

BUSINESS IMPACTS OF HIGHWAY BYPASSES

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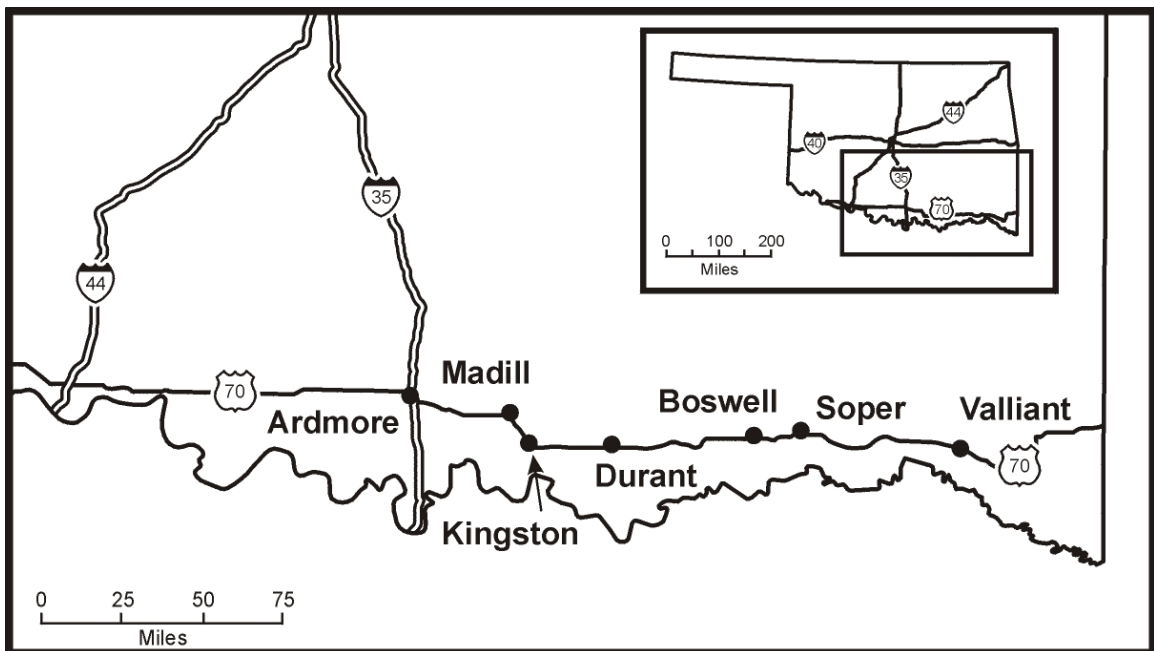
1. INTRODUCTION

Highway construction activities are important to communities both because of the investment they represent as well as the changes they cause. In larger cities, new highways represent growth and are welcomed by most of the general population as they often relieve congestion, shorten travel time, and provide new business opportunities. (10) However, in many small and medium-sized communities, a new highway can bring damaging change if that route is a bypass of an existing, older highway through town. The purpose of this paper is to analyze the changes that have occurred in smaller Oklahoma towns as the result of past bypasses. The goal is to apply this information to anticipate the changes that would be associated with new bypasses in other towns.

Presently, the Oklahoma Department of Transportation (ODOT) is focusing its attention on a major initiative along US Highway 70 in southeastern Oklahoma for significant route upgrades. (2) As part of this initiative, ODOT has identified six “target” towns for bypass consideration: Boswell, Durant, Madill, Kingston, Soper, and Valliant (Figure 1). A subset of the six towns will ultimately be bypassed, depending on several factors including total cost, ability to serve traffic, number of residential and commercial displacements, environmental considerations, and effect on local businesses. In order to compare alternative bypass possibilities, ODOT employs an ordinal ranking system and combines these five areas of interest into an overall score for each potential route (2), but its methods are the least standardized for assessing the business impacts.

Because it lacked a consistent and replicable methodology for assessing business impacts, ODOT commissioned this research project to develop appropriate tools to address this deficit. The desire of ODOT was two-fold. First, it wanted a comprehensive database from which to obtain socioeconomic data for impact assessments. Second, it wanted a user-friendly interface that would allow ODOT personnel to trace alternative bypass routes directly on a computer screen and simultaneously produce output with socioeconomic and business data relevant to the traced route. To facilitate these wishes, the deliverable of this project was a geographic information system (GIS) using ArcView GIS that merged a comprehensive database with specially designed functions for tracing bypass routes, creating impact buffers around those routes, and exporting raw and analyzed data to a spreadsheet. The specifics of the GIS functionality have been outlined elsewhere. (5) This paper presents an analysis of the business impacts in previously bypassed towns in Oklahoma, to be used as an analog for predicting potential changes in the target towns listed above.

FIGURE 1
STUDY AREA IN SOUTHEASTERN OKLAHOMA



This analysis provides crucial information to both ODOT and the general public with respect to the changes that can be expected if the proposed highway bypasses are built. While construction activities are certainly an expensive endeavor and worthy of study, most of the direct costs of the construction will probably not accrue to the towns themselves. Instead, the focus here is on the long-term changes in business composition that should occur, impacts that will be felt most directly by the residents.

The next section provides a brief overview of literature in the field of transportation studies and more specifically bypass analysis, followed by a description of the data collection and methodology. The paper concludes with the analysis of past bypass impacts and the implications for the towns under bypass consideration.

2. BACKGROUND

Much of the highway construction literature has been performed at a high level of aggregation, analyzing long-term economic changes of new highways through the use of census data at the county or state level. (7,11) While these studies form an important component of the overall impacts of highway construction, ODOT was concerned with a much finer geographic scale. Perera provided a useful framework for more detailed analysis of highway construction, dividing impacts into two categories, permanent (business and industry, tax revenues, and region-level economic impacts) and temporary (construction-related activities). (8) With respect to business, the three main areas of change were loss of business, attraction of new business, and relocation of existing business. (8) Due to the parameters outlined by ODOT, the focus of this project was on the permanent impacts. Tax revenues formed a complementary analysis, particularly since they represent an important component of these towns' capital expenditure budgets.

Qualitative assessments are also important, as demonstrated in a study of six bypassed Texas towns. (1) Community and business leaders were asked their perceptions of how the economy of their town changed after a bypass. Surprisingly, few felt that the bypass had devastated their town. While the overall business climate had changed, the removal of high volumes of traffic and congestion from the main route through town was seen as a positive for aesthetic and safety reasons, and many downtown businesses were able to restructure or repackage their merchandise and services to a new customer base. This type of analysis was incorporated into this project only informally, via fieldwork in each

town along the US 70 corridor, because ODOT desired a largely automated analysis package and minimal data collection expenses. Also, the Texas study combined several methods of analysis instead of relying on a single method or technique. This multi-faceted approach is common in the literature and was adopted in this project. (1,3)

Two final issues involved the temporal approach to conducting the study as well as aggregation of towns into a classification system. In terms of the first issue, the most common approaches in the literature are either before-and-after analyses of economic impacts, or comparisons of previously bypassed towns to non-bypassed towns of similar size and economic structure. (4) Because of the limited time frame of the ODOT project and the fact that very few bypasses have been built around small towns in Oklahoma since the 1980s, the latter approach was the only realistic method for conducting this study. The town classification issue was also important, as impacts are likely to be felt differently in towns of 15,000 people versus villages of fewer than 1,000 people. Horwood et al. in an important early work that summarized the results of all bypass studies performed through the mid-1960s, discovered that town size was perhaps the single most important indicator of the economic changes caused by bypasses. (6) There was also a clear implication that the relationship between economic impacts and town size was not linear. Hence, the methodology here was built upon a hierarchy of town sizes in which impact assessments were tailored to each size category.

3. DATA COLLECTION AND METHODOLOGY

Data collection for this project revealed one of the reasons that most economic impacts studies are performed at the county or even state level – data for very small towns, and route-specific data in terms of businesses, are extremely difficult to find in published form. The Economic Censuses, which are conducted every five years, are geo-referenced only to a town's boundaries, and data for places smaller than 2,500 persons are not published due to disclosure issues. Socioeconomic data can be obtained at the block group level now, but most Oklahoma counties were not reported at this level of detail until the 1990 Census. Further, during this project only the 1990 Census was available. Hence, comprehensive secondary sources of data proved extremely difficult to obtain.

3.1 BUSINESS DATA

Of the six target bypass towns, only Durant and Madill are large enough to be published in the Economic Census. While published data for all six towns would have been ideal, they are of limited use because they do not reflect the specific locations of the businesses within each town. A time series analysis of business changes in the entire town would have been useful, but the combination of scarce data for the smaller towns and the lack of geographic detail led to the rejection of this data source in this project.

As a result, fieldwork was conducted in eleven previously bypassed towns in southeastern Oklahoma and all ten towns located along US 70 between Interstate 35 and the Arkansas State Line, thus capturing the six target towns plus four others. Three of the towns along US 70 had already been bypassed, providing fourteen total bypassed “control” towns for study. Durant, which had already been bypassed along US 69, falls into both categories as a control town and a target town, as it is under consideration for a second bypass in this project. Additionally, Bokchito and Ft. Towson were treated as target towns even though ODOT has no plans for bypasses there.

In each town, the numbers of businesses in various categories were tabulated, both along the main route through town as well as along the alternate routes for the bypassed towns. Because there was little chance of ever having appropriate Census data for the smaller towns, North American Industrial Classification System (NAICS) codes (formerly SIC codes) were not used and instead a business classification system was devised that targeted business and services crucial to the livelihoods of these small towns.

The classification system comprised three main classes: 1) traffic dependent businesses (restaurants, gas stations/convenience stores, hotels, car washes), 2) traffic related businesses (car dealerships, auto parts stores, downtown shops, boutiques, professional/health services), and 3) non-traffic related businesses (factories, mines). Each of the three main classes was further divided into logical categories, including a tally of vacant stores and businesses. This system permitted analysis of the distribution of business types (including vacancy rates) in the fourteen control towns and comparisons of these distributions to the current business patterns of the target towns. A simple proportional adjustment technique was used to make predictions for the target towns based on the business distributions in the control towns.

3.2 SALES TAX DATA

A secondary level of analysis was performed using town sales tax collections. These data were obtained from the Oklahoma Tax Commission (OTC) for all available years back to 1968. Not all towns had data that far back, and many had gaps in their reported data, but overall a solid, time series data set from which to discern tax collection changes in previously bypassed towns was constructed. Business-classified data by four-digit SIC code were obtained but proved to be useless for the small towns under study for similar reasons as the Economic Census data. As a result, only the overall sales tax collections for control towns were analyzed, to get a glimpse of the city wide economic changes that might have occurred due to bypasses.

Each Oklahoma town and county may assess additional sales taxes above the state's four-and-one-half percent rate. Also, tax rates have often been implemented mid-year (the OTC collects calendar year totals). To control for local tax rates, implementation dates, and inflation, each town's annual sales tax collections were divided by twelve (months), by its then-current tax rate, and by an inflation adjustment factor (9) to express all tax collection values as dollar amounts representing one percent sales tax collections for one month in 1998 dollars. This was done to remove tax collection trends that resulted from mid-year rate changes, cross-county and cross-town rate differences, and inflation.

3.3 TOWN SIZE CATEGORIES

Exploratory analysis of the various characteristics of the control and target towns led to a subdivision of the towns into three size categories. "Small" towns had fewer than 2,500 people, "medium" towns had between 2,500 and 7,500 people, and "large" towns contained over 7,500 people. Notable breaks occurred across the 2,500 and 7,500 population boundaries in terms of both business characteristics as well as overall population sizes. The fourteen control towns were thus split into five Small, five Medium, and four Large towns, and formed the basis of size-dependent impact assessments when studying the six official and two unofficial target towns.

4. IMPACTS OF HIGHWAY BYPASSES

Overall, analysis of business tallies along with qualitative observation produces the conclusion that the small towns in this study, both in the control and target groups, have been in decline for quite some time and show few signs of revitalization. This was not a surprising finding, given recent trends toward urbanization. Southeastern Oklahoma is relatively inaccessible, which likely contributes to the decline. Three interstate highways (30, 35, and 40) bound the region, and hilly terrain and a toll road (from Hugo to Henryetta) further inhibit free and easy access. Presumably, the upgrade planned for US 70 across this region is intended to alleviate this isolation, but such changes may occur too late for the small and even some of the medium towns in the area. Narrowing the focus, the following sub-sections present evidence that, first, town size is crucial in assessing impacts, and second, that bypasses will only speed up the decline in some of the towns rather than being the sole cause of the future decay.

4.1 BUSINESS PATTERN CHANGES

Small control towns collectively have the highest vacancy rates in this study, averaging 33 percent (Table 1). Compared to the medium town average of 15 percent and Large town average of 17 percent, store success has been much more tenuous in the Small towns. Arcadia has an anomalous vacancy rate, but with just seven active and one vacant business, the eight total businesses represent a tiny amount of economic activity along the main route (State Route 66, in this case). Higher small town vacancy rates, along with a preponderance of lower order activities such as video stores, antique/boutique stores, and auto repair shops in downtown buildings that were clearly constructed for some other purpose, indicate that the economic bases of these towns are in steep decline and are serving primarily a local clientele. Few of the activities in the small towns except gas stations seem likely to catch the attention of passers-through. Bypassing small towns may only speed up the declines that have already been in progress.

TABLE 1
BUSINESS CHARACTERISTICS OF CONTROL TOWNS

Town	1998 Population	Number of Non-Vacant Establishments	Persons per Non-Vacant Establishment	Vacancy Rate (Percent)
Warwick	172	3	57.3	50
Arcadia	362	7	51.7	13
Stonewall	527	16	32.9	41
Wellston	971	16	60.7	24
Davenport	1,009	8	126.2	38
Small Avg.	608	10	60.8	33
Chandler	2,644	113	23.4	13
Holdenville	5,343	107	49.9	13
Tecumseh	5,856	60	97.6	10
Hugo	5,974	117	51.1	10
Idabel	7,278	153	47.6	22
Med. Avg.	5,419	110	49.3	15
Durant	13,187	96	137.4	19
Okmulgee	13,981	57	245.3	8
Ada	15,313	179	85.6	11
McAlester	17,074	155	110.2	24
Large Avg.	14,889	122	122.3	17

Notes: Durant's totals are for the original US 69 route through town.

Population data are from the US Census Bureau.

All other data are from the authors' research in 2000.

Medium and large towns are clearly in better shape, with vacancy rates ranging between eight and 24 percent. In the medium group, Idabel is an outlier in terms of vacancy. However, fieldwork revealed an extremely active economy. Ironically, nearly all this activity occurs along the bypassed US 70, even though Idabel essentially has a "loop" with a northern and southern bypass. McAlester stands out somewhat in the large group, but the bypassed route in that town (US 69) is not the "main drag" but rather skirts the west side of the downtown area, accounting for the higher vacancy rate as well as a smaller number of total businesses than Ada.

The Persons per Non-Vacant Establishment column was calculated to smooth out some of the size differences within categories, as well as to make comparisons between categories in terms of overall available customer base. This is not a perfect measure since the business tallies summarize only the business activities on the main route through town, and larger towns should have proportionally more activity away from the

bypassed route. However, it provides a rough basis for evaluating the threshold level of population that might be necessary to maintain a minimal level of retail and service activity. Because the primary focus is on the small towns and in most of these towns the main route is the primary business and traffic artery, this statistic is interesting. Davenport is unique among small and medium towns, and if it were to be excluded from the small town sample, the persons-per-business average would be approximately 48. Davenport's dearth of businesses is best explained by its proximity to Chandler to the west, the seat of Lincoln County, and Stroud to the east, which until the May 3, 1999 tornado outbreak had an outlet mall.

The growing importance of business activities away from the main route in larger towns can be inferred from Table 1, as (excluding Davenport) the persons-per-business ratios increases with town size. However, the primary uses of these data are in comparison to existing conditions in the target towns. There are relatively small differences between control and target towns (Table 2), though comparisons are difficult for medium and large towns since ODOT has only targeted one town in each of those size classes. While the average vacancy rate of the target small towns (23 percent) is ten percent less than the control towns, this still represents one-quarter of all available buildings along US 70 and is notably higher than the medium and large town averages.

TABLE 2
BUSINESS CHARACTERISTICS OF TARGET TOWNS

Town	1998 Population	Number of Non-Vacant Establishments	Persons per Non-Vacant Establishment	Vacancy Rate (Percent)
Soper	294	9	32.7	40
Ft. Towson	546	19	28.7	14
Bokchito	572	22	26.0	31
Boswell	622	26	23.9	30
Valliant	924	32	28.9	27
Kingston	1,433	60	23.9	10
Small Avg.	732	28	26.1	23
Madill	3,934	96	41.0	13
Med. Avg.	3,934	96	41.0	13
Durant	13,187	181	72.9	10
Large Avg.	13,187	181	72.9	10

Note: Durant's totals are for the current US 70 route through town.

Population data are from the US Census Bureau.

All other data are from the authors' research in 2000.

The persons-per-business ratios in the target towns follow the same pattern as the control towns, but are, on average, smaller in the target towns. If bypasses are built in any of these towns, especially the small towns, past experience indicates that a few more businesses will disappear along the old route without concomitant growth on the bypass, causing these ratios to increase to the levels seen in Table 1. Large towns should be the least impacted and might accrue overall benefits from bypasses. Durant does not appear to have been devastated by the bypassing of US 69 to the west of town in 1975, and the current US 70 route along an east-west axis is very congested. The large control town, Ada, has a very vibrant and rejuvenated economy along the original main route that probably resulted in part from the removal of large amounts of through traffic. Ada also has two bypasses, one south and one north, but its size, setting, and the presence of East Central University fosters a strong economy. Durant is very similar to Ada in that it has a reliable magnet in Southeastern Oklahoma State University and essentially serves as a higher order place between Ardmore and Idabel along US 70, ensuring continued economic life while the smaller towns around it continue to decline.

Another way of assessing the impacts that a bypass might bring is to look at the structure of the downtown businesses versus non-downtown businesses in the control towns along the original routes. Here, downtown is defined as the portion of town that clearly reflects the original core of economic activity, with multi-story buildings attached side-by-side to one another. This is in contrast to the non-downtown areas that usually feature newer, freestanding, mostly one-story buildings on the approach to downtown. This breakdown is shown in Table 3, and provides a clear picture of the differences both between towns of different sizes as well as between the original business core and outlying areas.

TABLE 3
BUSINESS DISTRIBUTIONS IN CONTROL TOWNS

Size	Downtown			Non-Downtown		
	Percent Retail	Percent Service	Percent Vacant	Percent Retail	Percent Service	Percent Vacant
Small	28	28	44	31	31	38
Medium	50	31	19	50	38	12
Large	57	21	22	64	23	13

All data are from the authors' research in 2000.

Small town businesses have clearly been the most impacted by bypasses, with average vacancy rates twice as high as in medium and large towns in the downtown area and three times higher along the approaches to downtown. In terms of business breakdown, small towns are also distinct in that they have an even split between retail and service activities, while the majority of medium and large town businesses are retail. Bypassing small towns will continue to erode the customer base of retail establishments more quickly than services (including medical, dental, and financial services), while also eroding the sales tax base and further providing reasons for people to leave.

4.2 SALES TAX COLLECTION CHANGES

Analysis of sales tax collections provides a complementary level of detail about the changes bypasses bring. The business data described above are useful for looking at long-term economic changes that have occurred in towns. While one can never conclusively separate the changes caused by a bypass from other influences, the preceding analysis did assume that a bypass was a significant contributor to the differences between the control and target towns, and that the target towns would behave in a similar fashion if bypassed. However, in any particular case, it is possible that the vacancies preceded the bypasses, or perhaps that the town's economic situation has actually improved since the bypass. Unfortunately, detailed year-by-year data are not available to examine more narrowly the business changes a bypass might have caused.

As a result, sales tax collections by year are used to examine economic changes at a finer temporal scale. While one still cannot say definitively that all the changes were the result of bypasses, year-by-year analysis of sales tax collections for a standard period of years before and after a bypass opened provides a better opportunity to eliminate long-term influences. This comes at the expense of a more detailed breakdown by business type, since the four-digit SIC data that were obtained from the OTC were extremely spotty and only marginally useful for large towns. As the focus is mainly on small towns, a standard method of analyzing these data across all size categories was developed.

After rejecting towns for which there were insufficient data, sales tax collection changes were analyzed for four small, four medium, and nine large towns that had already been bypassed. The sparseness of the data set creates the situation in which more information is available for the town size of lesser interest (large), and fewer observations for the critical small and medium towns. In the absence of better data, however, some broad trends can be drawn from the analysis of sales tax data (Table 4).

TABLE 4
ANNUAL CHANGES IN TAX COLLECTIONS
AS A PERCENTAGE OF THE PREVIOUS YEAR'S COLLECTIONS

Size	BP-4	BP-3	BP-2	BP-1	BP	BP+1	BP+2	BP+3	BP+4	BP+5
Small	-4.3	+4.4	+3.8	-1.0	+0.5	+2.9	+1.3	+3.7	-8.3	0.0
Medium	n/a	n/a	+8.7	+7.5	+10.1	-1.9	+9.5	+3.8	+4.2	-0.9
Large	+0.7	+1.3	+2.9	+1.7	+1.1	+4.4	+3.2	+4.4	+2.4	+2.0

Note: BP-4 is four years before the bypass opened, BP is the year the bypass opened, etc.

Raw Data Source: Oklahoma Tax Commission

After standardizing all collections to one month at one percent in 1998 dollars, as described earlier, the towns in each size category were merged and the percent change from one year to the next was computed, with the earlier year as the denominator. Large towns showed consistent and steady positive changes from year to year, supporting earlier logical and quantified conclusions that large towns more easily accommodate the changes caused by bypasses. Collections were generally several percent higher in the first three years after a bypass opened compared to the two years immediately prior to the bypass. A sudden rush of new stores and thus higher tax revenues along the bypass probably occurred first. This was likely followed by a combination of closings or business reorganizations of inefficient stores in town, lowering annual overall tax collection increases back to a steady growth of about two percent per annum.

Medium towns showed a very robust tax collection growth rate before and immediately after bypasses (excluding the first year post-bypass, BP+1), though eventually the average increases in tax collections dropped to about half their former level. This is the least reliable stratum in the analysis, however, as the four towns available for study did not permit analysis prior to two years before a bypass opened.

Small towns showed very little change in the first three years after a bypass opened, probably because few new stores colonized the bypass but also few stores in town had fully felt the impacts of the bypass. After four years, tax collections took a large collective plunge and stayed low in the fifth post-bypass year. This evidence reinforces the hypothesis that some of the decay observed in small towns occurred after a bypass.

5. CONCLUSIONS

The evidence presented here does not necessarily contradict conventional wisdom, but it does provide a more solid basis for the assumptions that are commonly made both among the public and in the literature that town size is a critical indicator of post-bypass economic change. Small towns (with fewer than 2,500 people) are already in an economic slump in southeastern Oklahoma. Evidence from past bypasses indicates that the situation will worsen if a bypass is built around one of the target towns, but the towns will not vanish. Fieldwork indicates that older residents of these small towns keep the local economy alive, and those businesses cater to a largely local clientele. However, some drive-through traffic will be removed from these routes if bypasses are built, speeding a decline that is already in evidence. In contrast, larger towns like Ada, McAlester, and Durant continue to prosper and even thrive, due to their greater diversity of business and other activities, and their lesser dependence on the bypassed routes.

This paper has offered evidence and explanations for the changes that Oklahoma towns have experienced due to highway bypasses. With ODOT planning to build several more bypasses in the state, this information can and is being applied both to assuage public fears of what is to come, as well as to provide ODOT with a replicable and defensible methodology for making economic comparisons of various bypass route proposals. By applying the results and methods of this project in its analysis of bypass alternatives, ODOT now possesses a better means of making rational and fair bypass decisions.

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