Housing & Transportation Cost Trade-offs and Burdens of Working Households in 28 Metros

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Abstract

This study examines neighborhood housing and transportation choices available to working households in 28 U.S. metropolitan areas. The purpose is to determine how constraints within the neighborhood and the region—e.g., lack of access to transportation choices, distance from job centers, shortages of affordable housing—affect household costs and how high-cost burdens impact the household, their neighborhoods and the region. Specifically, we examine the relationship between metro areas with the highest housing and transportation costs in relation to working family incomes and whether the highest cost regions for working households tend to be those with the greatest shortages of affordable housing and/or the worse congestion and/or the longest commutes. The results indicate that a number of factors cause high housing and transportation costs, and it is the regions where there are either a few factors at the extreme high end of costs or a number of factors at the medium level—both add up to total high costs for working families. All findings suggest the need for policies that address affordable housing location in concert with: affordable transportation, the location and creation of jobs—particularly in areas with concentrations of working families and existing infrastructure, e.g. inner-ring suburbs and central cities; and mixed-use, well-designed neighborhoods where residents can walk to fulfill some of their daily needs.

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Report Contents

This report is organized into six sections with three appendices. The main text of the report explains the approach, data, findings, and recommendations. Three appendices provide: supporting and background tables (Appendix A), separate profiles for each of the 28 metro areas (Appendix B), and a detailed explanation of the methods used in the study (Appendix C).

1. Introduction: A brief overview of the background and purpose of the study.

2. Approach & Methods: A brief summary of the methodology for estimating the incomes, housing costs, transportation costs, employment centers, job accessibility, and commuting characteristics used to study each of 29,607 neighborhoods (census tracts) in the 28 metro regions. This section is meant to aid the reader in understanding the data and terminology used in the study, but it is not an exhaustive explanation. More detailed methods are in Appendix C.

3. What are households paying to live in their neighborhood: Housing and Transportation Expenditures by Income and Place: A descriptive overview of the study's classification of metro areas according to their average household housing and transportation costs. The classification is based on the number and size of neighborhoods of each neighborhood type, in which the neighborhood type is based on the average housing and transportation expenditures of the (weighted) average income household in the neighborhood. The housing and transportation burden is summarized for all households in each region by six income categories (ranging from less than $20,000 annually to $250,000 annually) for each neighborhood type within the region.

4. What determines the burden? This section contains three parts: the association between housing and transportation costs and the conditions contributing to these costs, such as concentrations of affordable units and job accessibility; the impact on households and regions from commuting and congestion; and the trends in six to eight metro areas from 1990 to 2000 by Housing + Transportation Neighborhood Type.

5. Everyone Pays: Impacts on Households, Neighborhoods and Regions from high costs to working households

6. Summary of Findings

7. Recommendations

Appendix A. Summary and Background Tables: These tables provide additional reference and support for the major findings in the paper, including the 1990 and 2000 Consumer

Expenditure Survey results, the distribution of households by Area Median Income for each region, and other metro rankings of measures used or created in this study.

Appendix B. Metro Area Profiles: A 4-page profile for each of the 28 metros in the study including: a characterization of the region by housing and transportation costs and choices; a map of the region by neighborhood housing/transportation cost type with the location of the major employment centers (job clusters of 5,000 or more jobs in contiguous census tracts above seven jobs per acre); the distribution of households by income for each neighborhood type; the results of the regression analysis on the association between housing and transportation costs and neighborhood and region conditions; and a description of the commuting characteristics by neighborhood type. An additional set of maps of congestion and traffic levels in comparison to the housing/transportation expenditure patterns is also included for nine of the 28 regions.

Appendix C. **Technical Appendix:** A detailed explanation for the major data elements used in the study, including the household income distribution by neighborhood, the percentage of income spent on housing and transportation, the model used to predict total household transportation costs, the methods to define job density/accessibility, the location and size of regional employment centers, and the commute time, distance, and speed for workers by census tract.

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1. Introduction

Affordable and good quality housing for working families is increasingly becoming scarce throughout the nation. Many working families are spending more than one-half of their budgets for housing alone. While housing is often the largest household expense, it is but one of the many significant expenses facing working families. Transportation is a close second for most households in the U.S. and it is an even higher or equal percentage of income for lower income households. As gasoline prices and interest rates rise and regions expand further out into undeveloped areas away from established communities and job centers, housing and transportation costs are only getting higher. Rising costs and households in financially difficult situations also impact neighborhoods, regions, and communities. Sprawling development causes higher infrastructure costs for cities, congestion causes greater levels of pollution, and long commutes affect businesses through lost productivity, greater levels of absenteeism and tardiness, and ultimately turnover when a worker leaves in search of a better commute.

A recent study by the Center for Housing Policy, *Something's Gotta Give: Working Families and the Cost of Housing*, using the microsample from the Bureau of Labor Statistics Consumer Expenditure Survey (CES), documented the excessive housing and transportation cost burdens on working households[1]. The study found that 44.3% of all working families spend more than half their total expenditures on just these two costs. The Surface Transportation Policy Project and Center for Neighborhood Technology have also reported on these two combined costs in the three *Driven to Spend* reports since 2000. Based on the 2003 CES, the 2005 *Driven to Spend* report showed that the median income households in the 28 areas covered in the study spent $21,213, or 52%, of expenditures on housing and transportation[2].

Yet, there has not been enough analysis of the combined housing and transportation costs for working families at a specific and small unit of geography, e.g. a neighborhood or census tract. The CES expenditures that are reported by *specific income levels* are not available below the four major regions in the U.S. and the expenditures at the metropolitan level are only available for the *median income* household. This level of information (region and metropolitan) and frequency of the survey (the CES is reported annually based on quarterly surveys), makes the CES a useful source for identifying conditions and trends over time, but without detailed geographic information tied to these costs it does not lend itself to assessing the specific problems or causes in neighborhoods and/or regions that might be associated with household costs—particularly for lower income households.

For instance, in 1990 the combined housing and transportation costs in the CES survey were as low as 37% in Kansas City and as high as 47% in San Francisco, San Diego, Los Angeles, and Miami. By 2000, the range had jumped from to 48% at the low end, St. Louis, to 58% at the high

[1] Center for Housing Policy. "Something's Gotta Give: Working Families and the Cost of Housing". New Century Housing, Volume 5, Issue 2, 2004.
[2] Center for Neighborhood Technology and Surface Transportation Policy Project. "Driven to Spend: Pumping Dollars from our Households and Communities", June 2005, from www.transact.org.

end, San Diego. While some of this variation can be explained by the variation in the cost of living from region to region, it is not completely clear how much the costs vary within a region, particularly by incomes within a region.

Of the two costs—housing and transportation—uncovering the reasons for transportation cost variation is especially challenging. According to the 2000 CES, transportation was 18% of expenditures for households earning $51,298 in Kansas City, but 20% for households earning roughly the same income, $51,292, in Seattle. Was this difference statistically insignificant since these are regional averages, or is the difference in expenditures due to regional price differences in taxes, gasoline, and autos, or to variations in auto use and the necessity to drive more or less in one region or the other? Some critics have suggested it is simply regional differences in preferences for either higher priced or cheaper autos, but there is no support for this.

An additional comparison of similar incomes but different transportation costs for three regions further illustrates the need for more specific information below the metropolitan area. In the 2002-2003 survey, the surveyed households in Miami, Tampa, Phoenix, and Milwaukee earned between $48,411 and $49,794, a difference of $1,383. Tampa had the highest income and Miami had the lowest. But their transportation expenditures ranged from a low of $6,797 in Milwaukee to a high of $8,659 in Phoenix, a difference of $1,862. Yet, the Milwaukee households—those paying the lowest in absolute terms for transportation—had the highest reported vehicle ownership, 2.0 vehicles per household, and Phoenix had the lowest reported average, 1.8 vehicles. Typically, vehicle ownership is the most expensive portion of total transportation costs, yet Milwaukee households own more vehicles and have the lowest total costs. The differences in costs in this case were in the “other vehicle expenses” and “gasoline and motor oil” line items. How much of the difference in these expenses are from prices of gasoline, tires, oil, and insurance, versus higher maintenance costs due to wear and tear and mileage or weather is not clear. Unfortunately, the survey findings do not provide sufficient information to answer these questions. Without answers, it’s difficult to suggest solutions.

Therefore, this study is an attempt to examine these costs at the neighborhood level in thousands of neighborhoods for millions of households, in order to understand how location affects both housing affordability and transportation affordability. The relative affordability of these two costs in lower and moderate income neighborhoods is then compared to physical characteristics of neighborhoods and regions, such as housing unit density, the location of all jobs, the concentration of employment centers, and the concentrations of affordable housing units, in order to identify links between housing costs and shortages, transportation costs, commuting patterns and traffic congestion.

Using 2000 Census data on: household income, housing costs as a percentage of income, worker and job locations (CTPP 2000), and other demographic variables; and a new model that predicts total household transportation costs, we characterize each of 29,607 census tracts (proxies for neighborhoods) in the 28 metropolitan areas surveyed in the CES in terms of incomes, housing and transportation cost burdens, accessibility to jobs, and location within a region.

The 28 metro areas in this study are the same as those in the CES annual survey. They represent 25 of the largest metros in the U.S. and were home to nearly 47.1 million households, or 45% of all U.S. households, in 2000.[3] Of these 47.1 million households, 27% (12.6 million households) earned between 30% and 80% of their respective region's Area Median Income (AMI) in 2000. Relative to a dollar amount, 14.3 million households earned less than $35,000 a year. (See Table A3 in Appendix A).

We find that costs vary by neighborhood and by region and that lower income households most often have a higher cost burden for *both* housing and transportation in all neighborhoods and regions. For all households earning between $20,000 and less than $50,000 in the 28 metro areas, the study found the combined expenditures range from 54% of income in Seattle to 63% of income in Chicago. However, in instances where neighborhoods had local concentrations of affordable housing, households had lower housing *and* transportation costs. This was true in 23 of the 28 regions.

[3] In 2000, there were 105,480,101 households in the U.S. according to the 2000 Census, SF1.

2. Approach and Methods

In order to characterize the impacts of housing and transportation costs on lower and moderate income households and the communities in which they live, we analyze the range of factors determining a household's transportation costs and how they compare and combine with their housing costs according to the location in the region and the characteristics of that location. We do this separately for each of six income classifications based on the income breaks in the Census. These incomes range from less than $20,000 to less than $250,000.

To do this analysis, we first needed measures of income by census tract, including how many households of each income are in a census tract, the percentage of income spent on housing by each income group within a census tract, and the percentage of income spent on transportation by the same income groups within a census tract. To compare these expenditures by income and neighborhood to location characteristics, we developed measures to represent accessibility to all jobs within a region (job accessibility), distance to major employment centers, and workers commute distance, commute time, and commute speed. With this complete set of measures we were able to look for the associations between costs, incomes, and locations. The following briefly outlines the approach and source for each of these measures.

Neighborhood Data

This study uses the following seven key measures:

- Weighted Average Household Income by Census tract in 2000 for the entire tract and for each of six income bins within the tract.
- Housing Costs by Tenure as a percentage of household income in 2000 (H)
- Total Household Transportation Costs as a percentage of household income in 2000 (T)
- Housing + Transportation cost burden (H+T)
- Job Locations, Concentrations and Accessibility to Jobs- three uses of the Census Transportation Planning Package allow us to create three measures that represent: 1) the location of each job in the region; 2) the accessibility to all jobs in the region from each census tract; and 3) employment centers, which we define as relatively dense clusters of 5,000 or more jobs in contiguous tracts of more than 7 jobs per acre
- Worker Commuting Characteristics: the estimated distance and speed and the reported commute time for each worker in each census tract by transportation mode
- Household socioeconomic characteristics such as educational attainment levels, unemployment rates, and household size
- Availability of Affordable housing

Household Income

Using Census 2000 household income breakout for each tract we summed the number of households within the following six annual income ranges:

- Less than $20,000
- $20,000 to less than $35,000
- $35,000 to less than $50,000
- $50,000 to less than $75,000
- $75,000 to less than $100,000
- $100,000 to less than $250,000

We chose these categories because they represent, roughly, quintiles of national household incomes—i.e., each category contains nearly 20 percent of U.S. households. We did not include households above $250,000 since they are less than 3% of the population and the high incomes in this group would have greatly skewed the highest bin. And as the average median household income is approximately $46,000 in these regions, the first three categories roughly match the 30-50, 80, and 100 percent of area median income measures that are often used in qualifying households for affordable housing. This makes these income categories useful for policy makers that use AMI to operate programs based on incomes. While they are not exactly the same as AMI, we used a small range within each bin, $15,000 to $20,000, and several bins, to help make the comparison between these ranges and the percentage of AMI in each region.

However, in order to use the transportation cost model, which is based on a specific income, we could not use a range. Therefore, for each census tract, we used the Census PUMS 5% data from the PUMA[4] that encompasses each tract to determine the weighted average income of households in each income bin. For instance, to determine what actual income to use in the income bin range of "Less than $20,000", we used the PUMS data which provides a count of households at each income level. By querying the PUMS data for households by income restricted to just households earning an income of $0 to $20,000, and to households not living in group quarters, we could identify that the weighted average income in that bin and in that PUMA was actually, $10,385 for all households, $9,837 for renters, and 11,368 for owner households. We did this query for each PUMA and each income bin in each of the 28 metro areas. We then applied the results to each income bin in each tract in the 28 metro areas. While this method is not exact since PUMA's are 100,000 persons or more and census tracts are typically 3,000 persons, the error is contained within each income bin and is only used to obtain a weighted average in place of a range. The other alternative would have been to take a simple average of the $0 to $20,000 range, e.g. $10,000, but this would be even less precise. For a more detailed explanation on this technique see Appendix C. Table 1 lists the weighted average income results by tenure and for all households for the aggregate of the 28 metro areas.

[4] PUMAs are Public Use Micro Sample Areas defined by the Census in order to provide detailed cross-tabulated information on persons and households from the Census long form survey. The 5% Public Use Micro Sample includes data on PUMAs that are 100,000 persons or more.

Table 1

Weighted Average Household Income in each Income Bracket
(5% PUMA for 28 Metros)

Census Income Bin	Weighted Average Renters	Weighted Average Owners	Weighted Average All HHS	Renter HHS	Owner HHS	All HHS	% of HHS
<$20,000	$9,837	$11,368	$10,385	971,172	3,190,910	5,691,595	12%
$20,000 to <35,000	$26,941	$27,516	$27,221	1,144,763	3,956,933	7,080,693	15%
$35,000 to <50,000	$41,506	$42,175	$41,899	2,834,351	4,321,022	7,369,761	16%
$50,000 to <$75,000	$60,211	$61,599	$61,189	3,048,739	4,546,832	8,138,869	17%
$75,000 to <$99,000	$85,138	$86,059	$85,875	4,181,936	6,109,521	8,932,939	19%
$100,000 to <$250,000	$132,773	$138,051	$137,291	5,742,029	6,713,796	9,548,147	20%
Total Households				**17,922,990**	**28,839,014**	**46,762,004**	**100%**
No. of 5% PUMAs				**963**	**941**		

Housing Costs as a Percent of Income

In a similar manner to the household income measure from the census, we developed the average housing cost as a percent of income by tenure for the same six income bins. This allows us to examine the housing cost burden as a function of income for each income as well as the tract by using the weighted average of the housing costs for all households in the tract. Table 2 shows the percentage of income spent on housing by income level in the 28 metro areas using the PUMS 5% data. Table 3 shows the distribution of percent of income on housing by tenure.

Table 2

Percent of Income on Housing for 28 Metros
(5% PUMA, Census 2000)

Metro Area	<$20,000	$20,000 to <35,000	$35,000 to <50,000	$50,000 to <$75,000	$75,000 to <$99,000	$100,000 to <$250,000	Tracts
Anchorage, AK MSA	65%	35%	26%	22%	18%	14%	55
Atlanta, GA MSA	59%	33%	25%	20%	16%	14%	660
Baltimore, MD PMSA	58%	33%	26%	21%	17%	14%	1070
Boston, MA CMSA	56%	33%	25%	21%	18%	14%	1219
Chicago, IL CMSA	59%	31%	24%	20%	18%	14%	2055
Cincinnati, OH CMSA	51%	26%	21%	18%	15%	12%	476
Cleveland, OH CMSA	52%	27%	21%	18%	15%	12%	872
Dallas, TX CMSA	57%	29%	22%	18%	16%	13%	1050
Denver, CO CMSA	59%	33%	25%	21%	18%	14%	614
Detroit, MI CMSA	55%	27%	21%	18%	15%	12%	1567
Honolulu, HI MSA	61%	35%	27%	22%	20%	16%	210
Houston, TX CMSA	56%	27%	21%	17%	15%	12%	878
Kansas City, MO-KS MSA	51%	26%	20%	17%	14%	12%	493
Los Angeles, CA CMSA	63%	36%	27%	23%	20%	16%	3356
Miami, FL CMSA	63%	35%	27%	21%	18%	14%	623
Milwaukee, WI CMSA	54%	28%	21%	18%	16%	13%	453
Minneapolis, MN MSA	54%	30%	23%	19%	16%	13%	741
New York, NY CMSA	64%	36%	27%	22%	19%	15%	5072
Philadelphia, PA CMSA	57%	31%	24%	19%	17%	13%	1568
Phoenix, AZ MSA	58%	31%	23%	19%	16%	13%	692
Pittsburgh, PA MSA	47%	24%	18%	16%	14%	11%	702
Portland, OR CMSA	59%	32%	25%	20%	17%	14%	484
San Diego, CA MSA	63%	35%	27%	23%	20%	16%	602
San Francisco, CA CMSA	65%	39%	30%	25%	21%	17%	1455
Seatte, WA CMSA	60%	34%	26%	22%	19%	15%	769
St. Louis, MO MSA	51%	25%	19%	16%	14%	12%	524
Tampa, FL MSA	53%	28%	21%	17%	15%	12%	546
Washington, DC PMSA	61%	35%	27%	22%	18%	14%	1025
Average	**58%**	**31%**	**24%**	**20%**	**17%**	**14%**	**1065**
TOTAL TRACTS							**29,831**

Table 3

Percent of Households Paying 35% or more of Income by Income in 28 Metros (Census 2000, SF3, H.97, H.73)			
Income	**Rent**	**Own**	**All**
Less than $10,000	65%	70%	66%
$10,000 to $19,999	70%	54%	65%
$20,000 to $34,999	31%	39%	34%
$35,000 to $49,999	8%	25%	17%
$50,000 to $74,999	3%	12%	9%
$75,000 to $99,999	1%	5%	4%
$100,000 or more	0%	2%	2%
TOTAL	**31%**	**18%**	**23%**

Transportation Costs as a Percent of Income

The transportation cost data is predicted with a unique model developed by Center for Neighborhood Technology and Center for Transit Oriented Development that uses Census, transit system, National Household Travel Survey, and other data sources to estimate a household's auto use, auto ownership, and transit use at the census tract level for a particular household size and income. This model is run on the specific income bins described above. The monthly transportation cost derived from the model is then taken as a percent of each weighted average income for each income bin in each census tract. This is to report on transportation costs by income for each neighborhood. To characterize the entire neighborhood in terms of transportation costs, we calculated a weighted average of the percentage of income of the six income bins. See Appendix C for a more complete discussion of this technique and references to the model's development. The following table lists the estimated percentage of income on transportation for each of the six income bins in each of the 28 metros.

Table 4

Percent of Income on Transportation for 28 Metros
(Transportation Cost Model at Tract Level)

Metro Area	<$20,000	$20,000 to <35,000	$35,000 to <50,000	$50,000 to <$75,000	$75,000 to <$99,000	$100,000 to <$250,000
Anchorage, AK MSA	58%	36%	26%	19%	14%	9%
Atlanta, GA MSA	63%	38%	27%	20%	15%	10%
Baltimore, MD PMSA	55%	33%	24%	18%	13%	9%
Boston, MA CMSA	59%	35%	25%	18%	14%	9%
Chicago, IL CMSA	53%	31%	22%	16%	12%	8%
Cincinnati, OH CMSA	61%	37%	27%	20%	14%	9%
Cleveland, OH CMSA	57%	35%	25%	18%	13%	9%
Dallas, TX CMSA	61%	37%	27%	19%	14%	9%
Denver, CO CMSA	55%	34%	25%	18%	13%	9%
Detroit, MI CMSA	60%	37%	26%	19%	14%	10%
Honolulu, HI MSA	48%	29%	21%	15%	11%	7%
Houston, TX CMSA	62%	37%	27%	19%	14%	9%
Kansas City, MO-KS MSA	60%	37%	27%	20%	14%	9%
Los Angeles, CA CMSA	53%	32%	23%	17%	12%	8%
Miami, FL CMSA	55%	32%	23%	17%	13%	8%
Milwaukee, WI CMSA	55%	34%	25%	18%	13%	9%
Minneapolis, MN MSA	58%	35%	26%	19%	14%	9%
New York, NY CMSA	50%	28%	20%	15%	11%	7%
Philadelphia, PA CMSA	56%	34%	24%	18%	13%	9%
Phoenix, AZ MSA	58%	35%	26%	19%	14%	9%
Pittsburgh, PA MSA	61%	37%	27%	19%	14%	9%
Portland, OR CMSA	60%	37%	27%	20%	14%	10%
San Diego, CA MSA	54%	33%	24%	17%	13%	9%
San Francisco, CA CMSA	54%	32%	23%	17%	13%	8%
Seatte, WA CMSA	59%	36%	26%	19%	14%	9%
St. Louis, MO MSA	60%	37%	26%	19%	14%	9%
Tampa, FL MSA	62%	38%	27%	20%	15%	9%
Washington, DC PMSA	57%	34%	25%	18%	13%	9%
Weighted Average of 28 Metros	**56%**	**34%**	**24%**	**18%**	**13%**	**8%**

Housing + Transportation Cost Burden

By adding the housing and transportation cost burdens for each income bin, and taking a weighted average for each census tract we have an estimate for studying the combined household burden and how it affects households, neighborhoods and regions. The following table lists the combined percentage of income on housing and transportation for each of the six income bins in each of the 28 metropolitan areas.

Table 5

Percent of Income on Housing & Transportation for 28 Metros
(Census Housing Costs + Transportation Cost Model at Tract Level)

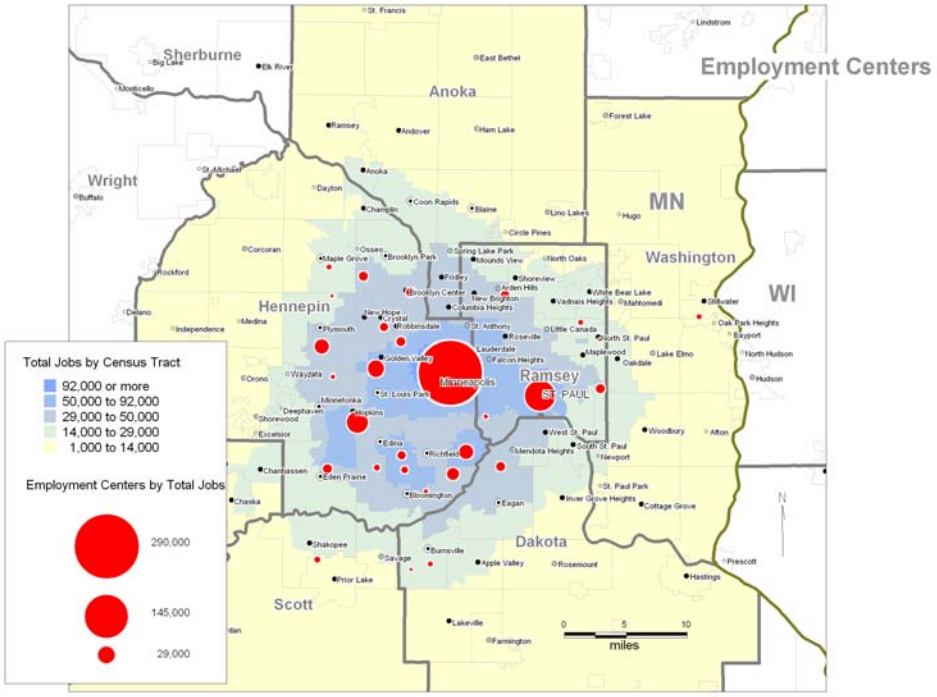
Metro Area	<$20,000	$20,000 to <35,000	$35,000 to <50,000	$50,000 to <$75,000	$75,000 to <$99,000	$100,000 to <$250,000
Anchorage, AK MSA	122%	71%	52%	41%	32%	23%
Atlanta, GA MSA	123%	71%	52%	40%	31%	23%
Baltimore, MD PMSA	113%	66%	50%	38%	30%	22%
Boston, MA CMSA	115%	68%	50%	39%	31%	23%
Chicago, IL CMSA	113%	63%	47%	37%	29%	22%
Cincinnati, OH CMSA	112%	63%	48%	37%	30%	22%
Cleveland, OH CMSA	109%	62%	46%	36%	28%	21%
Dallas, TX CMSA	118%	66%	48%	38%	30%	23%
Denver, CO CMSA	115%	67%	50%	39%	31%	23%
Detroit, MI CMSA	115%	64%	47%	37%	29%	22%
Honolulu, HI MSA	110%	64%	48%	38%	31%	23%
Houston, TX CMSA	118%	64%	47%	36%	29%	22%
Kansas City, MO-KS MSA	111%	63%	47%	36%	28%	21%
Los Angeles, CA CMSA	116%	67%	50%	40%	32%	24%
Miami, FL CMSA	117%	68%	50%	38%	30%	22%
Milwaukee, WI CMSA	110%	62%	46%	36%	29%	21%
Minneapolis, MN MSA	111%	65%	49%	38%	30%	22%
New York, NY CMSA	114%	64%	47%	37%	30%	22%
Philadelphia, PA CMSA	114%	65%	48%	37%	30%	22%
Phoenix, AZ MSA	116%	66%	49%	38%	30%	22%
Pittsburgh, PA MSA	108%	61%	45%	35%	28%	21%
Portland, OR CMSA	119%	69%	51%	40%	32%	23%
San Diego, CA MSA	117%	68%	51%	41%	33%	24%
San Francisco, CA CMSA	119%	71%	53%	42%	34%	25%
Seatte, WA CMSA	119%	69%	52%	41%	33%	24%
St. Louis, MO MSA	111%	61%	46%	36%	28%	21%
Tampa, FL MSA	114%	66%	48%	37%	30%	22%
Washington, DC PMSA	118%	69%	52%	40%	32%	23%
Average of 28 Metros	**115%**	**66%**	**49%**	**38%**	**30%**	**22%**

Job Locations, Concentrations, and Accessibility

In developing the transportation cost model, we developed two primary measures of proximity to work for each census tract. In this study, these measures are built into the transportation costs and are also used separately as location characteristics to compare to housing costs. The first measure of jobs, distance to employment center, is simply the distance from the geographic center of the census tract where a household lives to the geographic center of the nearest cluster of adjacent tracts that all have more than 7 jobs per acre, and that total at least 5,000 jobs. The second measure is of job accessibility based on total job density and distribution within a region in relation to a household's location. To obtain this measure, we add the number of jobs in all tracts in each region divided by the square of the distance to those tracts. This quantity, estimated with a gravity model, allows us to look at the relationship of jobs to housing and transportation

cost burden. The map below (figure 1) shows this job density measure in relation to the employment center measure in the Minneapolis-St. Paul area.

Figure 1



Source: The Census Transportation Planning Package (CTPP) 2000

Worker Commuting Characteristics

The Census Transportation Planning Package (CTPP), allows us to examine the commute patterns of workers in each census tract. In part three of CTPP the home and work place census tracts are provided for each worker. Using a GIS, we assigned the distance between the center of the home tract and work tract to estimate a commute distance. We then used this distance with the time to commute reported by each worker in the Census to calculate an average speed (distance / time = speed). These calculations gave us an average speed, time, and distance for the average worker in each tract by mode to work. However, this measure is not perfect since the distance is "as the Crow Flies", e.g. a straight line between two points, and therefore is generally an underestimate of the commute distance since workers are generally not able to travel from home to work in a straight line. Yet, it provides a consistent statistic by which to compare the journey to work for all workers for all tracts. Breaking the measure of distance, speed and time by mode allows us to compare public transit users to auto users.

In addition to using this measure to judge the quality and cost of the commute for the commuter, we also found it to be a reliable indicator of congestion faced by the workers within a census tract. The slower the speed, the more likely the worker is traveling in a congested area. Even with our underestimate of distance, we found the average speed to be approximately 24 miles per

hour across all 28 metros. According to The Nationwide Personal Transportation Survey (NPTS), "the average commuting speed, including trips by all modes, went from 28 mph in 1983 to 34 mph in 1995."[5]

Household Socioeconomic Characteristics

Household characteristics have been obtained from Census 2000. Variables analyzed include educational attainment, unemployment rates, household size, vehicle ownership, commute time, average household size, race, housing unit density, tenure, occupants per room, workers place of work, travel means to work, time leaving for work, year structure built, and housing unit structure type.

Availability of Affordable Housing

The Department of Housing and Urban Development (HUD) along with the Census creates a special tabulation of housing data using the housing and income data in the census to calculate the number of affordable units in each tract that are available to households of each AMI level. The National Low Income Housing Coalition, with Kathy Nelson, classified these data into shortages by region and percentages of households with a housing burden by region. We used the available unit data at the tract level to study the association with household and transportation costs in neighborhoods and summarized the shortage data to the 28 metro areas to aid in characterizing the housing market of that region. The shortages are categorized as low, medium and high. For instance, San Francisco is a hot housing market- it has a large shortage of affordable units, and 27% of families earning 30-50% of the area family median income have a severe housing cost burden.

[5] Federal Highway Administration. "Status of the Nation's Highways, Bridges, and Transit: 2002 Conditions and Performance Report", Chapter 4: Operational Performance. http://www.fhwa.dot.gov/policy/2002cpr/ch4b.htm.

Housing / Transportation Neighborhood Types

To further compare and quantify housing and transportation variations across and within regions we created a neighborhood typology that represents the proportion of income spent on housing and transportation by the weighted average household income in that neighborhood using the income, housing, and transportation measures described above. This typology is based on housing costs plus transportation costs and results in one of four combinations; high or low expenditures on housing as a percentage of income plus high or low expenditures on transportation as a percentage of income. The four categories are illustrated in figures 2 and 3 and are described below.

Note the matrix does not have values on either the vertical or horizontal axis. This is because the average percent of income spent on H and T is relative to each region. What constitutes above average in one region might not be above average in another. We used the regional average expenditure on H and T as the best measure for what a typical household might spend on housing and transportation rather than using a fixed percentage such as 30% of income on housing. While 30% on housing is an industry standard for lending and public subsidies, it is not the typical amount spent by most households. In the U.S., the average expenditure is closer to 21% on housing. Therefore, we used the average of all households as a fair measure of whether households were taking on a housing and/or transportation burden. Using the average of all households as the threshold was also necessary since there is no analogous standard percentage of income recommended for transportation. Table 5 lists the average expenditures on housing and transportation as a percentage of all incomes in each region. The combined percentage ranges from 42% in Washington D.C. to 54% in Miami. The average of all metros is 48%.

Figure 2

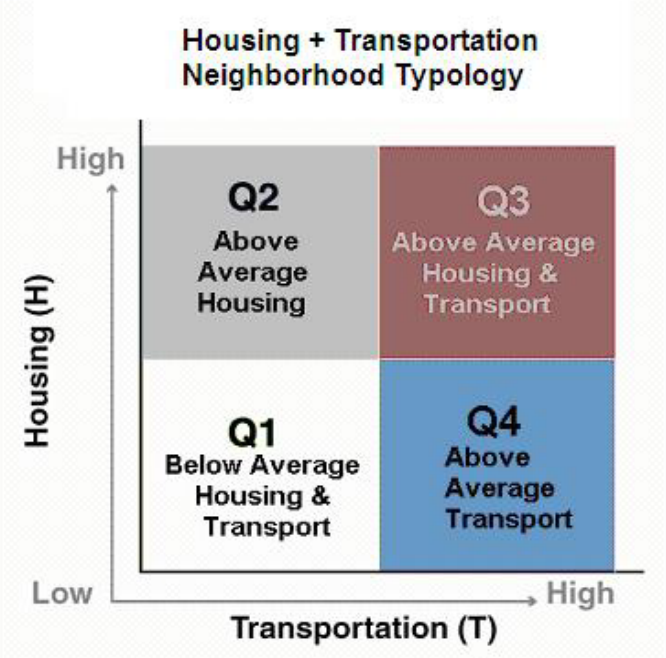


Table 6

Regional Average Expenditures on Housing & Transportation
(Based on Census Housing Costs & Modeled Transportation Costs)

Region	H%	T%	H+T%
Anchorage, AK MSA	28%	18%	46%
Atlanta, GA MSA	27%	21%	48%
Baltimore, MD PMSA	27%	19%	46%
Boston, MA CMSA	28%	19%	47%
Chicago, IL CMSA	28%	18%	46%
Cincinnati, OH CMSA	25%	23%	48%
Cleveland, OH CMSA	26%	22%	49%
Dallas, TX CMSA	26%	21%	47%
Denver, CO CMSA	27%	19%	46%
Detroit, MI CMSA	25%	21%	46%
Honolulu, HI MSA	30%	16%	45%
Houston, TX CMSA	26%	22%	48%
Kansas City, MO-KS MSA	24%	23%	47%
Los Angeles, CA CMSA	32%	19%	51%
Miami, FL CMSA	33%	21%	54%
Milwaukee, WI CMSA	26%	22%	48%
Minneapolis, MN MSA	25%	19%	44%
New York, NY CMSA	31%	16%	47%
Philadelphia, PA CMSA	28%	20%	47%
Phoenix, AZ MSA	27%	21%	48%
Pittsburgh, PA MSA	25%	25%	50%
Portland, OR CMSA	28%	22%	50%
San Diego, CA MSA	31%	19%	50%
San Francisco, CA CMSA	30%	15%	45%
Seatte, WA CMSA	29%	19%	48%
St. Louis, MO MSA	24%	23%	47%
Tampa, FL MSA	27%	25%	52%
Washington, DC PMSA	26%	17%	42%
Average of 28 Metros	**27%**	**20%**	**48%**

To understand the neighborhood categorizations, it is important to understand that the high or low expenditure categorizations of neighborhoods (tracts) are relative to the weighted average incomes in the neighborhood, ***not the absolute costs in neighborhood***. Therefore a low income household living in a tract categorized as Q1: Below Avg. H&T is not necessarily experiencing a "below average" burden by living in that tract, unless their income is similar to the weighted average income in that tract or their costs are uniquely lower than the average costs in the tracts. In fact, most households living in tracts characterized as Q1, Below Avg. H&T tracts were high income households and as such the low burden was a factor of income not of the costs associated with the location. Specifically, the average income of these types of neighborhoods in the 28

metro areas was $76,444 and 67% of the households living in this type of neighborhood earned at least $50,000. This is illustrated in figure 3 below for Below Avg. H&T neighborhoods residents and the residents of the other three H+T Neighborhood Types.

The burden characterization in the Q2 and Q4 neighborhood types, Above Avg. H and Above Avg. T, respectively, are a factor of moderate incomes and higher housing or higher transportation costs. The burdens in Q3—neighborhoods in which both costs are high—are the opposite of Q1. Absolute costs may be lower in these neighborhoods, since they're typically in the central city or inner-ring suburbs where both housing prices and transportation costs can be lower, but the high burden from housing is a factor of low incomes and the high burden from transportation is often due to low incomes as well as factors contributing to higher transportation costs, including a lack of nearby jobs and neighborhood amenities and lower quality public transit.

Figure 3

Neighborhood Types by Housing and Transportation Expenditures as a Percent of the Weighted Average Household Income in Each Neighborhood

High % on H	**Q2. Above Average H** (16% of HHS) **Mixed Income Urban Community**: Neighborhoods with high housing prices, but low transportation costs, and a mix of incomes with a slightly higher percentage of higher incomes. These places tend to be urban, near jobs, and near alternative transportation options and are the most diverse. *41% earn $50,000 or more* *Avg. Income: $52,184*	**Q3. Above Average H&T** (26% of HHS) **Lower Income Urban/Inner-Suburban Community:** Neighborhoods with low incomes and therefore above average expenditures on both housing and transportation relative to incomes. These places tend to be urban areas segregated by race and income, inner-suburbs with fewer jobs, and in some regions, outer suburbs or satellite cities away from jobs and services and close to rural areas. *(30% earn $50,000 or more* *Avg. Income: $41,387*
Low % on H	**Q1. Below Average H&T** (38% of HHS) **Wealthy Suburban Community:** Neighborhoods with higher incomes and therefore below average expenditures on both housing and transportation. These places tend to be suburban. *67% earn $50,000 or more* *Avg. Income: $76,444*	**Q4. Above Average T** (20% of HHS) **Moderate Income Exurb:** Neighborhoods with moderate incomes and moderate housing prices but exceptionally high transportation costs due to long distances to services and employment. These places are primarily in exurban areas. *52% earn $50,000 or more* *Avg. Income: $58,529*
	Low % on T	**High % on T**

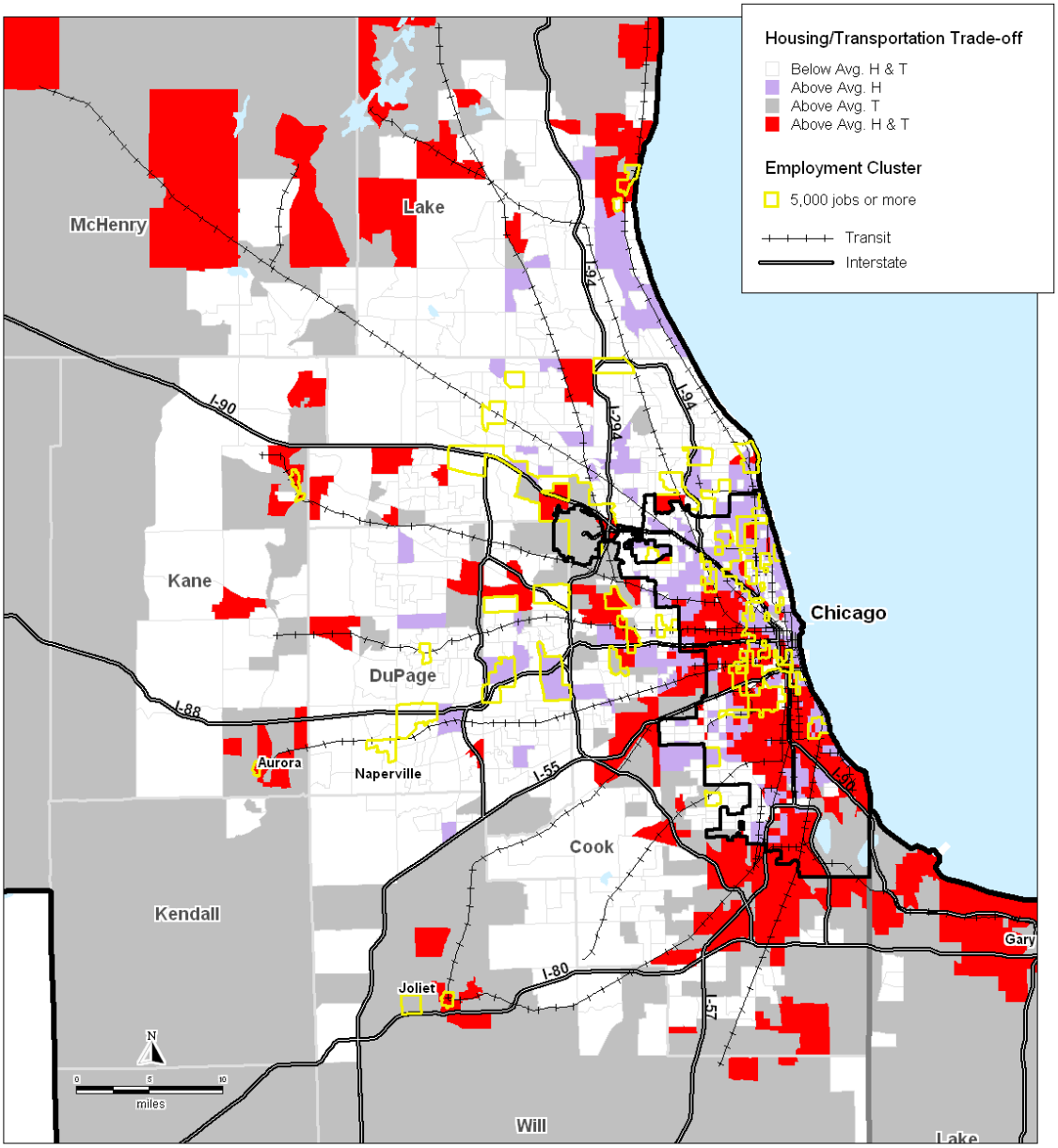
Using this typology we mapped the pattern of housing and transportation burdens in each region, which allowed us to see how these costs varied in relation to transportation infrastructure, the central city, inner suburbs, outer suburbs, exurbs, major centers of employment, and affordable housing shortages or availability. The numerical value of the quadrant type, e.g. 1, 2, 3, and 4, could also be used in statistical analysis to: identify associations between a household's expenditures on housing and transportation and household characteristics or impacts, such as commute time and mode to work, incomes, number of workers in a family, unemployment rates, educational attainment levels, vehicle ownership, etc.; and associations between burdens by neighborhood and regional impacts, such as congestion and density.

The map below is an example of how these neighborhood types (quadrants), and their respective burdens, are distributed in the Chicago region. Keep in mind that these maps represent housing and transportation costs as a percentage of *income*, and therefore they are depicting both the costs associated with the place as well as the predominant incomes in a neighborhood. Therefore, by simply looking at the map, without having an understanding of the distribution of incomes within a region it may not be clear in every instance whether the red areas, "Above Average H&T" are above average due primarily to high costs in that area, because the incomes are low in those areas, or from a combination of both high costs and low incomes. However, we found most households with moderate economic choice, e.g. those earning more than $35,000; tend to locate in places in which housing is close to 30% of income (See Table 2 for households earning $35,000 or more). Therefore, if an area is indicated as a place with both high housing and high transportation costs it is likely an area in which the majority of incomes are low because these households do not typically have economic choice and typically spend more than 30% on housing. To verify the incomes of the neighborhood types on each region's map, we provide detailed tables and explanations for each quadrant and each region in the next section and in Appendix B which provides more detail for each metro. The reader can reference the H+T type on the map with the type on the table to see both the income breakout by type and the expenditures on housing and transportation by type.

The maps also depict the employment center boundaries as well as the region's transportation infrastructure. Note in the Chicago map on the following page there are few employment centers (depicted by yellow outlines) within the red (Above Avg. H&T) or gray (Above Avg. T) areas. Most of the centers are surrounded or within the Below Avg. H&T or Above Avg. H areas, which we found contributes to the higher transportation costs of households in Above Avg. T and Above Avg. H&T neighborhoods. To access jobs, households in these two neighborhood types typically have to travel to the other two neighborhood types.

Figure 4

Chicago: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

3. What are households paying to live in their neighborhood: Housing and Transportation Expenditures by Income and Place

For several decades, households of all incomes- but higher incomes in particular- have been moving from central city neighborhoods to newer neighborhoods in surrounding and farther out suburban areas. As households have moved, jobs have followed. In search of better schools, more space, and less crime, households have also tended to move to neighborhoods of similar socioeconomic and demographic characteristics, e.g. places with other households of similar incomes, educational levels, family structures, and race. The concentration of jobs, e.g. "employment centers", has followed these higher income households and increasingly regions are becoming multi-centered, with the central city being only one of several employment centers.

This pattern of movement by both households and employers has resulted in many regions in which the job centers are increasingly within moderate to high income neighborhoods with housing prices to match. They are also mostly lower density communities with high percentages of single-family homes, low percentages of rental units and multi-family buildings, more segregated land uses, and very little public transit—factors which contribute to high transportation costs. (The white areas on the map of Chicago in Section 2 typify these higher income suburban areas.)

If high income low density suburbs are one type of area, the remaining areas are the central cities, inner suburbs, and outer suburbs. These three other areas each have lower incomes than the middle ring suburbs, and the inner and especially the outer suburbs have lower job concentrations. In all regions we studied, however, the central city is still an employment center although it may not always be the largest. Unlike many of the employment centers in the middle-ring suburbs the central city employment centers are generally surrounded by both high and low income neighborhoods and they also have lower transportation costs than the middle-ring suburbs. The number of high or low income neighborhoods near the central city employment center, and the values of the housing units, especially closest to the downtown business district, varies depending on the strength of the central city relative to the region.

Given these characteristics, the location and density of jobs, housing unit density, tenure, location in region, land uses, availability of transit, and incomes, there are clear differences in the expenditures on housing and transportation by different incomes in each of the four H+T Neighborhood Types. The chart below (Figure 5) shows the average expenditures for households of each income bin when they live in each neighborhood type.

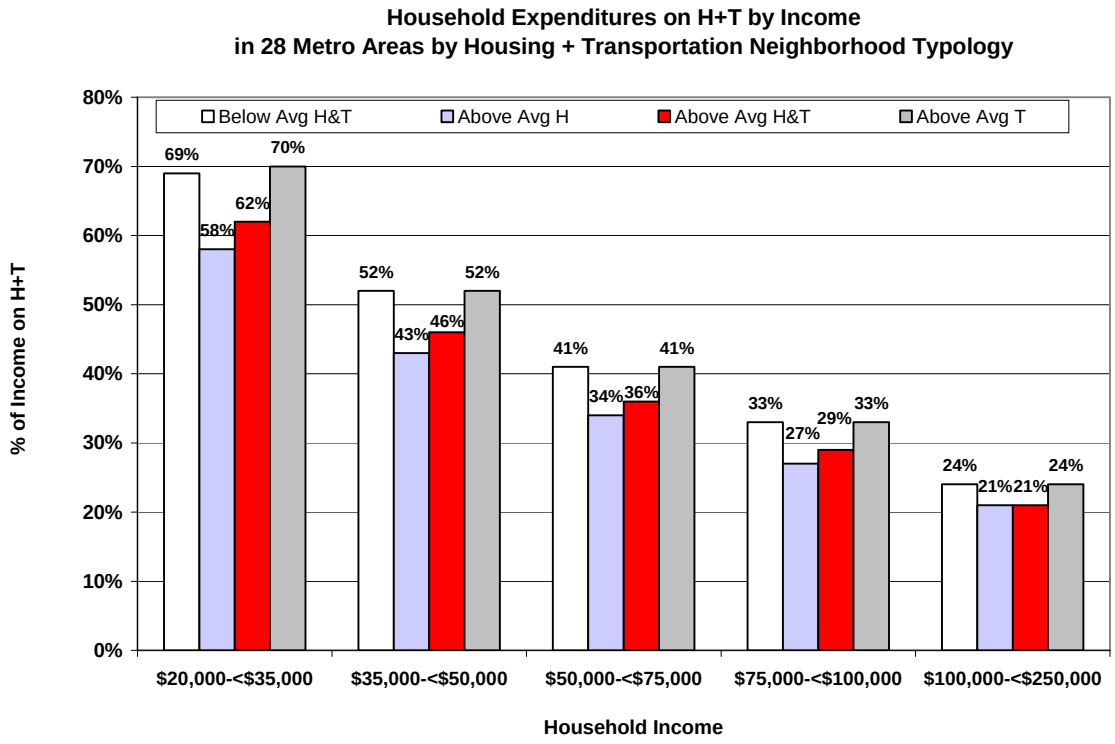
- For households earning $20,000 to less than $35,000, their average combined expenditures on housing and transportation range from 58% when they live in Above Avg. H neighborhoods to 70% when they live in Above Average T neighborhoods.

- Households in the highest income category, $100,000 to <$250,000, have the lowest combined housing and transportation expenditures from 21% of income in the Above Avg. H and Above Avg. H&T neighborhoods to 24% in the other two neighborhoods.

- At all income levels, at the 28 metro aggregate, the lowest combined housing and transportation expenditures are in the Above Avg. H neighborhoods. These neighborhoods provide the greatest mix of housing units and prices, as well as incomes, and the lowest transportation costs in absolute terms. The greater mix of housing types allows more households of various incomes to find housing that is nearby affordable transportation. However, for lower incomes, these neighborhoods often present a trade-off of higher housing prices for units that are often older, and therefore possibly in poor condition, and smaller in exchange for low transportation costs. Housing ownership by lower income households in these neighborhoods is often out of reach but renting in these neighborhoods can be the most affordable in terms of combined housing and transportation expenditures.

Note the costs are not the lowest in the "Below Avg. H&T" neighborhoods as a percentage of income even for the highest income bins. This is because these are mostly high income suburban areas (average income is $76,444) and housing and transportation costs are also high. However, at 24% of income, higher income households in these area spend well below the average combined housing and transportation expenditure for the region. Whereas, if a higher income household lives in another neighborhood type, their low combined expenditures are not typical of those neighborhoods and because they have higher incomes the lower costs in these areas afford them lower expenditures. This is why the higher income households have the lowest expenditures in the "Above Average H&T" neighborhoods.

Figure 5



Distribution of Households by Neighborhoods

As indicated in Figure 3, the neighborhood type "Below Avg. H&T" is the most common of the four neighborhood types, based on the percentage of households. However, at 38% of all households it is not the majority. The remaining share of households, 62%, live in neighborhoods where the average income household in the neighborhood has either an above average housing burden, an above average transportation burden, or above average housing and transportation burdens. Whereas the average combined percentage of income on housing and transportation for the average household in the Below Avg. H&T neighborhoods is 41%, the combined housing and transportation expenditures in the other three neighborhood types is 48% to 57%. The highest expenditure, 57%, is in the Above Avg. H&T neighborhoods where average incomes are the lowest, $41,387, and 53% of households earn less than$35,000. These neighborhoods house the second largest percentage of households of the four neighborhood types, 26%.

Table 7 displays the distribution of households by the four types and by the six income brackets for the 28 metro-aggregate. The percentages for each income bin can be added vertically to identify the percentage of households in a neighborhood type of a particular income (% in Neighb. column), e.g. 33% of households in Below Avg. H&T neighborhoods earn less than $50,000. Adding the figures in the % in income bin column horizontally shows the distribution of households of a particular income across neighborhood types, e.g. 19% of households earning less than $20,000 live in Below Avg. H&T neighborhoods.

Table 7

Distribution of Households by Income and Housing + Transportation Neighborhood Types

	Below Avg H & T			Above Avg. H			Above Avg. H & T			Above Avg T		
Income	% on H+T	% in Neighb.	% of income bin	% on H+T	% in Neighb.	% of income bin	% on H+T	% in Neighb.	% of income bin	% on H+T	% in Neighb.	% of income bin
<$50,000		**33%**	**26%**		**59%**	**19%**		**70%**	**36%**		**48%**	**19%**
$0-<$20,000	116%	8%	19%	106%	23%	21%	111%	30%	44%	119%	14%	16%
$20,000-<$35,000	69%	12%	26%	58%	20%	19%	62%	23%	35%	70%	17%	20%
$35,000-<$50,000	52%	13%	33%	43%	16%	17%	46%	17%	28%	52%	17.0%	22%
$50,000-<$75,000		**22%**	**41%**		**18%**	**15%**		**17%**	**21%**		**24%**	**23%**
$50,000-<$75,000	41%	22%	41%	34%	18%	15%	36%	17%	21%	41%	24%	23%
$75,000 or more		**45%**	**58%**		**23%**	**13%**		**14%**	**12%**		**28%**	**18%**
$75,000-<$100,000	33%	16%	50%	27%	10%	13%	29%	7%	15%	32%	14%	22%
$100,000-<$250,000	24%	29%	64%	21%	13%	12%	21%	6%	9%	24%	14%	15%
	% on H+T	% of HHS in 28 Metros		% on H+T	% of HHS in 28 Metros		% on H+T	% of HHS in 28 Metros		% on H+T	% of HHS in 28 Metros	
All Households	**41%**	**38%**		**48%**	**16%**		**57%**	**26%**		**48%**	**20%**	

From this analysis we found households earning less than $50,000 are paying from 43% (in Above Avg. H for households earning $35,000 to $50,000) to 119% (Above Avg. T for households earning less than $20,000) of their incomes on housing and transportation. The percentage above 100% of income by households earning less than $20,000 in each of the neighborhood types can be explained in part by households living in subsidized housing or sharing household costs with others that have not reported their income as part of the household's total income on the Census form. (The Census reports several instances where the housing costs alone are greater than 100% of household incomes in a given census tract). In other cases, the percentage greater than 100% may also be a factor of "under spending" on transportation relative to what our transportation model would predict a household would need to spend on transportation given the characteristics of the tract and typical household needs for transportation. The transportation model also applies the average auto cost for the average make and model vehicle on the road to the predicted number of autos per household whereas households of this income may be driving autos that have lower or no payments and/or may be sharing autos with other households. In this case, the predicted absolute transportation costs is higher than what the household may actually spend on vehicle purchase and ownership.

By Tenure

When we break this same distribution apart by tenure, it reveals that renter households have higher housing burdens in all four neighborhood types. However, renter households in each income bin (see Table 1), and each neighborhood type (see Table 8) have lower incomes which explains some of the higher burden as a percentage of income.

Of the total households that rent, the Above Avg. H&T neighborhoods are home to the greatest share, 6.3 million households and 37%. The Above Avg. T neighborhoods have the smallest share, 2.3 million and 13%. Within neighborhood type, renters are the majority of households in

the two neighborhood types that are primarily in cities and inner-suburbs in most regions, the Above Avg. H and Above Avg. H&T neighborhoods. These two neighborhood types are also where the median incomes of renters, when compared to all renter households, are the lowest at $33,578 and $24,198, respectively.

Table 8

Distribution of Households by Tenure and Neighborhood Type

	Below Avg H & T	Above Avg. H	Above Avg H & T	Above Avg. T
Median Income				
Owners	$79,671	$61,041	$43,783	$55,897
Renters	$47,767	$33,578	$24,198	$34,699
All Households	$71,930	$43,824	$31,718	$50,119
Households by Neighborhood				
Total Owners	11,972,149	2,225,590	4,453,270	5,973,487
% Owners	75%	33%	42%	73%
Total Renters	4,017,270	4,601,492	6,267,595	2,250,452
% Renters	25%	67%	58%	27%
Households across Metros				
% of all owners in 28 metros	49%	9%	18%	24%
% of all renters in 28 metros	23%	27%	37%	13%

The breakout above shows a trend, but even as a weighted average it hides some variation. While incomes within suburban neighborhoods, census tracts in this case, are typically within a narrow range, or there is at least a clear majority of an income level, more urban areas, such as the Above Avg. H neighborhoods, are the exception. Because of this income clustering (or segregation), the weighted average expenditure on H+T shown above is generally representative of at least 40% of households in each neighborhood type. However, the weighted average does not show the full range, especially at the ends of the distribution.

When the distribution is shown by income (See Table 9), for moderate income households ($20,000 to <$50,000) **housing costs** as a percentage of income:

- are *highest* in the Below Avg. H&T and the Above Avg. H neighborhoods for both owner and renter households;

- are *lowest* in the Above Avg. T neighborhoods for owners and for renters earning less than $20,000, and the Above Avg. H&T neighborhoods for renters earning $20,000 to <$50,000.

But, as this and other studies have shown, housing is only part of the picture. Combined housing and transportation costs as a percentage of income:

- are *lowest* for renters of all income categories, in the Above Avg. H neighborhood type;

- and for owners in the Above Avg. H neighborhoods for households earning less than $35,000 and the Above Avg. H&T neighborhoods for owners earning more than $35,000

Table 9

Percentage of Income on H and T Compared to % on H+T by Tenure, Income, and Neighborhood Type

	% of All HHS	Below Avg H&T				Above Avg. H				Above Avg. H&T				Above Avg. T			
		% H	% T	% H+T	% of HHS	% H	% T	% H+T	% of HHS	% H	% T	% H+T	% of HHS	% H	% T	% H+T	% of HHS
Owners	**59%**				**75%**				**33%**				**42%**				**73%**
<$20,000	5%	59%	57%	116%	**4%**	60%	48%	*109%*	**3%**	55%	56%	111%	**7%**	51%	65%	116%	**7%**
$20,000:<35,000	7%	35%	35%	71%	**7%**	37%	30%	*66.2%*	**4%**	32%	34%	*66.2%*	**8%**	31%	40%	71%	**10%**
$35,000:<50,000	8%	28%	26%	54%	**8%**	29%	22%	50.3%	**5%**	25%	25%	*49.6%*	**8%**	25%	29%	54%	**12%**
$50,000:<$75,000	14%	24%	19%	43%	**16%**	23%	16%	39%	**7%**	20%	18%	*38%*	**10%**	21%	21%	42%	**19%**
$75,000:<$99,000	10%	20%	14%	34%	**14%**	19%	12%	31%	**5%**	16%	14%	*30%*	**5%**	17%	16%	33%	**12%**
$100,000:<$250,000	15%	15%	9%	25%	**26%**	15%	8%	23%	**8%**	13%	9%	*22%*	**5%**	14%	11%	24%	**12%**
Renters	**41%**				**25%**				**67%**				**58%**				**27%**
<$20,000	12%	64%	53%	117%	**4%**	65%	41%	*105%*	**19%**	58%	52%	110%	**24%**	57%	64%	121%	**7%**
$20,000:<35,000	10%	35%	32%	66%	**5%**	33%	23%	*56%*	**16%**	29%	31%	60%	**15%**	30%	39%	69%	**7%**
$35,000:<50,000	7%	25%	23%	48%	**5%**	23%	17%	*40%*	**12%**	20%	23%	43%	**9%**	21%	28%	49%	**5%**
$50,000:<$75,000	7%	19%	17%	36%	**5%**	18%	12%	*30%*	**11%**	15%	17%	32%	**7%**	16%	21%	36%	**5%**
$75,000:<$99,000	3%	15%	12%	27%	**3%**	14%	9%	*23%*	**5%**	12%	12%	25%	**2%**	12%	15%	27%	**2%**
$100,000:<$250,000	3%	12%	8%	20%	**3%**	11%	6%	*17%*	**5%**	9%	8%	18%	**2%**	9%	10%	20%	**1%**
% in 28 metros	**100%**				**38%**				**16%**				**26%**				**20%**
Total HHS	**41,761,305**				**15,989,419**				**6,827,082**				**10,720,865**				**8,223,939**

Indicates lowest H+T neighborhood for respective income bin

Indicates lowest H neighborhood for respective income bin

The housing expenditure for moderate income households in Above Avg. H, Above Avg. H&T, and Above Avg. T neighborhoods compared to the combined H+T expenditure illustrates the trade-offs and constraints facing these households. Households of this income category can afford either good housing or good transportation, but rarely are they able to afford both to the quality or convenience desired.

- For **renters** of nearly all incomes, (except for those earning <$20,000 which may be corrected by taking into account household age or type), they have the lowest housing expenditure in the Above Avg. H&T neighborhoods. However, because these neighborhoods are primarily lower income, and because they also have higher transportation costs, the general situation of most households in these neighborhood types is above average housing and transportation expenditures. Lower income households would have a slightly lower combined burden in the Above Avg. H neighborhoods where they could reduce their transportation expenditures. However, finding affordable units in those higher priced "hot" neighborhoods next to jobs and amenities is becoming more and more difficult. The supply of rental units in major cities is shrinking and vacancies are low, especially for units that are affordable and in good condition.

- For **owners** earning less than $50,000, the difference in expenditures on H alone and H+T across neighborhood types is different from renters because of the location and supply of rental units and affordable ownership units. Owner households in these three income brackets

have the lowest H expenditure in the Above Average T neighborhoods, which demonstrates the reason more households in this income group are moving to outer suburban and exurban areas to purchase a lower-priced home. Yet, the housing burden is only slightly higher in the Above Avg. H&T neighborhoods for owner households earning $20,000 to $50,000, than it is in the Above Avg. T neighborhoods. However, the transportation costs in the Above Avg. H&T neighborhoods are much lower than the Above Avg. T neighborhoods thereby making these neighborhoods the most affordable in terms of combined H+T for owners of all incomes, except those earning <$20,000. The name of this neighborhood does not indicate this affordability because the majority of households in these neighborhoods are lower income renters and their costs are high as a percentage of income.

By Metro Area

For each metro area, the distribution of households by H+T Type is similar to the 28-metro average. In all regions, the Below Average H&T neighborhoods are the greatest share of neighborhoods, but not the majority. Within this neighborhood type households earning greater than $50,000 are the majority, however, ranging from 54% of households in Pittsburgh to 78% of households in Washington D.C. These households are paying from 22% of income to 45% of income on combined housing and transportation costs.

The neighborhood type with the second highest share of all neighborhoods varies somewhat across metros but in 25 of the 28 it is the Above Avg. H&T neighborhoods, ranging from 23% of neighborhoods in Chicago to 41% in Anchorage. Households earning less than $50,000 are the majority in this type and their expenditures on housing and transportation range from 42% of income to 119% of income. The three exceptions are Honolulu, where the second common type of neighborhood is Above Avg. H, and Boston and New York where the second type is Above Avg. T. In Boston and New York, households earning less than $50,000 living in Above Avg. T neighborhoods are 46% and 41% of households in these areas and are paying 55% to 124% of income on the combined expenses.

The following table (Table 10) shows the distribution of households for each metro across H+T Type, as well as the weighted average H+T expenditures of all households in the region compared to the H+T expenditures for the subset of households earning $20,000 to less than $50,000. The percentage of income on H+T for all households is on average across all 28 metros 48% of income, from a low of 42% in Washington D.C., reflecting the high incomes in that region, to a high of 54% in Miami. But for households earning $20,000 to less than $50,000, the average H+T expenditure is 57% of income, from a low of 54% in Pittsburgh to a high of 63% in San Francisco. These two extremes are due to the housing prices in those areas; Pittsburgh households in this income category have the lowest housing expenditure, 22%, and San Francisco households of this income have the highest, 35%. The Atlanta and Seattle regions are close seconds, each at 61% of income but in Atlanta the high H+T is due to high transportation costs, 32%, and moderately high housing costs, 29%, and the Seattle costs are due to high housing, 31%, and high transportation costs, 30%.

Table 10

Distribution by Metro of Household Housing & Transportation Burdens by Income

	% of All Households by H+T Type				% of Households earning <$50,000 by H+T Type				Expenditures of All Households in Metro			Expenditures of Households earning $20,000 to <$50,000		
Region	Below Avg H&T	Above Avg. H	Above Avg H & T	Above Avg T	Below Avg H&T	Above Avg. H	Above Avg H & T	Above Avg T	H%	T%	H+T%	H%	T%	H+T%
Anchorage, AK MSA	50%	0%	41%	10%	32%	0%	60%	9%	28%	18%	46%	31%	30%	60%
Atlanta, GA MSA	37%	17%	27%	19%	23%	18%	40%	20%	27%	21%	48%	29%	32%	61%
Baltimore, MD PMSA	42%	12%	27%	19%	27%	15%	40%	18%	27%	19%	46%	27%	29%	56%
Boston, MA CMSA	35%	18%	21%	26%	23%	22%	30%	25%	28%	19%	47%	29%	30%	59%
Chicago, IL CMSA	38%	18%	23%	20%	24%	23%	30%	23%	28%	18%	46%	28%	27%	55%
Cincinnati, OH CMSA	45%	8%	30%	17%	32%	9%	42%	17%	25%	23%	48%	24%	32%	56%
Cleveland, OH CMSA	43%	12%	25%	20%	33%	13%	34%	20%	26%	22%	49%	24%	30%	55%
Dallas, TX CMSA	41%	15%	26%	18%	26%	18%	37%	20%	26%	21%	47%	26%	31%	57%
Denver, CO CMSA	42%	15%	29%	14%	25%	19%	41%	14%	27%	19%	46%	29%	29%	59%
Detroit, MI CMSA	44%	11%	28%	17%	31%	10%	41%	18%	25%	21%	46%	24%	31%	56%
Honolulu, HI MSA	39%	24%	23%	13%	25%	32%	30%	13%	30%	16%	45%	31%	25%	56%
Houston, TX CMSA	37%	19%	30%	15%	22%	20%	41%	16%	26%	22%	48%	24%	31%	56%
Kansas City, MO-KS MSA	38%	12%	27%	23%	25%	12%	38%	25%	24%	23%	47%	23%	33%	56%
Los Angeles, CA CMSA	40%	17%	28%	16%	26%	18%	39%	16%	32%	19%	51%	32%	27%	59%
Miami, FL CMSA	43%	11%	34%	11%	30%	13%	45%	12%	33%	21%	54%	31%	28%	59%
Milwaukee, WI CMSA	43%	9%	26%	22%	31%	11%	37%	21%	26%	22%	48%	25%	30%	55%
Minneapolis, MN MSA	42%	12%	26%	20%	28%	15%	38%	19%	25%	19%	44%	27%	30%	56%
New York, NY CMSA	31%	23%	20%	26%	19%	31%	28%	22%	31%	16%	47%	32%	24%	55%
Philadelphia, PA CMSA	40%	15%	26%	18%	29%	18%	36%	17%	28%	20%	47%	27%	29%	56%
Phoenix, AZ MSA	39%	17%	29%	16%	25%	17%	40%	18%	27%	21%	48%	27%	30%	57%
Pittsburgh, PA MSA	35%	19%	20%	26%	26%	21%	25%	28%	25%	25%	50%	22%	33%	54%
Portland, OR CMSA	38%	13%	34%	15%	28%	14%	43%	15%	28%	22%	50%	28%	31%	60%
San Diego, CA MSA	40%	13%	30%	17%	26%	14%	42%	18%	31%	19%	50%	31%	28%	59%
San Francisco, CA CMSA	41%	15%	26%	18%	27%	18%	38%	17%	30%	15%	45%	35%	27%	63%
Seatte, WA CMSA	37%	16%	27%	20%	26%	19%	37%	19%	29%	19%	48%	31%	30%	61%
St. Louis, MO MSA	41%	10%	27%	21%	30%	11%	37%	22%	24%	23%	47%	23%	32%	55%
Tampa, FL MSA	37%	16%	26%	20%	27%	17%	33%	23%	27%	25%	52%	25%	33%	58%
Washington, DC PMSA	40%	16%	27%	17%	23%	19%	41%	17%	26%	17%	42%	32%	28%	60%
Average of Metros	38%	16%	26%	20%	27%	17%	38%	19%	27%	20%	48%	28%	30%	57%

Characteristics of Neighborhoods

To further define the neighborhood types, beyond what households were paying as a share of income on housing and transportation, we used a cluster analysis to identify whether other neighborhood characteristics were also related to place or to households expenditures. These other characteristics are: incomes, educational attainment (percent with a bachelor degree), unemployment rates, household density, household size, vehicle ownership, distance to work, tenure, and the daily number of household trips. Using these characteristics, the tracts clustered into four categories, with income as a significant discriminate variable. The clusters range from 30% of households in tracts with an average (weighted) income of $35,007 to 10% of households in tracts with an average (weighted) income of $100,128. The clustering also reveals a spatial dimension through the housing unit density variable ranging from urban for the lowest income category through suburban for the upper-income category. This spatial dimension is further analyzed in the next sub-section, Location of Neighborhood Types. Table 11 shows the average characteristics in each of the resulting four clusters.

Table 11

Neighborhoods Clustered by Socioeconomic and Place Characteristics

	Cluster				
Variables in Cluster Analysis	**1**	**2**	**3**	**4**	
T as a % of Income (all households)	20%	16%	25%	13%	
H as a % of income (all households)	28%	26%	34%	25%	
H + T as a % of income (all households)	48%	42%	58%	38%	
% unemployed	5%	4%	12%	3%	
% bachelor degree	16%	24%	8%	33%	
Avg. Distance to Work by Auto	9.6	10.5	7.7	10.7	
Avg. Number of vehicles per household	1.7	2.0	1.2	2.2	
Avg. Household Size	2.7	2.8	2.9	2.9	
Housing Unit Density (Units per square mile)	1,212	812	2,697	602	
Estimated Daily Trips per Household	10.2	10.6	10.1	11.0	
Tenure (% Owner)	63%	77%	39%	88%	
Weighted Average Income	$54,490	$74,818	$35,007	$100,128	
Number of Neighborhoods (tracts)	**10,252**	**7,200**	**8,815**	**2,967**	**29,234**
% of Neighborhoods (tracts)	**35%**	**25%**	**30%**	**10%**	**100%**

Across these neighborhood clusters, the characteristics are distinct but reflect the incomes of the respective cluster. The neighborhoods with the lowest incomes have the highest average unemployment rate (12%) and the lowest percentage of households with college degrees (8%). In terms of transportation-related characteristics, the households in the low income cluster own 1.2 vehicles compared with 1.7 to 2.2 in the other three clusters, make the fewest household trips per day (10.1), and have the shortest average distances to work, 7.7 miles. The two high income clusters make the most daily household trips (10.6 and 11), have the highest vehicle ownership (2 and 2.2), the longest distances to work (10.5 and 10.7 miles). Household sizes are largest for the highest and lowest income groups but in the middle for the second highest income group (2.8 for the cluster income of $74,818). Transportation and housing costs as a percentage of income

are more related to density, number of daily trips, distance to work, and the housing stock and location, in addition to income and household size.

Simply comparing the income of each cluster with the percentage of income spent on H+T makes it appear that expenditures—as a share of income—are just a matter of income. As incomes go up, expenditures go down. While this is true, it is not the complete story, especially since the average in a cluster represents at least 2,967 neighborhoods and each of those neighborhoods could vary from the average H+T expenditure of the cluster. For instance, a household earning $20,000 to $35,000 could have combined expenditures ranging from 66% in Above Avg. H neighborhoods to 71% in Above Avg. T neighborhoods and both neighborhoods might fall in the same cluster (see Table 10 above).

By matching the demographic neighborhood classification to the H+T neighborhood classification, we get a sense of whether all neighborhoods of a particular cluster do have the same H+T expenditures, and conversely whether all neighborhoods of a particular H+T expenditure share similar demographic characteristics. (See Table 12 below).

Table 12

Comparison of Neighborhoods and Households by Clusters and H+T Neighborhood Type

Median Incomes of Clusters	**Below Avg. H&T** % in Neighborhood	**Above Avg. H** % in Neighborhood	**Above Avg. H&T** % in Neighborhood	**Above Avg. T** % in Neighborhood	
$54,490	25%	48%	25%	59%	
$74,818	47%	15%	3%	26%	
$35,007	2%	35%	72%	14%	
$100,128	27%	3%	0%	1%	
TOTAL in H+T Type	100.0%	100.0%	100.0%	100.0%	
Median Incomes of Clusters	**Below Avg. H&T** % of Cluster	**Above Avg. H** % of Cluster	**Above Avg. H&T** % of Cluster	**Above Avg. T** % of Cluster	**Total in Cluster**
$54,490	25%	22%	20%	33%	100%
$74,818	67%	10%	3%	20%	100%
$35,007	2%	22%	66%	10%	100%
$100,128	93%	4%	0%	3%	100%

We found that the low income cluster neighborhoods (Cluster 3, $35,007), are primarily Above Avg. H&T neighborhoods which means this H+T Type is primarily neighborhoods with high unemployment rates (12%), low educational attainment (8% with a college degree), and low rates of home ownership (39%). Above Avg. T neighborhoods primarily consist of the moderate and high income clusters; the $54,490 and $74,818 clusters make up 85% of this H+T Type. Therefore, these neighborhoods have lower unemployment rates, 4-5%, higher rates of college degrees, 16-24%, and higher rates of home ownership, 63% to 77%. Below Average H&T neighborhoods are almost exclusively moderate and high income cluster neighborhoods with only 2% of the low income cluster neighborhoods falling into this H+T Type.

The lower half of Table 12, which shows the distribution of the demographic clusters across the H+T Types shows the segregation by income in neighborhood types for low and very high

incomes. While the moderate income cluster neighborhoods ($54,490) are nearly equally distributed across the four H+T Types (at 25%, 22%, 20%, and 33%), 88% of the low income cluster neighborhoods are in Above Avg. H or Above Avg. H&T, nearly the converse of the high income cluster neighborhoods ($74,818) of which 87% fall into the other two H+T types. The very high income cluster ($100,128) neighborhoods are almost exclusively (93%) in the Below Avg. H&T neighborhoods.

The significance of classifying the same set of 29,608 neighborhoods by a number of characteristics and not just the housing and transportation costs indicates that expenditures are largely a factor of place and where households live is largely a factor of income. Households do not have equal access to the same places and therefore shoulder additional burdens associated with the places they are able to access. The level of access is examined below.

Because of the similar distribution between the H+T Types and the cluster analysis, we summarized the remaining characteristics by the H+T Types.

Neighborhood Type Summary

The following descriptions and table of each H+T Type summarize the above findings.

Below Average H&T Neighborhoods: These neighborhoods contain 38% of households in the 28 metro areas. They spend an average of 39% of their income for housing and transportation. The neighborhoods are on average the second furthest away from the closest central city (16.8 miles), after Above Avg. T neighborhoods. Households in these areas are mostly homeowners (75%) with the highest median incomes of the four types, approximately $70,428. The households are predominantly white (81%), have the second largest household size, are majority family households, have the highest median age, and the highest percentage of the two household types: married with kids and married without kids. They also have the lowest percentage of male or female single-parent households. Members of these households have the highest percentage of graduate and bachelor's degrees and live in households with the highest average workers per household (1.55). As expected, this neighborhood type has the lowest unemployment rate (4%) and the lowest poverty rate (5%).

Above Average H Neighborhoods: These neighborhoods contain 16% of households in the 28 metro areas. They spend an average of 47% of their income for housing and transportation. The neighborhoods on average are the closest to the central city, 9.5 miles. Households in these areas are mostly renters (67%), with the third highest median income of the four types, $43,824. However, owner households in these neighborhoods have the second highest incomes among owners, $61,041, after the owners in the Below Average H&T neighborhoods ($78,007). These neighborhoods are in the middle for percentage of white households, 58%, have the smallest household size (2.6), lowest percentage of family households (58%), and the highest percentage of single person households (33%). The

second highest family type in these neighborhoods is married without children. Single parent households are also more common at 10% of households, after the Above Avg. H&T neighborhoods (16%). Members of these households have the second highest percentage of graduate and bachelors degrees. Yet, only the Above Average H&T neighborhoods have a higher unemployment rate (11% versus 7%) and poverty rate (23% versus 15%). These neighborhood types are the most diverse in terms of the range of incomes, tenure mix, and race.

Above Average H&T Neighborhoods: These neighborhoods contain 26% of households in the 28 metro areas. They spend an average of 59% of their income for housing and transportation. The neighborhoods on average are the second closest to the central city, 15.7 miles from the center, after the Above Avg. H neighborhoods. Households in these areas are mostly renters, 58%, second after Above Avg. H neighborhoods. These households have the lowest median incomes of the four neighborhood types, regardless of tenure. The median income is $31,718 for all households, $24,198 for renter households, and $43,783 for owner households. These neighborhoods have the lowest percentage of white households, 47%, the second smallest household size (3.21), second lowest percentage of family households (66%), and the second highest percentage of single person households (28%). After single person households, the second highest family types are married with or without children at 19% and 18%, respectively, followed by 16% single parent households, which is the highest percentage of this type of household among the four neighborhoods. Members of these households have the lowest educational attainment levels, 14% with a graduate or bachelor degree, compared to 20% in the next highest, Above Avg. T neighborhoods, and 41% in the Below Avg. H&T neighborhoods. This H+T Type also has the highest unemployment rate, 11%, and the highest poverty rate, 23%.

Above Avg. T Neighborhoods: These neighborhoods contain 21% of households in the 28 metro areas. They spend an average of 49% of their income for housing and transportation. The neighborhoods on average are by far the greatest distance to the nearest central city, 31 miles. Households in these areas are mostly owners, 73%, second only to the Below Avg. H&T neighborhoods at 75%. They have the second highest renter median incomes ($34,699) of the four neighborhood types. Owner incomes are only higher than the Above Avg. H&T neighborhoods, $55,897. These neighborhoods are tied with the Below Avg. H&T households for the highest percentage of white households, but they have a higher Hispanic population than the Below Avg. H&T neighborhoods, 13% compared to 9%. They have the largest household size, 4.35 persons, and are tied with the Below Avg. H&T neighborhoods for the percentage of family households (73%). Yet, despite the higher percentage of family households, there are not as many children (percentage of population under 18 years), as the Above Avg. H&T neighborhoods, 26% compared to 28%. The most common household type

is married households without children, 30%, followed by married households with children, 27%. Members of these neighborhoods have lower educational attainment levels than Below Avg. H&T and Above Avg. H, 20% with a graduate or bachelor degree, after the Above Avg. T neighborhoods. These neighborhoods have the second lowest unemployment rate (5%) and the second lowest poverty rate, 8%.

Table 13

Profiles of Households by Neighborhood Types in 28 Metro Areas				
Characteristic	**Below Avg H&T**	**Above Avg. H**	**Above Avg. H&T**	**Above Avg T**
Average Median Household Income (owners)	$78,007	$61,041	$43,783	$55,897
Average Median Household Income (renters)	$46,769	$33,578	$24,198	$34,699
Average Median Household Income (all)	$70,428	$43,824	$31,718	$50,119
Total Renter Households	4,017,270	4,601,492	6,267,595	2,250,452
Renters as % of all Households in 28 Metros	10%	11%	15%	5%
% of all Renters in 28 Metros	23%	27%	37%	13%
Renters as % of Households in the Neighborhood Type	25%	67%	58%	27%
Total Owner Households	11,972,149	2,225,590	4,453,270	5,973,487
Owners as % of all Households	29%	5%	11%	14%
% of all Owners	49%	9%	18%	24%
Owners as % of Households in the Neighborhood Type	75%	33%	42%	73%
Total Households in 28 Metros	15,989,419	6,827,082	10,720,865	8,223,939
% of all Households	38%	16%	26%	20%
Total Population in 28 Metros	48,558,067	19,850,410	35,428,365	27,056,943
% of Population	37%	15%	27%	21%
Average H as % of Income (owners)	23%	26%	28%	24%
Average H as % of Income (renters)	28%	35%	37%	30%
Average H as % of Income (all)	24%	32%	34%	26%
Average T as % of Income (owners)	14%	12%	20%	21%
Average T as % of Income (renters)	21%	19%	30%	31%
Average T as % of Income (all)	15%	15%	25%	23%
Average Job Density (Jobs/sq.mi. gravity model)	48,055	116,086	56,403	19,931
Average Distance to an Employment Center	6.3	3.9	6.7	15.3
Average Distance to the closest Central City	16.8	9.5	15.7	31.0
Unemployment Rate	4%	7%	11%	5%
Avg. % Poverty	5%	15%	23%	8%
% of All Workers in 28 metros	34%	19%	29%	18%
Average Workers per household	1.55	1.20	1.16	1.54
% of Workers commuting by auto to Work	92%	73%	84%	97%
Avg. Vehicles per household	1.99	1.24	1.34	1.96
% High School Degree	21%	22%	29%	32%
% Bachelors Degree	25%	20%	9%	13%
% Graduate Degrees	16%	13%	5%	7%
% White	81%	58%	47%	81%
% Black or African American	6%	20%	32%	7%
% Hispanic	9%	18%	25%	13%
Average Household Size	3.96	2.60	3.21	4.35
Avg. Family Size	3.1	3.1	3.4	3.2
Avg. Non-Family Household Size	2.7	2.5	2.8	2.8
% Family HouseholdS	73%	58%	66%	73%
Median Age	38	35	32	37
% under 5 years	6%	6%	8%	7%
% under 18 years	24%	21%	28%	26%
% over 65	12%	12%	11%	13%
% 1-person Households	22%	33%	28%	22%
% Married Household w/ Children	29%	18%	19%	27%
% Married Household no Children	31%	21%	18%	30%
% Male Single Parents	1%	2%	3%	2%
% Female Single Parents	4%	8%	13%	6%

Locations of Neighborhood Types

This section further analyzes the location of the H+T neighborhood types. Location matters for both housing and transportation costs since proximity to and availability of jobs is a factor that contributes to both transportation costs and household incomes, as well as housing prices, as does the density, mix of housing units types and tenure, availability of neighborhood services and amenities, and transportation choice.

To identify the general location of the neighborhood types within the region, we use the proximity to types of Employment Centers (EC) as a way to characterize whether the neighborhood is in the central city (Central City EC), an inner or middle-ring suburb (Other EC), or an outer-ring suburb or exurban area (Away from EC). Recall from Section One that employment centers are contiguous areas of at least 5,000 jobs or more in which the job density is at least 7 jobs per acre in the contiguous area.

This characterization is a first step in identifying the location of the H+T neighborhood types. It is not perfect however due to the varying nature of employment centers in each metro area. In total, there are more than 57 million jobs in these 28 regions and 37% of these jobs are contained within 466 employment centers. The number and percentage of jobs that fall within employment centers in regions varies from just 18% of all jobs in Miami to 51% of all jobs in New York. The total number of employment centers in a region also varies, from one and seven ECs in Anchorage and Atlanta, respectively, to 68 and 76 ECs in Los Angeles and New York, respectively.

The following table (Table 14) presents the number of jobs and employment centers within each region.

Table 14

Metro Area Jobs and Employment Centers

Metro Area	Total Jobs	Jobs in Employment Centers	% of Jobs in Employment Centers	Employment Centers in Region
Anchorage, AK MSA	135,997	41,074	30%	1
Atlanta, GA MSA	2,080,327	580,690	28%	7
Baltimore, MD PMSA	1,143,425	331,629	29%	9
Boston, MA CMSA	2,928,326	949,458	32%	22
Chicago, IL CMSA	4,189,946	1,429,970	34%	35
Cincinnati, OH CMSA	939,716	232,461	25%	8
Cleveland, OH CMSA	1,384,765	281,958	20%	12
Dallas, TX CMSA	2,544,920	867,795	34%	10
Denver, CO CMSA	1,347,391	442,980	33%	12
Detroit, MI CMSA	2,440,788	686,857	28%	25
Honolulu, HI MSA	403,983	234,546	58%	6
Houston, TX CMSA	2,052,949	705,336	34%	12
Kansas City, MO-KS MSA	896,319	215,170	24%	10
Los Angeles, CA CMSA	6,587,361	3,085,900	47%	68
Miami, FL CMSA	1,610,493	580,329	36%	9
Milwaukee, WI CMSA	826,523	188,218	23%	8
Minneapolis, MN MSA	1,614,633	542,483	34%	11
New York, NY CMSA	9,201,516	4,695,264	51%	76
Philadelphia, PA CMSA	2,733,936	684,550	25%	27
Phoenix, AZ MSA	1,448,838	468,745	32%	12
Pittsburgh, PA MSA	1,062,092	280,051	26%	6
Portland, OR CMSA	1,097,236	348,397	32%	9
San Diego, CA MSA	1,274,267	581,467	46%	12
San Francisco, CA CMSA	3,469,424	1,717,324	49%	25
Seatte, WA CMSA	1,770,097	781,072	44%	17
St. Louis, MO MSA	1,246,155	339,360	27%	9
Tampa, FL MSA	1,051,222	194,239	18%	8
Washington, DC PMSA	2,605,839	1,262,707	48%	18
TOTAL	**57,482,645**	**21,487,323**	**37%**	**466**
AVERAGE	**2,146,017**		**34%**	**17**

To compare the above list of employment centers to the H+T Types, we identified neighborhoods that were within or intersecting a Central City EC or Other EC. The limit to this method however, is in the “Away from ECs” category. A neighborhood that is “Away from ECs” because it’s not directly intersecting or within an EC could be a mile away from an EC cluster or 20 miles away. To compensate for this limitation, we also calculated the average distance from each neighborhood (tract centroid) to the center of the nearest central city. In multi-centered regions, such as the Bay Area, San Francisco, Oakland and San Jose were all identified as central cities. Across the 28-metro average, we see the following distribution of H+T neighborhood types to Central City ECs and Other ECs.

Table 15

Distribution of Neighborhoods by Housing & Transportation Costs by Location in Region based on Adjacency to Employment Centers (EC)

Below Avg H&T				Above Avg H				Above Avg H&T				Above Avg T			
Central City EC	Other EC	Away from ECs	Miles to CC	Central City EC	Other EC	Away from ECs	Miles to CC	Central City EC	Other EC	Away from ECs	Miles to CC	Central City EC	Other EC	Away from ECs	Miles to CC
8%	18%	74%	16.8	31%	26%	43%	9.5	17%	20%	64%	16.0	2%	8%	90%	31.0

- The Above Avg. T neighborhood type has by far the greatest share of neighborhoods away from major centers of employment, 90%, and they are 31 miles on average from the center of the nearest central city. With only 2% of these neighborhoods located near the Central City EC, it is safe to say these neighborhoods are mainly suburban and largely in outer or exurban communities.

- The Below Avg. H&T neighborhood is the other predominantly suburban type, with 74% away from ECs and 18% near Other ECs. Only 8% of these are proximate to Central City ECs. The lower distance from the central city, 16.8 miles, compared to 31 miles in the Above Avg. T neighborhoods, indicate these are mostly inner and middle ring suburbs, not exurbs.

- The Above Avg. H neighborhoods are the most likely to be near jobs--57% are within or adjacent to either the Central City EC or Other ECs. They are also mainly in the central cities or inner-ring suburbs, based on the average distance to the center of the central city, 9.5 miles. This proximity is often what makes the housing prices higher and the transportation costs lower in these neighborhoods.

- The Above Avg. H&T neighborhood type has a greater number of neighborhoods that are adjacent to employment centers (37%) than the Above Avg. T and Below Avg. H&T neighborhoods, however, the majority of these neighborhoods are away from employment centers, 64%. Gauging from the distance to the central city, 16 miles, which is similar to the Below Avg. H&T neighborhoods, and knowing that these neighborhoods had the highest share of the low income cluster, which also had the greatest household density, and that these areas are primarily lower income renter households, this is an instance where the Away from EC measure does not indicate the neighborhoods are in exurbs but rather they are in central city or inner-ring suburbs without major employment centers.

The following table shows this same distribution for each of the 28 metro areas. The Above Avg. H&T neighborhoods in all regions are always closer to the central city than the Above Avg. T neighborhoods. In all but three regions, the Above Avg. H&T neighborhoods are further from the central city than the Above Avg. H neighborhoods. The three exceptions are Phoenix, Detroit, and Kansas City. Detroit and Kansas have weaker housing markets and all three have weaker central cities and are overall low density regions.

In 20 regions, the Above Avg. H&T neighborhoods are also further from the central city than the Below Avg. H&T neighborhoods; the exceptions are New York, Boston, San Francisco, Seattle, Philadelphia, Denver, Washington D.C., Pittsburgh, and Portland. Except for Pittsburgh and Philadelphia, the places where the Below Avg. H&T neighborhoods are closer to the central city are hot housing markets, making many of the closer in suburbs just as desirable and expensive as the city neighborhoods and outer suburbs.

This comparison of distance to Central City and ECs for the Above Avg. H&T neighborhoods—H+T Type with the lowest incomes—is evidence that lower income households are more isolated from the central business district and the institutions, services, jobs, transportation assets, and amenities, that are often associated with these places in nearly all regions.

Table 16

Distribution of Neighborhoods by Housing & Transportation Costs by Location in Region

	Below Avg H&T				Above Avg H				Above Avg H&T				Above Avg T			
Metro Areas	Central City EC	Other EC	Away from ECs	Miles to CC	Central City EC	Other EC	Away from ECs	Miles to CC	Central City EC	Other EC	Away from ECs	Miles to CC	Central City EC	Other EC	Away from ECs	Miles to CC
New York, NY CMSA	21%	25%	54%	17.7	86%	7%	8%	8.2	30%	36%	35%	18.1	1%	16%	83%	38.9
Los Angeles, CA CMSA	5%	38%	58%	25.1	26%	46%	28%	17.0	15%	34%	50%	21.3	2%	20%	78%	48.0
Boston, MA CMSA	4%	17%	79%	18.0	61%	14%	25%	4.7	7%	37%	55%	24.5	0%	10%	90%	32.6
Anchorage, AK MSA	14%	0%	86%	14.4	n/a	n/a	n/a	n/a	44%	n/a	56%	11.5	10%	0%	90%	14.9
Miami, FL CMSA	7%	19%	74%	20.0	37%	21%	42%	12.8	30%	13%	57%	12.9	4%	5%	91%	20.9
San Francisco, CA CMSA	11%	38%	51%	9.9	22%	43%	35%	7.5	2%	38%	61%	16.7	0%	15%	85%	25.5
Phoenix, AZ MSA	5%	12%	82%	14.8	22%	27%	51%	11.7	18%	20%	61%	10.7	1%	9%	90%	24.5
Seatte, WA CMSA	9%	24%	68%	14.5	26%	31%	43%	8.3	6%	33%	61%	24.0	0%	5%	95%	30.7
San Diego, CA MSA	11%	24%	65%	14.9	33%	25%	42%	10.6	15%	23%	62%	13.4	2%	15%	82%	20.9
Cincinnati, OH CMSA	0%	7%	92%	13.0	16%	16%	68%	7.1	18%	17%	65%	10.6	2%	1%	97%	20.0
Milwaukee, WI CMSA	6%	9%	85%	11.8	37%	21%	42%	4.4	21%	13%	66%	5.4	1%	13%	86%	17.2
St. Louis, MO MSA	1%	14%	85%	16.4	20%	37%	44%	8.0	6%	27%	67%	9.5	0%	2%	98%	26.0
Philadelphia, PA CMSA	1%	17%	82%	16.3	23%	28%	49%	9.3	15%	18%	67%	18.8	0%	7%	93%	27.0
Honolulu, HI MSA	15%	18%	67%	10.7	64%	7%	29%	4.2	19%	13%	67%	10.5	4%	16%	80%	11.1
Denver, CO CMSA	1%	20%	79%	12.9	22%	43%	35%	8.3	14%	17%	69%	13.2	1%	6%	94%	18.9
Minneapolis, MN MSA	3%	18%	78%	10.9	23%	43%	34%	6.9	18%	11%	71%	7.9	0%	2%	97%	20.3
Tampa, FL MSA	2%	4%	94%	14.8	1%	30%	69%	14.0	5%	23%	72%	14.6	0%	1%	99%	23.3
Washington, DC PMSA	10%	31%	59%	12.6	31%	37%	31%	7.9	12%	14%	73%	13.4	1%	6%	93%	34.0
Chicago, IL CMSA	5%	25%	70%	19.0	37%	23%	39%	8.2	6%	20%	75%	14.7	0%	10%	90%	31.4
Pittsburgh, PA MSA	3%	5%	92%	11.2	29%	2%	69%	5.0	14%	11%	75%	15.3	0%	5%	95%	23.7
Detroit, MI CMSA	0%	23%	77%	21.7	4%	29%	68%	18.2	6%	19%	75%	17.7	0%	8%	91%	36.4
Baltimore, MD PMSA	2%	14%	84%	13.2	31%	18%	51%	4.9	13%	11%	75%	6.7	1%	5%	94%	15.1
Portland, OR CMSA	7%	21%	72%	11.4	25%	23%	52%	6.9	6%	18%	76%	16.2	1%	7%	92%	25.2
Kansas City, MO-KS MSA	1%	15%	83%	12.8	21%	33%	46%	8.4	6%	17%	77%	7.0	0%	0%	100%	19.6
Cleveland, OH CMSA	0%	9%	91%	14.3	1%	26%	73%	8.6	3%	19%	78%	12.8	0%	6%	94%	29.8
Houston, TX CMSA	5%	16%	79%	18.5	33%	20%	48%	11.8	6%	16%	78%	14.6	0%	3%	97%	26.0
Dallas, TX CMSA	4%	12%	83%	13.8	14%	34%	52%	10.0	8%	13%	79%	11.8	1%	4%	95%	19.3
Atlanta, GA MSA	5%	7%	88%	18.6	25%	26%	50%	9.8	5%	13%	81%	12.5	0%	0%	100%	28.6
Weighted Average	**8%**	**18%**	**74%**	**16.8**	**31%**	**26%**	**43%**	**9.5**	**17%**	**20%**	**64%**	**16.0**	**2%**	**8%**	**90%**	**31.0**

The locations of H+T Types can be used to target places for housing and transportation policies for working households and to identify causal effects between expenditures and neighborhood characteristics, such as the lack of services, public transit and affordable housing, and the distance to jobs.

It makes sense, and has been shown through the Location Efficiency study[6] and the development of the transportation cost model used here, that lower transportation costs are associated with proximity to jobs and services—households do not have to drive as far to commute or to access services and retail. However, it's not always clear how much lower, or whether the lower transportation costs are low enough to offset the higher housing costs that are generally associated with access. This question is explored in the next section.

[6] John Holtzclaw, Robert Clear, Hank Dittmar, David Goldstein, and Peter Haas, "Location Efficiency: Neighborhood and Socio-Economic Characteristics Determine Auto Ownership and Use—Studies in Chicago, Los Angeles, and San Francisco," Transportation Planning and Technology 25(1) (2002): 1-27.

4. What Determines the Burden?

This section seeks to answer the question raised in the previous section: How do savings on either housing or transportation costs vary from place to place?

To answer this question we first look at trends for all the neighborhoods within the 28 metro areas, without accounting for metro area differences, and then we breakout the differences by metro area.

Trends for All Metros

Location in Region compared to H+T Expenditures

Using the Employment Center proximity to define location in region, our analysis indicates that the lower transportation costs in central cities and inner-ring suburbs can offset the higher housing costs for moderate income households. We also found the combined housing and transportation costs substantially rises as one gets further from the central city and the rise is not due to rising housing costs as a percentage of income, but rising transportation costs. This is shown in Table 16 below. As distance from the central city increases, the housing costs as a percentage of income are only rising a few percentage points for each income category as they move from the Central City EC locations to Away from ECs whereas the transportation costs which are rising by 4% to 19%.

A household earning $20,000 to $35,000 living near the Central City EC is paying 54% combined for the two costs, with 32% for housing and 22% for transportation, but moving to a location Away from ECs, even when only increasing housing by one percent, increases the combined costs by 16 percent to a combined total of 70%. This is due to the extra 15% on transportation. The higher amount on transportation is due to higher vehicle ownership and more miles driven each day.

Table 17

Percent of Household Expenditures on Housing and Transportation

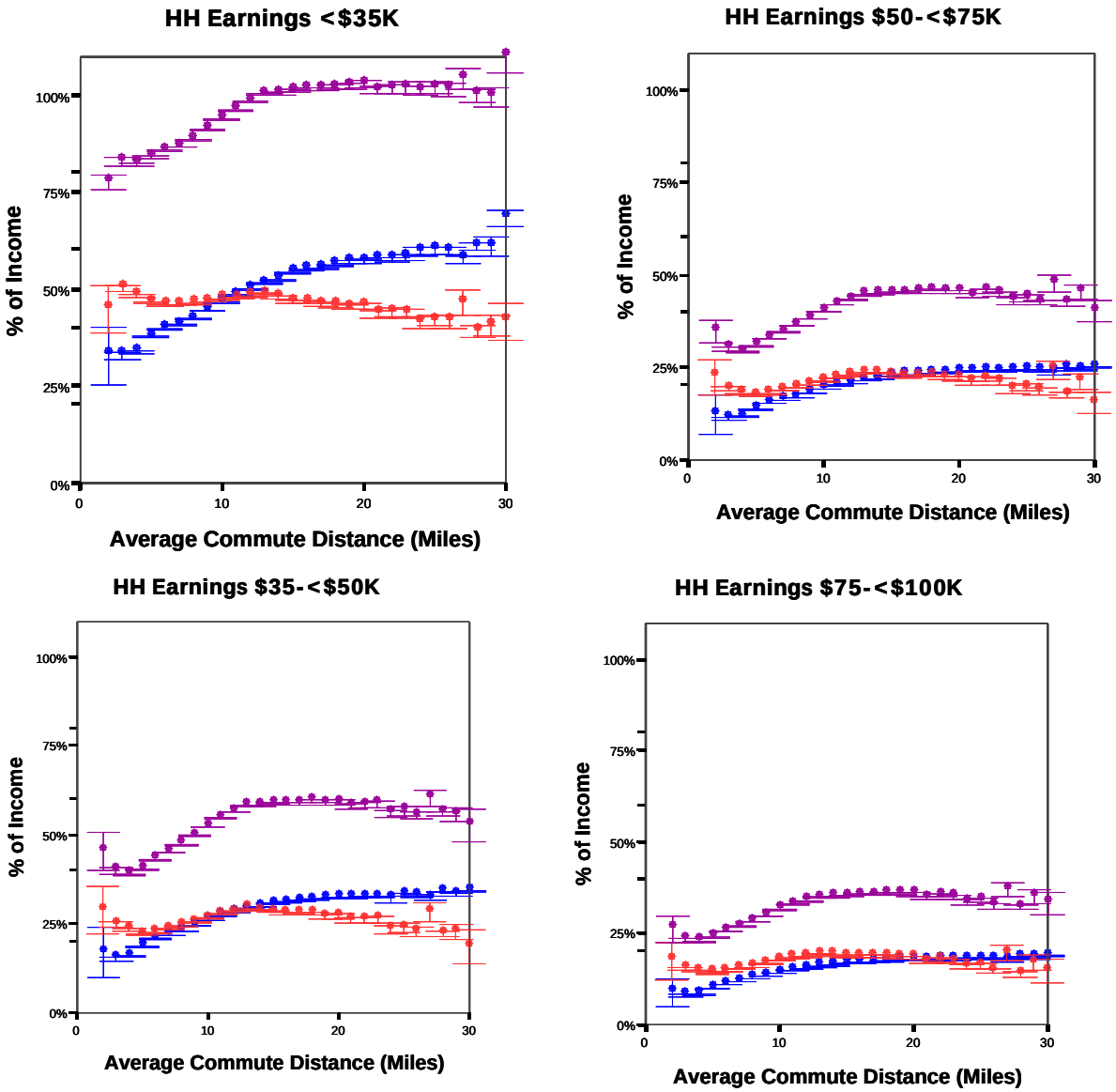
% of Expenditures by Income	Intersecting Central City Employment Center	Intersecting Other Employment Centers	Away from an Employment Center
$0-<$20,000			
% Income on Housing	63%	63%	60%
% Income on Transport.	41%	52%	60%
% Income on H+T	*104%*	*116%*	*120%*
$20,000 - <$35,000			
% Income on Housing	32%	35%	33%
% Income on Transport.	22%	31%	37%
% Income on H+T	*54%*	*66%*	*70%*
$35,000 - <$50,000			
% Income on Housing	23%	26%	25%
% Income on Transport.	16%	23%	26%
% Income on H+T	*39%*	*48%*	*52%*
$50,000 - <$75,000			
% Income on Housing	18%	21%	20%
% Income on Transport.	11%	17%	19%
% Income on H+T	*29%*	*37%*	*40%*
$75,000 - <$100,000			
% Income on Housing	15%	17%	17%
% Income on Transport.	8%	12%	14%
% Income on H+T	*23%*	*29%*	*31%*
$100,000 - <$250,000			
% Income on Housing	11%	13%	12%
% Income on Transport.	5%	8%	9%
% Income on H+T	*16%*	*21%*	*22%*
Owner Median Income	$56,074	$63,058	$61,530
Renter Median Income	$30,807	$37,741	$36,316
Median Income	$38,170	$51,387	$53,987

Commute Distance compared to H+T Expenditures

As regions become more multi-centered and an increasing number of households commute to secondary cities for employment, the Employment Center analysis is not sufficient for every region. For instance, the Central City EC in Detroit does not have the same pull as the Central City EC in Chicago. Therefore, we also looked at the commute distance of every worker in each neighborhood in comparison to the household housing and transportation expenditures in each neighborhood. This analysis compares the actual commute for a neighborhood with costs, which accounts for the dispersion of jobs away from central city and other employment centers in many regions.

The following plots represent all households in four income bins in the 28 metros. They compare housing and transportation expenditures within a neighborhood to the typical commute distance for workers of a particular income within a neighborhood. The red lines represent housing costs as a percentage of income, the blue lines represent transportation costs, and the purple lines are the combined housing and transportation costs[7]. These plots illustrate the strong relationship we found between the percent of income a household spends on each cost separately as well as the combined costs and their commute distance. By plotting these two costs separately along with the combined costs, we're able to see at what distance the increase in transportation costs outweigh the savings on housing costs, resulting in a higher total combined cost.

Figure 6



[7] In a black and white printout, the housing line begins in the middle of the three lines at the vertical axis, greater than the transportation line and less than the combined cost line.

The trends above for each income level for all households in the 28 metro areas are also consistent with the expenditures and commute distances by H+T Neighborhood Type. Comparing the housing and transportation expenditures for the three income bins from $35,000 to $75,000 in each of the H+T Neighborhood Types with the average commute distance of each neighborhood type, we found the following pattern of housing and transportation expenditures:

- The percentage of income spent on housing is higher in areas with the shortest distance (Above Avg. H), than it is in areas with longer distances, the Above Avg. H&T and Above Avg. T neighborhoods, but less than the housing percentage in the middle distance, Below Avg. H&T neighborhoods. In relation to the commute distance plots above; housing prices start high in the neighborhoods with the shortest distances which are typically in the central cities, drop with a slight increase in distance to the inner ring suburbs, then increase in price with the next increase in distance to the middle ring suburbs, and then drop again in the neighborhoods with the greatest distances in the exurban areas.

- Unlike the housing costs which rise and fall with distance to employment, transportation costs continue to increase with commute distance. At different distances for each income, transportation costs eventually rise above housing costs as a percentage of income.

The net effect is that total combined housing and transportation costs increase with commute distance even though housing prices ultimately decrease at the greatest distance.

Table 18

H+T Expenditures by Income & Neighborhood Compared to Average Commute Distance

	Above Avg. H	Above Avg. H&T	Below Avg H&T	Above Avg. T
Mean Distance	**7.4**	**8.3**	**9.6**	**12.1**
<$35,000				
% H	49.8%	45.7%	46.2%	41.0%
% T	33.9%	43.9%	42.8%	50.9%
% H+T	33.9%	43.9%	42.8%	50.9%
$35,000 to <$50,000				
% H	24.8%	22.2%	27.2%	23.7%
% T	18.3%	23.7%	24.8%	28.7%
% H+T	18.3%	23.7%	24.8%	28.7%
$50,000 to <$75,000				
% H	19.9%	18.1%	22.4%	19.7%
% T	13.8%	17.8%	18.5%	21.2%
% H+T	13.8%	17.8%	18.5%	21.2%
$75,000 to <$99,000				
% H	16.8%	15.1%	19.0%	16.7%
% T	10.6%	13.4%	14.0%	15.9%
% H+T	10.6%	13.4%	14.0%	15.9%

The trend is slightly different, however, for households earning less than $35,000. Housing and transportation are not the highest for these households living in the Below Avg. H&T neighborhoods as they are in the other three income groups. This trend needs more exploration but the lower housing costs could represent households who purchased homes in these areas before they developed and therefore have lower mortgage payments, and the lower transportation costs could be due to smaller household sizes at this income in these neighborhood types.

Regional Differences

The trends across all metro areas are useful for identifying general patterns and relationships, many of which can be used to interpret the reason for costs in specific neighborhoods within a region, but differences in metro areas, such as concentration of employment in employment centers, the availability and quality of mass transit, the strength of the housing market, etc., also make it necessary to look at each metro area separately.

To begin our comparison of burdens by region, we first compared our housing and transportation costs to the CES costs in 2000 as one benchmark for our hybrid of housing and transportation expenditures. We found a significant positive correlation between the CES housing and transportation expenditures for the median income in each metro area and the housing and modeled transportation costs for comparable incomes in this study (See Table A4 in Appendix A)[8]. With this validation for our average expenditures at the regional level, we used these averages to determine whether metro types could be classified into a combination of housing and transportation costs. A cluster analysis resulted in four different types of metro areas:

- 10 metros with Low Housing/High Transportation costs,
- 4 metros with High Housing/Low Transportation Costs;
- 3 metros with High Housing/Medium Transportation Costs; and
- 11 metros with Medium Housing/Medium Transportation costs.

These metro categories are listed in the table below. The category with the strongest relationship among regions is Low Housing/High Transportation. Regardless of the different clustering methods we tried, these 10 regions always clustered together.

Table 19

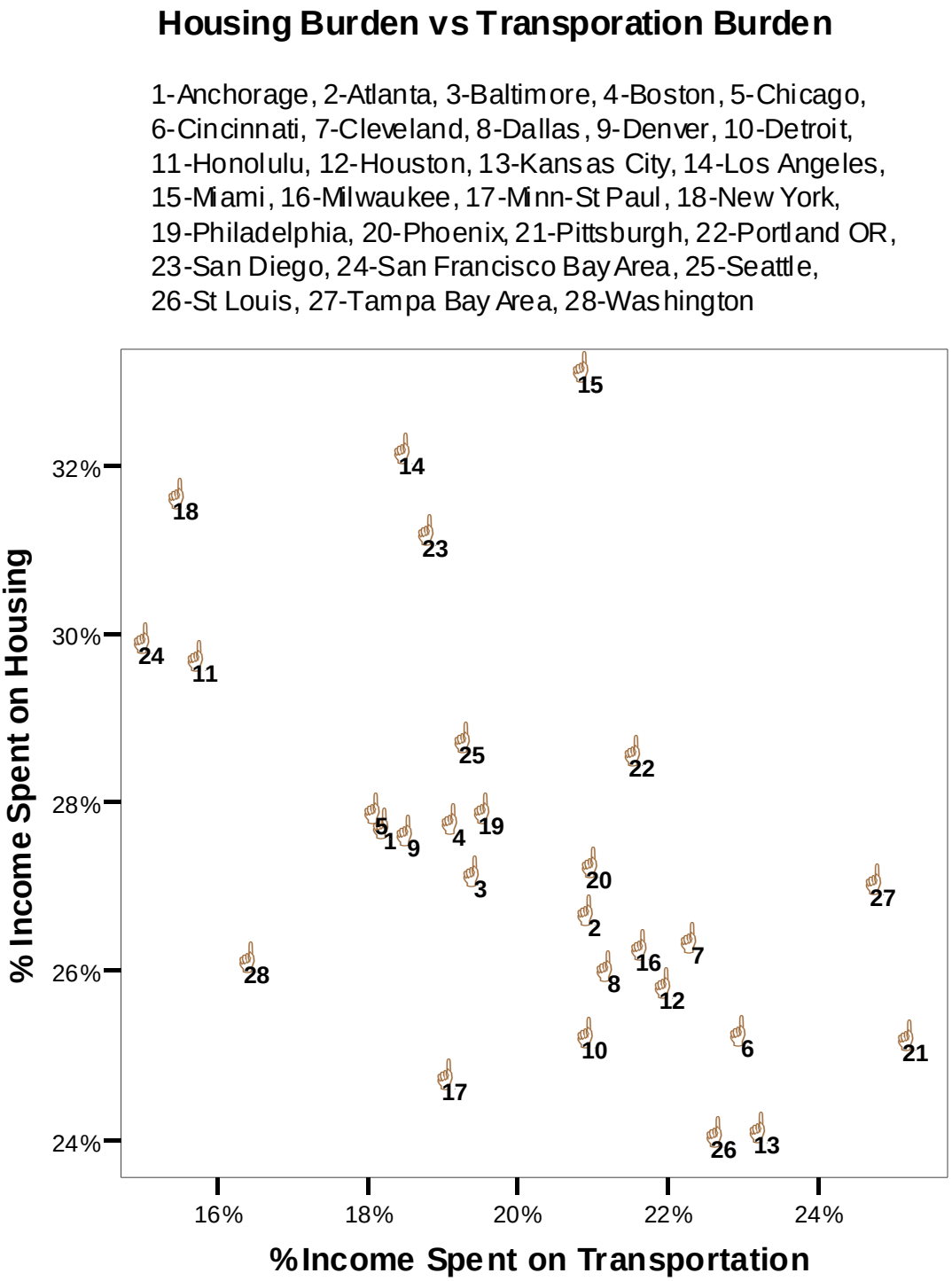
Metro Area Categorizations by Reported Housing and Modeled Transportation Expenditures as a Share of Income (2000)

Low Housing (25.4%) High Transportation (22.8%)	High Housing (29.2%) Low Transportation (15.8%)	High Housing (32.0%) Med Transportation (19.5%)	Med Housing (27.3%) Med Transportation (19.6%)
Cincinnati, OH CMSA	Honolulu, HI MSA	Los Angeles, CA CMSA	Anchorage, AK MSA
Cleveland, OH CMSA	New York, NY CMSA	Miami, FL CMSA	Atlanta, GA MSA
Dallas, TX CMSA	San Francisco, CA CMSA	San Diego, CA MSA	Baltimore, MD PMSA
Detroit, MI CMSA	Washington, DC PMSA		Boston, MA CMSA
Houston, TX CMSA			Chicago, IL CMSA
Kansas City, MO-KS MSA			Denver, CO CMSA
Milwaukee, WI CMSA			Minneapolis, MN MSA
Pittsburgh, PA MSA			Philadelphia, PA CMSA
St. Louis, MO MSA			Phoenix, AZ MSA
Tampa, FL MSA			Portland, OR CMSA
			Seattle, WA CMSA

[8] To obtain an income from our six income bins that could be compared to the median income surveyed for a metro area in the CES, we either used a single income bin that encompassed the CES median income, or took a weighted average of two income bins if the CES income was at the low or high end of an income bin.

The next figure, which plots each metro area along the housing and transportation expenditure axis shows the above categories but specifies where each region falls within the cluster.

Figure 7



On the whole, without considering the different burdens by income, the top five most expensive metro areas for households based on the combined housing and transportation costs relative to income are: Miami (54%), Tampa (52%), Los Angeles (51%), Pittsburgh (50%), and Portland (50%). These five areas are a mix of types: Miami and Los Angeles are High Housing/Medium Transportation regions, Tampa and Pittsburgh are Low Housing/High Transportation regions, and Portland is the only Medium Housing/Medium Transportation region. The region type, High Housing/Low Transportation, e.g. San Francisco, Honolulu, Washington D.C., and New York does not make the top five list when ranking regions according to the average of all households. Because these regions are known for their very high housing cost burdens on working families, we realized it was important to also rank each region according to income categories.

These additional rankings by income category show that certain "H/T region types" might be more expensive for working families than higher income families. When the 28 regions are ranked separately for the second through fifth income bins, there are 11 regions that were within the top five most expensive for either one of the income categories or for the region as a whole. The following table lists the 11 regions, their region type, and where they rank in terms of the Top 5 list for each income category. The combined housing and transportation expenditure for that income is shown in parenthesis along side the rank. The area median income of the region is also provided for additional reference. (The table is sorted by region type and the rank order for households earning $35,000 to <$50,000).

Table 20

Rank Among Top 5 Most Expensive by Income Category

Region Type	Region	$20K - <$35K	$35K - <$50K	$50K - <$75K	$75K - $100K	Avg. of All Incomes	2000 Area Median Income
High H-Low T	San Francisco	1 (71.7%)	1 (53.9%)	1 (42.7%)	1 (35.0%)		$62,024
High H-Low T	Washington, D.C.	4 (69.0%)	2 (52.5%)	3 (41.2%)	5 (33.2%)		$62,216
High H-Med T	Miami					1 (54.0%)	$38,632
High H-Med T	Los Angeles				4 (32.6%)	3 (50.6%)	$45,903
High H-Med T	San Diego			4 (40.8%)	3 (33.4%)		$47,067
Low H High T	Tampa					2 (51.8%)	$37,406
Low H-High T	Pittsburgh					4 (50.4%)	$37,467
Med H-Med T	Seattle	5 (68.8%)	3 (52.4%)	2 (41.9%)	2 (33.9%)		$50,733
Med H-Med T	Atlanta	2 (70.4%)	4 (50.7%)				$51,948
Med H-Med T	Portland		5 (51.0%)			5 (50.1%)	$46,090
Med H-Med T	Anchorage	3 (69.5%)		5 (40.7%)			$55,546

This approach results in a number of findings. First, two of the most expensive housing markets, New York and Honolulu do not appear in any of the lists. It may be that their Low Transportation costs off-set their higher housing costs for low to moderate income households and that they have greater housing choice than the other High Housing markets, San Francisco and Washington D.C.. It's not necessarily due to having higher area median incomes in these regions since the 2000 median incomes in New York and Honolulu were $50,795 and $51,914, respectively, which are much lower than median incomes of San Francisco and Washington.

Second, a region from each of the four H/T region types ranks among the five most expensive in at least one of the lists, however, the Low Housing/High Transportation only appears in the Average of All Incomes ranking. The two regions that make this list, Tampa and Pittsburgh, also have low median incomes.

Third, regions categorized as Medium Housing/Medium Transportation appear most often. It's possible in these regions, there are not enough instances to make a trade-off between housing and transportation for low to moderate incomes and therefore they are most often saddled with both costs in the medium range making the combined costs high, e.g. **(Med. H + Med. T = High H+T).**

Regardless of region type, the rankings illustrate the importance of addressing both household costs for low and moderate income households. The cities with the highest expenditures are not just those with either very high housing costs, although this is the issue with San Francisco because of *extreme* costs, or just the places with affordable housing shortages or with very high transportation costs. The high cost regions are a combination of regions with medium to high costs in both household necessities and a mixture of places with varying levels of affordable housing shortages and transportation options. In places with low levels of affordable housing shortages, high transportation costs outweigh the greater availability of affordable housing. In places with transportation choice, lower income households do not have equal access to the transportation assets and in places without transportation choice, lower income households bear a higher transportation burden from the lack of choice than do higher income households.

To illustrate this mix of factors that may contribute to the housing and transportation expenditures by working households in each region, Table 21 summarizes these housing and transportation characteristics: the H/T region type; the state of the housing market, e.g. hot, weak, sprawling, expanding; the availability of affordable housing; the level of transportation choice; the concentration of employment centers; the level of congestion, and the housing and transportation expenditures of households earning from $20,000 to <$50,000. The table is ranked by H/T region type and then by the expenditure on housing and transportation by households from $20,000 to <$50,000. (Note the regions that rank high in their respective region type, are not on the above ranking lists by smaller income bins because this table takes a weighted average of two income bins--$20,000 to <$35,000 and $35,000 to <$50,000.) Initial observations from the table include: the most expensive places for this combined income category are not always regions with high affordable housing shortages, e.g. Kansas City; places with high transportation costs have lower concentrations of jobs within employment centers, e.g. Tampa; congestion levels vary between and within region types, but tend to be highest within medium and high housing expenditure metros, e.g. Los Angeles; and regions with rail systems have higher shares of households commuting without autos to work, e.g. New York. The next analysis uses many of these factors listed in table 21 but at the neighborhood level in order to find a statistical relationship with these factors and affordable housing and employment access within each region.

Table 21

Metro Area Characterization by Housing and Transportation Choices and Burdens

MSA	H+T Type	Housing Market (Price and Construction Density)	Housing Burden (% of 30-50% HAMFII with Severe Burden)	Affordable Housing Shortage	Transportation Choice (% non-auto commuters, Rail Transit System Size)	Employment Centers (Pop. near ECs, Jobs in ECs)	TTI Congestion 2003, Change '93-'02		Expenditures of Households Earning $20,000 to <$50,000 % H	%T	% H+T
New York, NY CMSA	High H, Low T	Hot Densifying Mkt.	22%	high	31%, Extensive Rail	54%, 51%	49	16	29%	32%	61%
San Francisco, CA CMSA	High H, Low T	Warm Sprawling Mkt.	27%	high	14%, Extensive Rail	42%, 49%	72	13	31%	30%	60%
Honolulu, HI MSA	High H, Low T	Hot Single Family Mkt.	23%	medium	15%, No Rail	39%, 58%	20	-10	29%	30%	59%
Washington, DC PMSA	High H, Low T	Hot Single Family Mkt.	13%	medium	13%, Large Rail	35%, 48%	69	15	27%	29%	56%
Los Angeles, CA CMSA	High H, Med T	Hot Single Family Mkt.	28%	high	8%, Large Rail	45%, 47%	93	-15	24%	32%	56%
Miami, FL CMSA	High H, Med T	Hot Single Family Mkt.	42%	high	6%, Medium Rail	34%, 36%	51	14	28%	27%	55%
San Diego, CA MSA	High H, Med T	Hot Single Family Mkt.	31%	high	7%, Medium Rail	35%, 46%	52	22	24%	30%	55%
Kansas City, MO-KS MSA	Low H, High T	Cool Single Family Mkt.	15%	low	3%, New Start Rail	18%, 24%	17	2	31%	28%	59%
Tampa, FL MSA	Low H, High T	Hot Single Family Mkt.	31%	medium	4%, Small Expanding Rail	14%, 18%	46	0	29%	29%	59%
Cleveland, OH CMSA	Low H, High T	Cool Single Family Mkt.	16%	low	6%, Medium Rail	14%, 20%	10	1	32%	27%	59%
Detroit, MI CMSA	Low H, High T	Cool	14%	low	4%, No Rail	22%, 28%	57	-23	26%	31%	57%
Milwaukee, WI CMSA	Low H, High T	Warm L/Med Density Mkt.	15%	low	7%, No Rail	23%, 23%	23	5	27%	30%	56%
Pittsburgh, PA MSA	Low H, High T	Cool Single Family Mkt.	16%	low	10%, Medium Rail	14%, 26%	14	-1	23%	33%	56%
Houston, TX CMSA	Low H, High T	Cool Single Family Mkt.	16%	medium	5%, Small Expanding Rail	23%, 34%	63	27	24%	31%	56%
Dallas, TX CMSA	Low H, High T	Cool	17%	medium	3%, Medium Rail	19%, 34%	60	14	24%	31%	56%
Cincinnati, OH CMSA	Low H, High T	Cool Sprawling Mkt.	11%	low	5%, No Rail	16%, 25%	30	12	31%	25%	56%
St. Louis, MO MSA	Low H, High T	Cool Single Family Mkt.	12%	low	4%, Small Expanding Rail	21%, 27%	35	7	25%	30%	55%
Chicago, IL CMSA	Med H, Med T	Warm Sprawling Mkt.	16%	medium	15%, Extensive Rail	30%, 34%	58	13	35%	27%	63%
Phoenix, AZ MSA	Med H, Med T	Hot Single Family Mkt.	26%	medium	5%, New Start Rail	28%, 32%	49	7	31%	30%	61%
Minneapolis, MN MSA	Med H, Med T	Warm Single Family Mkt.	13%	medium	7%, New Start Rail	24%, 34%	43	13	32%	28%	60%
Anchorage, AK MSA	Med H, Med T	Warm Sprawling Mkt.	n/av	n/av	5%, No Rail	25%, 30%	5	2	28%	31%	60%
Philadelphia, PA CMSA	Med H, Med T	Hot Single Family Mkt.	18%	medium	13%, Extensive Rail	25%, 25%	38	15	31%	28%	59%
Denver, CO CMSA	Med H, Med T	Cool Single Family Mkt.	20%	medium	7%, Small Expanding Rail	27%, 33%	51	14	25%	33%	58%
Portland, OR CMSA	Med H, Med T	Warm Densifying Mkt.	24%	medium	9%, Large Rail	25%, 32%	39	8	27%	30%	57%
Boston, MA CMSA	Med H, Med T	Warm Sprawling Mkt.	17%	medium	14%, Extensive Rail	33%, 32%	51	10	27%	29%	56%
Atlanta, GA MSA	Med H, Med T	Cool Sprawling Mkt.	22%	medium	5%, Medium Rail	17%, 28%	67	26	32%	24%	55%
Baltimore, MD PMSA	Med H, Med T	TBD	15%	low	11%, Medium Rail	20%, 29%	50	17	23%	32%	55%
Seatte, WA CMSA	Med H, Med T	Warm Single Family Mkt.	22%	medium	11%, Small Expanding Rail	31%, 44%	46	-8	22%	33%	54%
High H, Low T Avg.			21%		18%	43%, 52%	53	9	29%	30%	59%
High H, Med T Avg.			34%		7%	38%, 43%	65	7	25%	30%	55%
Low H, High T Avg.			16%		5%	18%, 26%	36	4	27%	30%	57%
Med H, Med T. Avg.			19%		9%	26%, 32%	45	11	28%	29%	58%
Average of 28 Metros			**20%**		**9%**	**27%, 34%**	**45**	**8**	**28%**	**30%**	**57%**

Does the presence of affordable housing and employment access affect H+T and does it vary by region?

The table above suggests relationships among some of the characteristics and housing and transportation costs. This analysis further examines how various spatial features of the housing market, including the spatial distribution of affordable housing, are associated with average household expenditures on housing and transportation costs. To examine this issue, we estimated two linear regression models with housing as a percentage of income (H) and transportation as a percentage of income (T) as dependent variables and the following as independent variables: *measures of urban form and spatial location relative to employment* (natural log of housing unit density, distance from nearest employment center, census tract job accessibility using a gravity model, median commute time), *local supply of affordable housing* (percent of units in tract that are "affordable" to working families from CHAS), and *household income* (natural log of the median household income for the tract). Each model, estimated for the pooled sample of census tracts in all 28 metropolitan areas, also includes dummy variables ("fixed effects") indicating the metropolitan area in which the tract was located. The following summarizes the statistically significant results from these regression analyses for the average of all metro areas. Following the aggregate results, is a list of the variations in these results by metro area:

- *Expenditures on housing are higher in more densely-developed areas that are within close proximity to jobs, while expenditures on transportation are lower.* As suggested above, households make tradeoffs between housing costs and accessibility to jobs. In the models, increases in housing unit and employment density are associated with higher H and lower T and households in tracts closer to employment centers spend more on H and less on T.

- *Expenditures on housing are lower in areas with a larger supply of affordable housing units.* We find that increases in the percent of units affordable to working families locally are associated with large reductions in housing costs. Among all factors influencing housing costs, affordable housing supply has an impact that is second in magnitude only to the median household income of the census tract.

- *The results suggest that expenditures on housing are higher in areas with higher degrees of traffic congestion, while expenditures on transportation are lower.* The median commuting time is positively associated with housing costs and negatively associated with transportation costs. Since the models control for the factors influencing average commute distances for households within the tract, we interpret this finding to imply that increases in commute time signal increases in local roadway congestion, which tends to be higher in locations that are within a close distance to employment centers. The negative influence of commuting time on transportation costs may possibly indicate modal shifts that occur in areas experiencing high levels of auto congestion. Such shifts would lower transportation costs since commuting by transit is generally more affordable than commuting by auto.

When we studied the regression model results for each of the metro areas separately, we found similar trends with some exceptions.

- *In 20 of the 28 metro areas, local concentrations of affordable housing are associated with declining transportation **and** housing cost burdens.* The exceptions are five west coast cities in terms of lowering both costs: Anchorage, San Diego, San Francisco, Portland, Seattle, and San Francisco; Honolulu in terms of increasing housing costs; and Miami and Tampa in terms of increasing transportation costs. The five west coast exceptions may be due to State-supported affordable housing planning in Oregon and California, or because in San Francisco and San Diego affordable housing is in such scarce supply, that no one tract has a large enough share to exert influence on housing or transportation costs. The increases in affordable housing concentration and increased transportation costs in Miami and Tampa may be due to the tourism industry and the extensive Gulf coast and ocean coastlines in these cities, affordable housing is likely further inland and away from employment centers rather than in the downtown areas which would mean locations with affordable housing have high transportation costs.
- *Job Density and housing costs are positively associated in 19 of the 28 regions.* In seven regions, however, there is no association. In some cases, the lack of association may be due to the ubiquity of employment centers and high job density, such as New York, San Francisco, and Los Angeles. In these three regions, the percent of jobs in employment centers is 47% to 51%. In the other four regions where these two measures are not associated, it may be due to the exact opposite--there may be too few instances of sufficient job densities to exert significant pressure on housing costs. In St. Louis and Detroit, job density and housing costs are unexpectedly negatively associated. These two regions have weaker central city housing markets and therefore the employment centers in their central cities have high job density but are not exerting price pressures on the nearby housing.
- *Transportation Costs are positively associated with distance to employment centers in 21 regions, negatively associated in Detroit and St. Louis and are not associated in five other regions; Cleveland, Dallas, Miami, Milwaukee, and Phoenix* This again could be due to the nature of employment centers in these regions. These regions have relatively lower concentrations of jobs in employment centers. St. Louis, Detroit, Milwaukee and Cleveland each have less than 30% of jobs concentrated in centers and Dallas and Miami have less than 37% of jobs in employment centers.
- *Housing Costs are negatively associated with distance to employment centers in 19 regions and positively associated in Honolulu.* In eight other regions; Pittsburgh, Portland, San Diego, Seattle, Boston, Cleveland, Kansas City, Miami, and Milwaukee, housing costs are not associated with distance to employment centers.
- *Housing Unit Density is associated with housing costs in 23 of the metros, negatively associated in San Francisco and Denver, and not associated in Washington D.C., Chicago, and Phoenix*. In San Francisco and Washington D.C. the negative or neutral association may be due to the overall hot housing market, e.g. housing prices are high everywhere regardless of higher densities. In Denver and Phoenix, household preferences may be stronger for lower density communities than the downtown higher density areas. Additionally, or conversely, there may not be enough high density housing areas to show up in our models.

Table 22 lists the model results for each of the metro areas.

Table 22

Results of H and T Models of Affordability and Accessibility by Metro Area

Metro Area	Job Density and Housing Costs	Increase in HU Density and Housing Costs	Distance to Employment Centers and Housing Costs	Distance to Employment Centers and Transportation Costs	Local Concentration of Affordable units and Housing & Transportation Costs
Anchorage, AK MSA	Positive	Positive	Negative	Positive	
Atlanta, GA MSA	Positive	Positive	Negative	Positive	Negative
Baltimore, MD PMSA	Positive	Positive	Negative	Positive	Negative
Boston, MA CMSA	Positive	Positive		Positive	Negative
Chicago, IL CMSA	Positive		Negative	Positive	Negative
Cincinnati, OH CMSA	Positive	Positive	Negative	Positive	Negative
Cleveland, OH CMSA		Positive			Negative
Dallas, TX CMSA		Positive	Negative		Negative
Denver, CO CMSA	Positive	***Negative with H&T***	Negative	Positive	Negative
Detroit, MI CMSA	***Negative***	Positive	Negative	***Negative***	Negative
Honolulu, HI MSA	Positive	Positive	***Positive***	Positive	***H costs rise***
Houston, TX CMSA	Positive	Positive	Negative	Positive	Negative
Kansas City, MO-KS MSA	Positive	Positive		Positive	Negative
Los Angeles, CA CMSA		Positive	Negative	Positive	Negative
Miami, FL CMSA		Positive			***Positive T***
Milwaukee, WI CMSA		Positive	Negative		Negative
Minneapolis, MN MSA	Positive	Positive	Negative	Positive	Negative
New York, NY CMSA		Positive	Negative	Positive	Negative
Philadelphia, PA CMSA	Positive	Positive	Negative	Positive	Negative
Phoenix, AZ MSA	Positive		Negative		Negative
Pittsburgh, PA MSA	Positive	Positive		Positive	Negative
Portland, OR CMSA	Positive	Positive		Positive	
San Diego, CA MSA	Positive	Positive		Positive	
San Francisco, CA CMSA		***Negative with H&T***	Negative	Positive	
Seatte, WA CMSA	Positive	Positive		Positive	
St. Louis, MO MSA	Positive	Positive	Negative	***Negative***	Negative
Tampa, FL MSA	***Negative***	Positive	Negative	Positive	***Positive T***
Washington, DC PMSA	Positive		Negative	Positive	Negative

Exceptions in bold and italics, blanks indicate no correlation

5. Everyone Pays: Impacts on households, neighborhoods and regions from high costs to working households

In this section we assess the burdens on households, neighborhoods, and regions associated with the household costs in locations where working households live. Burdens are discussed in three categories:

1. Burdens on Working Households:
   - housing burdens, including overcrowding and the approximate quality of units
   - transportation burdens, including commute time and distance, availability of transportation choice, and the necessity to own and operate multiple vehicles
2. Burdens on Neighborhoods and Regions:
   - Levels of congestion and traffic
   - Neighborhoods with high rates of poverty and unemployment and residents straddled with high costs and little means to get ahead
   - All households and the region as a whole experience more congestion and traffic levels on roads from the jobs-housing mis-match. Government costs increase from a growing share of households with little remaining income for additional education, savings, or healthcare. Environmental problems of air and water quality, water availability, and brownfield abandonment increase when regions expand beyond existing developed areas.

Burdens on Working Households

Housing Burdens

As we've shown throughout, working households are likely to have the lowest combined H+T costs in Above Avg. H and Above Avg. H&T neighborhoods. But we recognize that the quality of housing stock –affordable to working households--was not incorporated into this analysis, and that the availability of affordable ownership units, particularly in the Above Avg. H neighborhoods was not fully addressed. Here, we look at four housing characteristics in six regions by H+T Type: overcrowding, age of housing stock, units built since 1990, and diversity of housing types. While these measures do not fully explore quality, since an older unit can be in better condition than some newer units, they can indicate average quality. They also indicate the availability of housing choices in each neighborhood type, both in terms of type of unit and size of unit.

Overcrowding

To measure overcrowding we used the Census variable which compares number of occupants in a housing unit to the number of rooms in a unit. Kitchens, bathrooms and closets are not included

in the room count, but common areas, such as living rooms, are included in the count in addition to bedrooms. We considered more than one person per room an overcrowded situation since the average number of occupants per room is 0.12 occupants.

In the six regions, the instance of overcrowding is greatest in the two neighborhood types that are most affordable to working households and have the highest percentages of working households, the Above Avg. H&T and Above Avg. H neighborhoods. Los Angeles was the exception with high overcrowding in the Above Avg. T neighborhoods as well. Based on the number of tracts with overcrowding in each region, the average number of households with more than one person per room in the Above Avg. H&T neighborhoods ranges from 1.7% in Pittsburgh to 35.6% in Los Angeles. Pittsburgh is the one region of the six that does not have a high rate of overcrowding in any of the four neighborhood types. Los Angeles, on the other hand, is notable in its high rate of overcrowding in all four neighborhood types. The lowest rates of overcrowding in all regions are in the Below Avg. H&T neighborhoods.

Table 23

Overcrowding by H+T Neighborhood Type in Six Regions
(Housing Units with greater than 1 person per room)

	Below Avg. H&T	Above Avg. H	Above Avg. H&T	Above Avg. T
Region	**2000**	**2000**	**2000**	**2000**
Atlanta	2.4%	5.6%	11.1%	3.5%
Chicago	3.1%	8.9%	13.1%	4.6%
Denver	1.6%	4.9%	11.6%	4.9%
Los Angeles	9.9%	19.0%	35.6%	20.5%
Pittsburgh	0.6%	1.7%	1.7%	1.1%
Portland	2.6%	4.2%	8.0%	4.3%
Wtd. Average	**5.9%**	**10.7%**	**18.6%**	**7.8%**

Age of Units and Recent Construction

The average age of units as well as the number of units constructed since 1990 can indicate whether the construction of newer homes, or even the rehab of existing homes is occurring within a neighborhood. Newer homes being built within an existing neighborhood, signals reinvestment in a neighborhood and could mean that the existing units are also being rehabbed or maintained. The lack of construction of new units in existing neighborhoods could be from the lack of space for new development but also from the lack of market interest. Even in developed neighborhoods there is often room for new construction through replacement and the adaptation of other uses.

When we compared the age of the housing stock across neighborhoods in the same six regions, we found the same trend as the overcrowding comparison; the neighborhoods types with the lowest incomes are also the types with the oldest housing stock, the Above Avg. H&T and Above Avg. H neighborhoods. This is also true of the percentage of units constructed since 1990. However, the greater percentage of units constructed in the Above Avg. H neighborhoods, which are the highest density of the four types, than the Above Avg. H&T neighborhoods, illustrates

our point that even in developed areas there is still room for new construction. The lower rate of newer construction in the Above Avg. H&T neighborhoods indicates lack of recent investment and probably units that are not only older but possibly in worse condition. Lower home prices in these areas could also indicate the condition.

Table 24

Age of Housing Stock by H+T Neighborhood Type

Region	Below Avg. H&T	Above Avg. H	Above Avg. H&T	Above Avg. T
Atlanta	1983	1973	1970	1983
Chicago	1964	1950	1952	1965
Denver	1979	1971	1965	1971
Los Angeles	1967	1965	1962	1971
Pittsburgh	1960	1947	1944	1956
Portland	1974	1965	1964	1973
Wtd. Average	**1968**	**1958**	**1958**	**1967**

Table 25

Percentage of Housing Units Constructed since 1990

Region	Below Avg. H&T	Above Avg. H	Above Avg. H&T	Above Avg. T
Atlanta	33%	22%	14%	34%
Chicago	14%	6%	6%	15%
Denver	27%	17%	12%	19%
Los Angeles	11%	9%	8%	14%
Pittsburgh	10%	3%	3%	8%
Portland	28%	19%	17%	24%
Wtd. Average	**24%**	**16%**	**10%**	**21%**

Housing Choice

The percentage of all housing units in each neighborhood type that are single family detached also indicates the number of housing options available to a working household. We found the four neighborhood types each have a disproportionate mix in all six regions with some regions having less choice by neighborhood type than others. If each neighborhood type is to accommodate households of all sizes and incomes, some neighborhoods may need a greater variety of multi-family buildings and other communities need to find a way to provide affordable single family housing in compact urban and inner suburban areas served by frequent transit. If larger households are to look for an affordable housing/transportation trade-off in Above Avg. H&T and Above Avg. H neighborhoods, there needs to be a greater availability of larger units. For instance, in Chicago, only 33% of the units in the Above Avg. H&T neighborhoods are single family. Conversely, households looking for smaller units in Below Avg. H&T neighborhoods in Atlanta would have a difficult time since 83% of units in these neighborhoods are single family detached.

Table 26

Percent of Single Family Detached Units by H+T Neighborhood Type

Region	Below Avg. H&T	Above Avg. H	Above Avg. H&T	Above Avg. T
Atlanta	83%	39%	51%	79%
Chicago	65%	25%	33%	70%
Denver	79%	32%	50%	75%
Los Angeles	70%	34%	42%	68%
Pittsburgh	79%	48%	55%	75%
Portland	75%	46%	55%	72%
Wtg. Average	**75%**	**33%**	**45%**	**69%**

In sum, the trade-off made by working households to live near work or have affordable transportation likely comes with a trade-off in housing quality. They are paying more for housing units that are older, and possibly in poor condition, and have less space. They also have fewer choices for single family units. While mild overcrowding may not be a problem for many households, it is serious in situations where overcrowding makes it difficult for workers, care givers, students or other occupants to sleep or where overcrowding causes safety or other health hazards. Older units can also have health and safety issues, such as exposure to lead paint, asbestos, and pests, and inadequate or unsafe heating and cooling systems. These hazards may be higher in areas that have seen little recent investment, e.g. the Above Avg. H&T neighborhoods.

Transportation Burdens

To see how the commutes of workers varied across neighborhood type, which would indicate whether households of lower incomes are taking on an additional burden in the form of a longer commute, *in both time and distance,* we compared the weighted average one-way commute speed, commute time, and commute distance of workers in each neighborhood by mode to work.

Table 27

Worker Average Commute Time, Speed, and Distance by Neighborhood Type in 28 Metro Areas

Neighborhood Type	Weighted Avg. Time	Weighted Avg. Distance	Weighted Avg. Speed	Mode Share	% H	% T	% H+T
Below Avg. H & T (all modes)	**28.8**	**9.9**	**20.3**		**24%**	**15%**	**39%**
by Auto	27.1	9.8	20.8	93%			
by Public Transit	51.6	11.5	12.7	7%			
Above Avg. H (all modes)	**31.1**	**7.6**	**15.7**		**32%**	**15%**	**47%**
by Auto	26.7	8.0	17.9	77%			
by Public Transit	45.9	6.2	8.5	23%			
Above Avg. H & T (all modes)	**29.4**	**8.9**	**18.7**		**34%**	**25%**	**59%**
by Auto	26.8	9.0	19.8	89%			
by Public Transit	50.4	7.7	10.0	11%			
Above Avg. T (all modes)	**29.4**	**12.3**	**24.0**		**26%**	**23%**	**49%**
by Auto	28.4	12.1	24.1	97%			
by Public Transit	64.4	18.9	17.4	3%			
All Neighborhoods (all modes)	**29.4**	**9.8**	**20.0**				
by Auto	27.3	9.9	21.0	91%			
by Public Transit	49.9	9.0	10.7	9%			

- On average, the Below Avg. H&T neighborhoods have the lowest *commute time*, but not the fastest speeds or the shortest distances. In comparison to household transportation costs, we found that these households are paying more for ***total*** transportation costs, despite the shorter commute **time**. This is due to the physical characteristics of these neighborhoods. Even though these households have a shorter time to work, they are located in areas where they likely need to use an auto for most of their other trips besides their commute. As such, these other trips add to their total household transportation costs, e.g. through multiple vehicles, more daily trips, and more miles each year, as shown in the cluster results for higher income households in Table 6—these household made the greatest number of trips and owned more vehicles. The shorter commute time does not save them money, except for the value of their time. Yet, relative to their higher incomes, households in these neighborhoods still spend a lower share on transportation than the households in the other neighborhood types.

- In contrast, the Above Avg. T neighborhoods have the longest commute *times* and *distances* by both auto and public transit. They also have the lowest share of public transit users. The longer distances and the lack of public transit options contribute to the high transportation costs in these areas. As a share of income, these households spend 23% on just transportation. The lower priced housing trade-off in these neighborhoods comes at a price as longer distances contribute to much higher transportation costs in these areas. Longer distances require more gas and add to the wear and tear on a car. A very low percentage of households are using transit in these neighborhoods, and to do so they spend an average of 64 minutes one way.

- The lower income households in the Above Avg. H&T neighborhoods have relatively short distances to travel, but their times are not significantly shorter than the two suburban

neighborhood types with longer distances. This is probably due to the higher percentage of public transit users, and the slower speed of some transit compared to auto travel. It's also an indication of congestion as well as slower speed limits and more stops and intersections on surface streets in urban and most inner-suburban areas. In terms of burdens, the commute is one of the few areas in which these neighborhoods are not the worse off. However, 11% of households in these neighborhoods do commute by public transit for an average of 50.4 minutes to go 7.7 miles. This is better slower than the rate of public transit travel in the Above Avg. T and Below Avg. H&T neighborhoods and there are more households in the Above Avg. H&T neighborhoods taking transit. Given the higher rate of public transit users in these neighborhoods, and the lower incomes, steps should be taken to improve the quality of the transit service.

- Households in Above Avg. H neighborhoods may have the best commute situation in terms of costs, distance, and time. By auto, they are nearly tied for the shortest commute times and they have the shortest distances. By transit, they have both the shortest commute times and the shortest distances. The shorter distances means a higher percentage of workers in these neighborhoods can also bike or walk. In these six regions, 5.6% of workers commuted by walking or biking in this neighborhood type, the highest percentage of all three types. The other types ranged from 1.7% in Below Avg. H&T to 4.8% in Above Avg. H&T. This neighborhood type also has the lowest combined housing and transportation costs, 47%. Costs are lower due to shorter distances, and therefore fewer miles and lower gasoline use, and because trips can be made by transit, walking, or biking instead of auto.

We also looked at the time workers leave for work as another possible indication of commute burden. In each of the six regions, the Above Avg. T and Above Avg. H&T neighborhoods had the greatest share of workers leaving before 6:00 am Despite there being some workers who may enjoy getting an early start, there are probably many more who are not able to maintain a daily schedule of rising by 4:00 am or 5:00 am in order to be on the road by 6:00 am while also getting enough sleep, especially workers with children or aging parents to care for.

Table 28

Percentage of Workers Leaving Home before 6 a.m. by H+T Neighborhood Type

Region	Below Avg. H&T	Above Avg. H	Above Avg. H&T	Above Avg. T
Atlanta	26%	20%	32%	35%
Chicago	29%	27%	34%	36%
Denver	28%	26%	36%	36%
Los Angeles	27%	25%	37%	39%
Pittsburgh	27%	23%	29%	34%
Portland	27%	24%	33%	35%
Wtd. Average	**26%**	**22%**	**31%**	**33%**

In sum, we found commute characteristics are highly associated with neighborhood type which also means they're associated with income. The households with the shortest commute times are those in the higher income neighborhood types, Below Avg. H&T and Above Avg. H plus the neighborhood type with the lowest incomes, Above Avg. H&T. On this measure—commute burden—lower income households in Above Avg. H&T do not take on a higher burden in terms of time or distance when commuting by auto, but they do have a high commute time by transit experienced by 11% of workers. The households with the worst commute burden are the predominantly moderate income households in Above Avg. T neighborhoods. They have the longest commute times and greatest distances by both auto and transit resulting very high transportation costs, whether measured by time or price. They also have the least amount of transportation choice.

The following table shows the commute time, distance and speed by mode for each metro area.

Table 29

Commuting Characteristics by Metro Area
(Interpretation of CTPP 2000)

	Auto Commuters				Public Transit Commuters			
Region	**% of Workers**	**Avg. Distance** (Miles)	**Avg. Time** (Minutes)	**Avg. Speed** (Miles/Hr)	**% of Workers**	**Avg. Distance** (Miles)	**Avg. Time** (Minutes)	**Avg. Speed** (Miles/Hr)
Anchorage, AK MSA	95%	6.4	17.9	20.4	5%	4.2	34.1	8.8
Atlanta, GA MSA	95%	11.5	30.7	22.0	5%	8.9	52.6	12.1
Baltimore, MD PMSA	89%	10.8	28.7	21.7	11%	9.2	52.9	10.7
Boston, MA CMSA	86%	9.8	26.7	20.5	14%	7.9	44.5	10.0
Chicago, IL CMSA	85%	9.8	29.2	19.5	15%	11.3	50.8	13.0
Cincinnati, OH CMSA	95%	9.0	24.0	21.4	5%	6.3	39.0	10.9
Cleveland, OH CMSA	94%	8.7	23.4	21.2	6%	6.8	43.7	10.7
Dallas, TX CMSA	97%	10.5	27.3	22.3	3%	8.6	50.3	12.3
Denver, CO CMSA	93%	8.7	25.1	20.1	7%	8.1	42.8	11.7
Detroit, MI CMSA	96%	10.3	26.1	22.7	4%	6.9	48.5	10.7
Honolulu, HI MSA	85%	7.8	26.8	17.3	15%	7.1	45.8	9.7
Houston, TX CMSA	95%	10.9	28.4	22.3	5%	10.6	51.3	13.8
Kansas City, MO-KS MSA	97%	9.5	22.8	23.8	3%	5.6	40.6	10.0
Los Angeles, CA CMSA	92%	10.7	28.7	21.4	8%	8.7	51.1	11.1
Miami, FL CMSA	94%	8.8	28.3	18.4	6%	7.6	52.0	10.4
Milwaukee, WI CMSA	93%	8.4	21.6	22.0	7%	5.5	40.7	9.1
Minneapolis, MN MSA	93%	9.8	23.4	23.8	7%	6.7	36.4	11.3
New York, NY CMSA	69%	9.9	28.9	19.8	31%	9.2	53.2	9.9
Philadelphia, PA CMSA	87%	9.2	26.4	20.0	13%	8.7	47.8	10.7
Phoenix, AZ MSA	95%	9.5	26.1	21.7	5%	7.0	47.0	10.6
Pittsburgh, PA MSA	90%	8.4	24.8	19.7	10%	5.9	39.1	9.3
Portland, OR CMSA	91%	8.4	23.3	20.4	9%	6.1	40.8	9.5
San Diego, CA MSA	93%	9.9	24.7	23.0	7%	9.2	51.9	11.8
San Francisco, CA CMSA	86%	10.1	28.1	20.5	14%	9.3	46.3	11.4
Seatte, WA CMSA	89%	9.6	26.7	20.7	11%	8.6	45.2	11.4
St. Louis, MO MSA	96%	10.1	25.3	22.8	4%	7.2	45.5	11.2
Tampa, FL MSA	96%	8.9	25.5	20.5	4%	6.1	43.7	10.9
Washington, DC PMSA	87%	11.0	31.7	19.9	13%	8.4	46.6	10.6
28-Metro Average	**91%**	**9.5**	**26.1**	**21.1**	**9%**	**7.7**	**45.9**	**10.8**
Minimum	**69%**	**6.4**	**17.9**	**17.3**	**3%**	**4.2**	**34.1**	**8.8**
Maximum	**97%**	**11.5**	**31.7**	**23.8**	**31%**	**11.3**	**53.2**	**13.8**

Burdens on Neighborhoods and Regions

Congestion

One hypothesis of this study was whether regions with the greatest shortages of affordable housing or with the highest transportation costs or highest housing costs had higher levels of congestion. To address this question, we mapped the commute speeds by neighborhood for ten regions in comparison to average daily traffic levels on major roads. Placing these maps along side the Housing/Transportation trade-off map created for each of the ten regions shows a strong relationship between congestion and the presence or absence of jobs and affordable housing.

The San Francisco region maps are shown below and the remaining nine regions are at the end of Appendix B.

The Bay Area has the most expensive housing market in the country. It also stands out in that nearly half of its jobs are concentrated in employment centers and 42% of the population lives near these centers. However, as the Housing/Transportation trade-off map on the right shows, the households near these employment centers are generally higher income—the white areas on the map. Looking at these same areas on the congestion map (map on the left), shows these areas also have the slowest commute speeds and that they line the highways leading to the employment centers. In contrast, the areas that have the highest commute speeds are generally the same areas as the Above Avg. H&T and the Above Avg. T neighborhoods —the red and gray areas on the Housing/Transportation trade-off map. The higher speeds in the low and moderate income areas indicate a worker living in one of these neighborhoods is able to begin the commute at a higher rate of travel, because there are lower levels of traffic since few workers are coming into these areas, but probably encounters congestion on the latter part of their commute once the worker reaches the congested highways and roads near the centers.

The percentage of workers that are commuting out of the place where they live in order to access work is highest for the Above Avg. T neighborhoods and typically lowest for the Above Avg. H neighborhoods. However, across the eight regions, this varies. Atlanta has low percentages of households in all four neighborhood types that can live and work in the same place whereas Chicago, Dallas and Portland have more than half their workers in Above Avg. H and Above Avg. H&T neighborhoods that live and work in the same place.

Table 30

Percent of Workers that Work and Live in Same Place by H+T Neighborhood Type

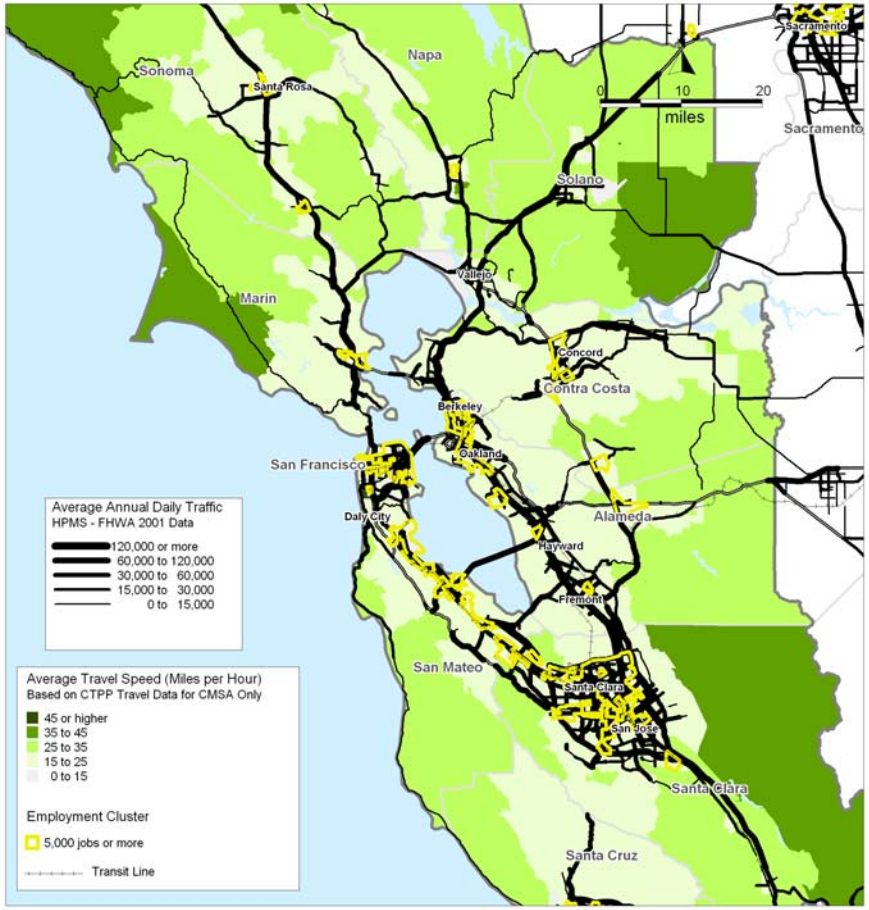
Region	Below Avg. H&T	Above Avg. H	Above Avg. H&T	Above Avg. T
Atlanta	23%	33%	35%	21%
Chicago	31%	61%	55%	25%
Denver	30%	48%	41%	27%
Los Angeles	29%	41%	38%	29%
Pittsburgh	22%	44%	34%	14%
Portland	37%	53%	50%	33%
Dallas	41%	58%	57%	38%
San Francisco	35%	45%	35%	30%
Wtd. Average	**30%**	**48%**	**43%**	**27%**

The impact on the higher income neighborhoods near employment centers is heavy traffic, possibly worse air quality, and longer times to work despite the ability to locate closer to work. The impact on the region as more households either commute to concentrated centers surrounded by higher priced housing, or to places around the region but outside the place they live, is clogged and congested major roads that require higher levels of maintenance, traffic safety and enforcement, and capital improvements.

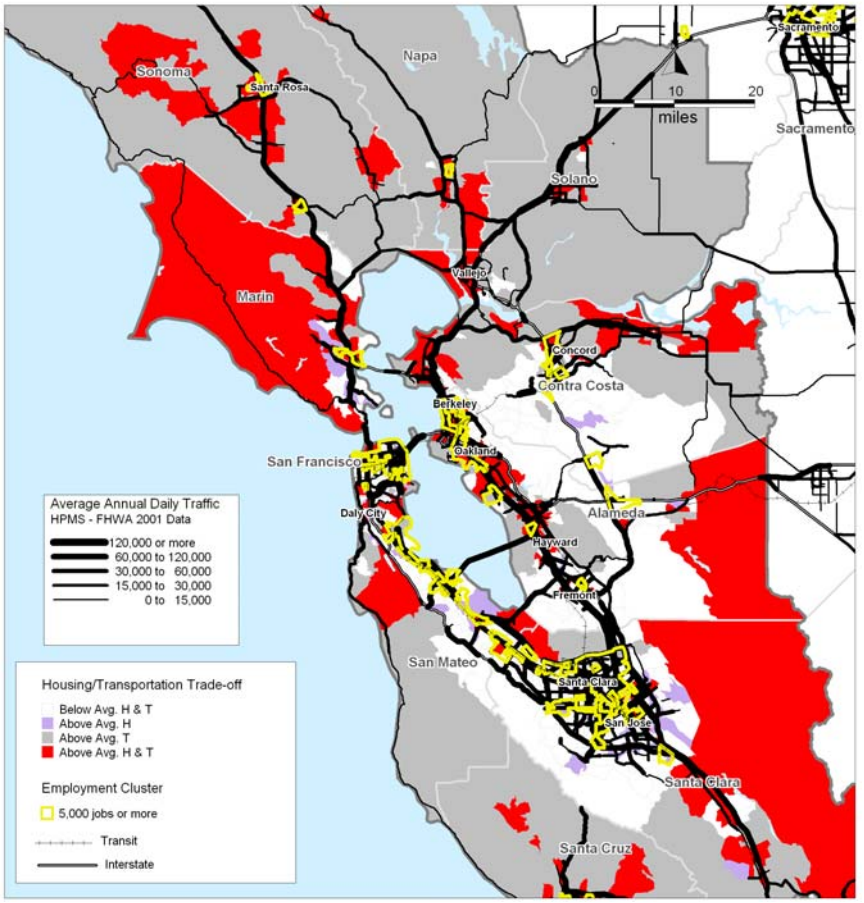
H+T Neighborhood Types compared to highway congestion, commute speeds, and employment centers

Figures 8 and 9 *(Additional comparison maps for 9 other regions are in Appendix B)*

San Francisco: Travel Speed in Relation to Average Annual Daily Traffic



San Francisco: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000 in Relation to Average Annual Daily Traffic



Trends 1990 to 2000

To obtain a sense of whether the patterns we have identified as of 2000 are different than they were in 1990 and therefore might change again, stay the same, or worsen by 2010, we looked at some of the contributing factors to housing and transportation costs in both 1990 and 2000.

The CES surveys indicate from 1990 to 2000 housing and transportation costs rose for most households in the 28 regions at a faster rate than incomes. From 1990 to 2000 the combined costs rose from 41.7% of median income to 52.4%, a 26% increase, while the percentage change in incomes of the surveyed households was 0.3% (adjusted for inflation). The 26% increase in expenditures was during the same period that median incomes, according to the Census, only rose by 4%, on average for all 28 regions. In eight of the regions real incomes dropped. Four regions experienced median income growth greater than 10%; San Francisco, Minneapolis-St. Paul, Portland, OR, and Denver, CO. (See Table A2, Appendix A for 1990 and 2000 Median Income comparisons from the Census by region). While the Census shows more favorable increases in median income than the income growth that was reported in the CES, a 4% increase in income on average is still much less than a 26% increase in household expenditures. Using either measure of income in comparison to the rise in expenditures, suggests expenditures rose faster than incomes during this time period for most households in the majority of the 28 regions.

For eight regions, we compare census tracts that maintained the same boundaries from 1990 to 2000 in eight of the metro regions; San Francisco, Portland, Los Angeles, Denver, Dallas, Chicago, Pittsburgh, and Atlanta. This limits our cases to mostly urban and non-growing areas since tracts that change boundaries between the decennial census are those tracts in which the population has grown beyond the typical tract population.

With costs rising faster than incomes, working households are in the best situation if they are in neighborhoods where housing and transportation are more affordable. Their costs are also likely to be lower if they work and live in the same place or an adjoining place. However, from 1990 to 2000 the greatest growth by neighborhood type in Atlanta, Chicago, Portland, and San Francisco was in the Above Avg. T neighborhoods, places in which this study has shown lower income households have a higher combined burden since they require higher rates of auto ownership and more auto use on a daily basis. At the same time, these neighborhoods had a decline in the percentage of workers in these areas that worked and lived in the same place. As more workers move to these areas for housing, more of them commute somewhere else for work. Table 30 shows the actual growth in households from 1990 to 2000 in the eight regions by neighborhood type. It's interesting to note that Los Angeles, a region more typically known for sprawl had the greatest growth in Above Avg. H neighborhoods. However, they had drops in all four areas in terms of the percentage of workers working and living in the same place.

In Atlanta, Chicago, Denver, Pittsburgh, and Portland, there was an increase in the percentage of households in Above Avg. H neighborhoods who work and live in the same place. These are all

regions with revitalized downtown and transit systems in their central cities and inner-ring suburbs.

In Dallas and San Francisco, only the Above Avg. T neighborhoods had an increase in workers working and living in the same place. This increase could represent an increase in the number of job opportunities in these types of neighborhoods with higher rates of housing growth.

Table 31

Growth in Households and Jobs 1990 - 2000 for Eight Regions Compared to H+T Neighborhood Types

	Growth in Households								
Neighborhood Type	Atlanta	Chicago	Denver	Los Angeles	Pittsburgh	Portland	San Francisco	Dallas	8 Regions
Below Avg H & T	39%	11%	23%	3%	7%	15%	8%	33%	11%
Above Avg. H	23%	7%	17%	7%	6%	13%	10%	19%	10%
Above Avg H & T	10%	1%	14%	4%	-2%	9%	7%	10%	6%
Above Avg. T	47%	13%	20%	6%	3%	20%	11%	19%	13%
	Change in Percent of Workers Working in Same Place They Live 1990 - 2000								
Below Avg H & T	-10%	-9%	-7%	-14%	-11%	-1%	-4%	-2%	-4%
Above Avg. H	5%	13%	11%	-1%	1%	7%	-4%	-8%	-8%
Above Avg H & T	-11%	-2%	-3%	-8%	-19%	7%	-7%	-11%	-10%
Above Avg. T	-18%	-19%	-13%	-16%	-19%	-15%	9%	1%	-5%

In contrast to the growth in some neighborhoods, the Above Average H&T neighborhoods were the slowest growing in all regions except for Los Angeles. In Pittsburgh, these neighborhoods actually declined by 2%. These numbers seem to represent the continued decline in these neighborhoods of predominantly lower income households and places with declining job bases and high rates of poverty.

Summary of impact on regions

The impact of these trends on regions is that a significant share of low income households, more than 12 million in the 28 regions, are living in places with little new investment, high rates of poverty and unemployment, low educational attainment levels, and little disposable income, after paying for housing and transportation, to put toward education, savings, health care, other necessities, and wealth creating assets.

At the same time a growing share of households are moving to places that are not only away from jobs but that lack existing infrastructure, including roads, sewers, schools, and services. Household growth in these areas, especially targeted to moderate income households that will little income left after paying for the increased transportation costs, cause higher costs for municipalities, regions and states. Local governments attempt to recover their costs through impact fees and new taxes, but the fees are often not enough and their residents do not necessarily have enough income to pay for the added housing and transportation costs, additional taxes, and the wealth creating assets mentioned above; savings for retirement, education, and healthcare. Though poverty and unemployment rates were lower in these neighborhoods, so were educational attainment levels.

6. Summary of Findings

The following points summarize our primary findings. In general, we identified a combination of forces—high income households wanting to live close to suburban job centers; limited affordable units in suburban areas; low transit availability in exurban areas; high income households in urban areas supporting high housing prices in the most accessible locations; moderate income households seeking higher quality and bigger homes being forced to look to places that are 30 miles from the central city; and a lack of employment centers in lower income areas—that combine to leave working households either stretched to afford the housing and/or transportation near jobs; pushed to exurbs in search of higher quality or more spacious housing that they can afford; or left behind in neighborhoods with lower quality housing, concentrated poverty, high unemployment rates, and low accessibility to jobs and daily necessities.

Trade-offs by Income, Place and Tenure

Because households generally live in neighborhoods they are able to afford, neighborhoods are highly segregated by income. In high income neighborhoods, home prices remain high because households have the incomes to afford them and supply matches demand. These neighborhoods are mostly suburban and also have high absolute transportation costs because land uses generally do not support non-auto modes. In low income neighborhoods, low income households have lower costs than if they were to locate in a high income neighborhood, but their costs burdens as a percentage of income are still above regional averages due to lower income levels:

- For households earning $20,000 to less than $50,000, their average combined expenditures on housing and transportation are lowest in Above Avg. H neighborhoods and Above Avg. H&T neighborhoods, the two lower income neighborhood types, but their combined expenditures, from 43% to 62% of income (see Figure 5), are still higher than combined housing and transportation expenditures for households earning $50,000 or more.

Combined costs by neighborhood type vary by tenure:

- As of 2000, combined housing and transportation costs as a percentage of income were *lowest* for **renters** of all income categories, in the Above Avg. H neighborhood type. These neighborhoods provide the greatest mix of housing units and prices, as well as incomes, and the lowest transportation costs in absolute terms. The greater mix of housing types allows more households of various incomes to find housing that is nearby affordable transportation. However, for lower incomes, these neighborhoods often present a trade-off of higher housing prices for units that are often older, and therefore possibly in poor condition, and smaller in exchange for low transportation costs. Housing ownership by lower income households in these neighborhoods is often out of reach but renting in these neighborhoods can be the most affordable in terms of combined housing and transportation expenditures.

- For owners earning less than $50,000, the difference in expenditures on H alone and H+T across neighborhood types is different from renters because of the location and supply of rental units and affordable ownership units. Owner households in the three income brackets below $50,000 have the lowest H expenditure in the Above Avg. T neighborhoods, which demonstrates the reason more households in this income group are moving to outer suburban and exurban areas to purchase a lower-priced home, but these areas do not have the lowest combined costs. Therefore, for owner households earning more than $20,000, the combined H+T costs are most affordable in the Above Avg. H&T neighborhoods. (The name of this neighborhood does not indicate this affordability because the majority of households in these neighborhoods are lower income renters and their costs are high as a percentage of income.)

What Determines the Burden

Identifying the pattern of housing and transportation cost trade-offs for working families at the neighborhood level for entire regions helps to identify the key factors that contribute to these costs. One major factor is the location of a neighborhood in relation to employment centers and all jobs.

- Total combined housing and transportation costs increase with commute distance even though housing prices ultimately decrease at the greatest distance. This is due to high transportation costs. In the Above Avg. T neighborhoods, of which 90% are away from employment centers, and on average are 31 miles from the nearest central city, transportation costs are by far the highest leading to the highest combined H+T costs.

- Expenditures on housing are higher in more densely-developed areas that are within close proximity to jobs, and with higher degrees of traffic congestion while expenditures on transportation are lower.

Expenditures on housing are lower in areas with a larger supply of affordable housing units. We find that increases in the percent of units affordable to working families locally are associated with large reductions in housing costs. Among all factors influencing housing costs, affordable housing supply has an impact that is second in magnitude only to the median household income of the census tract. In 23 of 28 metro areas local concentrations of affordable housing units is associated with declining housing and transportation cost burdens.

Regions categorized as Medium Housing/Medium Transportation, due to moderate to high shortages of affordable housing, and fewer places with affordable transportation options, appear most often in the most expensive rankings for each of the working household income bins. In these regions there are not enough instances to make a trade-off between affordable housing or affordable transportation for low to moderate incomes and therefore they are most often saddled with both costs in the medium range which results in a combined cost that is high, e.g. **(Med. H + Med. T = High H+T).**

Impacts on Regions and Neighborhoods

As home prices increase in Below Avg. H&T and Above Avg. H neighborhoods, and housing choices remain limited in Above Avg. H&T neighborhoods, moderate income households are increasingly moving to Above Avg. T neighborhoods. In eight regions where we studied growth by neighborhood type, Above Avg. T neighborhoods grew by 13% from 1990 to 2000 compared to Above Avg. H&T neighborhoods, which grew by 6% overall and declined in Pittsburgh. As neighborhoods of this type grow in terms of households faster than they grow in number of jobs, the households in these neighborhoods not only take on high combined, but also contribute to congestion within the region since they must drive greater distances to access jobs. Transit is rarely available in these areas.

As jobs and employment centers in many regions cluster primarily near highly educated households in higher income suburbs that are unaffordable to lower income households, congestion is worse in the high income employment center areas and low income neighborhoods are left in decline with little investment or opportunity. Residents in Above Avg. H&T neighborhoods—lower income areas with less access to employment—make up 26% of households in the 28 metros and are more likely to have lower educational attainment levels, lower earnings, higher rates of poverty, and higher rates of unemployment.

7. Recommendations

Our findings suggest four major policies:

I. Policies for workforce housing must be paired with policies that both support and improve workforce transportation and with policies to promote better planning of the location and distribution of employment and job centers within regions. Workforce transportation would mean major improvements to the frequency, extent, and capacity of public transit in all regions. Communities would need to be developed and redeveloped in ways that can support transit to and from the employment centers and within communities; this would go a long way toward ensuring that workforce transportation becomes a reality and so households could save money and congestion in regions would be reduced. Targeting employment to areas that already house a substantial number of working families would also highly benefit working households as well as regions by helping these neighborhoods with high rates of unemployment and low educational attainment levels. This was the intent of the Enterprise Zones and Empowerment Zones in the 1990s, many of which still offer businesses tax credits and sales and income tax exemptions for locating in disinvested areas today. Workforce transportation is important for high transportation cost regions such as Dallas, Houston, Detroit, and Tampa. Workers in these regions are taking on very high transportation costs with little return. But quality and reliable transit is also important for the outer suburbs in all regions. Suburb to suburb public transit is particularly important, as is continued and additional funding for programs that support the reverse commute for low and moderate income workers, e.g. Jobs Access Reverse Commute (JARC). In Chicago, the non-profit car-sharing company, I-Go has received JARC funds to allow cars in lower income neighborhoods to operate as “car-pool cars by day” and “car-share cars by night”.

II. Inclusionary zoning and mixed-income housing in employment center areas with high housing prices would allow lower income households to live near major centers of employment and may help to reduce regional congestion. This is especially important for metro areas with a high concentration of jobs within in employment centers and a high percentage of employment centers surrounded by high income neighborhoods, such as San Francisco. Our findings suggest that congestion is caused in part by dense destinations and origins and a lack of capacity for all income levels to live in these major work destinations. As high income households occupy the majority of neighborhoods near employment centers, lower income households are forced to drive further distances to access the employment clusters because they can’t afford to live near them. This increases their transportation costs and contributes to the congestion on highways and roads serving those centers.

III. Targeted job development in low income neighborhoods in central cities and inner-ring suburbs, the Above Average H&T neighborhoods, would help to raise the incomes of the households living there and eventually attract more households back to these neighborhoods. In the long term it would also help to reduce regional transportation costs and congestion. Without incentives, employers will

likely continue to follow the high income households and abandon or overlook the low income neighborhoods. This policy applies to all metro areas since every region has high concentrations of Above Average H&T neighborhoods. It could be especially helpful for regions with weak central cities, such as Detroit and St. Louis.

IV. Household transportation costs need to be communicated to consumers, policy makers, and planners. Consumers can use the information to make location decisions before they make choices on housing costs alone. Local government planners and policy makers can use the modeled transportation costs to adjust zoning so that commercial and industrial land uses can be proximate to affordable transportation and housing. This will allow some of the many daily household trips to be made on foot or by transit rather than by auto. MPO and State planning staff can use transportation cost maps to plan new transit lines and stations, and compare them to highway options and areas that are targeted for housing growth. Savings to households and communities from reduced congestion could be used as justification for greater expenditures on public transit and community planning. This is another policy that applies to all regions but is especially important to sprawling regions with little or not transit.

Appendix A. Summary and Background Tables

Table A1. Consumer Expenditure Survey of Housing and Transportation Costs by Region: 1990 - 20000

Metro Areas (PMSA, CMSA, MSA do not match for all areas 1990-2000)	1990-91 Consumer Expenditures on H & T					2000 Consumer Expenditure on H & T				Change 90-2000 Consumer Expend Survey H+T		
	IBT 1990-91	IBT 1990-1991 Inflation adjusted	1990 H	1990 T	1990 H+T	IBT 2000	2000 H	2000 T	2000 H+T	Change in H 90-2000	Change in T 90-2000	Change in H+T 90-2000
Anchorage, AK MSA	$50,560	$67,750	27%	15%	42%	$54,506	32%	18%	50%	5.1%	3.3%	8.4%
Atlanta, GA MSA	$38,535	$51,637	28%	15%	43%	$53,936	37%	17%	55%	9.4%	2.2%	11.6%
Baltimore, MD MSA	$40,367	$54,092	27%	14%	41%	$50,813	34%	17%	51%	7.0%	3.3%	10.3%
Boston-Lawrence-Salem, MA-NH CMSA	$42,042	$56,336	27%	11%	38%	$49,557	36%	17%	53%	9.4%	5.6%	15.1%
Chicago-Gary-Lake County, IL-IN-WI CMSA	$39,230	$52,568	27%	13%	39%	$51,332	36%	17%	53%	9.1%	4.8%	13.9%
Cincinnati-Hamilton, OH-KY-IN CMSA	$33,185	$44,468	25%	15%	39%	$45,737	32%	20%	52%	7.3%	5.1%	12.4%
Cleveland-Akron-Lorain, OH CMSA	$30,322	$40,631	26%	15%	41%	$48,578	33%	21%	54%	7.7%	5.7%	13.4%
Dallas-Fort Worth, TX CMSA	$38,804	$51,997	26%	17%	43%	$56,046	31%	21%	52%	5.0%	4.5%	9.4%
Denver-Boulder, CO CMSA	n/a	n/a	n/a	n/a	n/a	$55,168	36%	19%	55%	n/a	n/a	n/a
Detroit-Ann Arbor, MI CMSA	$35,702	$47,841	27%	16%	43%	$49,041	33%	19%	52%	6.0%	2.6%	8.5%
Honolulu, HI MSA	$41,499	$55,609	27%	15%	42%	$51,906	32%	15%	48%	5.3%	0.6%	5.9%
Houston-Galveston-Brazoria, TX CMSA	$34,539	$46,282	26%	19%	46%	$54,733	31%	20%	51%	4.4%	0.7%	5.1%
Kansas City, MO-KS MSA	$37,280	$49,955	23%	13%	36%	$51,298	32%	18%	50%	8.4%	5.9%	14.3%
Los Angeles-Anaheim-Riverside, CA CMSA	$39,356	$52,737	33%	14%	47%	$52,776	38%	18%	56%	4.9%	4.3%	9.1%
Miami-Fort Lauderdale, FL CMSA	$33,703	$45,162	30%	17%	47%	$46,034	37%	18%	55%	6.7%	1.1%	7.9%
Milwaukee-Racine, WI CMSA	$31,440	$42,130	29%	15%	44%	$43,161	34%	17%	50%	4.6%	1.9%	6.5%
Minneapolis-St. Paul, MN-WI MSA	$38,571	$51,685	27%	15%	42%	$60,574	31%	18%	49%	3.5%	3.2%	6.7%
New York-Northern New Jersey-Long Island, NY-NJ-CT CMSA	$41,448	$55,540	29%	12%	41%	$57,063	37%	15%	52%	7.9%	3.3%	11.2%
Philadelphia-Wilmington-Trenton, PA-NJ-DE-MD CMSA	$41,450	$55,543	25%	12%	37%	$49,932	36%	17%	53%	10.6%	5.4%	16.1%
Phoenix, AZ MSA	n/a	n/a	n/a	n/a	n/a	$47,492	33%	22%	54%	n/a	n/a	n/a
Pittsburgh-Beaver Valley, PA CMSA	$36,499	$48,909	25%	13%	38%	$41,371	29%	20%	49%	4.5%	7.0%	11.5%
Portland, OR PMSA, Portland-Vancouver, OR-WA CMSA	$36,339	$48,694	25%	15%	39%	$49,035	35%	16%	51%	10.5%	1.7%	12.2%
San Diego, CA MSA	$36,952	$49,516	31%	16%	47%	$52,898	38%	21%	58%	6.7%	4.4%	11.1%
San Francisco-Oakland-San Jose, CA CMSA	$42,215	$56,568	33%	14%	47%	$64,818	37%	17%	54%	4.2%	2.4%	6.7%
Seattle-Tacoma, WA CMSA	$39,921	$53,494	29%	14%	43%	$51,292	34%	20%	53%	4.6%	5.6%	10.3%
St. Louis, MO-IL MSA	$35,814	$47,991	24%	13%	37%	$45,251	29%	19%	48%	5.2%	5.6%	10.8%
Tampa-St. Petersburg-Clearwater, FL MSA	n/a		n/a	n/a	n/a	$45,116	32%	25%	56%			
Washington, DC-MD-VA MSA	$46,275	$62,009	27%	13%	40%	$69,331	37%	16%	53%	10.7%	2.5%	13.2%
Total	$ 38,482	$51,566	27%	14%	42%	$51,743	34%	18%	52%	6.7%	4.1%	10.8%

The Denver, Phoenix, and Tampa regions were not included in the surevey until 2000

Table A2. Growth in Area Median Income 1990 to 2000
(Sorted by Change in Income 1990 to 2000)

MSA	1990 Median Income	1990 Median Adjusted	2000 Median Income	Change 1990-2000
Los Angeles-Anaheim-Riverside, CA CMSA	$36,711	$49,193	$45,903	-7%
Anchorage, AK MSA	$43,946	$58,888	$55,546	-6%
Honolulu, HI MSA	$40,581	$54,379	$51,914	-5%
Boston-Lawrence-Salem, MA-NH CMSA	$40,666	$54,492	$52,792	-3%
New York-Northern New Jersey-Long Island, NY-NJ-CT CMSA	$38,445	$51,516	$50,795	-1%
Washington, DC-MD-VA MSA	$46,884	$62,825	$62,216	-1%
Philadelphia-Wilmington-Trenton, PA-NJ-DE-MD CMSA	$35,797	$47,968	$47,528	-1%
San Diego, CA MSA	$35,022	$46,929	$47,067	0%
Miami-Fort Lauderdale, FL CMSA	$28,503	$38,194	$38,632	1%
Baltimore, MD MSA	$36,550	$48,977	$49,938	2%
Cleveland-Akron-Lorain, OH CMSA	$30,332	$40,645	$42,215	4%
St. Louis, MO-IL MSA	$31,774	$42,577	$44,437	4%
Pittsburgh-Beaver Valley, PA CMSA	$26,501	$35,511	$37,467	6%
Detroit-Ann Arbor, MI CMSA	$34,729	$46,537	$49,160	6%
Chicago-Gary-Lake County, IL-IN-WI CMSA	$35,918	$48,130	$51,046	6%
Houston-Galveston-Brazoria, TX CMSA	$31,488	$42,194	$44,761	6%
Milwaukee-Racine, WI CMSA	$32,359	$43,361	$46,132	6%
Tampa-St. Petersburg-Clearwater, FL MSA	$26,036	$34,888	$37,406	7%
Atlanta, GA MSA	$36,051	$48,308	$51,948	8%
Dallas-Fort Worth, TX CMSA	$32,825	$43,986	$47,418	8%
Seattle-Tacoma, WA CMSA	$35,047	$46,963	$50,733	8%
Cincinnati-Hamilton, OH-KY-IN CMSA	$30,977	$41,509	$44,914	8%
Phoenix, AZ MSA	$30,797	$41,268	$44,752	8%
Kansas City, MO-KS MSA	$31,613	$42,361	$46,193	9%
Minneapolis-St. Paul, MN-WI MSA	$36,565	$48,997	$54,304	11%
Portland, OR PMSA, Portland-Vancouver, OR-WA CMSA	$30,930	$41,446	$46,090	11%
San Francisco-Oakland-San Jose, CA CMSA	$41,459	$55,555	$62,024	12%
Denver-Boulder, CO CMSA	$33,126	$44,389	$51,088	15%
Average	$34,701	$46,500	$48,372	4%

Table A3. 1999 Household Income by Region (2000 Census, 5% PUMS)

MSA 2000	30% AMI	50% AMI	80% AMI	100% AMI	120% AMI	Total HHS*	% of HHS >30% to 50% AMI	% of HHS >50 to 80% AMI	No. of HHS >30 to 80% AMI
Anchorage, AK MSA	$16,664	$27,773	$44,437	$55,546	$66,655	94,479	11%	17%	26,063
Atlanta, GA MSA	$15,584	$25,974	$41,558	$51,948	$62,338	1,460,540	10%	18%	405,034
Baltimore PMSA	$14,981	$24,969	$39,950	$49,938	$59,926	959,047	10%	16%	254,932
Boston-Worcester-Lawrence, MA-NH-ME-CT CMSA	$15,838	$26,396	$42,234	$52,792	$63,350	2,011,887	10%	15%	516,228
Chicago-Gary-Kenosha, IL-IN-WI CMSA	$15,314	$25,523	$40,837	$51,046	$61,255	3,268,555	10%	16%	871,343
Cincinnati-Hamilton, OH-KY-IN CMSA	$13,474	$22,457	$35,931	$44,914	$53,897	706,164	11%	17%	193,350
Cleveland-Akron, OH CMSA	$12,665	$21,108	$33,772	$42,215	$50,658	1,166,919	11%	16%	314,840
Dallas-Fort Worth, TX CMSA	$14,225	$23,709	$37,934	$47,418	$56,902	1,835,857	10%	18%	511,085
Denver-Boulder-Greeley, CO CMSA	$15,326	$25,544	$40,870	$51,088	$61,306	964,501	10%	18%	275,468
Detroit-Ann Arbor-Flint, MI CMSA	$14,748	$24,580	$39,328	$49,160	$58,992	1,966,826	11%	16%	527,437
Honolulu, HI MSA	$15,574	$25,957	$41,531	$51,914	$62,297	287,076	9%	16%	70,945
Houston-Galveston-Brazoria, TX CMSA	$13,428	$22,381	$35,809	$44,761	$53,713	1,638,172	10%	17%	444,120
Kansas City, MO-KS MSA	$13,858	$23,097	$36,954	$46,193	$55,432	662,131	10%	17%	182,543
Los Angeles-Riverside-Orange County, CA CMSA	$13,771	$22,952	$36,722	$45,903	$55,084	5,348,414	11%	16%	1,446,302
Miami-Fort Lauderdale, FL CMSA	$11,590	$19,316	$30,906	$38,632	$46,358	1,423,143	11%	16%	379,876
Milwaukee-Racine, WI CMSA	$13,840	$23,066	$36,906	$46,132	$55,358	657,490	11%	17%	182,193
Minneapolis-St. Paul, MN-WI MSA	$16,291	$27,152	$43,443	$54,304	$65,165	1,096,388	11%	18%	313,115
New York-N. New Jersey-Long Island, NY-NJ-CT-PA CMSA	$15,239	$25,398	$40,636	$50,795	$60,954	7,680,008	10%	15%	1,924,523
Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD CMSA	$14,258	$23,764	$38,022	$47,528	$57,034	2,290,899	10%	16%	605,970
Phoenix-Mesa, AZ MSA	$13,426	$22,376	$35,802	$44,752	$53,702	1,133,302	10%	17%	313,343
Pittsburgh, PA MSA	$11,240	$18,734	$29,974	$37,467	$44,960	934,238	11%	16%	251,164
Portland-Salem, OR-WA CMSA	$13,827	$23,045	$36,872	$46,090	$55,308	851,315	10%	18%	236,913
San Diego, CA MSA	$14,120	$23,534	$37,654	$47,067	$56,480	1,011,862	10%	17%	273,269
San Francisco-Oakland-San Jose, CA CMSA	$18,607	$31,012	$49,619	$62,024	$74,429	993,104	26%	41%	669,037
Seattle-Tacoma-Bremerton, WA CMSA	$15,220	$25,367	$40,586	$50,733	$60,880	2,557,400	5%	9%	378,869
St. Louis, MO-IL MSA	$13,331	$22,219	$35,550	$44,437	$53,324	1,363,171	8%	12%	274,242
Tampa-St. Petersburg-Clearwater, FL MSA	$11,222	$18,703	$29,925	$37,406	$44,887	1,007,811	11%	17%	278,777
Washington, DC PMSA	$18,665	$31,108	$49,773	$62,216	$74,659	1,777,086	10%	17%	474,130
*Total in 28 Metros (*not in group quarters)*						*47,147,785*			*12,595,111*

When we defined the costs at the regional level, we compared our housing and transportation costs to the 2000 Consumer Expenditure Survey (CES) to test whether there were similarities between the two measures. To make the comparison we selected the housing and transportation costs from the income bin that was the closest to the region's median income in the CES. We found a significant positive correlation between the two studies housing and transportation expenditures for each metro. The table compares the results from the two studies.

Table A4

Comparison of Metro Housing and Transportation Costs

	2000 CES by Median Income of Surveyed HHS			Cost Model by **a Comparable Income** to the CES Surveyed Income			
Metro Area	%H	%T	%H&T	Type by Study	%H	%T	%H&T
Anchorage, AK MSA	32%	18%	50%	Med H - Med T	24%	22%	46%
Atlanta, GA MSA	25%	13%	38%	Med H - Med T	22%	24%	46%
Baltimore, MD PMSA	27%	14%	41%	Med H - Med T	23%	21%	45%
Boston, MA CMSA	27%	13%	40%	Med H - Med T	25%	26%	51%
Chicago, IL CMSA	30%	14%	44%	Med H - Med T	22%	21%	43%
Cincinnati, OH CMSA	28%	17%	45%	Low H - High T	21%	27%	48%
Cleveland, OH CMSA	26%	17%	43%	Low H - High T	21%	26%	47%
Dallas, TX CMSA	26%	16%	42%	Low H - High T	20%	23%	43%
Denver, CO CMSA	29%	15%	44%	Med H - Med T	23%	21%	44%
Detroit, MI CMSA	28%	16%	44%	Low H - High T	21%	26%	47%
Honolulu, HI MSA	27%	11%	38%	High H - Low T	25%	19%	43%
Houston, TX CMSA	25%	18%	43%	Low H - High T	19%	23%	42%
Kansas City, MO-KS MSA	22%	15%	38%	Low H - High T	18%	24%	42%
Los Angeles, CA CMSA	31%	15%	46%	High H - Med T	25%	20%	45%
Miami, FL CMSA	32%	16%	48%	High H - Med T	27%	23%	50%
Milwaukee, WI CMSA	31%	16%	47%	Low H - High T	21%	26%	47%
Minneapolis, MN MSA	26%	14%	40%	Med H - Med T	19%	19%	39%
New York, NY CMSA	30%	12%	42%	High H - Low T	25%	18%	43%
Philadelphia, PA CMSA	29%	14%	42%	Med H - Med T	24%	24%	48%
Phoenix, AZ MSA	28%	19%	46%	Med H - Med T	23%	25%	48%
Pittsburgh, PA MSA	25%	15%	41%	Low H - High T	18%	27%	46%
Portland, OR CMSA	30%	16%	46%	Med H - Med T	25%	26%	51%
San Diego, CA MSA	32%	19%	51%	High H - Med T	27%	21%	48%
San Francisco, CA CMSA	30%	15%	45%	High H - Low T	22%	17%	39%
Seatte, WA CMSA	29%	14%	43%	Med H - Med T	18%	22%	40%
St. Louis, MO MSA	26%	18%	43%	Low H - High T	27%	27%	54%
Tampa, FL MSA	25%	17%	42%	Low H - High T	21%	27%	48%
Washington, DC PMSA	24%	11%	36%	High H - Low T	22%	18%	40%

Appendix B – 28 Metro Profiles

This section provides a profile on each of the 28 metro areas in the study. For each of the metropolitan areas, the profile includes the following sections. Following the 28 metro profiles are congestion maps of 9 of the regions referenced in the main paper.

1. **Profile:** This table provides a quick profile on the housing stock, current prices in the market, e.g. hot, cool, and an assessment of the affordable housing supply; the transportation choices in the region defined by the non-auto mode share to work and the size of the transit system; and the jobs/housing relationship, e.g. what percent of jobs are in employment centers and what percent of the population lives near employment centers.
2. **Region Housing + Transportation Neighborhood Map:** Map of the region's neighborhoods (tracts) according to the portion of income the average income households in each neighborhood are spending on housing and transportation. These maps also include the footprints of the major employment centers (centers of more than 5,000 jobs), and transit lines and interstates.

   The color scheme represents the following housing and transportation costs. It is important to note that the colors do not show the range of costs within a category. For instance, in the Above Average Housing neighborhoods (lavender), some households could be paying as much as 52% of their income while other households are paying as little as 21% of income, but the typical household in the tract (based on the weighted average household income), is paying more than the regional average expenditure on housing.

   - *White: Below Average Housing & Transportation (Q1).* The average households in these tracts are typically wealthier and therefore can choose to live close to employment. Somewhat high housing and transportation costs are still a smaller share of their higher incomes.
   - *Lavender: Above Average Housing (Q2):* These areas are mostly urban, served by transit, and are in close proximity to employment centers. They are also typically higher income, but not always. Households in these areas are making a range of trade-offs on how much they are paying for housing in exchange for relatively low transportation costs.
   - *Grey: Above Average Transportation (Q3):* Predominantly suburban and exurban, these areas have moderate housing prices but much higher transportation costs. They tend to be moderate income households earning $35,000 (renters) to $50,000 (owners).
   - *Red: Above Average Housing & Transportation (Q4):* in these neighborhoods, the average households have both high housing and high transportation cost burdens. In most regions, this category highlights areas with few jobs and predominantly lower incomes.

3. **Figure 1. Costs by income by neighborhood Type.** This table provides the estimated housing, transportation, and combined housing and transportation expenditures for each income category in each of the four neighborhood types.
4. **Figure 2. Distribution of households by income among the four Housing/Transportation Costs categories.** This table is useful to estimate the number of households in each income bin that are in a particular situation as a percent of all households in a region. For instance,

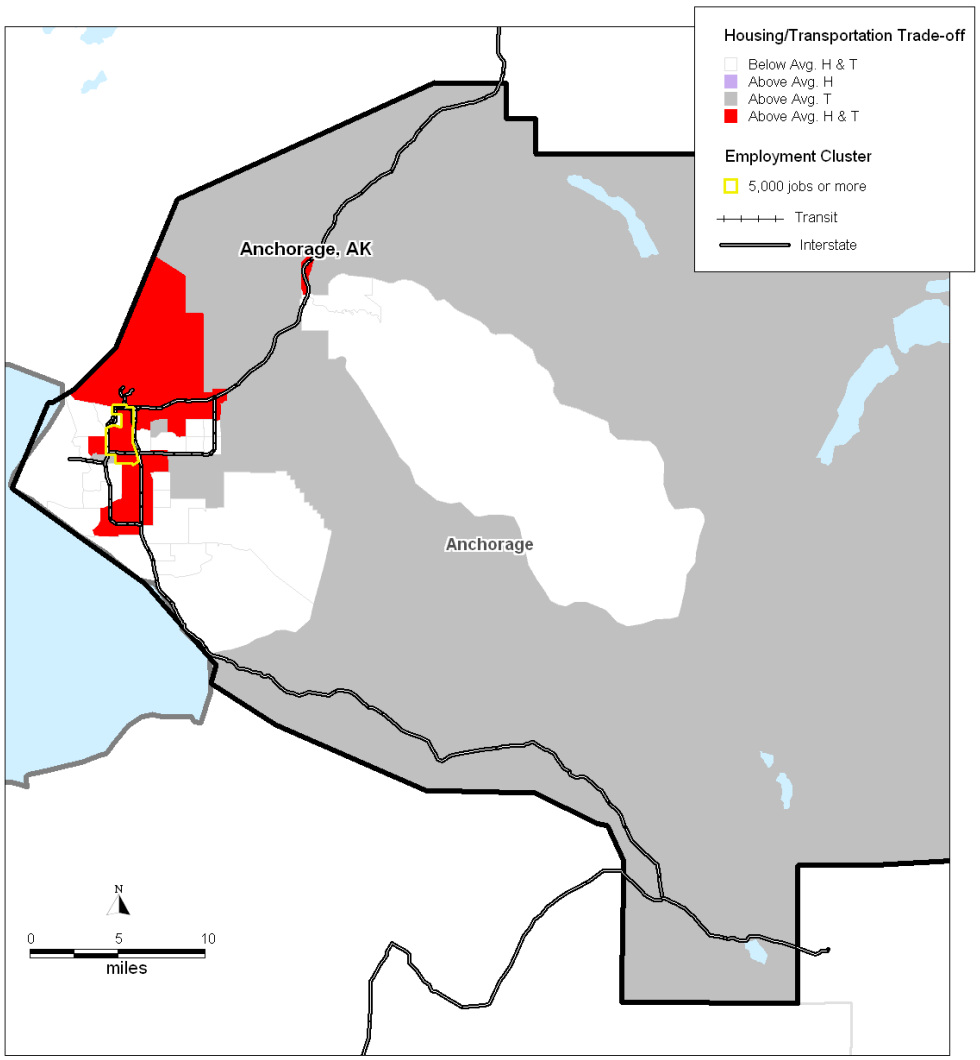
according to the table for Atlanta 14% of the region's households earn less than $20,000 a year and most of them, 92,834 are paying above average expenditures for housing and transportation.

5. **Regression analysis interpretation of housing and transportation costs in relation to job accessibility, affordable housing and housing unit density.** (described in Section 4) of the housing and transportation costs in the region, based on tract level data, in relation to *measures of urban form and spatial location relative to employment* (natural log of housing unit density, distance from nearest employment center, census tract jobs per square mile based on a gravity model, median commute time), *local supply of affordable housing* (percent of units in tract that are "affordable" to working families from CHAS), and *household income* (natural log of the median household income for the tract). The complete tables from the regression results are at the end of this appendix.
6. **Commute Time, Speed and Distance.** This table summarizes the commuting characteristics of the households in the four types of Housing and Transportation Cost categories. The characteristics include the reported commute *time* reported by workers on the census long form, a measure of distance calculated "as the crow flies" between the worker's home tract and the worker's work tract, and a calculated speed based on the reported distance and calculated time. The measures are reported by auto commute and transit commute.
7. **Housing and Transportation Expenditures as a percentage of income based on proximity to employment.** This table shows the costs for households at each income in relation to proximity to the central city, other employment centers in the region, or away from any employment centers. Living "near" employment is measured by whether the tract in which the household lives intersects with any of the tracts that are part of the appropriate employment center comparison. These tables show that the lowest combined housing and transportation costs for low and moderate income households are generally in tracts adjacent to central city employment centers.

Anchorage, AK MSA

Profile: Anchorage, AK MSA	
Combined Housing and Transportation Category:	Medium H, Medium T
Housing Market:	Lukewarm Sprawling Market
Households earning 30-50% HAMFI with Severe Burden:	n/av
Affordable Housing Shortage:	n/av
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	5%, No Rail System, 5
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	25%, 30%

Anchorage: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 50% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 72%. These households pay 24% to 43% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of the households in the region, 41% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods at 62%. These households pay 46% to 115% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Anchorage	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	69%	57%	126%				63%	65%	128%	64%	51%	115%	65%	53%	118%
$20,000 - <$35,000	39%	36%	75%				36%	41%	77%	33%	32%	66%	35%	34%	70%
$35,000 - <$50,000	29%	26%	55%				26%	29%	55%	23%	23%	46%	26%	25%	51%
$50,000 - <$75,000	24%	19%	43%				22%	21%	43%	19%	17%	36%	22%	19%	41%
$75,000 - <$100,000	19%	15%	34%				17%	16%	33%	16%	13%	29%	18%	14%	32%
$100,000 - <$250,000	14%	10%	24%				13%	11%	24%	12%	9%	20%	14%	10%	23%
ALL INCOMES	**25%**	**16%**	**41%**				**25%**	**20%**	**44%**	**31%**	**21%**	**53%**	**28%**	**18%**	**46%**

Fig 2: Distribution of Households by Income by Neighborhood Type

Anchorage	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	2,329	6%	3%	-		0%	571	8%	1%	6,635	21%	8%	9,535	12%
$20,000 - <$35,000	3,409	9%	4%	-		0%	1,087	14%	1%	7,483	23%	10%	11,979	15%
$35,000 - <$50,000	4,958	13%	6%	-		0%	1,215	16%	2%	5,854	18%	7%	12,027	15%
$50,000 - <$75,000	9,520	24%	12%	-		0%	1,794	24%	2%	6,410	20%	8%	17,724	23%
$75,000 - <$100,000	7,407	19%	9%	-		0%	1,211	16%	2%	3,036	10%	4%	11,654	15%
$100,000 - <$250,000	11,480	29%	15%	-		0%	1,686	22%	2%	2,450	8%	3%	15,616	20%
ALL INCOMES	**39,103**	**100%**	**50%**	**-**		**0%**	**7,564**	**100%**	**10%**	**31,868**	**100%**	**41%**	**78,535**	**100%**

Relationship of affordability to accessibility

Distance to employment centers and median commute time are the only spatial factors influencing housing costs in Anchorage. Transportation costs, on the other hand, are negatively associated with housing unit density and jobs per square mile.

It is interesting to note that the West Coast cities of Anchorage, Seattle, San Diego, San Francisco, and Portland are the only metropolitan areas where the concentration of affordable housing is not significantly associated with either transportation or housing cost burdens. (Adjusted R-Square: Housing Model, .8393, Transportation Model, .9260)

Commuting Characteristics

Households living in Above Average H & T neighborhoods have the shortest commute in distance by transit (3.1 miles) and by auto (4.4 miles). Households in Above Average Transportation neighborhoods have the shortest transit commute by time (31.2 minutes), while households in Above Average H & T neighborhoods have the shortest auto commute by time (16.3 minutes). Above average H & T neighborhoods have the greatest share of transit, 3%. Households in Above Average T neighborhoods drive the farthest (13.1 miles) and go the farthest on transit (10.2 miles).

Anchorage

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	59,816	-	42,895	11,920	114,631
% Transit	1%	0%	3%	1%	2%
Time all	18.3	-	16.9	22.5	18.2
Distance all	6.5	-	4.4	13.1	6.4
Speed All	20.8	-	15.6	33.2	20.2
Transit Commuters					
Time Transit	36.7	-	33.5	31.2	34.1
Distance Transit	5.3	-	3.1	10.2	4.2
Speed Transit	10.7	-	7.0	17.7	8.8
Auto Commuters					
Time Car	18.2	-	16.3	22.3	17.9
Distance Car	6.5	-	4.4	13.1	6.4
Speed Car	20.9	-	15.9	33.4	20.4

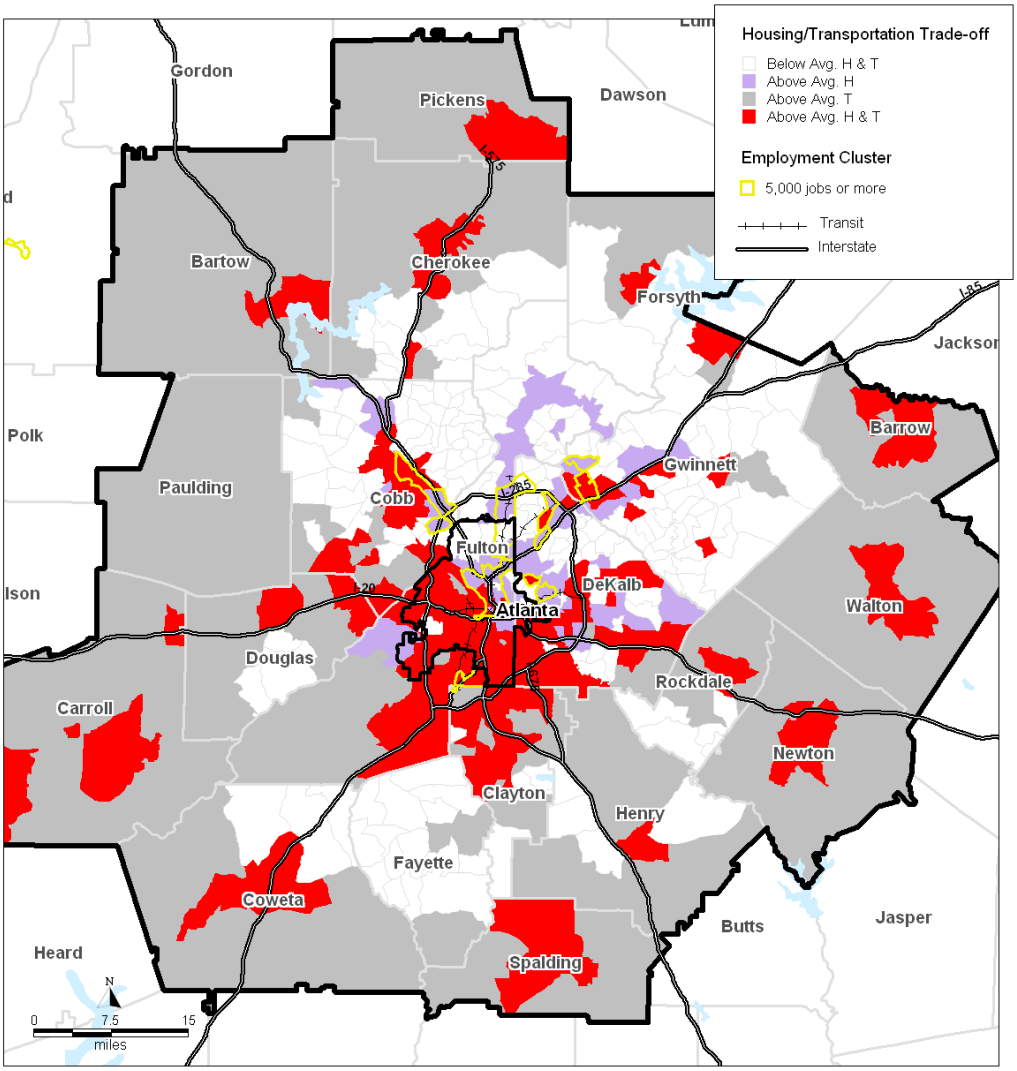
Household Expenditures by Income and Proximity to Employment
Anchorage, AK MSA

Expenditures by Income	Central City EC	Outside an EC
$0-<$20,000		
% Income on Housing	64%	68%
% Income on Transport.	52%	60%
% Income on H+T	117%	128%
$20,000 - <$35,000		
% Income on Housing	32%	38%
% Income on Transport.	33%	38%
% Income on H+T	65%	75%
$35,000 - <$50,000		
% Income on Housing	22%	28%
% Income on Transport.	23%	27%
% Income on H+T	45%	55%
$50,000 - <$75,000		
% Income on Housing	18%	23%
% Income on Transport.	17%	20%
% Income on H+T	35%	42%
$75,000 - <$100,000		
% Income on Housing	15%	18%
% Income on Transport.	13%	15%
% Income on H+T	27%	32%
$100,000 - <$250,000		
% Income on Housing	12%	13%
% Income on Transport.	9%	10%
% Income on H+T	20%	23%
Average of All Incomes		
% Income on Housing	31%	26%
% Income on Transport.	21%	18%
% Income on H+T	52%	44%
Owner Median Income	$60,824	$72,216
Renter Median Income	$33,418	$42,134
Median Income	$44,008	$63,127

Atlanta, GA MSA

Profile: Atlanta, GA MSA	
Combined Housing and Transportation Category:	Medium H, Medium T
Housing Market:	Cool Sprawling Market
Households earning 30-50% HAMFI with Severe Burden:	22%
Affordable Housing Shortage:	Medium
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	5%, Medium Rail System, 67
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	17%, 28%

Atlanta: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods, have the greatest share of households in the region, 37% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 71%. These households pay 24% to 43% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 27% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 68%. These households pay 48% to 119% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Atlanta	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	64%	64%	127%	66%	52%	119%	53%	73%	126%	58%	61%	119%	59%	62%	121%
$20,000 - <$35,000	37%	38%	75%	37%	31%	68%	31%	43%	74%	31%	37%	67%	33%	37%	70%
$35,000 - <$50,000	28%	28%	56%	26%	23%	49%	23%	31%	55%	22%	27%	48%	25%	27%	52%
$50,000 - <$75,000	22%	21%	43%	20%	17%	37%	18%	23%	41%	17%	20%	37%	20%	20%	40%
$75,000 - <$100,000	18%	15%	33%	17%	13%	29%	15%	17%	32%	14%	15%	29%	16%	15%	32%
$100,000 - <$250,000	14%	10%	24%	14%	8%	22%	12%	12%	23%	11%	10%	21%	14%	10%	23%
TOTAL	**23%**	**17%**	**40%**	**29%**	**17%**	**46%**	**24%**	**25%**	**49%**	**31%**	**27%**	**57%**	**27%**	**21%**	**48%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Atlanta	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	29,751	6%	2%	31,297	14%	2%	31,067	12%	2%	92,834	25%	7%	184,949	14%
$20,000 - <$35,000	48,558	10%	4%	41,568	18%	3%	43,227	17%	3%	87,436	24%	6%	220,789	16%
$35,000 - <$50,000	63,832	13%	5%	41,318	18%	3%	48,669	19%	4%	69,796	19%	5%	223,615	16%
$50,000 - <$75,000	112,226	22%	8%	49,645	22%	4%	69,686	27%	5%	69,673	19%	5%	301,230	22%
$75,000 - <$100,000	90,389	18%	7%	26,429	12%	2%	36,742	14%	3%	28,684	8%	2%	155,815	11%
$100,000 - <$250,000	156,401	31%	12%	37,649	17%	3%	27,659	11%	2%	21,204	6%	2%	205,264	15%
ALL INCOMES	**501,157**	**100%**	**37%**	**227,906**	**100%**	**17%**	**257,050**	**100%**	**19%**	**369,627**	**100%**	**27%**	**1,355,740**	**100%**

Relationship of affordability to accessibility

Housing costs in Atlanta increase with housing unit density and decline with distance to employment centers and the availability of affordable housing. Transportation costs are significantly influenced by a range of spatial factors, including the availability of affordable housing and the density of housing. The pattern of results suggests that transportation costs are higher in decentralized suburban locations and lower in areas that are more accessible to employment. This is one of several metropolitan areas where local concentrations of affordable housing are associated with declining transportation *and* housing cost burdens. (Adjusted R-Square: Housing Model, .7495, Transportation Model, .9455)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (46.4 minutes) or auto (26.7 minutes) and in distance (7.3 miles by transit and 8.6 miles by auto). Above Average H&T neighborhoods have the greatest share of transit, 9%. Households in Above Average Transportation cost neighborhoods drive the farthest distances, 14.6 miles, and spend the most time by car.

Atlanta

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	712,093	299,833	440,446	377,445	1,829,817
% Transit	1%	6%	9%	1%	4%
Time all	31.7	27.9	32.2	33.2	31.5
Distance all	11.4	8.5	10.4	14.6	11.4
Speed All	21.3	18.5	20.5	25.9	21.6
Transit Commuters					
Time Transit	48.4	46.4	56.6	53.3	52.6
Distance Transit	12.1	7.3	8.7	13.5	8.9
Speed Transit	16.5	10.8	11.1	20.9	12.1
Auto Commuters					
Time Car	31.4	26.7	29.9	33.1	30.7
Distance Car	11.4	8.6	10.5	14.6	11.5
Speed Car	21.4	19.0	21.4	25.9	22.0

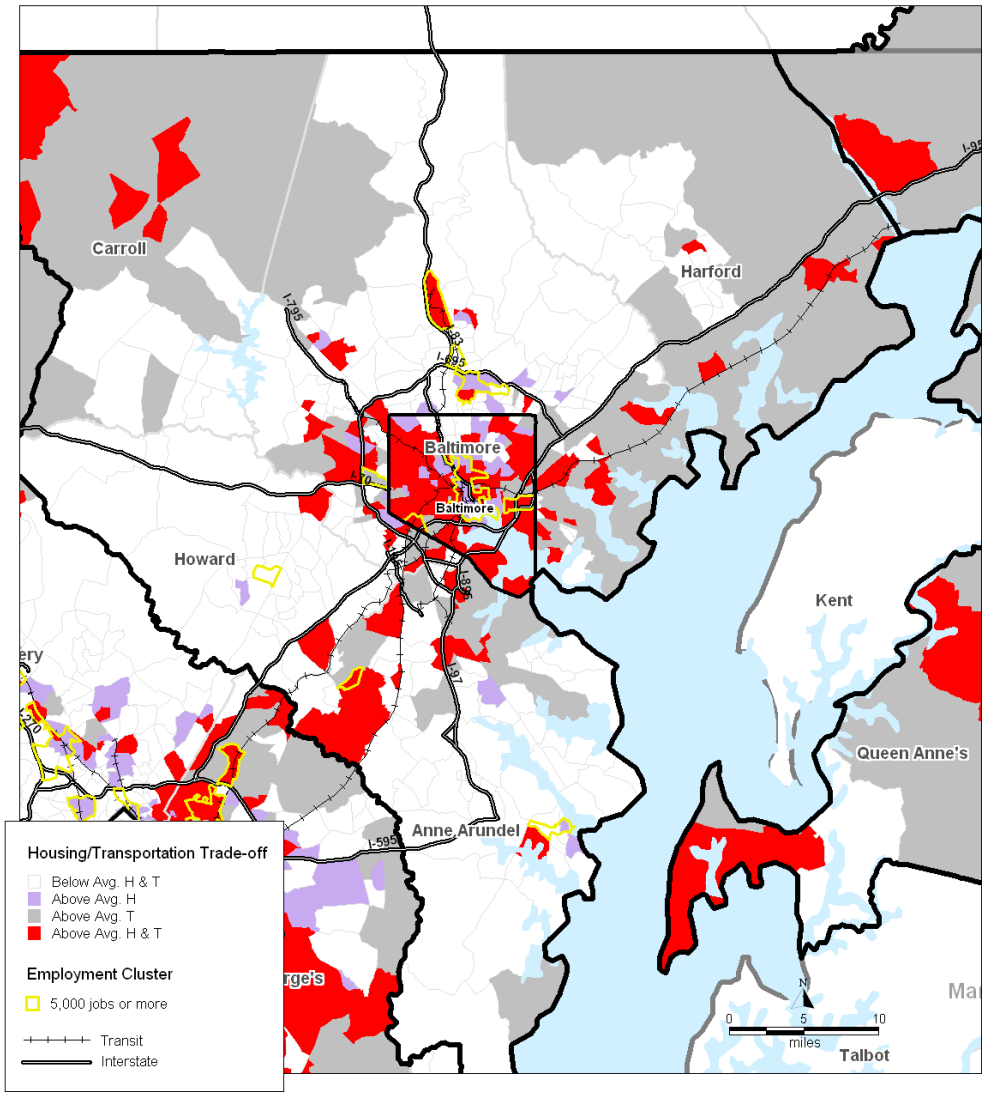
Household Expenditures by Income and Proximity to Employment
Atlanta, GA MSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	60%	64%	60%
% Income on Transport.	52%	56%	66%
% Income on H+T	112%	120%	126%
$20,000 - <$35,000			
% Income on Housing	33%	33%	33%
% Income on Transport.	30%	33%	39%
% Income on H+T	63%	66%	72%
$35,000 - <$50,000			
% Income on Housing	25%	24%	24%
% Income on Transport.	20%	24%	29%
% Income on H+T	45%	48%	53%
$50,000 - <$75,000			
% Income on Housing	19%	18%	19%
% Income on Transport.	16%	18%	21%
% Income on H+T	35%	36%	40%
$75,000 - <$100,000			
% Income on Housing	17%	15%	15%
% Income on Transport.	10%	13%	15%
% Income on H+T	28%	28%	31%
$100,000 - <$250,000			
% Income on Housing	13%	11%	12%
% Income on Transport.	7%	8%	10%
% Income on H+T	20%	20%	22%
Average of All Incomes			
% Income on Housing	31%	28%	26%
% Income on Transport.	20%	20%	23%
% Income on H+T	52%	48%	49%
Owner Median Income	$71,122	$61,669	$59,808
Renter Median Income	$32,403	$36,426	$36,058
Median Income	$46,222	$49,408	$52,750

Baltimore, MD PMSA

Profile: Baltimore, MD PMSA	
Combined Housing and Transportation Category:	Medium H, Medium T
Housing Market:	Lukewarm Densifying Market
Households earning 30-50% HAMFI with Severe Burden:	15%
Affordable Housing Shortage:	Low
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	11%, Medium Rail System, 50
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	20%, 29%

Baltimore: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov; http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 42% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 68%. These households pay 24% to 41% of their income for housing and transportation (Fig. 1).

Above average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 27% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 71%. These households pay 43% to 105% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Baltimore	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	58%	59%	117%	59%	44%	103%	52%	60%	112%	55%	49%	105%	56%	52%	108%
$20,000 - <$35,000	34%	36%	70%	30%	26%	57%	29%	37%	67%	28%	30%	58%	30%	33%	63%
$35,000 - <$50,000	27%	26%	53%	22%	19%	41%	23%	27%	51%	21%	22%	43%	24%	24%	48%
$50,000 - <$75,000	22%	19%	41%	17%	14%	31%	19%	20%	39%	16%	17%	33%	19%	19%	38%
$75,000 - <$100,000	18%	15%	33%	14%	11%	25%	16%	16%	31%	14%	13%	27%	17%	14%	31%
$100,000 - <$250,000	14%	10%	24%	12%	7%	19%	13%	11%	23%	11%	9%	20%	13%	10%	23%
TOTAL	**24%**	**16%**	**40%**	**30%**	**17%**	**48%**	**25%**	**22%**	**46%**	**32%**	**24%**	**55%**	**27%**	**19%**	**46%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Baltimore	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	27,167	7%	3%	25,632	25%	3%	21,386	13%	2%	77,509	32%	9%	151,694	17%
$20,000 - <$35,000	40,839	11%	5%	21,377	21%	2%	29,185	18%	3%	54,764	23%	6%	146,165	17%
$35,000 - <$50,000	49,336	13%	6%	16,920	16%	2%	29,032	18%	3%	39,464	16%	5%	134,752	15%
$50,000 - <$75,000	85,361	23%	10%	19,749	19%	2%	42,707	26%	5%	40,304	17%	5%	188,121	21%
$75,000 - <$100,000	64,711	18%	7%	9,420	9%	1%	23,946	15%	3%	16,730	7%	2%	105,387	12%
$100,000 - <$250,000	101,110	27%	12%	9,709	9%	1%	18,684	11%	2%	11,900	5%	1%	131,694	15%
ALL INCOMES	**368,524**	**100%**	**42%**	**102,807**	**100%**	**12%**	**164,940**	**100%**	**19%**	**240,671**	**100%**	**27%**	**876,942**	**100%**

Relationship of affordability to accessibility (Washington D.C. CMSA)

This is one of several metropolitan areas where local concentrations of affordable housing are associated with declining transportation *and* housing cost burdens. Also, unlike most metropolitan areas, housing unit density is not associated with housing costs. (Adjusted R-Square: Housing Model, .6768, Transportation Model, .9156)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (49.2 minutes) or by auto (26.2 minutes) and in distance by auto (7.9 miles). However, households in Above Average Housing and Transportation neighborhoods have the shortest transit commute by distance, 6.0%. Above Average H & T neighborhoods have the greatest share of transit, 15% and Above Average Transportation neighborhoods have the smallest share of transit, 2%. Households in Above Average Transportation cost neighborhoods drive the farthest distances, 11.9 miles, and spend the most time by car, 29.2 minutes.

Baltimore

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	522,264	101,609	236,691	257,050	1,117,614
% Transit	3%	14%	15%	2%	6%
Time all	29.9	29.7	31.6	29.7	30.2
Distance all	11.6	7.7	8.5	11.9	10.7
Speed All	22.6	16.0	17.4	23.2	21.0
Transit Commuters					
Time Transit	60.1	49.2	51.5	52.8	52.9
Distance Transit	17.5	6.6	6.0	15.2	9.2
Speed Transit	17.4	8.4	8.1	16.9	10.7
Auto Commuters					
Time Car	29.0	26.6	28.0	29.2	28.7
Distance Car	11.4	7.9	9.0	11.9	10.8
Speed Car	22.7	17.2	19.1	23.4	21.7

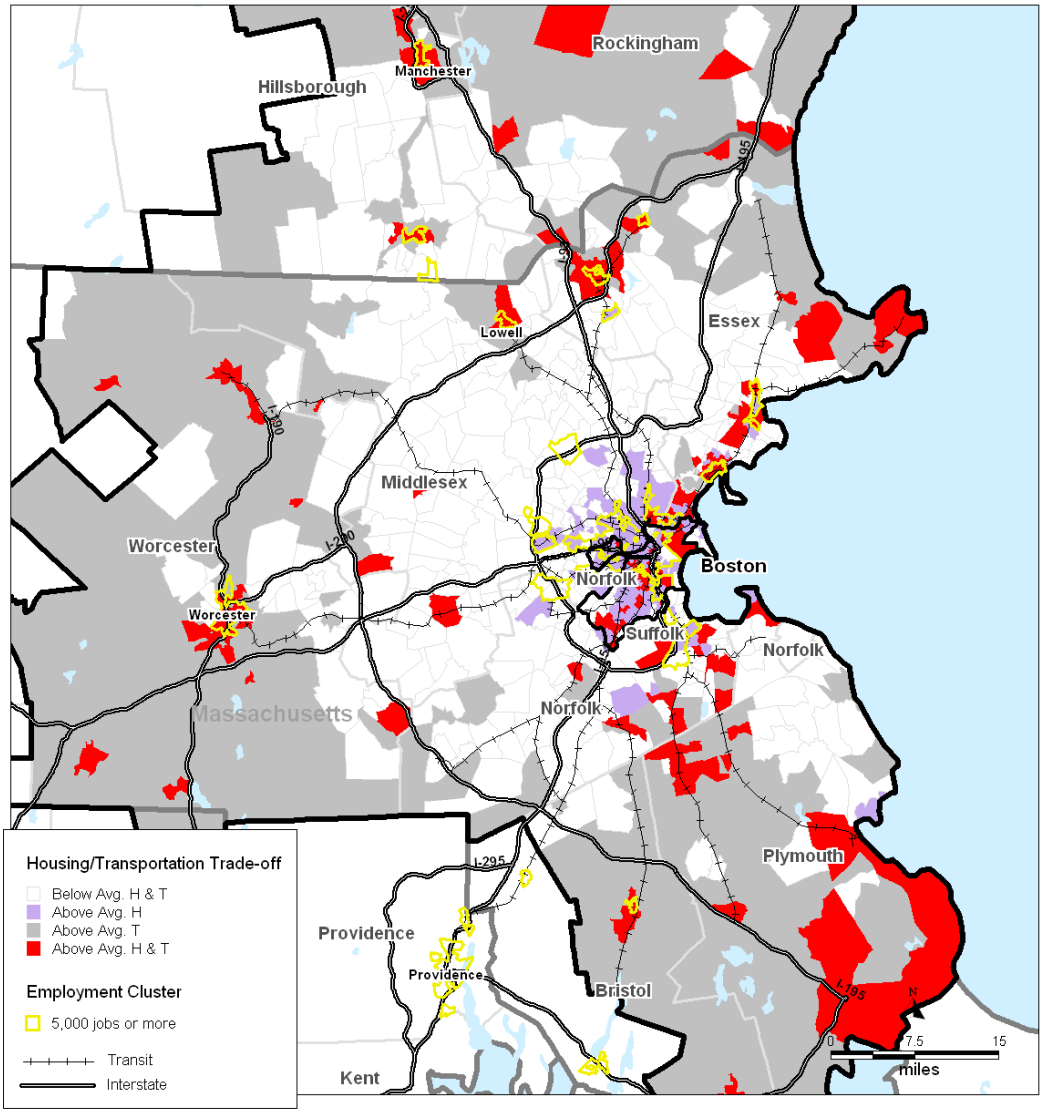
Household Expenditures by Income and Proximity to Employment
Baltimore, MD PMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	55%	59%	57%
% Income on Transport.	44%	51%	57%
% Income on H+T	99%	110%	114%
$20,000 - <$35,000			
% Income on Housing	26%	32%	31%
% Income on Transport.	24%	32%	35%
% Income on H+T	50%	65%	66%
$35,000 - <$50,000			
% Income on Housing	19%	23%	24%
% Income on Transport.	17%	24%	25%
% Income on H+T	36%	47%	49%
$50,000 - <$75,000			
% Income on Housing	15%	19%	19%
% Income on Transport.	13%	17%	18%
% Income on H+T	27%	36%	37%
$75,000 - <$100,000			
% Income on Housing	12%	15%	16%
% Income on Transport.	9%	13%	14%
% Income on H+T	21%	28%	29%
$100,000 - <$250,000			
% Income on Housing	10%	12%	12%
% Income on Transport.	6%	8%	9%
% Income on H+T	16%	20%	21%
Average of All Incomes			
% Income on Housing	32%	27%	26%
% Income on Transport.	20%	19%	20%
% Income on H+T	52%	46%	46%
Owner Median Income	$41,993	$60,368	$59,904
Renter Median Income	$21,657	$37,572	$34,350
Median Income	$27,376	$51,282	$52,668

Boston, MA CMSA

Profile: Boston, MA CMSA	
Combined Housing and Transportation Category:	Medium H, Medium T
Housing Market:	Lukewarm Sprawling Market
Households earning 30-50% HAMFI with Severe Burden:	17%
Affordable Housing Shortage:	Medium
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	14%, Extensive Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	33%, 32%

Boston: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 35% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 71%. These households pay 25% to 43% of their income for housing and transportation (Fig. 1).

Above Average Transportation cost neighborhoods have the second greatest share of households in the region, 26% (Fig. 2). Households earning $50,000 or more annually are the majority of households in these neighborhoods, at 56%. These households pay 24% to 42% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Boston	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	58%	62%	120%	61%	43%	104%	53%	68%	122%	54%	54%	108%	56%	56%	112%
$20,000 - <$35,000	36%	38%	73%	37%	24%	61%	31%	42%	72%	30%	33%	63%	33%	34%	68%
$35,000 - <$50,000	28%	27%	55%	27%	17%	44%	24%	30%	54%	22%	25%	47%	25%	26%	51%
$50,000 - <$75,000	23%	20%	43%	21%	13%	34%	20%	22%	42%	18%	19%	37%	21%	19%	40%
$75,000 - <$100,000	19%	15%	35%	17%	10%	26%	17%	17%	33%	15%	14%	29%	18%	15%	32%
$100,000 - <$250,000	15%	10%	25%	13%	6%	20%	13%	11%	24%	12%	10%	21%	14%	10%	24%
TOTAL	**25%**	**16%**	**41%**	**33%**	**15%**	**47%**	**25%**	**22%**	**47%**	**32%**	**25%**	**56%**	**28%**	**19%**	**47%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Boston	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	58,634	9%	3%	76,351	23%	4%	67,225	14%	4%	119,886	31%	6%	322,096	17%
$20,000 - <$35,000	64,997	10%	4%	58,555	18%	3%	71,283	15%	4%	78,277	20%	4%	273,112	15%
$35,000 - <$50,000	73,508	11%	4%	50,997	15%	3%	76,385	16%	4%	63,054	16%	3%	263,944	14%
$50,000 - <$75,000	128,363	20%	7%	62,108	19%	3%	118,837	24%	6%	68,815	18%	4%	378,123	20%
$75,000 - <$100,000	109,043	17%	6%	36,457	11%	2%	75,983	16%	4%	31,553	8%	2%	216,579	12%
$100,000 - <$250,000	219,394	34%	12%	44,900	14%	2%	76,050	16%	4%	26,329	7%	1%	321,773	17%
ALL INCOMES	**653,939**	**100%**	**35%**	**329,368**	**100%**	**18%**	**485,763**	**100%**	**26%**	**387,914**	**100%**	**21%**	**1,856,984**	**100%**

Relationship of affordability to accessibility

Boston largely mirrors the findings for all metropolitan areas (see above) with the exception that distance to employment centers is not significantly associated with housing costs. This may be due to the Boston regions hot market. (Adjusted R-Square: Housing Model, .7083, Transportation Model, .9247)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (38.5 minutes) and in distance by transit (4.4 miles) or auto (6.8 miles). Households living in Above Average Housing and Transportation neighborhoods have the shortest commute in time by auto (25.3 minutes). Above Average Housing neighborhoods have the greatest share of transit, 31%. Households in Above Average Transportation cost neighborhoods have the smallest share of transit, 2% but they go the farthest on both transit (22.1 miles) and by auto (11.4 miles) and they spend the most time by transit (66.1 minutes).

Boston

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	935,636	424,980	446,773	695,126	2,502,515
% Transit	7%	31%	8%	2%	10%
Time all	29.0	30.0	27.1	27.6	28.5
Distance all	9.9	6.1	9.2	11.6	9.6
Speed All	19.8	12.6	19.0	23.5	19.5
Transit Commuters					
Time Transit	50.0	38.5	47.8	66.1	44.5
Distance Transit	11.2	4.4	9.2	22.1	7.9
Speed Transit	13.0	7.0	11.1	20.4	10.0
Auto Commuters					
Time Car	27.4	26.3	25.3	26.8	26.7
Distance Car	9.8	6.8	9.2	11.4	9.8
Speed Car	20.4	15.0	19.6	23.5	20.5

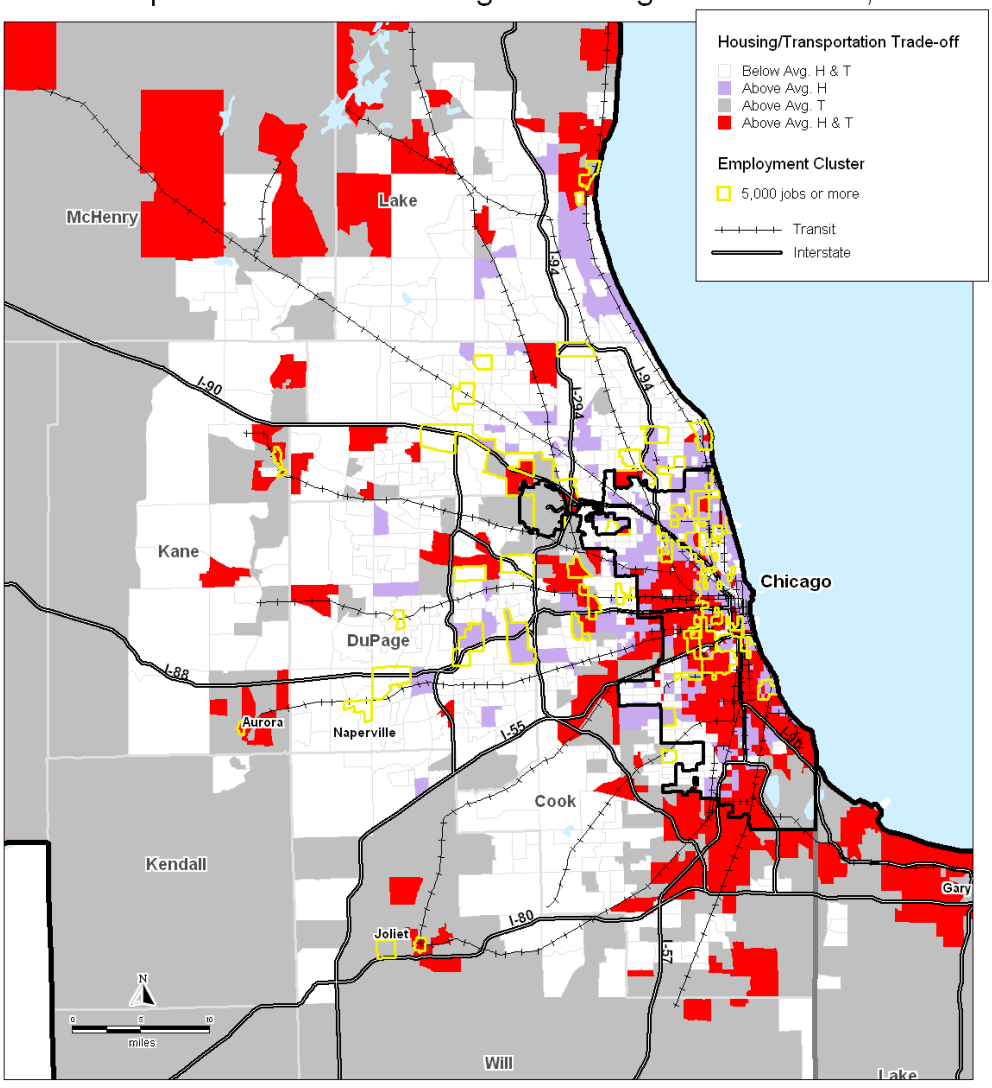
Household Expenditures by Income and Proximity to Employment
Boston, MA CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	63%	58%	57%
% Income on Transport.	43%	56%	64%
% Income on H+T	105%	114%	122%
$20,000 - <$35,000			
% Income on Housing	38%	32%	34%
% Income on Transport.	23%	33%	39%
% Income on H+T	61%	65%	72%
$35,000 - <$50,000			
% Income on Housing	27%	23%	26%
% Income on Transport.	16%	24%	28%
% Income on H+T	43%	47%	54%
$50,000 - <$75,000			
% Income on Housing	21%	19%	21%
% Income on Transport.	12%	17%	20%
% Income on H+T	32%	36%	42%
$75,000 - <$100,000			
% Income on Housing	16%	15%	17%
% Income on Transport.	9%	13%	15%
% Income on H+T	25%	28%	32%
$100,000 - <$250,000			
% Income on Housing	12%	11%	13%
% Income on Transport.	6%	8%	10%
% Income on H+T	18%	20%	23%
Average of All Incomes			
% Income on Housing	33%	30%	26%
% Income on Transport.	14%	21%	20%
% Income on H+T	47%	51%	46%
Owner Median Income	$65,192	$61,147	$68,085
Renter Median Income	$37,411	$33,170	$35,478
Median Income	$45,250	$48,023	$59,221

Chicago, IL CMSA

Profile: Chicago, IL CMSA	
Combined Housing and Transportation Category:	Medium H, Medium T
Housing Market:	Lukewarm Sprawling Market
Households earning 30-50% HAMFI with Severe Burden:	16%
Affordable Housing Shortage:	Medium
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	15%, Extensive Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	30%, 34%

Chicago: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 38% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 69%. These households pay 24% to 41% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 23% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 60%. These households pay 44% to 109% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Chicago	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	63%	54%	116%	62%	40%	102%	54%	63%	118%	59%	51%	109%	59%	51%	110%
$20,000 - <$35,000	35%	33%	68%	32%	23%	55%	30%	39%	69%	29%	31%	60%	31%	31%	63%
$35,000 - <$50,000	27%	24%	52%	24%	17%	40%	23%	28%	52%	22%	23%	44%	24%	23%	48%
$50,000 - <$75,000	23%	18%	41%	19%	13%	32%	19%	21%	40%	18%	17%	35%	20%	18%	38%
$75,000 - <$100,000	19%	14%	33%	16%	10%	26%	16%	16%	32%	15%	13%	28%	18%	14%	31%
$100,000 - <$250,000	15%	9%	24%	13%	6%	20%	13%	11%	23%	11%	9%	20%	14%	9%	23%
TOTAL	**25%**	**15%**	**40%**	**31%**	**15%**	**46%**	**25%**	**22%**	**47%**	**33%**	**23%**	**57%**	**28%**	**18%**	**46%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Chicago	Below Avg H&T Quad 1			Above Avg H Quad 2			Above Avg T Quad 4			Above Avg H&T Quad 3			TOTAL REGION	
Income Category	# of HHS	% of HHS in	% in Region	# of HHS	% of HHS	% in Region	# of HHS	% of HHS	% in Region	# of HHS	% of HHS	% in Region	# of HHS	% in Region
$0-<$20,000	78,756	3%	3%	117,969	23%	4%	83,848	15%	3%	179,121	27%	6%	459,694	16%
$20,000 - <$35,000	114,515	11%	4%	102,462	20%	4%	107,002	19%	4%	121,699	19%	4%	445,678	16%
$35,000 - <$50,000	132,300	13%	5%	89,315	17%	3%	112,630	20%	4%	92,924	14%	3%	427,169	15%
$50,000 - <$75,000	230,001	22%	8%	95,813	19%	3%	169,924	30%	6%	96,434	15%	3%	592,172	21%
$75,000 - <$100,000	179,176	17%	6%	47,407	9%	2%	98,296	17%	4%	44,055	7%	2%	368,934	13%
$100,000 - <$250,000	317,468	30%	11%	61,165	12%	2%	83,672	15%	3%	33,413	5%	1%	495,718	18%
ALL INCOMES	**1,052,216**	**100%**	**38%**	**514,131**	**100%**	**18%**	**567,646**	**100%**	**20%**	**655,372**	**100%**	**23%**	**2,789,365**	**100%**

Relationship of Affordability to Accessibility

Chicago largely mirrors the findings for all metropolitan areas; housing units decline with distance to employment centers and local concentrations of affordable housing are associated with declining transportation and housing costs. Chicago is an exception, along with Washington D.C., in that housing unit density is not significantly associated with housing costs. (Adjusted R-Square: Housing Model, .5992, Transportation Model, .8696)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (42.8 minutes) and in distance by transit (6.8 miles) or auto (8.5 miles). Households living in Above Average Transportation neighborhoods have the shortest commute in time by auto (27.7 minutes) but the longest commute in distance by auto (11.1 miles) and the longest commute in distance by transit (21.9 miles). Above Average Housing neighborhoods have the greatest share of transit, 26%.

Chicago

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	1,484,188	673,367	654,153	878,592	3,690,300
% Transit	10%	26%	15%	4%	12%
Time all	31.4	34.3	34.2	29.2	31.9
Distance all	10.3	8.1	9.3	11.5	10.0
Speed All	19.1	14.7	17.2	22.3	18.7
Transit Commuters					
Time Transit	54.0	42.8	54.5	66.0	50.8
Distance Transit	15.5	6.8	9.2	21.9	11.3
Speed Transit	16.4	9.7	11.0	20.1	13.0
Auto Commuters					
Time Car	28.8	31.4	30.5	27.7	29.2
Distance Car	9.7	8.5	9.3	11.1	9.8
Speed Car	19.4	16.4	18.4	22.4	19.5

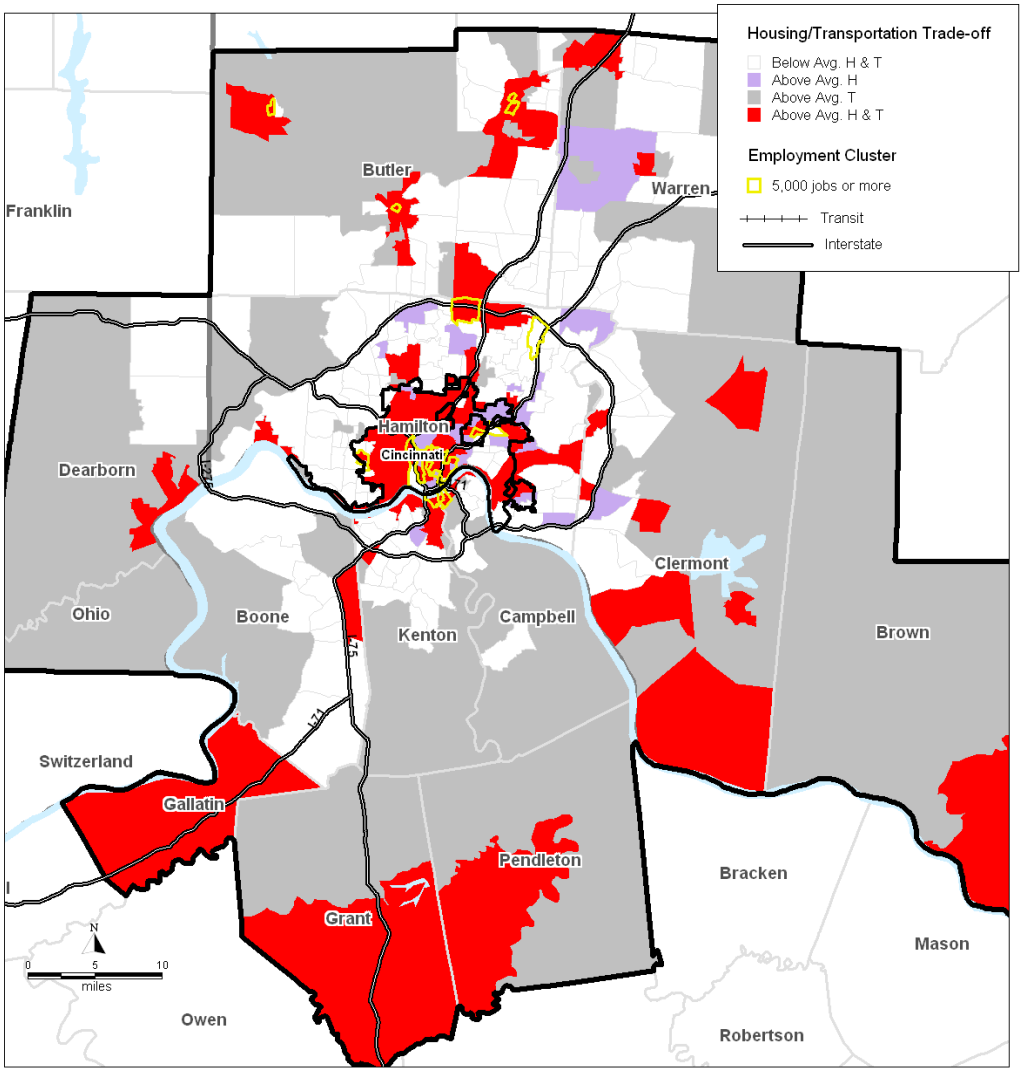
Household Expenditures by Income and Proximity to Employment
Chicago, IL CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	63%	61%	61%
% Income on Transport.	40%	50%	57%
% Income on H+T	102%	111%	118%
$20,000 - <$35,000			
% Income on Housing	31%	32%	32%
% Income on Transport.	21%	29%	34%
% Income on H+T	52%	62%	66%
$35,000 - <$50,000			
% Income on Housing	23%	24%	24%
% Income on Transport.	14%	21%	25%
% Income on H+T	37%	45%	49%
$50,000 - <$75,000			
% Income on Housing	19%	20%	20%
% Income on Transport.	11%	15%	18%
% Income on H+T	29%	35%	37%
$75,000 - <$100,000			
% Income on Housing	16%	16%	16%
% Income on Transport.	7%	11%	13%
% Income on H+T	23%	27%	29%
$100,000 - <$250,000			
% Income on Housing	13%	12%	12%
% Income on Transport.	5%	7%	9%
% Income on H+T	18%	20%	21%
Average of All Incomes			
% Income on Housing	31%	28%	29%
% Income on Transport.	15%	18%	20%
% Income on H+T	47%	46%	49%
Owner Median Income	$68,165	$60,756	$59,622
Renter Median Income	$34,112	$34,466	$33,564
Median Income	$42,978	$50,615	$51,356

Cincinnati, OH CMSA

Profile: Cincinnati, OH CMSA	
Combined Housing and Transportation Category:	Low H, High T
Housing Market:	Cool Sprawling Market
Households earning 30-50% HAMFI with Severe Burden:	11%
Affordable Housing Shortage:	Low
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	5%, No Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	16%, 25%

Cincinnati: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 45% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 61%. These households pay 23% to 39% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 30% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 74%. These households pay 44% to 108% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Cincinnati	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	52%	60%	112%	55%	55%	110%	46%	69%	115%	51%	57%	108%	51%	59%	110%
$20,000 - <$35,000	28%	38%	65%	28%	34%	62%	25%	42%	67%	25%	35%	60%	26%	37%	63%
$35,000 - <$50,000	23%	27%	50%	22%	25%	46%	20%	31%	51%	19%	26%	44%	21%	27%	48%
$50,000 - <$75,000	19%	20%	39%	18%	18%	37%	17%	23%	39%	15%	19%	35%	18%	20%	38%
$75,000 - <$100,000	16%	15%	31%	16%	14%	29%	14%	17%	31%	13%	14%	27%	15%	15%	31%
$100,000 - <$250,000	13%	10%	23%	13%	9%	21%	11%	11%	22%	10%	9%	20%	12%	10%	22%
TOTAL	**22%**	**19%**	**41%**	**28%**	**20%**	**48%**	**23%**	**26%**	**49%**	**30%**	**29%**	**58%**	**25%**	**23%**	**48%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Cincinatti	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	28,881	10%	4%	12,191	21%	2%	17,707	16%	3%	68,818	34%	10%	127,597	19%
$20,000 - <$35,000	41,289	14%	6%	11,446	20%	2%	22,040	20%	3%	49,045	24%	7%	123,820	18%
$35,000 - <$50,000	47,535	16%	7%	9,089	16%	1%	21,904	20%	3%	33,363	16%	5%	111,891	17%
$50,000 - <$75,000	72,479	24%	11%	10,731	19%	2%	28,328	25%	4%	31,456	16%	5%	142,994	21%
$75,000 - <$100,000	48,790	16%	7%	5,654	10%	1%	12,958	12%	2%	11,204	6%	2%	72,952	11%
$100,000 - <$250,000	63,094	21%	9%	7,978	14%	1%	8,771	8%	1%	8,443	4%	1%	80,308	12%
ALL INCOMES	**302,068**	**100%**	**45%**	**57,089**	**100%**	**8%**	**111,708**	**100%**	**17%**	**202,329**	**100%**	**30%**	**673,194**	**100%**

Relationship of Affordability to Accessibility

This is one of several metropolitan areas where local concentrations of affordable housing are associated with declining transportation *and* housing cost burdens. In Cincinnati, proximity to employment is not a significant factor influencing housing costs. This may be due to the low percentage of jobs in employment centers in Cincinnati--just 25%. The 28-metro average is 34% of jobs clustered in employment centers. (Adjusted R-Square: Housing Model, .7230, Transportation Model, .9448)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (35.3 minutes) or auto (21.5 minutes) and in distance auto (7.4 miles). Households living in Above Average H & T neighborhoods have the shortest commute by transit in distance, 4.7 miles. Above Average H&T neighborhoods have the greatest share of transit, 7%. Households in Above Average Transportation cost neighborhoods drive the farthest distances, 11.9 miles, and spend the most time by car, 28.1 minutes. These households also go the farthest distance on transit, 10.2 miles and spend the most time by transit 42. 5 minutes, although they have the smallest share of transit, only 1%.

Cincinnati

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	417,579	62,340	206,773	165,824	852,516
% Transit	2%	4%	7%	1%	3%
Time all	23.4	22.1	24.4	28.3	24.5
Distance all	8.7	7.3	7.6	11.9	8.9
Speed All	21.3	19.3	18.3	24.4	21.0
Transit Commuters					
Time Transit	38.1	35.3	39.7	42.5	39.0
Distance Transit	9.3	5.4	4.7	10.2	6.3
Speed Transit	15.3	9.9	8.4	16.2	10.9
Auto Commuters					
Time Car	23.1	21.5	23.3	28.1	24.0
Distance Car	8.7	7.4	7.8	11.9	9.0
Speed Car	21.4	19.7	19.0	24.5	21.4

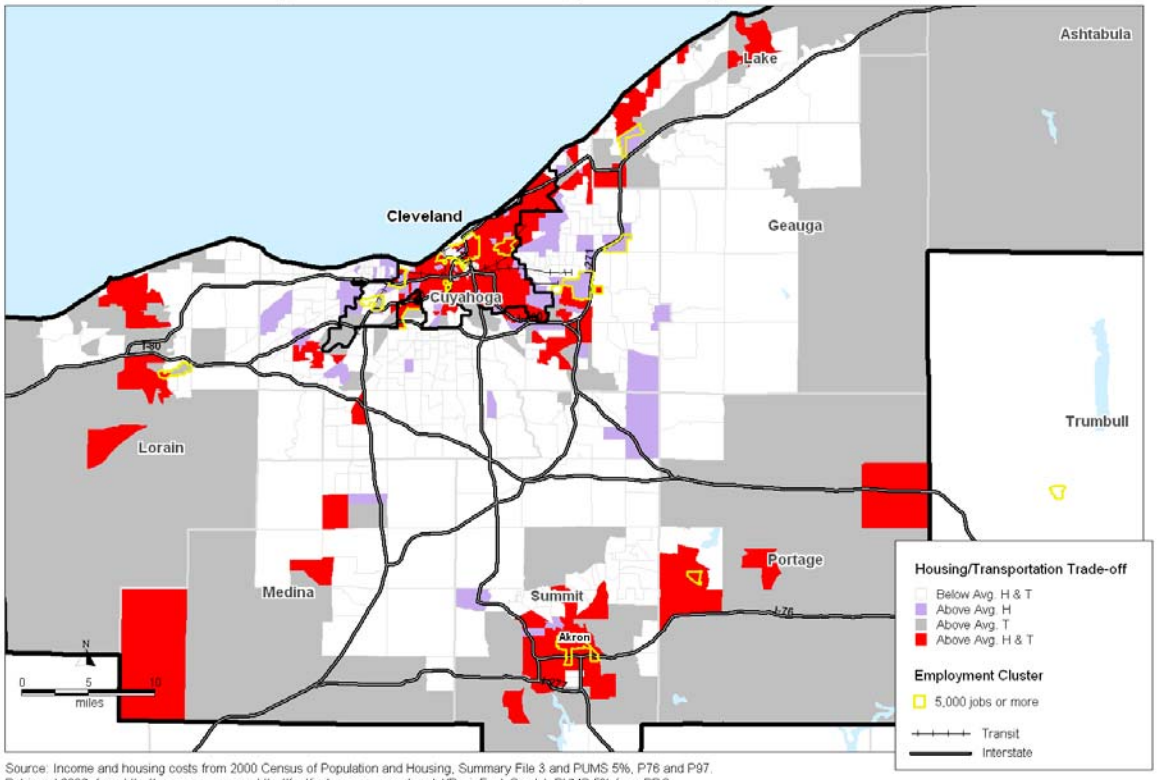
Household Expenditures by Income and Proximity to Employment
Cincinnati, OH CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	52%	53%	51%
% Income on Transport.	53%	57%	63%
% Income on H+T	104%	110%	115%
$20,000 - <$35,000			
% Income on Housing	23%	27%	27%
% Income on Transport.	30%	34%	39%
% Income on H+T	53%	61%	66%
$35,000 - <$50,000			
% Income on Housing	18%	20%	21%
% Income on Transport.	22%	24%	28%
% Income on H+T	39%	44%	49%
$50,000 - <$75,000			
% Income on Housing	14%	16%	18%
% Income on Transport.	16%	18%	21%
% Income on H+T	30%	34%	38%
$75,000 - <$100,000			
% Income on Housing	12%	13%	15%
% Income on Transport.	11%	13%	15%
% Income on H+T	23%	26%	30%
$100,000 - <$250,000			
% Income on Housing	9%	10%	11%
% Income on Transport.	6%	9%	10%
% Income on H+T	15%	19%	21%
Average of All Incomes			
% Income on Housing	32%	28%	24%
% Income on Transport.	28%	26%	23%
% Income on H+T	60%	53%	47%
Owner Median Income	$45,342	$52,409	$56,334
Renter Median Income	$18,762	$27,408	$31,267
Median Income	$23,979	$37,584	$48,818

Cleveland, OH CMSA

Profile: Cleveland, OH CMSA	
Combined Housing and Transportation Category:	Low H, High T
Housing Market:	Cool Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	16%
Affordable Housing Shortage:	Low
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	6%, Medium Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	14%, 20%

Cleveland: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov; http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 43% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 57%. These households pay 23% to 38% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 35% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 78%. These households pay 43% to 105% of their income for housing and transportation (Fig 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Cleveland	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	52%	56%	107%	57%	47%	104%	47%	65%	113%	53%	53%	105%	52%	55%	107%
$20,000 - <$35,000	29%	35%	64%	29%	29%	58%	25%	40%	66%	25%	33%	58%	27%	35%	62%
$35,000 - <$50,000	23%	26%	48%	22%	21%	43%	20%	29%	50%	19%	24%	43%	21%	26%	47%
$50,000 - <$75,000	19%	19%	38%	18%	16%	34%	17%	22%	39%	15%	18%	33%	18%	19%	37%
$75,000 - <$100,000	16%	15%	31%	14%	12%	27%	14%	16%	30%	12%	13%	26%	15%	15%	30%
$100,000 - <$250,000	13%	10%	23%	12%	8%	20%	11%	11%	22%	10%	9%	19%	12%	10%	22%
TOTAL	**23%**	**19%**	**42%**	**29%**	**19%**	**48%**	**24%**	**26%**	**49%**	**32%**	**28%**	**60%**	**26%**	**22%**	**49%**

Fig. 2 Distribution of Households by Income by Neighborhood Type

Cleveland	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	49,800	11%	5%	28,560	23%	3%	35,330	17%	3%	98,189	38%	9%	211,879	20%
$20,000 - <$35,000	69,926	16%	7%	27,220	22%	3%	44,471	21%	4%	62,378	24%	6%	203,995	20%
$35,000 - <$50,000	72,901	16%	7%	22,173	18%	2%	41,050	19%	4%	40,287	16%	4%	176,411	17%
$50,000 - <$75,000	105,662	24%	10%	23,275	19%	2%	51,460	24%	5%	36,158	14%	3%	216,555	21%
$75,000 - <$100,000	66,796	15%	6%	11,221	9%	1%	23,992	11%	2%	12,758	5%	1%	103,546	10%
$100,000 - <$250,000	82,658	18%	8%	12,499	10%	1%	15,916	7%	2%	8,616	3%	1%	107,190	10%
ALL INCOMES	**447,743**	**100%**	**43%**	**124,948**	**100%**	**12%**	**212,219**	**100%**	**20%**	**258,386**	**100%**	**25%**	**1,043,296**	**100%**

Relationship of Affordability to Accessibility

Cleveland largely mirrors the findings for all metropolitan areas with two exceptions: jobs density is not associated with housing costs and distance to employment is not associated with transportation costs. The lack of association between employment and housing costs may be due to the low percentage of jobs clustered in employment centers in this region, 20%. (Adjusted R-Square: Housing Model, .6398, Transportation Model, .9111)

Commuting Characteristics

Households living in Above Average Housing & Transportation neighborhoods have the shortest commute in distance by transit (5.6 miles) and in time by auto (23.1 minutes), they also share the shortest commute in distance by auto (7.4 miles) with households living in Above Average Housing neighborhoods. Above Average H&T neighborhoods have the greatest share of transit, 8%. Households in Above Average Transportation cost neighborhoods drive the farthest distances, 10.3 miles, and spend the most time by car, 23.8 minutes, and by transit, 46.0 minutes.

Cleveland

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	567,370	131,629	246,849	282,541	1,228,389
% Transit	2%	7%	8%	1%	3%
Time all	23.7	24.1	24.9	24.0	24.1
Distance all	8.7	7.3	7.3	10.3	8.6
Speed All	20.9	18.5	18.2	24.0	20.8
Transit Commuters					
Time Transit	41.4	42.0	45.4	46.0	43.7
Distance Transit	8.9	6.6	5.6	8.1	6.8
Speed Transit	13.6	10.5	8.9	13.1	10.7
Auto Commuters					
Time Car	23.3	22.9	23.1	23.8	23.4
Distance Car	8.7	7.4	7.4	10.3	8.7
Speed Car	21.1	19.0	19.0	24.1	21.2

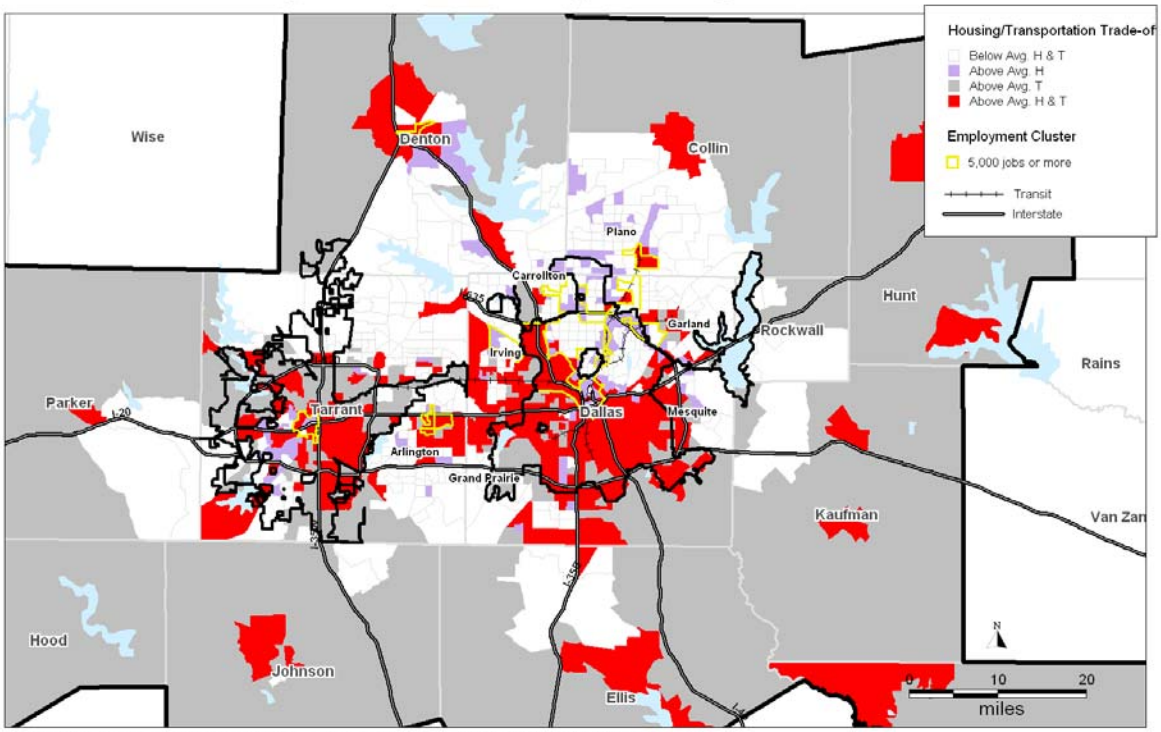
Household Expenditures by Income and Proximity to Employment
Cleveland, OH CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	48%	54%	53%
% Income on Transport.	40%	52%	58%
% Income on H+T	88%	106%	112%
$20,000 - <$35,000			
% Income on Housing	19%	26%	28%
% Income on Transport.	22%	31%	36%
% Income on H+T	41%	58%	64%
$35,000 - <$50,000			
% Income on Housing	16%	20%	21%
% Income on Transport.	14%	22%	26%
% Income on H+T	30%	43%	47%
$50,000 - <$75,000			
% Income on Housing	13%	16%	17%
% Income on Transport.	9%	16%	19%
% Income on H+T	21%	32%	36%
$75,000 - <$100,000			
% Income on Housing	9%	13%	14%
% Income on Transport.	4%	12%	14%
% Income on H+T	13%	25%	28%
$100,000 - <$250,000			
% Income on Housing	8%	10%	11%
% Income on Transport.	2%	7%	9%
% Income on H+T	10%	17%	20%
Average of All Incomes			
% Income on Housing	29%	30%	26%
% Income on Transport.	27%	25%	23%
% Income on H+T	56%	55%	49%
Owner Median Income	$19,754	$46,242	$51,805
Renter Median Income	$12,733	$24,019	$30,178
Median Income	$14,736	$35,247	$45,074

Dallas, TX CMSA

Profile: Dallas, TX CMSA	
Combined Housing and Transportation Category:	Low H, High T
Housing Market:	Cool
Households earning 30-50% HAMFI with Severe Burden:	17%
Affordable Housing Shortage:	Medium
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	3%, Medium Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	19%, 34%

Dallas: Average Household Expenditures on Housing
and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov; http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 41% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 68%. These households pay 24% to 40% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 26% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 73%. These households pay 45% to 115% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Dallas	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	62%	59%	122%	62%	48%	111%	51%	67%	119%	55%	60%	115%	57%	59%	116%
$20,000 - <$35,000	34%	36%	70%	31%	29%	59%	26%	40%	66%	26%	36%	62%	29%	35%	64%
$35,000 - <$50,000	26%	26%	52%	22%	21%	43%	19%	29%	48%	19%	26%	45%	22%	26%	48%
$50,000 - <$75,000	21%	20%	40%	18%	16%	34%	16%	22%	37%	15%	19%	34%	18%	19%	38%
$75,000 - <$100,000	17%	15%	32%	16%	12%	28%	13%	16%	30%	13%	14%	27%	16%	15%	30%
$100,000 - <$250,000	14%	10%	24%	13%	8%	22%	11%	11%	22%	10%	10%	20%	13%	10%	23%
TOTAL	**23%**	**17%**	**40%**	**28%**	**18%**	**46%**	**24%**	**26%**	**50%**	**30%**	**28%**	**58%**	**26%**	**21%**	**47%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Dallas	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	45,829	7%	3%	45,158	17%	3%	50,894	17%	3%	127,337	29%	7%	269,218	16%
$20,000 - <$35,000	82,061	12%	5%	61,199	23%	4%	63,813	21%	4%	114,540	26%	7%	321,613	19%
$35,000 - <$50,000	98,472	14%	6%	48,372	18%	3%	60,120	20%	4%	79,740	18%	5%	286,704	17%
$50,000 - <$75,000	161,405	23%	9%	49,609	19%	3%	68,637	23%	4%	72,606	16%	4%	352,257	21%
$75,000 - <$100,000	120,071	17%	7%	25,173	9%	1%	31,788	11%	2%	27,638	6%	2%	179,497	10%
$100,000 - <$250,000	195,022	28%	11%	35,478	13%	2%	25,162	8%	1%	20,609	5%	1%	240,793	14%
ALL INCOMES	**702,860**	**100%**	**41%**	**264,989**	**100%**	**15%**	**300,414**	**100%**	**18%**	**442,470**	**100%**	**26%**	**1,710,733**	**100%**

Relationship of Affordability to Accessibility

Although Dallas exhibits a pattern of results that is similar to the average metropolitan area, housing costs in Dallas are not associated with job density and transportation costs are not associated with distance to employment centers. Like Cleveland and Cincinnati, this may be due to the low percentage of jobs clustered in employment centers (34%) and an even lower percentage of the population living near these employment centers (19%).

This is also one of several metropolitan areas where local concentrations of affordable housing are associated with declining transportation *and* housing cost burdens. (Adjusted R-Square: Housing Model, .6482, Transportation Model, .9199)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (47.3 minutes) or auto (24.5 minutes) and in distance (6.7 miles by transit and 8.0 miles by auto). Above Average H&T neighborhoods have the greatest share of transit, 4%. Households in Above Average Transportation cost neighborhoods drive the farthest distances, 13.8 miles, and spend the most time by car, 30.6 minutes. Households in Above Average Housing & Transportation neighborhoods

spend the most time by transit, 52.8 minutes, while households in Below Average Housing and Transportation neighborhoods go the farthest distances by transit, 12.7 miles.

Dallas

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	971,310	320,454	518,054	447,043	2,256,861
% Transit	1%	3%	4%	1%	2%
Time all	27.2	25.3	27.7	30.7	27.7
Distance all	10.3	8.0	9.5	13.8	10.5
Speed All	22.2	19.0	20.9	25.8	22.2
Transit Commuters					
Time Transit	49.1	47.3	52.8	49.0	50.3
Distance Transit	12.7	6.7	7.7	9.7	8.6
Speed Transit	17.0	10.5	11.0	13.7	12.3
Auto Commuters					
Time Car	27.0	24.5	26.7	30.6	27.3
Distance Car	10.3	8.0	9.6	13.8	10.5
Speed Car	22.2	19.3	21.3	25.9	22.3

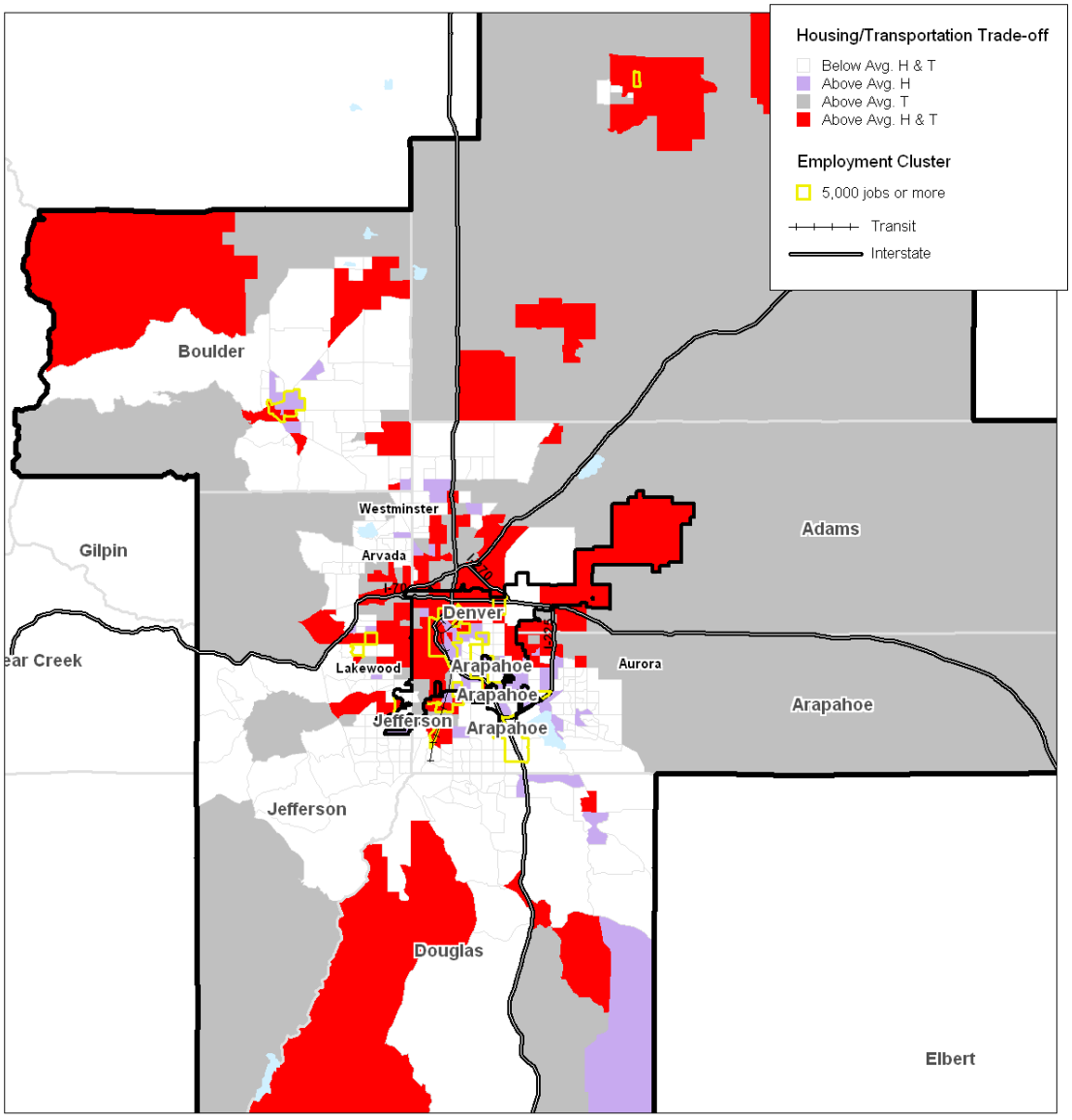
Household Expenditures by Income and Proximity to Employment
Dallas, TX CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	60%	62%	58%
% Income on Transport.	52%	54%	63%
% Income on H+T	112%	116%	121%
$20,000 - <$35,000			
% Income on Housing	29%	31%	30%
% Income on Transport.	30%	33%	38%
% Income on H+T	59%	64%	68%
$35,000 - <$50,000			
% Income on Housing	22%	23%	22%
% Income on Transport.	22%	24%	28%
% Income on H+T	43%	46%	50%
$50,000 - <$75,000			
% Income on Housing	17%	18%	18%
% Income on Transport.	16%	17%	20%
% Income on H+T	33%	36%	38%
$75,000 - <$100,000			
% Income on Housing	14%	15%	14%
% Income on Transport.	11%	12%	15%
% Income on H+T	25%	28%	29%
$100,000 - <$250,000			
% Income on Housing	11%	12%	11%
% Income on Transport.	7%	8%	10%
% Income on H+T	18%	20%	21%
Average of All Incomes			
% Income on Housing	28%	27%	25%
% Income on Transport.	22%	20%	23%
% Income on H+T	51%	48%	49%
Owner Median Income	$62,451	$65,631	$59,949
Renter Median Income	$34,916	$38,539	$35,901
Median Income	$45,334	$51,576	$50,449

Denver, CO CMSA

Profile: Denver, CO CMSA	
Combined Housing and Transportation Category:	Medium H, Medium T
Housing Market:	Cool Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	20%
Affordable Housing Shortage:	Medium
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	7%, Small Expanding Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	27%, 33%

Devner: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 42% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 71%. These households pay 24% to 42% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 29% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 67%. These households pay 47% to 111% of their income for housing and transportation (Fig. 1).

Fig. 1: H+ T Costs by Income by Neighborhood Type

Denver	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	63%	56%	119%	62%	43%	105%	54%	61%	116%	58%	53%	111%	59%	55%	113%
$20,000 - <$35,000	36%	34%	70%	32%	26%	58%	31%	37%	69%	32%	32%	64%	33%	34%	67%
$35,000 - <$50,000	29%	25%	54%	24%	19%	43%	25%	27%	52%	23%	24%	47%	26%	25%	51%
$50,000 - <$75,000	23%	19%	42%	19%	15%	34%	21%	20%	41%	19%	18%	37%	21%	19%	40%
$75,000 - <$100,000	19%	14%	33%	17%	11%	28%	17%	15%	33%	15%	13%	29%	18%	14%	32%
$100,000 - <$250,000	14%	9%	24%	13%	7%	20%	13%	11%	23%	12%	9%	21%	14%	10%	23%
TOTAL	**24%**	**15%**	**39%**	**31%**	**17%**	**47%**	**26%**	**21%**	**47%**	**31%**	**23%**	**55%**	**27%**	**19%**	**46%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Denver	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	21,426	6%	2%	27,391	21%	3%	15,136	12%	2%	61,216	24%	7%	125,169	14%
$20,000 - <$35,000	36,329	10%	4%	29,971	22%	3%	21,702	17%	2%	60,517	24%	7%	148,519	17%
$35,000 - <$50,000	48,725	13%	6%	23,404	18%	3%	23,515	19%	3%	48,433	19%	5%	144,077	16%
$50,000 - <$75,000	87,872	24%	10%	24,956	19%	3%	33,006	26%	4%	49,624	19%	6%	195,458	22%
$75,000 - <$100,000	67,766	18%	8%	13,337	10%	2%	17,327	14%	2%	20,076	8%	2%	105,169	12%
$100,000 - <$250,000	105,898	29%	12%	14,235	11%	2%	15,665	12%	2%	16,189	6%	2%	137,752	16%
ALL INCOMES	**368,016**	**100%**	**42%**	**133,294**	**100%**	**15%**	**126,351**	**100%**	**14%**	**256,055**	**100%**	**29%**	**883,716**	**100%**

Relationship of Affordability to Accessibility

This is one of only two metropolitan areas (San Francisco being the other) where housing and transportation costs both decline with higher housing unit density. Denver is also somewhat unique in that job density is not significantly associated with housing costs. (Adjusted R-Square: Housing Model, .6346, Transportation Model, .8845)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (36.9 minutes) or auto (36.3 minutes) and in distance (5.7 miles by transit and 6.9 miles by auto). Above Average Housing neighborhoods also have the greatest share of transit, 8%. Households in Above Average Transportation cost neighborhoods drive the farthest distances, 10.9 miles, and spend the most time by car, 26.7 minutes.

Denver

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	522,801	157,650	312,383	179,576	1,172,410
% Transit	3%	8%	7%	3%	5%
Time all	26.0	24.3	25.7	27.3	25.9
Distance all	8.9	6.8	7.7	10.9	8.6
Speed All	20.4	16.7	18.0	23.5	19.7
Transit Commuters					
Time Transit	46.5	36.9	42.1	47.9	42.8
Distance Transit	11.1	5.7	6.5	10.5	8.1
Speed Transit	14.7	9.2	10.2	14.5	11.7
Auto Commuters					
Time Car	25.4	23.3	24.6	26.7	25.1
Distance Car	8.9	6.9	7.8	10.9	8.6
Speed Car	20.6	17.3	18.6	23.7	20.1

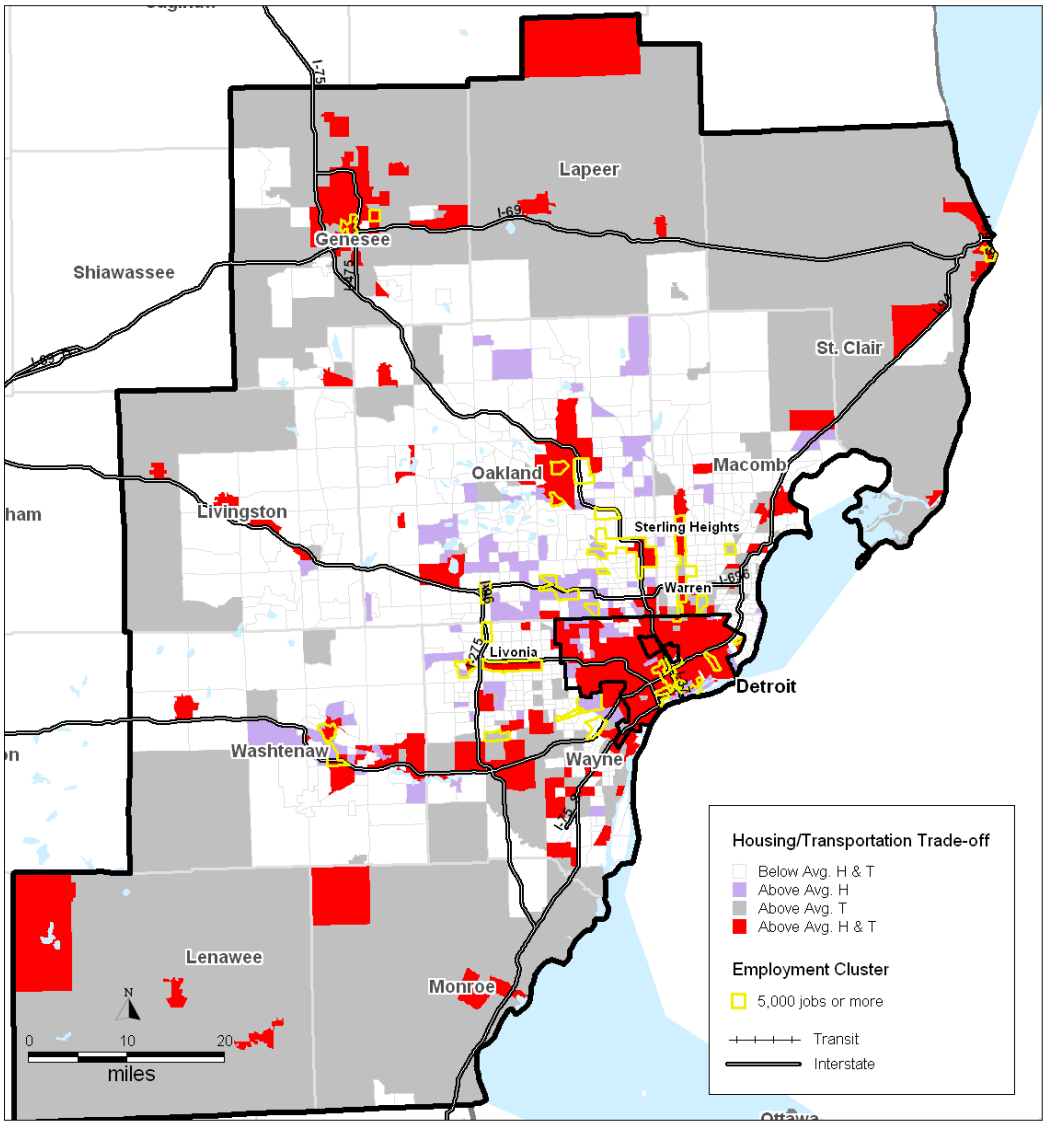
Household Expenditures by Income and Proximity to Employment
Denver, CO CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	54%	64%	63%
% Income on Transport.	46%	50%	58%
% Income on H+T	100%	114%	121%
$20,000 - <$35,000			
% Income on Housing	29%	33%	36%
% Income on Transport.	27%	31%	36%
% Income on H+T	56%	64%	72%
$35,000 - <$50,000			
% Income on Housing	22%	25%	27%
% Income on Transport.	19%	22%	26%
% Income on H+T	41%	48%	53%
$50,000 - <$75,000			
% Income on Housing	17%	20%	22%
% Income on Transport.	14%	16%	19%
% Income on H+T	31%	36%	41%
$75,000 - <$100,000			
% Income on Housing	15%	17%	17%
% Income on Transport.	10%	12%	14%
% Income on H+T	25%	29%	31%
$100,000 - <$250,000			
% Income on Housing	11%	12%	13%
% Income on Transport.	6%	8%	9%
% Income on H+T	17%	20%	22%
Average of All Incomes			
% Income on Housing	32%	28%	26%
% Income on Transport.	21%	18%	19%
% Income on H+T	53%	46%	45%
Owner Median Income	$50,428	$65,344	$64,558
Renter Median Income	$24,458	$37,447	$41,063
Median Income	$32,971	$52,760	$58,256

Detroit, MI CMSA

Profile: Detroit, MI CMSA	
Combined Housing and Transportation Category:	Low H, High T
Housing Market:	Cool
Households earning 30-50% HAMFI with Severe Burden:	14%
Affordable Housing Shortage:	Low
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	4%, No Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	22%, 28%

Detroit: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 44% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 66%. These households pay 23% to 39% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 28% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 72%. These households pay 43% to 113% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Detroit	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	54%	58%	113%	61%	55%	116%	49%	64%	113%	56%	57%	113%	55%	58%	113%
$20,000 - <$35,000	29%	36%	65%	34%	33%	67%	25%	40%	65%	26%	34%	60%	27%	36%	63%
$35,000 - <$50,000	23%	26%	49%	25%	24%	49%	20%	29%	48%	18%	25%	43%	21%	26%	47%
$50,000 - <$75,000	19%	19%	39%	19%	18%	37%	16%	21%	38%	14%	18%	33%	18%	19%	37%
$75,000 - <$100,000	16%	15%	31%	16%	13%	30%	13%	16%	30%	12%	14%	26%	15%	15%	30%
$100,000 - <$250,000	13%	10%	23%	13%	9%	22%	11%	11%	22%	9%	9%	18%	12%	10%	22%
TOTAL	**22%**	**17%**	**39%**	**28%**	**18%**	**45%**	**23%**	**24%**	**46%**	**31%**	**27%**	**57%**	**25%**	**21%**	**46%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Detroit	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	70,905	9%	4%	31,323	16%	2%	47,779	15%	3%	170,034	33%	9%	320,041	17%
$20,000 - <$35,000	100,378	12%	5%	31,889	16%	2%	58,629	19%	3%	117,262	23%	6%	308,158	17%
$35,000 - <$50,000	109,830	14%	6%	29,601	15%	2%	55,314	18%	3%	81,576	16%	4%	276,321	15%
$50,000 - <$75,000	182,144	23%	10%	40,176	21%	2%	75,973	24%	4%	81,920	16%	4%	380,213	21%
$75,000 - <$100,000	137,319	17%	7%	25,659	13%	1%	41,213	13%	2%	36,950	7%	2%	215,482	12%
$100,000 - <$250,000	208,064	26%	11%	36,965	19%	2%	32,256	10%	2%	28,560	6%	2%	268,880	15%
ALL INCOMES	**808,640**	**100%**	**44%**	**195,613**	**100%**	**11%**	**311,164**	**100%**	**17%**	**516,302**	**100%**	**28%**	**1,831,719**	**100%**

Relationship of Affordability to Accessibility

This is one of several metropolitan areas where local concentrations of affordable housing are associated with declining transportation *and* housing cost burdens.

This is one of a few metropolitan areas where housing costs decline with job density. This may be due to the weak housing market in the central city. Unexpectedly, transportation costs decline with distance from employment centers, which may be the result of a low percentage of job clusters within the region; 28% compared to 34% for all metro regions. (Adjusted R-Square: Housing Model, .6197, Transportation Model, .9134)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest transit commute in time (37.0 minutes) and in distance (4.9 miles). Above Average H & T neighborhoods have the shortest driving commute in time (25.3 minutes) and in distance (9.0 miles). Above Average H&T neighborhoods also have the greatest share of transit, 6%. Households in Above Average Transportation cost neighborhoods drive the farthest distances, 12.0 miles, and spend the most time by car, 27.0 minutes.

Detroit

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	1,062,297	221,918	498,523	422,757	2,205,495
% Transit	0%	2%	6%	0%	2%
Time all	26.4	25.5	26.6	27.0	26.4
Distance all	10.3	9.3	8.9	12.0	10.2
Speed All	22.6	21.2	20.7	25.1	22.5
Transit Commuters					
Time Transit	44.0	37.0	51.3	41.6	48.5
Distance Transit	9.8	4.9	6.8	7.9	6.9
Speed Transit	15.8	8.6	10.0	14.1	10.6
Auto Commuters					
Time Car	26.3	25.3	25.1	27.0	26.1
Distance Car	10.3	9.4	9.0	12.0	10.3
Speed Car	22.6	21.5	21.3	25.1	22.7

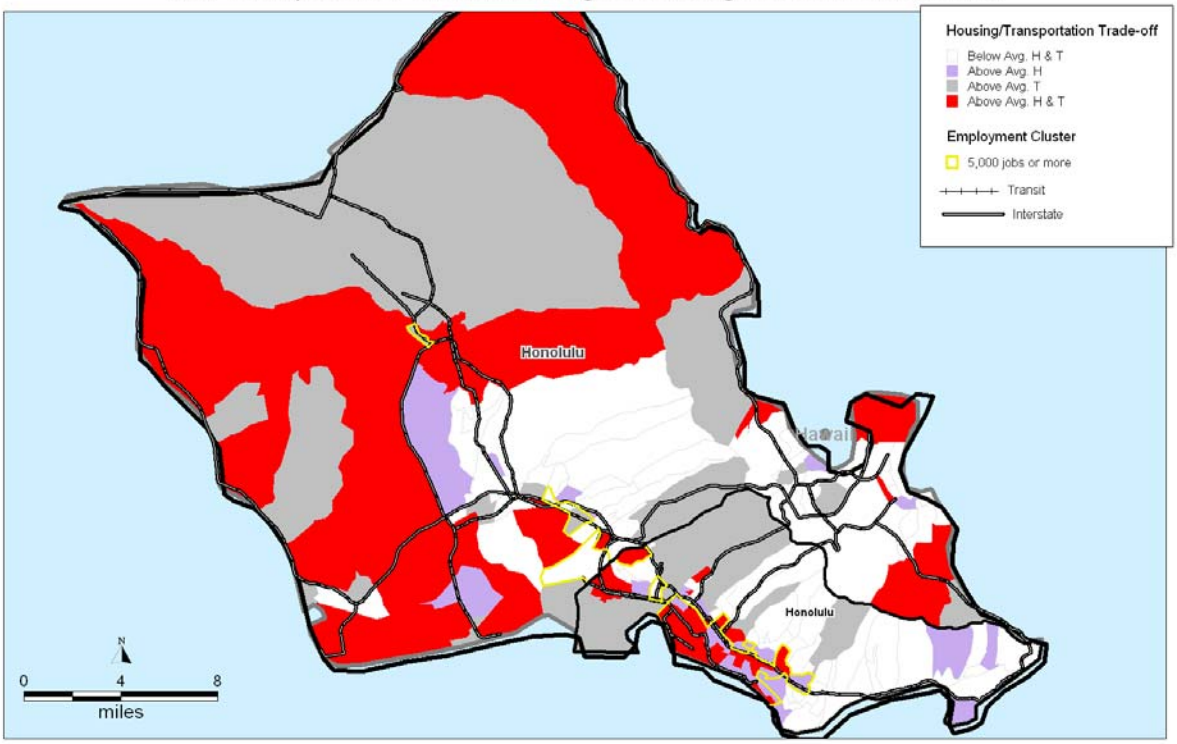
Household Expenditures by Income and Proximity to Employment
Detroit, MI CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	51%	58%	56%
% Income on Transport.	50%	57%	62%
% Income on H+T	101%	115%	118%
$20,000 - <$35,000			
% Income on Housing	23%	30%	28%
% Income on Transport.	28%	34%	38%
% Income on H+T	50%	64%	66%
$35,000 - <$50,000			
% Income on Housing	16%	22%	22%
% Income on Transport.	20%	25%	27%
% Income on H+T	36%	47%	49%
$50,000 - <$75,000			
% Income on Housing	12%	18%	17%
% Income on Transport.	14%	18%	20%
% Income on H+T	26%	36%	37%
$75,000 - <$100,000			
% Income on Housing	10%	14%	14%
% Income on Transport.	9%	13%	15%
% Income on H+T	19%	28%	29%
$100,000 - <$250,000			
% Income on Housing	8%	11%	11%
% Income on Transport.	6%	9%	10%
% Income on H+T	15%	19%	21%
Average of All Incomes			
% Income on Housing	29%	26%	25%
% Income on Transport.	27%	21%	22%
% Income on H+T	56%	47%	47%
Owner Median Income	$29,858	$60,051	$58,359
Renter Median Income	$17,637	$35,394	$33,323
Median Income	$20,299	$51,708	$51,992

Honolulu, HI MSA

Profile: Honolulu, HI MSA	
Combined Housing and Transportation Category:	High H, Low T
Housing Market:	Hot Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	23%
Affordable Housing Shortage:	Medium
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	15%, No Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	39%, 58%

Honolulu: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov; http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 39% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 69%. These households pay 25% to 40% of their income for housing and transportation (Fig. 1).

Above Average Housing cost neighborhoods have the second greatest share of households in the region, 24% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 61%. These households pay 40% to 99% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Honolulu	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	62%	51%	113%	64%	35%	99%	54%	59%	113%	61%	51%	113%	61%	47%	108%
$20,000 - <$35,000	37%	31%	67%	36%	19%	55%	31%	36%	67%	34%	31%	66%	35%	28%	63%
$35,000 - <$50,000	28%	23%	50%	26%	15%	40%	26%	26%	52%	27%	23%	50%	27%	21%	48%
$50,000 - <$75,000	23%	17%	40%	22%	12%	34%	20%	19%	39%	23%	18%	40%	22%	16%	39%
$75,000 - <$100,000	20%	13%	33%	19%	10%	29%	18%	14%	32%	22%	14%	36%	20%	13%	32%
$100,000 - <$250,000	16%	8%	25%	16%	7%	23%	15%	10%	24%	16%	9%	25%	16%	8%	24%
TOTAL	**25%**	**13%**	**39%**	**34%**	**13%**	**47%**	**27%**	**19%**	**46%**	**34%**	**21%**	**54%**	**30%**	**16%**	**45%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Honolulu	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	6,015	7%	3%	11,855	22%	5%	4,458	15%	2%	12,031	23%	5%	34,359	16%
$20,000 - <$35,000	9,234	11%	4%	11,056	21%	5%	4,652	16%	2%	9,903	19%	5%	34,845	16%
$35,000 - <$50,000	10,528	12%	5%	9,350	18%	4%	4,252	15%	2%	7,999	16%	4%	32,129	15%
$50,000 - <$75,000	18,048	21%	8%	9,744	18%	4%	6,568	22%	3%	9,978	19%	5%	44,338	20%
$75,000 - <$100,000	14,689	17%	7%	5,515	10%	3%	4,355	15%	2%	5,830	11%	3%	24,874	11%
$100,000 - <$250,000	26,740	31%	12%	5,617	11%	3%	4,957	17%	2%	5,571	11%	3%	37,268	17%
ALL INCOMES	**85,254**	**100%**	**39%**	**53,137**	**100%**	**24%**	**29,242**	**100%**	**13%**	**51,312**	**100%**	**23%**	**218,945**	**100%**

Relationship of Affordability to Accessibility

Honolulu is the only metropolitan area in which the concentration of affordable housing is positively associated with housing costs. This metropolitan area is also one of a few where housing costs increase with distance from employment centers. This may be due to the pressures on the housing market from the resort and second home market. (Adjusted R-Square: Housing Model, .3391, Transportation Model, .9051)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (38.0 minutes) or auto (24.1 minutes) and in distance (4.7 miles by transit and 6.2 miles by auto). Above Average Housing neighborhoods have the greatest share of transit, 15%. Households in Above Average Transportation cost neighborhoods have the longest commutes by transit (54.8 minutes) and they go the farthest by both transit (10.0 miles) and auto (9.3 miles). Households living in Above Average Housing & Transportation neighborhoods spend the most time in the car, 28.4 minutes.

Honolulu

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	140,624	77,323	86,444	49,561	353,952
% Transit	6%	15%	10%	8%	9%
Time all	28.0	26.2	30.5	30.2	28.5
Distance all	7.5	6.0	8.9	9.3	7.8
Speed All	16.5	13.8	18.0	19.1	16.6
Transit Commuters					
Time Transit	49.6	38.0	48.7	54.8	45.8
Distance Transit	7.5	4.7	8.5	10.0	7.1
Speed Transit	9.9	7.7	10.9	12.2	9.7
Auto Commuters					
Time Car	26.7	24.1	28.4	28.1	26.8
Distance Car	7.5	6.2	8.9	9.3	7.8
Speed Car	16.9	14.9	18.8	19.6	17.3

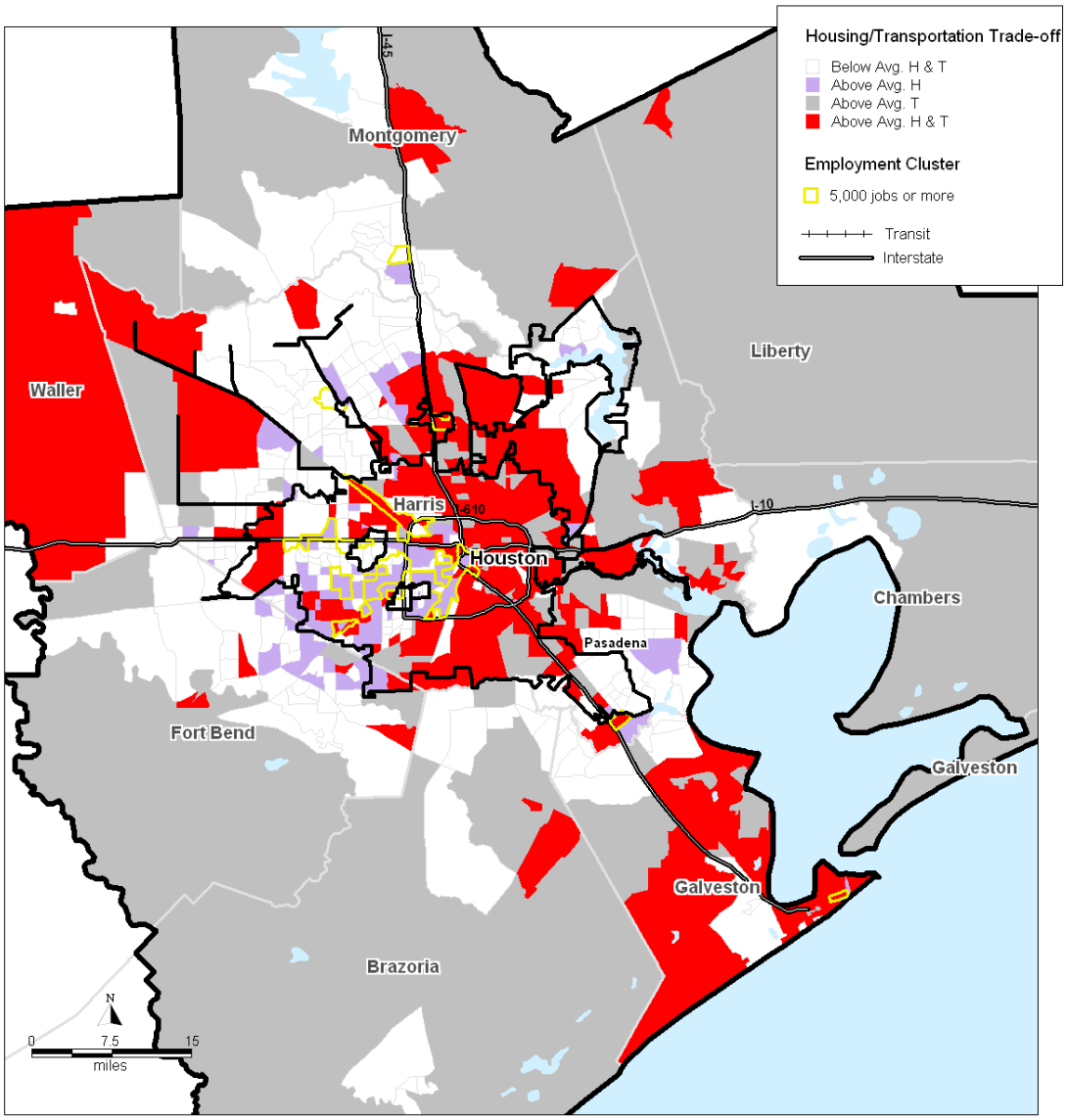
Household Expenditures by Income and Proximity to Employment
Honolulu, HI MSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	62%	66%	64%
% Income on Transport.	40%	41%	54%
% Income on H+T	102%	107%	118%
$20,000 - <$35,000			
% Income on Housing	32%	37%	38%
% Income on Transport.	23%	26%	33%
% Income on H+T	55%	63%	71%
$35,000 - <$50,000			
% Income on Housing	24%	27%	30%
% Income on Transport.	16%	20%	24%
% Income on H+T	40%	47%	54%
$50,000 - <$75,000			
% Income on Housing	18%	20%	24%
% Income on Transport.	12%	14%	17%
% Income on H+T	30%	34%	41%
$75,000 - <$100,000			
% Income on Housing	14%	17%	20%
% Income on Transport.	8%	10%	13%
% Income on H+T	23%	27%	33%
$100,000 - <$250,000			
% Income on Housing	13%	14%	16%
% Income on Transport.	6%	6%	8%
% Income on H+T	18%	20%	24%
Average of All Incomes			
% Income on Housing	32%	27%	27%
% Income on Transport.	15%	16%	17%
% Income on H+T	47%	43%	45%
Owner Median Income	$56,192	$51,810	$67,906
Renter Median Income	$33,193	$40,857	$44,403
Median Income	$41,776	$48,524	$60,077

Houston, TX CMSA

Profile: Houston, TX CMSA	
Combined Housing and Transportation Category:	Low H, High T
Housing Market:	Cool Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	16%
Affordable Housing Shortage:	Medium
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	5%, Small Expanding Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	23%, 34%

Houston: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov; http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 37% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 68%. These households pay 23% to 40% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 30% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 74%. These households pay 44% to 115% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Houston	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	61%	62%	123%	62%	49%	112%	49%	69%	119%	54%	61%	115%	56%	60%	116%
$20,000 - <$35,000	33%	37%	69%	30%	29%	59%	24%	41%	65%	25%	36%	61%	27%	36%	63%
$35,000 - <$50,000	25%	27%	52%	22%	22%	44%	18%	30%	47%	17%	26%	44%	21%	26%	47%
$50,000 - <$75,000	20%	20%	40%	17%	16%	34%	14%	22%	36%	14%	20%	33%	17%	20%	37%
$75,000 - <$100,000	16%	15%	31%	15%	12%	27%	12%	16%	28%	12%	15%	26%	15%	15%	30%
$100,000 - <$250,000	13%	10%	23%	12%	8%	20%	10%	11%	21%	10%	10%	19%	12%	10%	22%
TOTAL	**22%**	**17%**	**39%**	**28%**	**18%**	**47%**	**23%**	**27%**	**50%**	**29%**	**29%**	**58%**	**26%**	**22%**	**48%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Houston	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	39,880	7%	3%	50,781	19%	3%	40,971	19%	3%	134,037	31%	9%	265,669	18%
$20,000 - <$35,000	60,786	11%	4%	59,867	22%	4%	47,137	22%	3%	111,481	26%	8%	279,271	19%
$35,000 - <$50,000	71,949	13%	5%	47,569	18%	3%	40,389	19%	3%	74,175	17%	5%	234,082	16%
$50,000 - <$75,000	118,052	22%	8%	49,399	18%	3%	47,739	22%	3%	65,235	15%	4%	280,425	19%
$75,000 - <$100,000	91,846	17%	6%	25,881	10%	2%	23,308	11%	2%	26,484	6%	2%	141,638	10%
$100,000 - <$250,000	155,660	29%	11%	37,245	14%	3%	17,703	8%	1%	20,115	5%	1%	193,478	13%
ALL INCOMES	**538,173**	**100%**	**37%**	**270,742**	**100%**	**19%**	**217,247**	**100%**	**15%**	**431,527**	**100%**	**30%**	**1,457,689**	**100%**

Relationship of Affordability to Accessibility

This is one of several metropolitan areas where local concentrations of affordable housing are associated with declining transportation *and* housing cost burdens.

Unlike most other metropolitan areas, job density is not significantly associated with housing cost burdens. However, this region has a cool housing market and a lower percentage of the population living near its employment centers, which are primarily clustered in the downtown area. Additionally, 96% of Above Avg. T neighborhoods are not near employment centers. (Adjusted R-Square: Housing Model, .6459, Transportation Model, .9082)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (46.5 minutes) or by auto (26.2 minutes) and in distance by auto (8.5 miles). Households in Above Average Housing and Transportation neighborhoods have the shortest commute by transit at 7.9 miles and the greatest share of transit commuters, 6%. Households in Above Average Transportation cost neighborhoods drive the farthest distances, 14.6 miles, and spend the most time by car, 30.2 minutes and by transit, 54.6 minutes.

Houston

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	729,436	322,398	476,919	290,772	1,819,525
% Transit	2%	5%	6%	1%	3%
Time all	29.5	27.2	29.3	30.5	29.2
Distance all	11.7	8.5	9.6	13.5	10.9
Speed All	22.7	18.5	20.6	26.2	22.0
Transit Commuters					
Time Transit	50.5	46.5	54.2	54.6	51.3
Distance Transit	17.5	8.2	7.9	12.0	10.6
Speed Transit	20.8	11.8	10.7	15.5	13.8
Auto Commuters					
Time Car	29.0	26.2	27.7	30.2	28.4
Distance Car	11.5	8.5	9.7	13.6	10.9
Speed Car	22.8	18.9	21.2	26.3	22.3

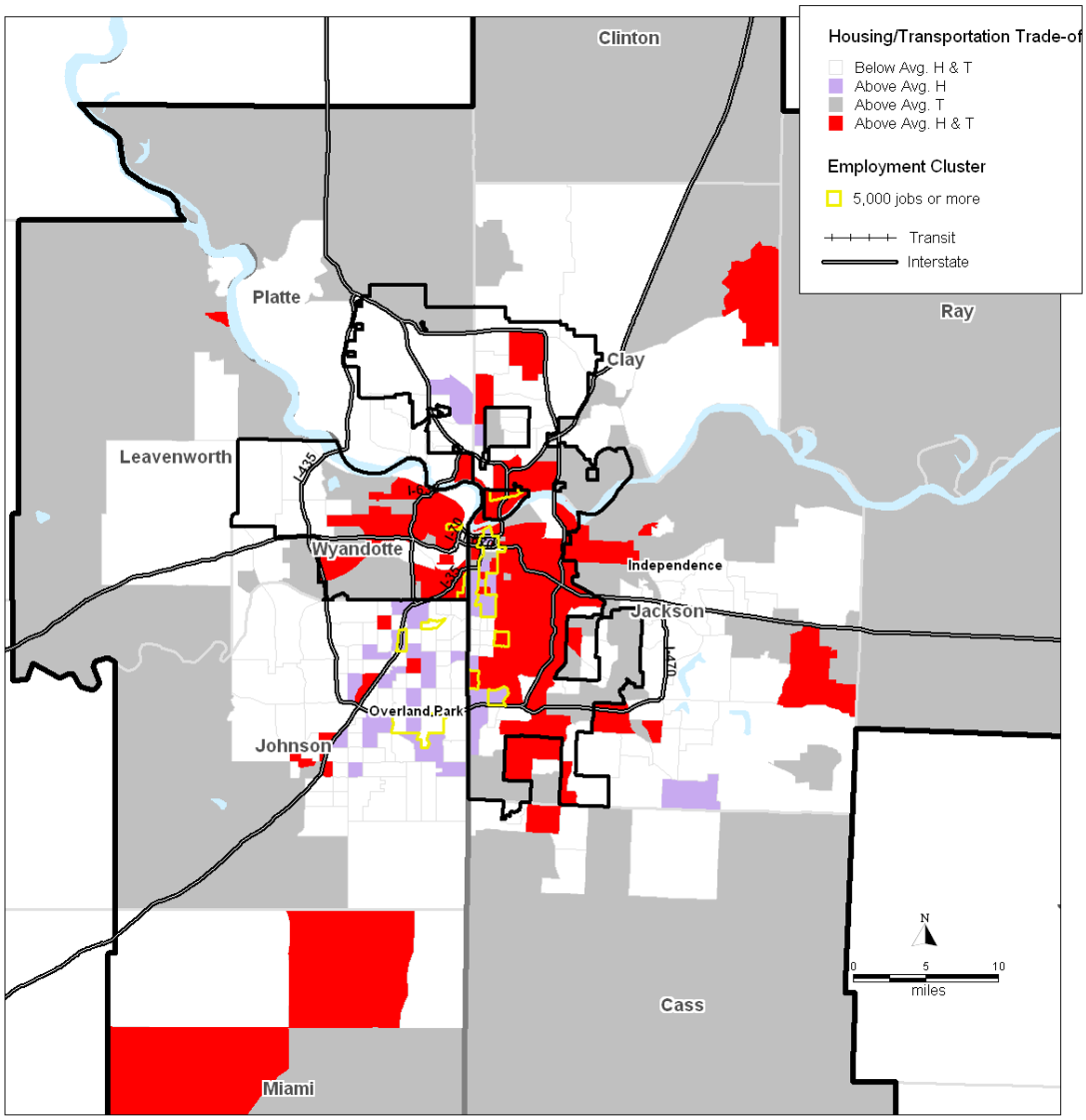
Household Expenditures by Income and Proximity to Employment
Houston, TX CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	61%	59%	56%
% Income on Transport.	50%	55%	65%
% Income on H+T	111%	115%	121%
$20,000 - <$35,000			
% Income on Housing	29%	29%	28%
% Income on Transport.	29%	34%	39%
% Income on H+T	58%	63%	66%
$35,000 - <$50,000			
% Income on Housing	22%	21%	20%
% Income on Transport.	21%	24%	28%
% Income on H+T	44%	46%	48%
$50,000 - <$75,000			
% Income on Housing	17%	17%	16%
% Income on Transport.	15%	18%	20%
% Income on H+T	33%	34%	36%
$75,000 - <$100,000			
% Income on Housing	15%	14%	13%
% Income on Transport.	12%	13%	15%
% Income on H+T	27%	27%	28%
$100,000 - <$250,000			
% Income on Housing	12%	11%	10%
% Income on Transport.	7%	8%	10%
% Income on H+T	19%	19%	20%
Average of All Incomes			
% Income on Housing	28%	27%	25%
% Income on Transport.	19%	21%	24%
% Income on H+T	47%	48%	49%
Owner Median Income	$69,750	$59,781	$54,004
Renter Median Income	$36,382	$36,027	$32,680
Median Income	$51,151	$47,120	$46,302

Kansas City, MO-KS MSA

Profile: Kansas City, MO-KS MSA	
Combined Housing and Transportation Category:	Low H, High T
Housing Market:	Cool Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	15%
Affordable Housing Shortage:	Low
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	3%, New Start Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	18%, 24%

Kansas City: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 38% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 64%. These households pay 23% to 39% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 27% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 74%. These households pay 43% to 109% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Kansas Cit	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	54%	62%	117%	59%	51%	110%	46%	68%	114%	51%	58%	109%	51%	60%	112%
$20,000 - <$35,000	29%	38%	68%	29%	32%	61%	24%	42%	66%	24%	36%	60%	26%	38%	64%
$35,000 - <$50,000	23%	28%	50%	22%	24%	45%	18%	30%	49%	17%	26%	43%	20%	28%	47%
$50,000 - <$75,000	19%	21%	39%	18%	18%	36%	15%	23%	38%	14%	19%	34%	17%	21%	37%
$75,000 - <$100,000	16%	16%	31%	15%	14%	29%	13%	17%	29%	12%	14%	26%	14%	15%	30%
$100,000 - <$250,000	12%	10%	23%	12%	9%	21%	10%	11%	22%	10%	10%	19%	12%	10%	22%
TOTAL	**21%**	**19%**	**40%**	**27%**	**19%**	**46%**	**22%**	**27%**	**49%**	**28%**	**28%**	**56%**	**24%**	**23%**	**47%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Kansas Cit	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	16,786	7%	3%	12,539	17%	2%	23,438	17%	4%	51,221	30%	8%	103,984	17%
$20,000 - <$35,000	30,439	13%	5%	14,850	20%	2%	30,356	21%	5%	43,916	26%	7%	119,561	19%
$35,000 - <$50,000	36,263	15%	6%	13,153	18%	2%	28,447	20%	5%	30,874	18%	5%	108,737	18%
$50,000 - <$75,000	59,469	25%	10%	15,731	21%	3%	34,062	24%	5%	27,293	16%	4%	136,555	22%
$75,000 - <$100,000	40,328	17%	6%	8,133	11%	1%	15,428	11%	2%	10,079	6%	2%	65,835	11%
$100,000 - <$250,000	52,633	22%	8%	9,593	13%	2%	9,589	7%	2%	6,639	4%	1%	68,861	11%
ALL INCOMES	**235,918**	**100%**	**38%**	**73,999**	**100%**	**12%**	**141,320**	**100%**	**23%**	**170,022**	**100%**	**27%**	**621,259**	**100%**

Relationship of Affordability to Accessibility

This is one of several metropolitan areas where local concentrations of affordable housing are associated with declining transportation *and* housing cost burdens.

Distance to employment center has no influence on either housing costs or transportation costs. Furthermore, job density is not significantly associated with housing costs. These factors may be influencing the high transportation costs in this region. (Adjusted R-Square: Housing Model, .6928, Transportation Model, .9352)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (32.3 minutes) or auto (19.0 minutes) and in distance (4.6 miles by transit and 6.8 miles by auto). Above Average H & T neighborhoods have the greatest share of transit, 4%. Households in Above Average Transportation cost neighborhoods drive the farthest distances, 12.6 miles, and spend the most time by car, 25.9 minutes. These households also go the farthest on transit, 9.6 miles and spend the most time by transit, 45.3 minutes.

Kansas City

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	333,008	82,543	174,804	200,093	790,448
% Transit	0%	2%	4%	0%	1%
Time all	22.3	19.3	22.7	26.0	23.0
Distance all	9.2	6.7	7.6	12.6	9.5
Speed All	23.9	20.1	20.3	27.7	23.7
Transit Commuters					
Time Transit	45.0	32.3	41.2	45.3	40.6
Distance Transit	9.5	4.6	4.8	9.6	5.6
Speed Transit	15.5	9.3	8.5	15.6	10.0
Auto Commuters					
Time Car	22.3	19.0	22.0	25.9	22.8
Distance Car	9.2	6.8	7.7	12.6	9.5
Speed Car	23.9	20.3	20.7	27.7	23.8

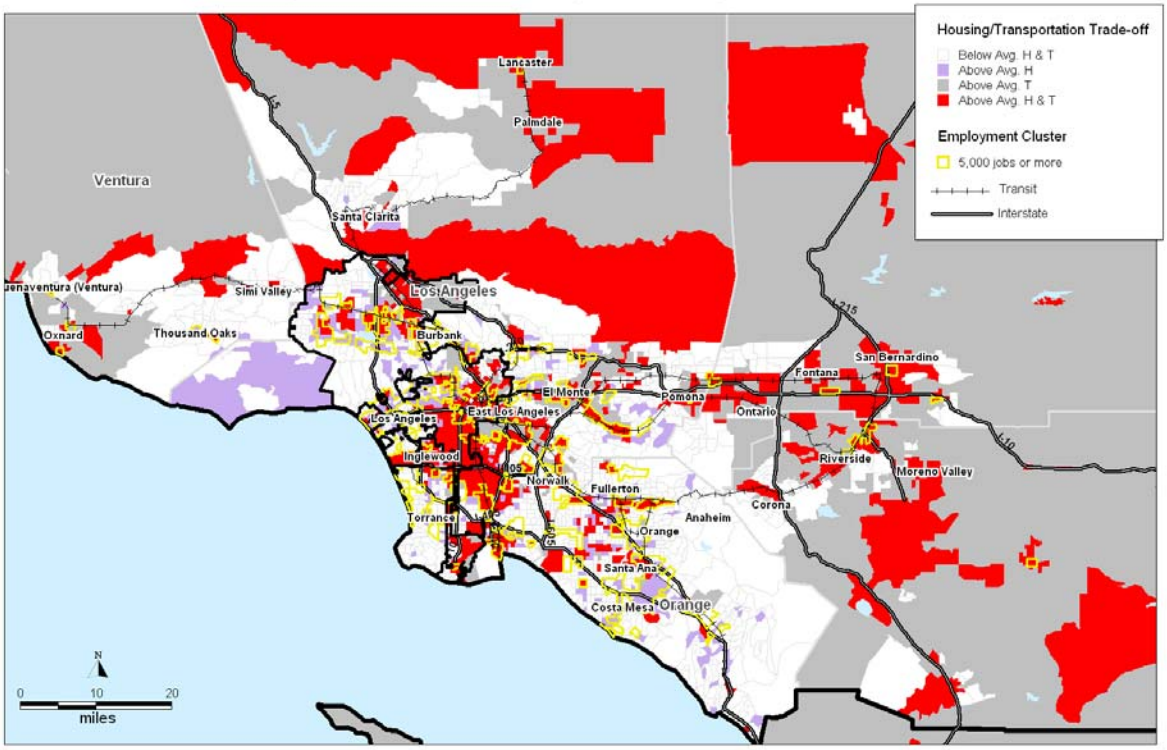
Household Expenditures by Income and Proximity to Employment
Kansas City, MO-KS MSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	52%	58%	52%
% Income on Transport.	47%	57%	63%
% Income on H+T	99%	116%	114%
$20,000 - <$35,000			
% Income on Housing	25%	28%	27%
% Income on Transport.	26%	34%	39%
% Income on H+T	50%	63%	66%
$35,000 - <$50,000			
% Income on Housing	18%	21%	20%
% Income on Transport.	19%	25%	28%
% Income on H+T	37%	46%	48%
$50,000 - <$75,000			
% Income on Housing	14%	17%	16%
% Income on Transport.	13%	18%	21%
% Income on H+T	27%	35%	37%
$75,000 - <$100,000			
% Income on Housing	11%	14%	13%
% Income on Transport.	8%	13%	15%
% Income on H+T	20%	26%	28%
$100,000 - <$250,000			
% Income on Housing	8%	11%	10%
% Income on Transport.	5%	9%	10%
% Income on H+T	14%	19%	20%
Average of All Incomes			
% Income on Housing	28%	25%	23%
% Income on Transport.	23%	22%	24%
% Income on H+T	51%	47%	48%
Owner Median Income	$38,829	$56,102	$53,913
Renter Median Income	$21,775	$31,719	$33,398
Median Income	$28,186	$47,211	$48,108

Los Angeles, CA CMSA

Profile: Los Angeles, CA CMSA	
Combined Housing and Transportation Category:	High H, Med T
Housing Market:	Hot Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	28%
Affordable Housing Shortage:	High
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	8%, Large Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	45%, 47%

Los Angeles: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov; http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 40% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 65%. These households pay 25% to 43% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 28% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 72%. These households pay 46% to 111% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Los Angeles	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	66%	52%	118%	68%	42%	110%	58%	63%	121%	62%	49%	111%	63%	50%	114%
$20,000 - <$35,000	39%	32%	71%	37%	25%	62%	33%	38%	72%	33%	30%	62%	36%	31%	66%
$35,000 - <$50,000	30%	23%	53%	28%	18%	46%	26%	28%	53%	24%	22%	46%	27%	23%	50%
$50,000 - <$75,000	26%	17%	43%	23%	14%	37%	21%	20%	41%	20%	16%	36%	23%	17%	40%
$75,000 - <$100,000	22%	13%	35%	19%	11%	30%	17%	15%	32%	16%	12%	28%	20%	13%	33%
$100,000 - <$250,000	17%	9%	25%	16%	7%	23%	13%	10%	23%	12%	8%	20%	16%	9%	24%
TOTAL	**29%**	**15%**	**43%**	**35%**	**16%**	**51%**	**29%**	**23%**	**52%**	**37%**	**23%**	**60%**	**32%**	**19%**	**51%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Los Angeles	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	175,831	9%	4%	174,212	22%	4%	130,142	17%	3%	430,574	32%	9%	910,759	19%
$20,000 - <$35,000	226,906	12%	5%	158,258	20%	3%	144,853	19%	3%	324,519	24%	7%	854,536	18%
$35,000 - <$50,000	254,321	13%	5%	127,261	16%	3%	134,703	18%	3%	218,638	16%	5%	734,923	15%
$50,000 - <$75,000	399,576	21%	8%	143,058	18%	3%	172,321	23%	4%	202,838	15%	4%	917,793	19%
$75,000 - <$100,000	296,374	16%	6%	77,856	10%	2%	89,747	12%	2%	85,484	6%	2%	471,605	10%
$100,000 - <$250,000	538,966	28%	11%	106,526	14%	2%	83,345	11%	2%	67,396	5%	1%	689,707	14%
ALL INCOMES	**1,891,974**	**100%**	**40%**	**787,171**	**100%**	**17%**	**755,111**	**100%**	**16%**	**1,329,449**	**100%**	**28%**	**4,763,705**	**100%**

Relationship of Affordability to Accessibility

Los Angeles is typical of the average metropolitan area in the sample with one exception: job density is not significantly associated with housing costs. This might be due to the high percentage of jobs clustered in employment centers, as well as a high number of employment centers scattered throughout the region. An increase in employment centers may relieve the price pressure on housing near jobs. There are also many other location characteristics that could be exerting greater pressures than job location, such as mountains and ocean views, and distance from congested areas. (Adjusted R-Square: Housing Model, .5892, Transportation Model, .8906)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (48.0 minutes) or auto (27.2 minutes) and in distance (7.0 miles by transit and 9.0 miles by auto). Above Average H&T neighborhoods have the greatest share of transit, 11%. Households in Above Average Transportation cost neighborhoods go the farthest distances by both auto (13.4 miles) and transit (13.5 miles) and spend the most time by auto (30.4 minutes) and by transit (56.0 minutes).

Los Angeles

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	2,442,147	915,791	1,452,612	903,265	5,713,815
% Transit	2%	7%	11%	2%	5%
Time all	29.2	28.7	30.8	31.1	29.8
Distance all	10.8	8.8	9.7	13.4	10.6
Speed All	21.5	18.4	19.2	24.3	20.9
Transit Commuters					
Time Transit	55.0	48.0	50.4	56.0	51.1
Distance Transit	12.6	7.0	7.5	13.5	8.7
Speed Transit	14.3	9.9	10.1	14.6	11.1
Auto Commuters					
Time Car	28.6	27.2	28.5	30.4	28.7
Distance Car	10.8	9.0	10.0	13.4	10.7
Speed Car	21.6	19.1	20.3	24.5	21.4

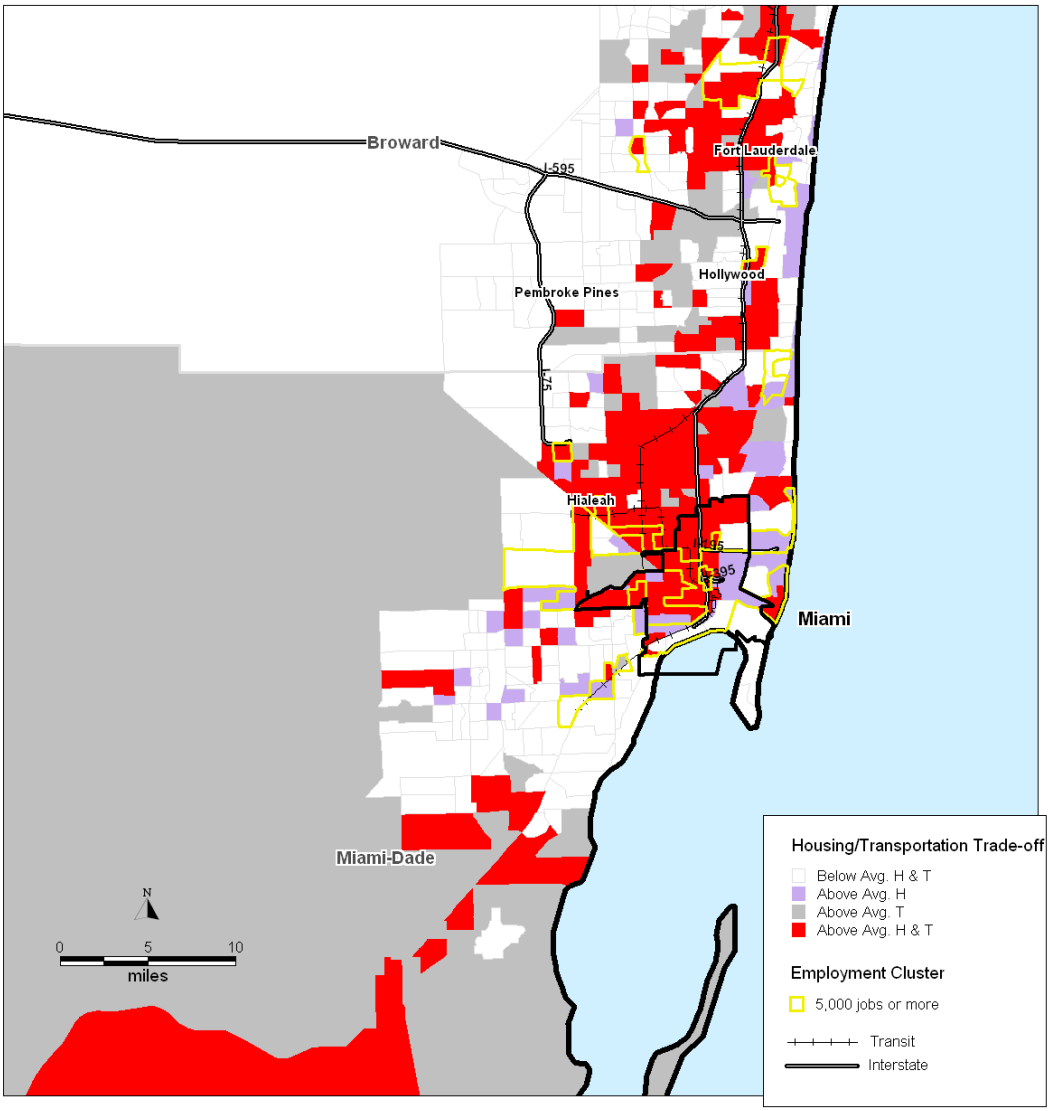
Household Expenditures by Income and Proximity to Employment
Los Angeles, CA CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	63%	65%	65%
% Income on Transport.	43%	50%	57%
% Income on H+T	107%	116%	122%
$20,000 - <$35,000			
% Income on Housing	33%	37%	38%
% Income on Transport.	24%	30%	35%
% Income on H+T	58%	67%	72%
$35,000 - <$50,000			
% Income on Housing	24%	28%	29%
% Income on Transport.	17%	22%	25%
% Income on H+T	42%	49%	54%
$50,000 - <$75,000			
% Income on Housing	20%	22%	23%
% Income on Transport.	13%	16%	18%
% Income on H+T	32%	38%	41%
$75,000 - <$100,000			
% Income on Housing	16%	18%	19%
% Income on Transport.	9%	12%	13%
% Income on H+T	25%	30%	32%
$100,000 - <$250,000			
% Income on Housing	12%	13%	14%
% Income on Transport.	6%	8%	9%
% Income on H+T	18%	21%	23%
Average of All Incomes			
% Income on Housing	36%	32%	31%
% Income on Transport.	19%	18%	20%
% Income on H+T	55%	50%	51%
Owner Median Income	$56,674	$60,886	$61,801
Renter Median Income	$29,646	$37,335	$37,197
Median Income	$36,413	$48,510	$52,784

Miami, FL CMSA

Profile: Miami, FL CMSA	
Combined Housing and Transportation Category:	High H, Med T
Housing Market:	Hot Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	42%
Affordable Housing Shortage:	High
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	6%, Medium Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	34%, 36%

Miami: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 43% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 59%. These households pay 24% to 42% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 34% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 78%. These households pay 45% to 111% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Miami	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	67%	56%	123%	67%	46%	113%	59%	60%	118%	60%	51%	111%	63%	52%	115%
$20,000 - <$35,000	39%	34%	73%	36%	27%	63%	34%	36%	70%	32%	31%	63%	35%	32%	67%
$35,000 - <$50,000	30%	25%	55%	26%	20%	46%	25%	26%	51%	23%	22%	45%	27%	23%	50%
$50,000 - <$75,000	24%	18%	42%	21%	15%	35%	19%	19%	38%	18%	17%	35%	21%	18%	39%
$75,000 - <$100,000	19%	14%	33%	17%	11%	28%	15%	14%	30%	14%	12%	27%	18%	13%	31%
$100,000 - <$250,000	15%	9%	24%	14%	7%	21%	12%	10%	21%	11%	8%	19%	14%	9%	23%
TOTAL	**29%**	**17%**	**46%**	**36%**	**18%**	**55%**	**31%**	**24%**	**55%**	**37%**	**26%**	**63%**	**33%**	**21%**	**54%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Miami	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	53,777	11%	5%	34,227	27%	3%	26,205	20%	2%	140,076	37%	13%	254,285	23%
$20,000 - <$35,000	69,616	14%	6%	29,020	23%	3%	27,817	22%	2%	93,712	25%	8%	220,165	20%
$35,000 - <$50,000	74,322	15%	7%	21,628	17%	2%	25,207	20%	2%	60,077	16%	5%	181,234	16%
$50,000 - <$75,000	108,175	23%	10%	21,436	17%	2%	27,692	22%	2%	52,373	14%	5%	209,676	19%
$75,000 - <$100,000	68,543	14%	6%	9,645	8%	1%	12,578	10%	1%	19,652	5%	2%	100,773	9%
$100,000 - <$250,000	105,777	22%	9%	12,452	10%	1%	8,711	7%	1%	14,438	4%	1%	128,926	12%
ALL INCOMES	**480,210**	**100%**	**43%**	**128,408**	**100%**	**11%**	**128,210**	**100%**	**11%**	**380,328**	**100%**	**34%**	**1,117,156**	**100%**

Relationship of Affordability to Accessibility

Miami is one of two metropolitan areas (Tampa being the other) where increases in the local concentration of affordable housing are associated with increased transportation costs. Miami is also one of several metropolitan areas where job density is not associated with housing costs. Furthermore, distance to employment centers does not influence either housing costs or transportation costs. Miami also has fewer employment centers than the average of the 28-metro areas—Miami has 9 and the average of the regions is 17. This low number of employment centers may be related to the low percentage of Above Average H neighborhoods, and why there is a lack of an association between distance to employment centers and housing costs and transportation costs; there are not enough employment centers to influence these costs. (Adjusted R-Square: Housing Model, .6854, Transportation Model, .8818)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest transit commute in time (46.2 minutes) and in distance (6.3 miles). Above Average H & T neighborhoods have the shortest driving commute in time (27.4 minutes) and in distance (7.7 miles). Above Average H&T neighborhoods also have the greatest share of transit, 8%. Households in Above Average Transportation cost neighborhoods and those in Below Average H & T neighborhoods both drive more than those in other

neighborhoods, 9.5 miles. Households in Above Average Transportation neighborhoods also have the longest transit commute by time, 57.6 minutes.

Miami

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	697,770	166,590	431,835	171,128	1,467,323
% Transit	2%	5%	8%	3%	4%
Time all	29.2	28.7	29.4	29.4	29.2
Distance all	9.5	7.9	7.6	9.6	8.7
Speed All	19.2	16.6	16.3	19.8	18.1
Transit Commuters					
Time Transit	53.7	46.2	52.1	57.6	52.0
Distance Transit	10.6	6.3	6.6	10.3	7.6
Speed Transit	13.5	9.7	9.3	12.5	10.4
Auto Commuters					
Time Car	28.8	27.7	27.4	28.7	28.3
Distance Car	9.5	8.0	7.7	9.5	8.8
Speed Car	19.3	17.0	16.8	19.9	18.4

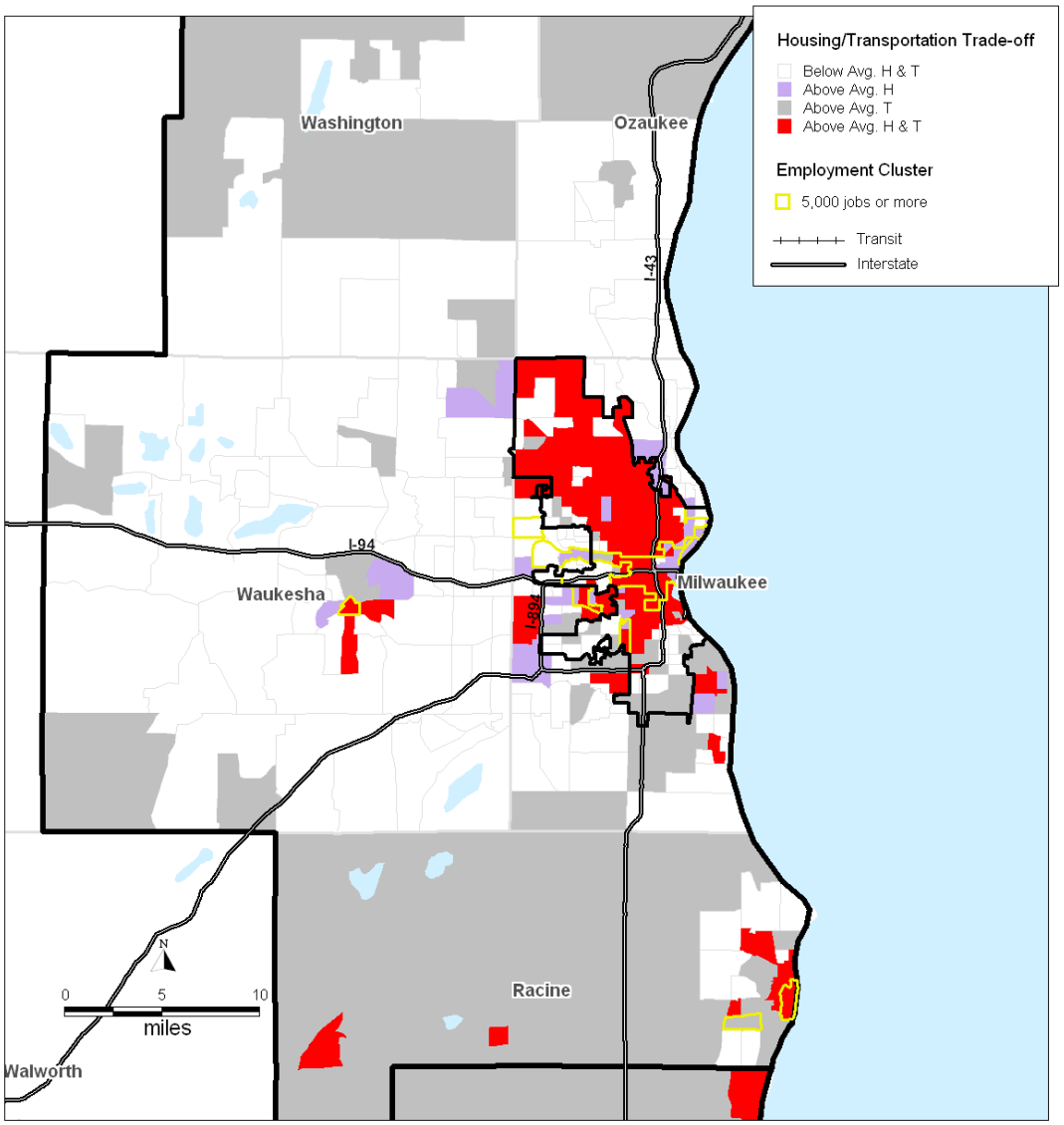
Household Expenditures by Income and Proximity to Employment
Miami, FL CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	62%	67%	66%
% Income on Transport.	47%	54%	57%
% Income on H+T	109%	121%	123%
$20,000 - <$35,000			
% Income on Housing	32%	37%	37%
% Income on Transport.	28%	32%	34%
% Income on H+T	60%	69%	71%
$35,000 - <$50,000			
% Income on Housing	24%	28%	27%
% Income on Transport.	20%	23%	24%
% Income on H+T	44%	51%	51%
$50,000 - <$75,000			
% Income on Housing	18%	22%	21%
% Income on Transport.	14%	17%	18%
% Income on H+T	33%	39%	39%
$75,000 - <$100,000			
% Income on Housing	15%	18%	16%
% Income on Transport.	10%	13%	13%
% Income on H+T	25%	30%	30%
$100,000 - <$250,000			
% Income on Housing	11%	13%	12%
% Income on Transport.	7%	8%	9%
% Income on H+T	18%	21%	21%
Average of All Incomes			
% Income on Housing	37%	32%	32%
% Income on Transport.	22%	19%	21%
% Income on H+T	59%	51%	53%
Owner Median Income	$42,276	$56,081	$49,784
Renter Median Income	$23,447	$32,743	$31,333
Median Income	$31,414	$47,615	$43,870

Milwaukee, WI CMSA

Profile: Milwaukee, WI CMSA	
Combined Housing and Transportation Category:	Low H, High T
Housing Market:	Lukewarm Low-Med Density Market
Households earning 30-50% HAMFI with Severe Burden:	15%
Affordable Housing Shortage:	Low
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	7%, No Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	23%, 23%

Milwaukee: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 43% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 62%. These households pay 24% to 40% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 26% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 76%. These households pay 42% to 106% of their income for housing and transportation (Fig.1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Milwaukee	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	55%	59%	114%	56%	45%	101%	52%	61%	113%	55%	51%	106%	54%	54%	108%
$20,000 - <$35,000	30%	37%	67%	29%	28%	57%	27%	38%	66%	25%	31%	56%	28%	34%	62%
$35,000 - <$50,000	23%	27%	50%	21%	21%	42%	21%	28%	50%	19%	23%	42%	21%	26%	47%
$50,000 - <$75,000	20%	20%	40%	17%	16%	33%	18%	21%	39%	15%	17%	32%	18%	20%	38%
$75,000 - <$100,000	17%	15%	32%	14%	12%	26%	15%	16%	31%	12%	13%	25%	16%	15%	31%
$100,000 - <$250,000	13%	10%	24%	12%	8%	20%	12%	11%	23%	9%	9%	18%	13%	10%	23%
TOTAL	**23%**	**19%**	**42%**	**29%**	**19%**	**48%**	**24%**	**24%**	**48%**	**32%**	**26%**	**58%**	**26%**	**22%**	**48%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Milwaukee	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	23,254	9%	4%	12,268	23%	2%	17,812	14%	3%	54,052	35%	9%	107,386	18%
$20,000 - <$35,000	35,727	14%	6%	11,488	22%	2%	23,595	19%	4%	36,996	24%	6%	107,806	18%
$35,000 - <$50,000	37,985	15%	6%	9,153	18%	2%	24,478	19%	4%	25,854	17%	4%	97,470	17%
$50,000 - <$75,000	61,224	24%	10%	9,889	19%	2%	33,930	27%	6%	22,877	15%	4%	127,920	22%
$75,000 - <$100,000	42,007	17%	7%	5,208	10%	1%	16,534	13%	3%	8,227	5%	1%	66,768	11%
$100,000 - <$250,000	52,621	21%	9%	4,263	8%	1%	11,046	9%	2%	5,128	3%	1%	68,795	12%
ALL INCOMES	**252,818**	**100%**	**43%**	**52,269**	**100%**	**9%**	**127,395**	**100%**	**22%**	**153,134**	**100%**	**26%**	**585,616**	**100%**

Relationship of Affordability to Accessibility

Milwaukee is typical of most metropolitan areas with one exception: distance to employment centers does not have a statistically significant influence on either housing or transportation costs. This may be a factor of the low number of employment centers in Milwaukee, there are 8 and they contain just 23% of all jobs in the region. Furthermore, job density does not have a significant influence on housing costs. (Adjusted R-Square: Housing Model, .7861, Transportation Model, .8856)

Commuting Characteristics

Households living in Above Average Housing cost neighborhoods have the shortest commute in time by transit (32.2 minutes) or auto (20.2 minutes). Above Average H&T cost neighborhoods have the shortest commute by car in distance (6.4 miles) and they share the shortest commute in distance by transit (4.7 miles) with those households living in Above Average Housing cost neighborhoods. Above Average H & T cost neighborhoods have the greatest share of transit, 12%. Households in Above Average Transportation cost neighborhoods drive the farthest distances, 9.8 miles, and spend the most time by car (22.2 minutes) and by transit (46.1 minutes).

Milwaukee

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	349,719	58,123	153,936	170,798	732,576
% Transit	1%	6%	12%	1%	4%
Time all	21.9	20.8	23.7	22.6	22.4
Distance all	8.7	6.7	6.2	9.8	8.3
Speed All	22.7	18.6	16.8	24.1	21.4
Transit Commuters					
Time Transit	42.7	32.2	41.1	46.1	40.7
Distance Transit	8.5	4.7	4.7	7.6	5.5
Speed Transit	12.4	9.0	8.1	10.5	9.1
Auto Commuters					
Time Car	21.7	20.0	21.2	22.2	21.6
Distance Car	8.7	6.8	6.4	9.8	8.4
Speed Car	22.8	19.2	18.0	24.3	22.0

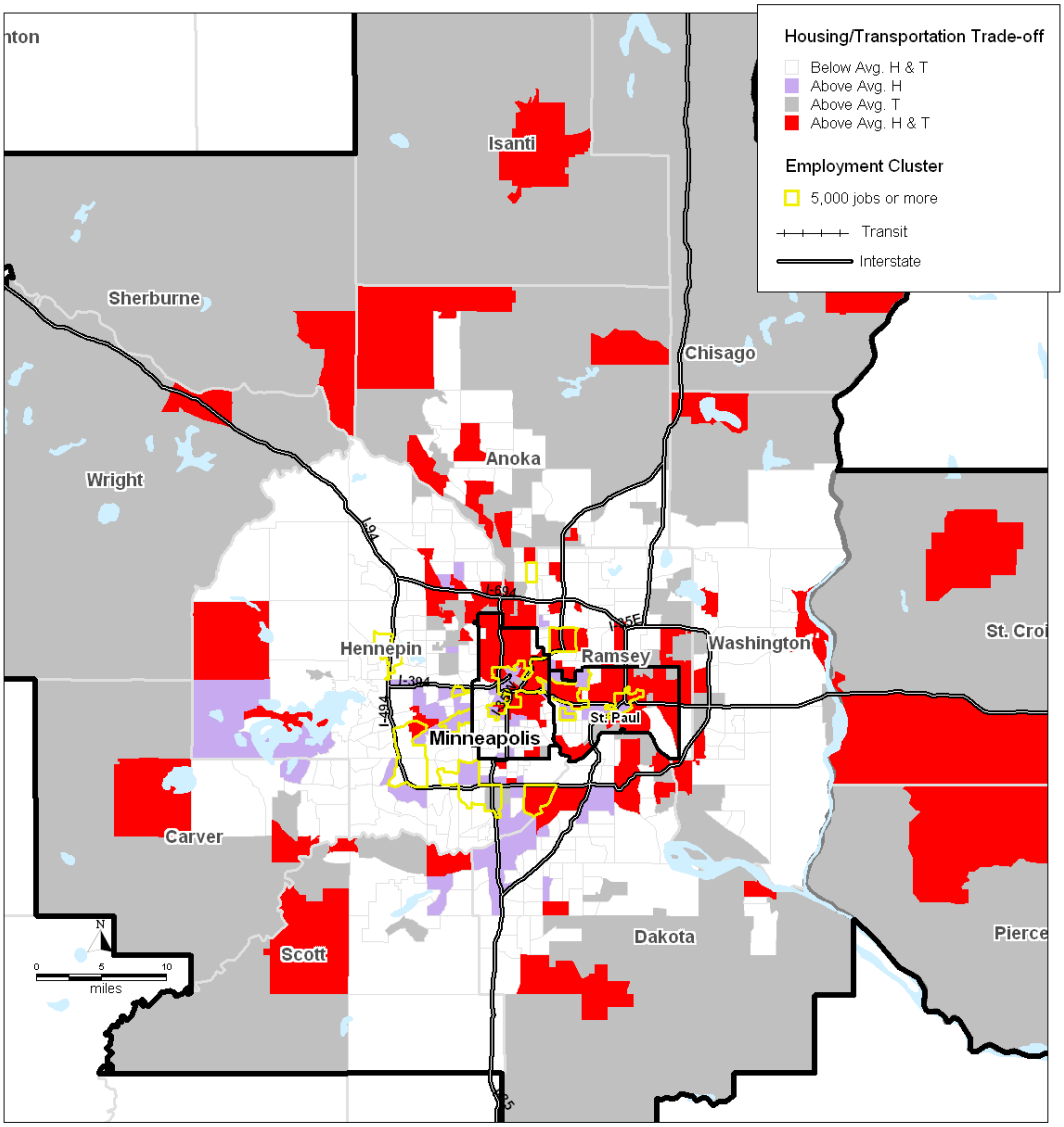
Household Expenditures by Income and Proximity to Employment
Milwaukee, WI CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	55%	53%	56%
% Income on Transport.	46%	54%	58%
% Income on H+T	101%	107%	114%
$20,000 - <$35,000			
% Income on Housing	24%	27%	29%
% Income on Transport.	27%	33%	36%
% Income on H+T	51%	61%	65%
$35,000 - <$50,000			
% Income on Housing	18%	21%	21%
% Income on Transport.	19%	24%	26%
% Income on H+T	37%	45%	48%
$50,000 - <$75,000			
% Income on Housing	14%	17%	18%
% Income on Transport.	14%	18%	19%
% Income on H+T	28%	34%	36%
$75,000 - <$100,000			
% Income on Housing	11%	13%	14%
% Income on Transport.	9%	13%	14%
% Income on H+T	20%	26%	28%
$100,000 - <$250,000			
% Income on Housing	8%	11%	11%
% Income on Transport.	6%	9%	9%
% Income on H+T	14%	20%	20%
Average of All Incomes			
% Income on Housing	31%	27%	27%
% Income on Transport.	23%	23%	23%
% Income on H+T	54%	50%	49%
Owner Median Income	$45,899	$53,275	$56,679
Renter Median Income	$23,597	$29,204	$32,714
Median Income	$30,334	$41,769	$48,331

Minneapolis, MN MSA

Profile: Minneapolis, MN MSA	
Combined Housing and Transportation Category:	Medium H, Medium T
Housing Market:	Lukewarm Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	13%
Affordable Housing Shortage:	Medium
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	7%, New Start Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	24%, 34%

Minneapolis: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov; http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 42% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 70%. These households pay 23% to 40% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 26% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 63%. These households pay 46% to 106% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Mn-St Paul	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	57%	56%	113%	56%	43%	99%	49%	65%	114%	53%	53%	106%	54%	54%	107%
$20,000 - <$35,000	32%	35%	67%	30%	27%	58%	29%	40%	69%	29%	33%	62%	30%	34%	64%
$35,000 - <$50,000	25%	26%	51%	23%	21%	44%	23%	30%	53%	21%	25%	46%	23%	26%	49%
$50,000 - <$75,000	21%	19%	40%	18%	16%	34%	19%	22%	41%	18%	19%	36%	19%	19%	39%
$75,000 - <$100,000	17%	15%	32%	16%	12%	28%	16%	16%	32%	14%	14%	29%	16%	15%	31%
$100,000 - <$250,000	14%	10%	23%	13%	8%	21%	12%	11%	23%	12%	10%	21%	13%	10%	23%
TOTAL	**22%**	**16%**	**38%**	**28%**	**17%**	**44%**	**23%**	**22%**	**45%**	**29%**	**23%**	**51%**	**25%**	**19%**	**44%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Mn-St Paul	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	25,740	6%	3%	21,652	18%	2%	20,243	10%	2%	63,754	24%	6%	131,389	13%
$20,000 - <$35,000	44,928	11%	4%	24,963	21%	2%	29,846	15%	3%	57,522	22%	6%	157,259	16%
$35,000 - <$50,000	55,792	13%	6%	20,490	17%	2%	33,295	17%	3%	46,198	17%	5%	155,775	16%
$50,000 - <$75,000	102,192	24%	10%	23,808	20%	2%	56,273	29%	6%	53,234	20%	5%	235,507	23%
$75,000 - <$100,000	79,153	19%	8%	12,836	11%	1%	32,942	17%	3%	24,704	9%	2%	136,799	14%
$100,000 - <$250,000	115,208	27%	11%	15,289	13%	2%	22,987	12%	2%	19,149	7%	2%	157,344	16%
ALL INCOMES	**423,013**	**100%**	**42%**	**119,038**	**100%**	**12%**	**195,586**	**100%**	**20%**	**264,561**	**100%**	**26%**	**1,002,198**	**100%**

Relationship of Affordability to Accessibility

Spatial factors other than the availability of affordable housing are not associated with housing costs in Minneapolis. This may be the result of a low number of employment centers (11), and a low percentage of jobs within the employment centers (34%), compared to the average of the 28 metros, Housing unit density and job density each influence transportation costs, however. (Adjusted R-Square: Housing Model, .7077, Transportation Model, .8554)

Commuting Characteristics

Households living in Above Average Housing cost neighborhoods have the shortest commute in time by transit (31.7 minutes) or auto (20.0 minutes) and in distance (4.7 miles by transit and 6.9 miles by auto). Above Average Household cost neighborhoods also have the greatest share of transit, 10%. Households in Above Average Transportation cost neighborhoods have the longest commutes in time by transit (42.3 minutes) and auto (27.1 minutes) and in distance (10.6 miles by transit and 13.7 miles by auto).

Minn-St Paul

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	630,873	145,608	319,609	320,498	1,416,588
% Transit	3%	10%	8%	2%	5%
Time all	23.1	21.2	23.7	27.3	24.0
Distance all	8.9	6.7	8.5	13.7	9.6
Speed All	22.6	18.9	21.2	28.3	23.2
Transit Commuters					
Time Transit	38.4	31.7	36.4	42.3	36.4
Distance Transit	9.0	4.7	5.1	10.6	6.6
Speed Transit	14.5	9.1	9.1	15.4	11.3
Auto Commuters					
Time Car	22.5	20.0	22.6	27.1	23.4
Distance Car	8.9	6.9	8.8	13.7	9.8
Speed Car	22.8	20.0	22.3	28.5	23.8

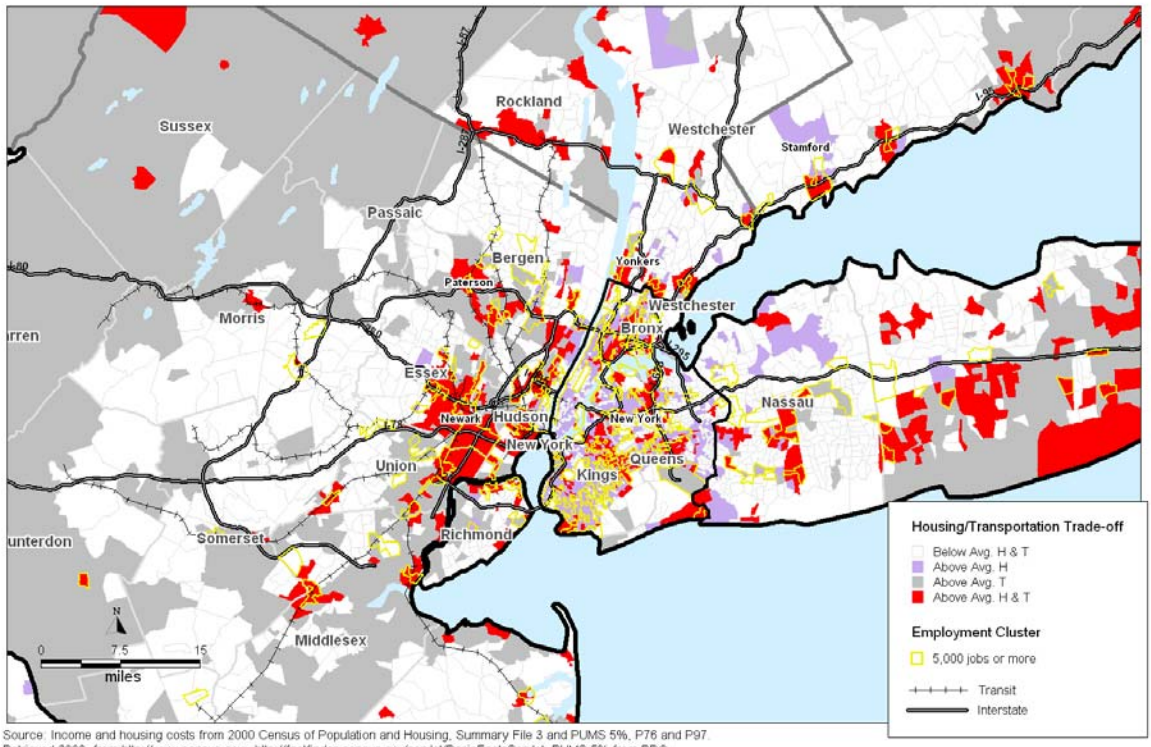
Household Expenditures by Income and Proximity to Employment
Minneapolis, MN MSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	53%	57%	56%
% Income on Transport.	46%	51%	61%
% Income on H+T	100%	108%	117%
$20,000 - <$35,000			
% Income on Housing	27%	30%	32%
% Income on Transport.	28%	32%	37%
% Income on H+T	55%	62%	69%
$35,000 - <$50,000			
% Income on Housing	21%	23%	24%
% Income on Transport.	20%	23%	27%
% Income on H+T	40%	46%	52%
$50,000 - <$75,000			
% Income on Housing	16%	19%	20%
% Income on Transport.	14%	17%	20%
% Income on H+T	30%	36%	40%
$75,000 - <$100,000			
% Income on Housing	13%	15%	16%
% Income on Transport.	10%	12%	15%
% Income on H+T	23%	28%	31%
$100,000 - <$250,000			
% Income on Housing	10%	12%	12%
% Income on Transport.	7%	8%	10%
% Income on H+T	17%	20%	22%
Average of All Incomes			
% Income on Housing	30%	25%	24%
% Income on Transport.	21%	18%	20%
% Income on H+T	51%	43%	43%
Owner Median Income	$54,852	$65,673	$64,769
Renter Median Income	$24,204	$37,186	$34,930
Median Income	$34,475	$53,022	$58,522

New York, NY CMSA

Profile: New York, NY CMSA	
Combined Housing and Transportation Category:	High H, Low T
Housing Market:	Hot Densifying Market
Households earning 30-50% HAMFI with Severe Burden:	22%
Affordable Housing Shortage:	High
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	31%, Extensive Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	54%, 51%

New York: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov; http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 31% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 69%. These households pay 24% to 41% of their income for housing and transportation (Fig. 1).

Above Average Transportation cost neighborhoods have the second greatest share of households in the region, 26% (Fig. 2). Households earning $50,000 or more annually are the majority of households in these neighborhoods, at 60%. These households pay 25% to 43% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

New York	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	67%	47%	114%	67%	34%	101%	62%	62%	124%	61%	47%	108%	64%	45%	109%
$20,000 - <$35,000	41%	28%	69%	34%	17%	51%	36%	38%	74%	34%	27%	61%	36%	27%	63%
$35,000 - <$50,000	31%	21%	51%	24%	12%	36%	28%	28%	55%	25%	21%	46%	27%	20%	47%
$50,000 - <$75,000	25%	16%	41%	19%	9%	28%	23%	20%	43%	20%	16%	36%	22%	16%	38%
$75,000 - <$100,000	21%	12%	34%	16%	7%	23%	19%	15%	34%	17%	12%	29%	19%	13%	31%
$100,000 - <$250,000	16%	8%	24%	13%	5%	17%	14%	10%	25%	13%	8%	21%	15%	8%	23%
TOTAL	**28%**	**12%**	**40%**	**36%**	**11%**	**48%**	**28%**	**19%**	**47%**	**37%**	**20%**	**57%**	**31%**	**16%**	**47%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

New York	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	194,172	10%	3%	449,561	30%	7%	203,220	12%	3%	438,620	33%	7%	1,285,573	20%
$20,000 - <$35,000	201,166	10%	3%	298,111	20%	5%	232,060	14%	4%	265,703	20%	4%	997,040	15%
$35,000 - <$50,000	220,004	11%	3%	232,311	15%	4%	248,203	15%	4%	194,514	15%	3%	895,032	14%
$50,000 - <$75,000	361,987	18%	6%	245,999	16%	4%	380,459	23%	6%	208,191	16%	3%	1,196,636	18%
$75,000 - <$100,000	291,097	15%	4%	121,905	8%	2%	268,320	16%	4%	104,594	8%	2%	664,011	10%
$100,000 - <$250,000	712,327	36%	11%	157,204	10%	2%	345,790	21%	5%	104,915	8%	2%	1,163,032	18%
ALL INCOMES	**1,980,753**	**100%**	**31%**	**1,505,091**	**100%**	**23%**	**1,678,052**	**100%**	**26%**	**1,316,537**	**100%**	**20%**	**6,480,433**	**100%**

Relationship of Affordability to Accessibility

This is one of several metropolitan areas where local concentrations of affordable housing are associated with declining transportation *and* housing cost burdens. Job density does not have a significant influence on housing costs in New York. Perhaps this is due to the ubiquity of employment in most census tracts within the region. New York has the second highest concentration of jobs within employment centers of the 28 regions; 51% of all jobs in the region are in employment centers. (Adjusted R-Square: Housing Model, .6046, Transportation Model, .8325)

Commuting Characteristics

Households living in Above Average Housing cost neighborhoods have the shortest commute in time by transit (49.4 minutes) and in distance by transit (6.3 miles) and by auto (7.4 miles). However, these households have the longest commute by time in autos (33.2 minutes). Above Average Housing cost neighborhoods have by far the greatest share of transit, 61%. Households in Above Average Transportation cost neighborhoods go the farthest distances by auto (11.7 miles), and by transit (24.1 miles) and they spend the most time by transit, (74.8 minutes).

New York

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	2,612,068	1,662,372	1,421,383	2,157,459	7,853,282
% Transit	25%	61%	26%	5%	28%
Time all	35.6	43.1	34.1	30.7	35.6
Distance all	10.2	6.7	8.2	12.4	9.7
Speed All	17.4	10.4	15.6	22.7	17.1
Transit Commuters					
Time Transit	55.2	49.4	53.6	74.8	53.2
Distance Transit	11.7	6.3	8.2	24.1	9.2
Speed Transit	11.5	8.1	9.6	18.6	9.9
Auto Commuters					
Time Car	28.9	33.2	27.3	28.3	28.9
Distance Car	9.6	7.4	8.2	11.7	9.9
Speed Car	19.4	14.1	17.7	22.9	19.8

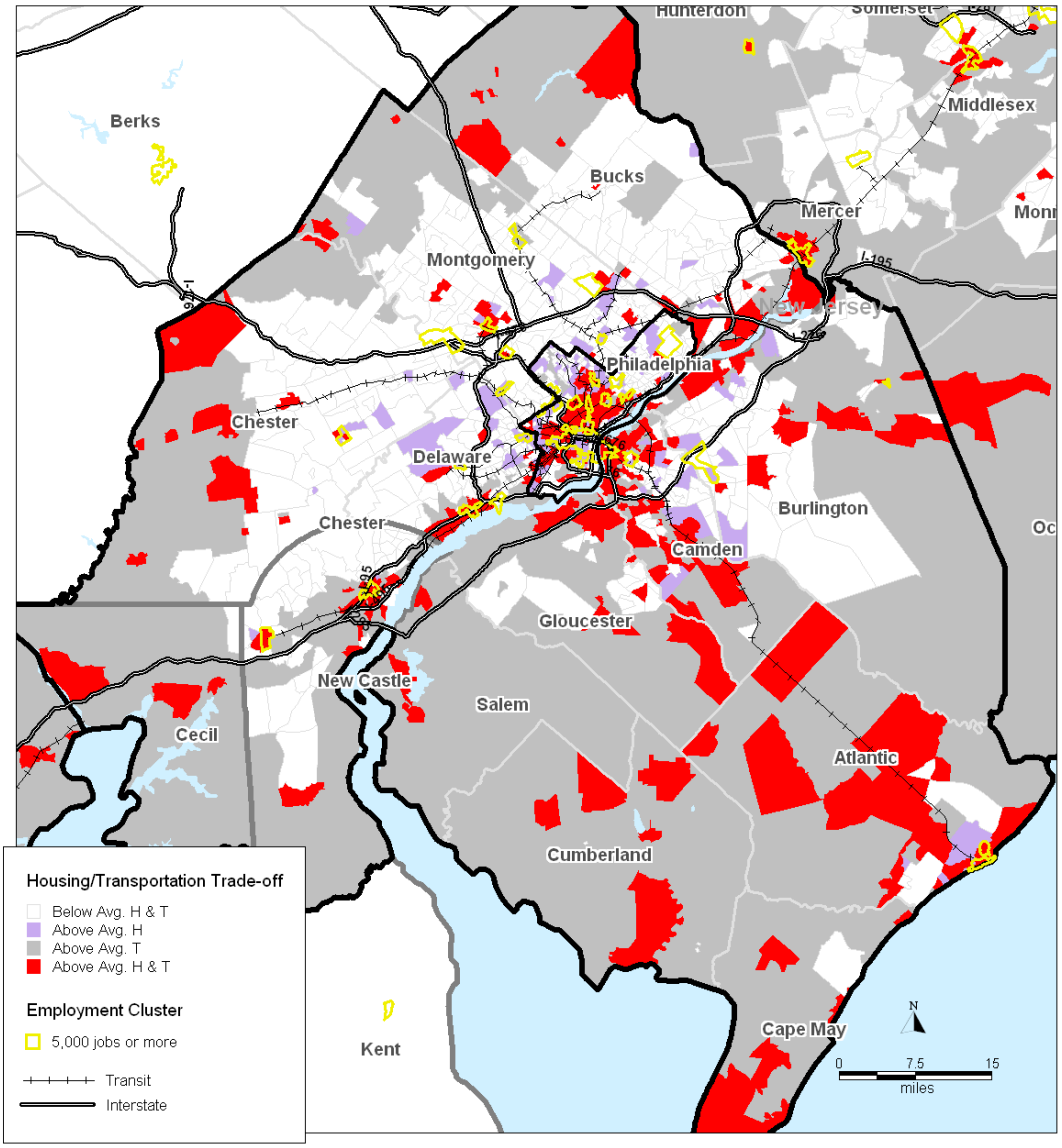
Household Expenditures by Income and Proximity to Employment
New York, NY CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	67%	68%	68%
% Income on Transport.	36%	52%	60%
% Income on H+T	104%	120%	127%
$20,000 - <$35,000			
% Income on Housing	34%	39%	40%
% Income on Transport.	18%	31%	36%
% Income on H+T	52%	70%	76%
$35,000 - <$50,000			
% Income on Housing	24%	28%	30%
% Income on Transport.	13%	22%	26%
% Income on H+T	37%	51%	56%
$50,000 - <$75,000			
% Income on Housing	18%	22%	24%
% Income on Transport.	9%	16%	19%
% Income on H+T	27%	39%	43%
$75,000 - <$100,000			
% Income on Housing	14%	18%	20%
% Income on Transport.	6%	12%	14%
% Income on H+T	21%	30%	34%
$100,000 - <$250,000			
% Income on Housing	10%	13%	14%
% Income on Transport.	4%	8%	9%
% Income on H+T	15%	21%	23%
Average of All Incomes			
% Income on Housing	35%	32%	29%
% Income on Transport.	13%	18%	17%
% Income on H+T	48%	49%	46%
Owner Median Income	$54,920	$67,439	$73,604
Renter Median Income	$31,596	$39,417	$42,282
Median Income	$37,432	$54,665	$65,680

Philadelphia, PA CMSA

Profile: Philadelphia, PA CMSA	
Combined Housing and Transportation Category:	Medium H, Medium T
Housing Market:	Hot Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	18%
Affordable Housing Shortage:	Medium
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	13%, Extensive Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	25%, 25%

Philadelphia: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 40% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 64%. These households pay 24% to 39% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 26% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 69%. These households pay 46% to 109% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Philadelphia	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	59%	53%	111%	60%	43%	104%	55%	64%	119%	56%	53%	109%	57%	52%	110%
$20,000 - <$35,000	33%	33%	65%	30%	25%	55%	31%	40%	71%	29%	33%	62%	31%	33%	63%
$35,000 - <$50,000	25%	24%	50%	23%	19%	41%	24%	29%	53%	22%	24%	46%	24%	24%	48%
$50,000 - <$75,000	21%	18%	39%	18%	14%	32%	20%	21%	41%	18%	18%	36%	19%	19%	38%
$75,000 - <$100,000	18%	14%	32%	15%	11%	26%	16%	16%	32%	15%	14%	29%	17%	14%	31%
$100,000 - <$250,000	14%	10%	24%	13%	8%	20%	13%	11%	24%	12%	10%	21%	13%	10%	23%
TOTAL	**25%**	**16%**	**41%**	**31%**	**17%**	**48%**	**26%**	**22%**	**48%**	**32%**	**25%**	**57%**	**28%**	**20%**	**47%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Philadelphia	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	83,665	10%	4%	80,881	25%	4%	50,988	13%	2%	172,800	31%	8%	388,334	19%
$20,000 - <$35,000	108,214	13%	5%	64,483	20%	3%	65,247	17%	3%	118,872	22%	6%	356,816	17%
$35,000 - <$50,000	114,980	14%	6%	51,754	16%	2%	67,546	18%	3%	89,661	16%	4%	323,941	16%
$50,000 - <$75,000	179,934	22%	9%	56,307	18%	3%	96,046	25%	5%	95,219	17%	5%	427,506	20%
$75,000 - <$100,000	131,848	16%	6%	30,671	10%	1%	56,957	15%	3%	42,365	8%	2%	231,170	11%
$100,000 - <$250,000	213,587	26%	10%	35,523	11%	2%	47,770	12%	2%	33,013	6%	2%	294,370	14%
ALL INCOMES	**832,228**	**100%**	**40%**	**319,619**	**100%**	**15%**	**384,554**	**100%**	**18%**	**551,930**	**100%**	**26%**	**2,088,331**	**100%**

Relationship of Affordability to Accessibility

This is one of several metropolitan areas where local concentrations of affordable housing are associated with declining transportation *and* housing cost burdens.

Philadelphia is also distinguished by the fact that housing cost burdens increase with distance from employment centers. One possible explanation for this finding is that the high levels of local government fragmentation in the Philadelphia region increase the incentives for suburban governments to engage in exclusionary zoning. (Adjusted R-Square: Housing Model, .6412, Transportation Model, .8907)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (45.2 minutes) and the shortest commute in distance by auto (7.8 miles). Above Average H & T cost neighborhoods have the shortest commute in distance by transit (6.5 miles) and in time by auto (25.2 miles). Above Average Housing cost neighborhoods have the greatest share of transit, 21%. Households in Above Average Transportation cost neighborhoods go the farthest distances by transit (13.8 miles) and by auto (10.6 miles) and have the longest transit commute in time (51.8 minutes). Households in Above Average Housing cost neighborhoods spend the most time in the car (27.7 minutes).

Philadelphia

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	1,079,355	310,519	547,584	514,955	2,452,413
% Transit	7%	21%	15%	2%	9%
Time all	28.4	31.4	28.4	26.7	28.4
Distance all	9.3	7.6	8.3	10.7	9.1
Speed All	19.0	14.9	18.0	23.0	19.1
Transit Commuters					
Time Transit	50.8	45.2	46.5	51.8	47.8
Distance Transit	12.1	6.7	6.5	13.8	8.7
Speed Transit	13.5	8.7	9.0	16.3	10.7
Auto Commuters					
Time Car	26.8	27.7	25.2	26.1	26.4
Distance Car	9.1	7.8	8.6	10.6	9.2
Speed Car	19.4	16.5	19.6	23.1	20.0

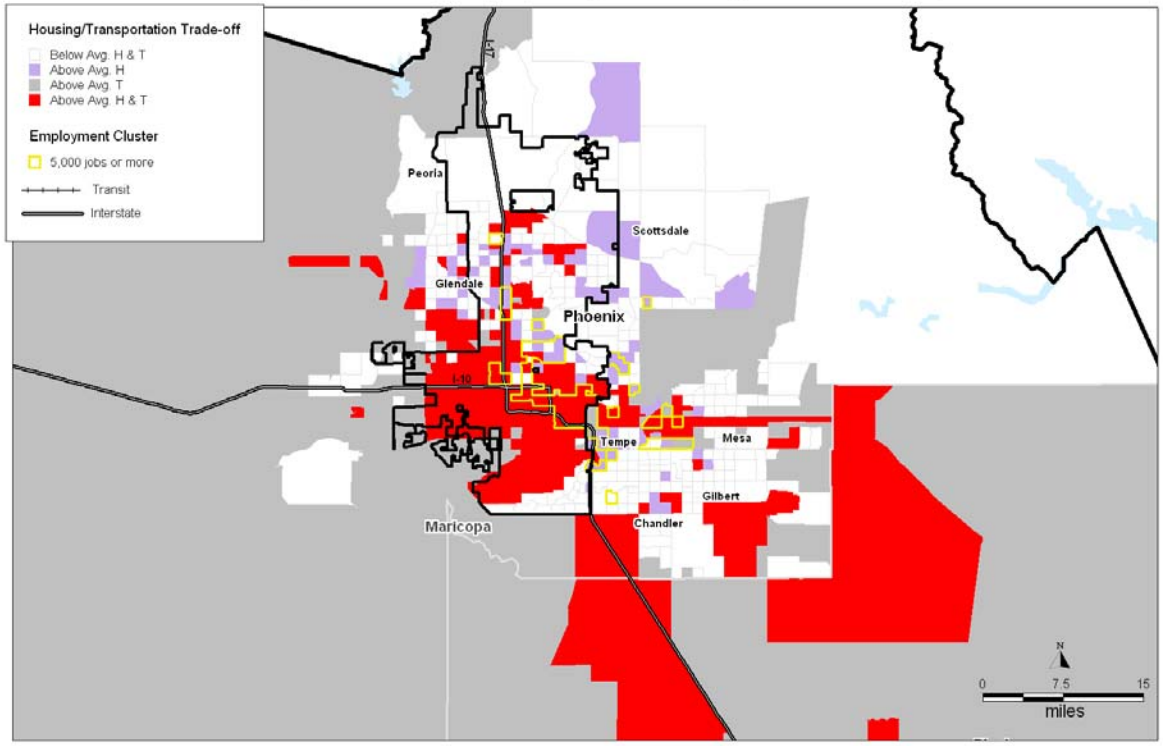
Household Expenditures by Income and Proximity to Employment
Philadelphia, PA CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	57%	60%	60%
% Income on Transport.	42%	50%	59%
% Income on H+T	99%	111%	119%
$20,000 - <$35,000			
% Income on Housing	25%	31%	33%
% Income on Transport.	22%	30%	36%
% Income on H+T	47%	61%	69%
$35,000 - <$50,000			
% Income on Housing	17%	23%	25%
% Income on Transport.	16%	22%	26%
% Income on H+T	33%	45%	51%
$50,000 - <$75,000			
% Income on Housing	14%	18%	20%
% Income on Transport.	11%	16%	19%
% Income on H+T	25%	34%	39%
$75,000 - <$100,000			
% Income on Housing	11%	14%	16%
% Income on Transport.	8%	12%	14%
% Income on H+T	19%	26%	30%
$100,000 - <$250,000			
% Income on Housing	9%	11%	12%
% Income on Transport.	5%	8%	9%
% Income on H+T	14%	19%	22%
Average of All Incomes			
% Income on Housing	33%	28%	27%
% Income on Transport.	20%	19%	20%
% Income on H+T	53%	48%	47%
Owner Median Income	$34,341	$53,511	$60,190
Renter Median Income	$20,056	$32,045	$34,862
Median Income	$24,147	$44,691	$53,454

Phoenix, AZ MSA

Profile: Phoenix, AZ MSA	
Combined Housing and Transportation Category:	Medium H, Medium T
Housing Market:	Hot Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	26%
Affordable Housing Shortage:	Medium
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	5%, New Start Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	28%, 32%

Phoenix: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov; http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 39% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 66%. These households pay 23% to 41% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 29% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 73%. These households pay 44% to 111% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Phoenix	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	63%	58%	121%	65%	51%	117%	49%	63%	112%	57%	53%	111%	58%	55%	114%
$20,000 - <$35,000	36%	36%	72%	34%	32%	65%	26%	39%	65%	28%	33%	61%	31%	34%	65%
$35,000 - <$50,000	27%	26%	53%	24%	23%	48%	20%	28%	48%	20%	24%	44%	23%	25%	48%
$50,000 - <$75,000	21%	19%	41%	19%	17%	36%	17%	21%	38%	16%	18%	34%	19%	19%	38%
$75,000 - <$100,000	18%	15%	32%	16%	13%	29%	14%	16%	29%	13%	13%	26%	16%	14%	30%
$100,000 - <$250,000	13%	10%	23%	13%	9%	21%	10%	10%	20%	10%	9%	19%	13%	9%	22%
TOTAL	**24%**	**17%**	**41%**	**29%**	**19%**	**48%**	**24%**	**25%**	**49%**	**31%**	**26%**	**57%**	**27%**	**21%**	**48%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Phoenix	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	28,551	7%	3%	28,095	16%	3%	26,613	16%	3%	84,391	28%	8%	167,650	16%
$20,000 - <$35,000	49,107	12%	5%	36,145	20%	3%	36,658	22%	4%	79,386	26%	8%	201,296	19%
$35,000 - <$50,000	60,580	15%	6%	32,411	18%	3%	34,491	21%	3%	57,429	19%	6%	184,911	18%
$50,000 - <$75,000	99,212	25%	10%	37,095	21%	4%	37,722	23%	4%	49,962	17%	5%	223,991	21%
$75,000 - <$100,000	68,011	17%	7%	19,464	11%	2%	16,838	10%	2%	17,029	6%	2%	101,878	10%
$100,000 - <$250,000	95,985	24%	9%	23,162	13%	2%	12,943	8%	1%	11,428	4%	1%	120,356	12%
ALL INCOMES	**401,446**	**100%**	**39%**	**176,372**	**100%**	**17%**	**165,265**	**100%**	**16%**	**299,625**	**100%**	**29%**	**1,042,708**	**100%**

Relationship of Affordability to Accessibility

This is one of several metropolitan areas where local concentrations of affordable housing are associated with declining transportation *and* housing cost burdens. Unlike most metropolitan areas, housing unit density is not associated with housing costs in Phoenix. Transportation costs in Phoenix are not associated with distance to employment centers. Phoenix is another region on the low end in terms of the number of employment centers and the percent of jobs within the employment centers, 12 and 32%, respectively. (Adjusted R-Square: Housing Model, .4977, Transportation Model, .9317)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (42.4 minutes) or auto (24.0 minutes) and in distance by auto (8.1 miles). Above Average H&T neighborhoods have the greatest share of transit, 5% and the shortest transit commute by distance (6.1 miles). Households in Above Average Transportation cost neighborhoods drive the farthest distances, 12.6 miles, and spend the most time by car (28.7 minutes) and by transit (52.2 minutes) while households in Below Average H & T neighborhoods have the highest transit commute by distance (9.8 miles).

Phoenix

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	535,092	210,275	358,518	153,214	1,257,099
% Transit	1%	2%	5%	1%	2%
Time all	26.6	24.4	26.7	28.9	26.5
Distance all	9.8	8.1	8.4	12.6	9.4
Speed All	22.1	19.9	19.6	25.6	21.4
Transit Commuters					
Time Transit	51.4	42.4	46.7	52.2	47.0
Distance Transit	9.8	6.5	6.1	9.6	7.0
Speed Transit	13.3	10.4	9.7	13.8	10.6
Auto Commuters					
Time Car	26.3	24.0	25.8	28.7	26.1
Distance Car	9.8	8.1	8.5	12.6	9.5
Speed Car	22.2	20.1	20.0	25.7	21.7

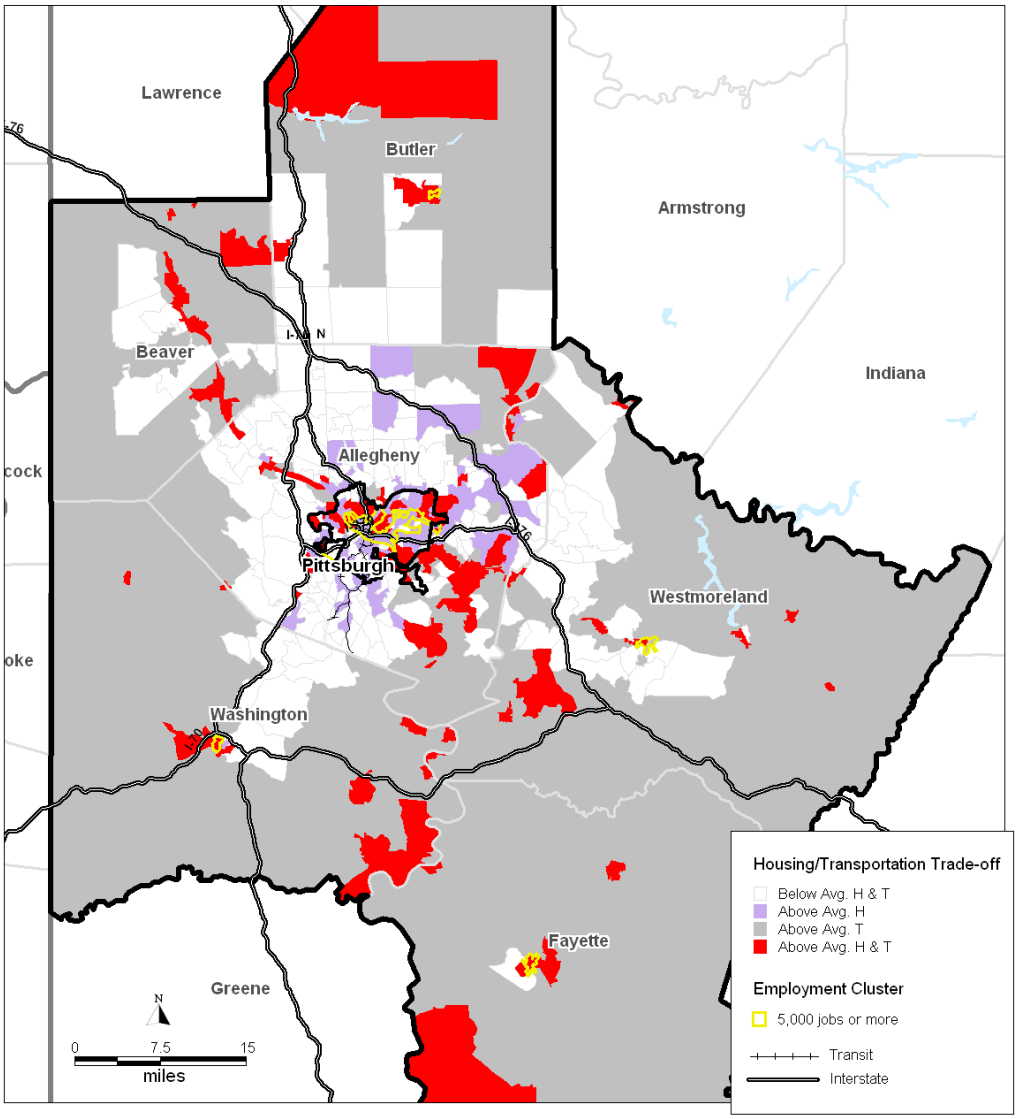
Household Expenditures by Income and Proximity to Employment
Phoenix, AZ MSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	58%	61%	61%
% Income on Transport.	52%	53%	60%
% Income on H+T	110%	114%	121%
$20,000 - <$35,000			
% Income on Housing	29%	31%	34%
% Income on Transport.	32%	32%	37%
% Income on H+T	60%	64%	70%
$35,000 - <$50,000			
% Income on Housing	20%	23%	24%
% Income on Transport.	23%	23%	26%
% Income on H+T	43%	46%	51%
$50,000 - <$75,000			
% Income on Housing	16%	18%	19%
% Income on Transport.	17%	17%	20%
% Income on H+T	33%	35%	39%
$75,000 - <$100,000			
% Income on Housing	13%	14%	15%
% Income on Transport.	11%	12%	14%
% Income on H+T	25%	27%	30%
$100,000 - <$250,000			
% Income on Housing	10%	11%	11%
% Income on Transport.	7%	8%	9%
% Income on H+T	17%	19%	21%
Average of All Incomes			
% Income on Housing	30%	28%	26%
% Income on Transport.	23%	21%	22%
% Income on H+T	53%	49%	48%
Owner Median Income	$46,519	$51,755	$55,355
Renter Median Income	$26,793	$32,951	$36,848
Median Income	$35,882	$44,028	$50,695

Pittsburgh, PA MSA

Profile: Pittsburgh, PA MSA	
Combined Housing and Transportation Category:	Low H, High T
Housing Market:	Cool Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	16%
Affordable Housing Shortage:	Low
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	10%, Medium Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	14%, 26%

Pittsburgh: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov; http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 35% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 54%. These households pay 22% to 38% of their income for housing and transportation (Fig. 1).

Above Average Transportation cost neighborhoods have the second greatest share of households in the region, 26% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 65%. These households pay 48% to 112% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Pittsburgh	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	49%	60%	109%	54%	48%	102%	42%	69%	112%	46%	59%	104%	47%	59%	107%
$20,000 - <$35,000	26%	37%	64%	26%	29%	56%	21%	43%	65%	22%	36%	59%	24%	37%	61%
$35,000 - <$50,000	21%	27%	48%	19%	21%	40%	17%	31%	48%	16%	26%	43%	18%	27%	46%
$50,000 - <$75,000	18%	20%	38%	16%	16%	32%	15%	23%	37%	13%	20%	33%	16%	20%	36%
$75,000 - <$100,000	15%	15%	30%	13%	12%	25%	12%	17%	29%	12%	15%	26%	14%	15%	29%
$100,000 - <$250,000	12%	10%	22%	11%	8%	18%	10%	11%	21%	9%	10%	19%	11%	10%	21%
TOTAL	**23%**	**20%**	**43%**	**29%**	**21%**	**50%**	**23%**	**30%**	**53%**	**29%**	**32%**	**61%**	**25%**	**25%**	**50%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Pittsburgh	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	39,921	13%	5%	45,061	28%	5%	54,032	24%	6%	67,973	41%	8%	206,987	24%
$20,000 - <$35,000	49,721	17%	6%	37,295	23%	4%	52,516	23%	6%	39,134	23%	5%	178,666	21%
$35,000 - <$50,000	48,933	17%	6%	25,921	16%	3%	41,225	18%	5%	26,005	16%	3%	142,084	17%
$50,000 - <$75,000	66,935	23%	8%	26,857	17%	3%	45,549	20%	5%	22,086	13%	3%	161,427	19%
$75,000 - <$100,000	40,081	14%	5%	12,090	8%	1%	19,231	9%	2%	7,449	4%	1%	66,761	8%
$100,000 - <$250,000	50,847	17%	6%	12,774	8%	2%	11,992	5%	1%	4,693	3%	1%	67,532	8%
INCOMES	**296,438**	**100%**	**35%**	**159,998**	**100%**	**19%**	**224,545**	**100%**	**26%**	**167,340**	**100%**	**20%**	**848,321**	**100%**

Relationship of Affordability to Accessibility

This is one of several metropolitan areas where local concentrations of affordable housing are associated with declining transportation *and* housing cost burdens. Unlike most metropolitan areas, housing costs are not associated with distance to employment centers, which may be related to the low number of employment centers, 6, and the low percentage of jobs within them, 26%. (Adjusted R-Square: Housing Model, .6443, Transportation Model, .9157)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (33.4 minutes) or auto (23.5 minutes) and in distance (4.3 miles by transit and 6.0 miles by auto). Above Average Housing neighborhoods have the greatest share of transit, 18%. Households in Above Average Transportation cost neighborhoods go the farthest distances by transit (11.6 miles) and by auto (10.2 miles) and spend the most time by transit (54.5 minutes) and by auto (25.7 minutes).

Pittsburgh

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	356,156	154,012	140,212	269,885	920,265
% Transit	5%	18%	10%	1%	7%
Time all	25.9	25.3	25.6	26.1	25.8
Distance all	8.1	5.7	7.5	10.2	8.2
Speed All	18.6	14.0	17.2	23.1	19.0
Transit Commuters					
Time Transit	42.8	33.4	41.9	54.5	39.1
Distance Transit	7.5	4.3	5.8	11.6	5.9
Speed Transit	10.7	8.2	8.8	13.9	9.3
Auto Commuters					
Time Car	24.9	23.5	23.8	25.7	24.8
Distance Car	8.2	6.0	7.7	10.2	8.4
Speed Car	19.1	15.2	18.1	23.2	19.7

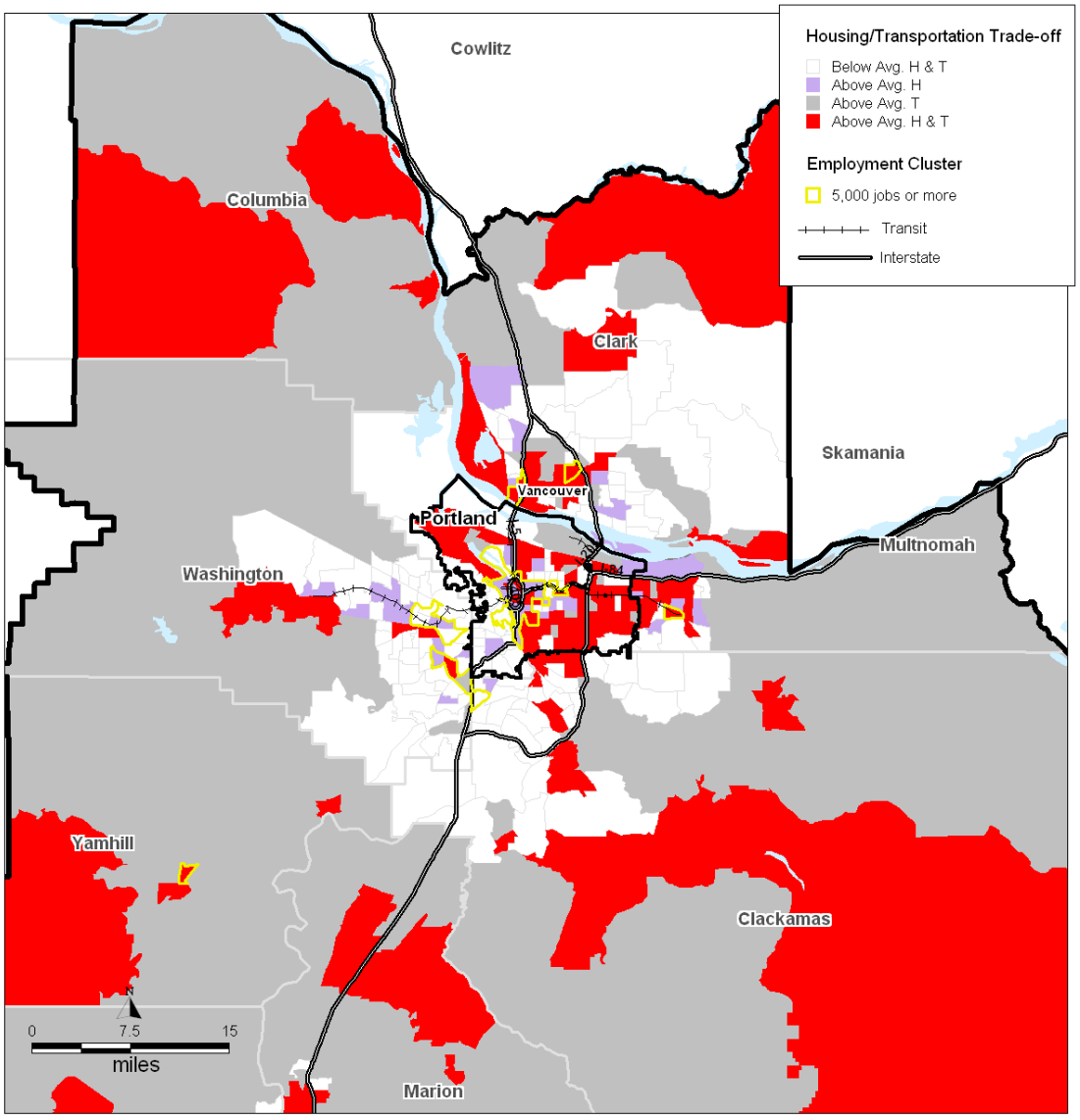
Household Expenditures by Income and Proximity to Employment
Pittsburgh, PA MSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	54%	47%	48%
% Income on Transport.	47%	62%	63%
% Income on H+T	101%	108%	110%
$20,000 - <$35,000			
% Income on Housing	25%	23%	24%
% Income on Transport.	27%	38%	39%
% Income on H+T	52%	60%	63%
$35,000 - <$50,000			
% Income on Housing	18%	17%	19%
% Income on Transport.	19%	27%	28%
% Income on H+T	37%	44%	46%
$50,000 - <$75,000			
% Income on Housing	15%	14%	15%
% Income on Transport.	14%	20%	20%
% Income on H+T	29%	34%	36%
$75,000 - <$100,000			
% Income on Housing	13%	11%	13%
% Income on Transport.	10%	15%	15%
% Income on H+T	22%	26%	28%
$100,000 - <$250,000			
% Income on Housing	9%	9%	10%
% Income on Transport.	6%	10%	10%
% Income on H+T	15%	19%	20%
Average of All Incomes			
% Income on Housing	32%	26%	25%
% Income on Transport.	23%	28%	26%
% Income on H+T	56%	54%	51%
Owner Median Income	$41,744	$42,926	$45,420
Renter Median Income	$20,985	$21,863	$26,478
Median Income	$29,200	$33,142	$39,949

Portland, OR CMSA

Profile: Portland, OR CMSA	
Combined Housing and Transportation Category:	Medium H, Medium T
Housing Market:	Lukewarm Densifying Market
Households earning 30-50% HAMFI with Severe Burden:	24%
Affordable Housing Shortage:	Medium
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	9%, Large Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	25%, 32%

Portland: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 38% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 61%. These households pay 24% to 42% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 34% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 67%. These households pay 49% to 115% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Portland	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	61%	60%	121%	61%	48%	109%	54%	67%	122%	58%	57%	115%	59%	58%	116%
$20,000 - <$35,000	34%	36%	70%	32%	30%	62%	30%	41%	71%	31%	35%	66%	32%	36%	67%
$35,000 - <$50,000	26%	27%	53%	24%	23%	47%	25%	30%	54%	24%	26%	49%	25%	26%	51%
$50,000 - <$75,000	22%	20%	42%	20%	17%	37%	20%	22%	42%	19%	19%	38%	20%	20%	40%
$75,000 - <$100,000	19%	15%	33%	16%	13%	29%	17%	17%	33%	15%	14%	30%	17%	15%	32%
$100,000 - <$250,000	14%	10%	24%	12%	8%	21%	13%	11%	24%	12%	10%	21%	14%	10%	23%
TOTAL	**26%**	**18%**	**44%**	**31%**	**19%**	**50%**	**26%**	**24%**	**51%**	**31%**	**25%**	**57%**	**28%**	**22%**	**50%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Portland	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	27,101	9%	4%	20,517	21%	3%	15,858	14%	2%	61,593	24%	8%	125,069	17%
$20,000 - <$35,000	40,558	14%	5%	20,775	22%	3%	21,320	19%	3%	60,471	24%	8%	143,124	19%
$35,000 - <$50,000	45,434	16%	6%	16,910	18%	2%	21,547	19%	3%	49,943	19%	7%	133,834	18%
$50,000 - <$75,000	69,125	24%	9%	18,797	20%	2%	28,087	25%	4%	51,647	20%	7%	167,656	22%
$75,000 - <$100,000	45,222	16%	6%	9,929	10%	1%	14,308	13%	2%	19,965	8%	3%	79,495	11%
$100,000 - <$250,000	61,673	21%	8%	9,173	10%	1%	11,894	11%	2%	12,819	5%	2%	86,386	11%
ALL INCOMES	**289,113**	**100%**	**38%**	**96,101**	**100%**	**13%**	**113,014**	**100%**	**15%**	**256,438**	**100%**	**34%**	**754,666**	**100%**

Relationship of Affordability to Accessibility

Anchorage, Seattle, San Diego, San Francisco, and Portland are the only metropolitan areas where the concentration of affordable housing is not significantly associated with either transportation or housing cost burdens. In Portland, this possibly reflects the fact that affordable housing is more dispersed within the region, due in part to the region's aggressive state-supported affordable housing planning requirement. Thus, no one census tract is necessarily more advantageous than another in terms of access to affordable housing options. Distance to employment centers does not influence housing costs in Portland, which may be related to the low number of centers, 9, and moderate percentage of jobs within them 32%. (Adjusted R-Square: Housing Model, .7267, Transportation Model, .8875)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (37.4 minutes) or auto (21.2 minutes) and in distance (5.0 miles by transit and 6.5 miles by auto). Above Average Housing neighborhoods have the greatest share of transit, 13%. Households in Above Average Transportation cost neighborhoods drive the farthest distances, 11.6 miles, and spend the most time by car, 26.0 minutes. These households also go the farthest distances by transit, 9.0 miles and spend the most time on transit, 46.2 minutes

Portland, OR

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	380,438	109,100	303,677	168,798	962,013
% Transit	5%	13%	8%	2%	6%
Time all	23.2	23.2	25.3	26.4	24.4
Distance all	7.4	6.3	8.1	11.5	8.2
Speed All	18.8	16.5	18.8	25.4	19.7
Transit Commuters					
Time Transit	41.3	37.4	41.5	46.2	40.8
Distance Transit	7.0	5.0	5.5	9.0	6.1
Speed Transit	10.8	8.2	8.7	12.6	9.5
Auto Commuters					
Time Car	22.3	21.2	23.9	26.0	23.3
Distance Car	7.4	6.5	8.3	11.6	8.3
Speed Car	19.2	17.7	19.7	25.6	20.4

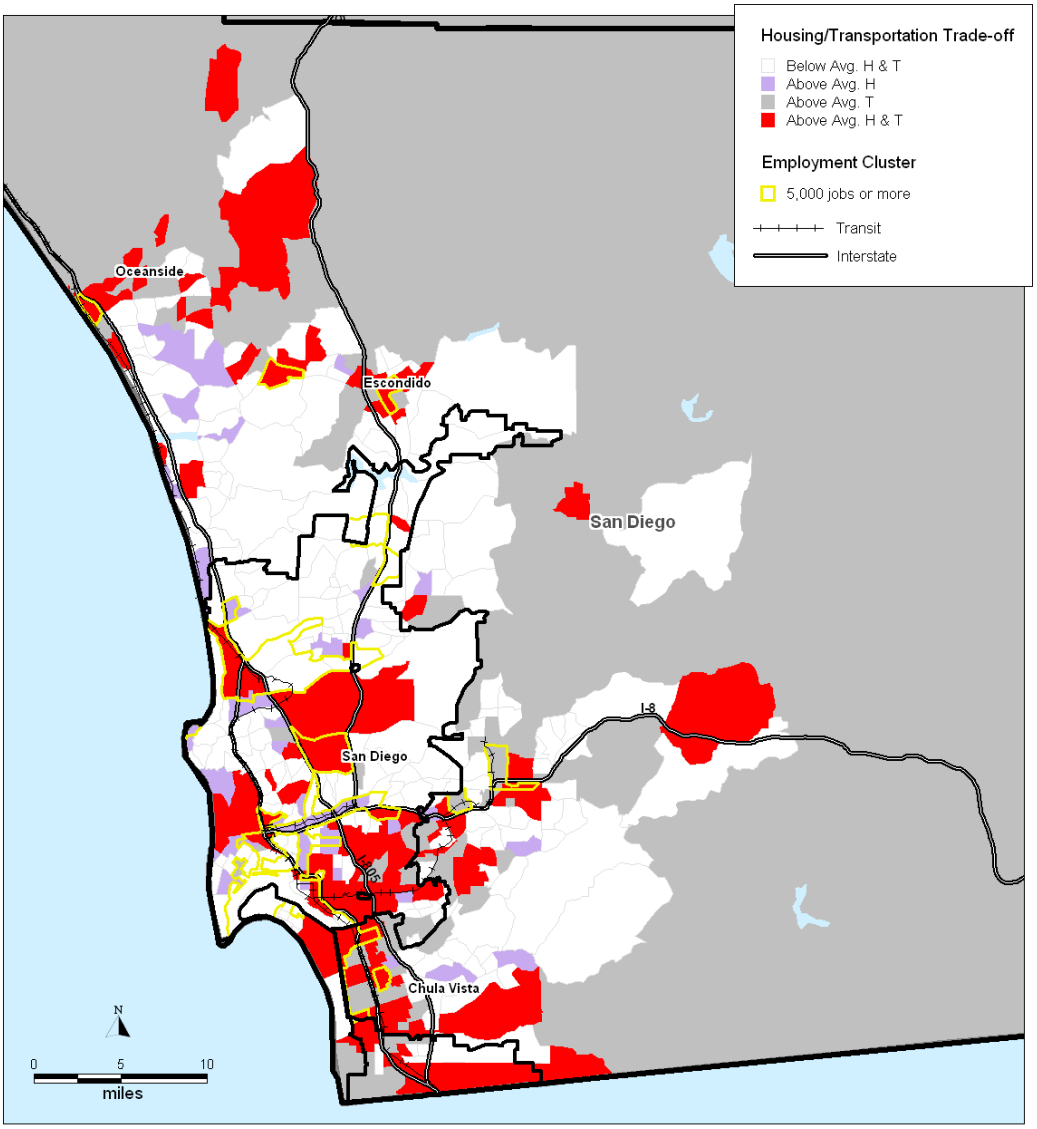
Household Expenditures by Income and Proximity to Employment
Portland, OR CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	61%	61%	59%
% Income on Transport.	51%	56%	63%
% Income on H+T	111%	117%	122%
$20,000 - <$35,000			
% Income on Housing	31%	32%	33%
% Income on Transport.	30%	34%	39%
% Income on H+T	62%	66%	71%
$35,000 - <$50,000			
% Income on Housing	24%	24%	25%
% Income on Transport.	21%	25%	28%
% Income on H+T	45%	48%	53%
$50,000 - <$75,000			
% Income on Housing	20%	19%	20%
% Income on Transport.	16%	18%	21%
% Income on H+T	35%	38%	41%
$75,000 - <$100,000			
% Income on Housing	16%	16%	17%
% Income on Transport.	11%	13%	15%
% Income on H+T	28%	29%	32%
$100,000 - <$250,000			
% Income on Housing	12%	12%	12%
% Income on Transport.	7%	9%	10%
% Income on H+T	20%	21%	22%
Average of All Incomes			
% Income on Housing	31%	29%	28%
% Income on Transport.	20%	22%	23%
% Income on H+T	51%	50%	51%
Owner Median Income	$67,134	$56,907	$56,680
Renter Median Income	$29,258	$31,529	$32,845
Median Income	$45,263	$43,794	$48,391

San Diego, CA MSA

Profile: San Diego, CA MSA	
Combined Housing and Transportation Category:	High H, Med T
Housing Market:	Hot Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	31%
Affordable Housing Shortage:	High
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	7%, Medium Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	35%, 46%

San Diego: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 40% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 66%. These households pay 26% to 44% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 30% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 72%. These households pay 46% to 111% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

San Diego	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	63%	55%	118%	68%	44%	111%	59%	59%	117%	62%	49%	111%	63%	51%	113%
$20,000 - <$35,000	38%	34%	73%	38%	27%	65%	34%	36%	70%	33%	30%	63%	35%	32%	67%
$35,000 - <$50,000	30%	25%	55%	29%	20%	48%	27%	26%	53%	24%	22%	46%	27%	24%	51%
$50,000 - <$75,000	25%	18%	44%	23%	15%	38%	22%	20%	42%	20%	17%	36%	23%	18%	41%
$75,000 - <$100,000	21%	14%	35%	19%	11%	31%	19%	15%	33%	17%	13%	29%	20%	13%	33%
$100,000 - <$250,000	17%	9%	26%	15%	8%	22%	15%	10%	25%	13%	9%	22%	16%	9%	25%
TOTAL	**28%**	**16%**	**43%**	**34%**	**16%**	**50%**	**29%**	**22%**	**51%**	**35%**	**23%**	**58%**	**31%**	**19%**	**50%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

San Diego	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	29,800	9%	3%	21,141	19%	2%	22,185	15%	3%	74,610	29%	9%	147,736	17%
$20,000 - <$35,000	41,320	12%	5%	21,071	19%	2%	29,596	20%	3%	65,008	25%	7%	156,995	18%
$35,000 - <$50,000	46,110	13%	5%	18,677	17%	2%	28,743	19%	3%	45,482	18%	5%	139,012	16%
$50,000 - <$75,000	77,673	22%	9%	22,845	20%	3%	35,447	23%	4%	42,523	16%	5%	178,488	21%
$75,000 - <$100,000	55,995	16%	6%	13,275	12%	2%	17,934	12%	2%	16,939	7%	2%	90,868	10%
$100,000 - <$250,000	95,605	28%	11%	15,537	14%	2%	17,308	11%	2%	14,301	6%	2%	127,214	15%
ALL INCOMES	**346,503**	**100%**	**40%**	**112,546**	**100%**	**13%**	**151,213**	**100%**	**17%**	**258,863**	**100%**	**30%**	**869,125**	**100%**

Relationship of Affordability to Accessibility

Anchorage, San Diego, San Francisco, Seattle, and Portland are the only metropolitan areas where the concentration of affordable housing is not significantly associated with either transportation or housing cost burdens. Here, this finding is likely due to one of two factors: (1) affordable housing is so scarce within the region that no tracts have a large enough share of affordable units to significantly influence cost burdens, or (2) affordable housing is more dispersed throughout the region due to the state's aggressive affordable housing planning requirements. In this region, the former explanation seems most likely. Unlike most metropolitan areas, proximity to employment does not influence housing costs in San Diego. This may be due to the hot housing market in San Diego in which housing prices are high throughout the region. (Adjusted R-Square: Housing Model, .5324, Transportation Model, .9131)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (45.5 minutes) or auto (21.7 minutes) and in distance by auto (8.5 miles). Above Average H&T neighborhoods have the greatest share of transit, 7% and they also have the shortest transit commutes by distance (7.9 miles). Households in Above Average Transportation cost neighborhoods drive the farthest distances, 11.4 miles, and spend the most time by car (26.9 minutes) and by transit (56.1 minutes).

Households in Below Average H & T neighborhoods have the longest transit commute by distance (11.7 miles).

San Diego

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	447,754	133,534	297,625	204,909	1,083,822
% Transit	2%	4%	7%	3%	4%
Time all	25.1	22.6	26.7	27.7	25.7
Distance all	10.0	8.5	9.3	11.4	9.9
Speed All	22.9	22.0	21.3	24.1	22.6
Transit Commuters					
Time Transit	50.1	45.5	53.1	56.1	51.9
Distance Transit	11.7	8.0	7.9	11.5	9.2
Speed Transit	14.7	10.9	10.5	13.7	11.8
Auto Commuters					
Time Car	24.6	21.7	24.6	26.9	24.7
Distance Car	9.9	8.5	9.5	11.4	9.9
Speed Car	23.0	22.4	22.1	24.4	23.0

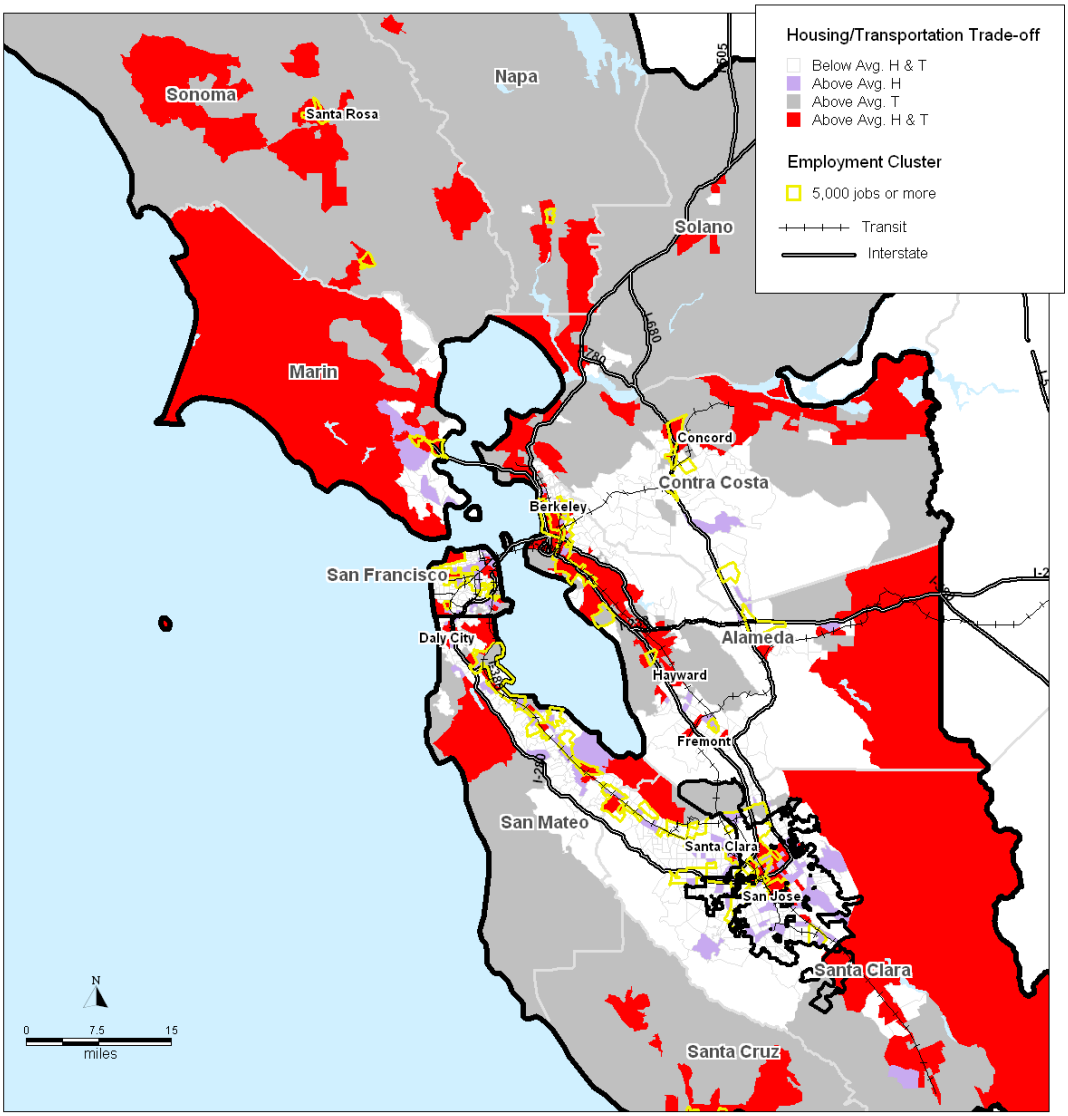
Household Expenditures by Income and Proximity to Employment
San Diego, CA MSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	60%	68%	64%
% Income on Transport.	44%	54%	57%
% Income on H+T	104%	122%	121%
$20,000 - <$35,000			
% Income on Housing	32%	40%	38%
% Income on Transport.	27%	32%	35%
% Income on H+T	59%	73%	73%
$35,000 - <$50,000			
% Income on Housing	24%	29%	29%
% Income on Transport.	19%	23%	25%
% Income on H+T	44%	52%	54%
$50,000 - <$75,000			
% Income on Housing	20%	23%	23%
% Income on Transport.	14%	17%	19%
% Income on H+T	34%	40%	42%
$75,000 - <$100,000			
% Income on Housing	16%	19%	19%
% Income on Transport.	10%	13%	14%
% Income on H+T	26%	32%	33%
$100,000 - <$250,000			
% Income on Housing	13%	14%	14%
% Income on Transport.	7%	8%	9%
% Income on H+T	20%	23%	23%
Average of All Incomes			
% Income on Housing	31%	31%	30%
% Income on Transport.	19%	18%	19%
% Income on H+T	50%	49%	50%
Owner Median Income	$52,446	$63,374	$62,384
Renter Median Income	$35,586	$40,628	$39,065
Median Income	$42,220	$53,376	$53,445

San Francisco, CA CMSA

Profile: San Francisco, CA CMSA	
Combined Housing and Transportation Category:	High H, Low T
Housing Market:	Lukewarm Sprawling Market
Households earning 30-50% HAMFI with Severe Burden:	27%
Affordable Housing Shortage:	High
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	14%, Extensive Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	42%, 49%

San Francisco: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 41% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 75%. These households pay 27% to 45% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 26% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 56%. These households pay 52% to 118% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

San Francisco	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	71%	49%	124%	66%	40%	107%	61%	63%	124%	65%	53%	118%	66%	51%	118%
$20,000 - <$35,000	45%	30%	76%	41%	24%	65%	37%	38%	75%	38%	32%	70%	40%	31%	72%
$35,000 - <$50,000	34%	22%	57%	31%	18%	49%	29%	28%	57%	28%	24%	52%	31%	23%	54%
$50,000 - <$75,000	28%	16%	45%	25%	13%	38%	24%	20%	44%	23%	18%	40%	25%	17%	43%
$75,000 - <$100,000	24%	12%	37%	21%	10%	31%	21%	15%	36%	19%	13%	32%	22%	13%	35%
$100,000 - <$250,000	19%	8%	27%	16%	7%	23%	16%	10%	26%	15%	9%	24%	18%	8%	26%
TOTAL	**29%**	**12%**	**41%**	**33%**	**12%**	**45%**	**28%**	**18%**	**46%**	**34%**	**20%**	**54%**	**30%**	**15%**	**46%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

San Francisco	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	65,120	7%	3%	57,869	17%	3%	39,296	10%	2%	125,761	21%	6%	288,046	13%
$20,000 - <$35,000	77,988	8%	3%	48,868	14%	2%	53,525	13%	2%	109,060	18%	5%	289,441	13%
$35,000 - <$50,000	93,965	10%	4%	48,508	14%	2%	60,195	15%	3%	98,580	17%	4%	301,248	13%
$50,000 - <$75,000	167,894	18%	7%	65,511	19%	3%	94,735	23%	4%	119,889	20%	5%	448,029	20%
$75,000 - <$100,000	145,370	16%	6%	44,345	13%	2%	68,705	17%	3%	67,928	11%	3%	282,003	12%
$100,000 - <$250,000	378,172	41%	17%	75,723	22%	3%	91,669	22%	4%	76,132	13%	3%	545,973	24%
ALL INCOMES	**928,509**	**100%**	**41%**	**340,824**	**100%**	**15%**	**408,125**	**100%**	**18%**	**597,350**	**100%**	**26%**	**2,274,808**	**100%**

Relationship of Affordability to Accessibility

Anchorage, San Diego, San Francisco, Seattle, and Portland are the only metropolitan areas where the concentration of affordable housing is not significantly associated with either transportation or housing cost burdens. Here, this finding is likely due to one of two factors: (1) affordable housing is so scarce within the region that no tracts have a large enough share of affordable units to significantly influence cost burdens, or (2) affordable housing is more dispersed throughout the region due to the state's aggressive affordable housing planning requirements. In this region, the former explanation seems most likely.

San Francisco is one of a few metropolitan areas where housing costs are negatively associated with job density. San Francisco has a high number of employment centers, 25, and a high percentage of jobs clustered within them, 49%. Therefore, job density outside of the employment center clusters may not exert as strong of an influence on housing prices. This metropolitan area is also one of only two (Denver being the other) where increases in housing unit density are associated with declines in both housing and transportation costs. (Adjusted R-Square: Housing Model, .6094, Transportation Model, .9053)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (40.8 minutes) or auto (26.9 minutes) and in distance (6.2 miles by transit and 8.8 miles by auto). Above Average Housing neighborhoods have the greatest share of transit, 18%. Households in Above

Average Transportation cost neighborhoods go the farthest distances by transit (17.0 miles) and by car auto (12.1 miles) and spend the most time by transit (59.2 minutes) and by auto (29.9 minutes).

San Francisco Bay Area

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	1,264,034	417,609	721,554	548,710	2,951,907
% Transit	11%	18%	11%	5%	11%
Time all	29.3	29.4	30.6	31.3	30.0
Distance all	9.3	8.3	10.3	12.4	10.0
Speed All	18.6	16.8	20.0	22.9	19.5
Transit Commuters					
Time Transit	45.2	40.8	49.2	59.2	46.3
Distance Transit	8.9	6.2	10.4	17.0	9.3
Speed Transit	11.0	8.5	13.0	17.6	11.4
Auto Commuters					
Time Car	27.4	26.9	28.4	29.9	28.1
Distance Car	9.3	8.8	10.3	12.1	10.1
Speed Car	19.5	18.6	20.9	23.2	20.5

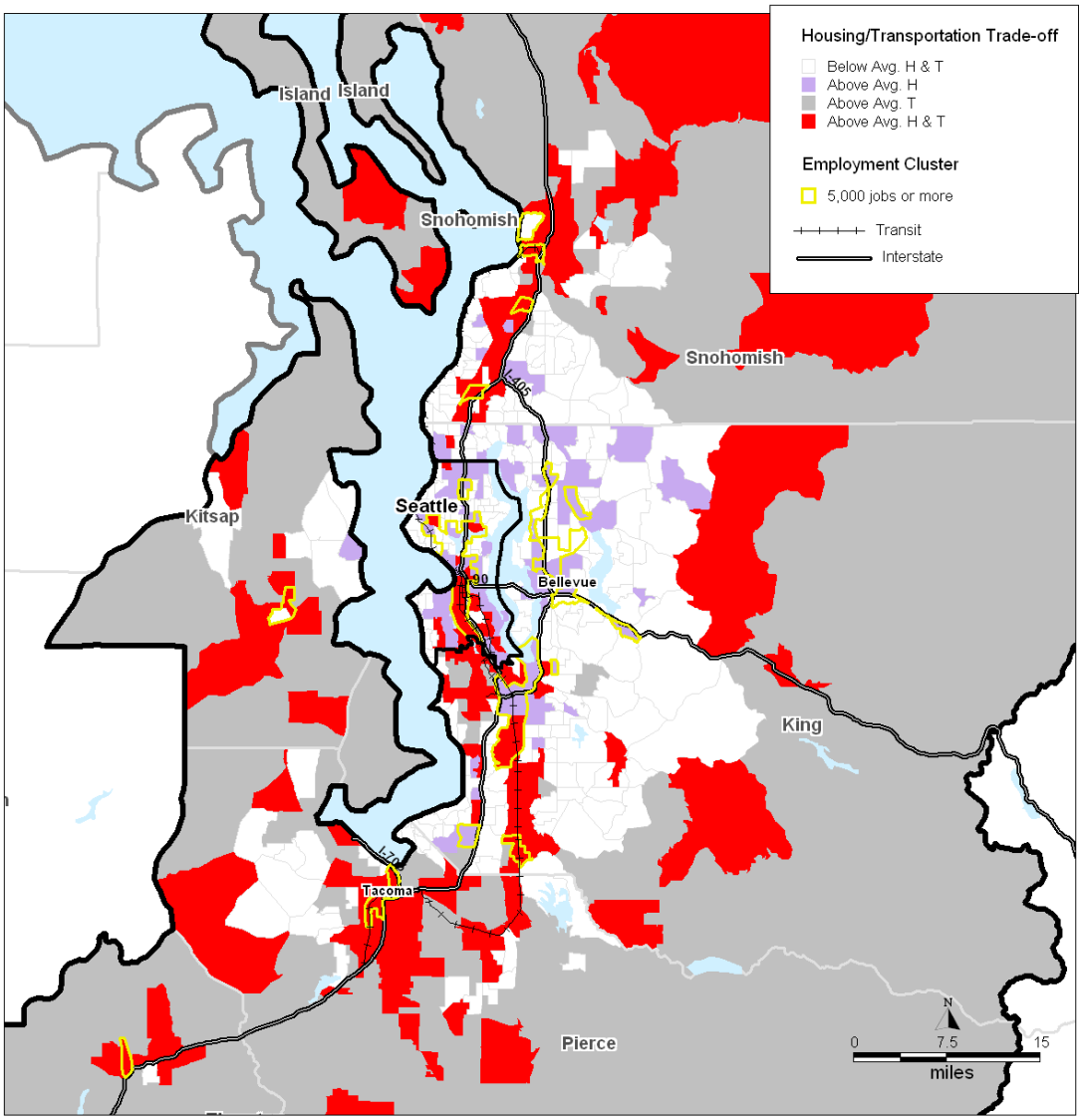
Household Expenditures by Income and Proximity to Employment
San Francisco, CA CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	64%	69%	66%
% Income on Transport.	38%	51%	58%
% Income on H+T	102%	120%	125%
$20,000 - <$35,000			
% Income on Housing	37%	41%	41%
% Income on Transport.	20%	31%	35%
% Income on H+T	58%	72%	76%
$35,000 - <$50,000			
% Income on Housing	28%	31%	31%
% Income on Transport.	14%	22%	25%
% Income on H+T	42%	53%	57%
$50,000 - <$75,000			
% Income on Housing	22%	25%	25%
% Income on Transport.	10%	16%	18%
% Income on H+T	33%	41%	44%
$75,000 - <$100,000			
% Income on Housing	19%	21%	21%
% Income on Transport.	7%	12%	14%
% Income on H+T	26%	32%	35%
$100,000 - <$250,000			
% Income on Housing	14%	16%	16%
% Income on Transport.	5%	8%	9%
% Income on H+T	19%	23%	25%
Average of All Incomes			
% Income on Housing	31%	31%	29%
% Income on Transport.	10%	15%	17%
% Income on H+T	41%	46%	46%
Owner Median Income	$83,081	$78,672	$77,453
Renter Median Income	$49,263	$51,735	$49,859
Median Income	$57,764	$64,888	$68,227

Seattle, WA CMSA

Profile: Seatte, WA CMSA	
Combined Housing and Transportation Category:	Medium H, Medium T
Housing Market:	Lukewarm Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	22%
Affordable Housing Shortage:	Medium
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	11%, Small Expanding Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	31%, 44%

Seattle: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 37% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 66%. These households pay 26% to 45% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 27% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 64%. These households pay 49% to 113% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Seattle	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	67%	55%	126%	63%	46%	109%	57%	65%	122%	58%	55%	113%	61%	55%	116%
$20,000 - <$35,000	39%	34%	75%	36%	28%	63%	32%	40%	72%	32%	34%	66%	34%	34%	69%
$35,000 - <$50,000	30%	25%	57%	27%	21%	47%	26%	29%	55%	24%	25%	49%	27%	25%	52%
$50,000 - <$75,000	25%	18%	45%	22%	16%	38%	21%	22%	43%	20%	19%	39%	23%	19%	42%
$75,000 - <$100,000	21%	14%	36%	19%	12%	31%	18%	16%	34%	17%	14%	31%	19%	14%	34%
$100,000 - <$250,000	16%	9%	26%	15%	8%	22%	13%	11%	24%	13%	10%	22%	15%	9%	25%
TOTAL	**28%**	**16%**	**45%**	**32%**	**16%**	**48%**	**27%**	**22%**	**49%**	**32%**	**24%**	**56%**	**29%**	**19%**	**49%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Seattle	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	34,114	8%	3%	36,484	18%	3%	27,860	12%	2%	78,187	24%	6%	176,645	15%
$20,000 - <$35,000	52,238	12%	4%	37,864	19%	3%	38,602	16%	3%	73,134	22%	6%	201,838	17%
$35,000 - <$50,000	62,710	14%	5%	32,920	17%	3%	42,551	18%	4%	59,668	18%	5%	197,849	16%
$50,000 - <$75,000	102,379	23%	8%	40,377	20%	3%	62,981	27%	5%	65,526	20%	5%	271,263	23%
$75,000 - <$100,000	77,770	18%	6%	22,853	11%	2%	35,145	15%	3%	29,471	9%	2%	142,386	12%
$100,000 - <$250,000	112,031	25%	9%	28,251	14%	2%	30,339	13%	3%	21,408	7%	2%	163,778	14%
ALL INCOMES	**441,242**	**100%**	**37%**	**198,749**	**100%**	**16%**	**237,478**	**100%**	**20%**	**327,394**	**100%**	**27%**	**1,204,863**	**100%**

Relationship of Affordability to Accessibility

Anchorage, San Diego, San Francisco, Seattle, and Portland are the only metropolitan areas where the concentration of affordable housing is not significantly associated with either transportation or housing cost burdens. Here, this finding is likely due to one of two factors: (1) affordable housing is so scarce within the region that no tracts have a large enough share of affordable units to significantly influence cost burdens, or (2) affordable housing is more dispersed throughout the region due to the state's aggressive affordable housing planning requirements. In this region, either of these explanations is likely.

Distance to employment centers does not influence housing costs in Seattle. This could be related to the difference between the percentage of the population that lives near Seattle's employment centers, 31% and the percentage of jobs that are in Seattle's employment centers, 44%, which is a difference of 13%. Although the region has a high concentration of jobs in centers, the population is not as highly concentrated near them. (Adjusted R-Square: Housing Model, .5934, Transportation Model, .9198)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (37.8 minutes) or auto (24.1 minutes) and in distance (6.0 miles by transit and 7.7 miles by auto). Above Average Housing neighborhoods also have the greatest share of transit, 15%. Households in

Above Average Transportation cost neighborhoods have the longest commute in time by transit (67.8 minutes) and by auto (28.5 minutes) and in distance (14.7 miles by transit and 11.4 miles by auto).

Seattle

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	596,630	231,273	384,294	328,580	1,540,777
% Transit	7%	15%	7%	3%	7%
Time all	27.7	26.2	28.5	29.7	28.1
Distance all	9.0	7.5	9.8	11.5	9.5
Speed All	19.3	17.0	20.2	23.1	20.0
Transit Commuters					
Time Transit	43.4	37.8	48.7	67.8	45.2
Distance Transit	8.8	6.0	9.1	14.7	8.6
Speed Transit	12.2	9.5	11.7	14.1	11.4
Auto Commuters					
Time Car	26.5	24.1	26.9	28.5	26.7
Distance Car	9.0	7.7	9.9	11.4	9.6
Speed Car	19.8	18.4	20.8	23.4	20.7

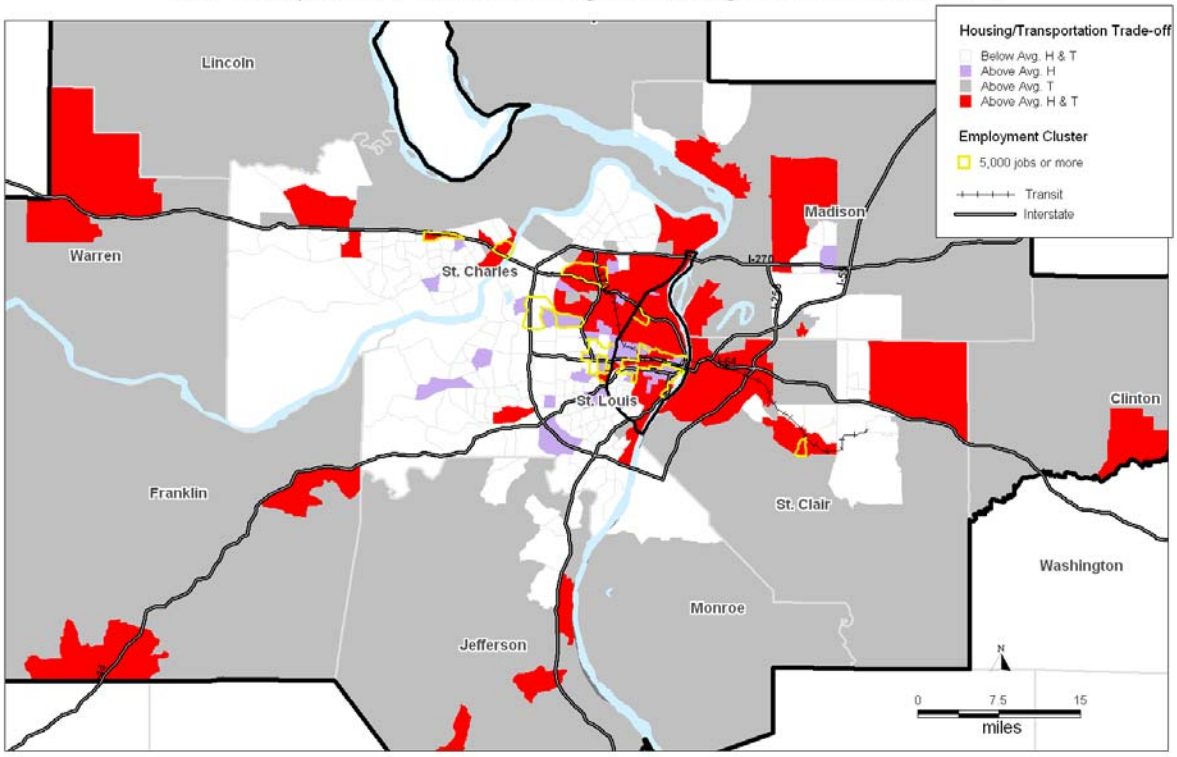
Household Expenditures by Income and Proximity to Employment
Seatte, WA CMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	61%	63%	62%
% Income on Transport.	46%	55%	62%
% Income on H+T	106%	118%	124%
$20,000 - <$35,000			
% Income on Housing	33%	35%	36%
% Income on Transport.	26%	33%	38%
% Income on H+T	59%	68%	74%
$35,000 - <$50,000			
% Income on Housing	25%	26%	27%
% Income on Transport.	19%	24%	28%
% Income on H+T	44%	50%	55%
$50,000 - <$75,000			
% Income on Housing	20%	21%	22%
% Income on Transport.	14%	18%	20%
% Income on H+T	34%	39%	42%
$75,000 - <$100,000			
% Income on Housing	17%	17%	18%
% Income on Transport.	10%	13%	15%
% Income on H+T	27%	31%	33%
$100,000 - <$250,000			
% Income on Housing	13%	13%	14%
% Income on Transport.	6%	9%	10%
% Income on H+T	19%	22%	24%
Average of All Incomes			
% Income on Housing	31%	29%	28%
% Income on Transport.	16%	19%	20%
% Income on H+T	47%	49%	48%
Owner Median Income	$66,817	$62,198	$62,679
Renter Median Income	$33,065	$38,351	$38,174
Median Income	$43,697	$51,017	$55,126

St. Louis, MO MSA

Profile: St. Louis, MO MSA	
Combined Housing and Transportation Category:	Low H, High T
Housing Market:	Cool Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	12%
Affordable Housing Shortage:	Low
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	4%, Small Expanding Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	21%, 27%

St. Louis: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov; http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 41% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 61%. These households pay 23% to 40% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 27% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 74%. These households pay 42% to 108% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

St. Louis	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	55%	58%	116%	55%	49%	103%	46%	70%	115%	51%	57%	108%	51%	58%	110%
$20,000 - <$35,000	29%	36%	67%	27%	30%	57%	23%	43%	66%	24%	35%	58%	25%	36%	63%
$35,000 - <$50,000	23%	26%	51%	20%	22%	42%	18%	31%	49%	17%	25%	42%	20%	27%	47%
$50,000 - <$75,000	19%	20%	40%	16%	17%	33%	15%	23%	38%	14%	19%	33%	17%	20%	37%
$75,000 - <$100,000	16%	15%	32%	14%	13%	27%	13%	17%	30%	11%	14%	25%	14%	15%	30%
$100,000 - <$250,000	13%	10%	23%	12%	8%	20%	10%	12%	21%	9%	10%	19%	12%	10%	22%
TOTAL	**22%**	**18%**	**42%**	**28%**	**19%**	**47%**	**22%**	**27%**	**48%**	**29%**	**28%**	**57%**	**24%**	**23%**	**48%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

St. Louis	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	33,814	9%	4%	22,209	25%	3%	30,266	16%	3%	79,148	33%	9%	165,437	19%
$20,000 - <$35,000	53,258	14%	6%	17,760	20%	2%	37,576	20%	4%	58,342	24%	7%	166,936	19%
$35,000 - <$50,000	56,731	15%	6%	14,531	16%	2%	36,322	19%	4%	40,870	17%	5%	148,454	17%
$50,000 - <$75,000	89,196	24%	10%	15,662	17%	2%	47,775	25%	5%	38,384	16%	4%	191,017	22%
$75,000 - <$100,000	57,537	16%	6%	8,618	10%	1%	22,526	12%	3%	14,387	6%	2%	94,450	11%
$100,000 - <$250,000	77,585	21%	9%	11,420	13%	1%	14,760	8%	2%	9,264	4%	1%	101,609	11%
ALL INCOMES	**368,121**	**100%**	**41%**	**90,200**	**100%**	**10%**	**189,225**	**100%**	**21%**	**240,395**	**100%**	**27%**	**887,941**	**100%**

Relationship of Affordability to Accessibility

This is one of several metropolitan areas where local concentrations of affordable housing are associated with declining transportation *and* housing cost burdens.

This is also one of the two metropolitan areas where transportation costs decline with distance from employment centers, Detroit is the other. Distance to employment centers does not influence housing costs in St. Louis, however, which may be due to the low number of employment centers and the low percentage of jobs within them, 9 and 27%, respectively. (Adjusted R-Square: Housing Model, .7781, Transportation Model, .9255)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (40.2 minutes) or auto (21.4 minutes) and in distance (5.2 miles by transit and 6.9 miles by auto). Above Average H&T neighborhoods have the greatest share of transit, 7%. Households in Above Average Transportation cost neighborhoods drive the farthest distances, 14.0 miles, and spend the most time by car (28.4 minutes). These households also go the farthest distances by transit (14.0 miles), although households living in Above Average H & T neighborhoods spend the most time by transit (47.1 minutes) even though they only go 6.2 miles on transit.

St Louis

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	500,184	97,111	249,148	268,113	1,114,556
% Transit	1%	5%	7%	1%	2%
Time all	24.9	22.3	25.8	28.5	25.8
Distance all	9.5	6.8	8.1	14.0	10.0
Speed All	22.1	18.3	19.4	27.9	22.5
Transit Commuters					
Time Transit	44.5	40.2	47.1	45.9	45.5
Distance Transit	10.6	5.2	6.2	14.0	7.2
Speed Transit	15.5	9.1	9.6	21.3	11.2
Auto Commuters					
Time Car	24.8	21.4	24.3	28.4	25.3
Distance Car	9.5	6.9	8.3	14.0	10.1
Speed Car	22.1	18.7	20.1	27.9	22.8

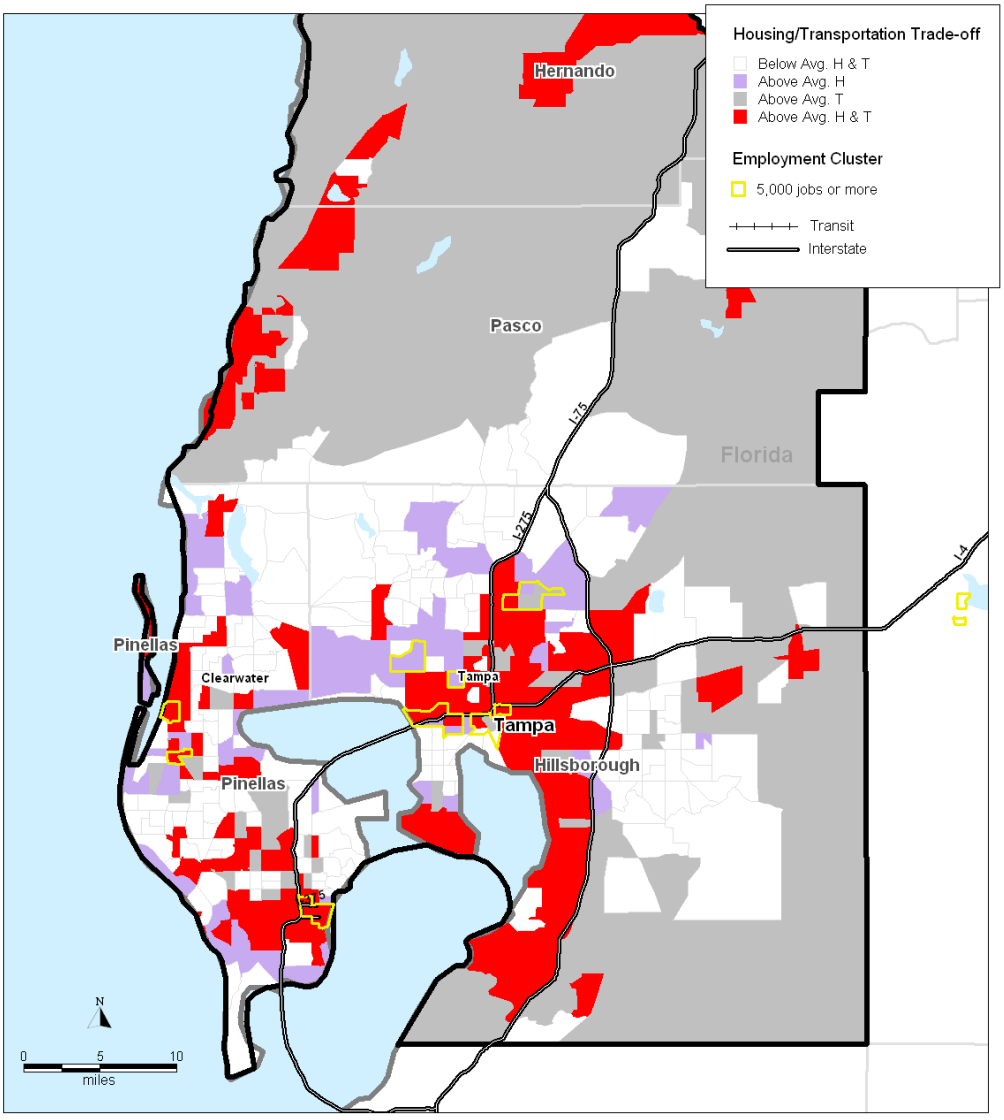
Household Expenditures by Income and Proximity to Employment
St. Louis, MO MSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	51%	55%	50%
% Income on Transport.	47%	55%	63%
% Income on H+T	98%	110%	113%
$20,000 - <$35,000			
% Income on Housing	23%	27%	25%
% Income on Transport.	26%	33%	38%
% Income on H+T	49%	60%	64%
$35,000 - <$50,000			
% Income on Housing	17%	19%	19%
% Income on Transport.	19%	24%	28%
% Income on H+T	36%	43%	47%
$50,000 - <$75,000			
% Income on Housing	14%	15%	16%
% Income on Transport.	14%	18%	20%
% Income on H+T	27%	33%	36%
$75,000 - <$100,000			
% Income on Housing	12%	13%	13%
% Income on Transport.	10%	13%	15%
% Income on H+T	21%	25%	28%
$100,000 - <$250,000			
% Income on Housing	9%	10%	10%
% Income on Transport.	6%	9%	10%
% Income on H+T	15%	18%	20%
Average of All Incomes			
% Income on Housing	31%	26%	24%
% Income on Transport.	24%	22%	24%
% Income on H+T	55%	47%	48%
Owner Median Income	$43,841	$54,337	$52,423
Renter Median Income	$19,263	$29,491	$29,249
Median Income	$24,204	$42,963	$46,107

Tampa, FL MSA

Profile: Tampa, FL MSA	
Combined Housing and Transportation Category:	Low H, High T
Housing Market:	Hot Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	31%
Affordable Housing Shortage:	Medium
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	4%, Small Expanding Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	14%, 18%

Tampa: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov; http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 37% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 56%. These households pay 24% to 41% of their income for housing and transportation (Fig. 1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 26% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 78%. These households pay 45% to 111% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Tampa	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	58%	60%	122%	61%	56%	117%	45%	65%	110%	53%	59%	111%	53%	60%	114%
$20,000 - <$35,000	32%	37%	72%	31%	34%	65%	24%	41%	65%	26%	36%	63%	28%	37%	66%
$35,000 - <$50,000	25%	27%	54%	22%	25%	48%	18%	29%	47%	19%	26%	45%	21%	27%	49%
$50,000 - <$75,000	20%	20%	41%	18%	19%	37%	15%	22%	37%	15%	19%	35%	18%	20%	38%
$75,000 - <$100,000	17%	15%	33%	15%	14%	29%	12%	16%	29%	13%	15%	27%	16%	15%	31%
$100,000 - <$250,000	14%	10%	24%	12%	9%	22%	9%	11%	20%	10%	10%	19%	13%	10%	23%
TOTAL	**26%**	**20%**	**47%**	**29%**	**22%**	**52%**	**24%**	**30%**	**54%**	**31%**	**30%**	**61%**	**27%**	**25%**	**53%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Tampa	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	34,477	11%	4%	26,141	20%	3%	37,475	23%	5%	72,012	34%	9%	170,105	21%
$20,000 - <$35,000	50,622	17%	6%	31,435	24%	4%	42,839	26%	5%	56,644	27%	7%	181,540	22%
$35,000 - <$50,000	51,669	17%	6%	24,653	19%	3%	32,768	20%	4%	37,164	17%	5%	146,254	18%
$50,000 - <$75,000	71,489	24%	9%	25,073	19%	3%	31,219	19%	4%	29,393	14%	4%	157,174	19%
$75,000 - <$100,000	41,043	14%	5%	11,077	8%	1%	10,699	7%	1%	10,045	5%	1%	61,787	8%
$100,000 - <$250,000	53,845	18%	7%	14,033	11%	2%	7,518	5%	1%	7,609	4%	1%	68,972	9%
ALL INCOMES	**303,145**	**100%**	**37%**	**132,412**	**100%**	**16%**	**162,518**	**100%**	**20%**	**212,867**	**100%**	**26%**	**810,942**	**100%**

Relationship of Affordability to Accessibility

This is one of the few metropolitan areas (Miami being the other) where increases in the local concentration of affordable housing are associated with increased transportation costs. This metropolitan area is also rather unique in that housing costs are negatively associated with job density. The explanation for this may be related to the presence of the Gulf shoreline. Housing prices and incomes are the highest along the coast and bay, (white and lavender areas on the map above), but employment centers are primarily inland. (Adjusted R-Square: Housing Model, .5184, Transportation Model, .9333)

Commuting Characteristics

Households living in Above Average Housing and Transportation neighborhoods have the shortest commute in time by auto (24.1 minutes) and in distance by transit (5.6 miles) and by auto (7.5 miles). Households in Below Average H & T cost neighborhoods have the shortest commute in time by transit (37.1 minutes). Above Average H&T neighborhoods have the greatest share of transit, 3%. Households in Above Average Transportation cost neighborhoods drive the farthest distances, 10.9 miles, and spend the most time by car, 27.6 minutes. These households also go the farthest distance by transit, 8.5 miles and spend the most time by transit, 48.6 minutes; however the number of transit riders in these households is negligible.

Tampa Bay Area

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	392,986	157,394	215,466	175,573	941,419
% Transit	1%	1%	3%	0%	1%
Time all	25.6	25.1	24.8	27.7	25.7
Distance all	8.9	8.2	7.4	10.9	8.8
Speed All	20.6	19.7	18.3	22.9	20.3
Transit Commuters					
Time Transit	37.1	44.5	45.6	48.6	43.7
Distance Transit	6.3	6.6	5.6	8.5	6.1
Speed Transit	13.0	11.9	9.4	13.7	10.9
Auto Commuters					
Time Car	25.5	24.8	24.1	27.6	25.5
Distance Car	9.0	8.2	7.5	10.9	8.9
Speed Car	20.6	19.8	18.6	22.9	20.5

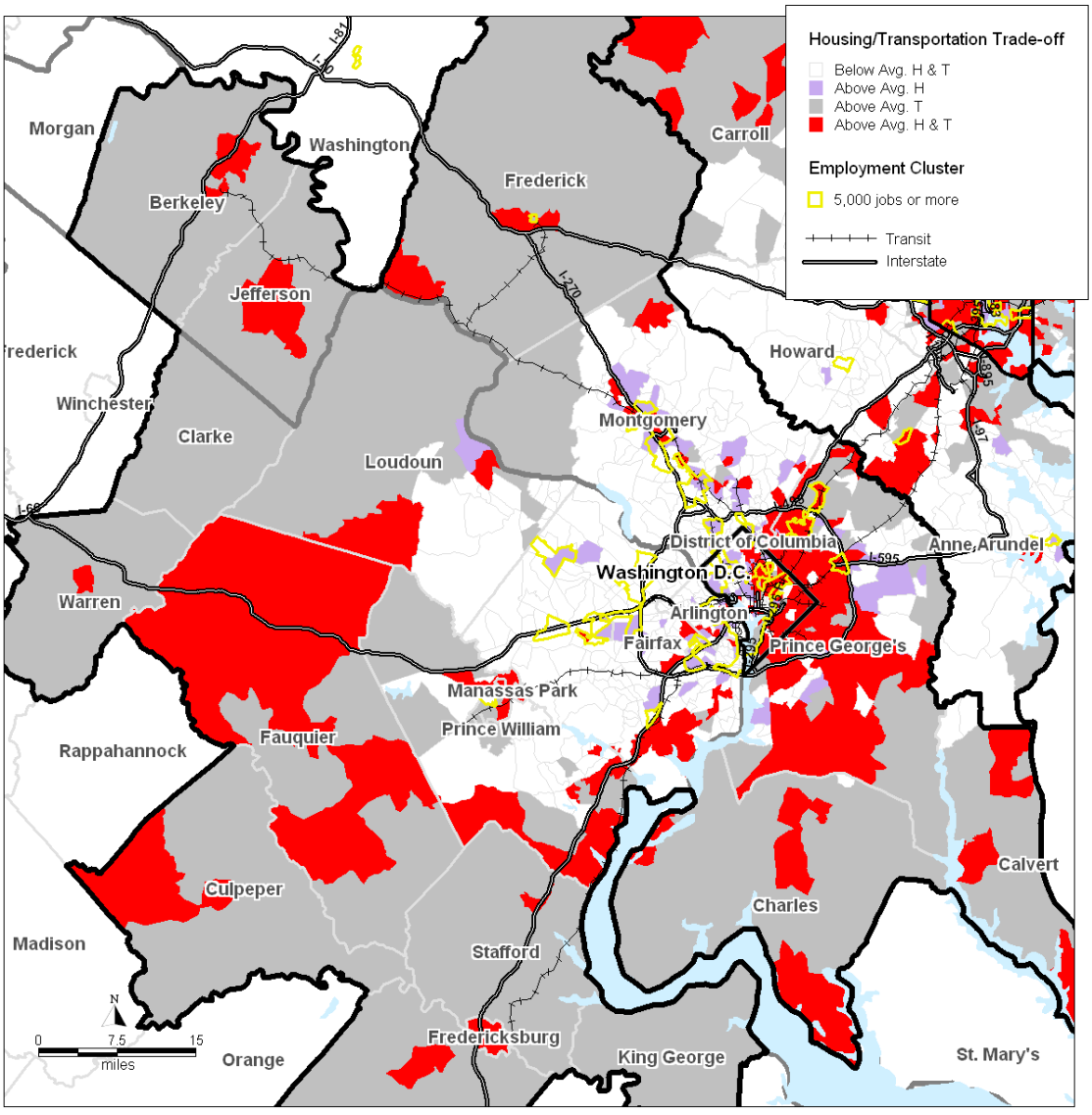
Household Expenditures by Income and Proximity to Employment
Tampa, FL MSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	51%	56%	54%
% Income on Transport.	53%	55%	63%
% Income on H+T	104%	112%	117%
$20,000 - <$35,000			
% Income on Housing	24%	28%	28%
% Income on Transport.	32%	34%	39%
% Income on H+T	56%	62%	67%
$35,000 - <$50,000			
% Income on Housing	20%	20%	21%
% Income on Transport.	22%	25%	28%
% Income on H+T	42%	45%	49%
$50,000 - <$75,000			
% Income on Housing	16%	17%	17%
% Income on Transport.	17%	18%	20%
% Income on H+T	33%	35%	37%
$75,000 - <$100,000			
% Income on Housing	14%	13%	14%
% Income on Transport.	11%	13%	15%
% Income on H+T	25%	26%	29%
$100,000 - <$250,000			
% Income on Housing	10%	10%	11%
% Income on Transport.	7%	8%	10%
% Income on H+T	18%	18%	21%
Average of All Incomes			
% Income on Housing	31%	31%	26%
% Income on Transport.	28%	27%	25%
% Income on H+T	58%	58%	51%
Owner Median Income	$49,681	$41,947	$45,556
Renter Median Income	$22,221	$25,256	$29,584
Median Income	$29,915	$32,068	$41,054

Washington, DC PMSA

Profile: Washington, DC PMSA	
Combined Housing and Transportation Category:	High H, Low T
Housing Market:	Hot Single Family Market
Households earning 30-50% HAMFI with Severe Burden:	13%
Affordable Housing Shortage:	Medium
Transportation: % Non-Auto Commute, Rail Transit System Size, 2003 Congestion:	13%, Large Rail System
Jobs-Housing: % of Pop. living near an Employment Center (EC), % of Jobs in ECs:	35%, 48%

Washington DC: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000



Source: Income and housing costs from 2000 Census of Population and Housing, Summary File 3 and PUMS 5%, P76 and P97. Retrieved 2006, from http://www.census.gov: http://factfinder.census.gov/servlet/BasicFactsServlet. PUMS 5% from PDQ Software, from http://www.pdq.com. Transportation costs based on 2000 data from a variety of national public sources and modeled by Center for Neighborhood Technology. Cities over 100,000 persons labeled.

Metro Summary

Housing / Transportation Costs by Income

Of the four types of neighborhoods, Below Average Housing & Transportation cost neighborhoods have the greatest share of households in the region, 40% (Fig. 2). Households earning $50,000 or more are the majority of households in these neighborhoods, at 78%. These households pay 25% to 45% of their income for housing and transportation (Fig.1).

Above Average Housing & Transportation cost neighborhoods have the second greatest share of households in the region, 27% (Fig. 2). Households earning less than $50,000 annually are the majority of households in these neighborhoods, at 58%. These households pay 49% to 113% of their income for housing and transportation (Fig. 1).

Fig. 1: H+T Costs by Income by Neighborhood Type

Washington	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			Wt. Avg of Quads		
Income Category	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T	% H	% T	% H&T
$0-<$20,000	70%	57%	130%	67%	45%	111%	55%	70%	125%	59%	54%	113%	62%	55%	117%
$20,000 - <$35,000	42%	34%	78%	37%	25%	62%	33%	42%	75%	33%	32%	65%	36%	33%	69%
$35,000 - <$50,000	32%	25%	59%	27%	19%	46%	26%	30%	57%	25%	24%	49%	28%	24%	53%
$50,000 - <$75,000	26%	18%	45%	21%	14%	36%	21%	22%	43%	20%	18%	38%	22%	18%	41%
$75,000 - <$100,000	21%	14%	36%	18%	11%	29%	18%	16%	34%	16%	14%	30%	19%	14%	33%
$100,000 - <$250,000	15%	9%	25%	14%	7%	21%	13%	11%	24%	12%	9%	22%	15%	9%	24%
TOTAL	**24%**	**13%**	**38%**	**29%**	**14%**	**43%**	**24%**	**20%**	**44%**	**30%**	**21%**	**51%**	**27%**	**17%**	**43%**

Fig. 2: Distribution of Households by Income by Neighborhood Type

Washington	Below Avg H&T (1)			Above Avg H (2)			Above Avg T (4)			Above Avg H&T (3)			TOTAL REGION	
Income Category	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% of HHS in Quad	% in Region	# of HHS	% in Region
$0-<$20,000	29,722	5%	2%	36,413	14%	2%	23,203	8%	1%	86,242	20%	5%	175,580	11%
$20,000 - <$35,000	46,393	7%	3%	40,087	15%	2%	36,443	13%	2%	88,717	20%	5%	211,640	13%
$35,000 - <$50,000	63,822	10%	4%	42,037	16%	3%	43,873	15%	3%	78,790	18%	5%	228,522	14%
$50,000 - <$75,000	126,174	19%	8%	55,374	21%	3%	72,095	25%	4%	92,052	21%	6%	345,695	21%
$75,000 - <$100,000	115,390	18%	7%	34,712	13%	2%	50,902	18%	3%	48,459	11%	3%	214,751	13%
$100,000 - <$250,000	268,794	41%	16%	51,638	20%	3%	56,778	20%	3%	44,265	10%	3%	369,837	23%
ALL INCOMES	**650,295**	**100%**	**40%**	**260,261**	**100%**	**16%**	**283,294**	**100%**	**17%**	**438,525**	**100%**	**27%**	**1,632,375**	**100%**

Relationship of Affordability to Accessibility

This is one of several metropolitan areas where local concentrations of affordable housing are associated with declining transportation *and* housing cost burdens. Also, unlike most metropolitan areas, housing unit density is not associated with housing costs. Chicago is the other exception. Perhaps this is because regions that have equally high housing prices throughout the region do not have particularly higher housing prices in high density areas than in lower and moderate density areas. (Adjusted R-Square: Housing Model, .6768, Transportation Model, .9156)

Commuting Characteristics

Households living in Above Average Housing neighborhoods have the shortest commute in time by transit (39.9 minutes) or auto (29.1 minutes) and in distance (6.0 miles by transit and 8.3 miles by auto). Above Average Housing cost neighborhoods also have the greatest share of transit, 24%. Households in Above Average Transportation cost neighborhoods drive the farthest distances, 15.8 miles, and spend the most time by car, 35.3 minutes. These households also spend the longest time (by far) on transit, 66.8 minutes and to go the farthest distances (by far) on transit, 21.4 miles.

Washington

Commuter Characteritics	Below Avg H&T	Above Avg H	Above Avg H & T	Above Avg T	All
All Commuters	945,206	334,193	531,323	416,866	2,227,588
% Transit	10%	24%	16%	3%	12%
Time all	31.7	31.7	35.6	36.3	33.5
Distance all	9.5	7.8	10.3	15.9	10.6
Speed All	17.9	14.8	17.9	25.3	18.8
Transit Commuters					
Time Transit	46.7	39.9	49.7	66.8	46.6
Distance Transit	9.6	6.0	7.3	21.4	8.4
Speed Transit	12.0	8.9	9.4	18.6	10.6
Auto Commuters					
Time Car	30.0	29.1	32.9	35.3	31.7
Distance Car	9.5	8.3	10.8	15.8	11.0
Speed Car	18.6	16.7	19.4	25.5	19.9

Household Expenditures by Income and Proximity to Employment
Washington, DC PMSA

Expenditures by Income	Central City EC	Other ECs	Outside an EC
$0-<$20,000			
% Income on Housing	64%	67%	62%
% Income on Transport.	45%	55%	61%
% Income on H+T	109%	122%	124%
$20,000 - <$35,000			
% Income on Housing	33%	39%	37%
% Income on Transport.	25%	33%	37%
% Income on H+T	58%	71%	73%
$35,000 - <$50,000			
% Income on Housing	24%	29%	28%
% Income on Transport.	18%	24%	27%
% Income on H+T	42%	53%	54%
$50,000 - <$75,000			
% Income on Housing	20%	23%	22%
% Income on Transport.	13%	17%	19%
% Income on H+T	33%	40%	41%
$75,000 - <$100,000			
% Income on Housing	16%	18%	18%
% Income on Transport.	9%	13%	14%
% Income on H+T	26%	31%	32%
$100,000 - <$250,000			
% Income on Housing	13%	13%	13%
% Income on Transport.	6%	8%	10%
% Income on H+T	19%	22%	23%
Average of All Incomes			
% Income on Housing	28%	26%	26%
% Income on Transport.	14%	15%	18%
% Income on H+T	42%	40%	44%
Owner Median Income	$74,661	$84,267	$74,393
Renter Median Income	$39,708	$52,634	$45,506
Median Income	$53,853	$72,433	$65,789

Appendix X- 28 Metro Affordability & Accessibility Regression Results

Housing Cost Model: All Metropolitan Areas

Regression Results

Variable	Coef.	Sig.
Constant	132.2043	0.0000
Anchorage, AK	-0.3997	0.3817
Atlanta, GA	-2.1488	0.0000
Boston--Worcester--Lawrence, MA--NH--ME--CT	-1.5038	0.0000
Chicago--Gary--Kenosha, IL--IN--WI	-1.5367	0.0000
Cincinnati--Hamilton, OH--KY--IN	-4.7873	0.0000
Cleveland--Akron, OH	-4.0586	0.0000
Dallas--Fort Worth, TX	-3.4813	0.0000
Denver--Boulder--Greeley, CO	-2.1182	0.0000
Detroit--Ann Arbor--Flint, MI	-4.3778	0.0000
Honolulu, HI	-0.7680	0.0030
Houston--Galveston--Brazoria, TX	-4.3855	0.0000
Kansas City, MO--KS	-5.3162	0.0000
Los Angeles--Riverside--Orange County, CA	0.6897	0.0000
Miami--Fort Lauderdale, FL	0.3110	0.0928
Milwaukee--Racine, WI	-3.1239	0.0000
Minneapolis--St. Paul, MN--WI	-3.6668	0.0000
New York--Northern New Jersey--Long Island,	1.0268	0.0000
Philadelphia--Wilmington--Atlantic City, PA-	-2.0310	0.0000
Phoenix--Mesa, AZ	-3.1419	0.0000
Pittsburgh, PA	-5.9004	0.0000
Portland--Salem, OR--WA	-1.9996	0.0000
San Diego, CA	-5.6604	0.0000
Seattle--Tacoma--Bremerton, WA	1.1458	0.0000
St. Louis, MO--IL	-1.3587	0.0000
Tampa--St. Petersburg--Clearwater, FL	-4.6675	0.0000
Washington--Baltimore, DC--MD--VA--WV	-2.3182	0.0000
(Log) Housing Unit Density	0.2857	0.0000
Distance to Nearest Employment Center	-0.0625	0.0000
Jobs Per Square Mile	6.5E-07	0.0083
Median Commute Time	0.0533	0.0000
(Log) Median Household Income	-9.5452	0.0000
% of Housing Units Affordable	-3.7738	0.0000
Adjusted R-Square	0.6884	

Transportation Cost Model: All Metropolitan Areas

Regression Results

Variable	Coef.	Sig.
Constant	2.1241	0.0000
Anchorage, AK	-0.0172	0.0000
Atlanta, GA	0.0152	0.0000
Boston--Worcester--Lawrence, MA--NH--ME--CT	0.0034	0.0185
Chicago--Gary--Kenosha, IL--IN--WI	0.0054	0.0001
Cincinnati--Hamilton, OH--KY--IN	0.0151	0.0000
Cleveland--Akron, OH	0.0030	0.0542
Dallas--Fort Worth, TX	0.0188	0.0000
Denver--Boulder--Greeley, CO	-0.0034	0.0419
Detroit--Ann Arbor--Flint, MI	0.0162	0.0000
Honolulu, HI	-0.0155	0.0000
Houston--Galveston--Brazoria, TX	0.0258	0.0000
Kansas City, MO--KS	0.0108	0.0000
Los Angeles--Riverside--Orange County, CA	0.0023	0.0706
Miami--Fort Lauderdale, FL	0.0113	0.0000
Milwaukee--Racine, WI	0.0031	0.0940
Minneapolis--St. Paul, MN--WI	-0.0053	0.0011
New York--Northern New Jersey--Long Island,	0.0039	0.0026
Philadelphia--Wilmington--Atlantic City, PA-	0.0032	0.0238
Phoenix--Mesa, AZ	0.0138	0.0000
Pittsburgh, PA	0.0200	0.0000
Portland--Salem, OR--WA	0.0051	0.0038
San Diego, CA	0.0100	0.0000
Seattle--Tacoma--Bremerton, WA	0.0045	0.0014
St. Louis, MO--IL	0.0021	0.1813
Tampa--St. Petersburg--Clearwater, FL	0.0278	0.0000
Washington--Baltimore, DC--MD--VA--WV	0.0066	0.0000
(Log) Housing Unit Density	-0.0223	0.0000
Distance to Nearest Employment Center	0.0006	0.0000
Jobs Per Square Mile	-1.1E-07	0.0000
Median Commute Time	-0.0014	0.0000
(Log) Median Household Income	-0.1585	0.0000
% of Housing Units Affordable	-0.0013	0.2111
Adjusted R-Square	0.8804	

380 Anchorage, AK MSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	146.0623	0.0000
(Log) Housing Unit Density	0.1493	0.5779
Distance to Nearest Employment Center	-0.2521	0.0658
Jobs Per Square Mile	-2.0E-05	0.4964
Median Commute Time	0.2470	0.0503
(Log) Median Household Income	-11.0667	0.0000
% of Housing Units Affordable	-1.7745	0.5043
Adjusted R-Square	0.8393	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	1.8848	0.0000
(Log) Housing Unit Density	-0.0115	0.0000
Distance to Nearest Employment Center	-0.0004	0.6880
Jobs Per Square Mile	-8.6E-07	0.0005
Median Commute Time	-0.0008	0.4387
(Log) Median Household Income	-0.1443	0.0000
% of Housing Units Affordable	0.0074	0.7276
Adjusted R-Square	0.9260	

520 Atlanta, GA MSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	114.7708	0.0000
(Log) Housing Unit Density	0.8779	0.0000
Distance to Nearest Employment Center	-0.0342	0.0414
Jobs Per Square Mile	5.3E-06	0.2843
Median Commute Time	0.0001	0.9969
(Log) Median Household Income	-8.4652	0.0000
% of Housing Units Affordable	-2.4529	0.0004
Adjusted R-Square	0.7495	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.5718	0.0000
(Log) Housing Unit Density	-0.0153	0.0000
Distance to Nearest Employment Center	0.0007	0.0000
Jobs Per Square Mile	-5.3E-07	0.0000
Median Commute Time	-0.0005	0.0017
(Log) Median Household Income	-0.2021	0.0000
% of Housing Units Affordable	-0.0299	0.0000
Adjusted R-Square	0.9455	

1122 Boston-Worcester-Lawrence, MA-NH-ME-CT CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	128.1952	0.0000
(Log) Housing Unit Density	0.6085	0.0000
Distance to Nearest Employment Center	-0.0187	0.1444
Jobs Per Square Mile	1.2E-05	0.0000
Median Commute Time	0.1198	0.0000
(Log) Median Household Income	-9.7312	0.0000
% of Housing Units Affordable	-4.0955	0.0000
Adjusted R-Square	0.7083	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.0908	0.0000
(Log) Housing Unit Density	-0.0185	0.0000
Distance to Nearest Employment Center	0.0008	0.0000
Jobs Per Square Mile	-2.9E-07	0.0000
Median Commute Time	-0.0018	0.0000
(Log) Median Household Income	-0.1562	0.0000
% of Housing Units Affordable	0.0003	0.9292
Adjusted R-Square	0.9247	

1602 Chicago-Gary-Kenosha, IL-IN-WI CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	120.7192	0.0000
(Log) Housing Unit Density	-0.0848	0.3296
Distance to Nearest Employment Center	-0.0983	0.0000
Jobs Per Square Mile	7.5E-06	0.0000
Median Commute Time	0.1520	0.0000
(Log) Median Household Income	-8.7635	0.0000
% of Housing Units Affordable	-1.4514	0.0052
Adjusted R-Square	0.5992	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.1572	0.0000
(Log) Housing Unit Density	-0.0266	0.0000
Distance to Nearest Employment Center	0.0005	0.0000
Jobs Per Square Mile	-8.7E-08	0.0000
Median Commute Time	-0.0010	0.0000
(Log) Median Household Income	-0.1593	0.0000
% of Housing Units Affordable	-0.0035	0.3760
Adjusted R-Square	0.8696	

1642 Cincinnati-Hamilton, OH-KY-IN CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	138.7748	0.0000
(Log) Housing Unit Density	0.5993	0.0000
Distance to Nearest Employment Center	-0.0039	0.8897
Jobs Per Square Mile	-1.4E-06	0.8471
Median Commute Time	-0.0314	0.3360
(Log) Median Household Income	-10.5092	0.0000
% of Housing Units Affordable	-6.2014	0.0000
Adjusted R-Square	0.7230	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.8106	0.0000
(Log) Housing Unit Density	-0.0160	0.0000
Distance to Nearest Employment Center	0.0006	0.0072
Jobs Per Square Mile	-7.0E-07	0.0000
Median Commute Time	-0.0012	0.0000
(Log) Median Household Income	-0.2218	0.0000
% of Housing Units Affordable	-0.0386	0.0000
Adjusted R-Square	0.9448	

1692 Cleveland-Akron, OH CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	127.9914	0.0000
(Log) Housing Unit Density	0.2311	0.0675
Distance to Nearest Employment Center	-0.1353	0.0000
Jobs Per Square Mile	-3.5E-06	0.6911
Median Commute Time	0.1356	0.0000
(Log) Median Household Income	-9.6297	0.0000
% of Housing Units Affordable	-3.2289	0.0001
Adjusted R-Square	0.6398	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.5332	0.0000
(Log) Housing Unit Density	-0.0253	0.0000
Distance to Nearest Employment Center	0.0001	0.6120
Jobs Per Square Mile	-7.8E-07	0.0000
Median Commute Time	-0.0024	0.0000
(Log) Median Household Income	-0.1907	0.0000
% of Housing Units Affordable	-0.0056	0.3192
Adjusted R-Square	0.9111	

1922 Dallas-Fort Worth, TX CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	132.2633	0.0000
(Log) Housing Unit Density	0.4996	0.0000
Distance to Nearest Employment Center	-0.0387	0.0040
Jobs Per Square Mile	-2.2E-06	0.5926
Median Commute Time	-0.0082	0.6172
(Log) Median Household Income	-9.6214	0.0000
% of Housing Units Affordable	-7.4228	0.0000
Adjusted R-Square	0.6482	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.6674	0.0000
(Log) Housing Unit Density	-0.0191	0.0000
Distance to Nearest Employment Center	0.0002	0.2689
Jobs Per Square Mile	-5.8E-07	0.0000
Median Commute Time	-0.0007	0.0001
(Log) Median Household Income	-0.2060	0.0000
% of Housing Units Affordable	-0.0458	0.0000
Adjusted R-Square	0.9199	

2082 Denver-Boulder-Greeley, CO CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	151.8169	0.0000
(Log) Housing Unit Density	-0.1900	0.0590
Distance to Nearest Employment Center	-0.0610	0.0206
Jobs Per Square Mile	-7.6E-06	0.1508
Median Commute Time	0.0079	0.7484
(Log) Median Household Income	-11.1509	0.0000
% of Housing Units Affordable	-3.2100	0.0001
Adjusted R-Square	0.6346	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.0394	0.0000
(Log) Housing Unit Density	-0.0134	0.0000
Distance to Nearest Employment Center	0.0009	0.0000
Jobs Per Square Mile	-4.7E-07	0.0000
Median Commute Time	-0.0011	0.0000
(Log) Median Household Income	-0.1562	0.0000
% of Housing Units Affordable	-0.0068	0.2922
Adjusted R-Square	0.8845	

2162 Detroit-Ann Arbor-Flint, MI CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	157.1221	0.0000
(Log) Housing Unit Density	0.5842	0.0000
Distance to Nearest Employment Center	-0.0427	0.0037
Jobs Per Square Mile	-1.9E-05	0.0089
Median Commute Time	0.0030	0.8731
(Log) Median Household Income	-12.0376	0.0000
% of Housing Units Affordable	-8.2163	0.0000
Adjusted R-Square	0.6197	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.5693	0.0000
(Log) Housing Unit Density	-0.0164	0.0000
Distance to Nearest Employment Center	-0.0003	0.0064
Jobs Per Square Mile	-6.6E-07	0.0000
Median Commute Time	-0.0001	0.6711
(Log) Median Household Income	-0.2019	0.0000
% of Housing Units Affordable	-0.0198	0.0000
Adjusted R-Square	0.9134	

3320 Honolulu, HI MSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	38.4961	0.0349
(Log) Housing Unit Density	0.5693	0.0480
Distance to Nearest Employment Center	0.3357	0.0376
Jobs Per Square Mile	4.9E-05	0.0043
Median Commute Time	0.1913	0.0011
(Log) Median Household Income	-2.2554	0.1464
% of Housing Units Affordable	8.2038	0.0004
Adjusted R-Square	0.3391	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.9171	0.0000
(Log) Housing Unit Density	-0.0305	0.0000
Distance to Nearest Employment Center	0.0021	0.0255
Jobs Per Square Mile	-6.5E-07	0.0000
Median Commute Time	-0.0010	0.0031
(Log) Median Household Income	-0.2241	0.0000
% of Housing Units Affordable	-0.0855	0.0000
Adjusted R-Square	0.9051	

3362 Houston-Galveston-Brazoria, TX CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	113.5049	0.0000
(Log) Housing Unit Density	0.4782	0.0000
Distance to Nearest Employment Center	-0.0951	0.0000
Jobs Per Square Mile	-3.8E-06	0.2793
Median Commute Time	0.0389	0.0166
(Log) Median Household Income	-8.1232	0.0000
% of Housing Units Affordable	-5.4456	0.0000
Adjusted R-Square	0.6459	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.8179	0.0000
(Log) Housing Unit Density	-0.0177	0.0000
Distance to Nearest Employment Center	0.0004	0.0198
Jobs Per Square Mile	-3.4E-07	0.0000
Median Commute Time	0.0001	0.6770
(Log) Median Household Income	-0.2225	0.0000
% of Housing Units Affordable	-0.0578	0.0000
Adjusted R-Square	0.9082	

3760 Kansas City, MO-KS MSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	150.9023	0.0000
(Log) Housing Unit Density	0.4526	0.0001
Distance to Nearest Employment Center	-0.0259	0.2426
Jobs Per Square Mile	-2.4E-06	0.7912
Median Commute Time	0.0307	0.3799
(Log) Median Household Income	-11.5195	0.0000
% of Housing Units Affordable	-8.8544	0.0000
Adjusted R-Square	0.6928	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.6746	0.0000
(Log) Housing Unit Density	-0.0132	0.0000
Distance to Nearest Employment Center	-0.0002	0.2606
Jobs Per Square Mile	-1.1E-06	0.0000
Median Commute Time	-0.0010	0.0003
(Log) Median Household Income	-0.2104	0.0000
% of Housing Units Affordable	-0.0289	0.0000
Adjusted R-Square	0.9352	

4472 Los Angeles-Riverside-Orange County, CA CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	130.2212	0.0000
(Log) Housing Unit Density	0.2579	0.0000
Distance to Nearest Employment Center	-0.0536	0.0000
Jobs Per Square Mile	-9.6E-07	0.5934
Median Commute Time	0.0654	0.0000
(Log) Median Household Income	-9.3234	0.0000
% of Housing Units Affordable	-3.1893	0.0000
Adjusted R-Square	0.5892	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.1131	0.0000
(Log) Housing Unit Density	-0.0191	0.0000
Distance to Nearest Employment Center	0.0005	0.0000
Jobs Per Square Mile	-4.7E-07	0.0000
Median Commute Time	-0.0009	0.0000
(Log) Median Household Income	-0.1588	0.0000
% of Housing Units Affordable	0.0001	0.9623
Adjusted R-Square	0.8906	

4992 Miami-Fort Lauderdale, FL CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	132.3191	0.0000
(Log) Housing Unit Density	0.4785	0.0004
Distance to Nearest Employment Center	0.0234	0.5946
Jobs Per Square Mile	8.5E-06	0.2898
Median Commute Time	0.0704	0.0146
(Log) Median Household Income	-9.7771	0.0000
% of Housing Units Affordable	-3.7691	0.0000
Adjusted R-Square	0.6854	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	1.9596	0.0000
(Log) Housing Unit Density	-0.0221	0.0000
Distance to Nearest Employment Center	0.0005	0.1840
Jobs Per Square Mile	-3.1E-07	0.0000
Median Commute Time	0.0001	0.7024
(Log) Median Household Income	-0.1472	0.0000
% of Housing Units Affordable	0.0474	0.0000
Adjusted R-Square	0.8818	

5082 Milwaukee-Racine, WI CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	162.6099	0.0000
(Log) Housing Unit Density	0.2853	0.0990
Distance to Nearest Employment Center	-0.0139	0.6207
Jobs Per Square Mile	1.6E-05	0.1485
Median Commute Time	0.1136	0.0084
(Log) Median Household Income	-12.6088	0.0000
% of Housing Units Affordable	-7.9144	0.0000
Adjusted R-Square	0.7861	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.3744	0.0000
(Log) Housing Unit Density	-0.0191	0.0000
Distance to Nearest Employment Center	-3.1E-05	0.9009
Jobs Per Square Mile	-7.3E-07	0.0000
Median Commute Time	3.1E-05	0.9343
(Log) Median Household Income	-0.1840	0.0000
% of Housing Units Affordable	-0.0028	0.7370
Adjusted R-Square	0.8856	

5120 Minneapolis-St. Paul, MN-WI MSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	164.2790	0.0000
(Log) Housing Unit Density	0.1040	0.3150
Distance to Nearest Employment Center	-0.0274	0.1478
Jobs Per Square Mile	-3.3E-06	0.3943
Median Commute Time	0.0386	0.1544
(Log) Median Household Income	-12.5057	0.0000
% of Housing Units Affordable	-7.0379	0.0000
Adjusted R-Square	0.7077	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.1995	0.0000
(Log) Housing Unit Density	-0.0176	0.0000
Distance to Nearest Employment Center	-0.0001	0.6732
Jobs Per Square Mile	-4.4E-07	0.0000
Median Commute Time	-0.0003	0.1733
(Log) Median Household Income	-0.1689	0.0000
% of Housing Units Affordable	-0.0069	0.2842
Adjusted R-Square	0.8554	

5602 New York-Northern New Jersey-Long Island, NY-NJ-CT-PA CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	122.4330	0.0000
(Log) Housing Unit Density	0.4363	0.0000
Distance to Nearest Employment Center	-0.0528	0.0000
Jobs Per Square Mile	-4.0E-07	0.2549
Median Commute Time	0.0420	0.0000
(Log) Median Household Income	-8.6758	0.0000
% of Housing Units Affordable	-2.4805	0.0000
Adjusted R-Square	0.6046	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	1.9502	0.0000
(Log) Housing Unit Density	-0.0262	0.0000
Distance to Nearest Employment Center	0.0002	0.0071
Jobs Per Square Mile	-5.7E-08	0.0000
Median Commute Time	-0.0016	0.0000
(Log) Median Household Income	-0.1387	0.0000
% of Housing Units Affordable	-0.0050	0.0677
Adjusted R-Square	0.8325	

6162 Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	125.3779	0.0000
(Log) Housing Unit Density	0.3809	0.0000
Distance to Nearest Employment Center	0.0569	0.0000
Jobs Per Square Mile	4.5E-06	0.0285
Median Commute Time	-0.0229	0.0975
(Log) Median Household Income	-9.0575	0.0000
% of Housing Units Affordable	-4.2893	0.0000
Adjusted R-Square	0.6412	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.2627	0.0000
(Log) Housing Unit Density	-0.0177	0.0000
Distance to Nearest Employment Center	0.0013	0.0000
Jobs Per Square Mile	-3.1E-07	0.0000
Median Commute Time	-0.0019	0.0000
(Log) Median Household Income	-0.1716	0.0000
% of Housing Units Affordable	-0.0181	0.0000
Adjusted R-Square	0.8907	

6200 Phoenix-Mesa, AZ MSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	108.4974	0.0000
(Log) Housing Unit Density	-0.1789	0.1349
Distance to Nearest Employment Center	-0.0873	0.0011
Jobs Per Square Mile	3.0E-05	0.0006
Median Commute Time	0.0907	0.0011
(Log) Median Household Income	-7.6279	0.0000
% of Housing Units Affordable	-1.2115	0.0855
Adjusted R-Square	0.4977	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.5347	0.0000
(Log) Housing Unit Density	-0.0180	0.0000
Distance to Nearest Employment Center	0.0003	0.1177
Jobs Per Square Mile	-5.1E-07	0.0000
Median Commute Time	-0.0002	0.2377
(Log) Median Household Income	-0.1984	0.0000
% of Housing Units Affordable	-0.0208	0.0000
Adjusted R-Square	0.9317	

6280 Pittsburgh, PA MSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	143.6502	0.0000
(Log) Housing Unit Density	0.5322	0.0000
Distance to Nearest Employment Center	0.0021	0.9151
Jobs Per Square Mile	3.8E-05	0.0000
Median Commute Time	0.0683	0.0189
(Log) Median Household Income	-11.0349	0.0000
% of Housing Units Affordable	-10.4695	0.0000
Adjusted R-Square	0.6443	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.7008	0.0000
(Log) Housing Unit Density	-0.0196	0.0000
Distance to Nearest Employment Center	0.0011	0.0000
Jobs Per Square Mile	-9.3E-07	0.0000
Median Commute Time	-0.0017	0.0000
(Log) Median Household Income	-0.2101	0.0000
% of Housing Units Affordable	-0.0157	0.0503
Adjusted R-Square	0.9157	

6442 Portland-Salem, OR-WA CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	113.2215	0.0000
(Log) Housing Unit Density	0.3566	0.0000
Distance to Nearest Employment Center	0.0068	0.7564
Jobs Per Square Mile	1.7E-05	0.0001
Median Commute Time	0.1311	0.0000
(Log) Median Household Income	-8.4521	0.0000
% of Housing Units Affordable	0.4883	0.5938
Adjusted R-Square	0.7267	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.2436	0.0000
(Log) Housing Unit Density	-0.0126	0.0000
Distance to Nearest Employment Center	0.0004	0.0709
Jobs Per Square Mile	-5.9E-07	0.0000
Median Commute Time	-0.0002	0.3742
(Log) Median Household Income	-0.1756	0.0000
% of Housing Units Affordable	-0.0089	0.3173
Adjusted R-Square	0.8875	

7040 St. Louis, MO-IL MSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	155.5542	0.0000
(Log) Housing Unit Density	0.5353	0.0000
Distance to Nearest Employment Center	-0.0180	0.3401
Jobs Per Square Mile	1.8E-05	0.0269
Median Commute Time	0.0444	0.1082
(Log) Median Household Income	-12.1482	0.0000
% of Housing Units Affordable	-8.6257	0.0000
Adjusted R-Square	0.7781	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.7720	0.0000
(Log) Housing Unit Density	-0.0180	0.0000
Distance to Nearest Employment Center	-0.0004	0.0401
Jobs Per Square Mile	-1.3E-06	0.0000
Median Commute Time	-0.0010	0.0001
(Log) Median Household Income	-0.2154	0.0000
% of Housing Units Affordable	-0.0434	0.0000
Adjusted R-Square	0.9255	

7320 San Diego, CA MSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	103.5686	0.0000
(Log) Housing Unit Density	0.5268	0.0000
Distance to Nearest Employment Center	-0.0525	0.1740
Jobs Per Square Mile	-6.0E-06	0.4705
Median Commute Time	0.1229	0.0011
(Log) Median Household Income	-7.2934	0.0000
% of Housing Units Affordable	-0.6827	0.5181
Adjusted R-Square	0.5324	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.0394	0.0000
(Log) Housing Unit Density	-0.0170	0.0000
Distance to Nearest Employment Center	0.0001	0.5682
Jobs Per Square Mile	-6.0E-07	0.0000
Median Commute Time	3.2E-05	0.8844
(Log) Median Household Income	-0.1556	0.0000
% of Housing Units Affordable	0.0009	0.8827
Adjusted R-Square	0.9131	

7362 San Francisco-Oakland-San Jose, CA CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	126.8090	0.0000
(Log) Housing Unit Density	-0.2799	0.0000
Distance to Nearest Employment Center	-0.1783	0.0000
Jobs Per Square Mile	-4.1E-06	0.0067
Median Commute Time	0.0494	0.0005
(Log) Median Household Income	-8.6002	0.0000
% of Housing Units Affordable	0.1973	0.7432
Adjusted R-Square	0.6094	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	1.9200	0.0000
(Log) Housing Unit Density	-0.0150	0.0000
Distance to Nearest Employment Center	0.0007	0.0000
Jobs Per Square Mile	-2.9E-07	0.0000
Median Commute Time	-0.0006	0.0000
(Log) Median Household Income	-0.1457	0.0000
% of Housing Units Affordable	-0.0002	0.9689
Adjusted R-Square	0.9053	

7602 Seattle-Tacoma-Bremerton, WA CMSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	107.3800	0.0000
(Log) Housing Unit Density	0.3641	0.0000
Distance to Nearest Employment Center	0.0215	0.2617
Jobs Per Square Mile	1.1E-05	0.0001
Median Commute Time	0.0544	0.0007
(Log) Median Household Income	-7.6407	0.0000
% of Housing Units Affordable	-0.7648	0.2902
Adjusted R-Square	0.5934	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.2273	0.0000
(Log) Housing Unit Density	-0.0175	0.0000
Distance to Nearest Employment Center	0.0003	0.0583
Jobs Per Square Mile	-5.2E-07	0.0000
Median Commute Time	-0.0005	0.0001
(Log) Median Household Income	-0.1715	0.0000
% of Housing Units Affordable	-0.0032	0.5601
Adjusted R-Square	0.9198	

8280 Tampa-St. Petersburg-Clearwater, FL MSA

Housing Cost Model

Variable	Coef.	Sig.
Constant	135.4104	0.0000
(Log) Housing Unit Density	0.2840	0.0336
Distance to Nearest Employment Center	-0.2269	0.0000
Jobs Per Square Mile	-4.7E-05	0.0019
Median Commute Time	0.0539	0.1437
(Log) Median Household Income	-10.0439	0.0000
% of Housing Units Affordable	-4.1088	0.0000
Adjusted R-Square	0.5184	

Transportation Cost Model

Variable	Coef.	Sig.
Constant	2.4724	0.0000
(Log) Housing Unit Density	-0.0160	0.0000
Distance to Nearest Employment Center	0.0012	0.0000
Jobs Per Square Mile	-6.1E-07	0.0000
Median Commute Time	-0.0006	0.0183
(Log) Median Household Income	-0.1957	0.0000
% of Housing Units Affordable	0.0231	0.0002
Adjusted R-Square	0.9333	

8872 Washington-Baltimore, DC-MD-VA-WV CMSA

Housing Cost Model

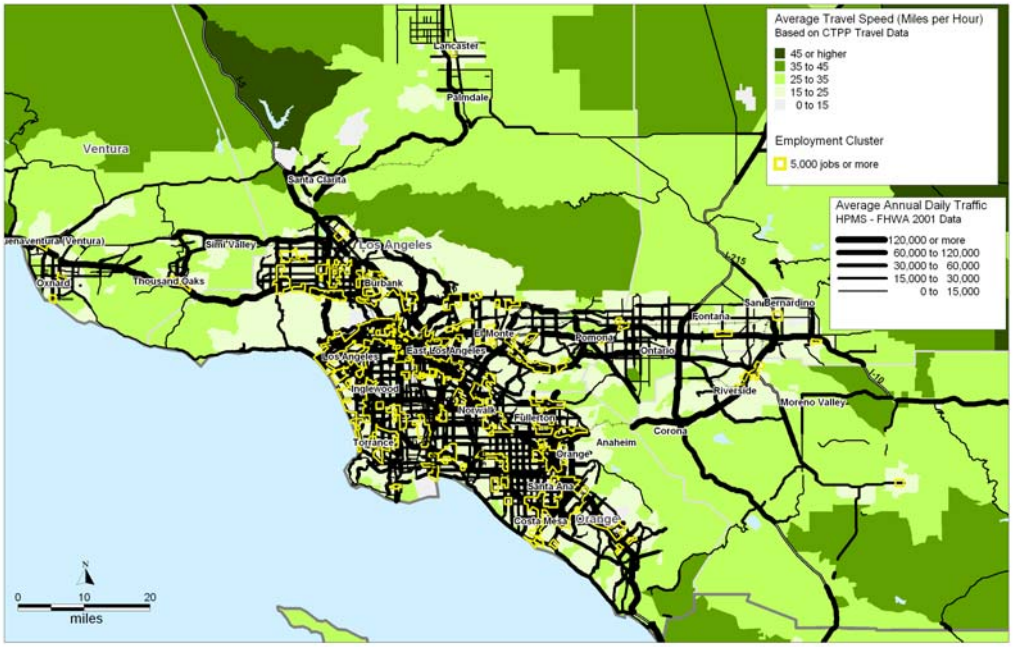
Variable	Coef.	Sig.
Constant	116.0361	0.0000
(Log) Housing Unit Density	-0.0421	0.5377
Distance to Nearest Employment Center	-0.0695	0.0000
Jobs Per Square Mile	1.0E-05	0.0000
Median Commute Time	0.0778	0.0000
(Log) Median Household Income	-8.3114	0.0000
% of Housing Units Affordable	-1.1361	0.0099
Adjusted R-Square	0.6768	

Transportation Cost Model

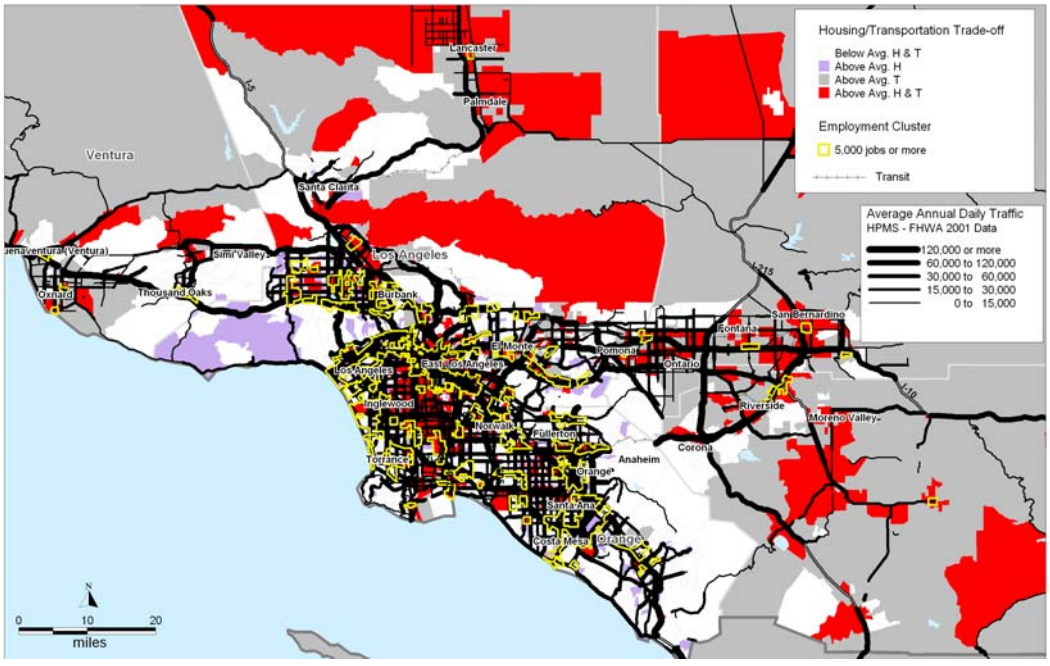
Variable	Coef.	Sig.
Constant	2.0140	0.0000
(Log) Housing Unit Density	-0.0151	0.0000
Distance to Nearest Employment Center	0.0007	0.0000
Jobs Per Square Mile	-2.0E-07	0.0000
Median Commute Time	-0.0006	0.0000
(Log) Median Household Income	-0.1534	0.0000
% of Housing Units Affordable	-0.0174	0.0000
Adjusted R-Square	0.9156	

Los Angeles Metro Area – Congestion compared to incomes and employment center locations

Los Angeles: Travel Speed in in Relation
to Average Annual Daily Traffic

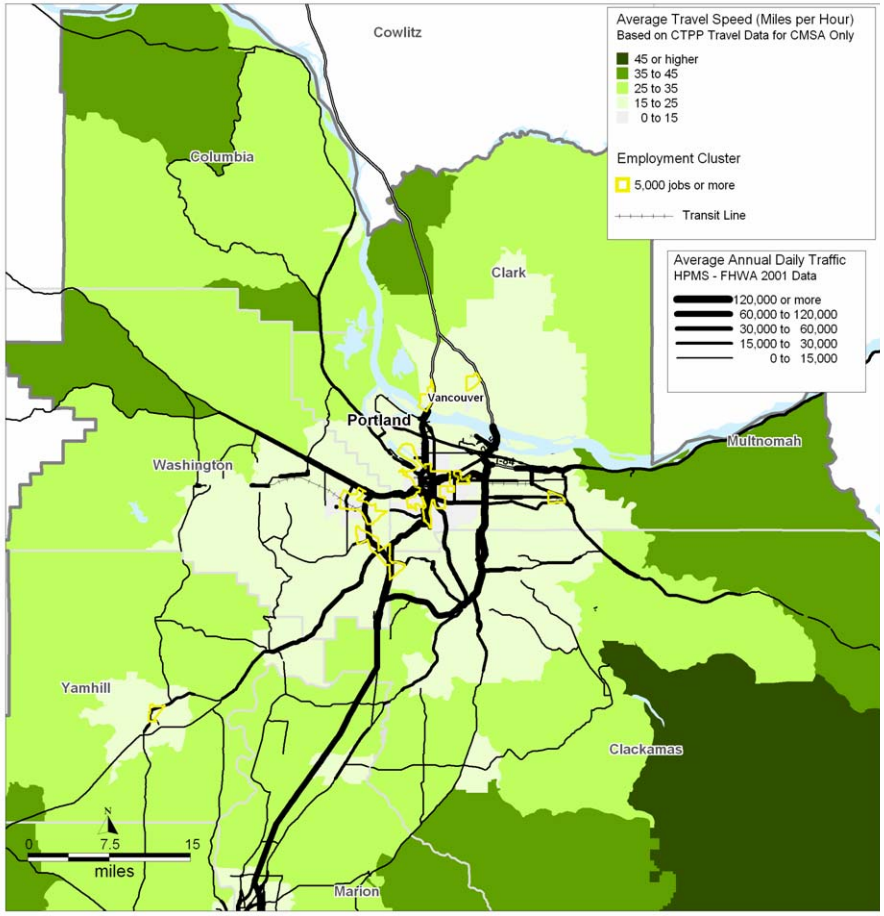


Los Angeles: Average Household Expenditures on Housing
and Transportation as a Percentage of Average Tract Income, 2000
in Relation to Average Annual Daily Traffic

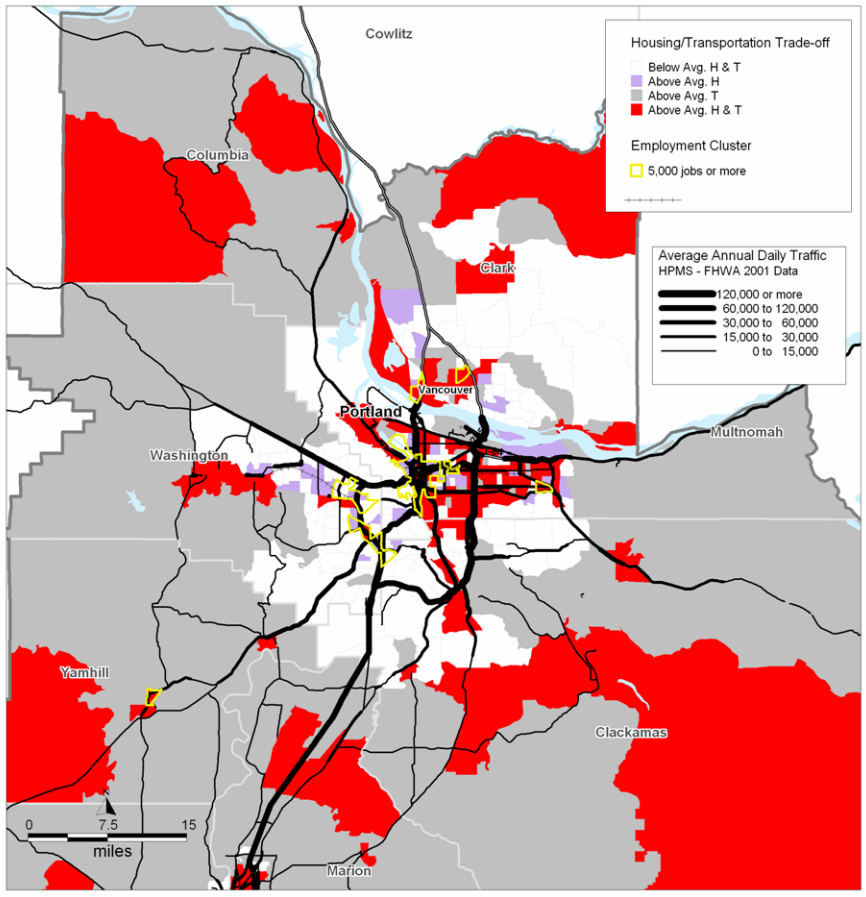


Portland Metro Area – Congestion compared to incomes and employment center locations

Portland: Travel Speed in Relation to Average Annual Daily Traffic

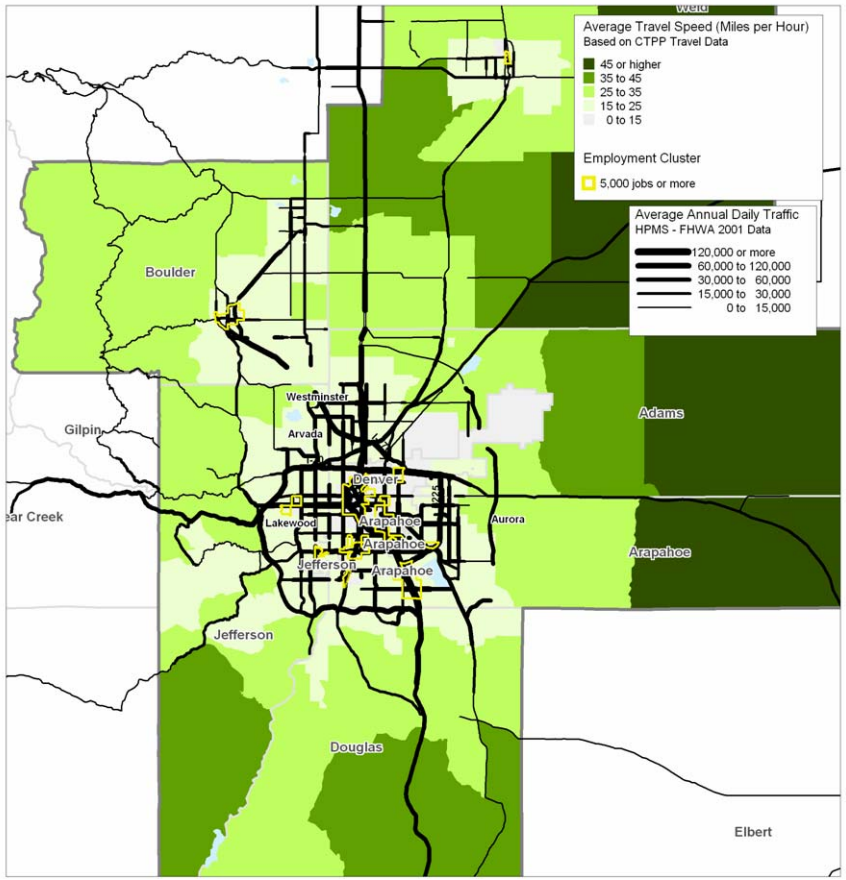


Portland: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000 in Relation to Average Annual Daily Traffic

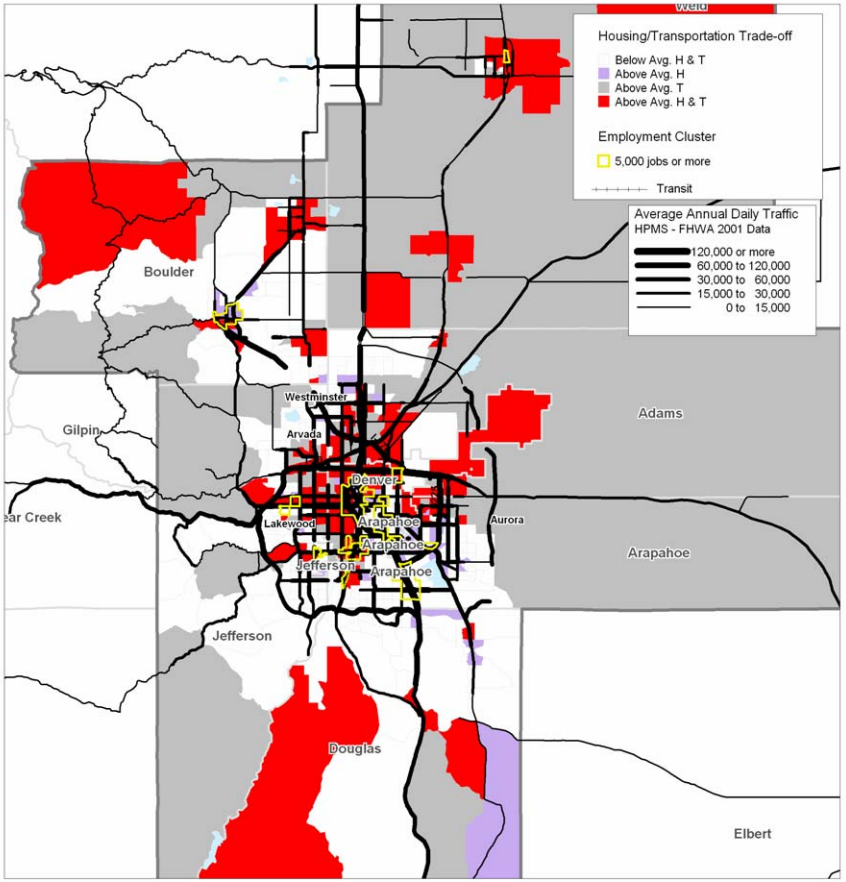


Denver Metro Area – Congestion compared to incomes and employment center locations

Devner: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000 in Relation to Average Annual Daily Traffic

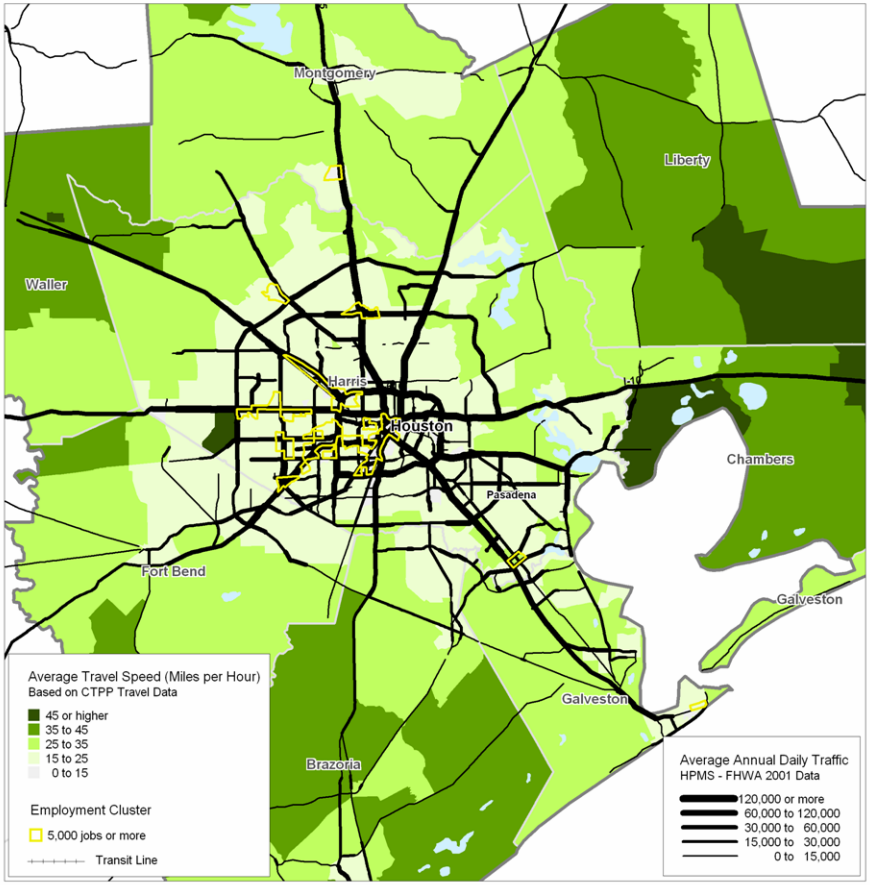


Devner: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000 in Relation to Average Annual Daily Traffic

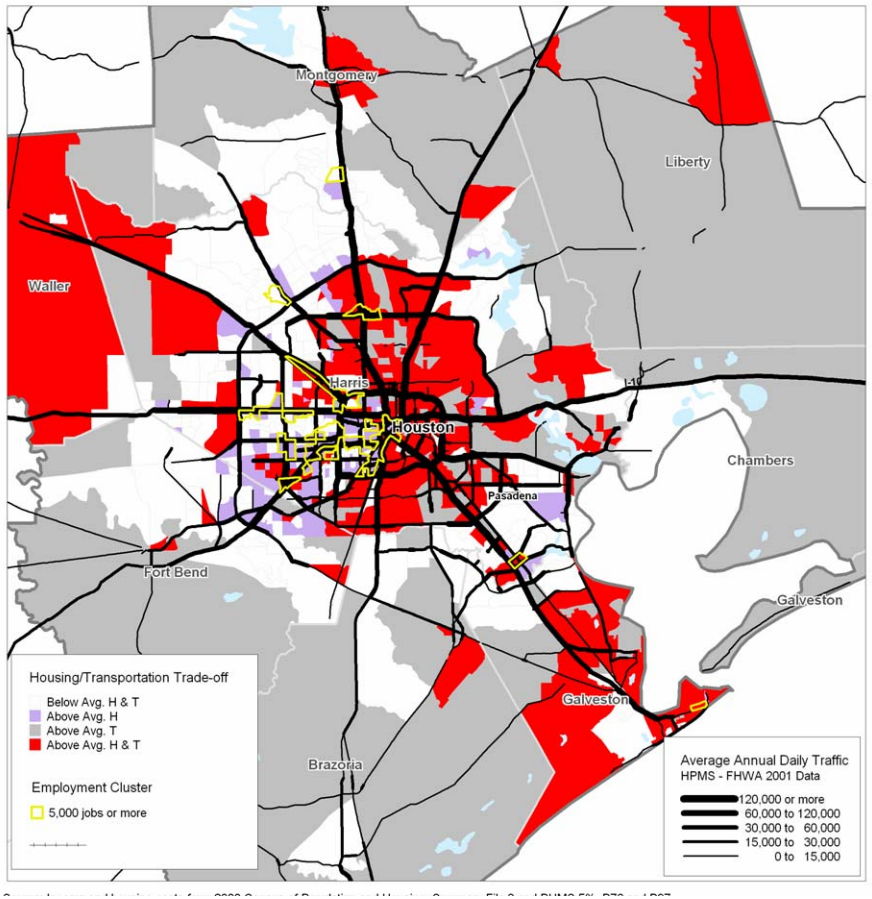


Houston Metro Area – Congestion compared to incomes and employment center locations

Houston: Travel Speed in Relation
to Average Annual Daily Traffic

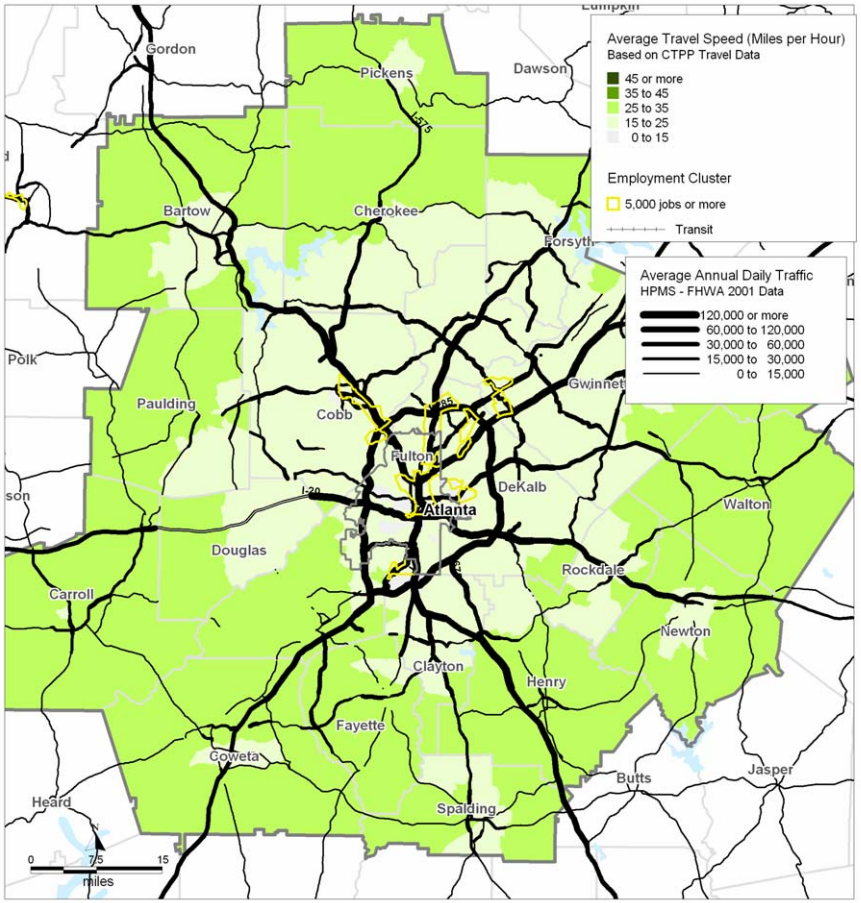


Houston: Average Household Expenditures on Housing
and Transportation as a Percentage of Average Tract Income, 2000
in Relation to Average Annual Daily Traffic

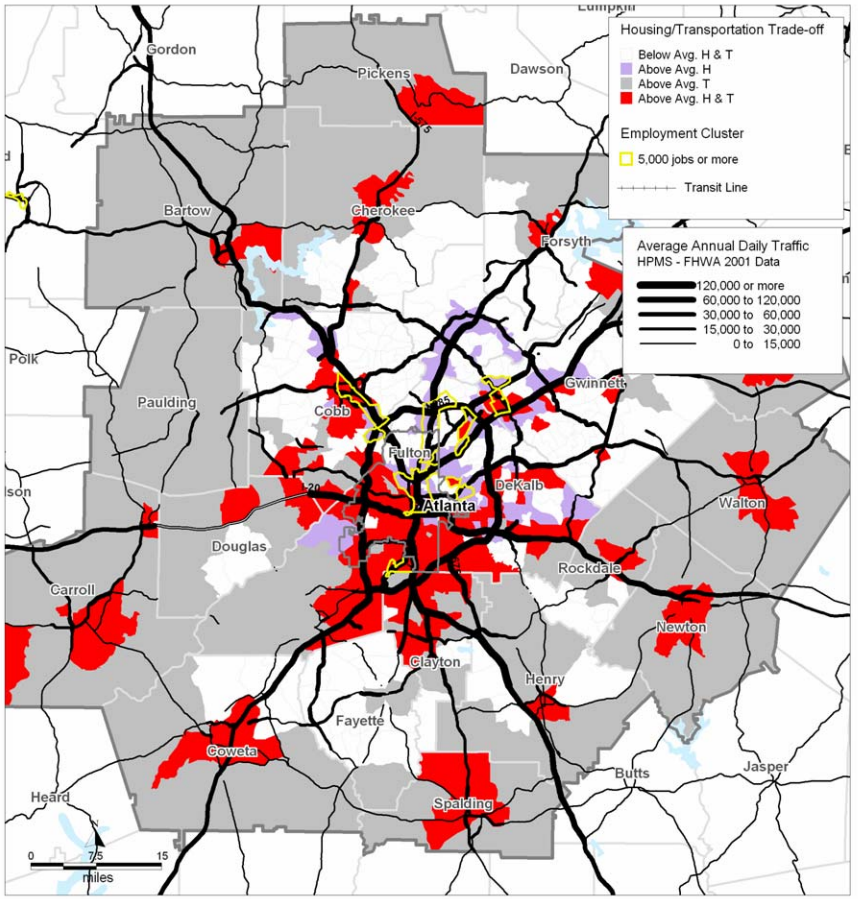


Atlanta Metro Area – Congestion compared to incomes and employment center locations

Atlanta: Travel Speed in Relation to Average Annual Daily Traffic

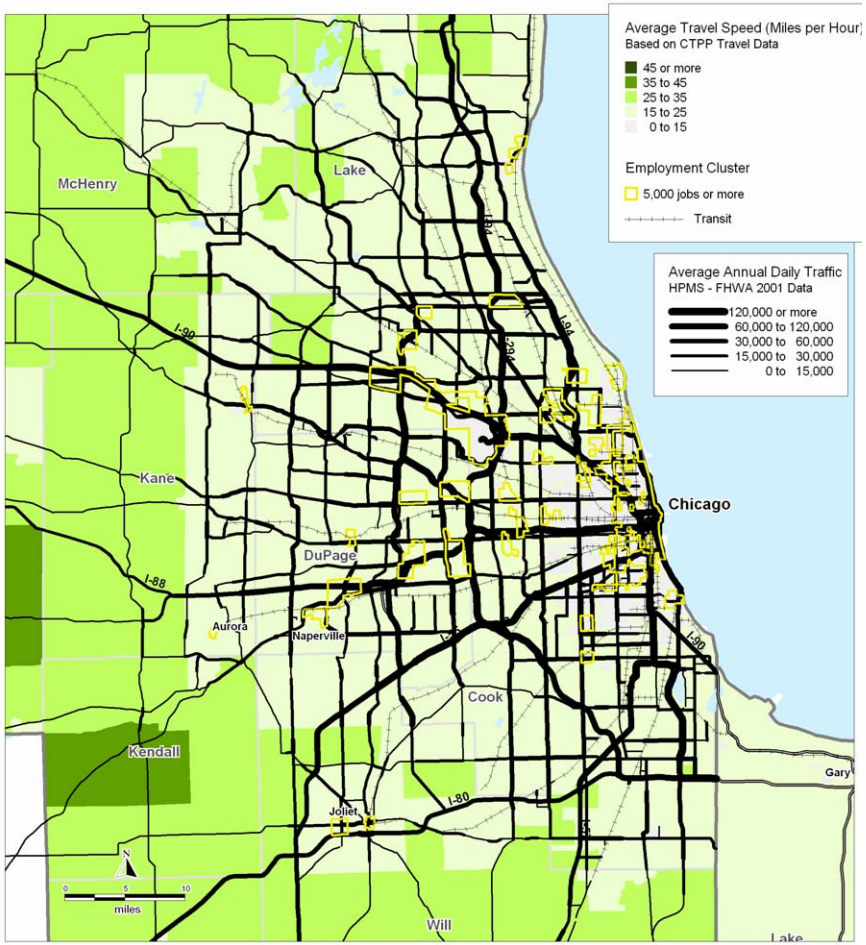


Atlanta: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000 in Relation to Average Annual Daily Traffic

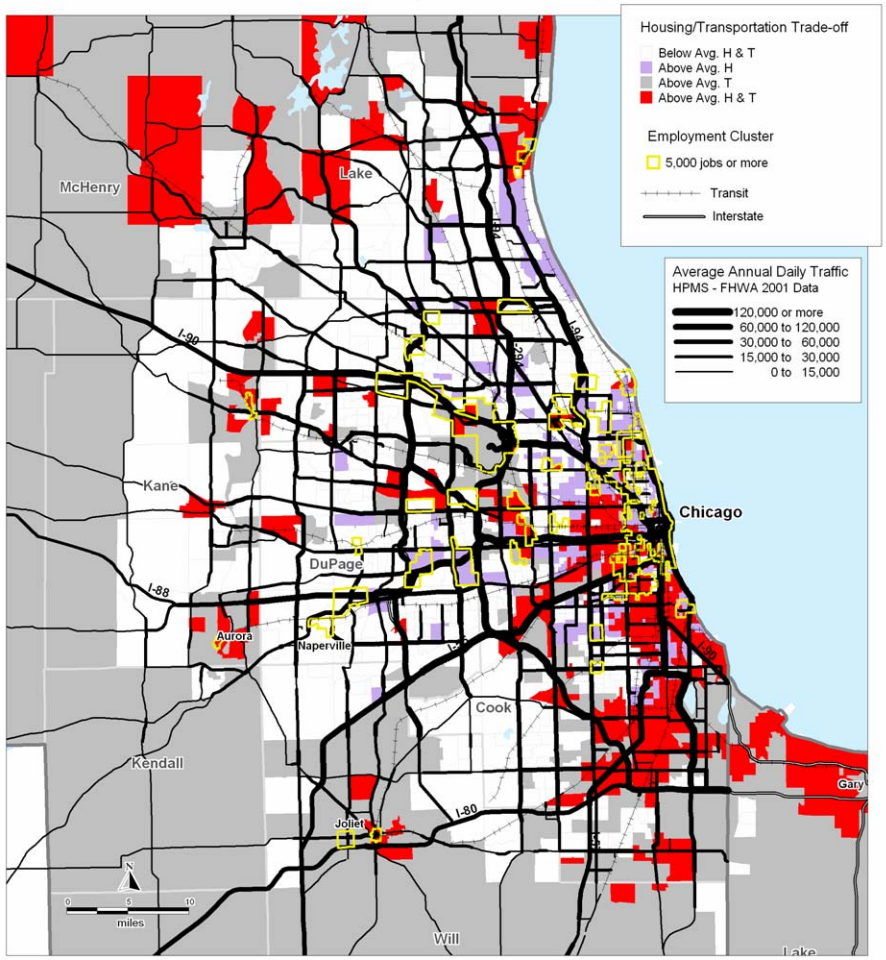


Chicago Metro Area – Congestion compared to incomes and employment center locations

Chicago: Travel Speed in Relation to Average Annual Daily Traffic

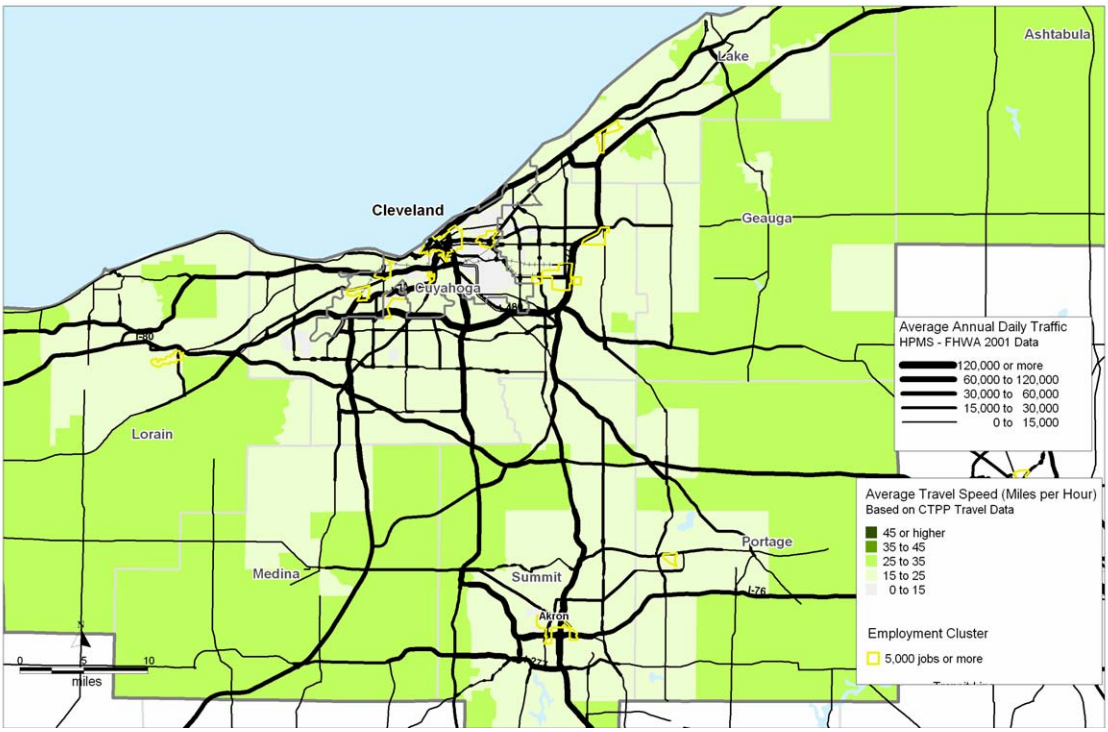


Chicago: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000 in Relation to Average Annual Daily Traffic

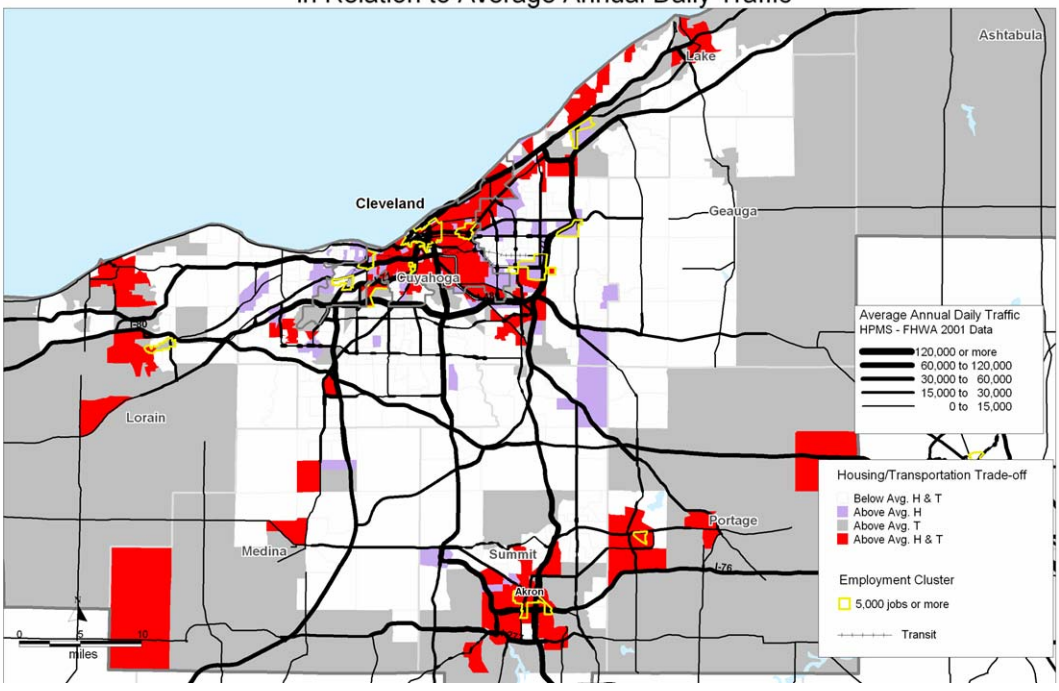


Cleveland Metro Area – Congestion compared to incomes and employment center locations

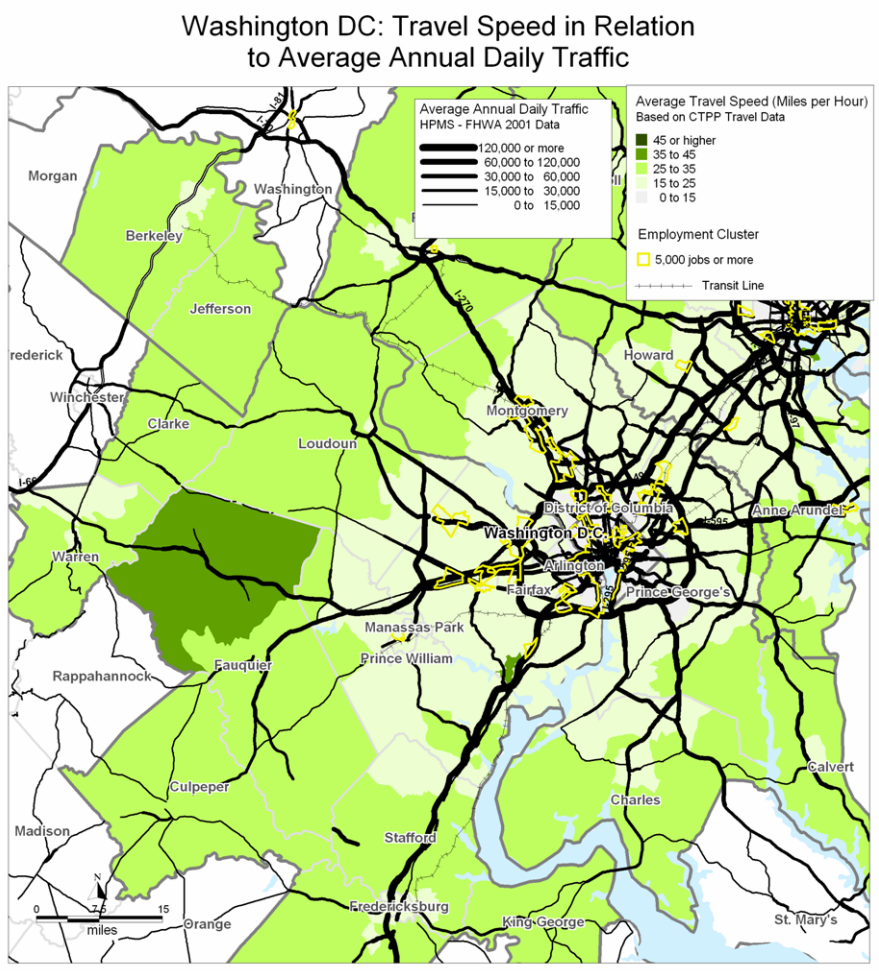
Cleveland: Travel Speed in Relation
to Average Annual Daily Traffic

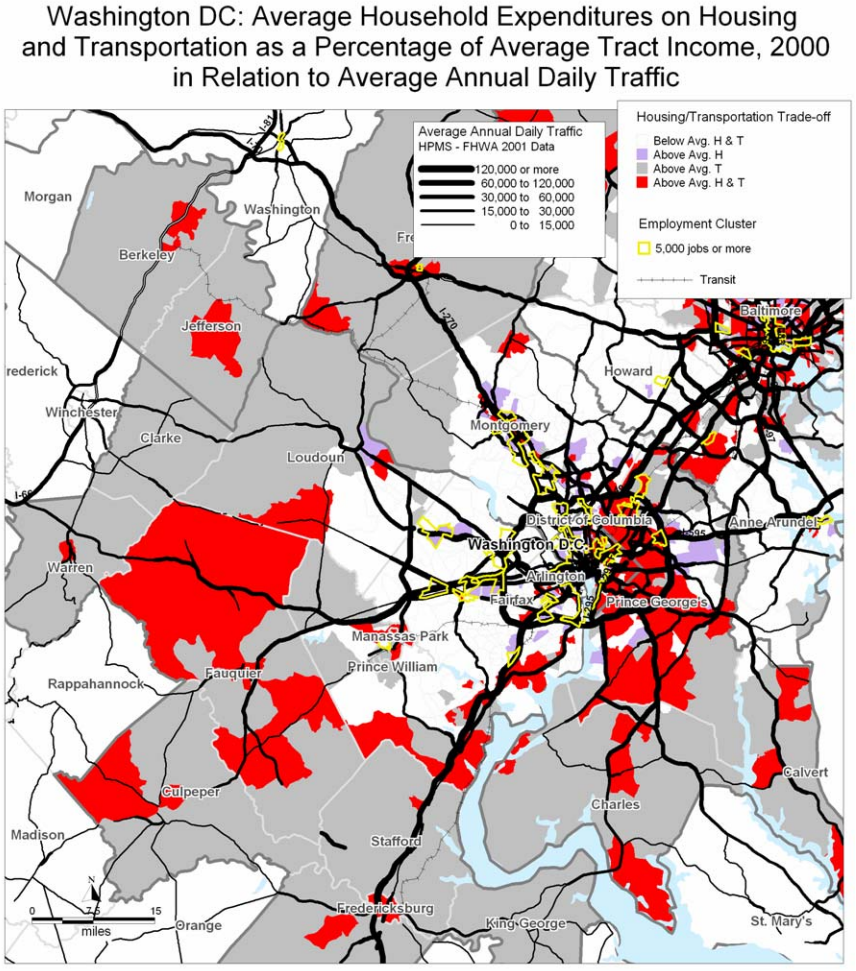


Cleveland: Average Household Expenditures on Housing
and Transportation as a Percentage of Average Tract Income, 2000
in Relation to Average Annual Daily Traffic



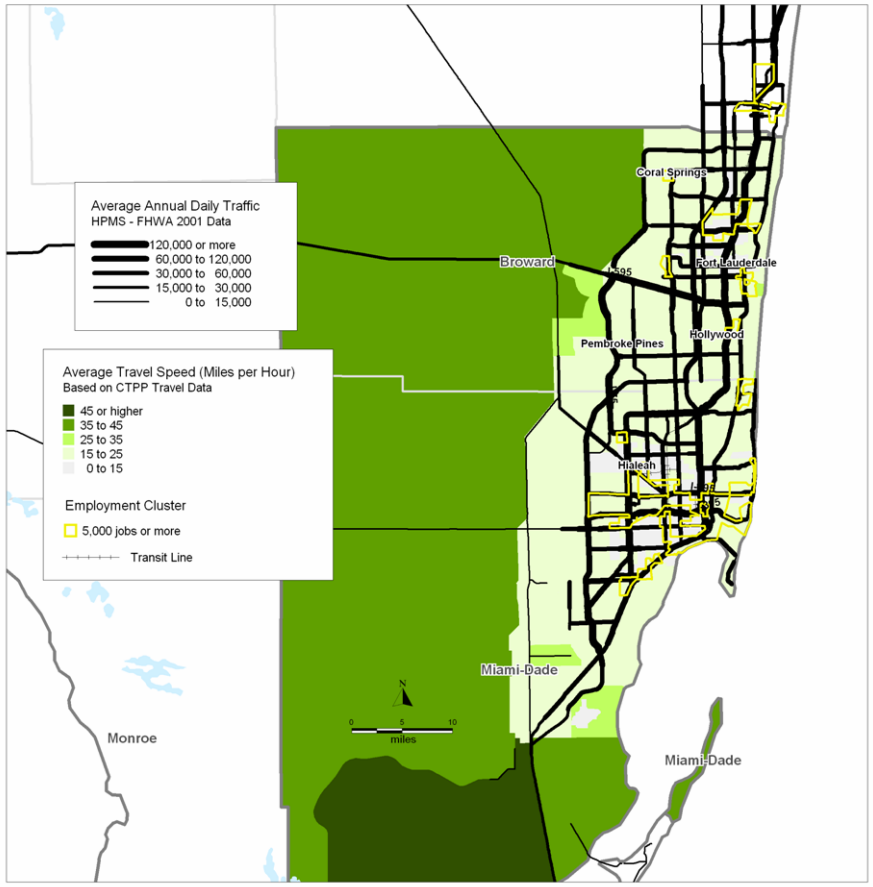
Washington D.C. Metro Area – Congestion compared to incomes and employment center locations



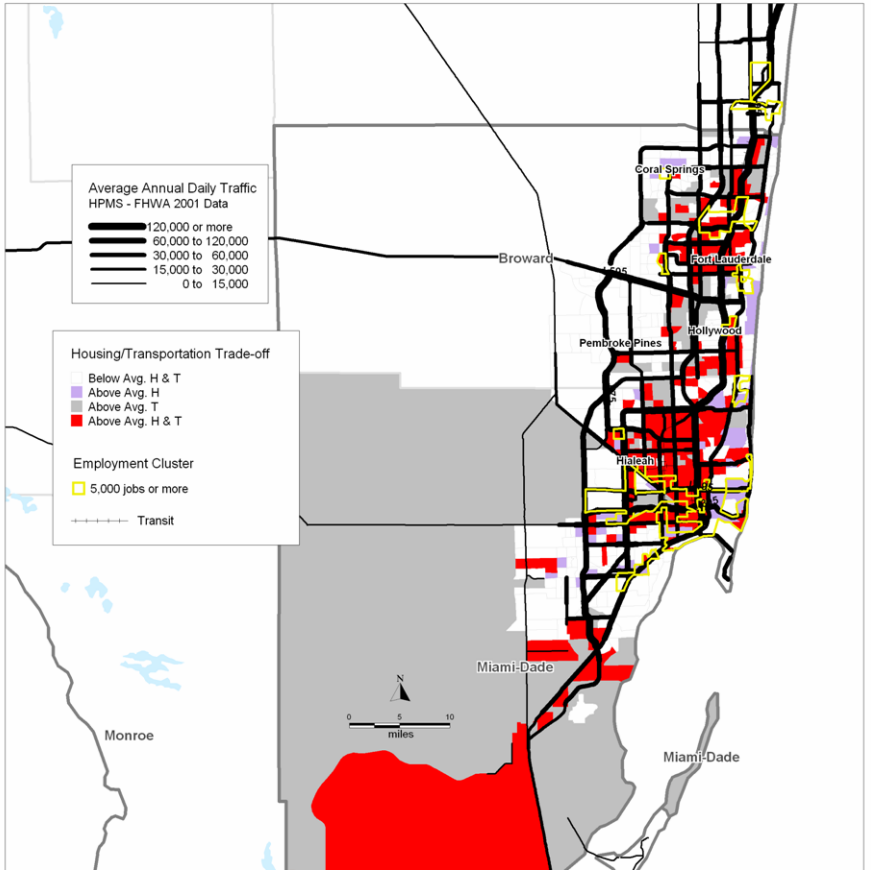


Miami Metro Area – Congestion compared to incomes and employment center locations

Miami: Travel Time in Relation to Average Annual Daily Traffic



Miami: Average Household Expenditures on Housing and Transportation as a Percentage of Average Tract Income, 2000 in Relation to Average Annual Daily Traffic



Appendix C. Technical Appendix

To perform the analysis, we needed to obtain reliable measures of household income, rental and ownership housing costs by income, household transportation costs by income, jobs and employment locations, and other socioeconomic measures of households by income and by place. In this section we explain how we derived or gathered each measure at the census tract level.

Household Incomes

To begin, we first had to identify specific incomes in multiple income bins at the census tract level that would roughly approximate to the standard HUD measures of income, e.g. 30%, 50%, 80%, and 100% of a region's Area Median Income (AMI). The census provides a count of each household by income at the tract level in 16 income bins and uses these bins for several other indicators, such as the percentage of income on housing by income, tenure by income, age of head of householder by income, etc. Therefore, at the tract level, we present the incomes by a nominal vale in six bins rather than as a percentage of AMI since AMI is not available for the 29,628 tracts. A translation table between dollar values and percent AMI for each region is in Table AX in the Appendix.

The census category of income at the tract level was not specific enough for our calculations. The income bin grouping at the tract level leaves two large bins at the bottom and the top that could have wide variation. The bottom bin is "less than $10,000" and the upper income bin is "$200,000 or more". The middle bins are in $5,000 to $10,000 increments. At the same time, there are more groupings than we needed for this analysis. Therefore, we both consolidated the bins from 16 bins to 6 bins, and then within each bin, calculated an average income for the households within each cohort (e.g. $17,982 rather than $15,000 to $19,999) in order to have a specific point rather than a range. The table below shows the income distribution results available at the tract level from the Census for a tract in California. We use both the Family and Non-Family Income fields (P76 and P79) to obtain the count of all households by income. Households in Group Quarters are excluded.

[1] In 2000, there were 105,480,101 households in the U.S. according to the 2000 Census, SF1.
[2] Some households were excluded from the sample if they were in census tracts with fewer than 100 households, or if they lived in group quarters, such as dormitories.
[3] We compared tracts in 1990 and 2000 that had the same boundaries each decennial census for eight regions; Portland, Los Angeles, San Francisco, Dallas, Chicago, Denver, Pittsburgh, and Atlanta.
[4] Other studies have noted this…

Table 4. Income Distribution by Census Tract

Tract 402.02, Riverside County, CA	P. 76 Family Income	P. 79 Non-Family Income	Total
Total:	543	234	777
Less than $10,000	21	13	34
$10,000 to $14,999	40	37	77
$15,000 to $19,999	30	41	71
$20,000 to $24,999	21	12	33
$25,000 to $29,999	33	15	48
$30,000 to $34,999	49	32	81
$35,000 to $39,999	38	13	51
$40,000 to $44,999	19	0	19
$45,000 to $49,999	9	0	9
$50,000 to $59,999	59	11	70
$60,000 to $74,999	84	30	114
$75,000 to $99,999	97	21	118
$100,000 to $124,999	28	9	37
$125,000 to $149,999	6	0	6
$150,000 to $199,999	9	0	9
$200,000 or more	0	0	0

To create six income bins for analysis, we collapsed the above income bins into the six bins in Table 5. Within each bin, we used the PUMS 5% census data to calculate the average income for the households in each bin in a 5% PUMA. The average of each bin from the PUMA was applied to the corresponding bin for each census tract within a PUMA. Table 5 shows the average and range of incomes by income bin calculated using the PUMAs in the 28 metro areas.

Table 5. Average Income by 5% PUMS in Each Income Bracket for 28 Metros

Census Income Bin	Weighted Average	Min	Max	N
<$ 20,000	$10,252	$7,204	$13,560	5,742,029
$20,000 to <35,000	$26,997	$25,340	$29,848	4,181,936
$35,000 to <50,000	$41,531	$40,024	$43,655	3,048,739
$50,000 to <$75,000	$60,146	$56,686	$62,807	2,834,351
$75,000 to <$99,000	$84,992	$78,666	$89,317	1,144,763
$100,000 to <$250,000	$131,036	$110,137	$176,710	971,172
Total 5% PUMAs				963

Housing Costs as a Percentage of Income (H)

For each income bin we used the same methodology. We first gathered the expenditures on housing by income at the census tract level for both renters and owners. However, again, this field as reported at the tract level has large bins at the top and bottom, less than 20% at the bottom and greater than 35% at the top. See Table 5 below. This table shows the results for the same census tract in California used above.

Table 4. Household Income in 1999 by Rent and Selected Monthly Owner Mortgage Costs as a Percentage of Household Income		
Tract 402.02, Riverside County, CA	**H.73 Renter Costs**	**H.97 Mortgage costs**
Total:	225	375
Less than $10,000:	17	0
Less than 20 percent	0	0
20 to 24 percent	0	0
25 to 29 percent	0	0
30 to 34 percent	7	0
35 percent or more	10	0
Not computed	0	0
$10,000 to $19,999:	49	43
Less than 20 percent	0	0
20 to 24 percent	0	0
25 to 29 percent	0	0
30 to 34 percent	6	0
35 percent or more	35	43
Not computed	8	0
$20,000 to $34,999:	48	53
Less than 20 percent	14	29
20 to 24 percent	0	0
25 to 29 percent	14	0
30 to 34 percent	0	0
35 percent or more	20	24
Not computed	0	0
$35,000 to $49,999:	27	40
Less than 20 percent	21	9
20 to 24 percent	0	12
25 to 29 percent	0	0
30 to 34 percent	0	8
35 percent or more	6	11
Not computed	0	0
$50,000 to $74,999:	23	143
Less than 20 percent	11	42
20 to 24 percent	12	56
25 to 29 percent	0	38
30 to 34 percent	0	7
35 percent or more	0	0
Not computed	0	0
$75,000 to $99,999:	49	55
Less than 20 percent	49	33
20 to 24 percent	0	14
25 to 29 percent	0	0
30 to 34 percent	0	0
35 percent or more	0	8
Not computed	0	0
$100,000 or more:	12	32
Less than 20 percent	0	32
20 to 24 percent	0	0
25 to 29 percent	0	0
30 to 34 percent	0	0
35 percent or more	0	0
Not computed	12	0
$150,000 or more:	Not computed	9
Less than 20 percent	Not computed	9
20 to 24 percent	Not computed	0
25 to 29 percent	Not computed	0
30 to 34 percent	Not computed	0
35 percent or more	Not computed	0
Not computed	Not computed	0

Summarizing the 28 metros by renters, owners, and all households, we found 31% of renters are paying more than 35% of their income on housing compared to 18% of owners. Overall, 23% of households are paying more than 35%.

Percent of Households Paying 35% or more of Income by Income in 28 Metros (Census 2000, SF3, H.97, H.73)

Income	Rent	Own	All
Less than $10,000	65%	70%	66%
$10,000 to $19,999	70%	54%	65%
$20,000 to $34,999	31%	39%	34%
$35,000 to $49,999	8%	25%	17%
$50,000 to $74,999	3%	12%	9%
$75,000 to $99,999	1%	5%	4%
$100,000 or more	0%	2%	2%
TOTAL	***31%***	***18%***	***23%***

Again we used the PUMS 5% sample to cross tab the six income bins by the average percentage of income households in each bin were spending on housing. These results were then applied to each specific "percent of income" bin for each income bin for each tract within a PUMA. The summary results at the regional level are displayed below.

On average, households earning less than $35,000 were spending between 31% and 58% of their income on housing.

Note: For the highest income bin, we limited our analysis to households earning <$250,000. This eliminated 5,386,480 household records and reduced total households in our analysis to 41,761,305. Extremely high incomes above $250,000 would have greatly skewed the analysis for this income bin.

Table 6. Percent of Income on Housing by 5% PUMA for 28 Metros

MSA	<$ 20,000	$20,000 to <35,000	$35,000 to <50,000	$50,000 to <$75,000	$75,000 to <$99,000	$100,000 to <$250,000	N
Anchorage	65%	35%	26%	22%	18%	14%	55
Atlanta	59%	33%	25%	20%	16%	14%	660
Baltimore	58%	33%	26%	21%	17%	14%	1070
Boston--Worcester-Lawrnece	56%	33%	25%	21%	18%	14%	1219
Chicago--Gary--Kenosha, IL	59%	31%	24%	20%	18%	14%	2055
Cincinnati	51%	26%	21%	18%	15%	12%	476
Cleveland--Akron	52%	27%	21%	18%	15%	12%	872
Dallas-Fort Worth	57%	29%	22%	18%	16%	13%	1050
Denver-Boulder	59%	33%	25%	21%	18%	14%	614
Detroit	55%	27%	21%	18%	15%	12%	1567
Honolulu	61%	35%	27%	22%	20%	16%	210
Houston-Galveston	56%	27%	21%	17%	15%	12%	878
Kansas City, MO	51%	26%	20%	17%	14%	12%	493
Los Angeles--Riverside	63%	36%	27%	23%	20%	16%	3356
Miami--Fort Lauderdale	63%	35%	27%	21%	18%	14%	623
Milwaukee--Racine	54%	28%	21%	18%	16%	13%	453
Minneapolis--St. Paul	54%	30%	23%	19%	16%	13%	741
New York--North	64%	36%	27%	22%	19%	15%	5072
Philadelphia--Wilmington	57%	31%	24%	19%	17%	13%	1568
Phoenix--Mesa	58%	31%	23%	19%	16%	13%	692
Pittsburgh, PA	47%	24%	18%	16%	14%	11%	702
Portland--Salem	59%	32%	25%	20%	17%	14%	484
San Diego, CA	63%	35%	27%	23%	20%	16%	602
San Franciso--Oakland, CA	65%	39%	30%	25%	21%	17%	1455
Seattle--Tacoma, WA	60%	34%	26%	22%	19%	15%	769
St. Louis, MO	51%	25%	19%	16%	14%	12%	524
Tampa--St. Petersburg--Cle	53%	28%	21%	17%	15%	12%	546
Washington	61%	35%	27%	22%	18%	14%	1025
Average	58%	31%	24%	20%	17%	14%	1065

Transportation Cost as a Percentage of Income (T)

The premise for this study is the examination of the fraction of income a household spends on transportation and housing. Housing cost is relatively easy to assess, since the US Census and many other sources gather it. However, the amount of money a household has to spend on transportation, especially for a specific location, is not as readily available. To do this study, we have applied a model developed to calculate the average household transportation costs using a regression analysis based on the analysis and theory of the Location Efficient Mortgage® (LEM), which was peer reviewed and developed by a group of researchers including the Center for Neighborhood Technology[5]. For this study we use a model that was developed under the Urban Markets Initiative of the Brookings Institution's Metropolitan Policy Program by the Center for Neighborhood Technology with the Center for Transit-Oriented Development[6]. This model calibrated with data from the Minneapolis/St Paul metropolitan area provides output that give the

5 John Holtzclaw, Robert Clear, Hank Dittmar, David Goldstein, and Peter Haas, "Location Efficiency: Neighborhood and Socio-Economic Characteristics Determine Auto Ownership and Use—Studies in Chicago, Los Angeles, and San Francisco," Transportation Planning and Technology 25(1) (2002): 1-27, available online at www.tandf.co.uk/journals/online/0308-1060.html.

6 See http://www.brook.edu/metro/umi.htm and http://www.cnt.org/publications/Affordability-Index-White-Paper-Draft-0805.pdf for more detailed discussion.

average household transportation cost within a census tract given the household's income and size.

The household transportation costs consist of a combination of auto ownership auto use and transit use and therefore the model estimates each cost separately. This allows each to be estimated separately based on the neighborhood and the household size and income. These three components are the dependent variables in the model and are affected by the combination of seven independent variables about the built environment and two independent household variables, household size and income. Together, these nine variables represent the independent place-based neighborhood characteristics and the socioeconomic characteristics that predict household transportation costs at the census tract level, a geography that approximates a neighborhood. It is important to model these costs at a neighborhood level, given that many of the independent variables can vary block by block.

To develop the regression formula, we tested each of the independent variables separately against the dependent variables, and then in combination to determine their relationship. The analysis showed that the independent variables co-vary and are interdependent of one another. Thus, no one variable, such as transit accessibility or household income, by itself completely determines transportation costs. Rather, it is the combination of these variables that determines how many autos a household owns, how many miles members drive each vehicle, and how much transit they use. Because transportation is an integral part of our daily routines, it makes sense that it is the combination of how a household's workers commute to work, the distance to services such as a grocery store, how children get to school or other activities, and how much a family earns that determines total household transportation costs.

It's important to note, while many of the findings by Housing/Transportation trade-off are directly related to the variables in the model that predict the transportation costs, we focused on the other characteristics in the neighborhood or region that are related to transportation and housing costs but are not directly related to the variables in the model, such as auto ownership, which is predicted by the model but also reported by the census. In the findings, we are able to compare modeled auto ownership to reported auto ownership and use reported auto ownership to cite a finding rather than just the modeled cost.

In this analysis we used the model described above to assess the household transportation cost for households within each of the six income cohorts described above. As model inputs we used the average income in that income bin, and used the average size of households in the census tract. We then took the weighted average of these costs to determine the overall average household transportation cost. We then divided that cost by the cohort's income to obtain our transportation cost burden (T). The following table shows this burden for each metropolitan regions by income bin, and for the average Household in each region.

	> $20,00	$20,000 - $30,000	$30,000 - $50,000	$50,000 - $75,000	$75,000 - $100,000	>= $100,000	All Households
Anchorage	53%	34%	25%	19%	14%	10%	18%
Atlanta	62%	37%	27%	20%	15%	10%	21%
Baltimore	52%	33%	24%	19%	14%	10%	19%
Boston	56%	34%	26%	19%	15%	10%	19%
Chicago	51%	31%	23%	18%	14%	9%	18%
Cincinnati	59%	37%	27%	20%	15%	10%	23%
Cleveland	55%	35%	26%	19%	15%	10%	22%
Dallas	59%	35%	26%	19%	15%	10%	21%
Denver	52%	32%	24%	18%	14%	9%	19%
Detroit	58%	36%	26%	19%	15%	10%	21%
Honolulu	47%	28%	21%	16%	13%	8%	16%
Houston	60%	36%	26%	20%	15%	10%	22%
Kansas Cit	60%	38%	28%	21%	15%	10%	23%
Los Angeles	50%	31%	23%	17%	13%	9%	19%
Miami	52%	32%	23%	18%	13%	9%	21%
Milwaukee	54%	34%	26%	20%	15%	10%	22%
Mn-St Paul	54%	34%	26%	19%	15%	10%	19%
New York	45%	27%	20%	16%	13%	8%	16%
Philadelphia	52%	33%	24%	19%	14%	10%	20%
Phoenix	55%	34%	25%	19%	14%	9%	21%
Pittsburgh	59%	37%	27%	20%	15%	10%	25%
Portland	58%	36%	26%	20%	15%	10%	22%
San Diego	51%	32%	24%	18%	13%	9%	19%
San Francisco Bay Area	51%	31%	23%	17%	13%	8%	15%
Seattle	55%	34%	25%	19%	14%	9%	19%
St. Louis	58%	36%	27%	20%	15%	10%	23%
Tampa	60%	37%	27%	20%	15%	10%	25%
Washington	55%	33%	24%	18%	14%	9%	17%
Total	53%	33%	24%	18%	14%	9%	19%

Job Locations

To locate and define the size of the employment centers for a region, we use the Census Transportation Planning Package 2000 that provides the total number of employees per census tract.

This analysis used a simple clustering analysis to determine where the centers of employment are within the region and the size of each employment center based on the number of employees within its boundaries.

The following describes how the automated algorithm locates and defines each employment center within a region using GIS software, Census TIGER/Line® Files, and CTPP 2000 job data.

Automated Algorithm to Identify Employment Centers with GIS

1. Calculate the land area for each polygon (excluding water) within the region

2. Calculate the job density (jobs per acre of land) for each polygon

3. Use 7 jobs/acre as the minimum job density threshold

4. Sort the polygons by the total number of jobs within each polygon

5. Assign the tract with the most jobs a number starting at one. This will be the first employment center cluster.

6. A single census tract is most likely only a portion of an entire employment center cluster. Therefore, the additional neighboring tracts that are also part of the cluster must be identified and assigned to this cluster. To do so, the neighboring tracts are scanned and those where the

density is higher than or equal to the chosen minimum density threshold are assigned to the cluster. The area of the first employment center cluster is now defined.

7. Continue adding polygons in step 6 until there are no new adjacent polygons to add to the cluster.

8. To identify the remaining employment center clusters, remove the polygons that have been assigned to an employment center cluster from the list and repeat steps 4 through 7 until there are no more polygons that have a job density above or equal to the minimum density threshold.

9. We chose a weighted center to find the employment geographical center so we can definne a center point from which to measure distance..

10. The final step is to choose only those employment centers that have at least 5000 jobs associated with them.

The total number of jobs is a measure of employment used in the transportation model, and in our classification of job access. We use the gravity model to measure the employment density in the area of each tract. That is, for a given tracts we the sum of all the number of jobs in every other tract in the region divided by the square of the distance, included in that sum is also the number of jobs in the census tract itself. Note that although this measure has units of "jobs/square mile" and therefore an job density measure, it should only be interpreted as a relative measure of job access.

The following map shows the employment centers with a background of the job density measure.

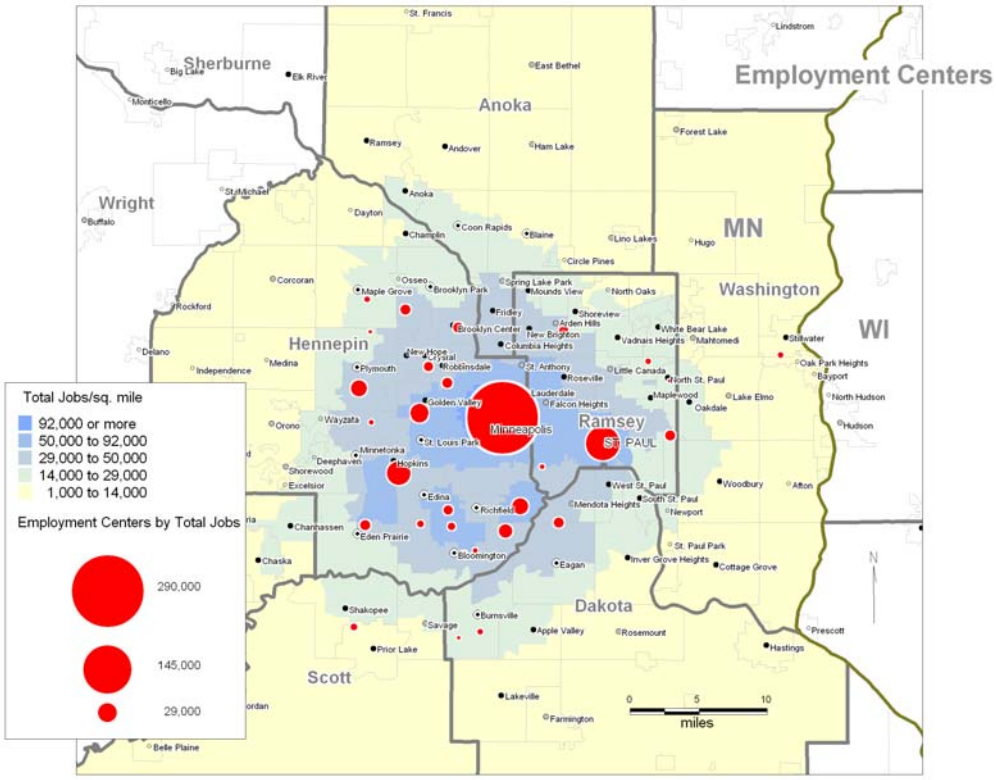


Figure 7. Employment Center clusters in Minneapolis/St. Paul region.

Worker Commuting Characteristics

In order to define commuter characteristics and congestion, we looked at four different but related statistics. These are the mode of commute, the time of commute, the distance of commute and the average speed of commute.

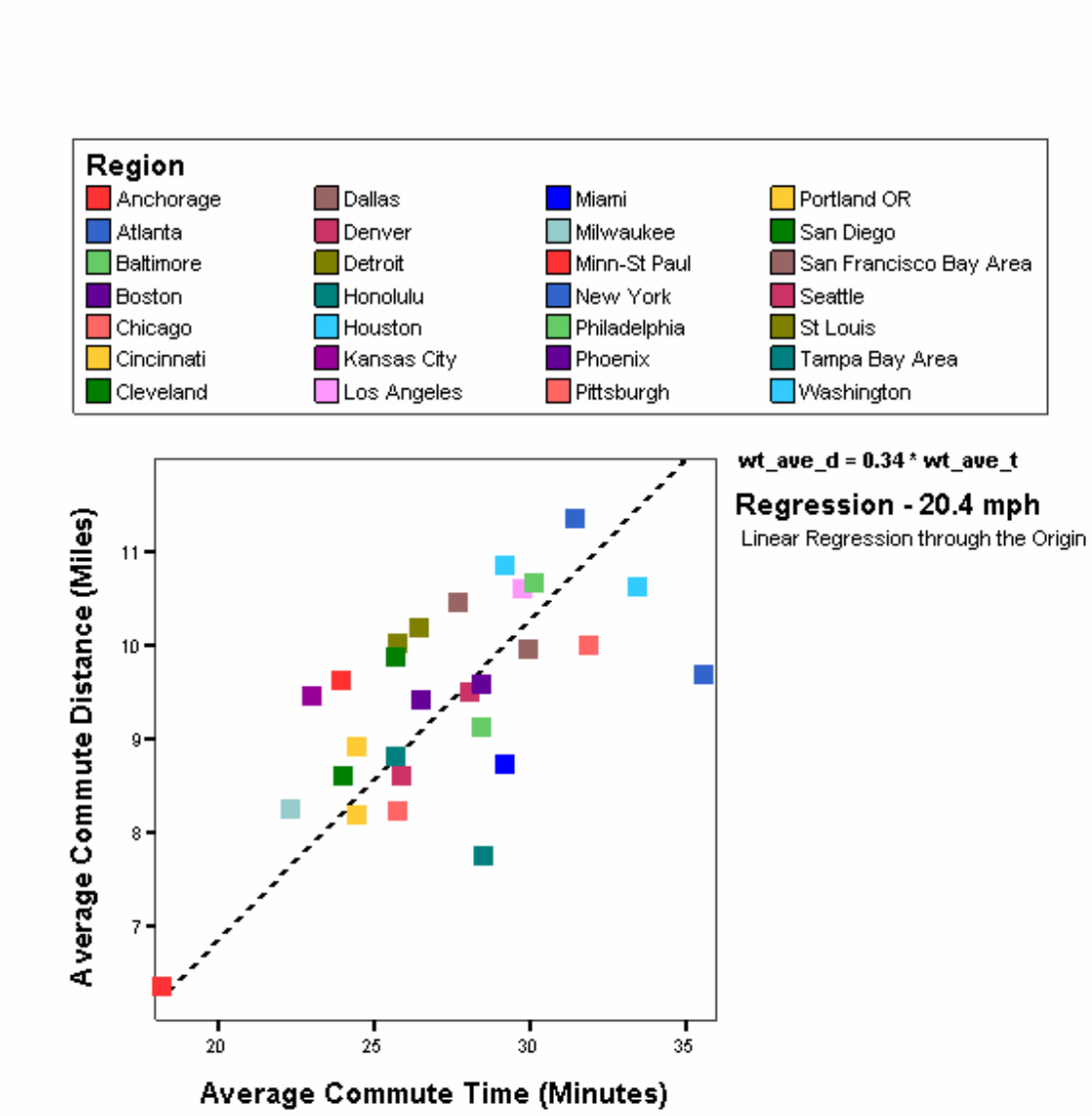
The first of these is very straight forward. The mode of the journey to work is part of the long form in Census 2000. The following table shows how this breaks out for the census tract in California:

Census Tract 403.02, Riverside County,	Workers
Total:	2,940
Car, truck, or van:	2,792
Drove alone	2,412
Carpooled	380
Public transportation:	37
Bus or trolley bus	9
Streetcar or trolley car (publico in Puerto Rico)	0
Subway or elevated	0
Railroad	28
Ferryboat	0
Taxicab	0
Motorcycle	8
Bicycle	15
Walked	9
Other means	9
Worked at home	70

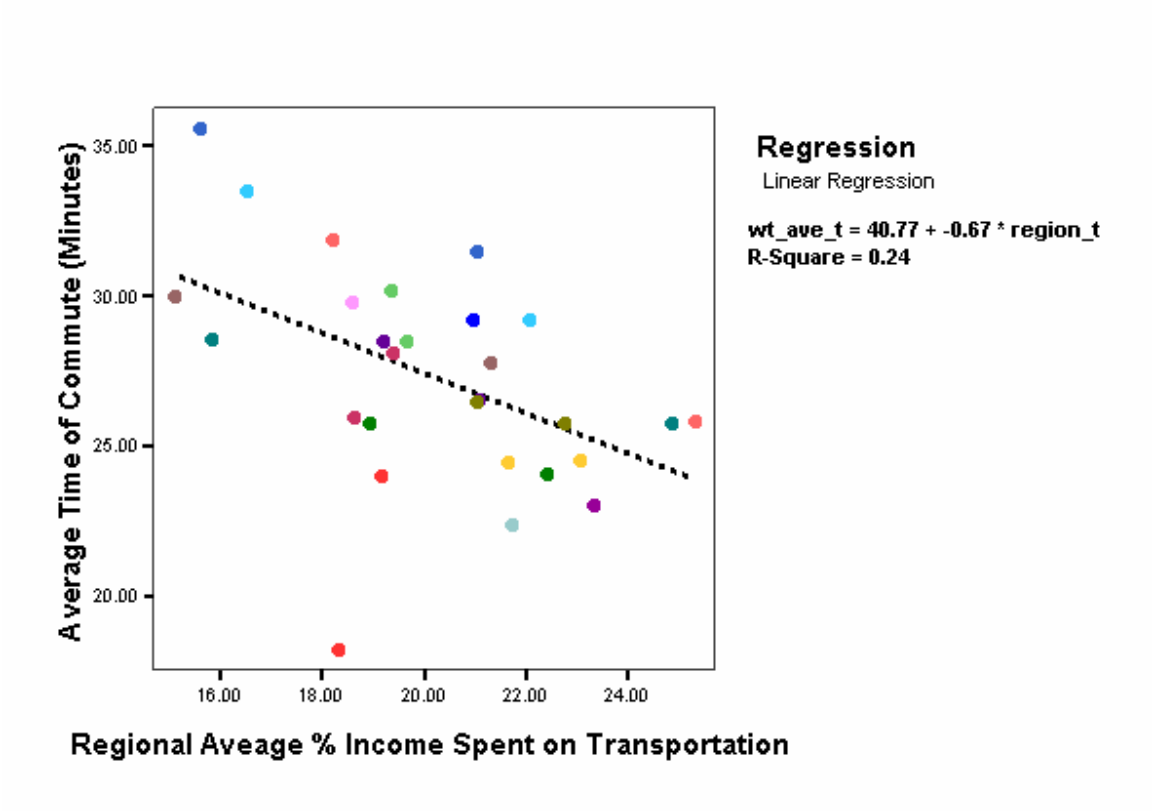
In order to measure the time, distance and average speed to get to work we have used the CTPP data once again. Here we used the part 3 portion of the CTPP, This gives for every tract the tracts that those workers live in, and the mode and time they use to get there. We exported these tract pairs to a GIS and calculated the distance from the center of each tract to get an "as the crow flies" distance of each commute. For the workers that live and work in the same tract, we use the use the average radius of the tract ($r=\sqrt{area}/\pi$). We then group the modes into by auto, public transportation and other. We can then calculate the weighted average of the time and distance of each commute to obtain the time, distance and speed by mode and overall.
For example the census tract that we have been using as an example in Riverside County California, there are 170 census tracts where those workers go to work (including the tract it self), the distances vary from 0.8 miles (the tract itself) to 792 mile (4 workers who work in Colorado). The mean time of commute go from 2 minutes to 200 minutes. Because of the nature of self reported surveys like the census, we had to eliminate tracts that did not make sence, for instance the four workers who work in Colorado say they commute by auto and it takes them 20 minutes, this would mean that they would be going 2374 mph (that is over 3 time the speed of sound!) what this probably represents is people who work in a different city and commute there and stay the week, and then use an auto in Colorado. We eliminated such cases from our average by only accepting commutes where the speed is less than or equal to 65 mph.
The following table shows the average of these by metro region:

region	Overall Average distance (miles)	Average time (minutes)	Average speed (miles/hour)	Auto Commuters Average speed (miles/hour)	Transit Commuters Average speed (miles/hour)
Anchorage	6.37	18.22	20.16	20.38	8.8
Atlanta	11.36	31.49	21.6	21.97	12.05
Baltimore	10.67	30.16	21.04	21.72	10.74
Boston	9.6	28.46	19.45	20.49	9.95
Chicago	10.01	31.88	18.72	19.53	12.96
Cincinnati	8.94	24.48	21.04	21.36	10.9
Cleveland	8.61	24.06	20.81	21.18	10.71
Dallas	10.47	27.73	22.15	22.34	12.27
Denver	8.62	25.91	19.75	20.14	11.7
Detroit	10.19	26.45	22.49	22.7	10.65
Honolulu	7.77	28.52	16.64	17.34	9.66
Houston	10.87	29.2	21.98	22.28	13.77
Kansas City	9.46	23.02	23.65	23.83	9.98
Los Angeles	10.62	29.8	20.87	21.39	11.13
Miami	8.74	29.21	18.1	18.42	10.44
Milwaukee	8.26	22.36	21.44	21.96	9.07
Minn-St Paul	9.65	23.99	23.18	23.77	11.28
New York	9.69	35.58	17.06	19.77	9.93
Philadelphia	9.14	28.44	19.11	19.99	10.7
Phoenix	9.43	26.53	21.44	21.68	10.64
Pittsburgh	8.24	25.78	18.95	19.65	9.33
Portland OR	8.2	24.44	19.7	20.38	9.46
San Diego	9.89	25.71	22.57	22.98	11.84
San Francisco Bay Area	9.98	29.98	19.51	20.46	11.43
Seattle	9.52	28.09	19.98	20.67	11.43
St Louis	10.03	25.76	22.54	22.82	11.18
Tampa Bay Area	8.82	25.72	20.33	20.46	10.93
Washington	10.64	33.47	18.81	19.93	10.59

The following graphs show these data. Note that the overall fit gives 20.4 mph for the average speed. This speed recall is not the average speed of the vehicle transporting the worker since it is a direct line from the center of the two census tracts but this makes for a good surrogate for congestion as the map on page xx shows.



One more plot like this is very interesting. In the following plot we use the same colors as above, but plot these points as average commute time vs average cost of transportation from our model. The regression shows that as the average time of commute goes down the average total fraction of income spent on transportation is reduced – this would imply that households within regions are optimizing their commute time but not their overall transportation burden.



We believe there is much more that can be done with this measure, but for this study we limit it here.