.1%	3.3%	26.6%	25.4%	56.0%	60.1%	40.2%	6.3%	53.8%	8.7%
Lincoln (Stanford)	20,045		33.7		10.8%		27.2%		57.3%		50.4%	6.2%		
Control Counties														
Hart (Munfordville)	14,890		34.9		6.4%		27.1%		56.4%		45.3%	5.2%		
Shelby (Shelbyville)	24,824		34.9		3.3%		14.2%		67.5%		69.9%	12.9%		
Marion (Lebanon)	17,910	16,499	27.1	32.3	10.3%	6.0%	23.0%	25.6%	58.1%	58.1%	44.9%	6.7%	58.9%	6.4%
Carroll (Carrollton)	9,270	9,292	31.8	33.9	9.7%	9.3%	17.8%	22.0%	57.8%	60.8%	46.5%	7.6%	59.6%	10.7%
Leslie (Hyden)	14,882	13,642	25.0	30.4	14.4%	12.2%	34.1%	35.6%	37.4%	41.7%	30.6%	7.0%	40.4%	6.6%
Carter (Grayson)	24,340		33.0		11.6%		26.8%		52.3%		51.3%	7.6%		
Grant (Williamstown)	13,308	15,737	30.2	32.2	6.5%	4.9%	13.1%	15.1%	56.7%	62.6%	49.0%	5.6%	61.6%	7.2%
Morgan (West Liberty)	11,648		33.1		12.6%		38.8%		45.4%		44.1%	6.7%		

Figure 1. Map of Bypass Counties and Matched Counties

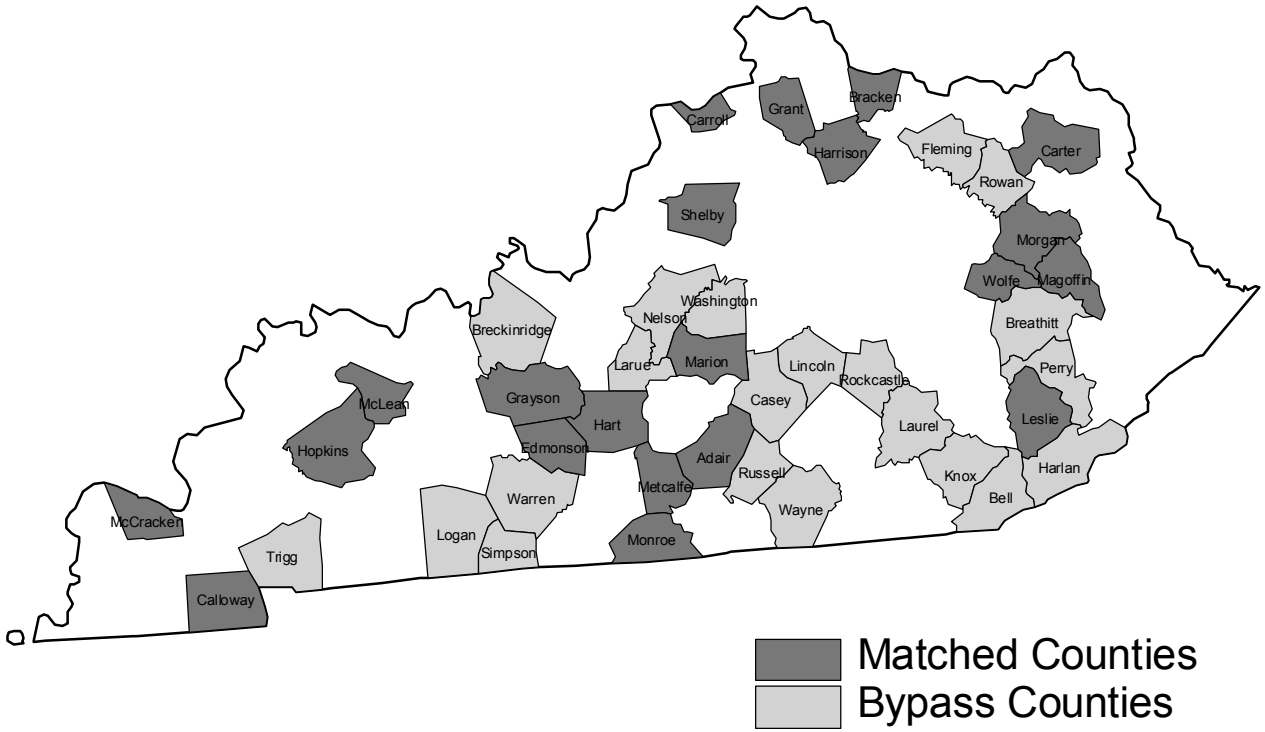


Figure 2. Map of Eight Case Study Bypass Communities and Matched Communities

Bypass County	Twin County
Breckinridge (Hardinsburg)	Marion (Lebanon)
Fleming (Flemingsburg)	Grant (Williamstown)
Knox (Corbin)	Carter (Grayson)
Lincoln (Stanford)	Morgan (West Liberty)
Logan (Auburn)	Shelby (Simpsonville)
Perry (Hazard)	Leslie (Hyden)
Simpson (Franklin)	Carroll (Carrollton)
Trigg (Cadiz)	Hart (Munfordville)

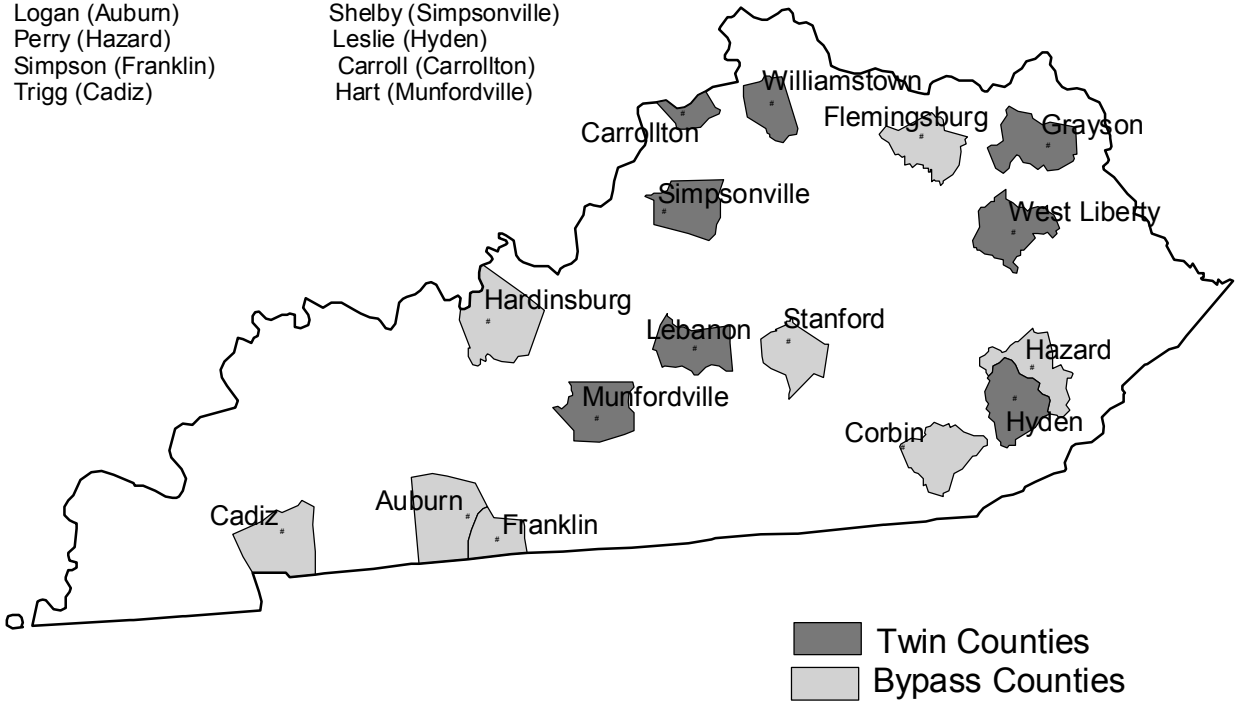


Figure 3. Opinions of Government Officials, Media Representatives, and Businesspeople on Bypass Construction.

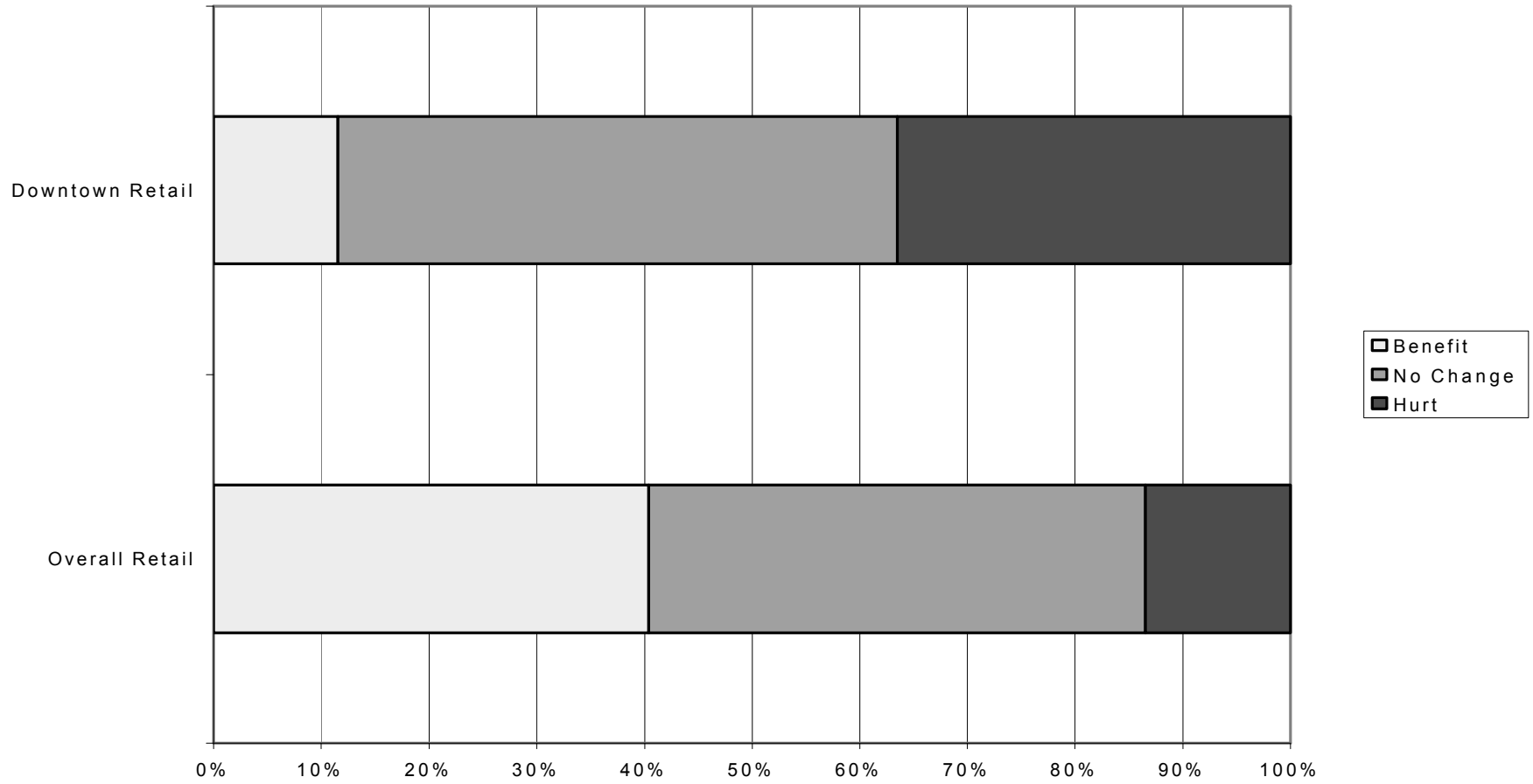


Figure 4. Opinions of Businesspeople Only on Bypass Construction.

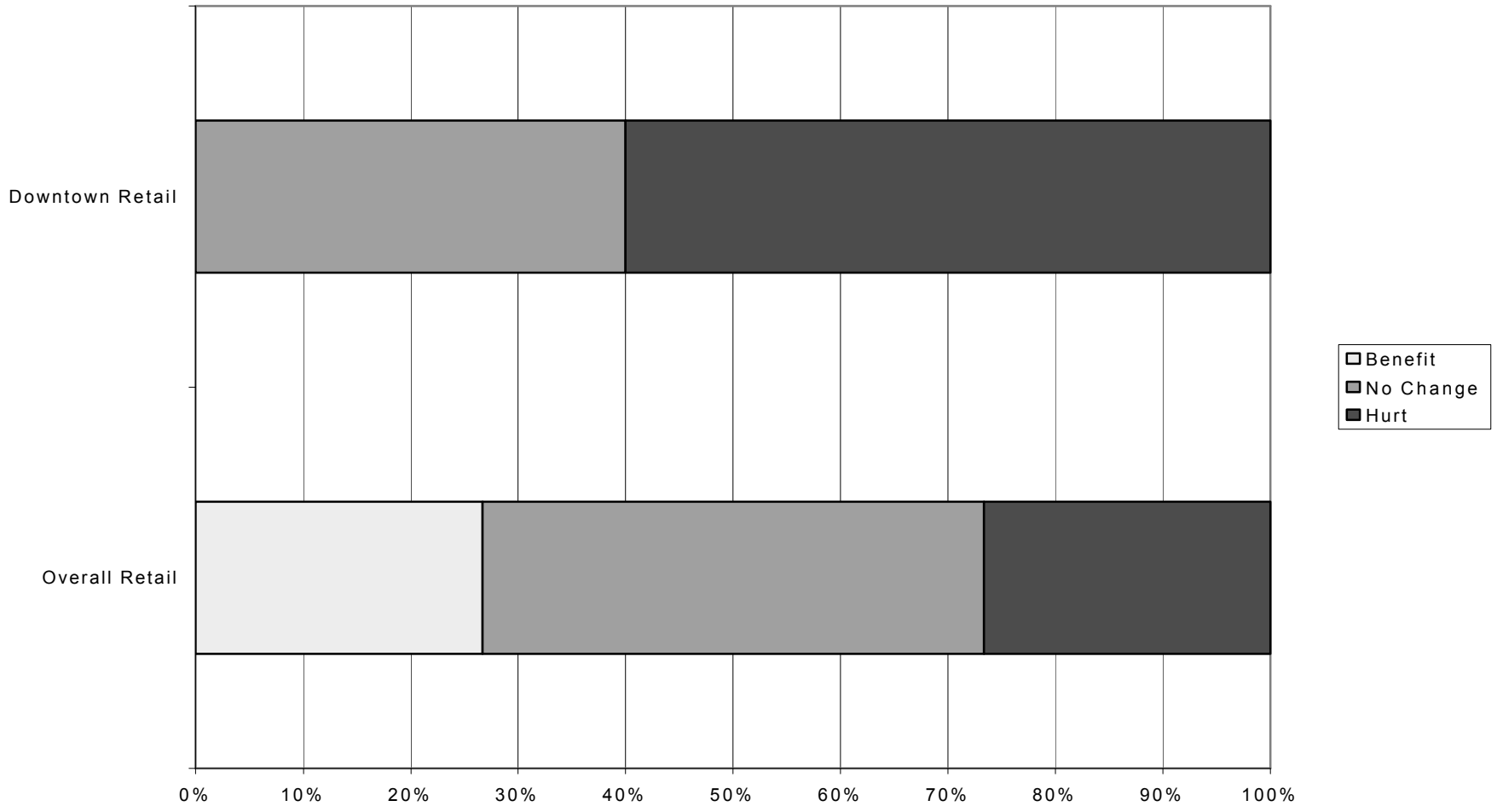


Figure 5. Opinions of Officials and Businesspeople in Small Towns on Bypass Construction.

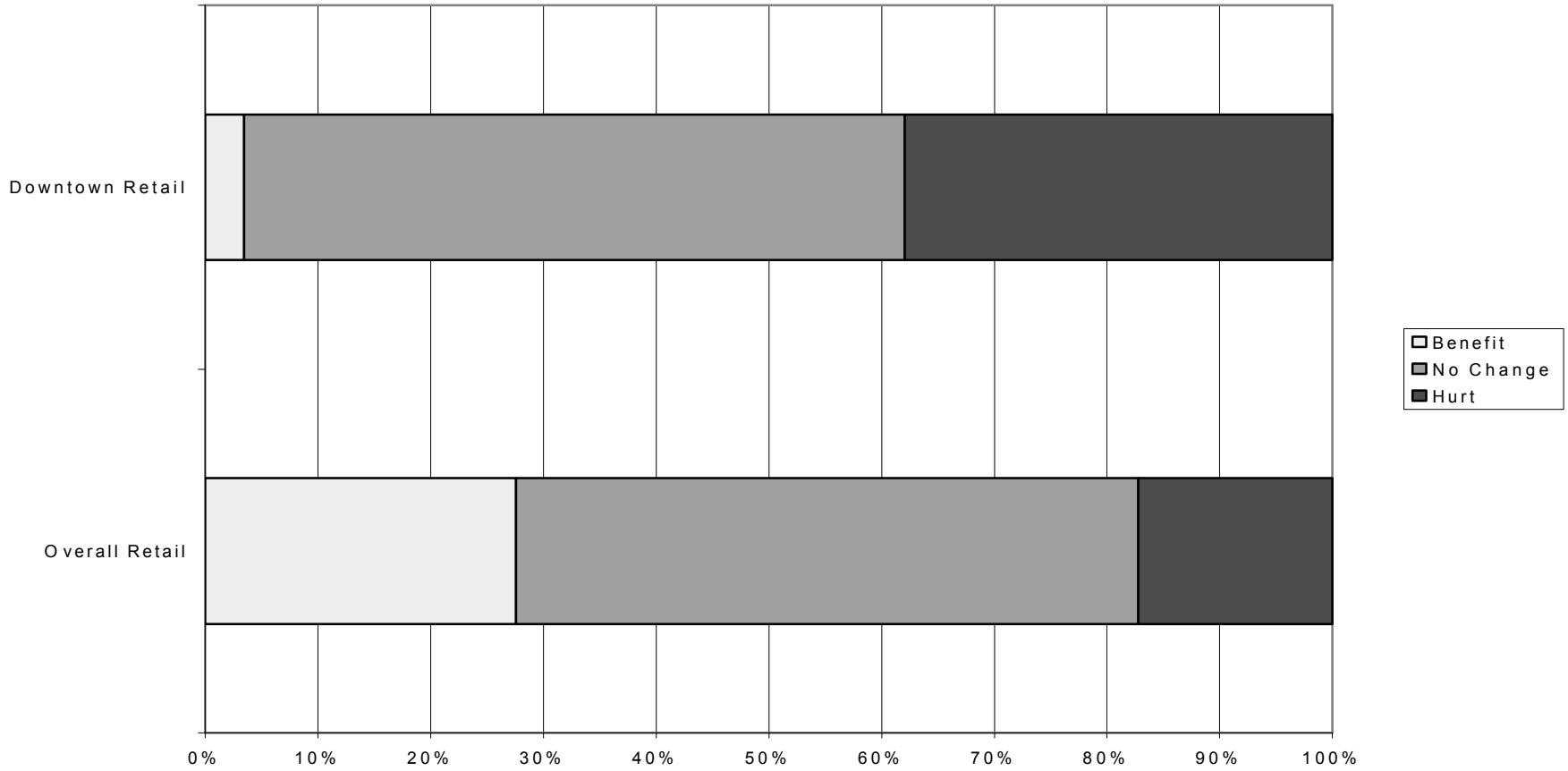
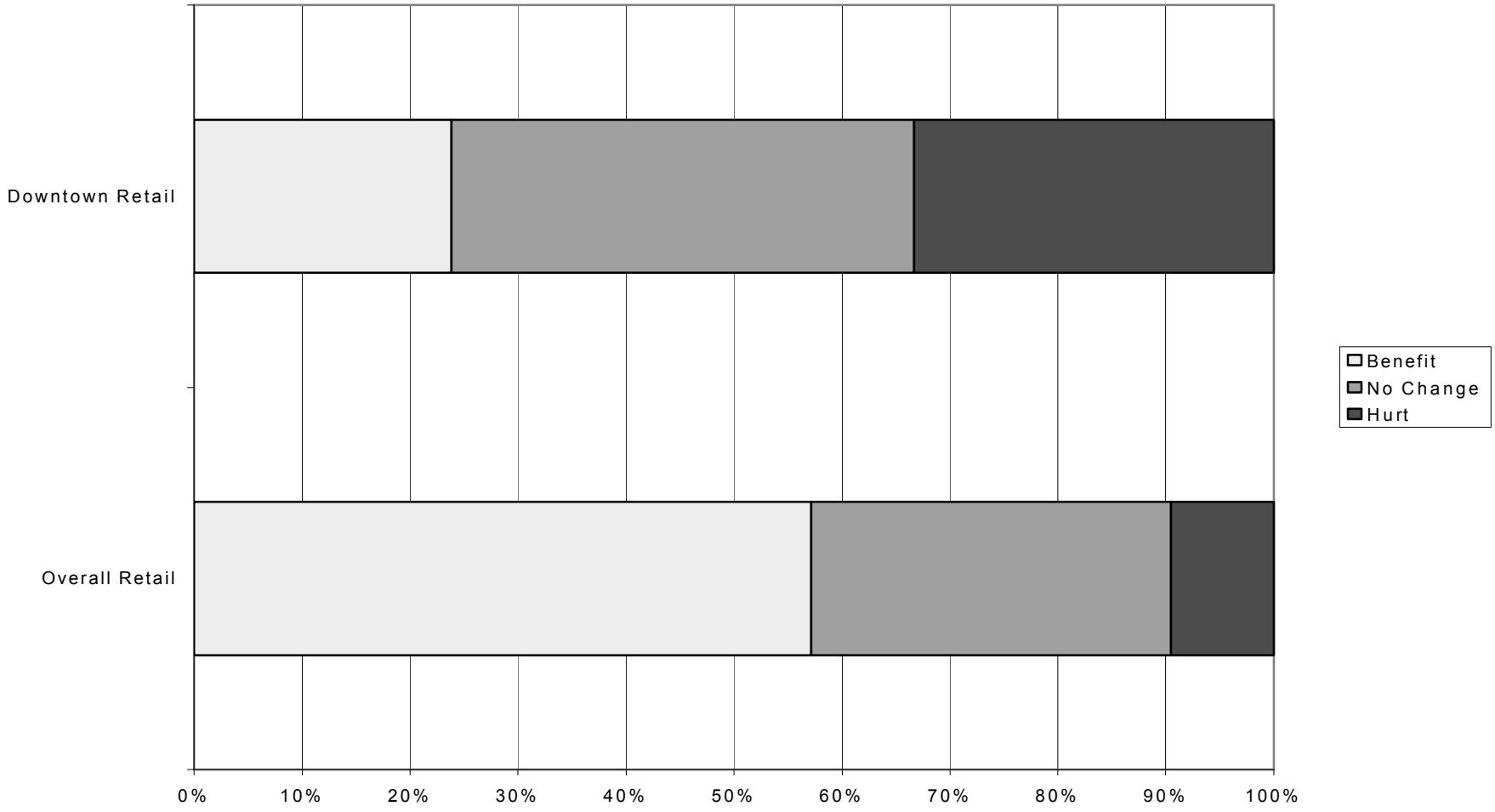


Figure 6. Opinions of Officials and Businesspeople in Large Towns on Bypass Construction.



APPENDIX A
RESULTS FROM BYPASS COMMUNITY SURVEYS

Survey Instrument 51

Breckenridge County (Cloverport and Hardinsburg) 52

Fleming County (Flemingsburg) 53

Knox County (Corbin) 54

Lincoln County (Stanford) 55

Logan County (Auburn and Russellville) 56

Perry County (Hazard) 57

Simpson County (Franklin) 58

Trigg County (Cadiz) 59

Survey of Bypassed Communities

1) What has been the overall impact of the bypass on quality of life in the community?

2) What has been the overall impact of the bypass on traffic congestion in the entire community?

3) What has been the overall impact of the bypass on traffic congestion in the downtown area?

4) What has been the overall impact on retail and service businesses in the entire community?

5) What has been the impact on retail and service business in the downtown area?

6) What has been the impact of the bypass on building stock in the downtown area?

7) What has been the impact of the bypass on land use in the community, including around the bypass area?

   7a) Did any homes need to be taken down to make way for the by-pass?

8) What has been the general impact of the bypass on the environment in the community?

9) Did public involvement help address community impacts related to by-pass activities?

Breckenridge County (Cloverport and Hardinsburg):

- Community opinion on the Cloverport and Hardinsburg bypasses was positive overall, with four respondents claiming that the bypass had "helped" the cities, and two claiming that the bypass had not had a lot of impact. No one described the effects of the bypasses as negative.

- All six of the respondents felt that the bypass had reduced traffic congestion throughout the community, with three specifically mentioning the reduction in through traffic.

- Four of six respondents believed that the bypass had, overall, a positive effect on business in the community. These respondents included the County Judge-Executive, the mayor of Hardinsburg, a Hardinsburg businessperson (not located on the bypass), and a columnist for the *Breckenridge County Herald-News*. Two respondents noted that businesses downtown had been hurt, including the mayor of Cloverport (who also owns an antique business downtown) and the Cloverport City Clerk (who, to be fair, only mentioned one business that had suffered). The clear division of opinion between city lines suggests that Cloverport's downtown businesses may have suffered, while Hardinsburg's downtown area may not have incurred any negative effects. It should be remembered, however, that these results are based on an extremely small (and nonrandom) sample from each town, so they may not fully reflect the effects that the bypasses have had on the respective communities.

- Five respondents indicated that the bypass had no effect on the building stock in the downtown area. The mayor of Hardinsburg alone noticed an increase in the number of vacancies and a "general switch from retail stores to professional offices."

- All of the respondents reported a general change in land use since the construction of the bypass. Two respondents noticed a "rezoning of agricultural land for commercial use," two mentioned that land values had increased, and two noted that new housing units had been (or were being) built. According to the respondents, two homes in Cloverport were taken down in order to make way for the bypass, but no homes needed to be taken down in Hardinsburg.

- Five respondents reported no environmental changes resulting from the bypass, while the mayor of Hardinsburg mentioned that, due to the bypass, a park was built on a formerly empty lot, which he counted as an environmental improvement.

- Community involvement was apparently unnecessary in Breckenridge County: several of the respondents made clear that "most people wanted the bypass." The Cloverport City Clerk noted that there were "several meetings," but there were apparently few community concerns.

Portions of the US60 bypass lie within both the city limits of Hardinsburg and the city limits of Cloverport.

Fleming County (Flemingsburg):

- The majority of individuals interviewed felt that the bypass in Flemingsburg was a positive impact on the community. Most of the bypass is located on the western and northern parts of town, connecting SR11 to SR32. When asked what has been the overall impact of the bypass on the quality of life, an increase in business, as well as the diverting of traffic from the center of town were the two most popular responses.

- Before the bypass, many commercial trucks passed through the center of town while en route to Maysville, Mount Sterling (and I-64), and Morehead. According to those interviewed, the bypass significantly decreased this thru traffic and relegated it to the bypass. However, Carolyn Schwartz of the *Flemingsburg Gazette* notes that AA Highway (KY9) to the north of town has brought increased traffic to Flemingsburg. While the majority of this traffic passes through Flemingsburg via the bypass, some traffic does pass downtown.

- As for the impact on businesses, the bypass added new businesses to the bypass area. The impact on the downtown business community is mixed. Those businesses that left the downtown area did so due to regular business cycles and not necessarily because of the bypass. Most commercial businesses that existed before the bypass still exist in Flemingsburg. All grocery stores in Flemingsburg are still located within the downtown area, as well as pharmacies. There has been an increase in the number of chain stores along the bypass including McDonalds and Subway. Banks branches also exist on the bypass, while maintaining main offices in the downtown area. The Fleming County Health Dept did move to the bypass area, in order to enjoy more parking spaces. One business owner had a dissenting opinion concerning the impact on business. That respondent believed the bypass substantially hurt businesses in the downtown area. Almost all commercial business moved to the bypass area.

- The bypass impact on building stock is minimal at best. Vacant and decrepit buildings do exist in Flemingsburg, but much of this has been a result of businesses either closing for good or moving to areas other than the bypass. Many of the vacant buildings are rented out, and the city of Flemingsburg is about to bring in small business incubators. As for the land surrounding the bypass, most of it is farmland. The bypass affected this land by increasing the price of property around the bypass. In addition to new restaurants, at least one pre-fabricated housing community has sprung up on the bypass. The impact has been positive. In addition, ¾ of the bypass and adjoining land lie within city limits. No one is sure if any homes needed to be taken down to make way for the bypass. The bypass did however divide one street.

- As for an environmental impact, there has been no noticeable difference in water or air quality that can be attributed to the bypass. The water reservoir for Flemingsburg is located off of the bypass.

- Public sentiment and concerns were minimal during the consideration of the bypass. There were town meetings. Those farm owners though whose land the bypass would run did initially oppose the bypass. Currently, the State Department of Highways is considering expanding the bypass. According to the Chairman of the Fleming County Planning Commission, the Highway Dept. is actively soliciting public involvement and feedback for the proposed bypass extension.

Knox County (Corbin):

- The citizens and workers in Corbin that I spoke with were, for the most part, grateful for the bypass. Most felt that the quality of life had improved, while those at the Industrial Authority felt that the quality of life had not changed much. The man whom I spoke with at the Industrial Authority felt that the bypass had hurt downtown business and only helped the entire community's traffic congestion by a small amount. Others said traffic has improved, both downtown and in the entire community.

- One respondent from a downtown business said some citizens love the bypass while others hate it. She says that some Corbinites believe that the bypass has killed downtown, although she feels that the downtown area remains unchanged and traffic is greatly improved. The County Judge Executive said that the bypass helped the entire community's traffic congestion, but also noted that traffic could "always be better." He also felt that the bypass had a negative impact on downtown business in the beginning, but after time the lack of traffic downtown has greatly improved the downtown area.

- Industrial Authority said that there are more vacant buildings and that many were torn down. On the contrary, everyone else felt that downtown buildings were well kept. A respondent from one downtown business stated that 90% of the buildings were in great shape, and another downtown businessperson reported that people were moving in and fixing up the buildings downtown. Growth in the south End was reported, as was industrial growth around the bypass.

- Most felt that the environment had not been affected and it seems that only a few houses were torn down for construction.

- There were no reports of opposition to bypass before it was built. The opinion on the bypass in Corbin was somewhat mixed, but the community seems to be satisfied with the effects of the bypass. One respondent, however, said that the traffic in the entire community and downtown had actually increased and that there is a bigger problem of people speeding and wrecking downtown. The respondent also felt that the bypass ruined some of the downtown businesses, and that the bypass has not been responsible for any growth in the community.

Lincoln County (Stanford):

- Community opinion on the Stanford bypass was split fairly evenly, with three people describing the overall effect of the bypass as positive, two describing the bypass' effects as mainly negative, and two believing that the bypass has had "very little impact."

- All seven of the respondents felt that the bypass had reduced traffic congestion throughout the community, with the most significant improvements being made in the downtown area. (One respondent, a County Councilmember, went against this trend, saying that while traffic had improved throughout the community, there had been "very little difference" in downtown traffic congestion).

- Four of seven respondents believed that the bypass had, overall, a positive effect on business in the community. These respondents included the County Judge-Executive/former mayor, a Chamber of Commerce worker, and two downtown businesspeople. Three of their opinions were typified by the remarks of the Chamber of Commerce worker, who noted that while downtown had been hurt, "more businesses are available on the bypass than there were downtown originally;" the fourth respondent (a downtown businessman) reported "no change" to downtown business. Stanford's mayor believed that the bypass had hurt business overall; neither the Director of Planning and Zoning nor the County Councilmember saw any significant effects.

- Five respondents noted an increase in the number of vacancies in the downtown area, although four of these five described this problem as "minor" or "slight;" the mayor was alone in describing a "significant negative impact" to the building stock in the downtown area.

- No respondents reported any significant changes in land use due to the bypass, although several new businesses have moved in and more are expected the next few years. Five respondents claimed that no homes were taken down to make way for the bypass; the County Councilmember remembered "a few" and the mayor remembered "four to five."

- Five respondents reported no environmental changes resulting from the bypass, while two (the mayor and the Judge/Executive) mentioned runoff problems due to increased asphalt.

- Community involvement was apparently of little consequence in Stanford: while the mayor maintained that public involvement was present but ineffective, three respondents reported little to no involvement and three were unsure.

- The Chamber of Commerce reported that the Stanford bypass does lie partially within city limits.

Logan County (Auburn and Russellville):

The current bypass around the city of Russellville (completed in 1998) only affects about ¾ of the city; the remaining sections of the bypass are scheduled to be completed sometime within the next few years. The bypass around the city of Auburn was completed in 1993.

- Community opinion on the Logan county bypasses was split fairly evenly, with three people describing the overall effect of the bypass as positive, one claiming that the bypass' effects were mainly negative, and five describing the effects of the bypass either as mixed or as insignificant.

- Eight of the nine respondents felt that the bypass had reduced traffic congestion throughout the community, and five of these specifically mentioned significant improvements in the volume of through-truck traffic. The final respondent expected improvements in traffic congestion once the bypass is completed.

- Five respondents believed that the bypass had, overall, a positive effect on business in the community. These respondents included the Russellville city magistrate, the Logan County road supervisor, Auburn's chief of police, one downtown businesswoman in Auburn, and one major real estate developer in Russellville. Two respondents (a Russellville administrator speaking for the mayor and an Auburn businesswoman) believed that the bypass had hurt business in the community overall. The County Judge/Executive reported a "negligible" effect, while the Russellville Street Superintendent declined to comment. Four respondents (including both downtown businesspeople) noted that business downtown had suffered the worst, while Auburn's Chief of Police believed that downtown business had actually "picked up" due to the bypass.

- Eight respondents noted no change in the building stock downtown, while the Russellville street superintendent declined comment.

- Seven respondents reported significant increases in land usage and property values due to the bypass. New businesses have contributed to a general "agricultural to commercial shift" in the area, in the words of a local property developer. The County Judge/Executive and the Russellville administrator speaking for the mayor have not noticed any changes in land usage, although the County Judge/Executive sees significant development as "likely two years down the line." Although there was some disagreement, it appears that several homes were taken down in order to make way for the bypass. (Estimates ranged from six to fifteen). Two respondents specifically mentioned, however, that the demolished homes were "substandard."

- Eight of the nine respondents reported little or no environmental changes resulting from the bypass, while one Auburn downtown businessman reported "sewage overcrowding," stating that the city sewers couldn't handle the new business brought in by the bypass.

- Community involvement apparently played some role in Logan County: seven of the nine respondents remember a series of public meetings, and five of these respondents credit the meetings with helping to address community concerns. The Logan County Judge/Executive recalled "better than average" public involvement, and the Russellville city magistrate even reported that the bypass route was changed several times due to public concerns.

Perry County (Hazard):

- In Hazard, it seems that the quality of life in the community has greatly improved. Some cite development around the bypass and also reduced traffic congestion not only downtown but also in the entire community as the reasons for the improvement. Those that I spoke to who hold political offices had nothing but positive things to say about the bypass. The mayor said that there was $51,000,000 in improvements in Hazard.

- Downtown is no longer the retail center of the community (as it only has 2 or 3 businesses left downtown), but is the government and banking center of the community.

- I was told that no homes were removed for construction. The building stock downtown is unchanged if not improved since the construction of the bypass.

- Those whom I spoke with did not believe that the bypass had any affect on the environment.

- A business manager downtown, one of the few left, was more skeptical. He felt that there was a probably increase in pollution, buildings had deteriorated, and the that the downtown area was not as "friendly." He also mentioned that the downtown buildings were not as well maintained as before the bypass, but that this was just a minor problem. Despite these drawbacks, he was happy with the results.

- Everyone in Hazard seemed to be very excited about what the bypass had done for the community, and no one could think of anyone that had been opposed to the bypass.

Simpson County (Franklin):

- The Franklin Bypass is more of a "low-key" bypass than in other counties. The majority of the bypass is located in the industrial area of town. There are residential areas located along the bypass, but no retail businesses. The intention of the Franklin Bypass is to serve as a transportation link between the industrial area of Franklin and Interstate 65. So far the bypass encompasses half of Franklin. The extension of the bypass to encircle all of Franklin is part of the State Highway Department 6-year plan for Franklin. The overall impact of the bypass on Franklin is positive. Most respondents stated that the bypass brought more industry to Franklin and opened the way for more industry in the future.

- Another positive benefit of the bypass is the decrease in the amount of large commercial traffic through the center of town. The position of the bypass between the industrial area and downtown has streamlined commercial transportation as well as through transportation. There is not a lot of traffic around the bypass and it is still possible to travel from one end of Franklin to the next via the bypass in 10 minutes.

- Due to the fact that retail and services businesses were not located originally in the area of the bypass, and no new businesses relocated to the bypass, there has not been much of an effect of the bypass on retail and services businesses. Most of the food service and retail businesses were already located along Interstate 65, which serves to satisfy demand for both interstate traffic and the Franklin population.

- In addition, the bypass has not affected building stock in Franklin. According to Charlie Portmann of the *Franklin Favorite*, planning and zoning laws around the bypass have allowed for more industrial growth. When the bypass was under construction, a few homes needed to be taken down. Most of these homes were in a dilapidated state.

- As for environmental impact, a decrease in air quality in Franklin does exist and is loosely connected to the bypass. However, any impact on air and water quality as caused by the bypass is small when compared to the environmental damage caused by Interstate 65.

- When the bypass was under construction, public involvement was minimal and some basic issues such as land use were addressed.

Trigg County (Cadiz):

- Most individuals interviewed expressed a positive outlook concerning the bypass and its impact on the community. The most common quality of life attribute of bypass is the removal of commercial truck traffic from the center of town. Before the bypass, most truck traffic passed through Cadiz via Route 68. Others felt that the bypass connected the community. On the east side of town the bypass facilitated the movement of business traffic to Interstate 24. Another positive benefit of the bypass is that it opened the downtown area for more development by sending some businesses and associated traffic to the bypass area. Tom Berry of the *Cadiz Record* offered a few drawbacks to the bypass: 1) an increase in the number of traffic accidents (an article about this will appear in a future edition of the Cadiz Record, 2) Some businesses were hurt by the bypass.

- The reduction of commercial truck traffic through the center of town is the most popular impact of the bypass on traffic congestion. The bypass also offers an option for those wanting the reach the outlying parts of town that do not need to drive through the downtown area. However, this reduction in traffic has come at a price of heavier traffic on the bypass, more car accidents, and recent traffic fatalities. Jim Lancaster, City Planning Commissioner, felt that the same local traffic levels exists as before the bypass and that there is still traffic congestion in some parts of the downtown area that the bypass cannot alleviate.

- Impact of the bypass on retail and service businesses in Cadiz is mixed. Although the bypass brought some businesses from the downtown to the outside area, those businesses remaining feel sort of a crunch from both the bypass area business and the development projects planned by the city government. The majority of businesses that remain in Cadiz are small antique shops. The city is currently using state "Renaissance" grants to renovate the downtown area and make it more picturesque and appealing to tourists coming to Cadiz from the Lakes area to shop at the antique stores. As a result, the downtown area contains mainly antique stores and some specialty/professional businesses such as banks, law firms, and Insurance brokers. According to Tom Berry, there needs to be more restaurants and residences in the downtown area.

- Land developments along the bypass include several service businesses, retail, public utilities (Pennyroyal RECC re-located to the bypass), recreational facilities (large Arrowhead Golf Course development), and bank branches. The bypass has spurned new housing development in the eastern part of town. During bypass construction, only a few houses needed to be taken down.

- The main environmental impact from the bypass is a perceived decrease in the amount of air pollution in the downtown area attributed to commercial truck traffic.

- When the bypass was being considered, there were town meetings to address issues. Compensation for houses taken down and farmland used for the bypass seemed to be the main issues. Most of those individuals interviewed about the bypass expressed a very optimistic and positive tone.

APPENDIX B
MAPS OF CASE STUDY BYPASS COMMUNITIES

Breckenridge County (Hardinsburg) 61

Fleming County (Flemingsburg) 61

Knox County (Corbin) 62

Lincoln County (Stanford) 62

Logan County (Auburn) 63

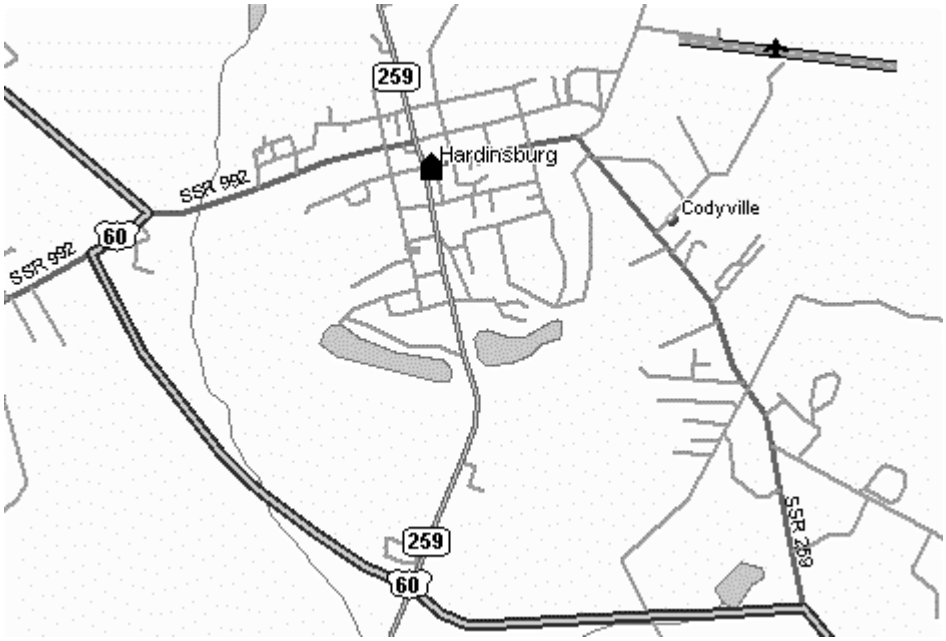
Perry County (Hazard) 63

Simpson County (Franklin) 64

Trigg County (Cadiz) 64

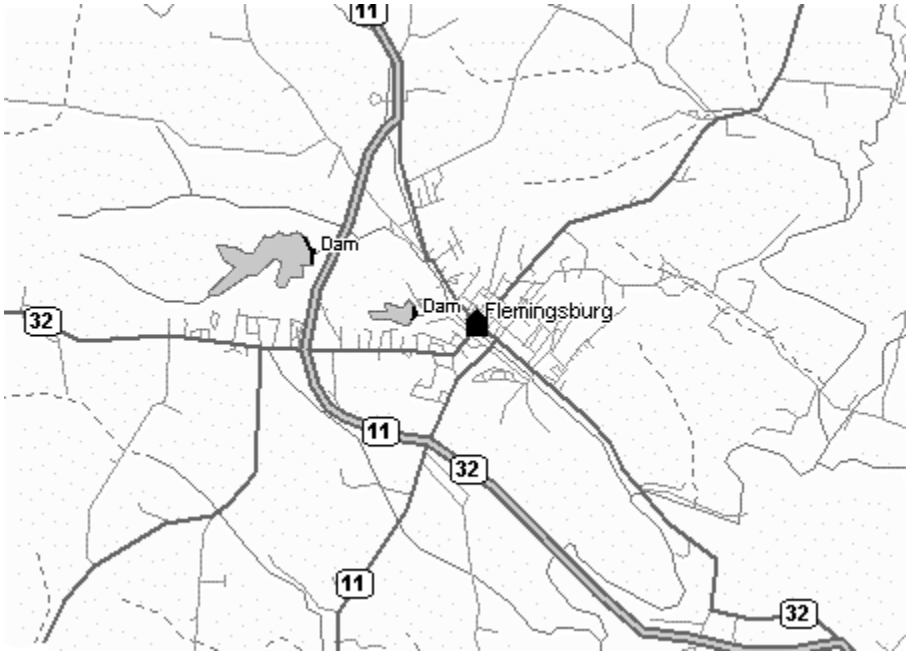
Note: Downtown areas are indicated by an "  " icon on all maps.

Breckenridge County (Hardinsburg):



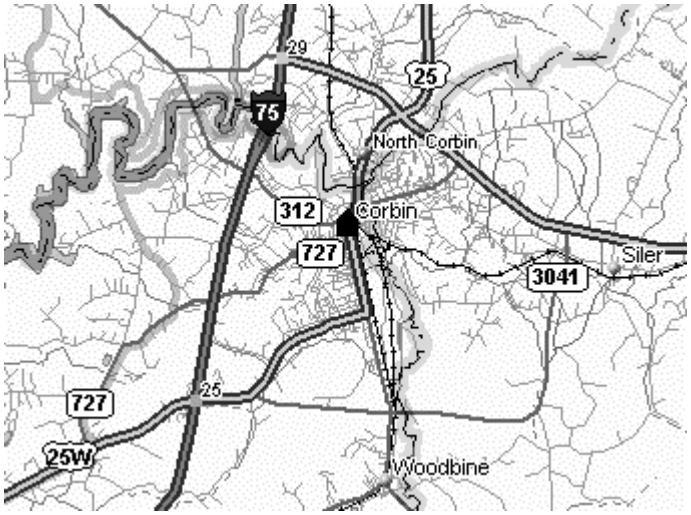
US60 is a bypass around the city of Hardinsburg.

Fleming County (Flemingsburg):



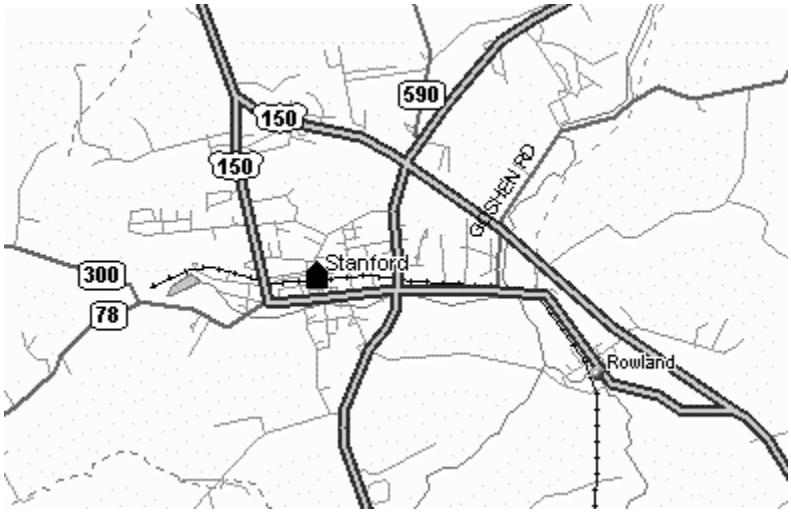
KY11/KY32 serve as a bypass around the city of Flemingsburg.

Knox County (Corbin):



KY3041 is a bypass around the city of Corbin.

Lincoln County (Stanford):

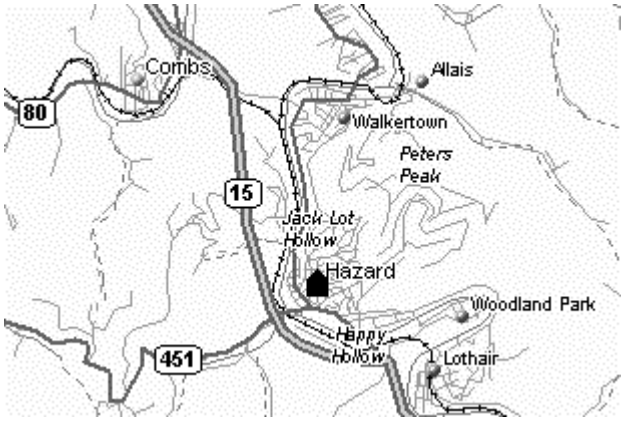


US150 is a bypass around the city of Stanford.

Logan County (Auburn):

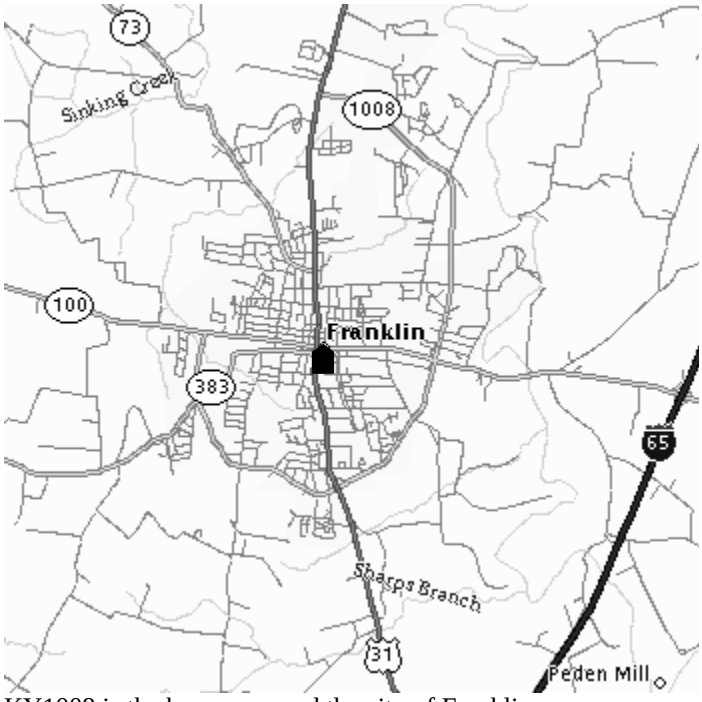
US68 is the bypass around the city of Auburn.

Perry County (Hazard):



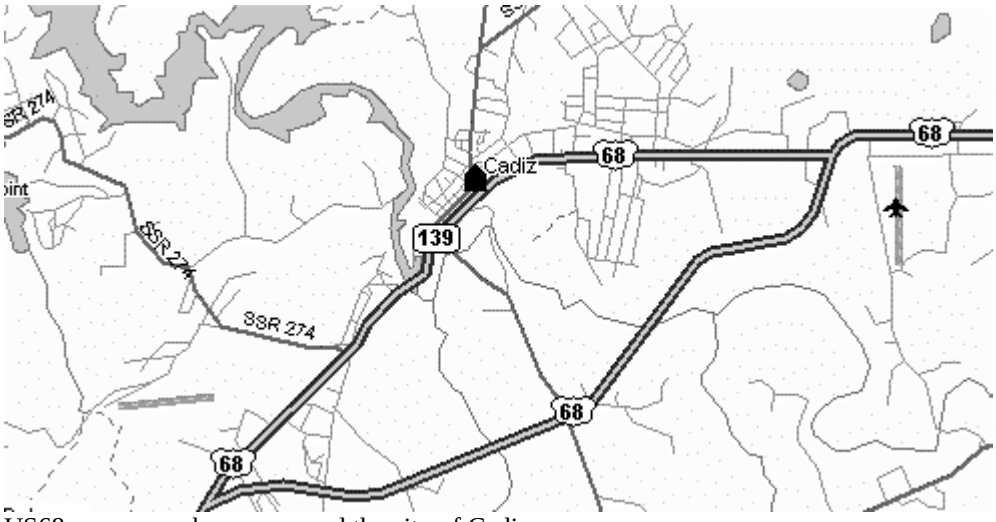
KY15 is the bypass around the city of Hazard.

Simpson County (Franklin):



KY1008 is the bypass around the city of Franklin.

Trigg County (Cadiz):



US68 serves as a bypass around the city of Cadiz.