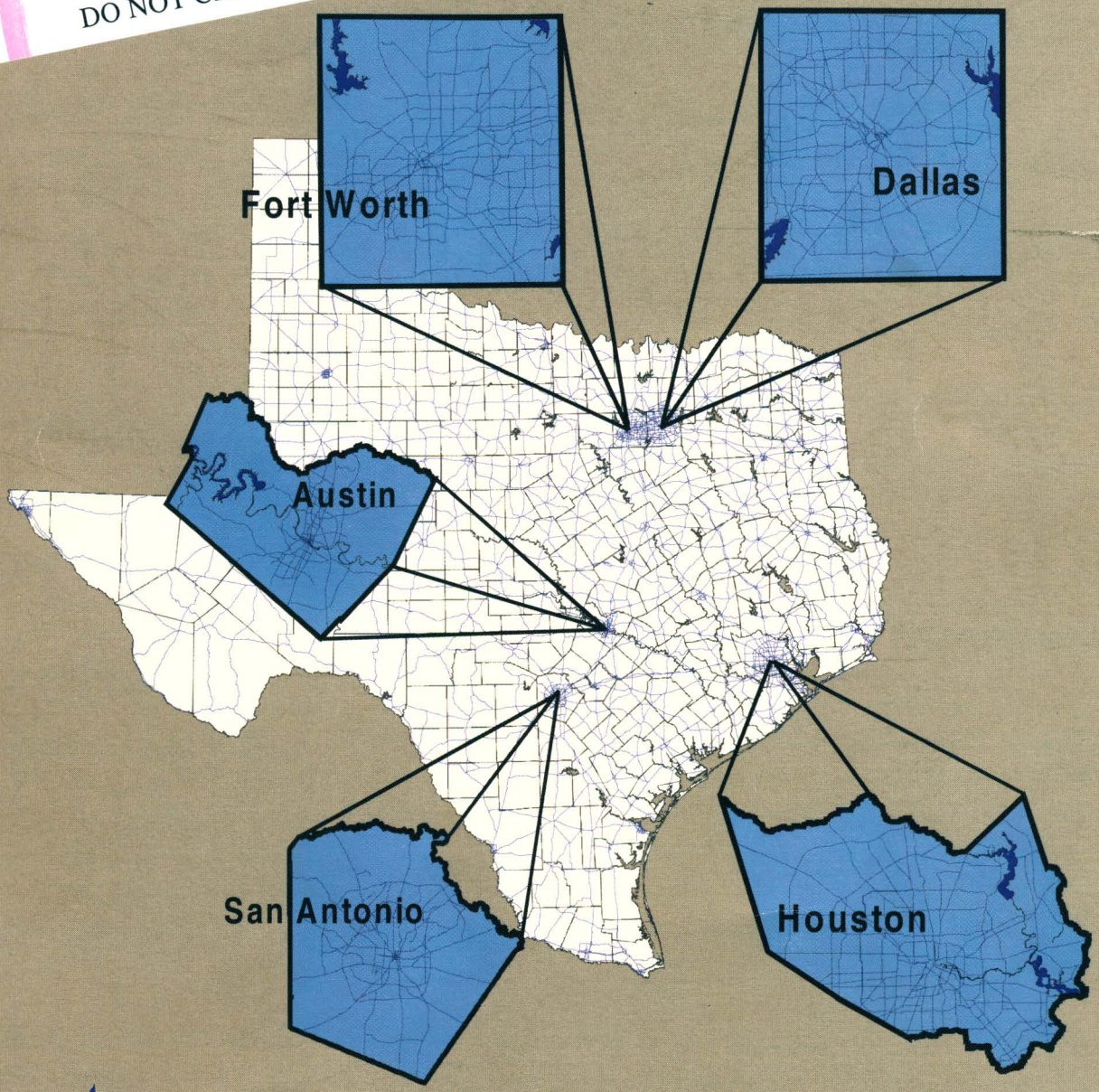
COMMUTING IN TEXAS: PATTERNS AND TRENDS

AN EXECUTIVE SUMMARY



Texas Department of Transportation

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Commuting in Texas: Patterns and Trends

An Executive Summary

by

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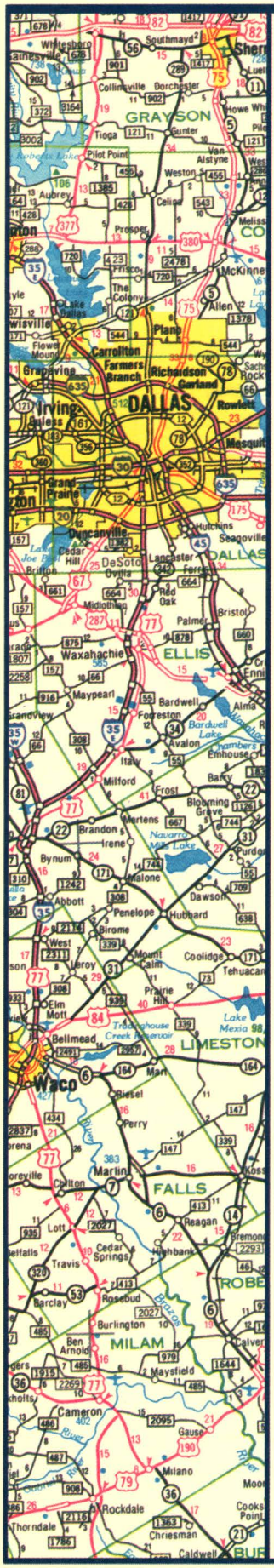
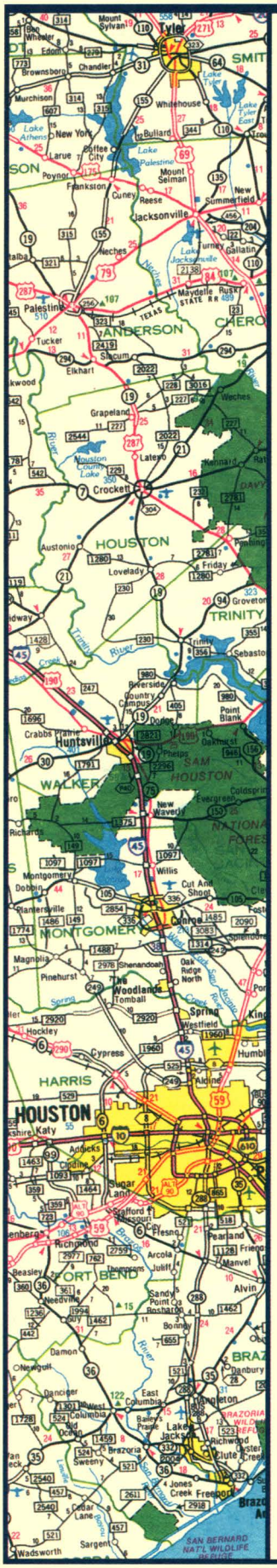


Contents

List of Figures

List of Tables



INTRODUCTION

The daily commute trip, also known as the journey to work, typically accounts for over a third of daily traffic volume in urban areas. More importantly, commuting is the cause of the two peak periods of congestion experienced in most urban areas (the so-called morning rush hour and the evening rush hour, though both typically last longer than an hour). Thus, commuting is a major factor in traffic congestion, air quality, quality of life, and transportation investment decisions. A better understanding of commuting is critical for those who would plan the future of the transportation system.

The research summarized in this document examines commuting patterns and trends in Texas. It was conducted for the Texas Department of Transportation (TxDOT) and utilizes Census Transportation Planning Package (CTPP) data, Nationwide Personal Transportation Study (NPTS) data, and travel survey data collected by the Texas Transportation Institute (TTI). This summary discusses national commute patterns and trends, Texas commute patterns and trends, and a comparison of Texas and national commute patterns.

NATIONAL COMMUTE PATTERNS AND TRENDS

Commuting (i.e., the traditional suburb to central business district [CBD] commute) was "invented" in the 1950s. Recent demographic trends involving the suburbanization of the population, employment, and auto availability have profoundly altered commute patterns. More complex travel patterns have replaced the traditional radial, CBD-oriented commute. Following Pisarski, these altered commute patterns are the result of three demographic changes.

- Workers: The workforce has increased dramatically. This growth is much greater than population growth and is more than just the baby boom reaching working age. It involves both jobs and people.
    - Job boom - There has been a massive increase in employment since the 1950s. For example, between 1960 and 1990 the number of workers increased 78% while the population increased only 39%.
    - Worker boom - The baby boom reached working age beginning in the mid-1960s resulting in a major increase in the proportion of the population of working age.

    - Gender boom - Females also entered the workforce in large numbers beginning in the 1950s. Females in the workforce increased from 32% to 45% between 1960 to 1990.

- Suburban commuting: Beginning in the 1950s, increases in the suburban population, followed by increases in suburban employment, made suburb to suburb commuting the dominant commuting pattern nationally.

    - Suburban population - The tradition of the country estate and our egalitarian culture made the suburbs desirable. The post-war economy made it affordable. Transportation technology made it feasible.

    - Suburban employment - Jobs followed the population to the suburbs.

- Private vehicles: Increases in the availability of private vehicles increased the predominance of the private vehicle for the journey to work. There are three factors involved.

    - More vehicles per household - Nationally there were 1.03 vehicles per household in 1960 compared to 1.66 vehicles per household in 1990.

    - Households are smaller - Nationally there were 3.3 persons per household in 1960 compared to 2.6 in 1990.

    - More vehicles per worker - There were 0.85 vehicles per worker in 1960 compared to 1.32 vehicles per worker in 1990. Many households have more vehicles than workers, and some have more vehicles than people.

Clearly, many of these changes will not, and cannot, continue.

- The worker boom is over. The three forces driving the worker boom (i.e., baby boom, job growth, and female employment) have diminished.

- The private vehicle boom is over. Automobile ownership by household is stabilizing at current high levels. Most importantly, the number of vehicles available exceeds the number of drivers. However, the forces that originally impelled the use of private vehicles for commuting are still in place (i.e., dispersion of jobs, time pressure on individuals, and low vehicle operating costs).

- The suburban commuting boom continues. Suburban areas continue to grow more rapidly than other areas and are now the primary destination of work trips nationally.

TEXAS COMMUTE PATTERNS AND TRENDS

Texas has faced these same demographic changes. It has usually been assumed that the impact on commuting has been the same as well. In order to see if this is true, we will first look at commuting patterns in Texas.

Table 1 presents commute patterns for Texas workers residing in Metropolitan Statistical Areas (MSAs). The table represents two aspects: location (central city versus suburb), and time (1980 versus 1990). (Central city refers to the primary city in an MSA and is defined by the legal city limits. It is not the same as the CBD.)

Focusing first on the central city versus suburb dimension, the table shows that in 1980 most workers in Texas worked in the central city (62%), increasing to over two-thirds (67%) by 1990. During this same period, only about one-fourth of workers were employed in the suburbs and there was little change between 1980 and 1990 (24% to 26%).

However, there has been a dramatic decrease in workers commuting outside their MSA (8% to 3% and 6% to 4%), implying a slowing of the more extreme forms of suburbanization (i.e., "ruralization").

TABLE 1
Texas MSA Commuting Patterns 1980 versus 1990

Commute Pattern	1980		1990	
	Workers (000)	Pct	Workers (000)	Pct
LIVING IN CENTRAL CITY	3,049	58%	3,629	56%
Commuting within central city	2,379	45%	3,020	47%
Commuting to suburbs	282	5%	424	6%
Commuting outside MSA	388	8%	185	3%
LIVING IN SUBURBS	2,182	42%	2,800	44%
Commuting to central city	910	17%	1,263	20%
Commuting within suburbs	977	19%	1,284	20%
Commuting outside MSA	295	6%	253	4%
TOTAL WORKERS LIVING IN AN MSA	5,231	100%	6,429	100%

Table 2 refines the picture of Texas workers, showing commute patterns by MSA size. Small and medium sized MSAs have similar commute patterns for 1980 for central city commuting (66% and 67%). However, suburban commuting increases with MSA size (16%, 20%, and 27% respectively). In addition, small MSAs have a greater proportion of workers commuting outside the MSA than medium or large MSAs (18% versus 13% and 12%).

Using Table 2 to compare 1980 commute patterns with 1990 shows the same pattern for 1980 regarding suburban commuting increasing with MSA size emerging for 1990 (14%, 24%, and 28% respectively). Table 2 also shows a dramatic increase (66% to 79%) in central city commuting for small MSAs from 1980 to 1990. There is a corresponding decline in outside commuting for small MSAs from 1980 to 1990 (18% to 7%).

Also in Table 2, the relatively greater proportion of workers in small MSAs commuting outside the MSA that was observed for 1980 does not continue in 1990 (7% versus 6% and 7%). This is reflected in the overall decline in external commuting (from 13% to 7%).

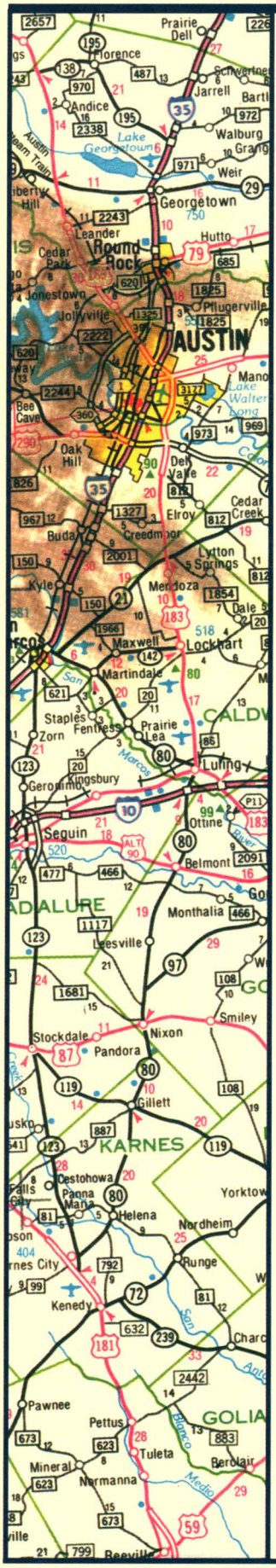


TABLE 2
Texas MSA Commuting Patterns
1980 versus 1990 by Area Size

Area	Commute Pattern	1980		1990	
		Workers (000)	Pct	Workers (000)	Pct
Small MSA	**Workers Living in MSA**	802	100%	445	100%
	Commuting to central city	531	66%	352	79%
	Commuting to suburbs	125	16%	62	14%
	Commuting outside MSA	146	18%	31	7%
Medium MSA	**Workers Living in MSA**	1,092	100%	1,274	100%
	Commuting to central city	726	67%	893	70%
	Commuting to suburbs	221	20%	310	24%
	Commuting outside MSA	145	13%	71	6%
Large MSA	**Workers Living in MSA**	3,337	100%	4,710	100%
	Commuting to central city	2,030	61%	3,037	65%
	Commuting to suburbs	913	27%	1,336	28%
	Commuting outside MSA	394	12%	336	7%
TOTAL MSA	**Workers Living in MSA**	5,231	100%	6,429	100%
	Commuting to central city	3,287	63%	4,282	66%
	Commuting to suburbs	1,259	24%	1,708	27%
	Commuting outside MSA	685	13%	438	7%

Small = less than 200,000
Medium = 200,000 to 1,000,000
Large = greater than 1,000,000

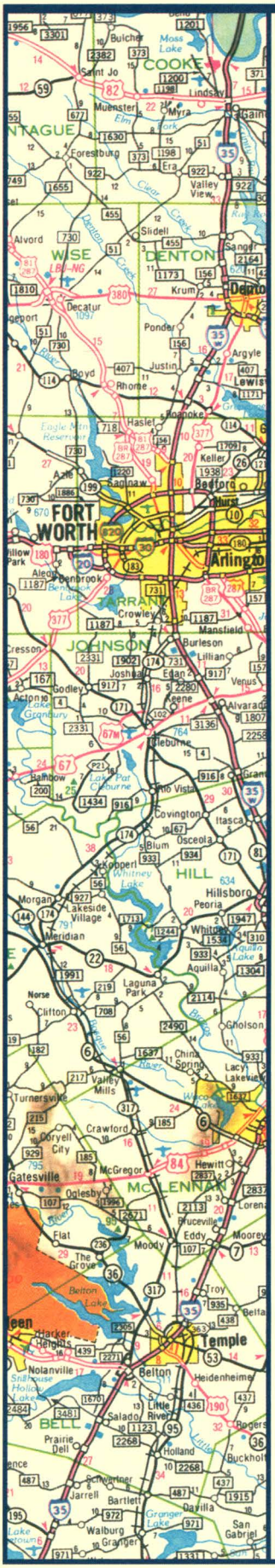
Table 3 compares Texas workers in 1980 and 1990 by MSA size. Figure 1 shows this relationship graphically. There are two Texas MSAs that changed size categories between 1980 and 1990. Galveston moved from small to medium and Fort Worth moved from medium to large. Table 3 adjusts for these changes, i.e., the 1980 categories of MSA size are retained. The proportion of workers living in large MSAs is unchanged from 1980 to 1990 (64%). The proportion of workers living in medium-sized MSAs increased moderately from 1980 to 1990 (21% to 28%). There is a corresponding decline in the proportion of workers living in small MSAs (15% to 8%). Table 3 also compares the distribution of workers between MSA size categories. The dramatic drop in the number of workers in small MSAs (802 to 546, a 32% decrease) from 1980 to 1990 is illustrated clearly in this table. This table also illustrates the drop in the relative proportion of workers in small MSAs noted previously.

TABLE 3
Workers Living in Texas MSAs 1980 versus 1990 by Area Size (Adjusted for Area Size Category Shift)

MSA	1980		1990		Change	
	Workers (000)	Pct	Workers (000)	Pct	Workers (000)	Pct
Small	802	15%	546	8%	-256	-32%
Medium	1,092	21%	1,790	28%	698	64%
Large	3,337	64%	4,093	64%	756	23%
TOTAL	5,231	100%	6,429	100%	1,198	23%

CC = central city
Sub = suburb
Out = outside MSA of residence

Similarly, the changes in commute patterns between 1980 and 1990 summarized in Tables 4 and 5 could result from changes in the MSA boundaries. There were, in fact, several changes in Texas MSA boundaries between 1980 and 1990. Abilene, Dallas/Fort Worth, Texarkana, and Wichita Falls MSAs all lost rural counties between 1980 and 1990. In the Houston area, Brazoria became a separate MSA. The impact of these changes is impossible to determine, given the aggregate nature of the data (i.e., MSA level). However, the loss of outlying counties would inflate external commuting estimates, understating the extent of the dramatic decline observed in Texas for external commuting. The change relating to Brazoria would compensate for this somewhat. Therefore, these changes in MSA geography understate the observed decline in external commuting.



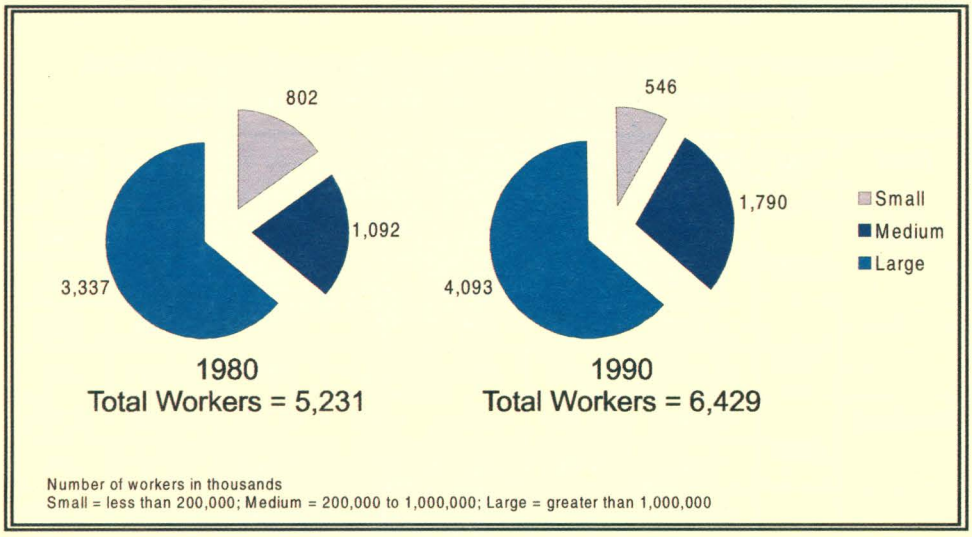


FIGURE 1. Workers Living in Texas MSAs 1980 versus 1990 by Area Size (Adjusted for Area Size Category Shift)

TEXAS VERSUS NATIONAL COMMUTE PATTERNS

Table 4 summarizes Texas and national commute patterns. Figure 2 shows this relationship graphically. The trends between 1980 and 1990 are shown clearly and the difference between Texas and national patterns is obvious. These differences include the central city to central city commute statistics (45% and 47% for Texas versus 31% and 29% for the nation, for 1980 and 1990 respectively). The differences also include the lower percentage of suburb based commuting in Texas (the suburb to suburb commute, 19% and 20% for Texas versus 37% and 36% for the nation, for 1980 and 1990 respectively).

Texas commuting trends also differ from national trends in the decline of workers commuting outside of the MSA of residence (8% and 6% in 1980 for central city and suburban based outside commutes declining to 3% and 4% in 1990), compared to no decline or an increase nationally (2% and 5% in 1980 for central city and suburban based outside commutes compared to 2% and 8% in 1990). While MSA boundaries can influence the interpretation of flows between broad sub-regional categories such as these, there appears to be a clear trend away from outward bound commuting in Texas. This trend is interesting given that in 1980 Texas had a higher percentage of workers making outward bound commutes than the nation as a whole (8% versus 2% for central city and 6% versus 5% for suburban based outside commutes).

TABLE 4
Summary of Texas and National Commuting Patterns
(Workers Living in an MSA 1980 and 1990)

Area	Year	Workers (000)	CC to CC	CC to Sub	CC to Out	Sub to CC	Sub to Sub	Sub to Out
Texas	1980	5,231	2,379	282	388	910	977	295
		100%	45%	5%	8%	17%	19%	6%
	1990	6,429	3,020	424	185	1,263	1,284	253
		100%	47%	6%	3%	20%	20%	4%
National	1980	67,903	20,900	4,200	1,200	12,700	25,300	3,700
		100%	31%	6%	2%	19%	37%	5%
	1990	91,515	26,893	6,322	2,170	16,393	33,200	6,537
		100%	29%	7%	2%	18%	36%	8%

CC = central city
Sub = suburb
Out = outside MSA of residence

Table 5 compares changes in Texas and national commute patterns between 1980 and 1990. Nationally, workers living in an MSA increased 35%. Against this aggregate increase, so-called "reverse" commuting increased substantially more than the population of workers. The reverse commutes are central city to suburb, central city to outside the MSA, and suburb to outside the MSA (which increased 51%, 81%, and 77%, respectively).

TABLE 5
Comparison of Texas and National Commuting Pattern Growth
(1980 - 1990)

Area	Workers (000)	CC to CC	CC to Sub	CC to Out	Sub to CC	Sub to Sub	Sub to Out
Texas	23%	27%	50%	-52%	39%	31%	-15%
National	35%	29%	51%	81%	29%	31%	77%

CC = central city
Sub = suburb
Out = outside MSA of residence

Thus, nationally, "reverse" commuting grew substantially from 1980 to 1990, reflecting the continued suburbanization of jobs and the departure of residential population from the central city.

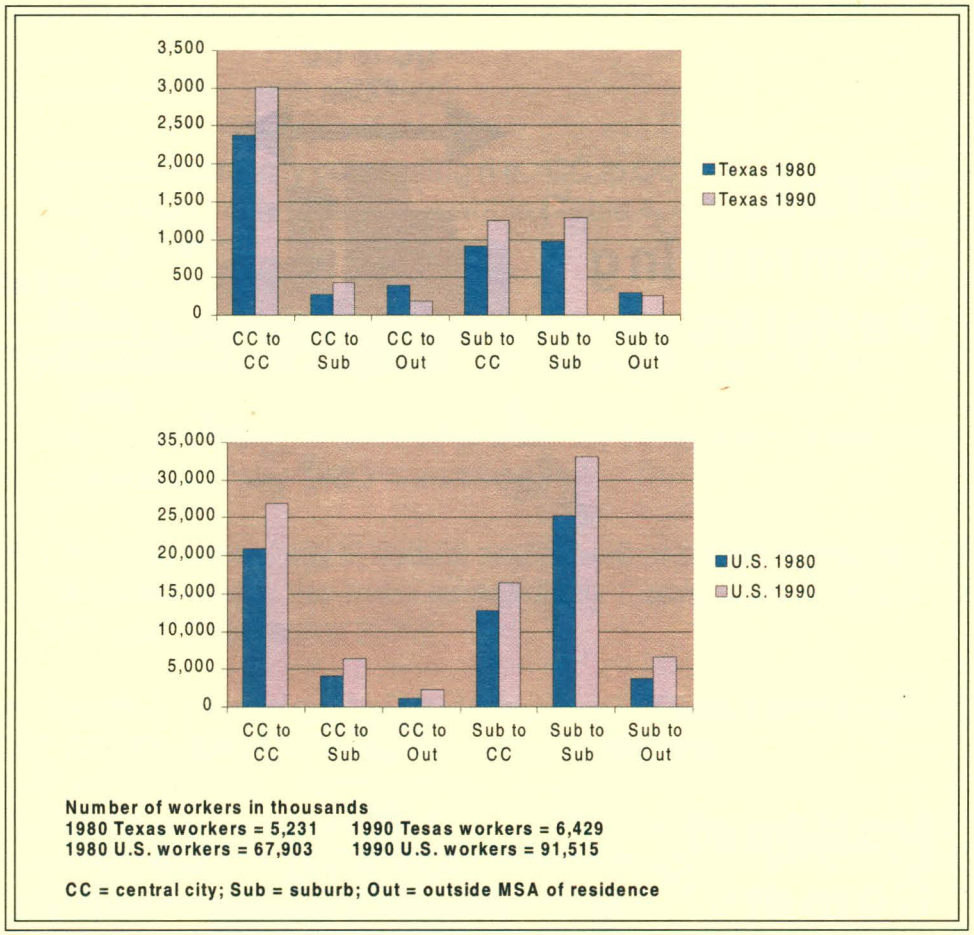


FIGURE 2. Summary of Texas and National Commuting Patterns (Workers Living in an MSA 1980 - 1990)

In Texas, workers increased only 23% from 1980 to 1990. Internal commuting (i.e., central city to central city or suburb to suburb) increased slightly more than the worker population. However, suburban commuting (central city to suburb and suburb to central city) increased substantially more than the general increases in workers (50% and 39% respectively).

More importantly, external commuting (outside the MSA of residence) declined in Texas. This decline was dramatic (-52%) in central city to suburb commuting, but still substantial (-15%) in suburb to outside the MSA commuting. Both the direction and the magnitude are important. (Recall that external commuting increased nationally during the same period.)

Taken together, these Texas trends indicate a pattern of vigorous suburbanization, but not outside the MSA. The data shows there appears to be a retreat from external commuting in Texas. Figure 3 illustrates this trend graphically.

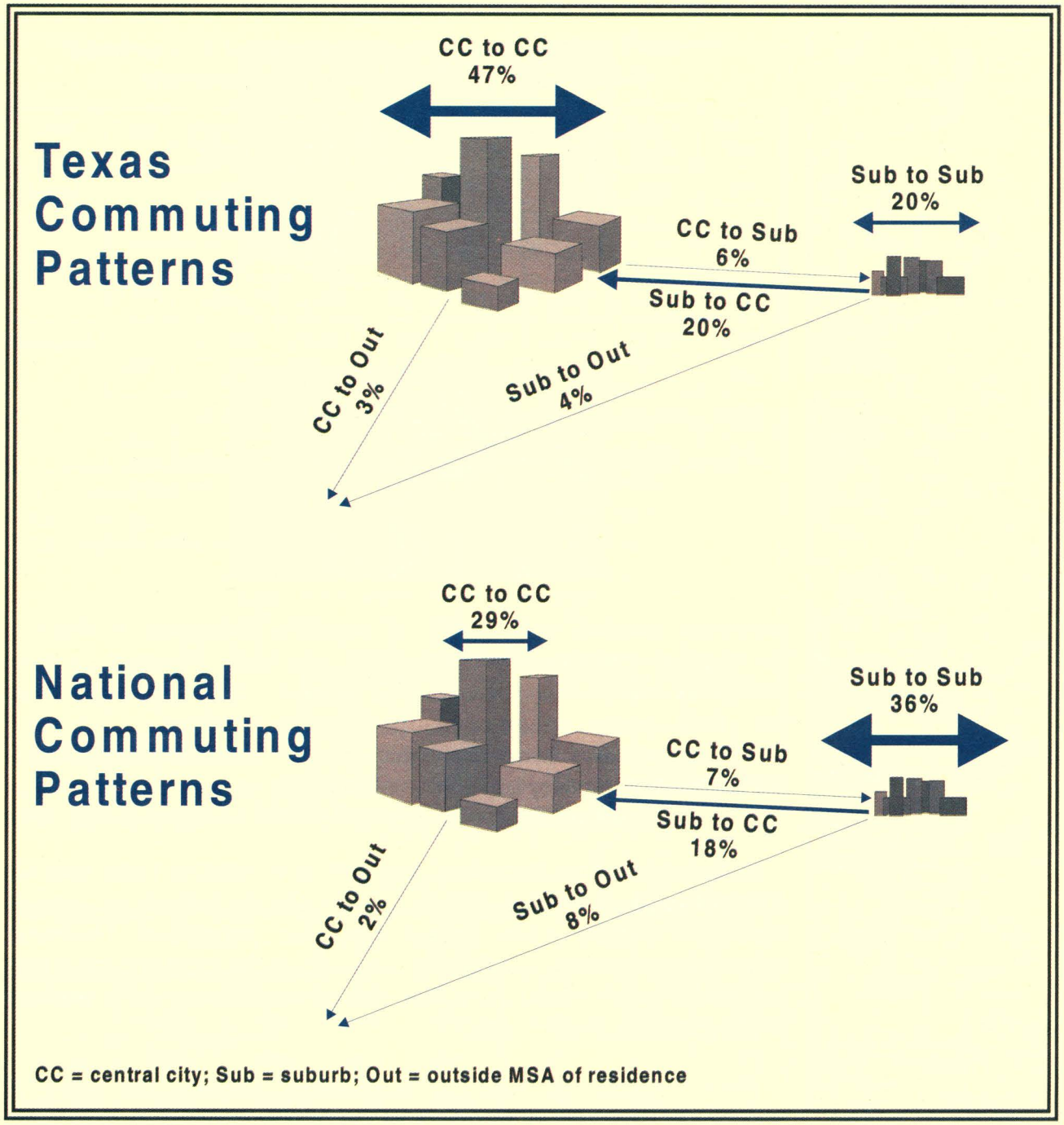


FIGURE 3. Summary of Texas and National Commuting Patterns

SUMMARY

In summary, for 1980 and 1990:

- Internal central city commuting (i.e., CC to CC) is more prevalent in Texas than in the nation as a whole (Table 4, 45% and 47% versus 31% and 29%);
- Suburb to suburb commuting is less prevalent in Texas than nationwide (Table 4, 19% and 20% versus 37% and 36%);
- Growth in workers is somewhat lower for Texas than for the nation as a whole (Table 5, 23% versus 35%);
- Growth in central city to suburb and suburb to suburb commuting in Texas is virtually the same as nationally (Table 5, 50% versus 51% and 31% versus 31%);
- Growth in internal central city commuting in Texas is slightly slower than nationally (Table 5, 27% versus 29%); and
- Commuting outside the MSA (i.e., CC to out and suburb to out) has grown rapidly nationally but has declined sharply in Texas (Table 5, 81% versus -52% and 77% versus -15%).

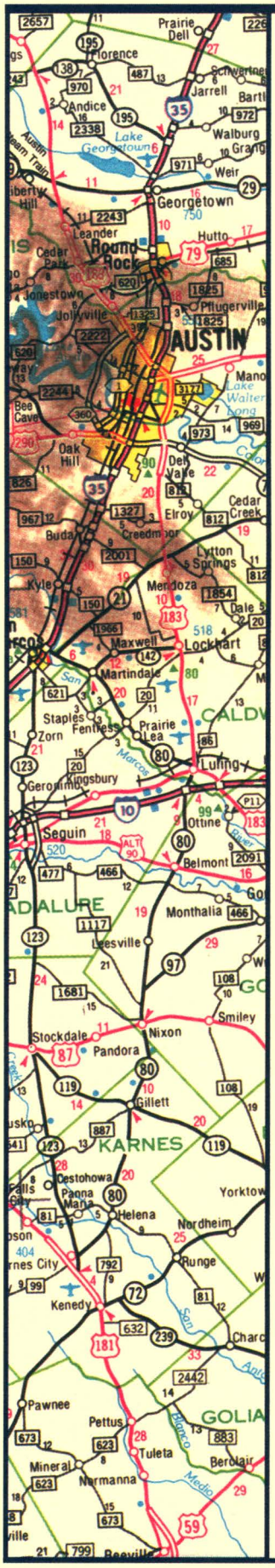
CONCLUSIONS

Extrapolating expected changes in the demographic factors critical to commuting (i.e., workers and household income) and applying these extrapolations to the Texas commuting trends previously identified (i.e., vigorous suburbanization, but not outside the MSA), shows that Texas commuting trends are very different from the nation. This produces two broad conclusions:

- The central city is predominant in Texas commuting; and
- National data and policies have limited application in Texas.

These two conclusions regarding the significance of the central city in Texas commuting and the limited applicability of national commuting trends to Texas, have important implications for those who would plan the future of the Texas transportation system. Each conclusion is discussed below.

- The role of the central city in Texas commuting:
    - The central city is currently a significant element in the commute patterns of Texas cities. This trend is likely to continue.
    - Texas will continue to be characterized by a high proportion of central city to central city commuting and a very low proportion of commuting outside the MSA of residence.
    - Furthermore, it is expected that growth in commuting will concentrate in and around existing central cities.
    - Commuting from outside the MSA, which is a concern at the national level, is not a critical problem in Texas (isolated local situations notwithstanding).
    - Therefore, congestion is expected to occur along more or less traditional commuting patterns (i.e., within the central city and between the central city and the suburbs).
    - Consequently, demand for improvements is greatest on central city links and central city to suburban links, contrary to national trends.
- The applicability of national data and policies to Texas commuting:
    - Data relating to national trends have limited value in developing commuting policy and strategies in Texas.
    - Commuting and congestion relief policies formulated at the national level have limited application in Texas.



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