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# *The Impact of Commuter Rail Transit*

Estimating the net impact on average home values  
commuter rail transit would have on Ann Arbor, Dearborn,  
and Freedom Township in the State of Michigan

*A Plan B Master's Degree Paper*

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## *I. Executive Summary*

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**PURPOSE OF REPORT** This report provides an analysis of the net impact that Commuter Rail Transit may have on home values in three municipalities in Southeast Michigan (“Michigan Study Area”). The report is the culmination of a three-month study of comparable markets, concluding with the net impact of a commuter rail system on a municipality’s average home values.

**Michigan Study Area Defined.** For this report, we evaluated the potential impact commuter rail transit has on average home values in the communities of Ann Arbor, Dearborn, and Freedom Township.

**Comparable Market Defined.** To qualify results of the net impact of commuter rail transit on a community, a comparative market that has an established system was examined. For this report we have chosen the Dallas-Ft. Worth market in Texas. Specifically, the Cities of Ft. Worth, Irvine, and Aledo.

**Estimated Net Benefits Defined.** Throughout the report we identified, where possible, the *estimated net* benefits of commuter rail transit. These are the benefits *after* deducting the “likely” events that would otherwise have occurred in the region without the operation of the commuter transit system.

**Commuter Rail Transit Defined.** Commuter rail systems can be defined as rail service between a central business district and suburbs or vice-versa, and from other locations that draw large numbers of people to a concentrated area.<sup>1</sup>

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1. Source: Memphis Online, “Let’s Learn From Nashville’s Rail”, 2006.

Commuter rail does not, however, include light rail or rapid transit service.

Light rail generally requires construction of new track and overhead electric circuits to power the trains. Commuter rail service is generally powered by diesel fuel rather than electricity and is typically built to run on the same tracks utilized by freight trains.

## **POTENTIAL BENEFITS OF COMMUTER RAIL TRANSIT**

In this report, we focused on identifying the impact of commuter rail transit on average home values on a municipality, therefore this approach is more clearly a regional impact study. We have not “drilled down” to examine the impact of station location on a local market, nor have we determined distance of rail track from home vs. value increase or decrease.

There are other potential benefits that the commuter rail brings to the region. These benefits may include: improved environmental quality, increased safety of travel, reduction in travel costs, increased employment opportunities, higher density development near stations, increased tax revenue for municipalities, and improved access to name a few. These potential benefits are important, however, they are not quantified in this report.<sup>2</sup>

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2. Source: Transit Now, “Kenosha-Racine-Milwaukee Commuter Rail Extension”, December 2002.



**OVERVIEW OF  
APPROACH**

Our analysis included the following steps:

1. The collection and management of data from several sources, including the US Census, the State of Michigan, the State of Texas, each municipality in the study area and comparable market area, and ESRI, Inc.
2. A comparison of the Southeast Michigan Study Area to an established commuter rail system in Central Texas.
3. An analysis of the socio-economic and demographic characteristics of the primary markets, neighboring counties and, the States of Michigan and Texas.
4. An analysis of the changes in average home values for comparable markets.
5. An economic impact analysis providing a measure (multiplier) that commuter rail has on average home values in the comparable municipalities.
6. An assessment of the portion of these changes that represent new or additional changes in the municipality, above those that would otherwise occur if the commuter rail system were not in operation.
7. A review of recent literature that focus on the impact of commuter rail.
8. A discussion of results benefits the commuter rail has on economies, but which are not quantified in this study.
9. Measuring the additional impacts that may contribute to a change in average home prices.

9. An application and analysis of the measures to the Michigan Study Area to quantify the impact of commuter rail to a municipalities' average home values.

## **CONSERVATIVE APPROACH TO MEASURING NET BENEFITS**

The approach we have taken is a broad view impact analysis. However, we have attempted to calculate only the *net* benefit, that is, the benefit *after* subtracting out the estimated income, population, employment, or other benefits that may have otherwise impacted average home values in the municipality regardless of whether commuter rail was constructed.

For example, we calculate the benefit of the market's household income levels, the changes in population and households, and the unemployment rates of that market. We then apply these measures to the changes in average home values before concluding the result is the sole effect of the commuter rail system. As a result, we make a reasonable effort, when possible, to provide clear and quantitative results that are based solely on a single variable, the existence of commuter rail.

## **OVERVIEW OF FINDINGS**

### *Comparing the Michigan Study Area with Markets in Texas*

Our comparison of the Michigan Study Area with select municipalities in Texas found that:

- Although larger in Population and Households, the Texas markets had lower overall per capita and median household incomes levels. (See Exhibit 1 and Exhibit 5 in Appendix B)

- Although dissimilar in size (acreage), the populations of Freedom Township, Michigan and Aledo, Texas are comparable, separated by only a few hundred people, as of 2005. (See Exhibit 1 and Exhibit 5 in Appendix B)
- The 2005 Unemployment Rate in Texas was lower than the state average in Michigan (5.3% and 6.7% respectively). (See Exhibit 1 and Exhibit 5 in Appendix B)
- The average home values for all markets was lowest in Ft. Worth, Texas at \$110,296, and highest in Freedom Township, Michigan at \$328,804, nearly triple Ft. Worth. (See Exhibit 3 and Exhibit 7 in Appendix B)

#### *The Study Area Economies*

We further examined the Michigan Study Areas relative to each other. This helps us understand to what extent the municipalities effect the regional economies.<sup>3</sup> Some prominent socio-economic and demographic characteristics of these markets area are as follows:

- Despite no significant population change in Dearborn over the last five years, populations in Ann Arbor and Freedom Township are growing, albeit at a minimal rate of 0.7% and 1.0% respectively (see Exhibit 1 in Appendix B).
- Ann Arbor and Freedom Township both gained households from 2000 to 2005, whereas Dearborn had 0.1% negative growth over that period. The

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3. See "Socio-Economic and Demographic Analyses" on page 6 for further description of both the Michigan Study Area and Texas comparable market economies.

number of Households are expected to continue increasing for both Ann Arbor and Freedom Township, however, Dearborn is expected to remain stable from 2005 to 2010 (see Exhibit 1 in Appendix B).

- The Per Capita Income levels of Ann Arbor and Freedom Township were both higher than the state average, while Dearborn was slightly lower in 2005.<sup>4</sup> In addition the Median Household Income level for Freedom Township was significantly higher than the State average, while the levels for Ann Arbor and Dearborn remained consistent with that of the State (see Exhibit 1 in Appendix B).
- While data was unavailable for Freedom Township for unemployment rates, both Ann Arbor and Dearborn both posted lower percentage than the state average (see Exhibit 1 in Appendix B).

## **IMPACT**

Adjustments to a community's transportation system, such as implementing a commuter rail system, impact not only transportation, but also the economy; in this case average home values, in the communities nearby and within the rail line.<sup>5</sup> The results of the impact analysis can be found in "Appendix C: Impact Model and Results". Our analysis of the net benefit due to the introduction of commuter rail on average home values found that:

- 
4. The State of Michigan average per capita income for 2005 was \$25,633, and the Median Household Income level was \$50,118.
  5. Average Home Values normally increase as time moves forward regardless, the impact of commuter rail nearly increases or decreases the rate of growth.



- The results of the impact analysis for Ann Arbor shows an increase in average home values from \$314,812 to \$316,523 in 2007, and from \$366,927 to \$388,799 by 2010.
- The average home values for Dearborn increased from \$198,387 to \$200,901 in 2007, and from \$226,255 to \$237,942 by 2010.
- The results of the analysis for Freedom Township indicate a decrease in the rate of growth for average home values. Based on our analysis, the average home values in Freedom Township were \$41,768 lower with the commuter rail than without by year 2010.

All these measures are net benefits, meaning they have been calculated by subtracting out the likely economic factors that would have occurred by other economic events in the area if the Commuter Rail were not in operation, such as changes in population, households, per capita income, and unemployment.

We recognize that this analysis is partial, as it ignores many of the important benefits of the commuter rail system, including impacts on home values relative to distance from rail line or stations, tax dollars added to communities, added employment opportunities, as well as the local and state costs associated with construction and operation of the commuter rail system.

However, it does indicate an important finding: the possibility of increasing the average home values of communities such as Ann Arbor and Dearborn and improving the region's transportation network both at the same time. These

types of economic activities help generate attention to an area in the form of business recruitment, as well as improved attractiveness to potential residents.

A more detailed discussion on the economic benefits can be found in “Net Impact” on page 25.

## *II. Market Overview*

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In the sections below, we detail the Michigan Study Area and the comparable markets used in our analysis. In determining which market to use as a comparable market for this study, we first examined the makeup of the markets in the Michigan Study Area.

Second, we looked for markets with established commuter rail systems and examined the distance of the route between endpoints, distance of municipalities from each other, distance of municipalities from the rail line, and socioeconomic and demographics.

### **MICHIGAN**

The Michigan Study Area is comprised of the City of Ann Arbor, the City of Dearborn and Freedom Township.

**Ann Arbor.** Ann Arbor is a college-town, located approximately 30 miles west of the City of Detroit. Ann Arbor is the County Seat of Washtenaw County and is widely known as the location of the main campus of the University of Michigan. As of 2000, 82.4% of the cities 27.3 square miles of land had been developed.<sup>3</sup>

**Dearborn.** Dearborn is a suburban metro area adjacent (west) to the City of Detroit in Wayne County, and is east of Ann Arbor along Interstate 94. Consid-

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3. Source: Southeast Michigan Council of Governments (SEMCOG), <http://www.semco.org>

ering the city's proximity to Detroit, roughly 90% of the city's 24.5 square miles of land has been developed.<sup>4</sup>

**Freedom Township.** Freedom Township is a rural community approximately 10 miles southwest of Ann Arbor in Washtenaw County. Freedom Township is the largest market, in terms of area, in the Michigan Study Area. The Township covers an area of 35.6 square miles<sup>5</sup>, of which 5.8% has been developed.

See Map 1, "Michigan Study Area Overview and Proposed Commuter Rail Route," in Appendix A, for the market area overview.

## **TEXAS**

In researching markets with established, but relatively new, commuter rail systems in place, we discovered the Dallas, Texas to Ft. Worth, Texas commuter rail link. The system has been in place since 1996, and was extended to Ft. Worth in 2001.

The municipalities we choose to compare and analyze were the City of Ft. Worth, the City of Irving and the City of Aledo. Geographically speaking, these municipalities were comparable to the Michigan Study Area municipalities.

**Ft. Worth.** The City of Ft. Worth is located approximately 30 miles west of Dallas, and is the county seat of Tarrant County. Ft. Worth is the 19th-largest city in the United States and covers an area of approximately 300 square miles.<sup>6</sup>

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4. *Ibid.*

5. *Ibid.*

6. Source: United States Census Bureau



**Irving.** Irving is adjacent (west) to the City of Dallas in Dallas County. According to the US Census, the city covers a total area of 67.7 square miles.

**Aledo.** Texas is one of few states that does not have townships as a jurisdiction.<sup>7</sup> Therefore, we could not compare township to township and as such we compared Freedom Township to a market in Texas based on distance from the commuter rail line, the proximity to the other study areas (Ft. Worth and Irving), and similar population and household sizes. Aledo is a relatively small city approximately 15 miles southwest of Ft. Worth along Interstate 20, covering a total area of 1.9 square miles.

See Map 5, “Texas Study Area Overview and Commuter Rail Route,” in Appendix A, for the Texas market area overview.

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7. *Ibid*

### *III. The Model*

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Our goal in this study is to determine the potential net impact on average home values when commuter rail transit is introduced into a market. To evaluate how commuter rail translates into impact, we:

1. Determined annual average home values in three communities in Texas where commuter rail transit has been established.
2. Calculated average home values based on 1990-2000 growth rates before the rail was constructed and compared those with forecasted 2000-2005 and 2005-2010 growth rates after the rail was established to estimate the gross impact on average home value prices.
3. Applied those impacts to the three communities in Southeast Michigan (Study Area) to determine the estimated net impact the commuter rail would have on these communities from 2006 to 2010.

We accomplished this through the use of our economic model. The average home value impact model is used to determine the economic activity stemming from the introduction of commuter rail to a community. The model relies on data collected from US Census and ESRI, Inc, and includes 1990 and 2000 Census figures and ESRI estimates for 2005 and 2010. In the sections below, we outline the steps for completing the model.<sup>2</sup>

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2. See "Appendix C: Impact Model and Results" for the results of the Model.

In step 1, we input the average home values from 1990 to 2000 and 2000 to 2010 for the Texas comparable markets, as well as the calculated growth rates between those two periods. The commuter rail was non-existent prior to 1996 and would most likely had little impact from 1996 to 2000. We applied the growth rate from 1990 to 2000 to the average home values from 2000 to 2010, as this is the “status quo” scenario prior to commuter rail existing in the market.

We then calculated the 2000-2010 average home values based on the growth rates from 2000-2005 and 2005-2010 projections. The percentage change between the original values and those with the adjusted growth rates is determined to be the potential gross impact of commuter rail on the Texas comparable markets.

In step 2, we determined the average home values in the Michigan Study Areas between 2000 and 2010 based on 2000 to 2005 and 2005 to 2010 growth rates. This was our benchmark to calculate the change in average home values between unadjusted and adjusted average home values.

In order to quantify the weight of each economic factor, we measured the 2000-2005 Compounded Annual Growth Rates (CAGR) for each market. If the market’s CAGR was higher than the state average, the market received a 2. If the market’s CAGR was comparable to the state average, the market received a 1.

Likewise, if the market's CAGR was under the state average, the market received a 0.<sup>3</sup> Applying these numbers to the results adjusts the impact on average home values, and helps us gauge the net economic impact of commuter rail.

The model is then used to calculate the change in average home values based on the introduction of commuter rail transit to a community. We choose not to begin applying the impact to values before 2007 since 2006 is more than half over.

The substitution effects were averaged, divided by 100, and subtracted from '1' to determine the percentage of the gross impact that would be applied as a result. The largest reduction the substitution effect can have in this model is 2%. For instance, if a municipality scores all '2s' in five categories, the average (2) is then divided by 100 (.02), and finally subtracted from '1' (.98 or 98%).

The substitution effect accounts for the likely substitution of other economic activities for increases to home values, should the commuter rail never have been established. These "substitution" effects were then weighted against the gross impact to arrive at an estimated net direct economic impact figure. The results can be found in section "Impact of Commuter Rail" on page 25

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3. Note that for unemployment rates, we assigned lower numbers for lower rates. If the market's CAGR was higher than the state average, then the market would receive a 0. Likewise, if data was unavailable for any market in any economic category, we considered the market aligned with the state average and assigned a 1.



## *IV. Literature Review*

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This literature review is an essential step in analyzing the impact of commuter rail on home values. An analysis of the results of these reports and studies provides insight into the impacts of commuter rail on property value in general and strengthens the methodology of this report.

### **READINGS**

The following subsections provide a brief summary and analysis of methodologies used in the reviewed literature.

#### **KENOSHA-RACINE-MILWAUKEE CORRIDOR TRANSIT STUDY. PRELIMINARY REPORT. TRANSIT NOW, DECEMBER 2002.**

The study concluded that commuter rail enhances economic development, workforce development, and has a perceived value which increases the value of local communities. Through an alternatives analysis the study also found that between Commuter Rail, Combination Bus and Rail, and Commuter Bus that Commuter Rail provided:

- The best transportation option for serving low income and minority populations;
- The best access to the most jobs; and
- The best overall impact on highway traffic reduction.

**LAND VALUE IMPACTS OF RAIL TRANSIT SERVICES IN SAN DIEGO.  
ROBERT CERVERO AND MICHAEL DUNCAN, JUNE 2002.**

This study found appreciable land-value premiums for different land uses in different rail-transit corridors in Sand Diego County. The most appreciable benefits were: 46% premiums for condominiums and 17% for single-family housing near Coaster commuter rail stations in the north country; 17% and 10% premiums, respectively, for multifamily housing near East Line and South Line Trolley stations; and for commercial properties, 91% premiums for parcels near downtown Coaster stations and 72% for parcels near Trolley stations in the Mission Valley.

**THE BOSTON GLOBE: RAIL LINES BOOSTING HOME VALUES,  
JANUARY 12, 2002.**

This Boston Globe article provided an analysis of data on home prices between 1995 and 2001, that showed the median price of single-family homes nearly doubled in 19 communities after they gained MBTA commuter rail services. The methodology used in this analysis was unclear, however, it appears as though the analysis simply evaluated the median home values from year to year of communities with commuter rail stops.

**CHARLOTTE OBSERVER: COMMUTER RAIL LINE DRIVES UP PRICE  
OF LAND, JULY 7, 2002.**

This press publication addressed the impact on land values along the South End leg of the light rail corridor that opened in 2006 in Charlotte, North Carolina. The article reported that land values have doubled, and in some cases tripled, in

the past four years. The analysis was based on the City Assessor's evaluation of results from two home value studies conducted four years apart.

**TRANSIT'S VALUE-ADDED: EFFECTS OF LIGHT AND COMMUTER  
RAIL SERVICES ON COMMERCIAL LAND VALUES.  
ROBERT CERVERO & MICHAEL DUNCON, NOVEMBER 2001.**

This research uncovered significant capitalization benefits on distance of a LRT station in Santa Clara County CA, increased land values on average by over \$4.00 per square foot, or by around 23 percent. For properties in commercial business districts and within a quarter mile of a CalTrain commuter rail stop, the capitalization premium was even larger, over \$25 per square foot, or more than 120% above the mean property value.

**IMPACTS OF RAIL TRANSIT ON PROPERTY VALUES.  
RODERICK B. DIAZ, MAY 1999.**

The 1999 report found that property value premiums due to increases in accessibility range between 3% and 40%. The relative increase in accessibility provided by the new transit investment was found to be the primary factor in increasing property values. Conversely, slightly negative impacts of rail on property values were attributed to noise, visual intrusion, and the association of the rail right-of-way with industrial uses.

In general, both proximity to rail and investment in rail transit have positive impacts on property values. Additionally, the effect of a new fixed guideway transit investment benefits two ways. First, transit investments improve accessibility to other parts of a region via station locations. Second, rail transit accessi-

bility enhances the attractiveness of property, increasing the likelihood that the property can be developed or redeveloped to a higher or better use.

The report utilized the results of several recent studies to determine the impact of twelve rail projects (including both heavy rail and light rail) throughout North America. Several measures were assessed in the process including sales prices of single-family homes, apartment rents, and median home values.

**RAIL TRANSIT INVESTMENTS, REAL ESTATE VALUES, AND LAND  
USE CHANGE: A COMPARATIVE ANALYSIS OF FIVE CALIFORNIA  
RAIL TRANSIT SYSTEMS.  
JOHN LANDIS, ET AL, 1995**

This report did not find any significant impact on home values based on the proximity to a rail station. However, homes within 300 meters of a CalTrain right-of-way typically sold for \$51,000 less than comparable homes not within 300 meters of a rail station. The study areas were defined by measuring ground distance from the nearest station.

**IMPACTS OF COMMUTER RAIL SERVICE AS REFLECTED IN SINGLE-  
FAMILY RESIDENTIAL PROPERTY VALUES.  
ROBERT J. ARMSTRONG, JR., 1994.**

In this report, single-family residential properties in metropolitan Boston, Massachusetts, are examined. Results of the analysis indicate that there is an increase in single-family residential property values of approximately 6.7 percent by virtue of being located within a community having a commuter rail station. At the regional level there appears to be a significant impact on single-family residential property values resulting from the accessibility provided by commuter rail service.

The study area covered municipalities with 50% or more of their land area within 10 miles of the commuter rail line. The report focused primarily on nuisance complaints near the right-of-way, and the location of rail stations to determine the overall impact.

**CAPITALIZATION OF TRANSIT INVESTMENTS INTO SINGLE-FAMILY HOME PRICES.  
JOHN LANDIS, ET AL, 1994.**

This analysis identified no discernible positive or negative impact of commuter rail or rapid transit in general. Property values varied greatly from mode to mode and location to location relative to non transit proximate property. The study also found that the extent to which a rail system captures ridership from its market area affects the extent to which property values are increased. Overall, frequency of service and regional accessibility affect the value of a rail system.

## **SUMMARY**

While this study only touched on the impact of commuter rail on home values, there are several publicly available reports that address an array of results with varying methodologies for measuring the impacts of commuter rail. After reviewing these reports, it is clear that this report looks at the impact of commuter rail differently. This report adds to the current literature in the following ways:

- No analysis was found that identified the implied impact on average home values,
- Few reports provided a model similar to the one used in this report,

- The use of the “substitution effect” provided in this report was not found in other reviewed reports, and
- Few studies provided a defined study area similar to this report.

Overall, the literature review revealed the numerous benefits and positive impacts of commuter rail, and showed that the majority of property values increased as a direct or indirect result of commuter rail.

It is worth noting that the author and researcher John Landis, who has written several articles and reports on the impact of commuter and light rail transit, has found that property values have risen and decreased following the introduction of commuter and light rail. And that there is no discernable impact based on these types of transit.

## *V. Socio-Economic and Demographic Analysis*

In order to fully understand commuter rail's economic contribution to local economies, we must first understand the markets of the study area, which is defined to include Ann Arbor, Dearborn, and Freedom Township in Michigan. To accomplish this, we have evaluated the populations and households, household incomes, employment, and average home values in the sections below.

### **POPULATION & NUMBER OF HOUSEHOLDS**

As evidenced by Table 1 below, the overall population of the State of Michigan is rising, at a rate of .7%. All of the communities, with the exception of Dearborn, experienced positive changes in population from 2000-2005. These trends are expected to continue from 2005-2010.

**TABLE 1. Population Profiles**

Geography	Population				Compound Annual Growth Rate (CAGR)		
	1990	2000	2005	2010	1990-2000	2000-2005	2005-2010
<i>State of Michigan</i>	9,295,297	9,938,444	10,310,273	10,731,309	0.7%	0.7%	0.8%
<b>Ann Arbor</b>	110,134	113,092	117,116	123,263	0.3%	0.7%	1.0%
<b>Dearborn</b>	89,395	95,267	97,900	98,092	0.9%	0.0%	0.0%
<b>Freedom Township</b>	1,404	1,562	1,643	1,729	1.1%	1.0%	1.0%

*Source: US Census and ESRI, Inc.*

The number of households is also important in determining the economics of a region. The State of Michigan outpaced the study area from 1990 to 2000 in growth of households, however from 2000 to 2005, Freedom Township exceeded the State of Michigan's growth. The number of households for the Study Area has increased, and is projected to continue to do so. Again, the exception to the rule is Dearborn, which posted a -0.1% annual loss of house-

holds from 2000-2005, but is not expected to gain or lose households from 2005-2010. Table 2 below displays the results of the household growth analysis.

**TABLE 2. Household Profiles**

<b>Geography</b>	<b>Number of Households (HH)</b>				<b>Compound Annual Growth Rate (CAGR)</b>		
	<b>1990</b>	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>1990-2000</b>	<b>2000-2005</b>	<b>2005-2010</b>
<i>Michigan</i>	<i>3,419,331</i>	<i>3,785,661</i>	<i>3,980,867</i>	<i>4,176,763</i>	<i>1.0%</i>	<i>1.0%</i>	<i>1.0%</i>
<i>Ann Arbor</i>	<i>41,697</i>	<i>45,112</i>	<i>47,710</i>	<i>50,954</i>	<i>0.8%</i>	<i>1.1%</i>	<i>1.3%</i>
<i>Dearborn</i>	<i>35,482</i>	<i>36,809</i>	<i>36,682</i>	<i>36,686</i>	<i>0.4%</i>	<i>-0.1%</i>	<i>0.0%</i>
<i>Freedom Township</i>	<i>523</i>	<i>561</i>	<i>607</i>	<i>649</i>	<i>0.7%</i>	<i>1.6%</i>	<i>1.3%</i>

*Source: US Census and ESRI, Inc.*

## **INCOME FIGURES**

If the incomes of individuals and households in a market area are increasing, then potentially, more people can be expected to spend money, buy more expensive houses, etc., in turn adding value to the locale. Table 3, "Income Profiles," on page 23 shows the income trend in the Study Area.

All markets experienced an annual growth in both per capita and median household income, from 2000-2005. Although increasing, the growth in per capita and median household income in Dearborn was under 2% at 1.7% and 1.9%, respectively. The market with the highest growth was Ann Arbor, with a 2.9% growth in Per Capita Income levels and 2.3% growth in Median Household Incomes.



TABLE 3. Income Profiles

Geography	Per Capita Income				Median Household (HHld) Income			
	2000	2005	CAGR 2000-2005	Projected 2010	2000	2005	CAGR 2000-2005	Projected 2010
Michigan	\$22,711	\$25,633	2.5%	\$30,029	\$44,683	\$50,118	2.3%	\$55,605
Ann Arbor	\$27,324	\$31,597	2.9%	\$37,626	\$46,248	\$51,824	2.3%	\$59,544
Dearborn	\$21,942	\$23,916	1.7%	\$27,314	\$44,576	\$48,927	1.9%	\$54,024
Freedom Township	\$27,051	\$31,059	2.8%	\$36,564	\$63,872	\$71,318	2.2%	\$81,347

Source: US Census and ESRI, Inc.

## LABOR MARKET

Equally important to the level of income for the region is the number of people actually who are employed, and unemployed for that matter. Table 4 shows that the majority of markets are experiencing relatively high unemployment rates.

To put these numbers into perspective, the current national unemployment rate is 4.8%. The only market in the analysis under the national average was Ann Arbor, Michigan at 4.5%.<sup>2</sup>

TABLE 4. Unemployment Profiles

Geography	Unemployment Rate			
	1995	2000	2005	CAGR 2000-2005
Michigan	5.3%	3.7%	6.7%	12.6%
Ann Arbor	2.3%	2.5%	4.5%	12.5%
Dearborn	3.0%	2.7%	5.5%	15.3%
Freedom Township <sup>a</sup>	-	-	-	-

Source: Bureau of Labor Statistics - Not Seasonally Adjusted

a. Data not available.

2. The low water mark for each of the markets' unemployment rate occurred in 1999, however the data also illustrates the volatility of the markets from 1995 to present as there are few consistencies between then and now. -Source: Bureau of Labor Statistics

**PROPERTY VALUES**

Table 5, “Average Home Values,” on page 24 details how the average home values of the markets have changed from 1990 to 2005 and what the forecast shows for 2010. Freedom Township had the highest average home value in 2005, at \$328,804. Inversely, Dearborn had the lowest average home value in 2005 at \$181,669.

**TABLE 5. Average Home Values**

Geography	Average Home Value				Compound Annual Growth Rate (CAGR)		
	1990	2000	2005	2010	1990-2000	2000-2005	2005-2010
Michigan	\$73,927	\$137,227	\$175,940	\$225,638	6.4%	5.1%	5.1%
Ann Arbor	\$137,461	\$212,403	\$283,919	\$366,927	4.4%	6.0%	5.3%
Dearborn	\$79,382	\$148,341	\$181,669	\$226,255	6.5%	4.1%	4.5%
Freedom Township	\$100,809	\$241,105	\$328,804	\$430,329	9.1%	6.4%	5.5%

Source: US Census and ESRI, Inc.

**Note on Data Precision.** This analysis is based on survey data from the US Census and the Bureau of Labor Statistics, as well as supplemental data and analysis from ESRI, Inc. Every effort is made to represent the data completely and accurately without bias.

## *VI. Impact of Commuter Rail*

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As it would pose a change in environmental impacts, safety, and development, commuter rail transit is more than just an alternative to automobiles. Commuter rail transit also adds increased access to employment, recreation, family, and entertainment. As such, access to commuter transit is a major consideration for residential location, which we quantify below.

### **SUBSTITUTION EFFECT**

In completing this impact analysis, we have researched, and examined, numerous economic impact analyses on the matter of transit. In most cases, the impact to the economy was based on a multiplier. As is the case in this report, as we have taken sufficient steps to find a true indicator (multiplier) of the impact commuter rail has on a community.

The economic impact is based on several economic factors in the community, however it does not take into account the costs associated with the development of the commuter transit system. Considering this, we have weighted the *gross economic benefit*, meaning just the increase of average home values alone, against the other economic factors in consideration—such as population, income, and employment—to conclude with a net economic benefit to a community. We have considered these economic factors to be the substitution effect.

Table 6 below shows the numbers used to weigh in the economic factors that may have a role in increasing or decreasing average home values.

**TABLE 6. Substitution Effect Parameters**

<b>Geography</b>	<b>Population Effect</b>	<b>Household Effect</b>	<b>Per Capita Income Effect</b>	<b>Median HHld Income Effect</b>	<b>Unemployment Effect</b>
Ann Arbor	1	1	2	1	1
Dearborn	0	0	0	0	0
Freedom Township	1	2	2	1	1

## **NET IMPACT**

The multiplier that results from weighing in substituted economic activity, is what we refer to as the net direct impact. To remain consistent in our measures, we have applied the impact from years 2001 to 2004 to the Michigan Study Areas 2007 to 2010 numbers.<sup>2</sup> Using the values from the Texas comparable markets from 2006 to 2010 would show what would have been likely to occur had the commuter rail been established in the Michigan Study Area pre-2001, as is the case in Texas.

Table 7 below shows the potential impact of commuter rail on average home values in the Michigan Study Area. The average home values in all markets dips slightly in the first year, however by 2008, average home values for the majority of the study area markets begin increasing at an increasing rate.

In Ann Arbor, average home values increased from \$331,497 to \$339,181 in 2008, and from \$366,927 to \$388,799 in 2010. In Dearborn the multiplier

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2. As shown in Table 7 on page 27, we have calculated the net impact beginning with 2007 as 2006 is more than half way over.

increases from 1.013 in 2007 to 1.052 by 2010, creating a net increase in average home values of \$11,687 by 2010.

Suprisingly, there is a negative effect on average home values in Freedom Township, and even though the average home values are increasing, the values are increasing at a lower rate than the status quo values.<sup>3</sup>

**TABLE 7. Impact on Michigan Study Areas**

	<b>Ann Arbor</b>			<b>Dearborn</b>			<b>Freedom Township</b>		
	Original Value	Multiplier	<i>Net Impact</i>	Original Value	Multiplier	<i>Net Impact</i>	Original Value	Multiplier	<i>Net Impact</i>
<b>2007</b>	\$314,812	1.005	<i>\$316,523</i>	\$198,387	1.013	<i>\$200,901</i>	\$365,967	.965	<i>\$352,992</i>
<b>2008</b>	\$331,497	1.023	<i>\$339,181</i>	\$207,315	1.026	<i>\$212,601</i>	\$386,095	.944	<i>\$364,303</i>
<b>2009</b>	\$349,066	1.041	<i>\$363,460</i>	\$216,644	1.038	<i>\$224,983</i>	\$407,331	.923	<i>\$375,976</i>
<b>2010</b>	\$366,927	1.060	<i>\$388,799</i>	\$226,255	1.052	<i>\$237,942</i>	\$430,329	.903	<i>\$388,561</i>

## **CONCLUSIONS**

The results of this analysis are positive for the study area communities. Both Dearborn and Ann Arbor stand to benefit, in terms of increasing home values. The results indicate that there can be positive impacts on home values for a municipality and some negative.

Although the majority of the study area markets improved their average home value prices, the reverse effect occurred in Freedom Township. This may be due to a number of scenarios, including:

1. The more attractive locale is near the commuter rail line, and Freedom Township is furthest from the route,

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3. It is important to note, that average home values continued to increase with time in Freedom Township, but at a slower rate than if the commuter rail had not been introduced.

2. The rural character of the community may be perceived to be threatened with the construction of a commuter rail in the market area,
3. The home value market plateauing once values begin to rise for surrounding markets.

Another factor to consider from the results is the notion that increasing property values may not be what a community wants. In some cases the opposite is true. For example, California's housing affordability is becoming a crisis, where home values are outpacing incomes in the area.<sup>4</sup>

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4. See: <http://www.cbia.org/index.cfm?pageid=1154>

## EXHIBIT 1. Michigan Study Area Overview and Proposed Commuter Rail Route

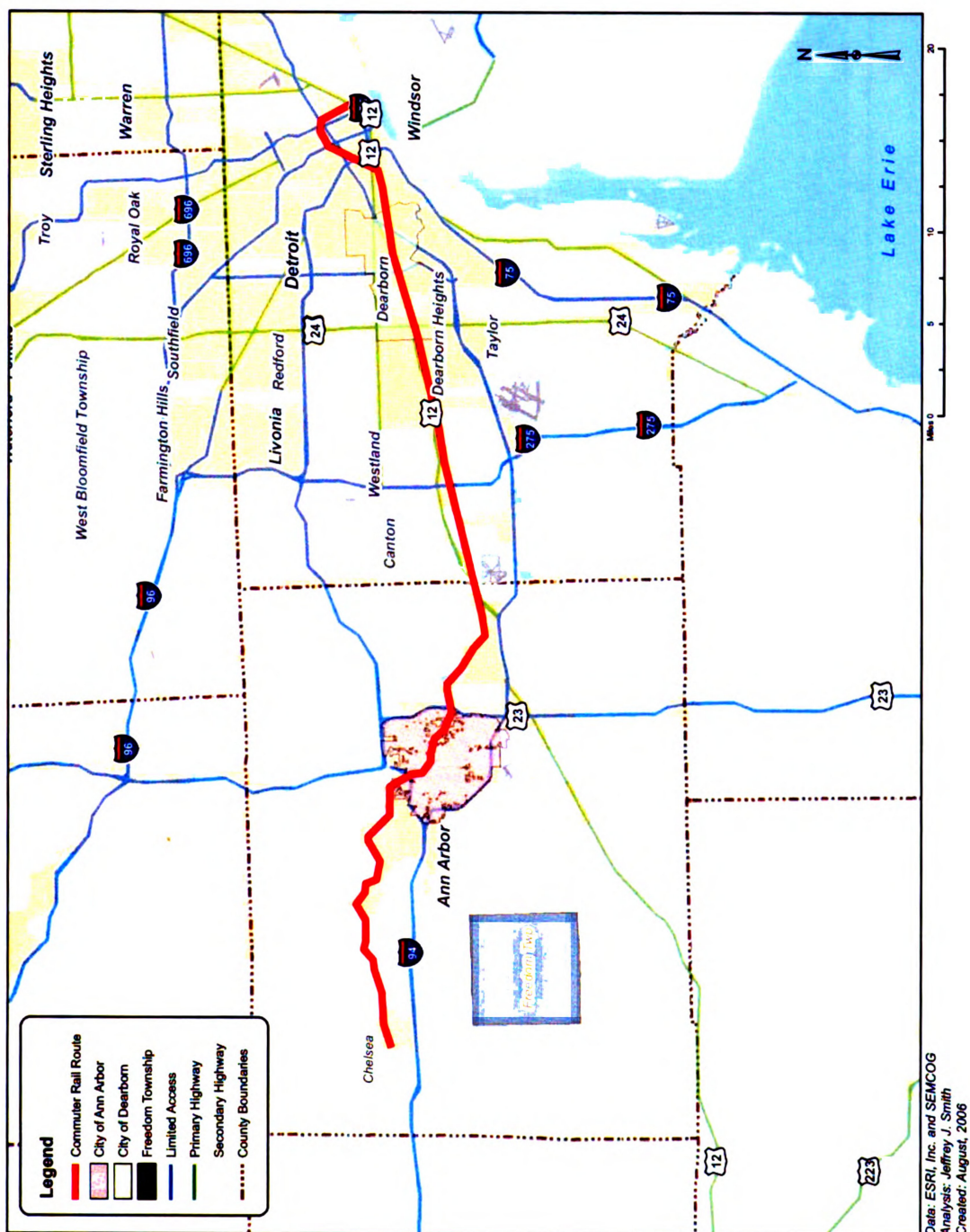




EXHIBIT 2. Michigan Study Area - 1990 Average Home Values

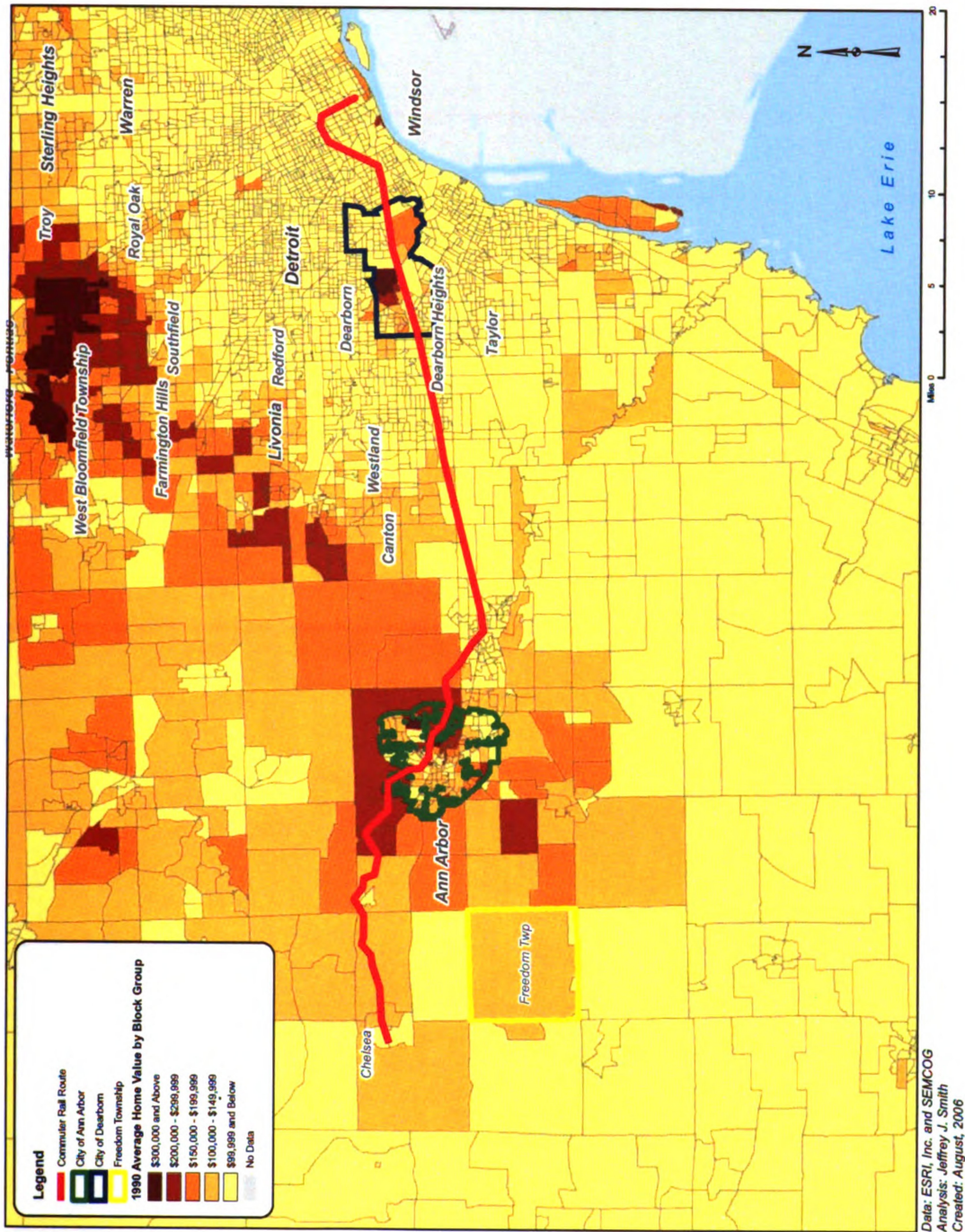




EXHIBIT 3. Michigan Study Area - 2000 Average Home Values

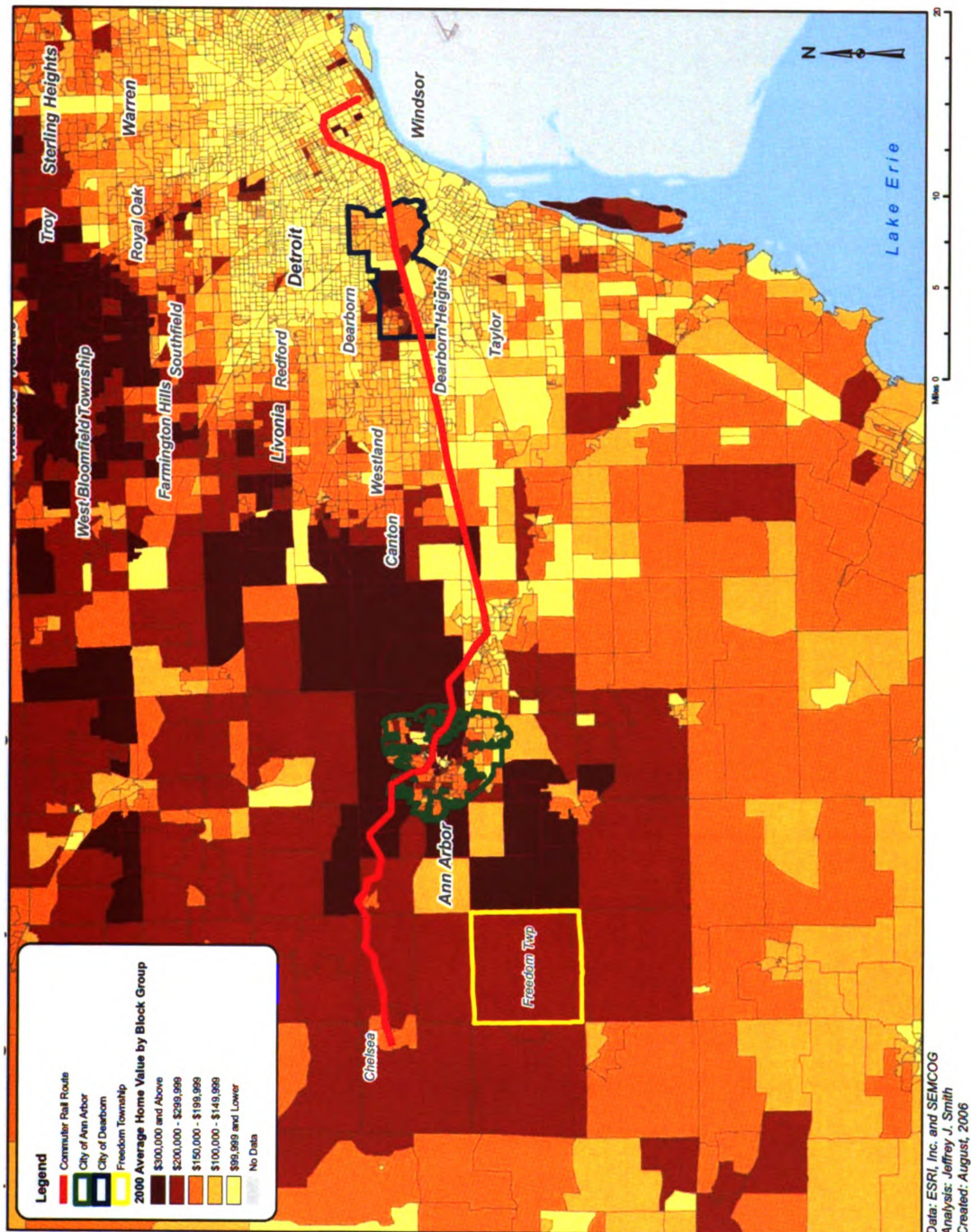


EXHIBIT 4. Michigan Study Area - 2005 Average Home Values

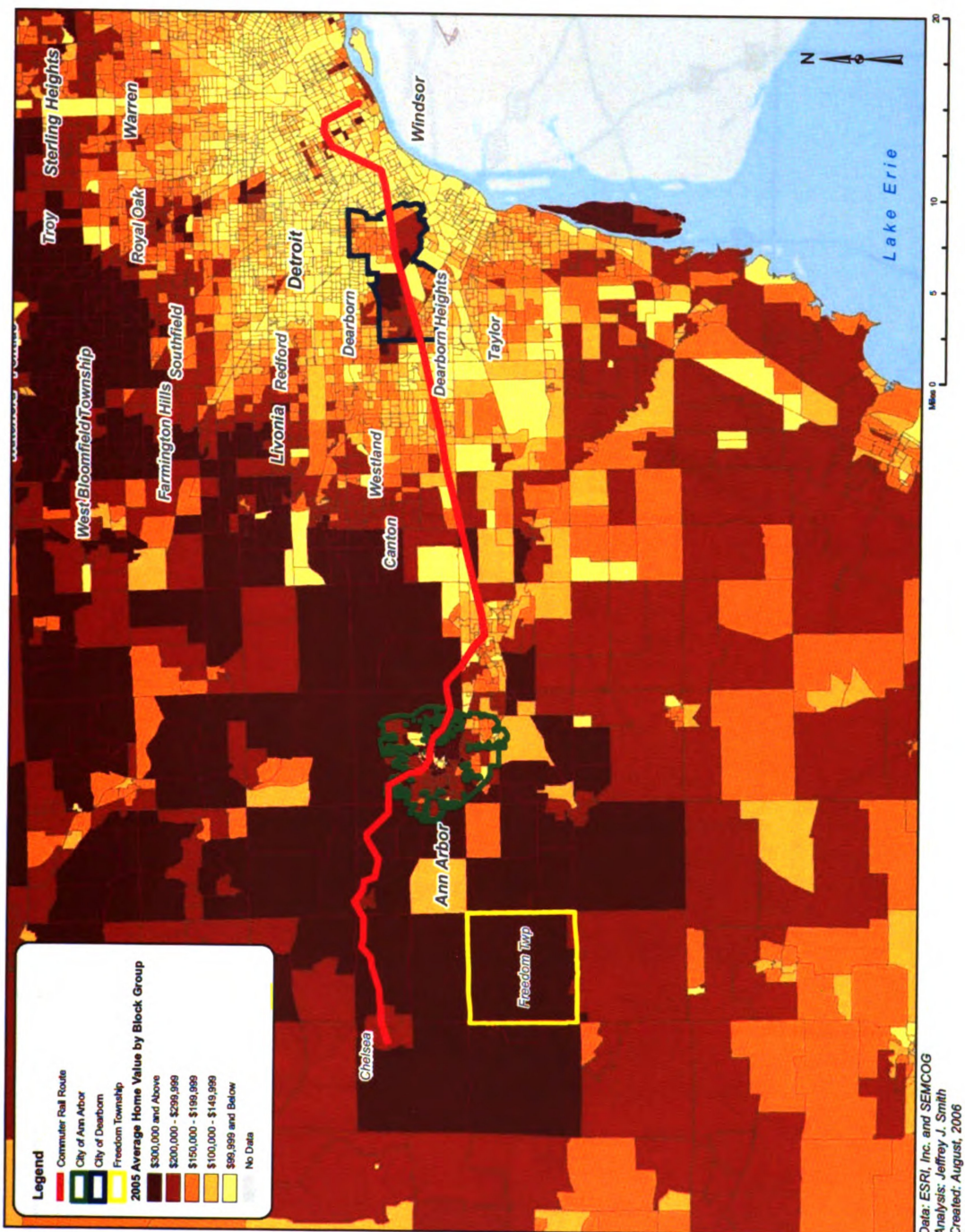




EXHIBIT 5. Texas Study Area Overview and Commuter Rail Route

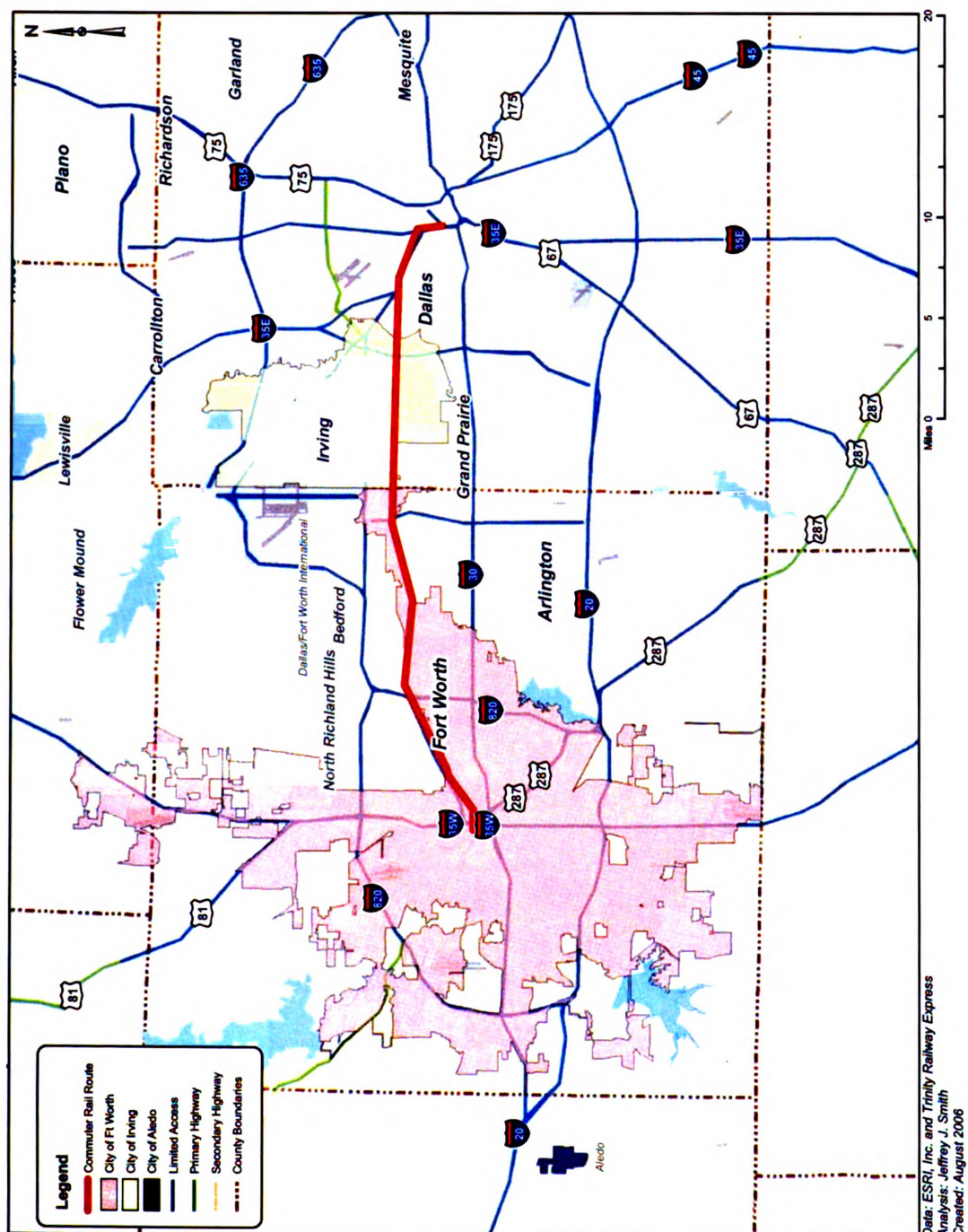


EXHIBIT 6. Texas Study Area - 1990 Average Home Values

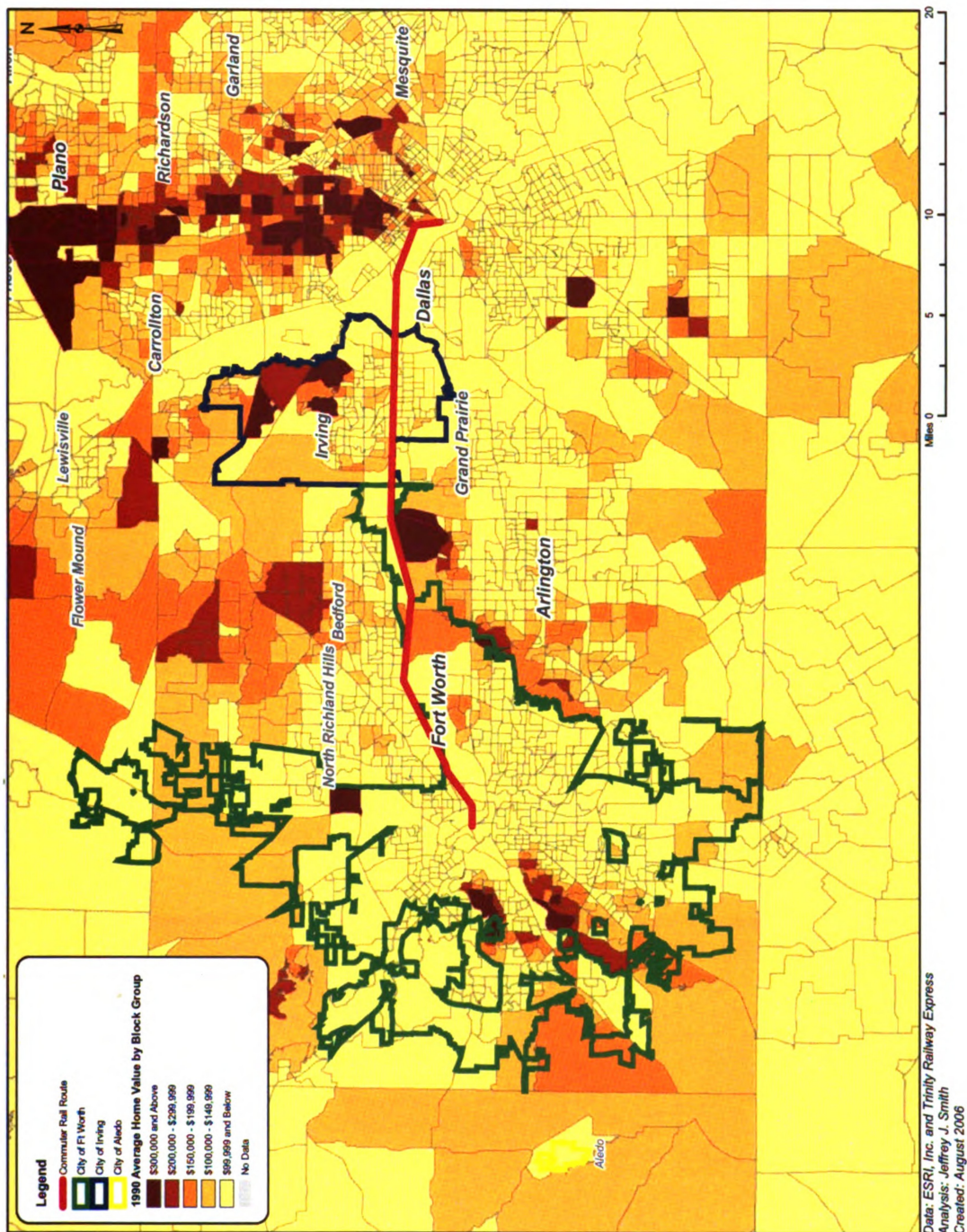






EXHIBIT 7. Texas Study Area - 2000 Average Home Values

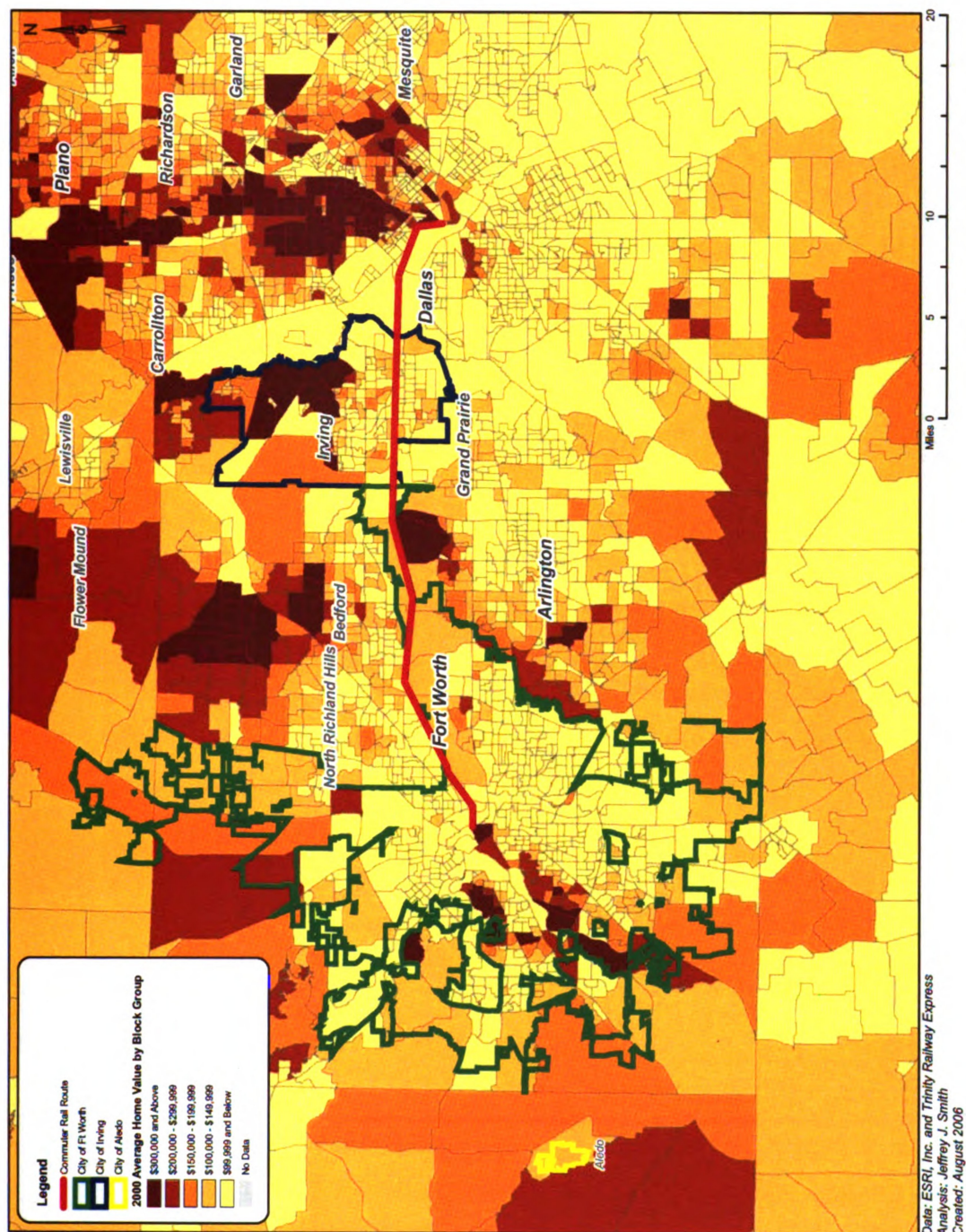
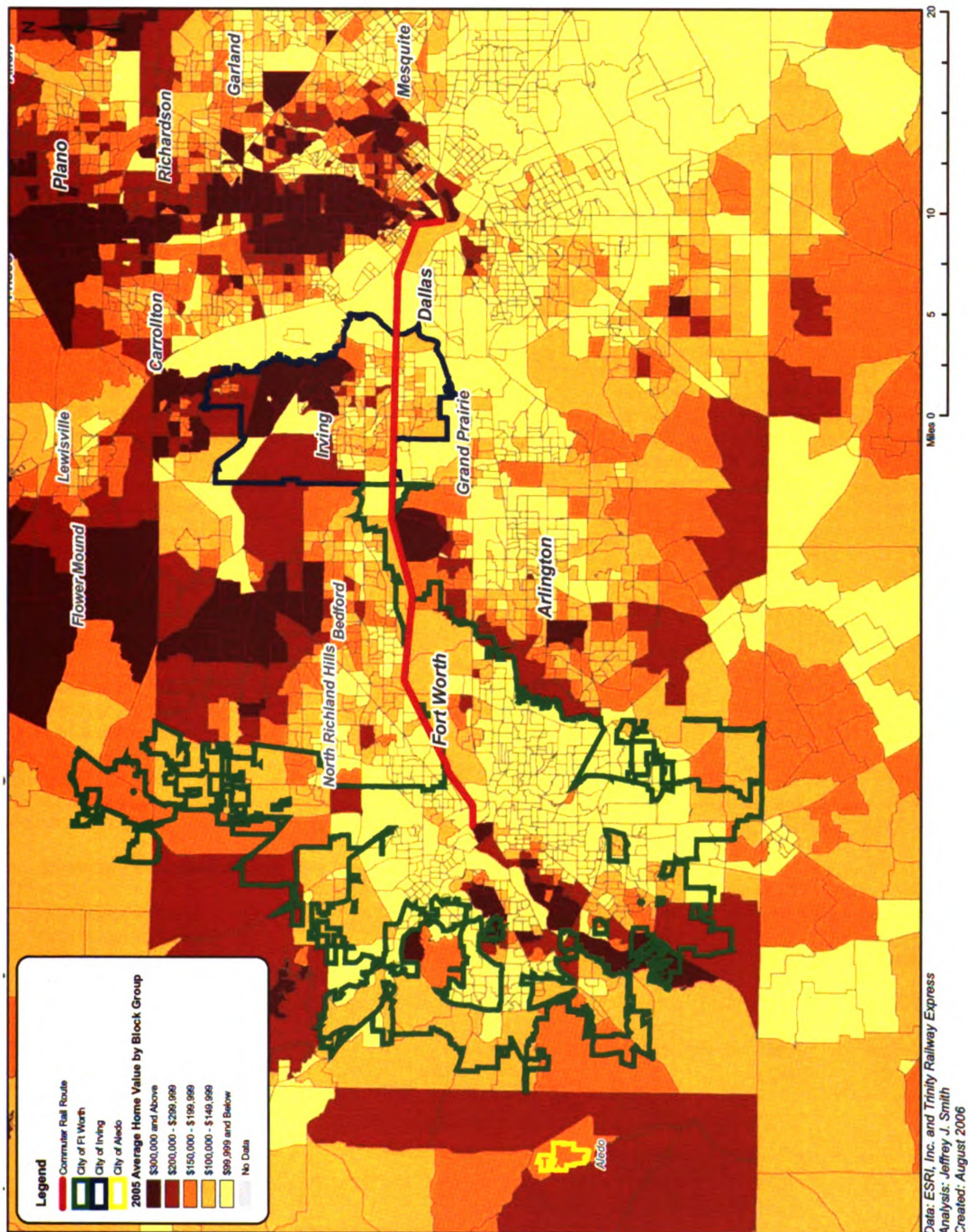




EXHIBIT 8. Texas Study Area - 2005 Average Home Values



## Appendix B: Demographic and Socioeconomic Profile

### EXHIBIT 1. Comparative Demographic and Socioeconomic Tables - Michigan

	Michigan	Ann Arbor	Dearborn	Freedom Township
<b>POPULATION</b>				
1990 Total Population (census)	9,295,297	110,134	89,395	1,404
1997 Total Population (interp.)	9,740,962	112,196	95,267	1,513
2000 Total Population (census)	9,938,444	113,092	97,900	1,562
2005 Total Population	10,310,273	117,116	98,092	1,643
2010 Total Population	10,731,309	123,263	98,313	1,729
CAGR 1990-2000	0.7%	0.3%	0.9%	1.1%
CAGR 2000-2005	0.7%	0.7%	0.0%	1.0%
CAGR 2005-2010	0.8%	1.0%	0.0%	1.0%
<b>PER CAPITA INCOME</b>				
1989 Per Capita Income (census)	\$14,154	\$17,768	\$16,841	\$17,681
1990 Per Capita Income (interp.)	\$14,803	\$18,482	\$17,255	\$18,385
1997 Per Capita Income (interp.)	\$20,265	\$24,352	\$20,456	\$24,168
1999 Per Capita Income (census)	\$22,168	\$26,349	\$21,475	\$26,132
2000 Per Capita Income (interp.)	\$22,711	\$27,159	\$21,864	\$26,895
2005 Per Capita Income	\$25,633	\$31,597	\$23,916	\$31,059
2010 Per Capita Income	\$30,029	\$37,626	\$27,314	\$36,564
CAGR 1990-2000	4.4%	3.9%	2.4%	3.9%
CAGR 2000-2005	2.5%	3.1%	1.8%	2.9%
CAGR 2005-2010	3.2%	3.6%	2.7%	3.3%
<b>HOUSEHOLDS</b>				
1990 Total Households	3,419,331	41,697	35,482	523
2000 Total Households	3,785,661	45,112	36,809	561
2005 Total Households	3,980,867	47,710	36,682	607
2010 Total Households	4,176,763	50,954	36,686	649
CAGR 1990-2000	1.0%	0.8%	0.4%	0.7%
CAGR 2000-2005	1.0%	1.1%	-0.1%	1.6%
CAGR 2005-2010	1.0%	1.3%	0.0%	1.3%
<b>HOUSEHOLD INCOME TOTALS</b>				
2000 Median HH Income	\$44,683	\$46,248	\$44,576	\$63,872
2005 Median HH Income	\$50,118	\$51,824	\$48,927	\$71,318
2010 Median HH Income	\$55,605	\$59,544	\$54,024	\$81,347
1990 Average HH Income	\$38,064	\$45,053	\$42,474	\$48,822
2000 Average HH Income	\$57,400	\$64,574	\$56,858	\$72,737
2005 Average HH Income	\$65,583	\$74,216	\$63,821	\$83,891
2010 Average HH Income	\$76,307	\$87,553	\$73,053	\$97,622
<b>UNEMPLOYMENT</b>				
1995 Unemployment Rates	5.3%	2.3%	3.0%	-
2000 Unemployment Rates	3.7%	2.5%	2.7%	-
2005 Unemployment Rates	6.7%	4.5%	5.5%	-

Source: ESRI, Inc. 2005, US Census and Bureau of Labor Statistics



**EXHIBIT 2. Comparative Demographic and Socioeconomic Tables - Michigan**

	Michigan	Ann Arbor	Dearborn	Freedom Township
<b>OWNER OCCUPIED HOME VALUES</b>				
2000 OOHUs by Value Base	2,793,346	20,687	27,028	469
2000 OOHUs/Value <\$10000	44,144	44	35	2
2000 OOHUs/Value \$10K-14999	34,181	19	8	2
2000 OOHUs/Value \$15K-19999	34,550	6	32	4
2000 OOHUs/Value \$20K-24999	36,835	51	40	0
2000 OOHUs/Value \$25K-29999	39,913	15	47	0
2000 OOHUs/Value \$30K-34999	47,257	54	56	0
2000 OOHUs/Value \$35K-39999	52,304	22	77	0
2000 OOHUs/Value \$40K-49999	109,527	70	323	0
2000 OOHUs/Value \$50K-59999	129,389	206	231	0
2000 OOHUs/Value \$60K-69999	152,719	313	524	0
2000 OOHUs/Value \$70K-79999	168,860	376	895	6
2000 OOHUs/Value \$80K-89999	202,669	457	1,645	12
2000 OOHUs/Value \$90K-99999	194,105	498	2,246	11
2000 OOHUs/Value \$100K-124999	366,134	1,476	6,341	35
2000 OOHUs/Value \$125K-149999	325,681	2,948	5,901	33
2000 OOHUs/Value \$150K-174999	234,496	3,386	3,351	55
2000 OOHUs/Value \$175K-199999	158,801	2,752	1,739	41
2000 OOHUs/Value \$200K-249999	183,836	3,210	1,634	80
2000 OOHUs/Value \$250K-299999	113,640	1,790	901	76
2000 OOHUs/Value \$300K-399999	87,308	1,601	562	79
2000 OOHUs/Value \$400K-499999	35,236	645	145	22
2000 OOHUs/Value \$500K-749999	24,963	531	163	9
2000 OOHUs/Value \$750K-999999	8,365	179	52	4
2000 OOHUs/Value \$1000000+	8,433	39	80	0
2005 OOHUs by Value Base	2,996,786	22,790	27,448	519
2005 OOHUs/Value <\$10000	37,872	39	32	2
2005 OOHUs/Value \$10K-14999	24,140	24	13	2
2005 OOHUs/Value \$15K-19999	25,707	16	11	2
2005 OOHUs/Value \$20K-24999	29,636	5	30	4
2005 OOHUs/Value \$25K-29999	31,235	30	32	1
2005 OOHUs/Value \$30K-34999	33,198	46	41	0
2005 OOHUs/Value \$35K-39999	36,527	15	50	0
2005 OOHUs/Value \$40K-49999	85,923	82	118	0
2005 OOHUs/Value \$50K-59999	87,814	53	257	0
2005 OOHUs/Value \$60K-69999	104,674	116	227	0
2005 OOHUs/Value \$70K-79999	118,523	187	335	0
2005 OOHUs/Value \$80K-89999	132,780	271	571	0
2005 OOHUs/Value \$90K-99999	144,842	328	792	3
2005 OOHUs/Value \$100K-124999	402,214	989	4,110	20
2005 OOHUs/Value \$125K-149999	316,695	1,175	4,803	28
2005 OOHUs/Value \$150K-174999	292,688	1,740	5,243	32
2005 OOHUs/Value \$175K-199999	250,185	2,363	3,973	26
2005 OOHUs/Value \$200K-249999	329,497	5,115	3,517	79
2005 OOHUs/Value \$250K-299999	155,187	3,017	1,170	59
2005 OOHUs/Value \$300K-399999	190,566	3,665	1,284	123
2005 OOHUs/Value \$400K-499999	74,923	1,525	435	73
2005 OOHUs/Value \$500K-749999	57,893	1,352	190	54
2005 OOHUs/Value \$750K-999999	16,951	356	95	6
2005 OOHUs/Value \$1000000+	17,116	280	118	5

Source: ESRI, Inc. 2005, US Census and Bureau of Labor Statistics

**EXHIBIT 3. Comparative Demographic and Socioeconomic Tables - Michigan**

	Michigan	Ann Arbor	Dearborn	Freedom Township
<b>OWNER OCCUPIED HOME VALUES</b>				
2010 OOHUs by Value Base	3,173,124	24,859	27,555	559
2010 OOHUs/Value <\$10000	32,104	34	27	2
2010 OOHUs/Value \$10K-14999	18,254	19	11	1
2010 OOHUs/Value \$15K-19999	18,095	18	8	1
2010 OOHUs/Value \$20K-24999	21,811	14	10	2
2010 OOHUs/Value \$25K-29999	24,651	6	24	3
2010 OOHUs/Value \$30K-34999	25,937	17	27	2
2010 OOHUs/Value \$35K-39999	27,018	31	27	1
2010 OOHUs/Value \$40K-49999	59,383	55	74	0
2010 OOHUs/Value \$50K-59999	67,518	62	93	0
2010 OOHUs/Value \$60K-69999	73,865	58	183	0
2010 OOHUs/Value \$70K-79999	79,736	65	174	0
2010 OOHUs/Value \$80K-89999	90,192	99	205	0
2010 OOHUs/Value \$90K-99999	100,430	161	270	0
2010 OOHUs/Value \$100K-124999	275,845	578	1,332	2
2010 OOHUs/Value \$125K-149999	328,711	843	3,385	15
2010 OOHUs/Value \$150K-174999	295,392	909	3,944	20
2010 OOHUs/Value \$175K-199999	260,674	1,209	3,695	28
2010 OOHUs/Value \$200K-249999	455,438	3,424	7,334	49
2010 OOHUs/Value \$250K-299999	270,667	4,147	2,883	57
2010 OOHUs/Value \$300K-399999	289,157	5,418	2,050	98
2010 OOHUs/Value \$400K-499999	161,623	3,280	1,016	108
2010 OOHUs/Value \$500K-749999	123,825	2,817	482	119
2010 OOHUs/Value \$750K-999999	38,575	925	115	38
2010 OOHUs/Value \$1000000+	34,223	672	186	12
2000 Median Home Value	\$110,257	\$178,661	\$129,296	\$221,563
2005 Median Home Value	\$141,049	\$238,275	\$160,974	\$301,220
2010 Median Home Value	\$179,567	\$312,578	\$201,967	\$397,959
CAGR 2000-2005 (%)	5.0%	5.9%	4.5%	6.3%
CAGR 2005-2010 (%)	4.9%	5.6%	4.6%	5.7%
1990 Average Home Value	\$73,927	\$137,461	\$79,382	\$100,809
2000 Average Home Value	\$137,227	\$212,403	\$148,341	\$241,105
2005 Average Home Value	\$175,940	\$283,919	\$181,669	\$328,804
2010 Average Home Value	\$225,638	\$366,927	\$226,255	\$430,329
CAGR 1990-2000 (%)	6.4%	4.4%	6.5%	9.1%
CAGR 2000-2005 (%)	5.1%	6.0%	4.1%	6.4%
CAGR 2005-2010 (%)	5.1%	5.3%	4.5%	5.5%

Source: ESRI, Inc. 2005, US Census and Bureau of Labor Statistics

**EXHIBIT 4. Comparative Demographic and Socioeconomic Tables - Michigan**

	Michigan	Ann Arbor	Dearborn	Freedom Township
<b>OWNER OCCUPIED HOME VALUES</b>				
2005 OOHUs/Value \$49,999 and Below (#)	304,238	257	327	11
2005 OOHUs/Value \$50,000 - \$99,999 (#)	588,633	955	2,182	3
2005 OOHUs/Value \$100,000 - \$149,999 (#)	718,909	2,164	8,913	48
2005 OOHUs/Value \$150,000 - \$199,999 (#)	542,873	4,103	9,216	58
2005 OOHUs/Value \$200,000 - \$249,999 (#)	329,497	5,115	3,517	79
2005 OOHUs/Value \$250,000 - \$299,999 (#)	155,187	3,017	1,170	59
2005 OOHUs/Value \$300,000 - \$399,999 (#)	190,566	3,665	1,284	123
2005 OOHUs/Value \$400,000 - \$499,999 (#)	74,923	1,525	435	73
2005 OOHUs/Value \$500,000 - \$749,999 (#)	57,893	1,352	190	54
2005 OOHUs/Value \$750,000 and Above (#)	34,067	636	213	11
2005 OOHUs/Value \$49,999 and Below (%)	10.2%	1.1%	1.2%	2.1%
2005 OOHUs/Value \$50,000 - \$99,999 (%)	19.6%	4.2%	7.9%	0.6%
2005 OOHUs/Value \$100,000 - \$149,999 (%)	24.0%	9.5%	32.5%	9.2%
2005 OOHUs/Value \$150,000 - \$199,999 (%)	18.1%	18.0%	33.6%	11.2%
2005 OOHUs/Value \$200,000 - \$249,999 (%)	11.0%	22.4%	12.8%	15.2%
2005 OOHUs/Value \$250,000 - \$299,999 (%)	5.2%	13.2%	4.3%	11.4%
2005 OOHUs/Value \$300,000 - \$399,999 (%)	6.4%	16.1%	4.7%	23.7%
2005 OOHUs/Value \$400,000 - \$499,999 (%)	2.5%	6.7%	1.6%	14.1%
2005 OOHUs/Value \$500,000 - \$749,999 (%)	1.9%	5.9%	0.7%	10.4%
2005 OOHUs/Value \$750,000 and Above (%)	1.1%	2.8%	0.8%	2.1%

Source: ESRI, Inc. 2005, US Census and Bureau of Labor Statistics

**EXHIBIT 5. Comparative Demographic and Socioeconomic Tables - Texas**

	Texas	Ft Worth	Irving	Aledo
<b>POPULATION</b>				
1990 Total Population (census)	16,986,510	450,402	154,981	1,197
1997 Total Population (interp.)	19,607,943	507,872	179,214	1,547
2000 Total Population (census)	20,851,820	534,695	190,727	1,728
2005 Total Population	23,107,948	593,108	207,060	2,154
2010 Total Population	25,551,854	655,268	226,735	2,607
CAGR 1990-2000	2.1%	1.7%	2.1%	3.7%
CAGR 2000-2005	2.1%	2.1%	1.7%	4.5%
CAGR 2005-2010	2.0%	2.0%	1.8%	3.9%
<b>PER CAPITA INCOME</b>				
1989 Per Capita Income (census)	\$12,904	\$13,153	\$16,415	\$13,242
1990 Per Capita Income (interp.)	\$13,456	\$13,632	\$17,002	\$14,061
1997 Per Capita Income (interp.)	\$18,041	\$17,509	\$21,746	\$21,396
1999 Per Capita Income (census)	\$19,617	\$18,807	\$23,330	\$24,123
2000 Per Capita Income (interp.)	\$20,268	\$19,345	\$24,166	\$24,630
2005 Per Capita Income	\$23,864	\$22,272	\$28,815	\$27,328
2010 Per Capita Income	\$29,378	\$26,967	\$36,164	\$33,696
CAGR 1990-2000	4.2%	3.6%	3.6%	5.8%
CAGR 2000-2005	3.3%	2.9%	3.6%	2.1%
CAGR 2005-2010	4.2%	3.9%	4.6%	4.3%
<b>HOUSEHOLDS</b>				
1990 Total Households	6,070,937	169,146	63,207	416
2000 Total Households	7,393,354	195,072	75,826	601
2005 Total Households	8,120,435	215,014	80,653	749
2010 Total Households	8,955,460	237,231	87,584	907
CAGR 1990-2000	2.0%	1.4%	1.8%	3.7%
CAGR 2000-2005	1.9%	2.0%	1.2%	4.5%
CAGR 2005-2010	2.0%	2.0%	1.7%	3.9%
<b>HOUSEHOLD INCOME TOTALS</b>				
2000 Median HH Income	\$39,928	\$37,034	\$44,812	\$53,427
2005 Median HH Income	\$47,845	\$44,109	\$53,952	\$62,751
2010 Median HH Income	\$56,486	\$51,681	\$64,250	\$72,220
1990 Average HH Income	\$35,618	\$34,392	\$40,135	\$37,981
2000 Average HH Income	\$54,412	\$50,090	\$58,067	\$67,725
2005 Average HH Income	\$66,999	\$60,615	\$73,781	\$78,926
2010 Average HH Income	\$82,912	\$73,687	\$93,415	\$97,122
<b>UNEMPLOYMENT</b>				
1995 Unemployment Rates	6.1%	6.5%	4.3%	-
2000 Unemployment Rates	4.4%	4.7%	3.1%	-
2005 Unemployment Rates	5.3%	5.3%	5.0%	-

Source: ESRI, Inc. 2005, US Census and Bureau of Labor Statistics

**EXHIBIT 6. Comparative Demographic and Socioeconomic Tables**

	Texas	Ft Worth	Irving	Aledo
<b>OWNER OCCUPIED HOME VALUES</b>				
2000 OOHUs by Value Base	4,717,294	109,306	28,236	515
2000 OOHUs/Value <\$10000	110,444	1,408	390	5
2000 OOHUs/Value \$10K-14999	96,725	1,780	206	9
2000 OOHUs/Value \$15K-19999	110,275	2,531	112	23
2000 OOHUs/Value \$20K-24999	129,360	3,326	119	8
2000 OOHUs/Value \$25K-29999	149,804	4,124	95	17
2000 OOHUs/Value \$30K-34999	168,256	5,198	182	19
2000 OOHUs/Value \$35K-39999	186,731	6,093	349	25
2000 OOHUs/Value \$40K-49999	350,516	11,355	644	16
2000 OOHUs/Value \$50K-59999	370,747	9,148	1,488	7
2000 OOHUs/Value \$60K-69999	390,983	10,202	2,530	20
2000 OOHUs/Value \$70K-79999	375,722	9,897	3,328	36
2000 OOHUs/Value \$80K-89999	372,957	8,848	3,925	57
2000 OOHUs/Value \$90K-99999	298,947	6,738	3,257	37
2000 OOHUs/Value \$100K-124999	445,597	9,002	3,354	79
2000 OOHUs/Value \$125K-149999	338,554	6,440	2,213	62
2000 OOHUs/Value \$150K-174999	230,978	4,187	1,529	16
2000 OOHUs/Value \$175K-199999	147,348	2,418	1,314	19
2000 OOHUs/Value \$200K-249999	160,690	2,378	1,141	17
2000 OOHUs/Value \$250K-299999	98,429	1,206	847	10
2000 OOHUs/Value \$300K-399999	85,475	1,440	569	8
2000 OOHUs/Value \$400K-499999	37,542	590	228	16
2000 OOHUs/Value \$500K-749999	33,899	536	171	4
2000 OOHUs/Value \$750K-999999	12,815	170	70	0
2000 OOHUs/Value \$1000000+	14,500	290	175	5
2005 OOHUs by Value Base	5,327,782	124,202	31,699	647
2005 OOHUs/Value <\$10000	99,766	1,324	381	5
2005 OOHUs/Value \$10K-14999	68,690	1,114	222	6
2005 OOHUs/Value \$15K-19999	90,414	1,933	151	15
2005 OOHUs/Value \$20K-24999	99,596	2,465	106	25
2005 OOHUs/Value \$25K-29999	116,712	3,343	114	9
2005 OOHUs/Value \$30K-34999	130,739	3,801	96	16
2005 OOHUs/Value \$35K-39999	143,659	4,079	150	22
2005 OOHUs/Value \$40K-49999	324,907	11,007	532	43
2005 OOHUs/Value \$50K-59999	316,665	10,993	589	16
2005 OOHUs/Value \$60K-69999	330,440	8,949	1,245	8
2005 OOHUs/Value \$70K-79999	344,157	8,251	2,206	17
2005 OOHUs/Value \$80K-89999	349,913	9,167	2,662	30
2005 OOHUs/Value \$90K-99999	339,517	9,179	3,207	38
2005 OOHUs/Value \$100K-124999	758,777	17,855	7,472	122
2005 OOHUs/Value \$125K-149999	402,607	7,893	2,818	69
2005 OOHUs/Value \$150K-174999	330,149	6,225	2,108	65
2005 OOHUs/Value \$175K-199999	257,286	4,343	1,689	32
2005 OOHUs/Value \$200K-249999	322,947	5,368	2,471	36
2005 OOHUs/Value \$250K-299999	145,235	2,023	912	16
2005 OOHUs/Value \$300K-399999	166,875	1,942	1,293	19
2005 OOHUs/Value \$400K-499999	77,200	1,248	565	10
2005 OOHUs/Value \$500K-749999	57,694	813	342	17
2005 OOHUs/Value \$750K-999999	25,849	414	124	3
2005 OOHUs/Value \$1000000+	27,988	474	242	7

Source: ESRI, Inc. 2005, US Census and Bureau of Labor Statistics

**EXHIBIT 7. Comparative Demographic and Socioeconomic Tables**

	Texas	Ft Worth	Irving	Alledo
<b>OWNER OCCUPIED HOME VALUES</b>				
2010 OOHUs by Value Base	5,944,728	138,100	35,563	786
2010 OOHUs/Value <\$10000	89,022	1,233	354	5
2010 OOHUs/Value \$10K-14999	53,012	826	189	5
2010 OOHUs/Value \$15K-19999	76,311	1,426	182	12
2010 OOHUs/Value \$20K-24999	81,583	1,567	129	17
2010 OOHUs/Value \$25K-29999	88,880	2,260	98	26
2010 OOHUs/Value \$30K-34999	102,262	2,924	101	9
2010 OOHUs/Value \$35K-39999	112,009	3,297	92	15
2010 OOHUs/Value \$40K-49999	269,341	7,841	272	46
2010 OOHUs/Value \$50K-59999	289,927	9,469	462	41
2010 OOHUs/Value \$60K-69999	283,611	10,154	545	16
2010 OOHUs/Value \$70K-79999	290,322	8,946	896	8
2010 OOHUs/Value \$80K-89999	299,603	7,953	1,475	16
2010 OOHUs/Value \$90K-99999	307,921	7,445	2,126	30
2010 OOHUs/Value \$100K-124999	814,827	20,488	6,857	111
2010 OOHUs/Value \$125K-149999	677,367	15,766	6,500	136
2010 OOHUs/Value \$150K-174999	399,091	9,090	3,338	59
2010 OOHUs/Value \$175K-199999	319,014	6,067	2,120	59
2010 OOHUs/Value \$200K-249999	507,193	8,960	3,460	60
2010 OOHUs/Value \$250K-299999	288,358	4,362	2,143	36
2010 OOHUs/Value \$300K-399999	253,934	3,606	1,726	21
2010 OOHUs/Value \$400K-499999	139,076	1,383	1,100	16
2010 OOHUs/Value \$500K-749999	103,360	1,602	774	19
2010 OOHUs/Value \$750K-999999	47,308	632	254	10
2010 OOHUs/Value \$1000000+	51,396	802	369	11
2000 Median Home Value	\$77,846	\$69,498	\$92,303	\$94,189
2005 Median Home Value	\$97,311	\$85,283	\$114,011	\$114,959
2010 Median Home Value	\$119,285	\$104,525	\$140,396	\$131,434
CAGR 2000-2005 (%)	4.6%	4.2%	4.3%	4.1%
CAGR 2005-2010 (%)	4.2%	4.2%	4.3%	2.7%
1990 Average Home Value	\$74,451	\$75,135	\$97,444	\$72,880
2000 Average Home Value	\$105,029	\$91,367	\$125,642	\$127,074
2005 Average Home Value	\$131,644	\$110,296	\$152,081	\$150,254
2010 Average Home Value	\$161,796	\$133,879	\$186,564	\$170,904
CAGR 1990-2000 (%)	3.5%	2.0%	2.6%	5.7%
CAGR 2000-2005 (%)	4.6%	3.8%	3.9%	3.4%
CAGR 2005-2010 (%)	4.2%	4.0%	4.2%	2.6%

Source: ESRI, Inc. 2005, US Census and Bureau of Labor Statistics

**EXHIBIT 8. Comparative Demographic and Socioeconomic Tables**

	Texas	Ft Worth	Irving	Aledo
<b>OWNER OCCUPIED HOME VALUES</b>				
2005 OOHUs/Value \$49,999 and Below (#)	1,074,483	29,066	1,752	141
2005 OOHUs/Value \$50,000 - \$99,999 (#)	1,680,692	46,539	9,909	109
2005 OOHUs/Value \$100,000 - \$149,999 (#)	1,161,384	25,748	10,290	191
2005 OOHUs/Value \$150,000 - \$199,999 (#)	587,435	10,568	3,797	97
2005 OOHUs/Value \$200,000 - \$249,999 (#)	322,947	5,368	2,471	36
2005 OOHUs/Value \$250,000 - \$299,999 (#)	145,235	2,023	912	16
2005 OOHUs/Value \$300,000 - \$399,999 (#)	166,875	1,942	1,293	19
2005 OOHUs/Value \$400,000 - \$499,999 (#)	77,200	1,248	565	10
2005 OOHUs/Value \$500,000 - \$749,999 (#)	57,694	813	342	17
2005 OOHUs/Value \$750,000 and Above (#)	53,837	888	366	10
2005 OOHUs/Value \$49,999 and Below (%)	20.2%	23.4%	5.5%	21.8%
2005 OOHUs/Value \$50,000 - \$99,999 (%)	31.5%	37.5%	31.3%	16.8%
2005 OOHUs/Value \$100,000 - \$149,999 (%)	21.8%	20.7%	32.5%	29.5%
2005 OOHUs/Value \$150,000 - \$199,999 (%)	11.0%	8.5%	12.0%	15.0%
2005 OOHUs/Value \$200,000 - \$249,999 (%)	6.1%	4.3%	7.8%	5.6%
2005 OOHUs/Value \$250,000 - \$299,999 (%)	2.7%	1.6%	2.9%	2.5%
2005 OOHUs/Value \$300,000 - \$399,999 (%)	3.1%	1.6%	4.1%	2.9%
2005 OOHUs/Value \$400,000 - \$499,999 (%)	1.4%	1.0%	1.8%	1.5%
2005 OOHUs/Value \$500,000 - \$749,999 (%)	1.1%	0.7%	1.1%	2.6%
2005 OOHUs/Value \$750,000 and Above (%)	1.0%	0.7%	1.2%	1.5%

Source: ESRI, Inc. 2005, US Census and Bureau of Labor Statistics

## Appendix C: Impact Model and Results

## EXHIBIT 9. Average Home Value Impact Model

Step 1. Determine the percentage change between average home values in comparable market between those with 1990-2000 growth rates and those with 2000-2005 and 2005-2010 growth rates.

Values based on 1990-2000 growth rate		1990-2000	2000-2005	2005-2010	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Prior to rail construction															
a	FL Worth	2.00%			\$ 91,367	\$ 93,194	\$ 95,058	\$ 96,959	\$ 98,899	\$ 100,877	\$ 102,894	\$ 104,952	\$ 107,051	\$ 109,192	\$ 111,376
	Irving	2.60%			\$ 125,842	\$ 129,114	\$ 132,471	\$ 135,915	\$ 139,449	\$ 143,075	\$ 146,794	\$ 150,611	\$ 154,527	\$ 158,545	\$ 162,667
	Alledo	5.70%			\$ 127,074	\$ 134,317	\$ 141,973	\$ 150,066	\$ 158,620	\$ 167,661	\$ 177,218	\$ 187,319	\$ 197,996	\$ 209,282	\$ 221,211
Values based on 2000-2005 and 2005-2010 growth rates															
After rail construction															
a	Gross Impact - FL Worth	3.80%	4.00%		\$ 91,367	\$ 94,839	\$ 98,443	\$ 102,184	\$ 106,067	\$ 110,296	\$ 114,708	\$ 119,296	\$ 124,068	\$ 129,031	\$ 133,879
	Gross Impact - Irving	3.90%	4.20%		\$ 125,842	\$ 130,750	\$ 135,849	\$ 141,147	\$ 146,652	\$ 152,081	\$ 158,468	\$ 165,124	\$ 172,059	\$ 179,286	\$ 186,564
	Gross Impact - Alledo	3.40%	2.60%		\$ 127,074	\$ 131,395	\$ 135,862	\$ 140,481	\$ 145,258	\$ 150,254	\$ 154,161	\$ 158,169	\$ 162,281	\$ 166,500	\$ 170,904
Gross economic impact of commuter rail transit on average home values in Texas comparable markets <sup>1</sup>															
a	FL Worth				100.0%	101.8%	103.6%	105.4%	107.2%	109.3%	111.5%	113.7%	115.9%	118.2%	120.2%
	Irving				100.0%	101.3%	102.6%	103.8%	105.2%	106.3%	108.0%	109.6%	111.3%	113.1%	114.7%
	Alledo				100.0%	97.8%	95.7%	93.6%	91.6%	89.6%	87.0%	84.4%	82.0%	79.6%	77.3%

Step 2. Determine the average home values in the study area between 2000-2010 based on 2000-2005 and 2005-2010 growth rates.

Values based on 2000-2005 and 2005-2010 growth rates		2000-2005	2005-2010	2000-2005	2005-2010	2000-2005	2005-2010	2000-2005	2005-2010	2000-2005	2005-2010	2000-2005	2005-2010	2000-2005	2005-2010
Am Arbor		6.00%	5.30%	\$ 212,403	\$ 225,147	\$ 238,656	\$ 252,975	\$ 268,154	\$ 283,919	\$ 298,967	\$ 314,812	\$ 331,497	\$ 349,066	\$ 366,927	\$ 388,799
Deaborn		4.10%	4.50%	\$ 148,341	\$ 154,423	\$ 160,754	\$ 167,345	\$ 174,206	\$ 181,669	\$ 189,844	\$ 198,387	\$ 207,315	\$ 216,644	\$ 226,255	\$ 237,042
Freedom Twp.		6.40%	5.50%	\$ 241,105	\$ 256,536	\$ 272,954	\$ 290,423	\$ 309,010	\$ 328,804	\$ 346,888	\$ 365,967	\$ 386,095	\$ 407,331	\$ 430,329	\$ 454,329

Step 3. Determine the impact of additional economic factors (substitution effect).

	(e)	(f)	(g)	(h)	(i)	(j)
	Population	HHs	Per Capita Income	Median HH Income	Unemp.	Substitution Effect <sup>2</sup>
Am Arbor	1	1	2	1	1	0.988
Deaborn	0	0	0	0	0	1.000
Freedom Township	1	2	2	1	1	0.986

<sup>2</sup> If 2000-2005 CAGR is above state average, "1" if comparable, and "0" if below

Step 4. Calculate the multiplier.

No adjustment should be made to the first year

	Year 1	Year 2	Year 3	Year 4	Year 5
Am Arbor	0.988	1.005	1.023	1.041	1.060
Deaborn	1.000	1.013	1.026	1.038	1.052
Freedom Township	0.986	0.965	0.944	0.923	0.903

Step 5. Calculate the net impact on average home values based on the first five years of the study area markets' average home values, applied to the first five years of the study area average home values.

The multiplier has been applied to 2007, due to 2006 being more than half way passed <sup>3</sup>		2000-2005	2005-2010	2000-2005	2005-2010	2000-2005	2005-2010	2000-2005	2005-2010	2000-2005	2005-2010	2000-2005	2005-2010	2000-2005	2005-2010
Net Impact - Am Arbor		6.00%	6.49%	\$ 212,403	\$ 225,147	\$ 238,656	\$ 252,975	\$ 268,154	\$ 283,919	\$ 298,967	\$ 314,812	\$ 331,497	\$ 349,066	\$ 366,927	\$ 388,799
Net Impact - Deaborn		4.10%	5.55%	\$ 148,341	\$ 154,423	\$ 160,754	\$ 167,345	\$ 174,206	\$ 181,669	\$ 189,844	\$ 198,387	\$ 207,315	\$ 216,644	\$ 226,255	\$ 237,042
Net Impact - Freedom Twp.		6.40%	3.10%	\$ 241,105	\$ 256,536	\$ 272,954	\$ 290,423	\$ 309,010	\$ 328,804	\$ 346,888	\$ 365,967	\$ 386,095	\$ 407,331	\$ 430,329	\$ 454,329

Notes:

- <sup>1</sup>  $f(c) = (b)/(a)$  - Average home values and growth rates prior to controlling for substitution effects.
- <sup>2</sup>  $f(i) = 1 - (\text{sum}(e) + (f) + (g) + (h) + (i)) / 5(100)$  - This formula calculates the impact that each substitution effect has on growth rates ( $i$  = no effect, less than  $i$  = some effect).
- <sup>3</sup>  $f(k) = (c) * (i)$  - The result is the multiplier to adjust the average home values from Year 1 to Year 5.
- <sup>4</sup>  $f(l) = (k) * (d)$  - The result is the adjusted average home values and growth rate due to the estimated impact of Commuter Rail.



EXHIBIT 10. Michigan Study Area Average Home Values 2000 to 2010 - With Commuter Rail and Without

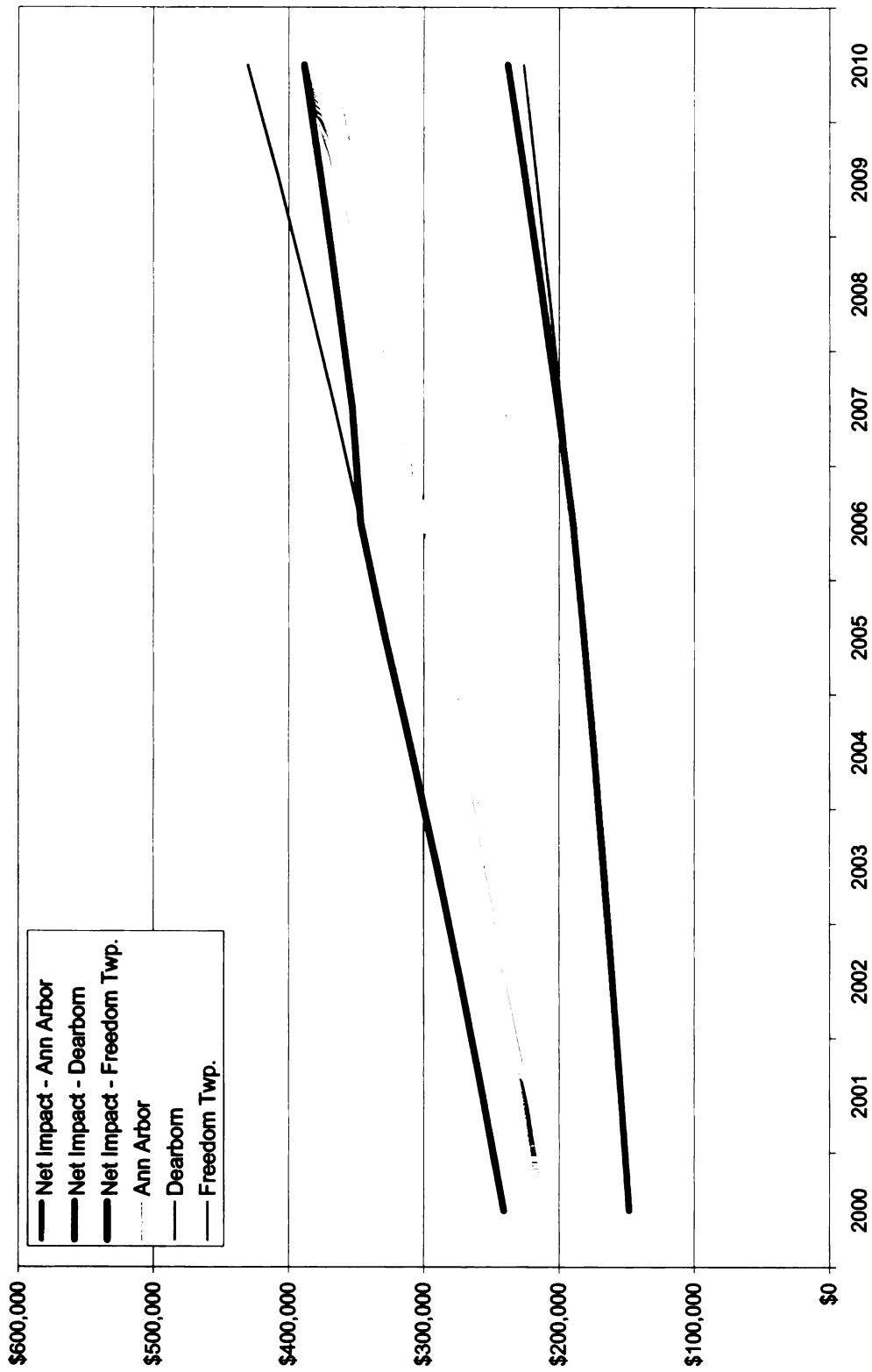
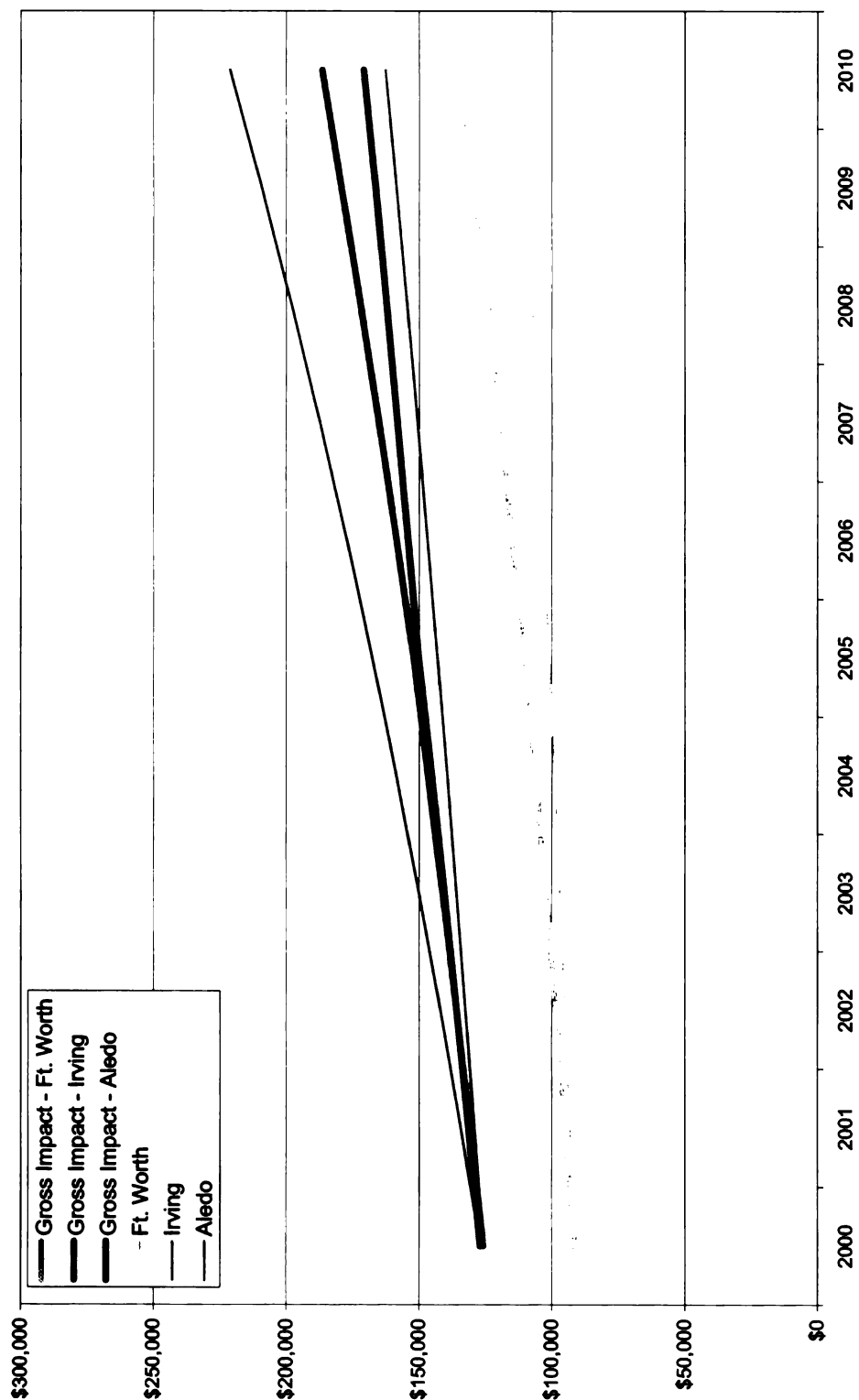


EXHIBIT 11. Texas Study Area Average Home Values 2000 to 2010 - With Commuter Rail and Without



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