

***The Economic and Developmental Impacts  
of the President George Bush Turnpike  
and the North Dallas Tollway***

**In partial completion of Texas Department of Transportation  
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## **A. Introduction**

### **1. Purpose**

The purpose of the following case studies is to examine property development trends and other data to assess the economic and developmental impacts of the Dallas North Tollway and the President George Bush Turnpike on neighboring communities. This information will be used as a component of a public information program describing how tollroads can impact a community.

### **2. Scope**

For purposes of our analysis, we have separated the two tollroads into study segments corresponding to construction components. The Dallas North Tollway is divided into four segments:

- Downtown to LBJ (Loop 635)
- LBJ to Briargrove
- Briargrove to Legacy
- Legacy to Gaylord

Similarly, the President George Bush Turnpike is segmented as:

- Dallas North Tollway to Campbell
- Campbell to Highway 78
- Frankford to the Dallas North Tollway

Our examination, unless otherwise noted, includes an area within 1 mile of either side of the subject tollway.

### **3. Methodology**

We employ quantitative and qualitative methodologies to describe development that has occurred within the study areas and to contextualize that information within

broader regional and national economic trends. Where practical and useful, we discuss specific developments, including firms when that information contributes to our understanding of why development occurs where it has. This is a case study approach and no broad-based claims are made about the generalizability of our findings to any other tollroad project. However, our findings are indicative of the growth potential that attends significant roadway development in the context of a rapidly growing urban area.

#### 4. Sources of Data

In conducting our analysis we have extensively employed property data from the Collin County Appraisal District, Dallas Central Appraisal District, and the Denton County Appraisal District. We have also gathered relevant data from the North Central Texas Council of Government, the U.S. Census Bureau, the Bureau of Labor Statistics, the Minnesota IMPLAN Group, and other sources of secondary data. Importantly, the authors have also relied on over 40 years of combined experience in economic development to assess critical factors contributing to our understanding of the impacts of tollroads.

#### 5. Content and Organization

Section B of this chapter is devoted to describing the background and historical context of the Dallas North Tollway and the President George Bush Turnpike, while Section C looks at the impacts of the two tollroads. In assessing the impact of each tollroad we begin by discussing development within each segment. This is followed by a summation and consideration of those impacts best described for the entire roadway.

**B. Toll Project Background: The Dallas North Tollway and the President George Bush Turnpike**

1. Location

The greater Dallas-Fort Worth Metropolitan Area, with a population of nearly six million, is currently the 5<sup>th</sup> largest urban region in the nation (see Table 1). Between 1990 and 2004, the DFW Metroplex grew by almost 43 percent, making it the second fastest-growing major metropolitan area in the U.S. Projections by the U.S. Department of Commerce, as well as the North Central Texas Council of Governments, foresee population continuing to grow at about three percent annually for the next 25 years, at which time the region’s population could well approach 10 million (see Table 2).

**Table 1**  
**Metro Growth 1990 to 2004**  
(in thousands)

		<b>1990</b>	<b>2004</b>	<b>%</b>
	<b>Combined Statistical Area</b>	<b>Population*</b>	<b>Population</b>	<b>Change</b>
1.	Atlanta-Sandy Springs-Marietta	3,069,425	4,708,297	53.4%
2.	Dallas-Fort Worth-Arlington	3,989,294	5,700,256	42.9%
3.	Houston-Baytown-Sugar Land	3,767,335	5,180,443	37.5%
4.	Miami-Fort Lauderdale-Miami Beach	4,056,100	5,361,723	32.2%
5.	Washington-Arlington-Alexandria	4,122,914	5,139,549	24.7%
6.	Chicago-Naperville-Joliet	8,182,076	9,391,515	14.8%
7.	Los Angeles-Long Beach-Santa Ana	11,273,720	12,925,330	14.7%
8.	New York-No. New Jersey-Long Island	16,846,046	18,709,802	11.1%
9.	Philadelphia-Camden-Wilmington	5,435,468	5,800,614	6.7%
10.	Detroit-Warren-Livonia	4,248,699	4,493,165	5.8%

\*1990 Population was calculated using counties in the 2004 defined CSAs  
Source: U.S. Census Bureau

**Table 2**

**Population Growth and Forecast: DFW, Collin County, Denton County, and Frisco**

	1980	1990	2000	2005	2020	2030	% Change 1980-2005	% Change 2005-2030
DFW	3,017,230	3,989,294	5,161,544	5,819,475	7,892,000	9,479,600	92.9%	62.9%
Collin County	144,576	264,036	492,267	652,498	938,681	1,166,645	351.3	78.8
Denton County	143,126	273,525	428,080	560,200	862,332	1,085,343	291.4	93.7
Frisco	3,499	6,138	34,028	74,150	178,558	227,911	2,019.2	207.4

*Source: North Central Texas Council of Governments, U.S. Bureau of Census*

In tandem with its burgeoning population, DFW has become a major national and international business center. Between 1990 and 2004, the Metroplex recorded a net increase of 707,000 jobs and added employment at a faster pace than any other urban area of the Sunbelt, despite major cutbacks in the technology industries during 2001 to 2003 (see Table 3). Today, the region boasts one of the largest and most diversified economies in the nation and is fortunately endowed with a broad range of fast-growing and competitive industries, especially in the information technology sector. Not only can DFW lay claim to one of the largest concentrations of computer, electronics, and software companies in the world, the region is also a major trade and distribution center for all of North America.

**Table 3****Employment Growth 1990-2004**  
(in thousands)

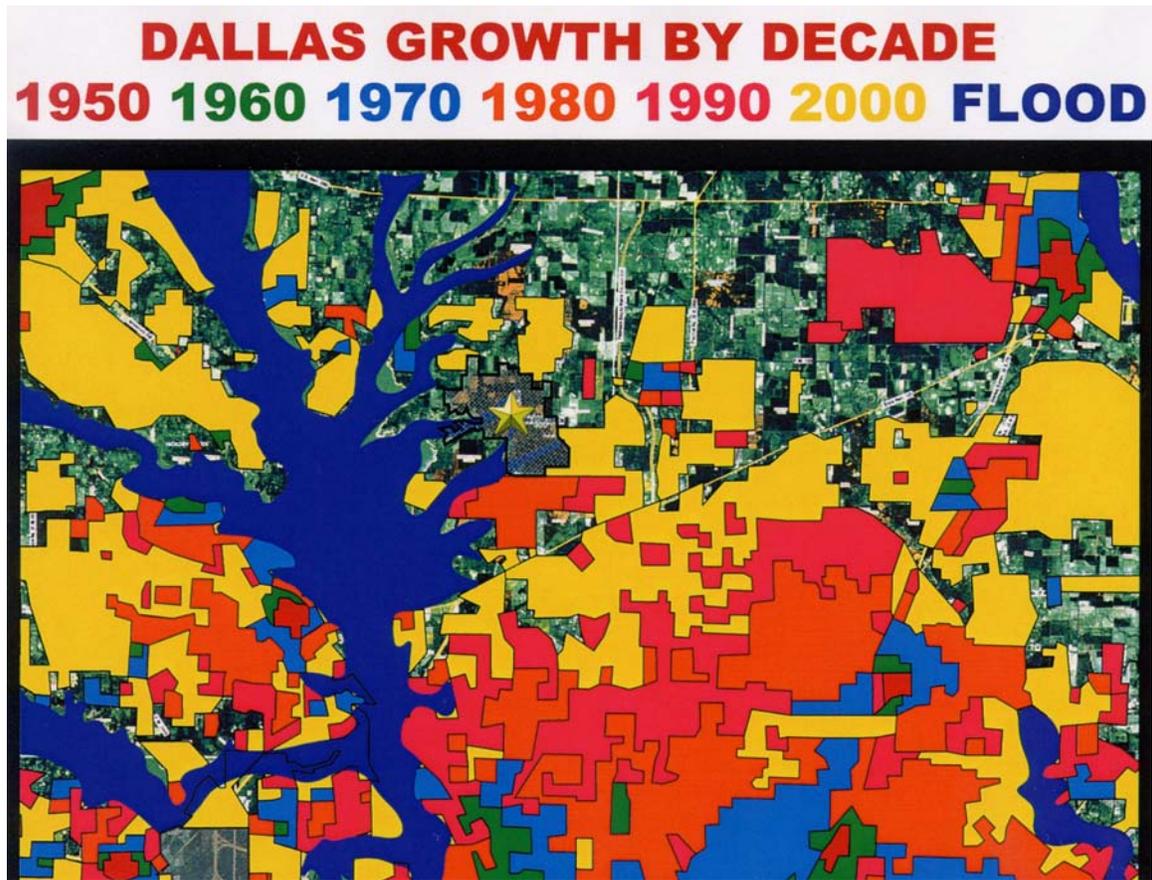
<b>Metro Area</b>	<b>1990 Employment</b>	<b>2004 Employment</b>	<b>Absolute Growth 1990-2004</b>	<b>Growth Rate 1990-2004</b>
Boston-Worcester-Manchester	2,096.3	2,868.2	771.9	36.8%
Los Angeles-Long Beach-Riverside	5,958.6	8,071.2	2,112.6	35.5%
New York-Wayne-White Plains (MD)	3,747.9	5,037.7	1,289.8	34.4%
Dallas-Fort Worth	2,189.5	2,896.5	707.0	32.3%
Houston-Baytown-Huntsville	1,919.1	2,489.4	570.3	29.7%
San Francisco-Oakland-San Jose	2,781.3	3,531.3	750.0	27.0%
Washington-Baltimore-Northern Virginia	3,543.1	4,092.4	549.3	15.5%
Chicago-Naperville-Michigan City	4,039.1	4,538.4	499.3	12.4%
Detroit-Warren-Flint	2,379.4	2,474.4	95.0	4.0%
Philadelphia-Camden-Vineland	2,758.6	2,864.9	106.3	3.9%

Source: U.S. Bureau of Labor Statistics

About 3 million persons are gainfully employed in the region at present, a number that should exceed 4.5 million within the next two decades. With 25 percent of Texas' population, the DFW region is projected to account for 35 percent of the state's job growth for the foreseeable future.

Within the Metroplex, a separate dynamic has been at work—namely, the inexorable northward march of growth from both Dallas and Fort Worth. What's more, most of the northern sector's population gains have occurred along major highway vectors: US 75, the Dallas North Tollway (DNT), Interstates 35E and 35W, the President George Bush Turnpike (PGBT), and State Highways 114 and 121 to name a few (see Figure 1).

Figure 1



In recent decades, population growth in the northern suburban counties of Collin and Denton has accelerated relative to the rest of the Dallas metropolitan area. Comparing the population gains of Collin and Denton Counties to the north with those of Ellis and Johnson Counties to the south dramatically illustrates this trend (see Table 4). In 1960, the population difference between the northern and southern counties was only about 10,000. But during the ensuing 46 years, Collin and Denton Counties added 1,180,321 residents compared to only 213,085 in Ellis and Johnson Counties. Put differently, the two northern counties have added 5.5 times as many residents as the two southern counties since 1960.

**Table 4**

**Population Growth: Northern vs. Southern Suburbs  
1960 – 2006**

	<b>Collin / Denton</b>	<b>Ellis / Johnson</b>
<b>1960</b>	88,679	78,115
<b>1970</b>	142,553	92,407
<b>1975</b>	205,600	108,700
<b>1980</b>	287,702	127,392
<b>1985</b>	415,326	160,018
<b>1990</b>	537,561	182,332
<b>1995</b>	646,560	196,159
<b>2000</b>	924,651	238,171
<b>2006</b>	1,269,000	291,200
<b>% Change 1960-2006:</b>	<b>1,331%</b>	273%

*Sources: U.S. Bureau of the Census and North Central Texas Council of Governments.*

Similarly, the Council of Governments projects the northern counties to grow faster than the southern counties over the next 25 years in both absolute and relative terms (see Table 2). Between 2005 and 2030, Collin County alone is projected to add more than 514,000 new residents, with the fastest growth—more than 150,000—occurring in the City of Frisco. These may well turn out to be underestimates, as the Council of Governments’ projections have historically undershot the mark.

2. Economic Context

The growth of northern Dallas County and the northern suburbs has occurred simultaneously with the highway projects undertaken by the North Texas Tollway Authority (NTTA). This is not a coincidence. Without question, the Dallas North Tollway and the President George Bush Turnpike have been important catalysts for

northward development, a phenomenon that began in the 1960s when the first section of the DNT was built from downtown Dallas to the Lyndon B. Johnson Freeway (LBJ).

A 12-mile extension of the DNT was proposed in 1978, and construction on this new leg began in 1983. By 1994, the extension was completed and carrying traffic all the way to State Highway 121 in Frisco. Construction is now underway to extend the DNT an additional 9.6 miles north to U.S. Highway 380.

The history of the President George Bush Turnpike is somewhat different. Originally proposed in the 1960s as an outer loop that would run from Interstate 20 to Garland, in 1977 TxDOT split the project into two highway segments: The section west of Interstate 635 (LBJ) was designated State Highway 161 while the section from I-35E in Carrollton to State Highway 78 in Garland was designated State Highway 190. Initial construction started in 1987, but the going was slow because of limited TxDOT funding. To accelerate construction, in the early 1990s community leaders proposed turning SH 161 and SH 190 into a tollroad. Revenue bonds were sold in 1995, and on May 2, 1996, ground was officially broken on the PGBT. Facilitated by the donation of 103 parcels valued at \$113 million by private and public landowners, within 10 years the turnpike was fully operational between SH 78 in Garland and SH 183 in Irving.

By the traffic count measure, both the DNT and the PGBT have been unqualified successes. From average daily traffic of 40,000 in 1969, the count had risen to 152,000 by 1988 and is more than 1,000,000 today.<sup>1</sup> But more important is the impact that these two transportation corridors have had on the pattern of development in northern Dallas County and the suburban counties of Collin and Denton.

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<sup>1</sup> The NTTA also operates the Mountain Creek Lake Bridge and the Addison Airport Tunnel, but these account for just over one percent of total traffic volume.

### ***C. The Economic and Developmental Impacts of the DNT/PGBT***

In what follows, we look at the two major projects of the NTTA as a regional economic generator. First, we examine the impacts from the NTTA's construction spending on the DNT and the PGBT. Second, we look at the value of all the residential and commercial development that has occurred along the DNT and PGBT corridors over the past 30-40 years as well as the annual tax revenues generated by this development.

#### **1. Effects of Construction of the DNT and the PGBT on the Regional Economy**

The DNT and PGBT have been among the Dallas area's largest public infrastructure in the past half century. In historical dollars, the costs of building the DNT between downtown Dallas and SH 121 totaled more than \$163 million (see Table 5). Outlays for constructing the PGBT between SH 78 in Garland and Belt Line Road in Irving exceeded \$840 million. Because construction of these two tollroads occurred over a 40-year span, we have adjusted these outlays to express the costs in current (2005) dollars.<sup>2</sup> ***Adjusted for inflation, and including the DNT extension between SH 121 and US 380, scheduled to open in 2007, outlays to build the DNT and PGBT will approach \$1.6 billion.***

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<sup>2</sup> *Engineering News-Record*, a McGraw-Hill publication, calculates a construction cost index (CCI) for Dallas and 19 other cities. We have used the Dallas index to adjust the historical costs to current (2005) dollars. The index level of the year each segment was completed has been used to calculate the current value for that segment.

**Table 5****Construction Cost of Dallas North Tollway and President George Bush Turnpike**

	<b>Date of Completion</b>	<b>Historical Cost</b>	<b>Index Adjustment</b>	<b>Cost in Current Dollars</b>
<u>Dallas North Tollway</u>				
Downtown to LBJ	1968	\$31,600,000	526%	\$166,216,000
LBJ to SH 121	1994	\$131,650,000	129%	\$169,828,500
SH 121 to US 380	2007	\$264,000,000	n.a.	\$264,000,000
DNT/SH 121 interchange	2007	\$30,998,000	n.a.	\$30,998,000
<u>President George Bush Turnpike</u>				
Midway Rd to Coit Rd	1999	\$131,400,000	118%	\$155,052,000
Coit Road to SH 78	2000	\$89,100,000	118%	\$105,138,000
Midway Road to I-35E	2001	\$201,300,000	122%	\$245,586,000
I-635 to Belt Line Rd	2001	\$84,200,000	122%	\$102,724,000
I-35E to I-635	2005	\$334,500,000	n.a.	\$334,500,000
			<b>Grand Total</b>	<b>\$1,574,042,500</b>

*Sources: North Texas Tollway Authority and Engineering News-Record (copyright The McGraw Hill Companies, Inc., all rights reserved)*

Projects of this magnitude have significant economic and fiscal impacts. To estimate these impacts, we have utilized the IMPLAN economic input-output model developed by the Minnesota IMPLAN Group. The IMPLAN model provides estimates of total economic activity including direct, indirect, and induced impacts based on the activities of a given entity—namely, the contractors responsible for building the DNT and PGBT. The direct effects would include the activities of the construction firms that hire employees, pay wages, and purchase building materials. In addition, the construction firms will buy office supplies, contract for construction site sanitary services, and engage professional service providers such as accountants and attorneys as a part of their normal business operations.

Indirect effects capture the economic activities of the construction companies' vendors. For example, the accounting firm that provides bookkeeping services to a

construction firm buys office supplies, rents space, purchases computer equipment, and hires services for their business needs. Induced effects include the impact of the employees of all of these firms spending a portion of their wages and salaries on goods and services in the local economy.

The IMPLAN model provides impact estimates at the county level or aggregation of counties such as the Dallas metropolitan area and adjusts the impact estimates for spending that leaks out of the local economy. For example, the fuel used for construction equipment was not refined in the Dallas area; therefore, little of the estimated purchase value of that fuel is counted as contributing to the local economy.

As shown in Table 6, construction activities for the DNT and PGBT have had a very large economic impact on the Dallas Metropolitan Division<sup>3</sup> area economy. Based on more than \$1.5 billion in spending, in adjusted dollars, construction of the DNT and PGBT have added almost \$2.6 billion to the regional economy supporting well over 25,000 person years of employment paying in excess of \$1.1 billion in salaries, wages, and benefits. In addition, property income in the form of rents, royalties, dividends, and corporate profits have been boosted by nearly \$250 million. Local and state taxing jurisdictions have also benefited receiving an estimated \$75.6 million in indirect tax revenues including sales and property taxes, as well as permit and licensing fees.

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<sup>3</sup> The Dallas Metropolitan Division includes Collin, Dallas, Delta, Denton, Ellis, Hunt, Kaufman and Rockwall counties. Even though the tollroads do not enter several of these counties, the impacts of construction activities including procurement, contracted services, and employment impact the entire region.

**Table 6**

**Economic and Fiscal Impacts of Construction of the  
Dallas North Tollway and the President George Bush Tollway  
Dallas Metropolitan Division**

<b>Description</b>	<b>Impact</b>
Economic Activity	\$ 2,597,092,000
Labor Income*	\$ 1,122,547,000
Employment <sup>#</sup>	25,700
Other Property Income <sup>+</sup>	\$ 248,750,000
Indirect Business Taxes <sup>^</sup>	\$ 75,651,000

*\* Salaries, wages, benefits. # Expressed as person-years of employment. + Includes rents, royalties, dividends, and corporate profits. ^ Includes sales taxes, property taxes, permit fee, licensing fees to state and local taxing entities.*

**2. Impacts on Land Use and Property Values**

In this section we will examine property development that has occurred along the Dallas North Tollway and the President George Bush Turnpike. In most instances we discuss each segment of the subject tollroad; however, there are a few data elements that are best presented in aggregate. Each of the tollroads examined here have had noticeable, even dramatic, impacts on surrounding property development. However, what will become clear is that the methodologies for assessing the impacts of the tollroads must be done cautiously. Specifically, in causal research there is the requirement that cause must precede effect. The uncertainty in examining the impact of tollroad development is determining which of the following is the primary causal event—the actual opening of the roadway, the announcement of the roadway’s path, or the beginning of construction. Of course, one might expect that if the roadway does not have a pre-existing parallel alternative route, then development cannot be supported until the new tollway opens. However, this is not always the case as will be seen later in this report. This phenomenon is also seen in development surrounding other transportation modes. For example, the

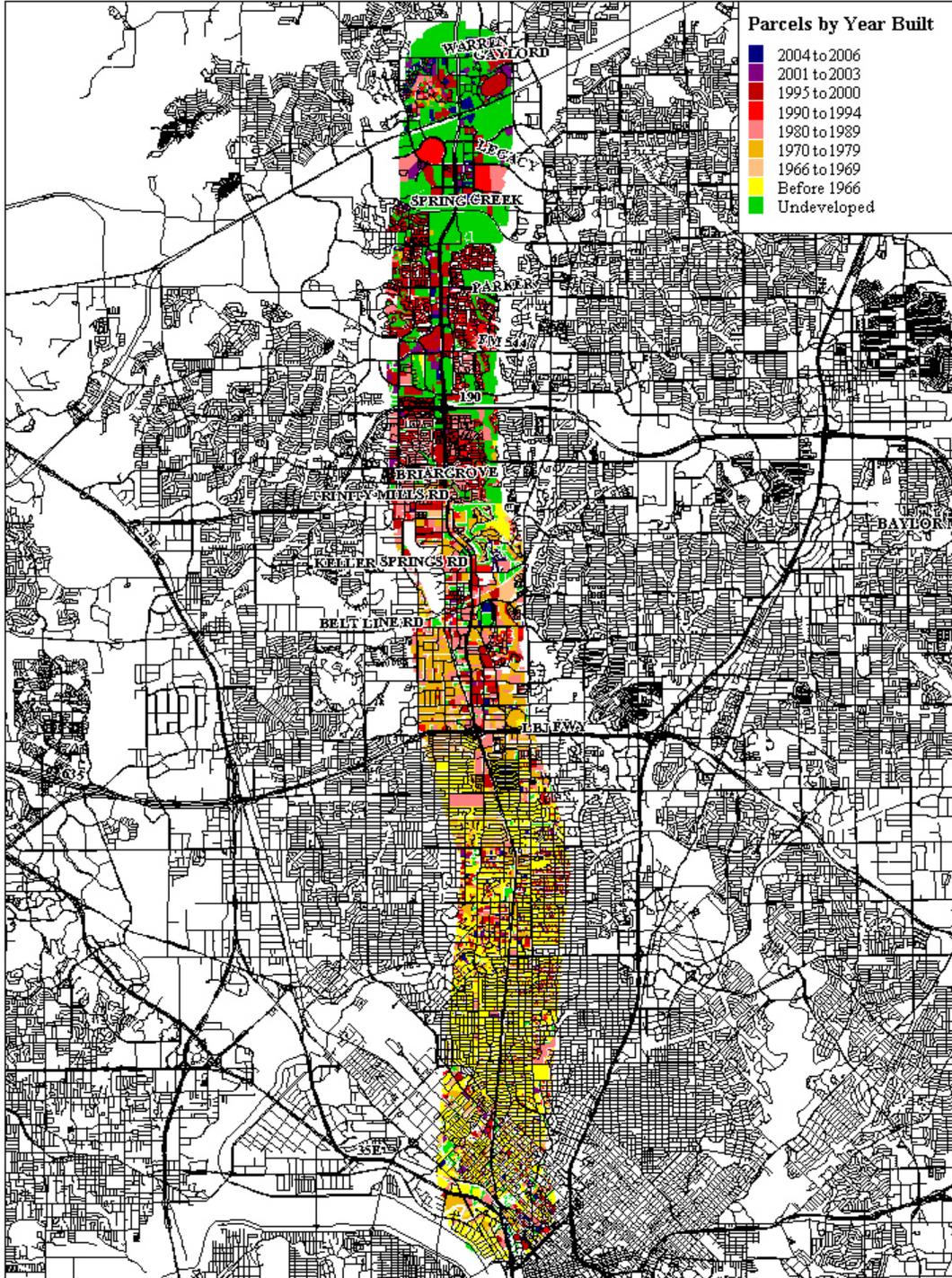
Dallas Area Rapid Transit (DART) light rail station adjacent to old downtown Plano sparked tremendous development and redevelopment activity from the time the station location was announced several years before it actually opened. Other DART stations did not have significant impact on local development until after the station opened. Therefore, as these cases are unfolded, it becomes clear that context—economic, market, location, land ownership, community standards, and other factors—plays a critical role in the pace, quality, and volume of development surrounding a tollroad.

### *2.1 Dallas North Tollway*

As noted earlier, our analysis of the DNT is divided into 4 segments. Figure 2 offers an overview of development, including remaining vacant land, along the DNT. As expected, the available land is concentrated in the northern reaches as the Dallas area economy continues a 50-year trend of northward expansion.

**Figure 2**

Land Parcels within One Mile of the Dallas North Tollway  
By Year of Land Development

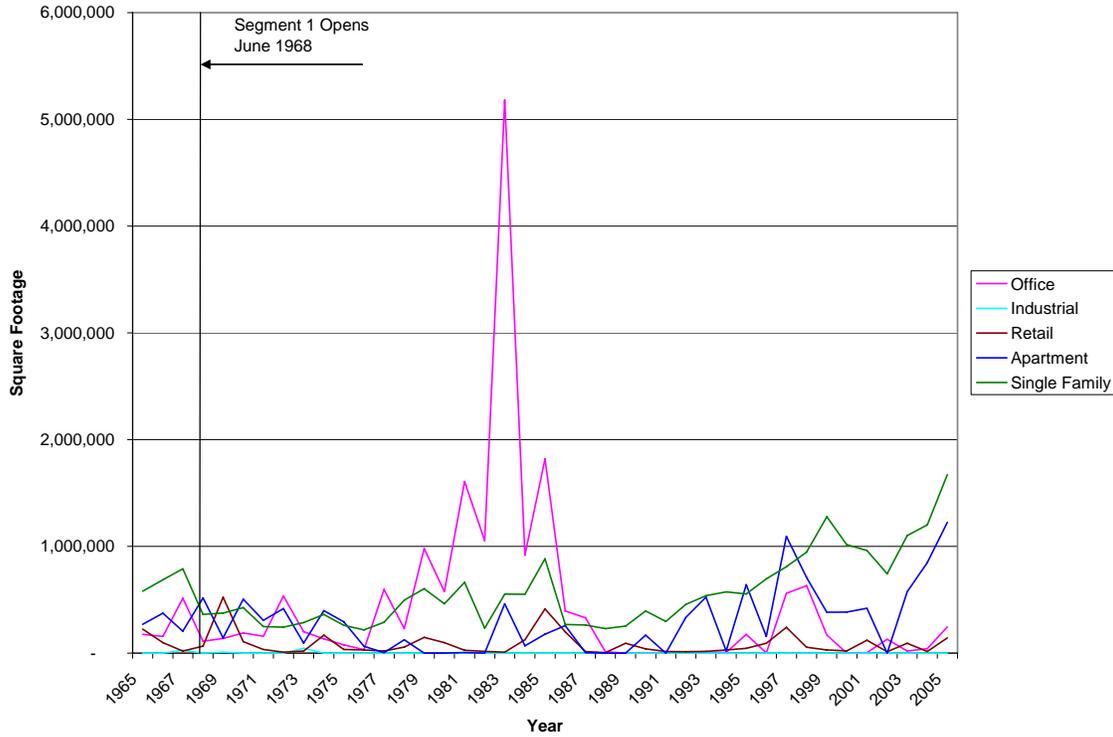


## **Segment 1 – Downtown to Loop 635**

Segment 1 of the DNT, which includes the roadway from downtown Dallas to Loop 635, was opened in June 1968. As shown in Figure 3, it is easy to see that overall economic and real estate market trends dominated the development impacts along this segment. In large part this is due to development that had occurred in this area of town starting in the early 1950s that was well underway prior to construction of the DNT. The spike in office development shown in the late 1970s and early 1980s describes the Texas real estate boom and, unfortunately, the subsequent bust. Note the volatility in the development of apartment units throughout the time period shown. Apartment construction fluxuates highly as several developers typically respond simultaneously to market demand by, in the short run, overbuilding multifamily residential space followed by periods of relatively little development activity as market demand catches up with the new supply. Interestingly, since the early 1990s, there has been continued development in residential properties, much of which represents backfill and redevelopment. The DNT, even in its most congested segment, continues to serve as an amenity supporting residential development. Table 7 summarizes the development that has occurred within 1 mile of either side of DNT Segment 1 during our study period. Figure 4 illustrates development along this segment by year built.

**Figure 3**

**New Development in Square Feet of Building Space by Year  
Dallas North Tollway  
(Downtown to Loop 635)**



**Table 7**

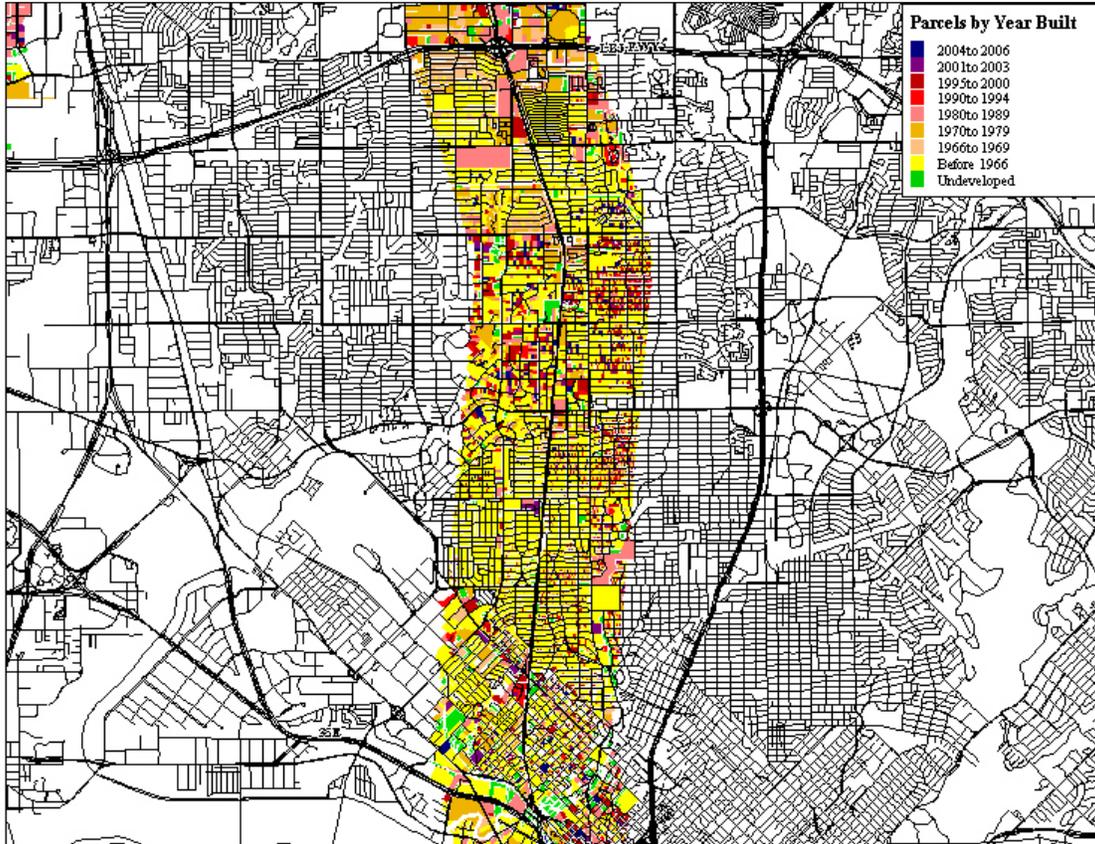
**Development by Type  
Dallas North Tollway (Downtown to Loop 635)  
1965-2005**

Land Use	Square Feet of Building Space	Taxable Value*
Office	18,124,217	\$ 1,710,451,050
Industrial	80,848	\$ 1,830,550
Retail	3,535,077	\$ 465,513,760
Apartments	12,172,314	\$ 658,736,250
Single Family Residential	23,819,673	\$ 4,802,249,630

Source: Dallas Central Appraisal District. \* Real property value (not including business personal property).

**Figure 4**

**Land Parcels within One Mile of the Dallas North Tollway Segment 1  
By Year of Land Development**



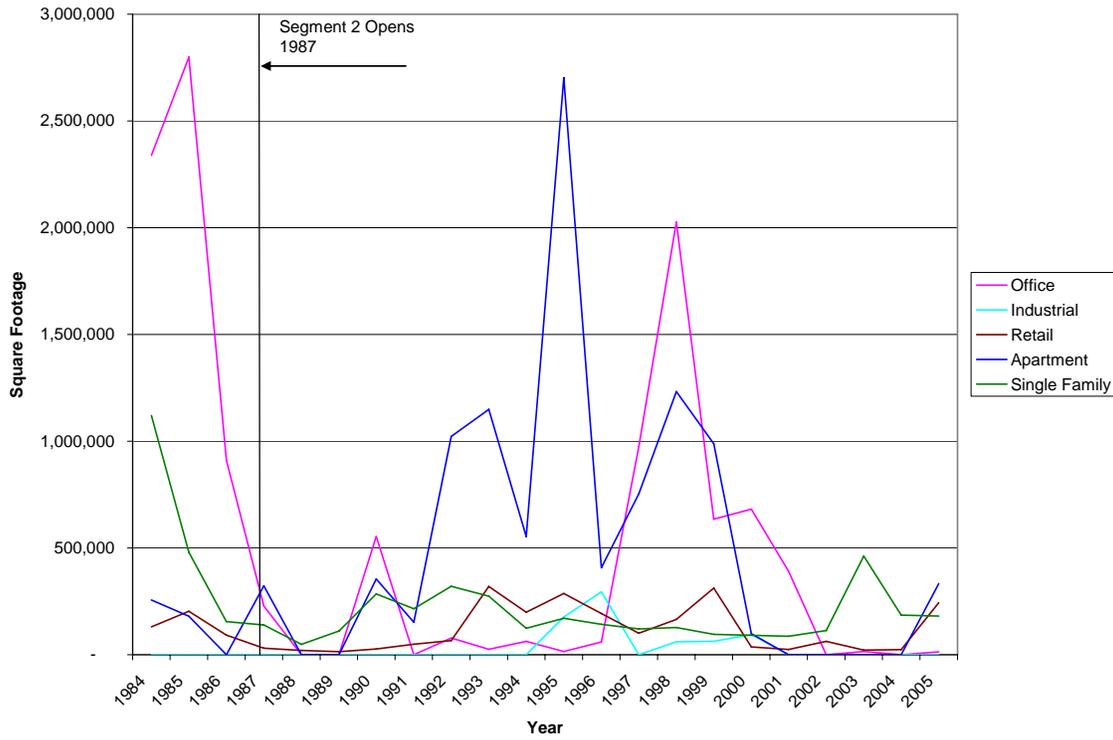
**Segment 2 – Loop 635 to Briargrove Parkway**

Segment 2 of the DNT runs from Loop 635 to Briargrove Parkway. Segment 2 opened in mid-1987 at the height of the Texas real estate bust. With the exception of some apartment development, all types of property development were in a downward trend—some in a downward spiral (see Figure 5). However, by the early 1990s new development was starting to occur with the northward expansion of the Dallas metro area. The significant development in Segment 2 occurred in office and multi-family residential properties. This corresponds with significant business development in Plano, Frisco, and

other Collin County communities, though it is interesting that one could claim that based on the timing of the developments businesses moved to be closer to where their employees were choosing to live. Figure 5 also provides evidence that proximity to the tollway is more important for apartment and office developments. Other team members in separate studies have found that apartments and offices prefer to be adjacent to the tollway, while single family residential development occurs in convenient proximity but not adjacent to toll facilities (based on information provided by Sharada Vidali of TTI). As shown in Table 8, overall growth during the study period boosted taxable values along Segment 2 tremendously with over \$1 billion in new office properties, \$670 million in single family residential values within 1 mile of the tollway, \$586 million in apartment property values, \$335 million in retail properties, and \$34 million in industrial space. Development in the area was, again, influenced by overall economic and market conditions, but the DNT was certainly a catalyst driving the specific location of many of these developments. In Table 8 and Figure 5 you also see the influence of local economic development priorities. Though there was space available for industrial development, which includes manufacturing and distribution activities, comparatively little is developed as this land use. Figure 6 illustrates development along this segment by year built.

**Figure 5**

**New Development in Square Feet of Building Space by Year  
Dallas North Tollway  
(Loop 635 to Briargrove)**



**Table 8**

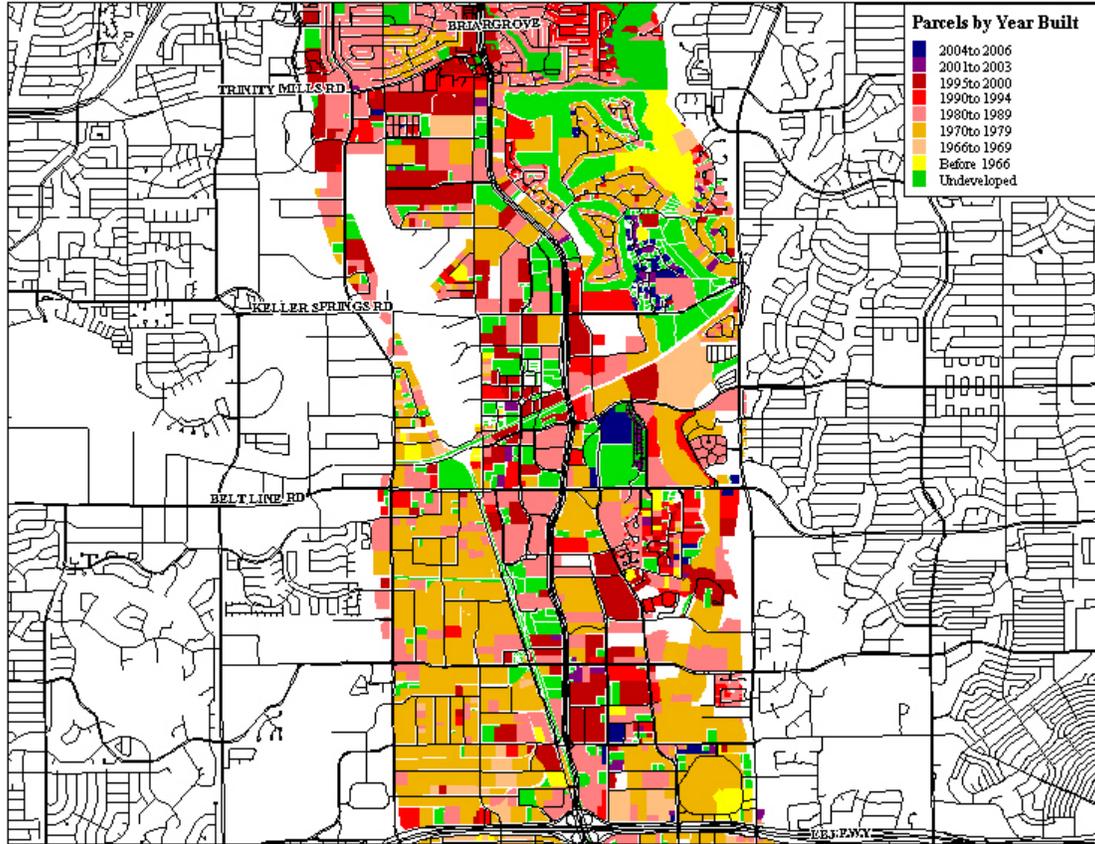
**Development by Type  
Dallas North Tollway (Loop 635 to Briargrove)  
1984-2005**

Land Use	Square Feet of Building Space	Taxable Value*
Office	11,806,909	\$ 1,016,815,964
Industrial	687,518	\$ 33,750,070
Retail	2,619,253	\$ 335,354,518
Apartments	10,504,045	\$ 586,368,688
Single Family Residential	5,047,670	\$ 669,937,635

Source: Dallas Central Appraisal District, Collin County Appraisal District. \* Real property value (not including business personal property).

**Figure 6**

**Land Parcels within One Mile of the Dallas North Tollway Segment 2  
By Year of Land Development**



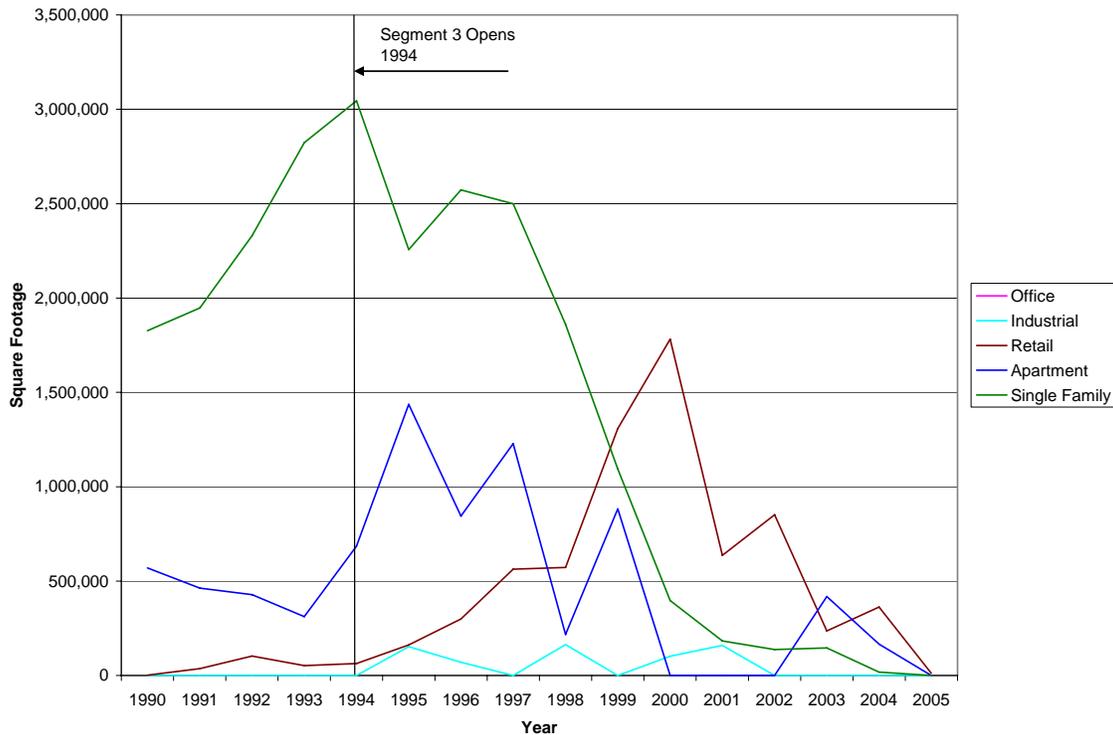
**Segment 3 – Briargrove Parkway to Legacy**

Segment 3 of the DNT extends from Briargrove to Legacy and was opened in 1994. Development along this segment has been dominated, both before and after the tollway opened, by single family residential properties (see Figure 7). However, it is clear that this land use approached buildout—at least in terms of current zoning—by the year 2000. Development has also been strong immediately after Segment 3 opened for apartment dwellings. The development phenomenon most clearly shown in Figure 7 and Figure 8 confirms that retail development follows rooftops. (Figure 8 offers some detail

on development that has occurred along Segment 3). Figure 7 also shows the effects of the economic recession in 2001 and subsequent extended period of stable, but slow, economic growth locally and nationally. We also judge that some of the slowdown in development since 2001 is a pause in construction activity after a period of unsustainably high growth, which is readily apparent in Figure 7 and Figure 9. As shown in Table 9, overall growth during the study period boosted taxable values along Segment 3 to over \$937 million in new office properties, over \$842 million in retail properties, and almost \$3 billion in single family residential values.

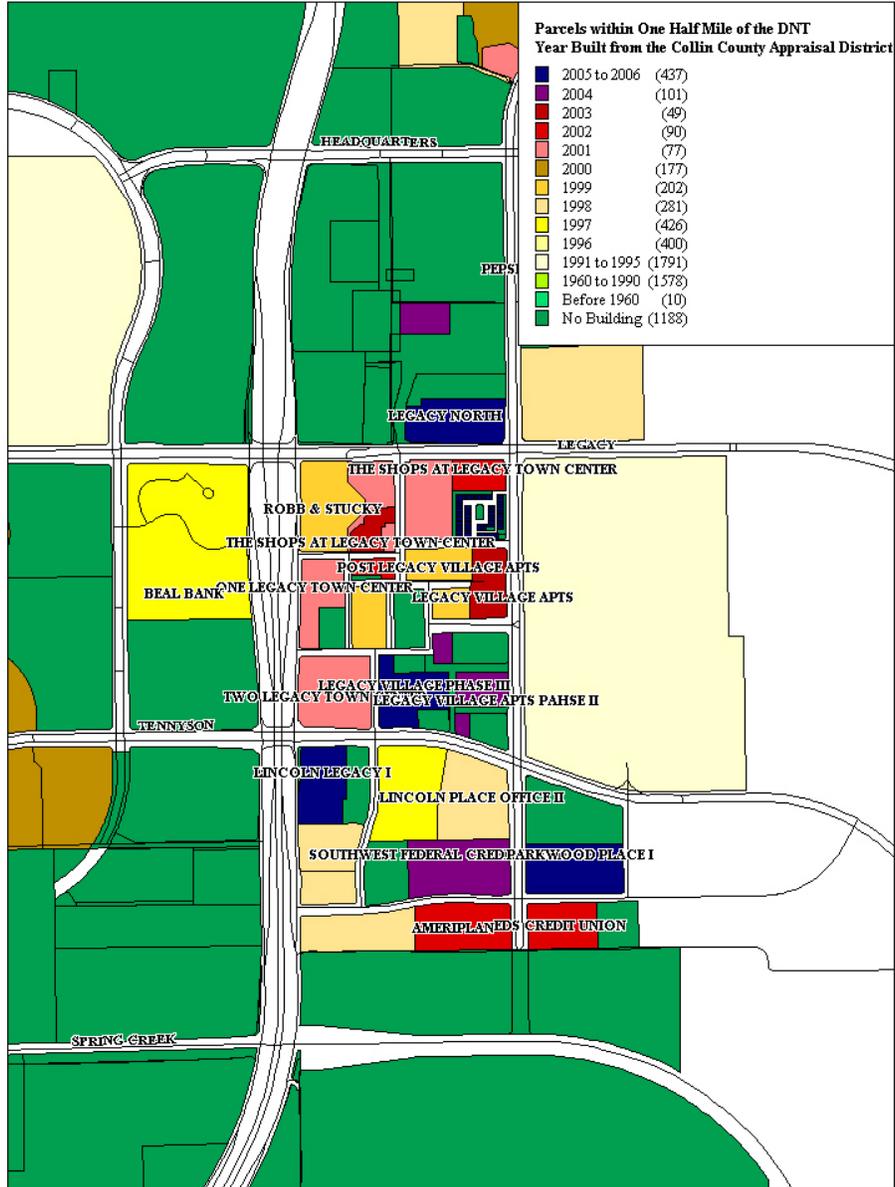
**Figure 7**

**New Development in Square Feet of Building Space by Year  
Dallas North Tollway  
(Briargrove to Legacy)**



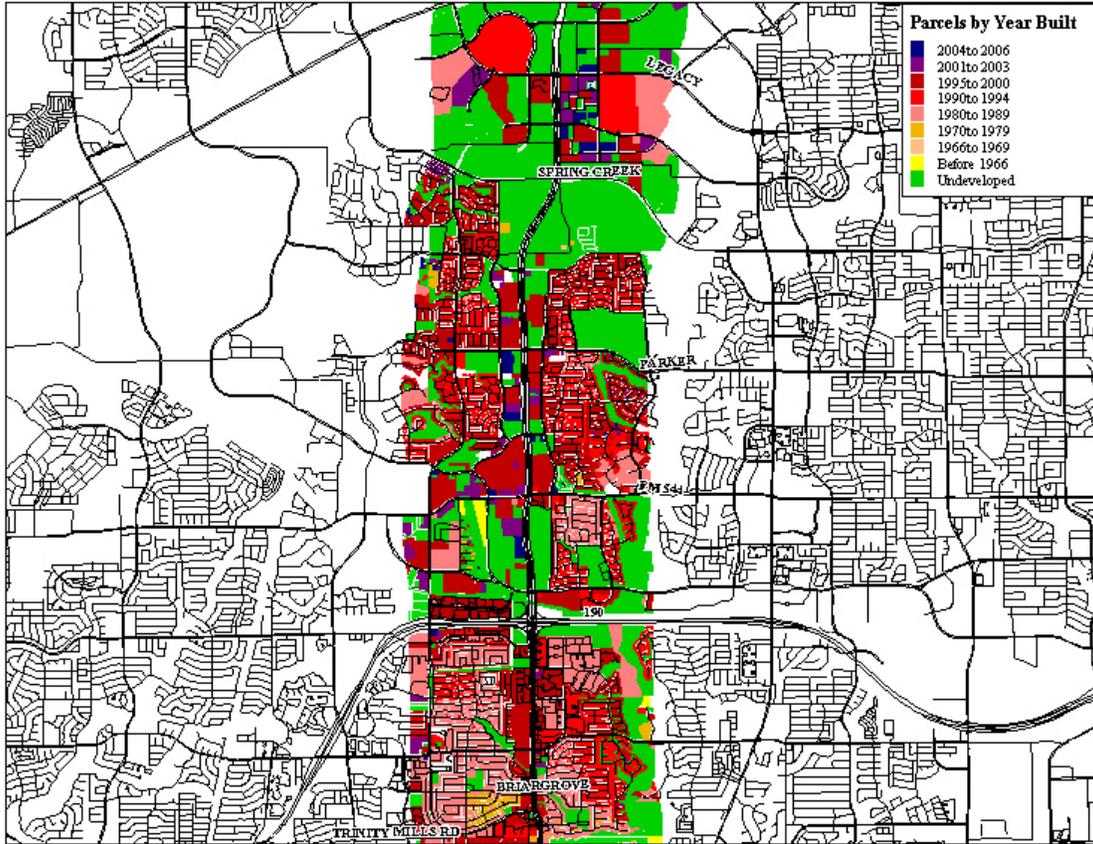
# Figure 8

## Development Detail Dallas North Tollway Segment 3



**Figure 9**

**Land Parcels within One Mile of the Dallas North Tollway Segment 3  
By Year of Land Development**



**Table 9**

**Development by Type  
Dallas North Tollway (Briargrove to Legacy)  
1990-2005**

Land Use	Square Feet of Building Space	Taxable Value*
Office	8,411,941	\$ 937,665,855
Industrial	649,656	\$ 39,009,313
Retail	7,045,845	\$ 842,310,337
Apartments	7,654,568	\$ 467,160,358
Single Family Residential	23,140,200	\$ 2,917,033,018

Source: Dallas Central Appraisal District, Collin County Appraisal District. \* Real property value (not including business personal property).

#### **Segment 4 – Legacy to Gaylord Parkway**

Segment 4 of the DNT extends from Legacy to Gaylord Parkway and was opened in 2004. Figure 10 shows that there is still considerable land available for development. The spike in retail development shown in Figure 11 prior to the opening of Segment 4 is associated with Stonebriar Mall located in Frisco. The City of Frisco has aggressively pursued retail development as a major component of their economic development strategy. Moreover, in development, growth tends to beget growth. Once one major development proves to be successful, perceived risk is lower for the next development and so on. Therefore, after the economic downturn in 2001 through 2003, we have started to see new retail development surrounding Stonebriar Mall. Based on prior work with the developer of Stonebriar Mall, we can state unequivocally that the location of the mall was dependent on the presence of the DNT and the expansion of Highway 121. Table 10 shows taxable values of various types of properties during the study period.

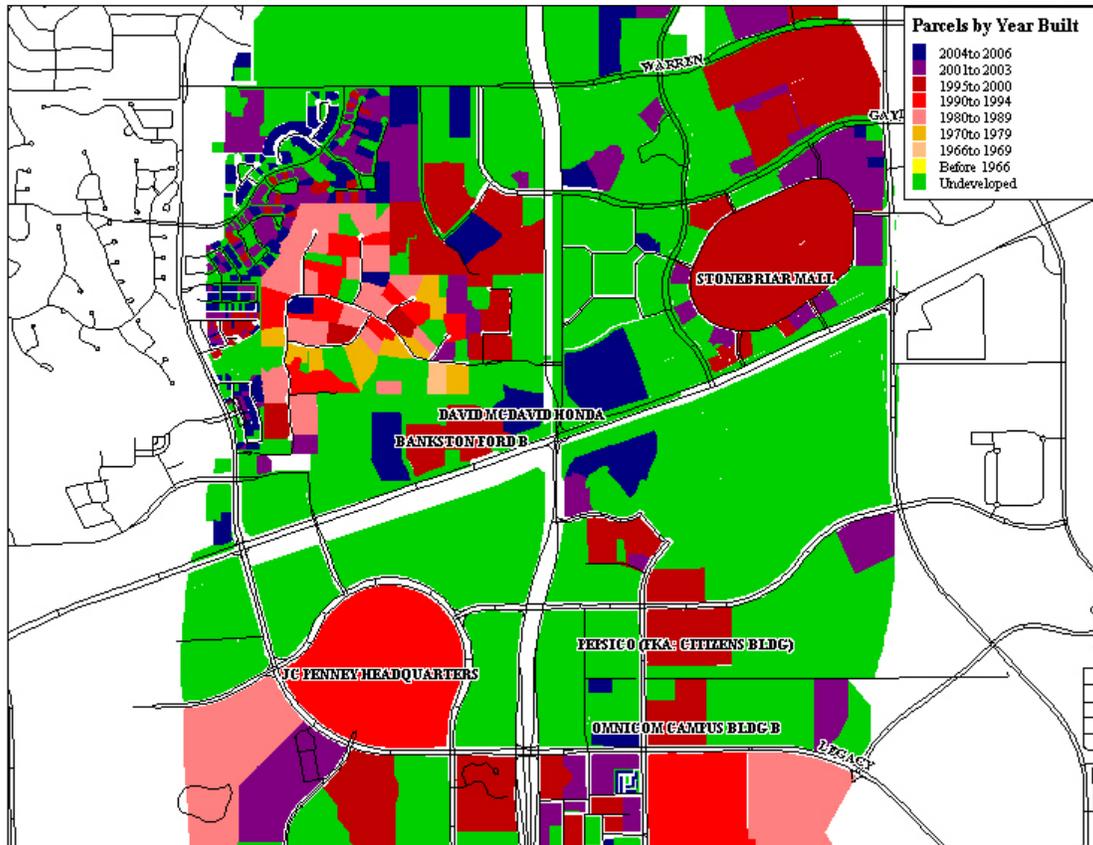
**Table 10**  
**Development by Type**  
**Dallas North Tollway (Legacy to Gaylord Parkway)**  
**1998-2005**

<b>Land Use</b>	<b>Square Feet of Building Space</b>	<b>Taxable Value*</b>
Office	2,582,520	\$ 311,919,574
Industrial	169,900	\$ 23,506,178
Retail	4,666,407	\$ 526,398,030
Apartments	717,454	\$ 52,111,929
Single Family Residential	1,084,694	\$ 158,844,656

*Source: Dallas Central Appraisal District, Collin County Appraisal District. \* Real property value (not including business personal property).*

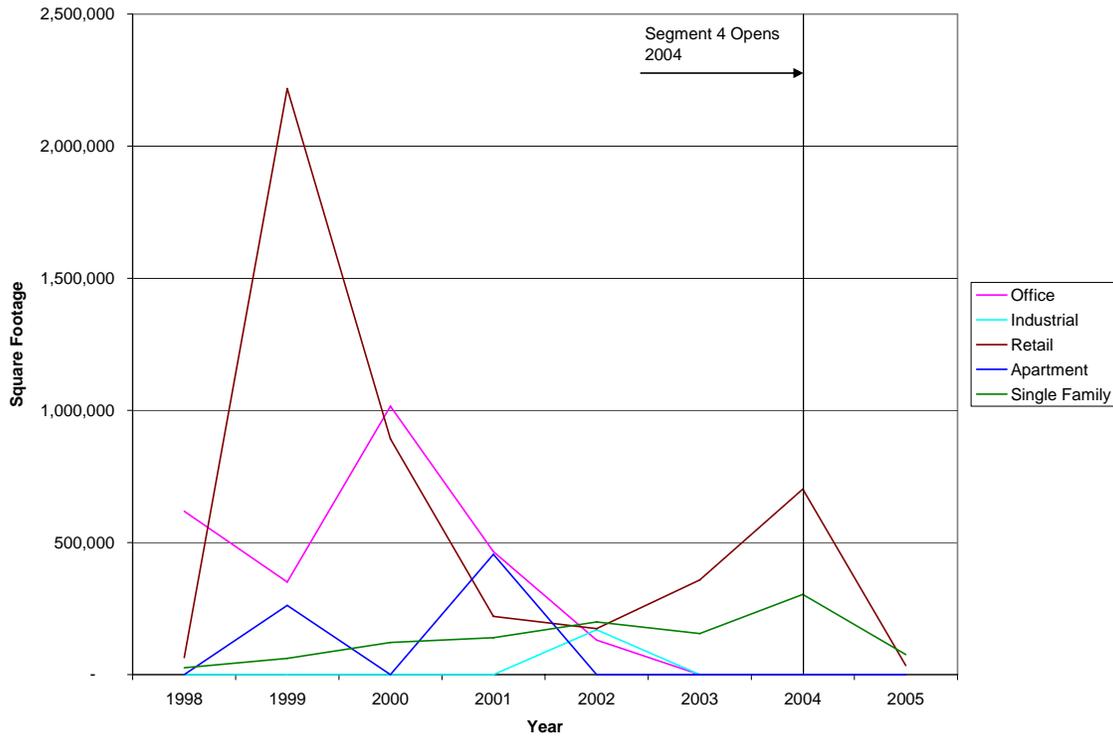
Figure 10

Land Parcels within One Mile of the Dallas North Tollway Segment 4  
By Year of Land Development



**Figure 11**

**New Development in Square Feet of Building Space by Year  
Dallas North Tollway  
(Legacy to Gaylord Parkway)**



**Summary**

The development that is associated with the DNT has supported the creation of thousands of jobs and billions of dollars in total taxable values. Employing a land use forecasting model developed by the authors, we can offer a broad assessment of these impacts. We must caution that these are broad estimates. The development that has occurred along the DNT provides the space to support over 250,000 jobs, over \$17 billion in taxable property values<sup>4</sup>, and more than \$4 billion in annual retail sales.

<sup>4</sup> The granting of tax abatements and other municipal incentives make this a difficult figure to estimate. We have taken a fairly conservative approach that includes business personal property values.

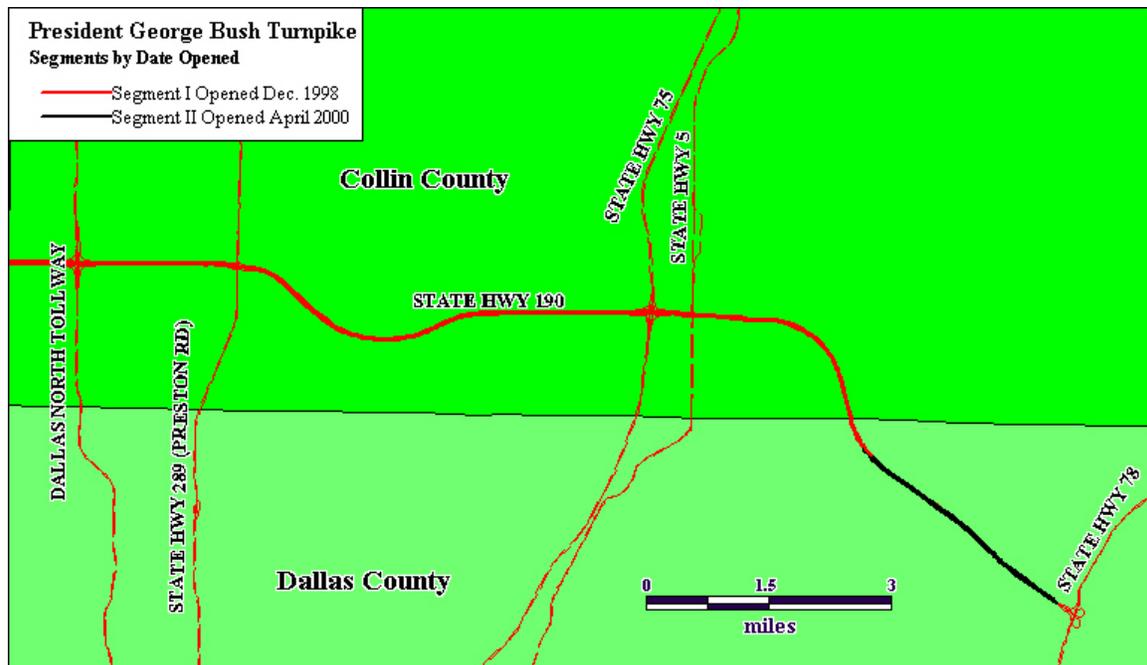
The Dallas North Tollway has been a focus of growth for the northern half of the Dallas Metropolitan Division. Although broader economic and real estate market trends and growth strategies employed by individual municipalities dominate the timing and nature of development, the tollway is an attractant and catalyst for growth.

## 2.2 *President George Bush Turnpike*

The President George Bush Turnpike was built in five segments that opened between December 1998 and October 2005. This study only looks at the economic impacts of the PGBT from the Dallas North Tollway to State Highway 78—Segments 1 and 2 as shown in Figure 12.<sup>5</sup>

**Figure 12**

### **President George Bush Turnpike**



Source: North Texas Tollway Authority

<sup>5</sup> Segment 1 actually extends from Midway Road to Campbell Road. Except where otherwise noted, we are focusing on only that portion of Segment 1 that begins at the Dallas North Tollway and ends at Campbell Road.

The President George Bush Turnpike differs in purpose and impact from the Dallas North Tollway. While the DNT has extended northward development well into Collin County, the President George Bush Turnpike is a ring road that increases the efficiency of traffic flow. It traverses existing development. While there are opportunities for development, i.e., there are a number of vacant commercial parcels adjacent to the PGBT, the neighborhoods that surround it are largely built out.

The PGBT was built in a corridor that did not require the demolition of existing structures. A number of landowners—several of which still own parcels along the PGBT—donated undeveloped land for the PGBT with the provision that the portions of the parcels that they retained would be zoned commercial.

Aerial photography taken during the period of construction clearly demonstrates that few, if any, structures were removed in order to build the PGBT (see Figure 13). The land was predominantly used for agriculture, i.e., the owners maintained their agricultural exemptions, so there were few structures. The large pre-existing buildings on land contiguous with the PGBT actually had frontage on other roads. Given the lack of businesses in the corridor, negative effects were minimal. While some businesses would be affected by traffic that was traveling on roads that crossed the construction area, no businesses appear to have been directly on the right-of-way. This is largely due to the route designation of the roadway that eventually became PGBT predating much of the development that has occurred over the past 30 years in Dallas' northern suburbs.

**Figure 13**

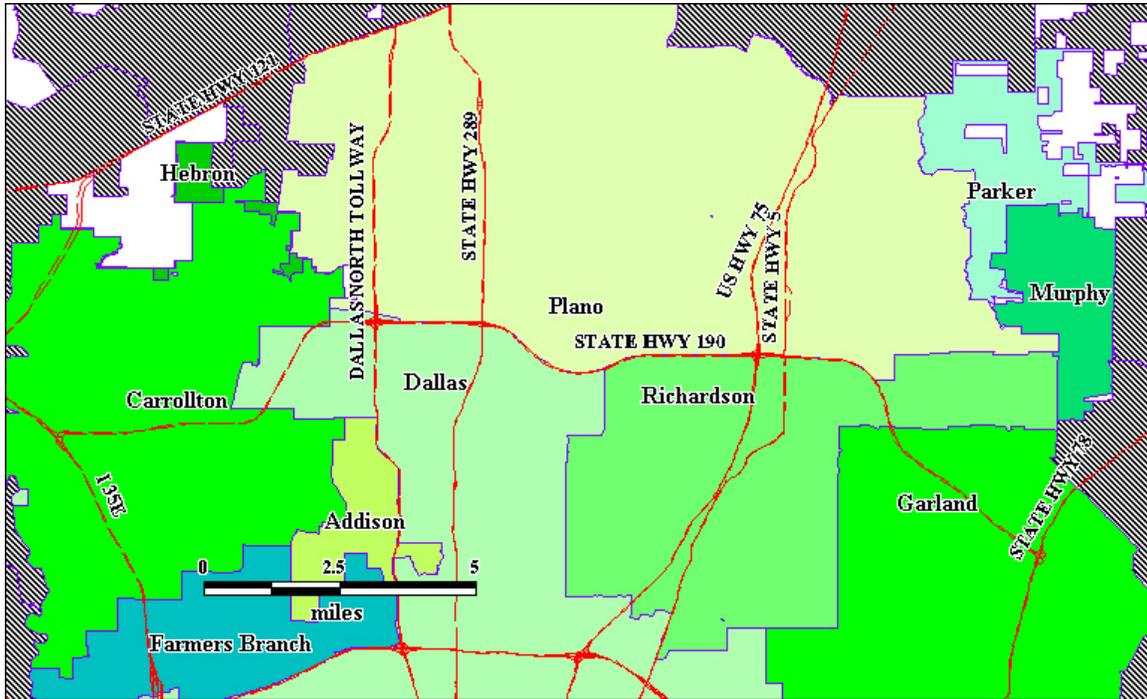
**Aerial Photograph Taken during Early Stages of Construction of the President George Bush Turnpike**



The PGBT also serves as the border for several cities. It divides Plano from Dallas, and Plano from Richardson (see Figure 14). Note also that the Dallas North Tollway is a border between Addison / Dallas and Farmers Branch / Dallas. This presents a problem of land use planning coordination between adjoining cities that could influence the pace and quality of development.

**Figure 14**

**Municipal Boundaries Along the President George Bush Turnpike**



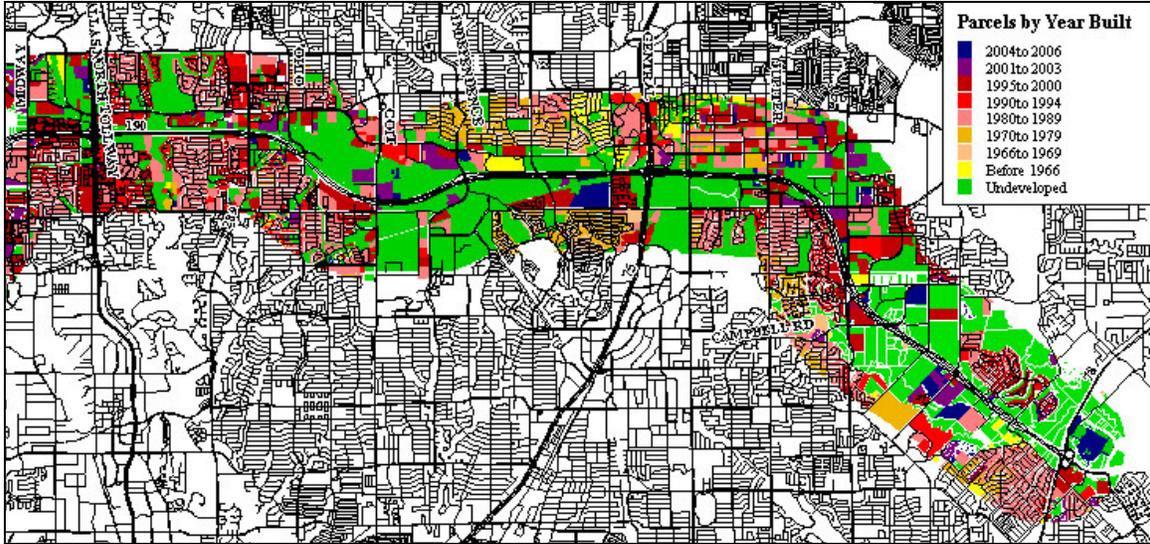
**Segment 1 – Midway Road to Campbell Road**

Segment 1 of the PGBT runs from Midway Road east to Campbell Road, and this sub-section discusses Segment 1 as a whole. Subsequent sub-sections focus in on smaller areas of Segment 1.

This segment opened in December 1998; however, frontage road development brought traffic to the corridor as early as the mid 1990s. As shown in Figure 15 and 16, much of the development along this segment predated the opening of the PGBT. However, as suggested earlier, anticipation of the presence of the PGBT drove much of the development decision making.

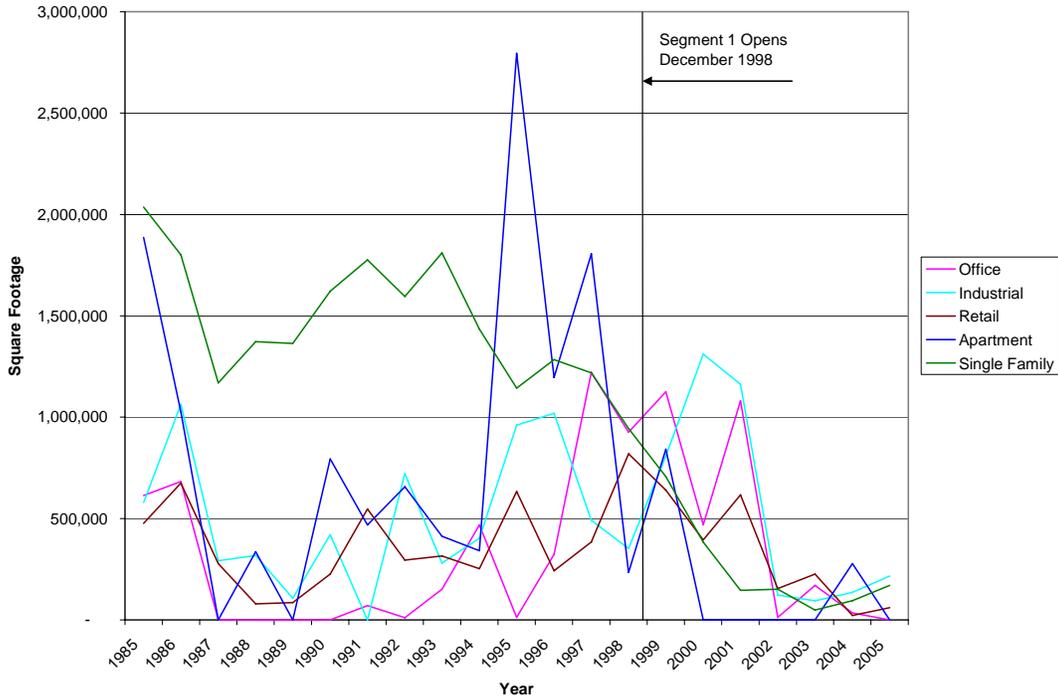
**\*\*Figure 15**

**Land Parcels within One Mile of the President George Bush Turnpike  
By Year of Land Development**



**Figure 16**

**New Development in Square Feet of Building Space by Year  
President George Bush Tollway  
(Midway Road to Campbell Road)**

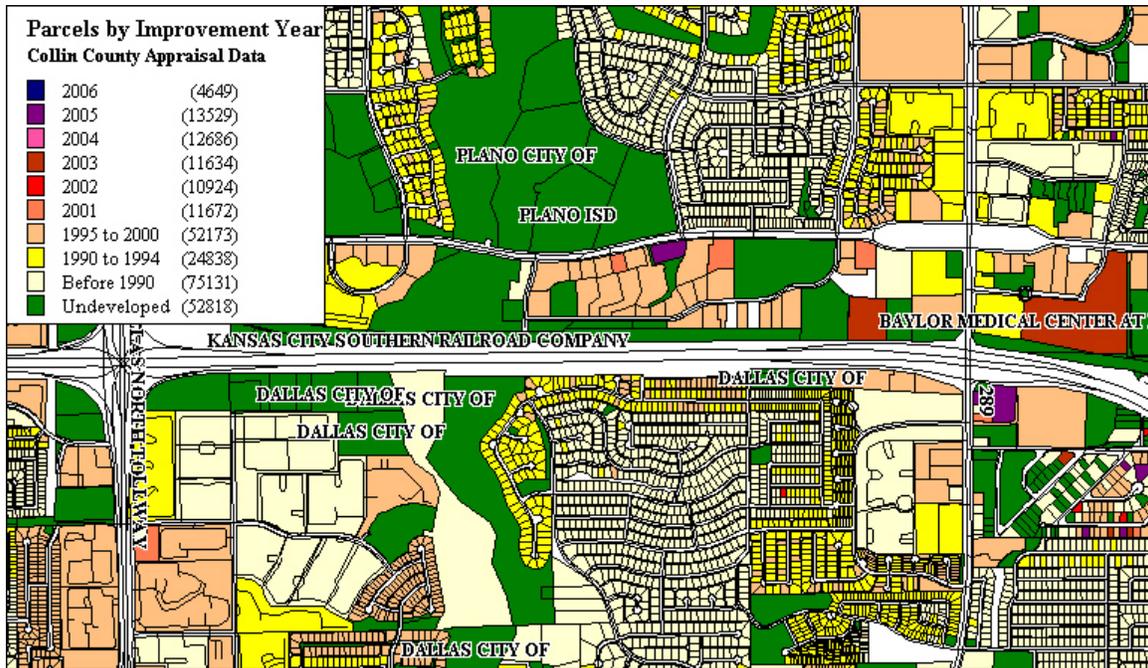


*Segment 1a – Dallas North Tollway to Preston Road (289)*

The portion of Segment 1 that runs from the Dallas North Tollway east to Preston Road (289) is more developed than other areas, with the larger undeveloped parcels appearing to be owned by cities or the local school district (see Figure 17). It is also clear that the presence of other transportation infrastructure—in this case rail line owned by the Kansas City Southern Railroad Company—consumes prime developable land along the Plano side of the PGBT. Municipal ownership also precludes development, at least currently, so there are very few parcels available for commercial development that front on the PGBT in this portion of Segment 1.

**Figure 17**

**Parcel Data for Segment 1 of the President George Bush Turnpike  
(Dallas North Tollway to Preston [289] Only)**

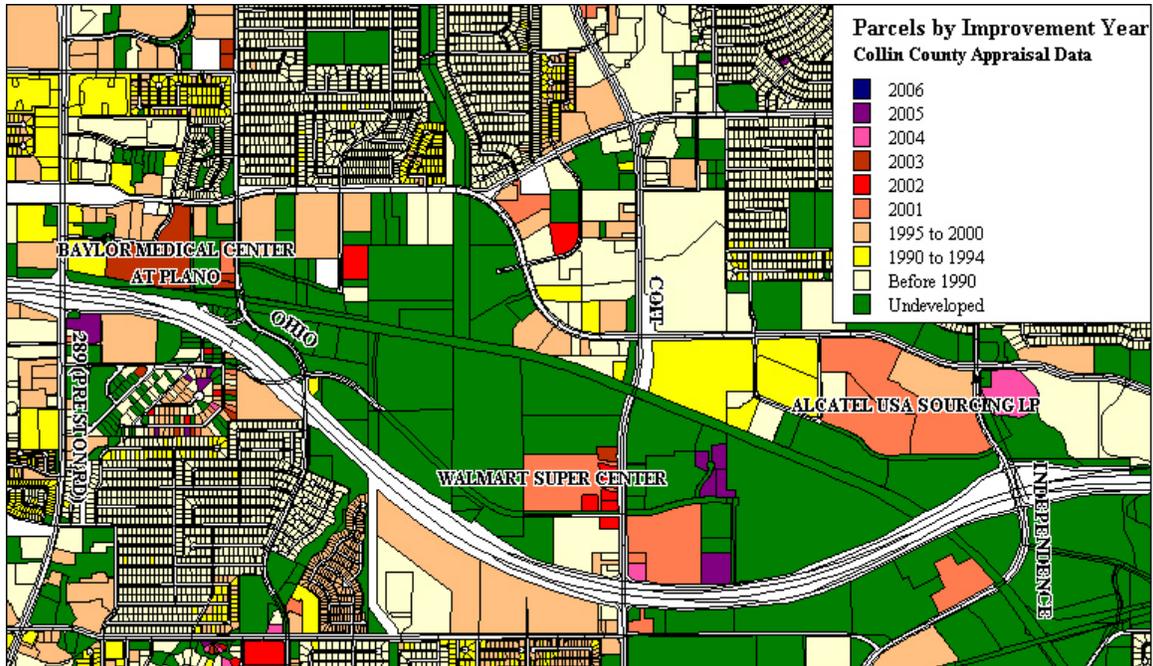


*Segment 1b – Preston Road (289) to Independence Parkway*

The part of Segment 1 from Preston Road to Independence Parkway has seen substantial development following the completion of this segment (see Figure 18). The development has included retail land uses—note the WalMart Supercenter—and the addition of a new hospital belonging to the Baylor group on the north side of the PGBT. Some residential growth is visible to the south of 190 and to the west of Ohio, and there are a number of parcels in that subdivision that remain undeveloped.

**Figure 18**

**Parcel Data for Segment 1 of the President George Bush Turnpike  
(Preston [289] to Independence Parkway Only)**



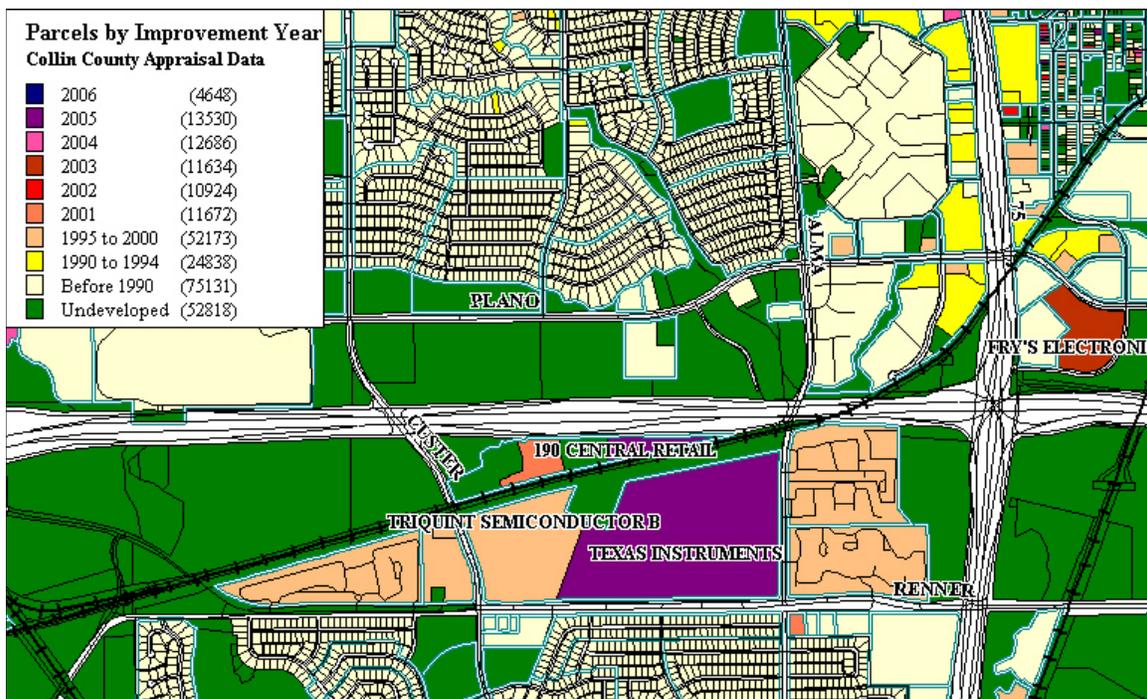
*Segment 1c – Independence Parkway to State Highway 75*

Examination of the portion of Segment 1 from Independence Parkway to State Highway 75 reveals a considerable amount of commercially zoned property that is undeveloped (see Figure 19). We surmise two primary reasons for this comparatively

slow growth: First, a small number of investors control the bulk of the land in the Plano/Richardson/Dallas portion of the PGBT corridor, and they seem to be using a hold-for-better-market strategy. This strategy is most often employed by large, well-capitalized investors. Financially smaller land owners, including individuals, may not have the resources to wait for target market prices. The effect of a hold strategy is to delay development for reasons that have little or nothing to do with transportation infrastructure. Second, on several parcels in this part of Segment 1 we can again see the impact of the adjacent railroad line limiting available frontage road and creating some small irregularly shaped parcels that are more difficult to access. However, there has still been impressive growth along this segment.

**Figure 19**

**Parcel Data for Segment 1 of the President George Bush Turnpike  
(Independence Parkway to Highway 75 Only)**



As noted in the October 27, 2005, edition of the Dallas Morning News, the developer of the 190 Central Retail Center on the south frontage road notes that the primary attractant for the development is the 110,000 cars per day that pass his location on the PGBT. This is in addition to a Fry's Electronics Superstore on the north side of the PGBT.

Much more than along the Dallas North Tollway, the PGBT has attracted industrial development. The new Texas Instruments chip fabricating facility is located just to the east of the Triquint plant, which specializes in gallium arsenide semiconductors, forming a cluster of high-tech activity.<sup>6</sup>

As with other segments of the PGBT, single family residences predate the PGBT both to the north in Plano and south in Richardson. The bulk of single family homes predate 1990. However, there is some newer housing to the east of Shiloh, north of Renner.

#### *Segment 1d – State Highway 75 to Renner Road*

Parcel data for Segment 1 from State Highway 75 to just south of Renner Road shows a continuation of industrial development focused primarily in the high-tech sector, in particular telecommunications. While this sector of the regional economy grew tremendously during the 1990s, generating substantial industrial property development both before and after the opening of the PGBT, the sector suffered massive employment losses that are reflected in the notable drop in new industrial space development shown in Figure 16 after 2002.<sup>7</sup> As shown in Figure 20, Cisco has not built a new building since

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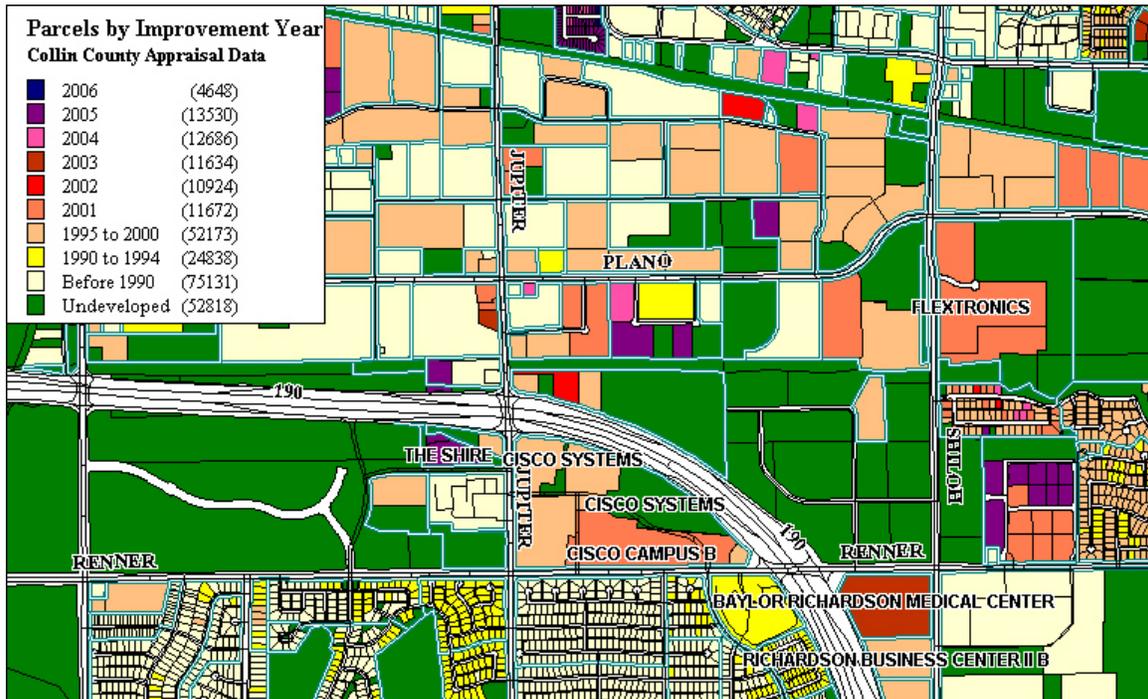
<sup>6</sup> The gallium arsenide foundry was originally owned by Texas Instruments.

<sup>7</sup> Even though the tech-wreck occurred in 2001, there were facilities already under construction that came online in 2001 and 2002. Flextronics, a contract manufacturer of electronics products, who are located just north of PGBT, is one example of a firm that moved in at the downturn.

the Cisco Campus B building was completed in 2001. Since 2003 there has been a slight uptick in industrial development activity that holds promise for continued industrial development along the PGBT corridor.

**Figure 20**

**Parcel Data for Segment 1 of the President George Bush Turnpike  
(Highway 75 to Renner Road Only)**



South of Renner there are a number of neighborhoods that were built prior to the construction of the PGBT. While there is some infill, the majority of home construction predates development. Development appears to be industrial and office, with some in health care—Richardson Hospital relocated to a larger facility with more services such as cancer treatment. The hospital will have an effect of increased numbers of doctor’s offices and medical services offices.

One particular development deserves specific mention. The Shire, located at the southwest intersection of PGBT and Jupiter Road (see Figure 20), is a mixed use

development with shops, restaurants, and offices. This type of mixed use, new urban design may hold particular promise for development in close proximity to highly-traveled toll facilities.

*Segment 1 – Summary*

In sum, development along Segment 1 of the PGBT is dominated by residential development in terms of total building space (see Table 11 and Figure 16). Much of the single family residential development pre-dates the opening of the PGBT by several years. However, it does appear that apartment development saw a substantial anticipatory boost in development coinciding with the opening of frontage roads. More than any other roadway segment analyzed in the study of the DNT or PGBT, Segment 1 of the PGBT has drawn substantial industrial development (almost 11 million square feet) and office space (7 million square feet). The 7.4 million square feet of retail development has undoubtedly been attracted by the traffic flow along the PGBT, as note above, and the presence of nearby residential properties.

**Table 11**

**Development by Type  
President George Bush Turnpike  
(Midway Road to Campbell Road)  
1985-2005**

<b>Land Use</b>	<b>Square Feet of Building Space</b>	<b>Taxable Value*</b>
Office	7,373,899	\$ 634,179,930
Industrial	10,859,770	\$ 481,630,610
Retail	7,425,393	\$ 812,968,053
Apartments	13,072,814	\$ 764,706,695
Single Family Residential	22,274,131	\$ 2,207,079,942

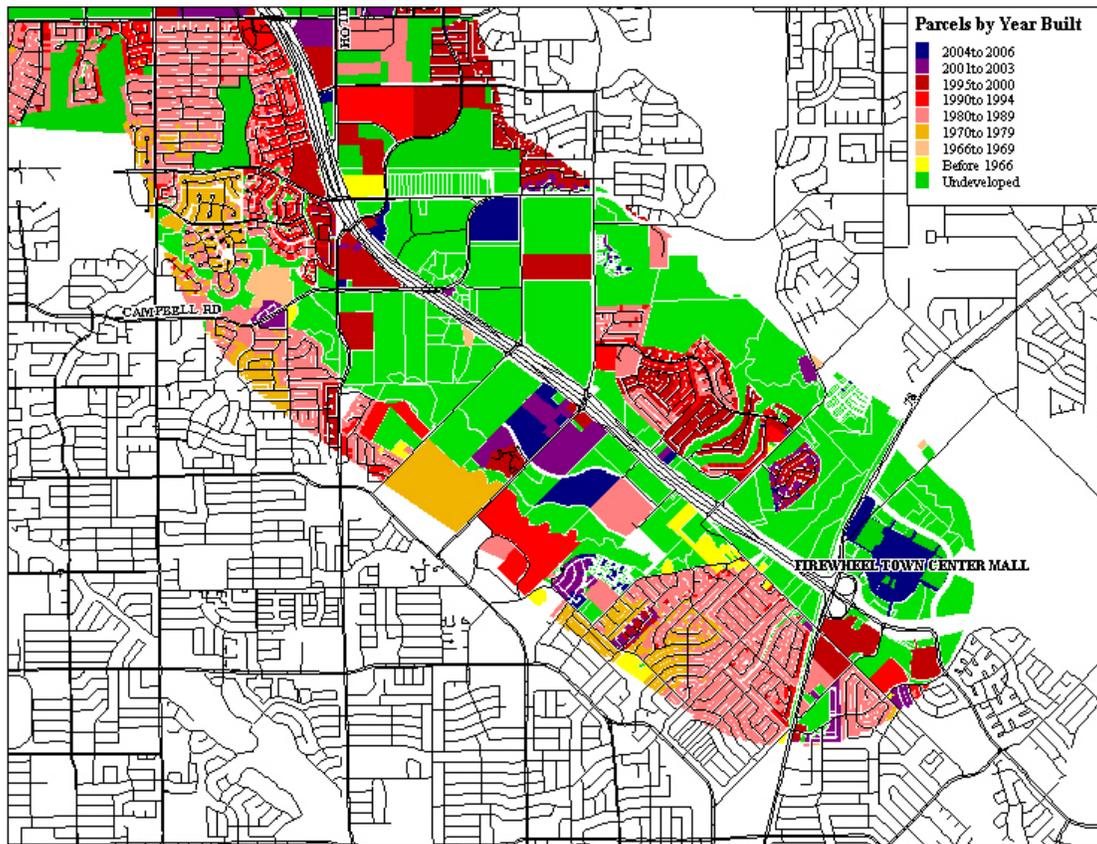
Source: Dallas Central Appraisal District, Collin County Appraisal District. \* Real property value (not including business personal property).

## Segment 2 – Campbell Road to State Highway 78

Segment 2 of the PGBT runs from Campbell Road to State Highway 78. More so than even Segment 1, Segment 2 has substantial vacant land available for development (see Figure 21). This reflects the previously noted strategies of a few large land holders. Still, as shown in the detailed discussions below, there have been several noteworthy developments along Segment 2.

**Figure 21**

### Land Parcels within One Mile of the President George Bush Turnpike Segment 2 By Year of Land Development



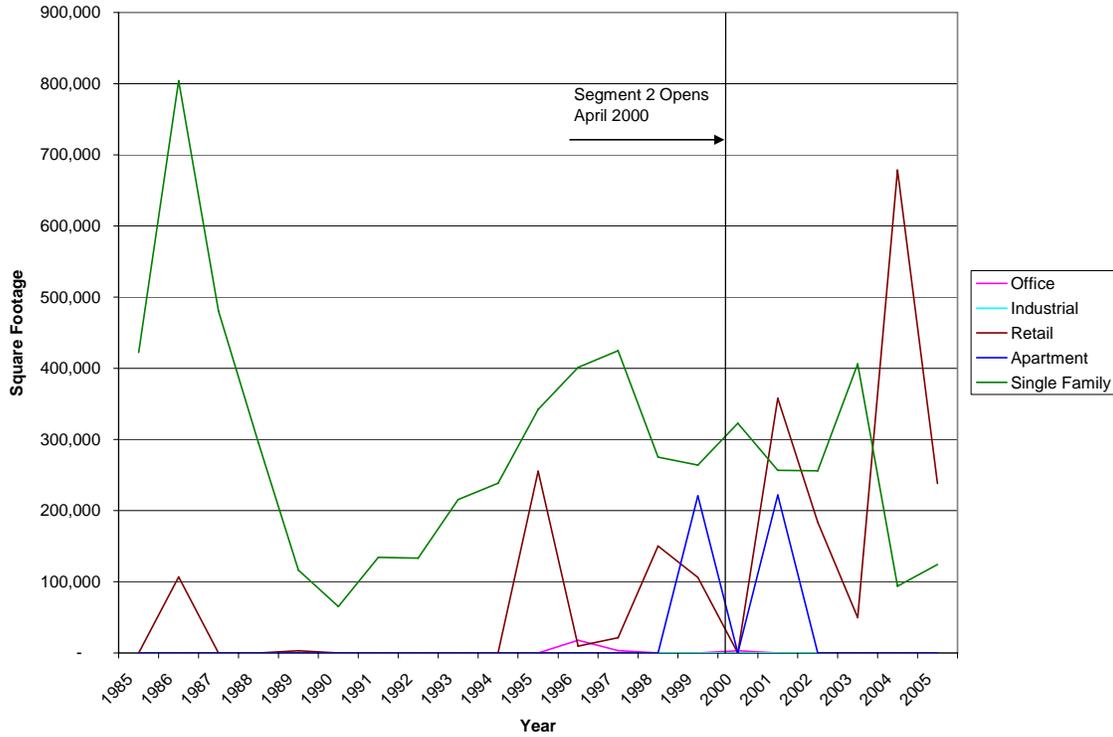
Single family residential development near the PGBT in Segment 2 has occurred much more recently, especially in the Firewheel area of the City of Garland northwest of the 190 / 178 intersection. Home builders in that community specifically noted the

construction of the PGBT as an amenity for these neighborhoods in promotional materials and presentations. In our judgment, the presence of the PGBT is a larger influence on single family residential markets in this area than most because of a dearth of significant alternative arterial roads in the area—particularly arterials serving east-west traffic patterns.

Though there is limited existing zoning for multifamily properties along Segment 2, there has been some apartment development activity immediately preceding and just after this segment's opening. Retail, as most everywhere, has followed the development of residential properties. However, the large spike of retail development in 2004 at Firewheel Mall can be directly attributed the availability of a major east-west roadway enhancing the effective retail trade area (see Figure 22). To date, however, there has been very little office development and no industrial development along Segment 2. Since 1985, there has been over 6 million square feet of single family residential space developed, 2 million square feet of retail space, and 442,000 square feet in apartments in this portion of the PGBT (see Table 12).

**Figure 22**

**New Development in Square Feet of Building Space by Year  
President George Bush Tollway  
(Campbell Road to Highway 78 Only)**



**Table 12**

**Development by Type  
President George Bush Tollway  
(Campbell Road to Highway 78)  
1985-2005**

Land Use	Square Feet of Building Space	Taxable Value*
Office	24,214	\$ 2,784,100
Industrial	--	--
Retail	2,160,485	\$ 172,445,890
Apartments	442,886	\$ 37,500,000
Single Family Residential	6,073,338	\$ 464,237,538

Source: Dallas Central Appraisal District, Collin County Appraisal District. \* Real property value (not including business personal property).

## Summary

Employing our land use planning model, we can state that the development associated with the construction of the PGBT has contributed significantly to local economic growth. That growth includes almost 130,000 jobs, over \$8.6 billion in taxable property values<sup>8</sup>, and about \$2.8 billion in retail sales.

Proximity to the PGBT does seem to have some positive influence on overall development. As shown in Figure 25, we examined annual development in total land area (acres) within ½ mile of the PGBT and within 1 mile of the turnpike. The recession of 2001 dramatically slowed development in both areas, again confirming our belief that overall market forces are the driving force behind property development. However, it does appear that those properties closer to the tollroad are experiencing a more rapid pace of development during the current economic recovery. We cannot draw any conclusions based on this limited sample, but it does appear that the tollroad can help spark development activity.

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<sup>8</sup> Including business personal property value, but not including tax abatements, exemptions, and other incentives.

**Figure 25**

**Total Development in the President George Bush Turnpike Corridor  
Segments 1-3  
1996-2005**



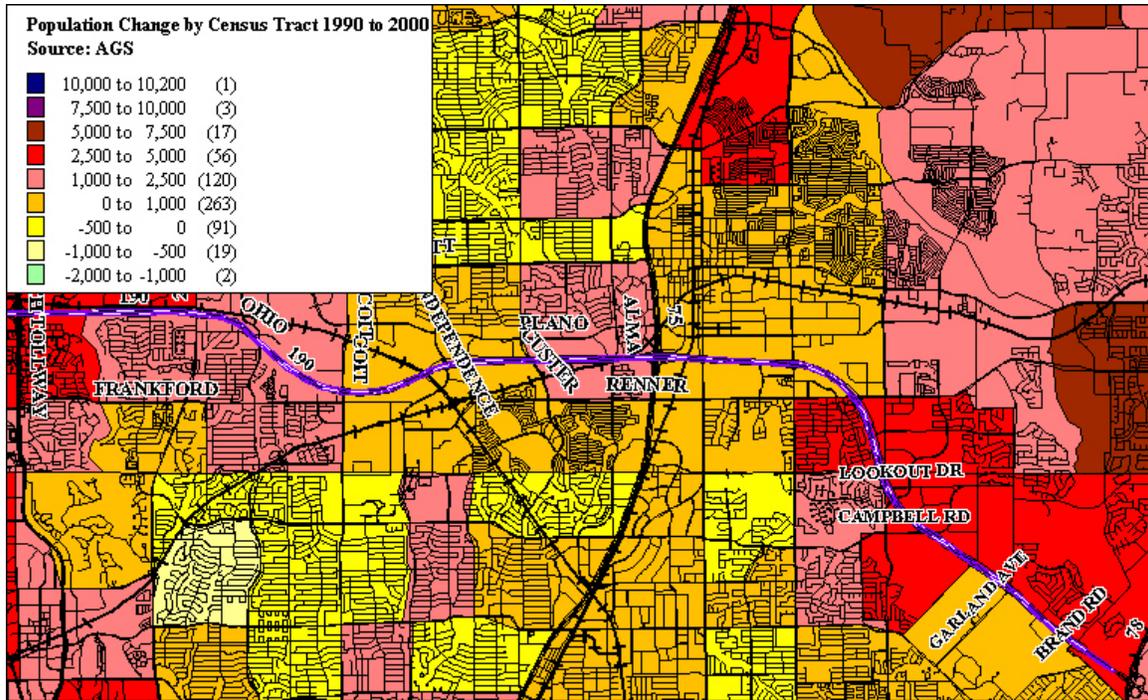
The professional and academic literature suggest that it is possible for a new roadway (because it attracts development) to have an impact on local population and income. Examining Figure 26 indicates that recent population growth (1990 to 2000) has, in some areas, concentrated around the PGBT. Of course, this is likely an artifact of previous growth having leap-frogged the path of the turnpike in the 1980s or before—as suggested in previous figures showing growth in residential areas.<sup>9</sup> Nonetheless, some

<sup>9</sup> The geographic boundaries of the census tracts also impacts population change due to the varying size of each tract.

the area's strongest growth during the most recent census period shows a correlation between population growth and the PGBT.

**Figure 26**

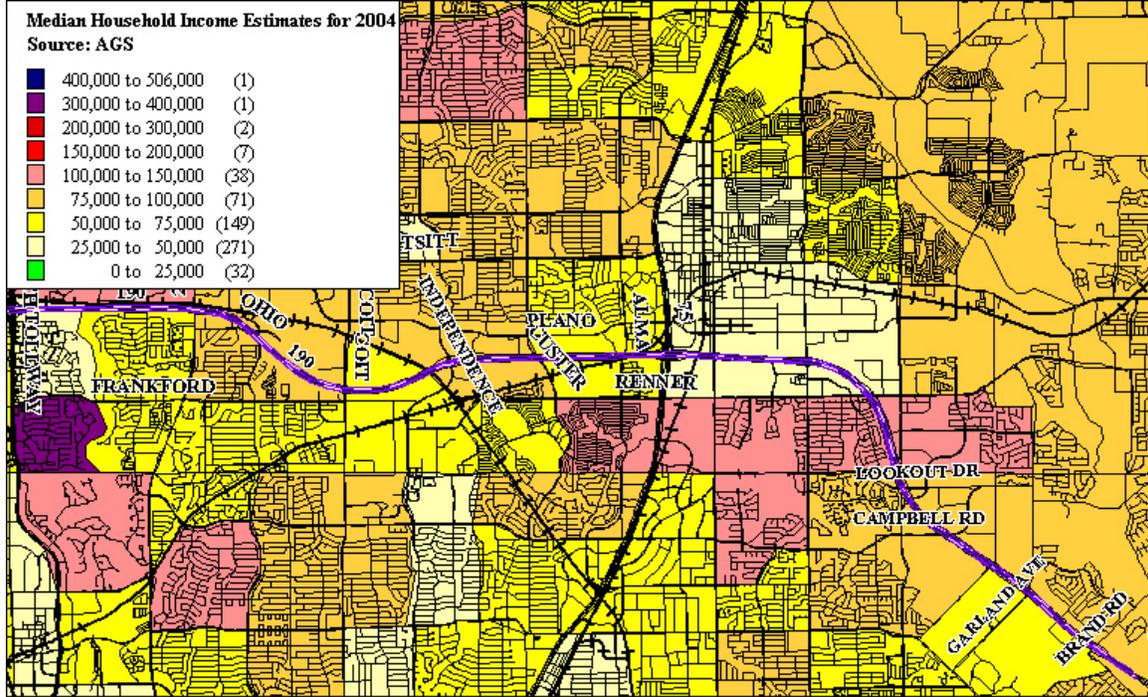
**Population Change by Census Tract Near the PGBT  
1990-2000**



There is little visual evidence of a relationship between income and the PGBT, suggesting that broader economic forces are dominate any infrastructure effects. See Figure 27, which maps median household income along the PGBT.

Figure 27

Median Household Income Estimates By Census Tract Near the PGBT  
2004



## Supplemental Case Study: DNT Versus State Highway 75

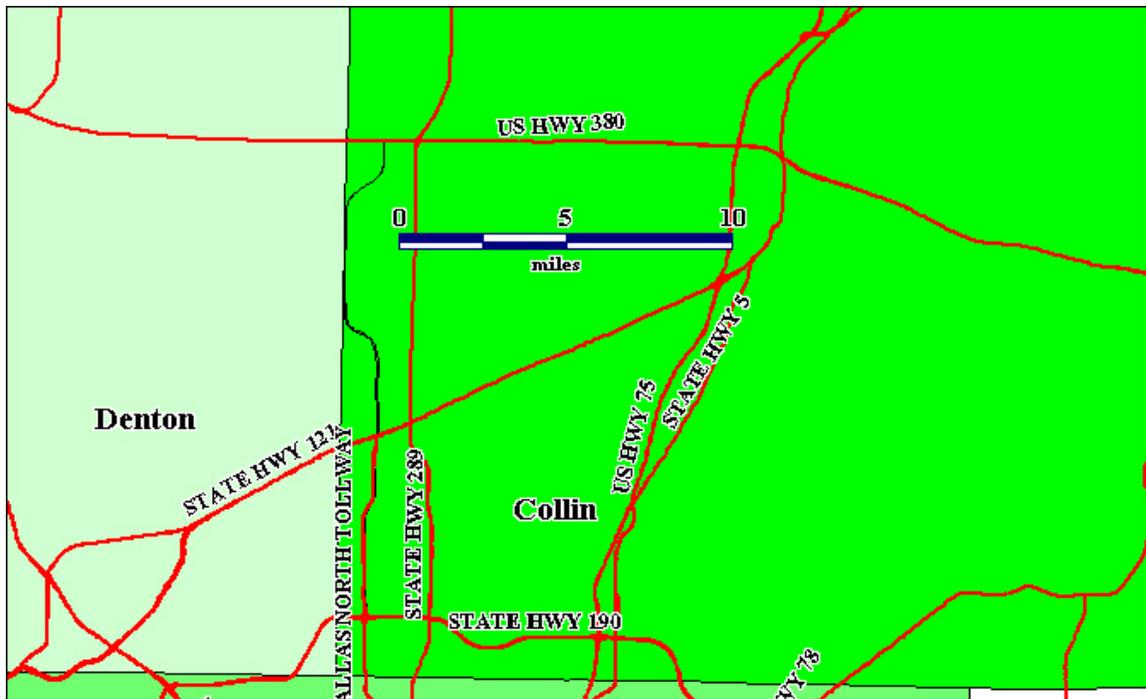
### Introduction

The location of the Dallas North Tollway in relation to State Highway 75 (SH 75) offers an opportunity to examine differential impacts of tollroad versus free-road infrastructure of local property development. The Dallas North Tollway (DNT) and SH 75 both are north-south roads that extend north into Collin County and have had an impact on development in one of the fastest growing counties in Texas.

Figure 1 shows that both roads are within roughly ten miles of each other for most of Collin County. Also the DNT is currently open only to Gaylord which is just north of State Highway 121 (SH 121). The black line indicates the path that the phase 3 extension will take from Gaylord Parkway to State Highway 380 (SH 380) in Frisco.

Figure 1

### Dallas North Tollway Phase 3 Extension



## **The Dallas North Tollway (DNT) in Frisco**

The extension into Frisco—from Legacy Drive in Plano to Gaylord Parkway in Frisco, a length of 1.5 miles—was opened on April 6, 2004. The Phase 3 extension that will run from Gaylord Parkway north to SH 380 is scheduled for completion in September 2007 and will measure 9.6 miles in length.

The street file for Collin County appears in Figure 2. It indicates the presence of neighborhoods in proximity to the DNT. The DNT is just to the east of the border of Collin County and Denton County. The Collin County Central Appraisal District is responsible for appraising all parcels within the City of Frisco, so their parcel layer extends into the portion of Denton County that is within Frisco limits.

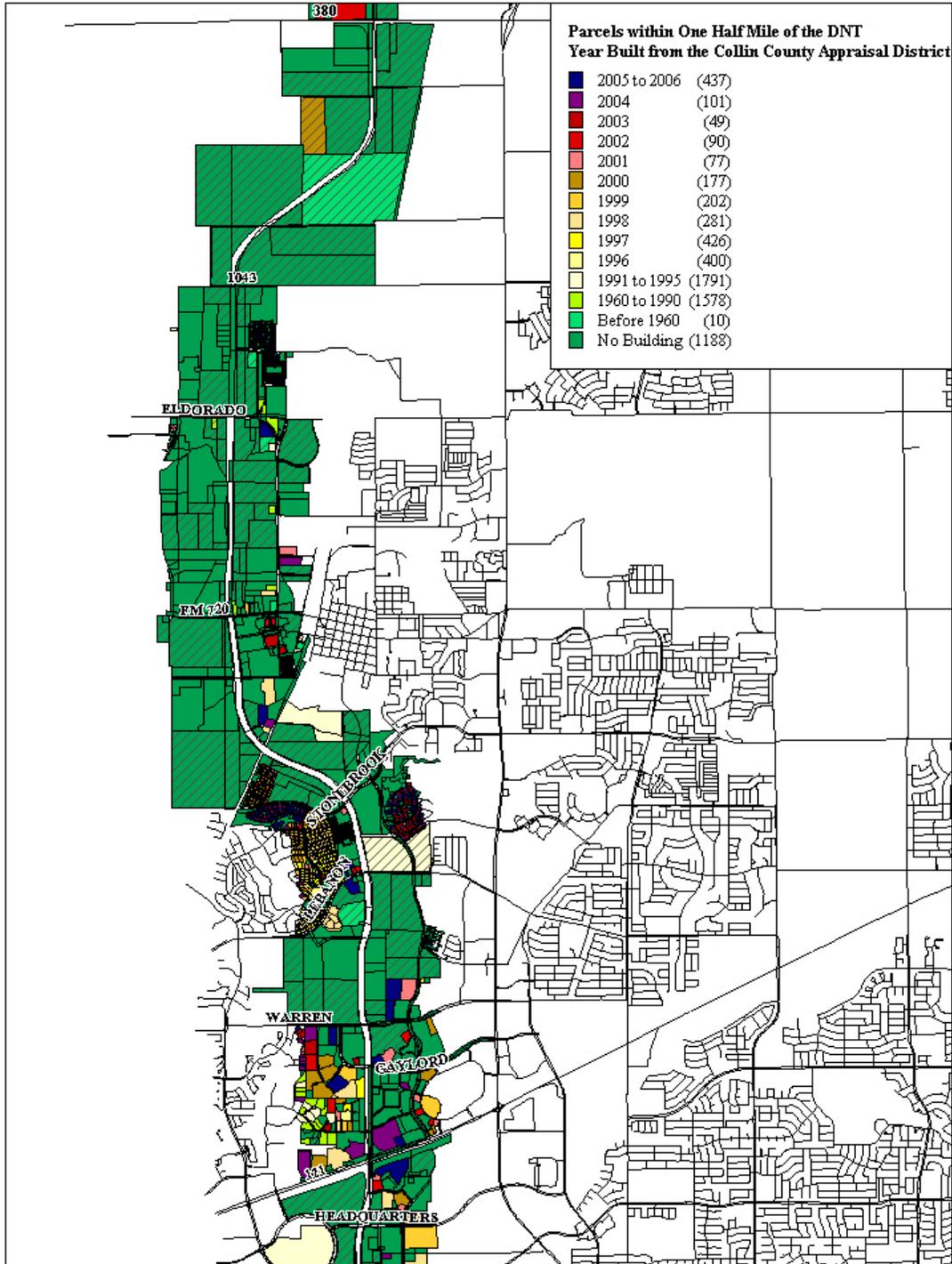
Frisco is one of the fastest growing cities in North Texas. In the area surrounding Phase 3, clusters of new homes are being built north between Lebanon and Stonebrook and are due to open next year.

Figure 2 also shows parcels within ½ mile of the DNT that have agricultural exemptions. These are marked by diagonal lines. The significance of the agricultural exemption is that it indicates that the owner may inexpensively continue to maintain the land as undeveloped by performing some basic agricultural activities on the land. Thus, the owner—often an investor or investment trust in Collin County—can wait for a much longer time before developing or selling the land for development. Identifying a large number of parcels with an agricultural exemption may indicate that development will take place at a slower rate than expected.

There are no parcels with agricultural exemptions within Frisco south of Gaylord, i.e., within ½ mile of the completed DNT segment between Legacy and Gaylord. (Note that 121 is the boundary between Frisco and Plano.)

Figure 2

Current Development along Dallas North Tollway  
Phase 3 Extension



### **State Highway 75 in McKinney**

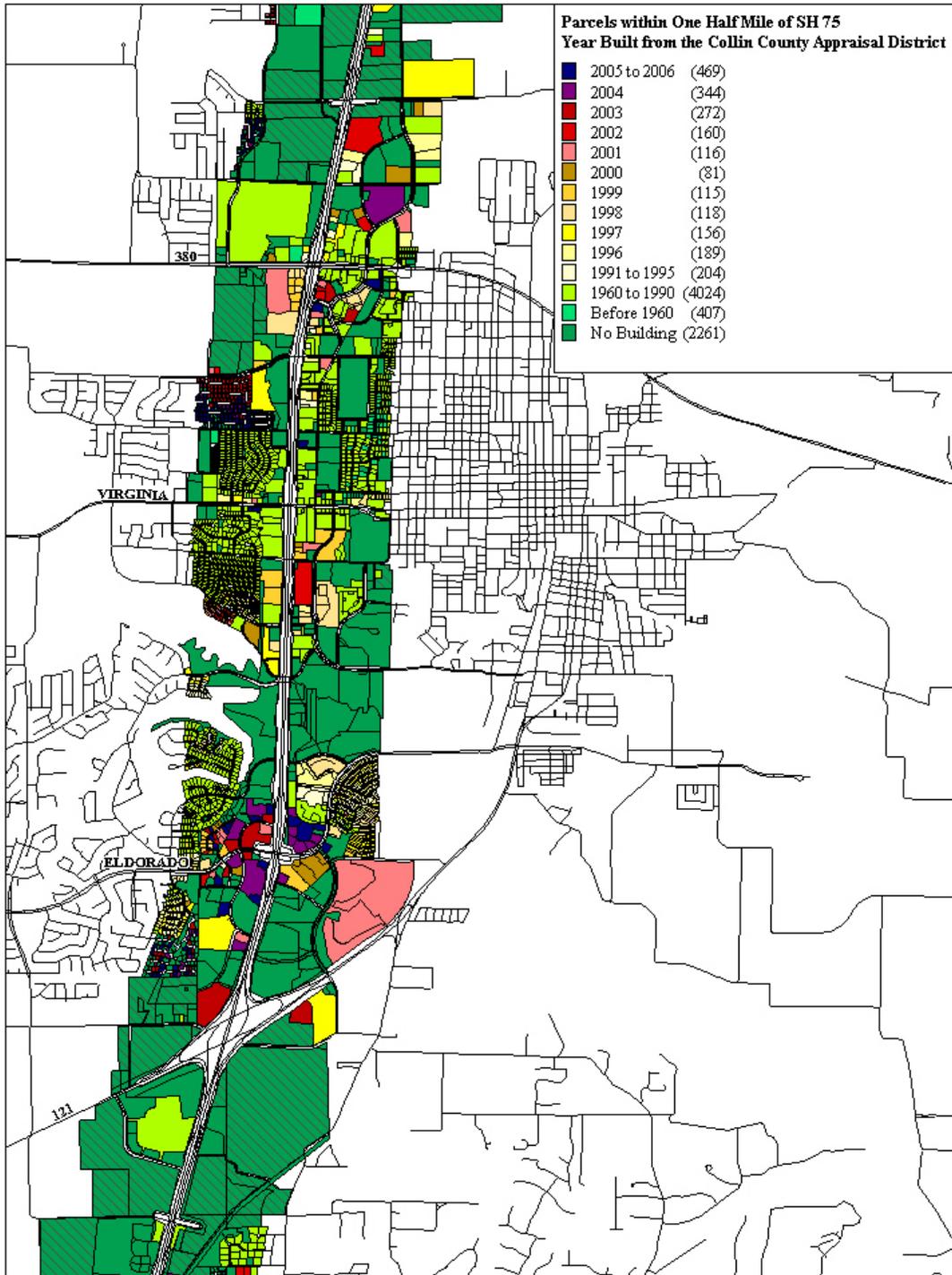
The segment of SH 75 that is between SH 121 and SH 380 is considerably older than the DNT. It also continues farther north into Grayson County. There is more development along SH 75 than along the DNT in Frisco.

Recently, a number of commercial clusters have been built along SH 380 and Eldorado Parkway.

While there are a number of parcels with no buildings within ½ mile of SH 75, there are very few with an agricultural exemption within the City of McKinney, between SH 380 and SH 121. See Figure 3.

Figure 3

Current Development along State Highway 75 in McKinney



## Dallas North Tollway in Plano

Within Plano there remain a number of large parcels with agricultural exemptions that are within ½ mile of the Dallas North Tollway. See Figure 4.

Figure 4

### Current Development along Dallas North Tollway in Plano

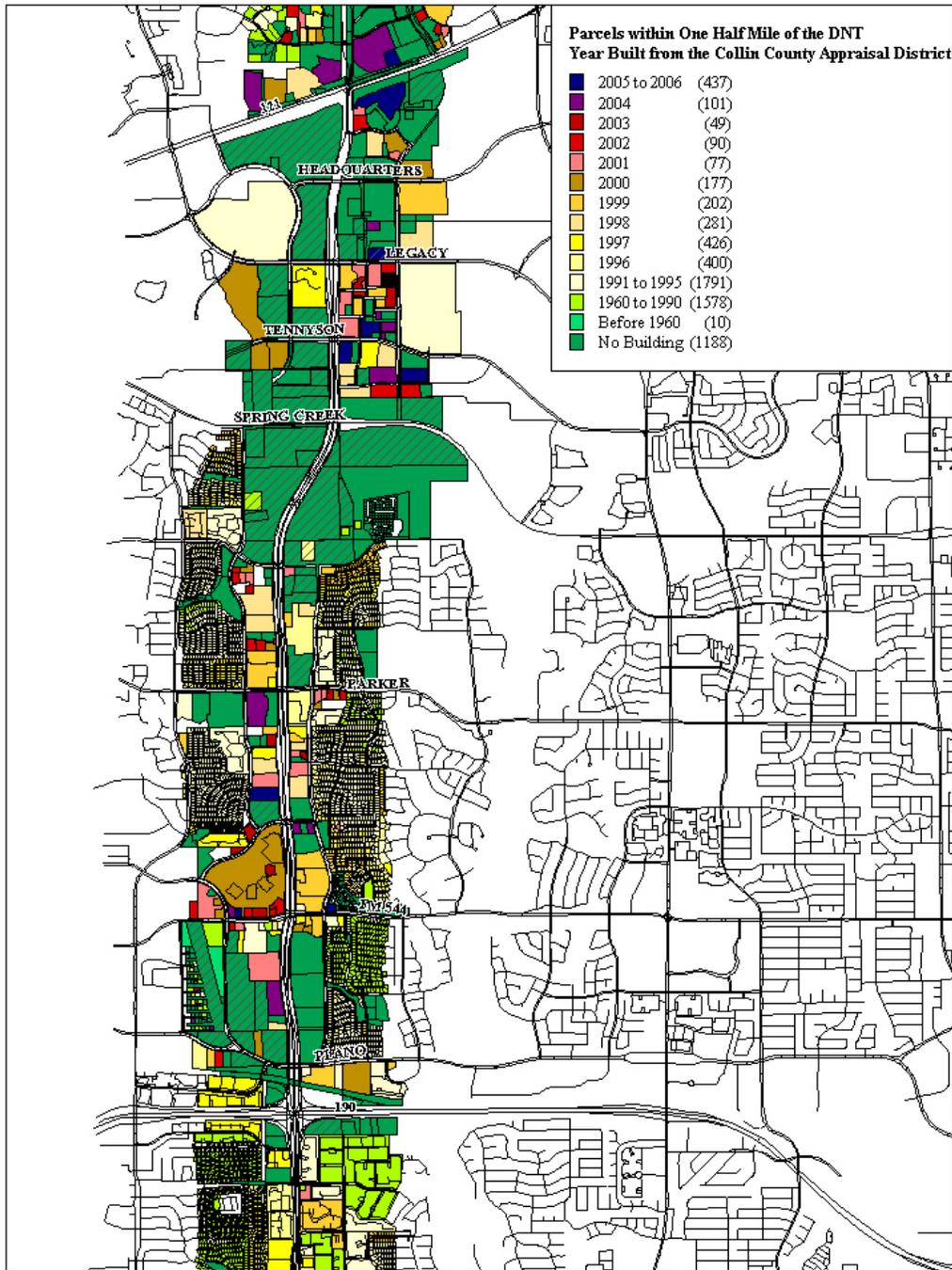
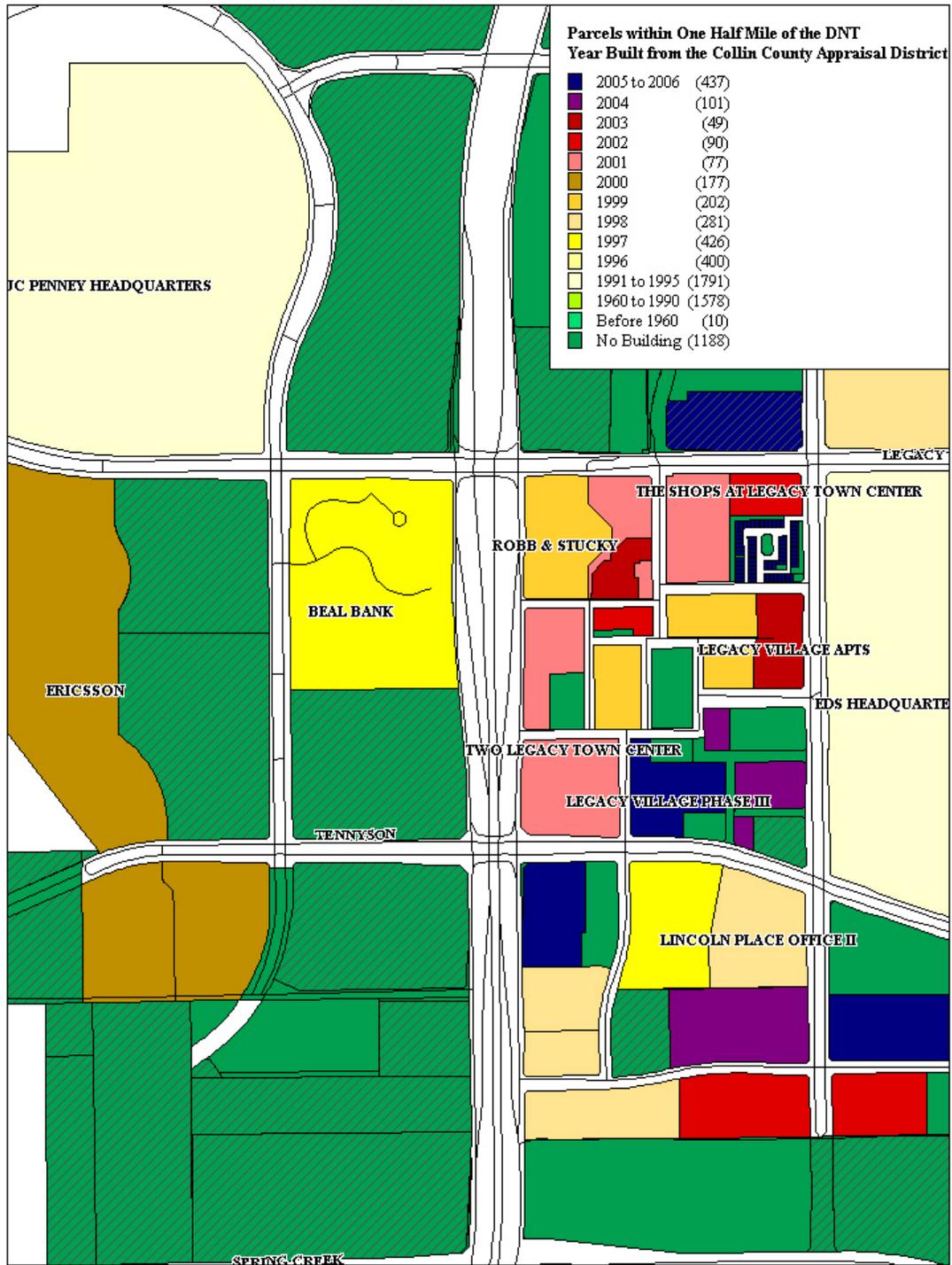


Figure 5 shows a cluster of development along the DNT and Legacy Drive in Plano. It is within what was originally an office park that began with Electronic Data Systems (EDS). The area shown in Figure 5 is to the west of the EDS Headquarters. It has become a mixed use retail, office, apartment, and town home development.

Also, visible is the presence of agricultural land. A good example of the use of an agricultural exemption is the parcel that is just to the east of the J. C. Penney headquarters. J. C. Penney owns that undeveloped parcel and the parcel just to the north of that parcel. Through the use of the exemption, the cost of retaining those parcels is very inexpensive; however, it slows development.

Figure 5

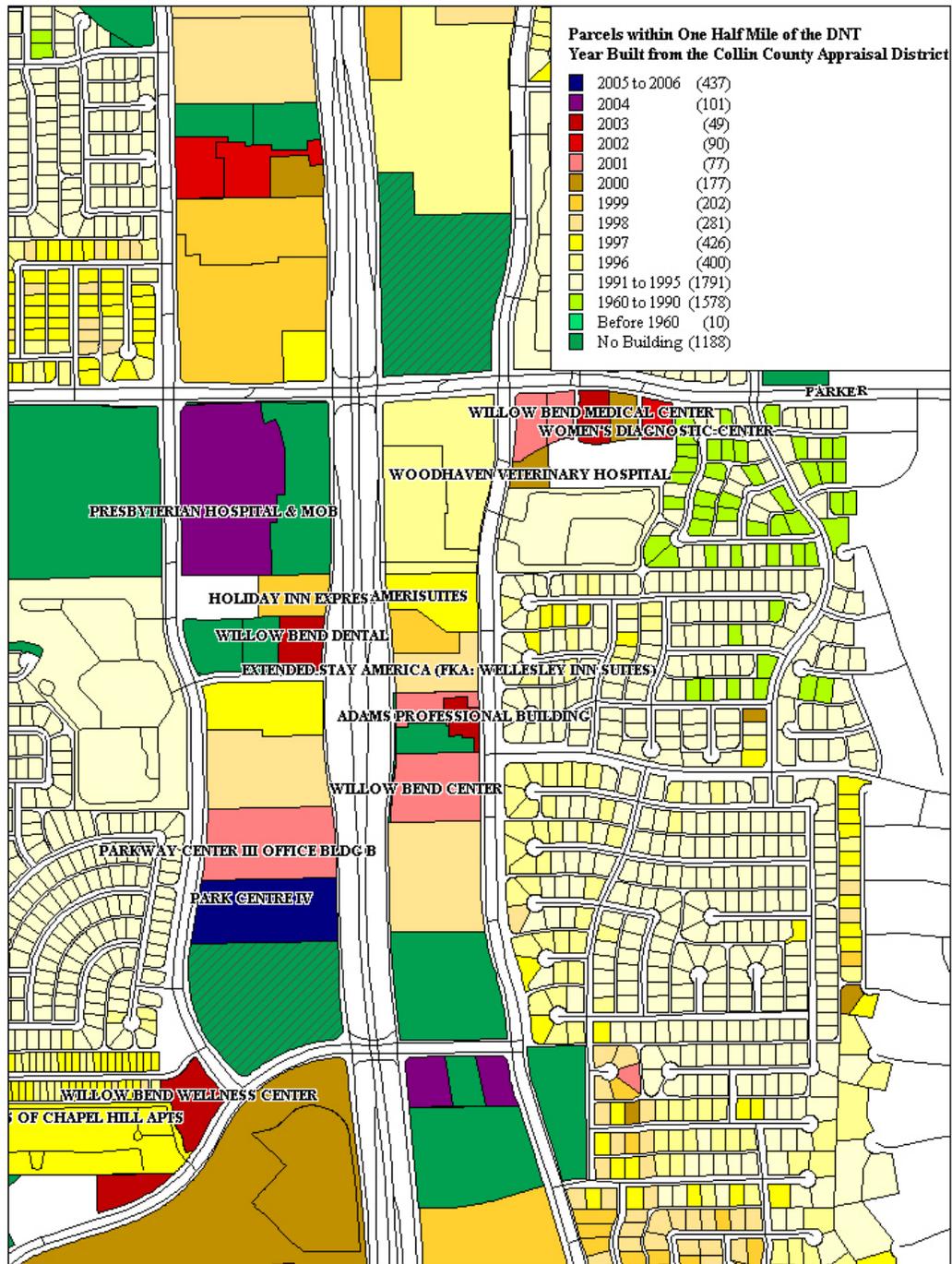
Current Development along Dallas North Tollway and Legacy Drive in Plano



Farther south in Plano by the intersection of Parker and the DNT the influence of Presbyterian Hospital is seen (see Figure 6). The hospital is just to the west on Parker Road. Note the number of new medical related businesses. The presence of the hospital has resulted in the development of a health care cluster.

Figure 6

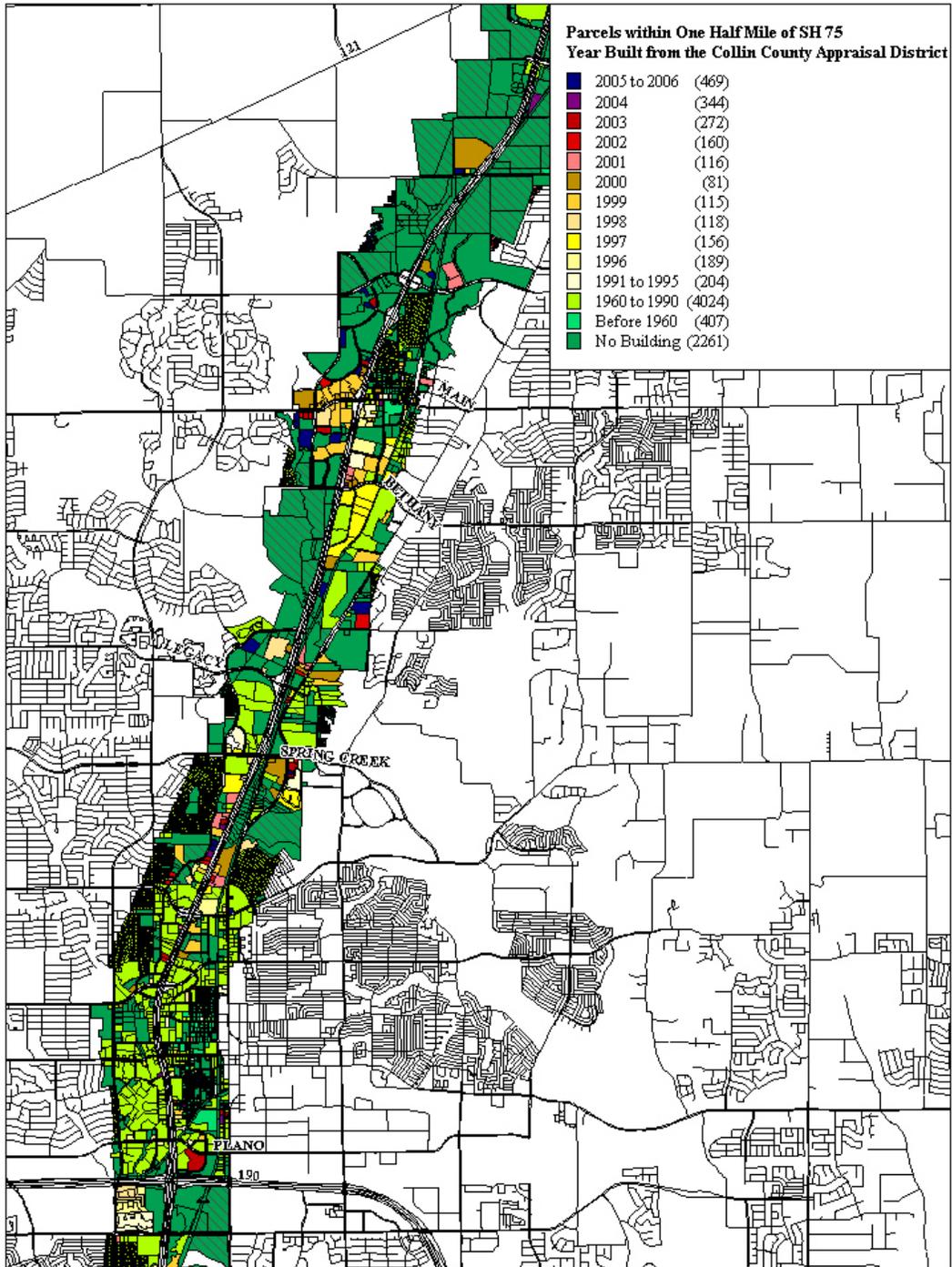
**Current Development along Dallas North Tollway and Parker in Plano**



# SH 75 Allen and Plano

## Figure 7

### Current Development along SH 75 in Allen and Plano

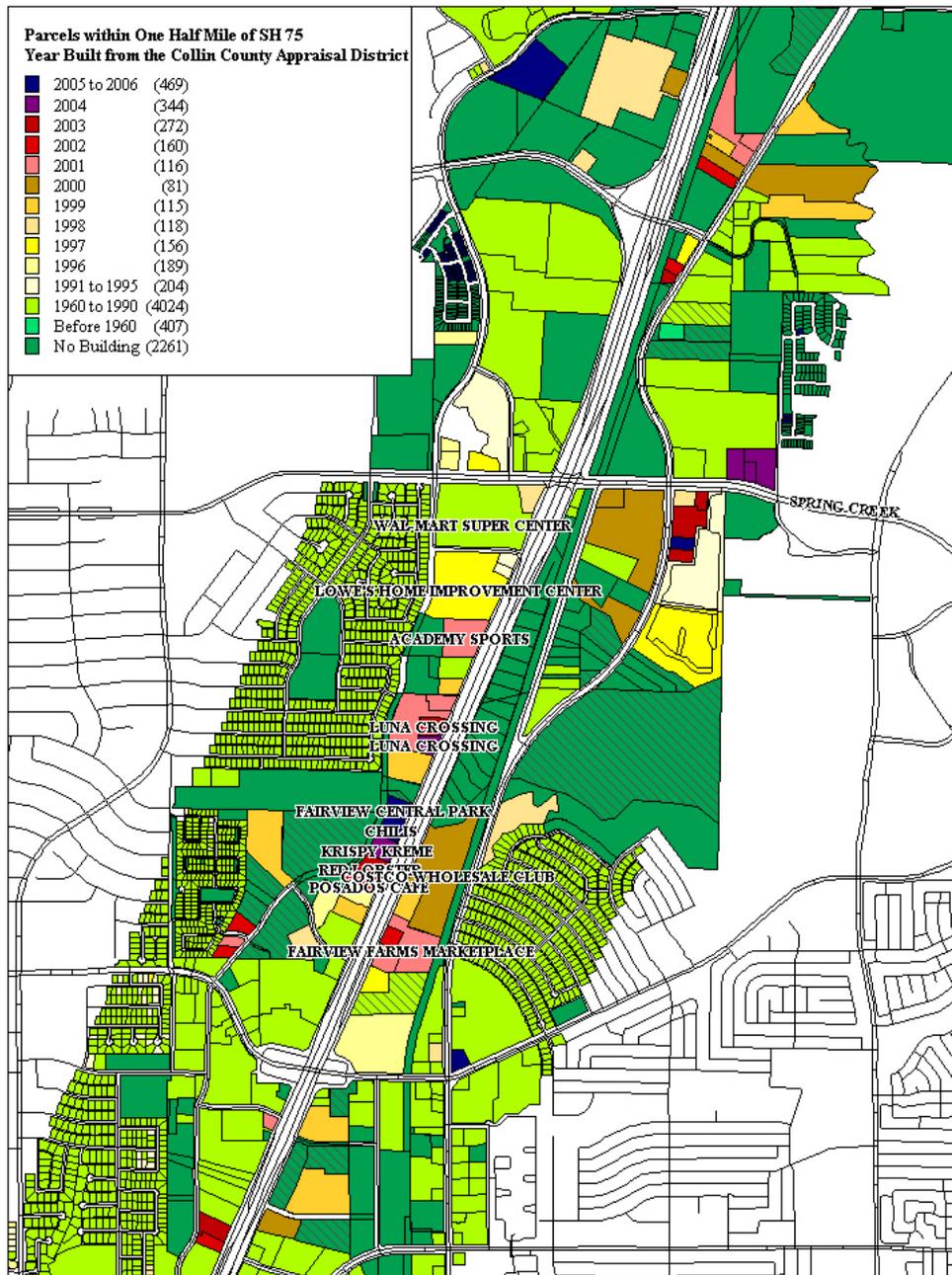


One growth cluster is just to the south of Spring Creek. South of WalMart, a number of retail businesses and restaurants have opened in the last five years.

While the residential areas are considerably older and the neighborhoods are built out, there remain a number of commercial parcels on 75. Note the number of parcels on the east side and the existence of parcels with an agricultural exemption (see Figure 8).

**Figure 8**

**Current Development along SH 75 at Spring Creek**



## **Conclusion**

While SH 75 and the Dallas North Tollway are in close proximity and provide access from the northern suburbs to Dallas, the two roads differ in age and range. SH 75 is considerably older and extends north from Dallas to the Canadian border. Its origin is US Route 75, and construction began in 1926.

Development on the eastside of Plano—SH 75 is on the eastside—is considerably older than on the westside where the DNT is located. The residential areas were built out a number of years ago. Within Plano, there is some infill by SH 75. A number of retail businesses have opened fronting on SH 75 in the past five years. Also, a number of undeveloped parcels remain available on SH 75 in Plano.

The northern range of the DNT is within Collin County. In looking at development in Plano and Frisco, it appears that development is linked to the building of the tollway. Residential construction appears before the completion of each segment and following completion of apartments, retail is next.

While there remain available parcels that front on the Dallas North Tollway, clusters of commercial development are evident shortly after the completion of each segment. We speculate that the difference between development on SH 75 and the DNT is more rapid development along the DNT.