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## *Growing More Affordably: Connecting the Dots on Housing, Energy and Transportation Costs*

By Scott Bernstein, Peter Haas, Kara Heffernan, Carrie Markarewicz, Rachel Scheu, and Anthony Star

This paper was written for the Funders' Network for Smart Growth and Livable Communities by Scott Bernstein, Peter Haas, Kara Heffernan, Carrie Markarewicz, Rachel Scheu, and Anthony Star of the Center for Neighborhood Technology, a Chicago-based organization focused on the development of more livable and sustainable communities.

This paper is the fourth and final in a series of four papers, edited by Stephanie Jennings, that examine the interconnections between housing and other issues of concern to philanthropic organizations and the communities in which they work. This paper addresses the connections among housing, energy, and transportation costs. Other papers in the series address the unique features of the housing market and emerging trends, the relationship between housing and regionalism, and the effects of housing conditions on various aspects of child well-being.

## Abstract

In the first paper in this series, Dr. Chris Nelson aptly explained the basic operating principles as well as some of the complexities of the housing market. This paper seeks to build on Nelson's paper, but to go into further discussion of the relationship between the housing market and markets for energy and transportation and how these markets affect households and the environment. The housing market of course does not operate in a vacuum, and how it interfaces with transportation and energy systems has important consequences for a range of actors, from households to communities and entire regions with respect to both household economics and public finances and the environment.

Drawing in large part on research the Center for Neighborhood Technology (CNT) has carried out in its 27-year history in terms of energy and transportation, and most recently in collaboration with the Center for Transit-Oriented Development (CTOD) and through the Community Energy Cooperative, a program of CNT, we hope to help funders better understand the relationship between housing issues, and affordable housing specifically, transportation and energy use, and environmental impacts. We'll also draw from best practices nationally to help develop a shared understanding about what can be done to advance the agendas of funders who support these areas.

This paper is organized in three sections.

- The first section discusses the impacts from the high and increasing use of transportation and energy on family finances and on the environment
- The second section challenges as well as promising programs and changes in behavior that might be leveraged for significant improvements
- The third section provides suggestions for how funders could support programs that reduce the costs for households and at the same time, the impact on the environment.

## Introduction

Families in the United States are facing difficult economic times. From the decline of pensions and retirement savings to changes in the social welfare system to continuing changes in the economy that have resulted in flat wages, families face, in the long-term, an uncertain economic future. Even in the short-term, things are not much better. Families are confronted on a daily basis with rising costs, for goods ranging from housing to energy to healthcare. According to a recent poll, over 3 in 10 Americans named transportation as their biggest monthly expense after their rent or mortgage. Almost 2 in 10 said it was health care.<sup>1</sup> National surveys have shown since at least 1985 that Transportation is the second highest cost. Energy, when it includes utilities and gasoline, ranges from 25 percent to 38 percent of moderate incomes.

Housing costs and their precipitous incline in particular have received much attention, as have strategies to address them. From workforce housing campaigns to the rise of employer-assisted housing, housing and its increasing lack of affordability has come under close scrutiny. And while the cost of housing is an issue that affects a broad swath of the U.S. population, it is especially important for those at the bottom of the income pyramid.

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<sup>1</sup> <http://www.kff.org/newsmedia/upload/7371.pdf>, The USA Today/Kaiser Family Foundation/Harvard School of Public Health, Health Care Costs Survey, August 2005

In a 2005 report, the National Housing Conference (NHC) identified a significant uptick among low- to moderate-income families with “critical housing needs,” defined as households that spend at least half their income on housing, or live in severely dilapidated conditions. Between 1997 and 2003, the number of families in this situation rose from 3 million to 5 million, an increase of 67 percent.<sup>2</sup> And in another recent study, the Harvard Joint Center for Housing Studies found that housing cost burdens between 2001 and 2004 were on the rise, across most income categories, and regardless of tenure type, whether owners or renters. Renters in the middle quartiles were extremely hard hit. For example, among renter households in the lower-middle quartile, the number of households experiencing a severe housing burden increased 42 percent in three years.<sup>3</sup> This is compared to their owner household peer, which saw a rise of 24 percent.

### **The Complete Affordability Problem is Even Worse**

Despite the dire picture these findings illustrate, the complete affordability problem is even worse than it appears. These studies, and most studies about affordability, just take into account the cost of housing. But what about two other inherently related costs—the cost of energy and the costs of transportation? Transportation costs, when you boil it down, are really about how one gets to and from one’s home given where it is located and the kind of urban form that surrounds it. And energy costs are about the size of the home and its systems (energy, building envelope, electrical) and maintaining the those systems to ensure a minimal level of comfort with maximum efficiency. So if we expand the affordability framework for understanding housing affordability to include energy and transportation, what does the affordability problem really look like, and what does that have to do with smart growth and the environment?

Housing costs continue to cause fundamental shifts in patterns of development. Wealthy suburbs beyond central cities and inner-ring suburbs contribute to leap frog development as lower and moderate income households leave the cities looking for newer and/or larger housing but need to look further and further out until they can find a home price they can afford. The departure by higher income households and middle income households to the outer rings and exurban areas is continuing to contribute to the decline of inner-ring suburbs and central cities, and the continued development of farm and forested land.

The following section will quantify this development and the impact it is having on the environment and households. In addition to the loss of rural land and open space as more land is developed on the urban fringe, these development patterns also create greater emissions from more vehicles and more miles driven per year per household, and disruption to wildlife habitats and water quality from more roads and infrastructure.

Larger homes in these developing areas, which is possible because of the lower land costs, drives additional energy use per household. The environmental impact of home energy use comes in many ways. The generation of electricity in the United States varies by region, but the dominant fuels used are coal, nuclear, natural gas and hydroelectric. Each has its own environmental issues. Nuclear power on the other hand does not have the same air quality impacts, but the hazards of radioactive

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<sup>2</sup> [http://www.nhc.org/pdf/pub\\_nc\\_land\\_04\\_05.pdf](http://www.nhc.org/pdf/pub_nc_land_04_05.pdf)

<sup>3</sup> State of the Nation’s Housing 2006, Table A-6,  
[http://www.jchs.harvard.edu/publications/markets/son2006/son2006\\_appendix\\_tables.xls](http://www.jchs.harvard.edu/publications/markets/son2006/son2006_appendix_tables.xls)

materials, problems in its disposal, and the risk of accidents are all open issues, generating much debate. Natural gas is arguably the cleanest of fossil fuels and is used for both electricity generation and for heating, but there are ongoing controversies over where to drill for it.

## I. Impacts on Family Finances and Well-being & the Environment

For low income households, transportation, energy, and housing consume more than half their expenditures each year. With earnings from \$10,000 to \$20,000 a year, that leaves less than \$1,000 a month for food, healthcare, phone, education, housekeeping supplies, and many other items that range from every day basics to savings for retirement. But, expenditures do vary, especially when a household has choices; e.g. the ability to use transit more than a private vehicle; living in a large or small, or efficient or inefficient home or apartment; and whether or not affordable housing is available. These “choices” or options not only have budgetary impacts for households, but they also directly affect the environment: transit, efficient homes, and affordable housing in existing places all have better environmental outcomes than their alternatives. The purpose of this paper is to highlight the opportunities to support programs, regulations, advocacy, and changes to urban form that would lead to dual positive outcomes from more efficient and affordable choices for households.

### *Transportation and Energy Impacts on Family Finances and Well-being*

Transportation costs are the second highest household expenditure after total housing costs. Housing, including utilities, operations, and furnishings in 2004 was on average 32.1 percent of household expenditures, with utilities consuming 6.7 percent of this total. Transportation, for the same households surveyed in the annual Bureau of Labor Statistics Consumer Expenditure Survey, was another 18 percent of expenditures. Combined, housing, utilities, and transportation were at least 50 percent of expenditures for households earning less than \$70,000 in the 28 regions surveyed annually by BLS.

**Table 1**

2004 Expenditures by Income Quintiles					
	Lowest	2nd	3 <sup>rd</sup>	4th	5th
<b>Income before taxes</b>	<b>\$9,168</b>	<b>\$24,102</b>	<b>\$41,614</b>	<b>\$65,100</b>	<b>\$132,158</b>
Housing (without utilities)	28.3	26	25	24.3	25.3
Transportation*	14.7	18.3	18.5	19.5	17.4
Utilities	9.6	8.7	7.8	6.6	5.1
<b>% of Expenditures on Housing, Transportation, Energy</b>	<b>52.6</b>	<b>53</b>	<b>51.3</b>	<b>50.4</b>	<b>47.8</b>

Note: Transportation costs here are a combined average of households that use more transit or more autos, which masks the variation.

**Figure 1 - SIDEBAR**

Some indicators of “urban form” include:

- Households/residential acre
- Households/total acre
- Average block size (indicates a walk-able neighborhood)
- Transit connectivity and access
- Distance to employment centers
- Job density
- Access to amenities

These indicators are used in a new transportation cost model developed by CNT and CTOD.

Perhaps contrary to popular belief, how much households spend on transportation is not solely a function of income or household size, though these play a role. Even more of a factor in determining costs are urban form characteristics like households per residential acre average block size and distance to job centers.<sup>4</sup> This was shown in an extensive study of millions of households in three major metropolitan areas. Researchers found a statistically significant relationship to urban form and density and VMT and auto ownership. (See Figure 2). Despite having this proven information – that a slight increase in

density results in lower auto ownership, there has been only a mild response. In the 2005 Census, two the fastest growing counties in the country were those on the urban fringe while many inner ring counties, where household get by with fewer cars and miles each year, continue to loose population.

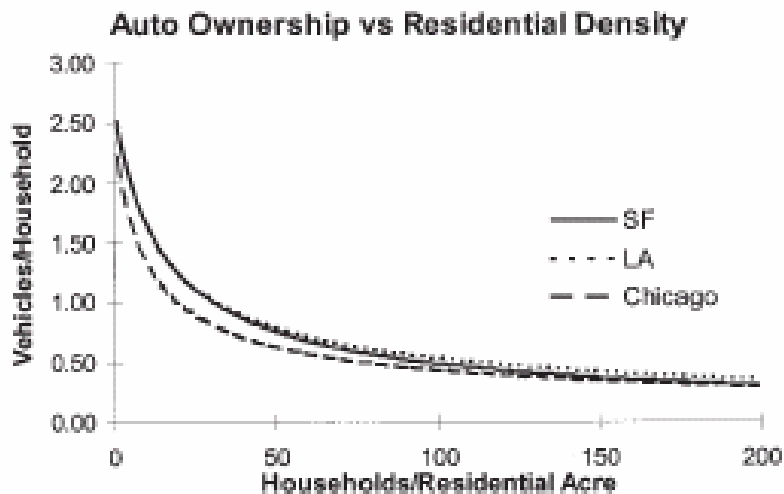
**Figure 2**

FIGURE 4 The reduction in vehicles per household as residential density increases.

In a recent CNN/Gallup Poll, 69 percent of respondents said that the rise in gas prices was causing them hardship. Of that 69 percent, 23 percent said that hardship was severe, while another 46

<sup>4</sup> 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.

percent said that it was moderate.<sup>5</sup> Transportation costs are of course not just about the price of gas, though even modest rises can imperil households already having a hard time trying to make ends meet, an annual increase from \$1,000 to \$2,000 per year means an extra \$100 per month. It is the price of gas that has been getting much attention in recent months, but what really drives transportation costs is how many cars a household needs in the first place, and secondarily, how much they need to drive them. This is where the urban form characteristics come in.

In two studies using the detailed individual survey responses from the Consumer Expenditure Survey, the Economic Policy Institute and Public Policy Institute of California found low income households paid from between \$440 per year and \$2800 per year on transportation. The difference was whether the household was predominantly a transit user or a vehicle user. If auto ownership is highly correlated with density, as the LEM study showed, then so is transit. Hence, urban form—particularly when it supports transit, plays a large role in transportation expenditures; a \$2,400 a year difference for these sampled households.

Since urban form is such a key determinant, it makes sense that expenditures vary by place and not just by income. We found significant differences in regions with good transit systems and higher densities than those with little or no transit and low densities. Consider the differences between New York, Tampa, San Francisco, and Kansas City in the table below.

**Table 2**

Sample Variation in Transportation Expenditures by Region			
Region	Transit Commute Share	Average Residential Density of Tracts	Transportation as % of Income
New York, CMSA	31%	16.24	16%
Tampa MSA	4%	2.5	25%
San Francisco, CMSA	14%	6.52	15%
Kansas City MSA	3%	2.14	23%

Because location drives both housing prices and transportation costs, but in opposite directions, when housing and transportation costs are combined, it's difficult for a lower income household to attain both at a moderate cost. For example, in a study for the Center for Housing Policy on housing/transportation trade-offs of working households in 28 metropolitan areas, a homeowner earning between \$35,000 and \$50,000 with an 12.1 mile one-way commute in a place approximately 31 miles out from the central city of the region, was spending 23.7 percent of income on housing in 2000 (U.S. Census 2000). A homeowner with the same income but in a place approximately 9 miles from the central city and a 7.4-mile one-way commute was spending 24.8 percent on housing. The range in a region like Washington, D.C., was 28 percent on housing further out and 29 percent closer in near suburban job centers. Here, housing as a percent of income is largely a factor of location. Because transportation costs typically move in opposite directions, one would not be surprised that further out, this household would pay 27 percent on transportation and close in would pay 18 to 24 percent. In D.C., a place with a large transit system and good commute share,

<sup>5</sup> CNN Poll based on interviews with 1,012 adult Americans conducted by telephone by Opinion Research Corporation on April 21-23, 2006. The margin of sampling error is +/- 3 percent.

<http://i.a.cnn.net/cnn/2006/images/04/24/re111a.pdf>.

transportation costs are significantly lower for the closer in households. In Tampa, however, a place not shaped by transit, the transportation costs are not much better closer in, 22 percent, than further out, 25 to 28 percent, although housing is 20 to 21 percent in close in and far out places. What this comparison doesn't include however, is the type and size of housing.

In the same 28 metro study, which uses a sample size that accounted for 47 percent of the entire U.S. population in 2000<sup>6</sup>, to characterize the burden of housing and transportation costs on households and regions, the researchers developed a typology of neighborhoods based on how much households living in each neighborhood spent on housing and transportation costs. The four neighborhood types are: 1) places with high housing costs, 2) high transportation costs, 3) high housing *and* high transportation costs, or 4) low housing and low transportation costs. Current households and their expenditures as a percentage of income were used, rather than the costs of the neighborhood in order to show current burden. However, these four types therefore do not whether the costs are high or low from the urban form of that place or because the incomes are low. Each of the four neighborhoods has implications for this paper. Neighborhoods two, three and four all have high transportation costs because residents are forced to drive more and own more cars to access jobs and amenities and neighborhood type one has very high housing costs which eventually pushes households to further out locations in the region which then creates more environmental impacts and it comes with higher transportation costs.

While all four have consequences for households and the environment, the high transportation cost exurban communities are those that pose the greatest challenge to smart growth efforts. The average distance from the nearest central city of these communities is 31 miles. While the housing stock is generally affordable by traditional measures, transportation costs are exceptionally high, accounting for 23 percent of income on average, and 30 to 40 percent of income for households earning \$20,000 to \$50,000. If these percentages seem high for just transportation, consider the costs of a Marathon gas station manager recently profiled in an in-depth Chicago Tribune article on gasoline.<sup>7</sup> Michelle Vargo, the store manager, drives 40 miles one way from her home in Lockport, Ill., which is a city of with high transportation cost neighborhoods in which 93 percent of workers drive alone to work and 83 percent work outside of Lockport, to South Elgin. Her vehicle is a Chevrolet Suburban that gets 10 miles per gallon. Earning just \$2100 a month after taxes, despite working 11-hour shifts, being on call most evenings, and holding the store management position, she spends 25 percent of her take-home pay just on gasoline. Add in auto payments, insurance, maintenance, and other vehicle fees and her transportation costs very quickly rise to 30 to 40 percent of her income.

Michelle Vargo's high transportation cost situation, and that of at least 9.4 million other households in the 28 study regions, are in large part a result of these communities being located so far away from their regions' major employment centers. The average distance to an employment center from these neighborhoods is over fifteen miles, between two and four times the distance as all other neighborhoods. It's also a factor of the urban form—residents of these neighborhood types live in mostly low-density subdivisions where housing is the only use and to access a grocery store or other typical need, they need to travel at least a mile, if not five to ten miles, and therefore use a car. In these neighborhoods, the average median household income is just over \$50,000, poverty and

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<sup>6</sup> Center for Neighborhood Technology and Virginia Tech. "Housing & Transportation Cost Trade-offs and Burdens of Working Households in 28 Metros". Center for Housing Policy, Washington, D.C., forthcoming October 2006.

<sup>7</sup> Paul Salopek, Brenda Kilianski, and Kuni Takahashi. "Special Report: Twilight of the Oil Age", Chicago Tribune, Section 2, Sunday, July 30, 2006.

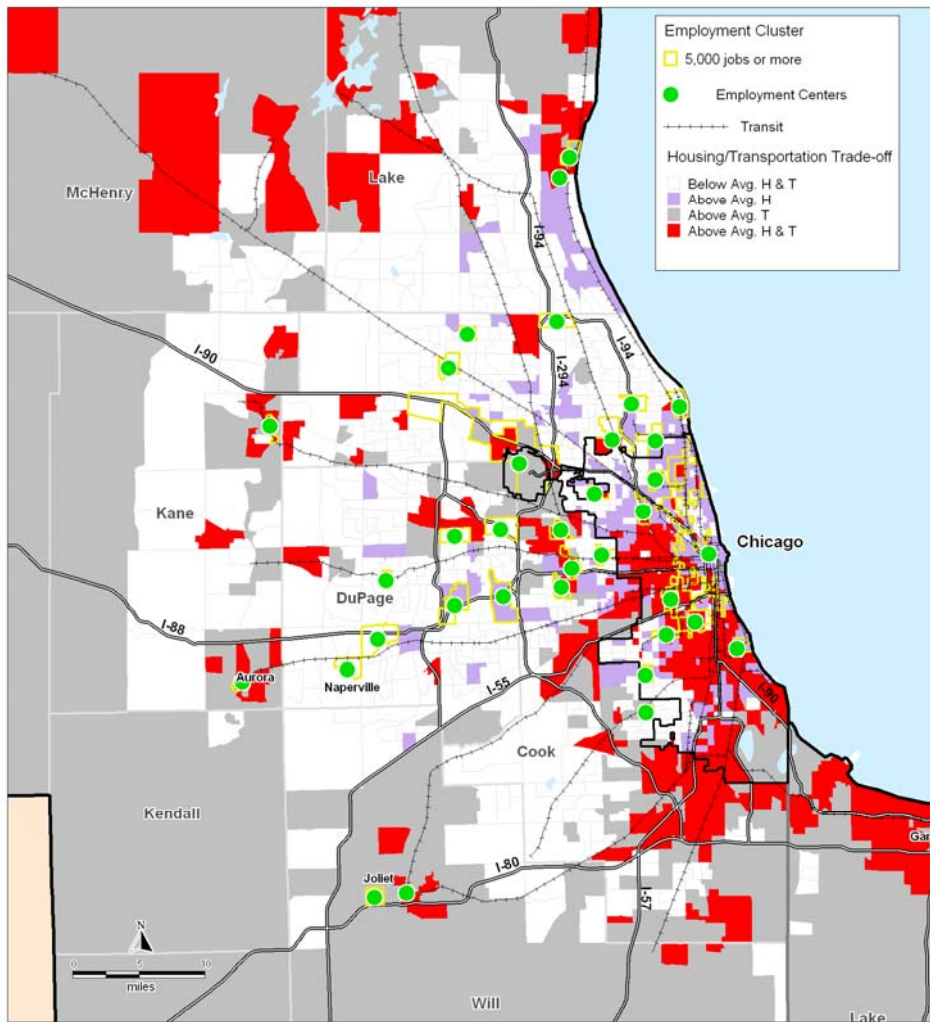
unemployment rates are very low, and car ownership rates are very high—almost 2 cars per household. The median year of housing is 1969 in these neighborhoods, and 17 percent have been built since 1990, which is twice the rate of housing built since 1990 in the city and inner ring suburban neighborhoods.

The other neighborhoods with high transportation costs as a percentage of income are typically inner ring suburban neighborhoods. Twenty-six percent of households in the regions we studied live in these communities, where the average median household income is almost \$32,000, the lowest of the four neighborhood types in inner ring suburbs. These neighborhoods tend to have high rates of unemployment and poverty, high rates of single-family housing units and low rates of car ownership. On both the indicators of distance to the nearest central city and nearest employment center, these communities fall in the middle. Housing and transportation account for 59 percent of income on average. While these neighborhoods are often closer to the central city, since they are typically inner-ring suburbs, they are also more distant from major employment centers and they lack neighborhood services that were once a walking distance away. When jobs and household began to leave these areas for other suburbs, more households and jobs followed, other jobs went overseas, and eventually even local retail declined.

As an illustration of the spatial distribution of these types of neighborhoods, a map of Chicago is used. The neighborhoods where moderate and low income households experience high housing and high transportation costs mostly cluster in the poorer parts of the region, covering much of the south and west city and older suburban communities. The High Transportation areas fill the outskirts of the region. Note the lack of employment centers in either of these neighborhood types.

Figure 3

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.

**Table 3**

<b>Energy Use and Land Consumption by H+T Neighborhood Type in 28 Regions</b>				
	Expensive H, Low T High Density urban	Expensive H&T Middle ring suburbs)	Expensive T, Moderate H Exurban	Moderate H, Moderate to Expensive T Inner-ring
% of HHS in 28 Regions	17%	36%	26%	20%
HHs / Sq. Mi	2700	532	501	84
<b>Costs to Households</b>				
Avg. Annual VMT/HH	15,057	23,589	18,232	25,686
Annual Cost of VMT at \$3/gal	\$1656	\$2595	\$2005	\$2825
Avg. Commute Distance	7.4 miles	8.3 miles	8.3 miles	12.1 miles
<b>Environmental Impacts</b>				
Aggregate Annual VMT	130,711,552,880	439,839,700,035	245,288,661,600	268,659,411,458
% of Total VMT in 28 regions	12%	41%	23%	25%
% of Land Area	2%	18%	14%	66%
% Built since 1990	10%	18%	9%	17%
Land Area (acres)	3,215	35,009	26,851	124,359

As the table shows, households living in the urban and inner ring areas house 43 percent of the population on 6 percent of the land, whereas the 38 percent of households living in the middle-ring suburbs and exurbs are on 84 percent of the land (net of water), and contribute 66 percent of the total vehicle miles driven in the region and the pollution and congestion that comes with it.

A key relationship among these neighborhoods are the push and pull factors of housing prices and housing quality and convenience based on their locations and the level of investment in the area. Households moving to high transportation places are often in search of good housing and schools, and recognize they're trading off housing for convenience; they're not necessarily seeking long commutes and to be 30 or more miles from the central city. Improving the housing affordability in central cities and the housing quality in inner-ring suburbs will help lower and moderate income households looking for more housing choice to stay closer in and therefore have lower transportation costs, contribute less to sprawl, and consume less gasoline and oil.

## Energy Impacts on Family Finances and Well-Being

The primary factors that influence a household's energy budget are use and price, and unfortunately both are rising. Households may have some control over their energy use behavior, but energy price varies considerably with demand, weather and regulatory environment- all of which are increasingly volatile. The variability of these factors makes energy costs a significant household budget component that is difficult to quantify. For households whose discretionary income is small and depend on fixed and/or known household costs, energy cost volatility is especially troublesome

**Figure 4**

ENERGY USE	X	ENERGY PRICES	=	HOUSEHOLD ENERGY COSTS
<b>Rising due to home size, AC units, poorly maintained systems and buildings, and greater use of electronics</b>		<b>Rising due to weather events, increased demand, state regulation, depletion of fuels</b>		<b>Rising due to both greater use and higher prices</b>

### Energy Use

Similar to transportation, household energy costs are driven not just by household size and income but by where and how we live; the types buildings we occupy, our geographical location, and our behavior. For households nationally, 44 percent of home energy costs are spent on heating and cooling. Total energy costs for households earning \$30,000 were approximately \$2000 in 2004. Homes vary greatly in size, age, construction and geographical location, but in general, the following is true: larger homes use more energy than smaller ones, newer homes are built with advanced efficiency technologies than older ones but bigger size often drives up total costs; and energy costs vary by location.<sup>8</sup>

One of the major trends influencing energy use in the United States is increasing home size, even as household size decreases. Energy consumption is correlated to home size. A household living in a single family home with 2,047 square feet of heated space will consume 51.5 million btu per household, while an 1,197 square foot apartment in a 2-4 unit building will consume 44.2 million btu per household and similarly a 785 square feet apartment in an apartment building with 5+ units will consume 14.8 million btu per household.<sup>9</sup> This range in total btu shows how home size and economics vary together and that energy intensity per household is not necessarily related to the building's occupants, but to the building's size – a factor that unlike the weather or markets, is not volatile and therefore can be addressed by technology.

The average U.S. single family home size has increased to 2,434 square feet in 2005 compared to 1,520 square feet in 1971. Nearly a quarter of these new homes are larger than 3,000 square feet, up from 13 percent just a decade ago.<sup>10</sup> This means households are spending more of their income to heat and cool more space.

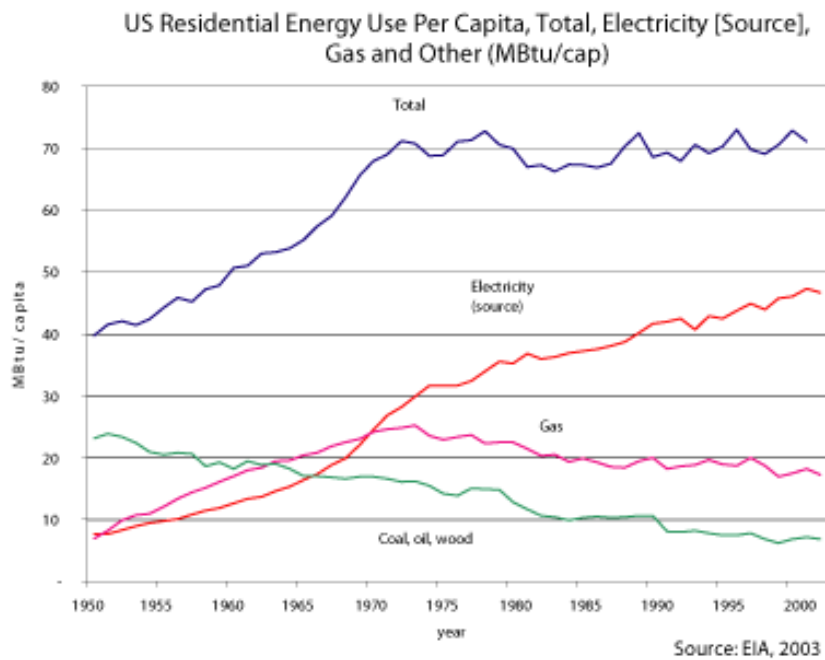
<sup>8</sup> For example, home heating is more important in Northern states than Southern states, and similarly, home cooling is a more dominant energy demand issue in the South

<sup>9</sup> Average for All Heated Households-Heated Square Footage (HSF) per Household, Table CE2-4c. Space-Heating Energy Consumption in U.S. Households by Type of Housing Unit, 2001. Energy Information Administration, of the 2001 Residential Energy Consumption Survey.

<sup>10</sup> US Bureau of the Census, C-25. Compiled by National Association of HomeBuilders Economics Group, 2006.

Also, 89 percent of new homes are now built with central air conditioning, compared to 36 percent in 1971. The increase in air conditioner use has had a significant impact on the increase in peak electrical demand,<sup>11</sup> demand that is increasingly being met by natural gas. The chart below (Figure 3) shows the dramatic rise in electricity use from 1950 to 2000; millions of btu per capita went from less than 10 to more than 45.

**Figure 5**

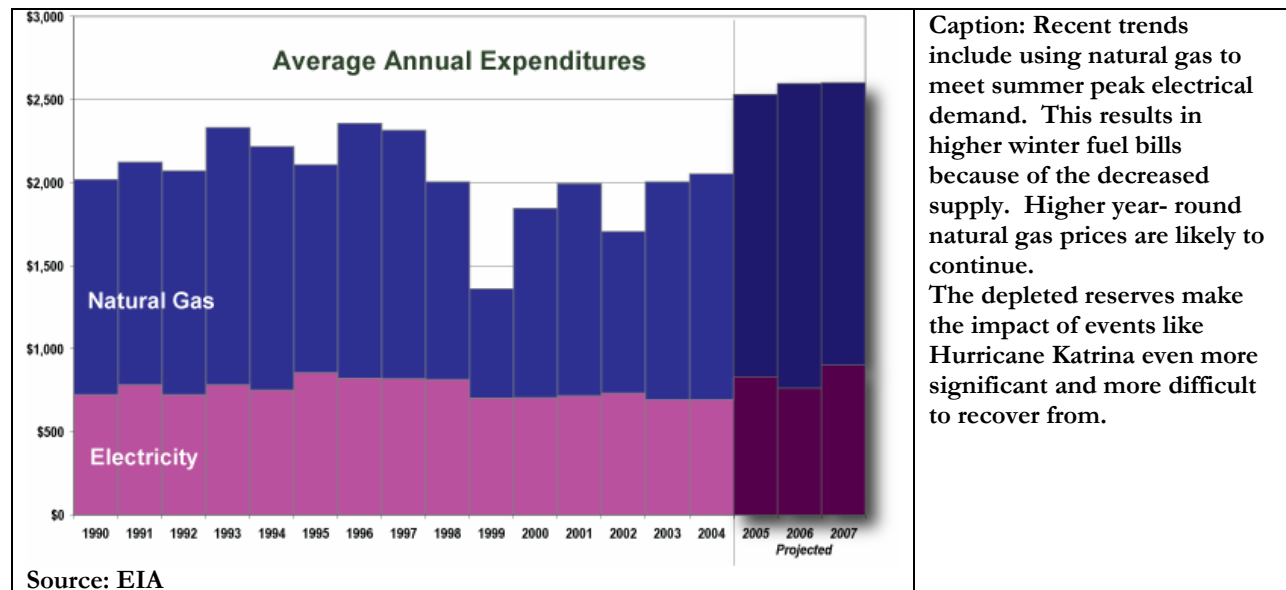


**Caption:** The rate of electricity use growth is due in part to increased air conditioning use.

And projections show this trend of rising electricity use continuing. (Figure 4)

<sup>11</sup> Peak electrical demand is defined as the highest electricity requirement in any given time period, (eg an hour, day, month, year.)

Figure 6



**Caption: Recent trends include using natural gas to meet summer peak electrical demand. This results in higher winter fuel bills because of the decreased supply. Higher year-round natural gas prices are likely to continue. The depleted reserves make the impact of events like Hurricane Katrina even more significant and more difficult to recover from.**

Another impact of the trend towards larger homes and greater electricity use is the increase in the amount of electronics. Computers and their peripherals, televisions (especially plasma TVs), multiple refrigerators or freezers and the numerous rechargeable appliances considerably add to households' monthly energy bills. The costs increase as incomes rise, but for all households, expenditures on lighting, refrigeration and other electrical appliances account for another 43% of energy use.

### Energy Prices

In recent years across the United States as a whole, energy prices are rising and are unlikely to decrease significantly. However, the impacts of rising prices are felt differently regionally. Some of the factors that affect energy price are:

- Severe weather (prolonged cold and hot spells from global warming);
- Type of fuel (natural gas vs oil or electricity); and
- State regulatory policy (whether or not consumers are paying true cost of energy).

Weather impacts are different regionally. As mentioned earlier, cold winters combined with high natural gas and fuel oil price increases will have more impact on households in the North than the South, and likewise increasing summer temperatures and rising electric prices have a greater impact in the South.

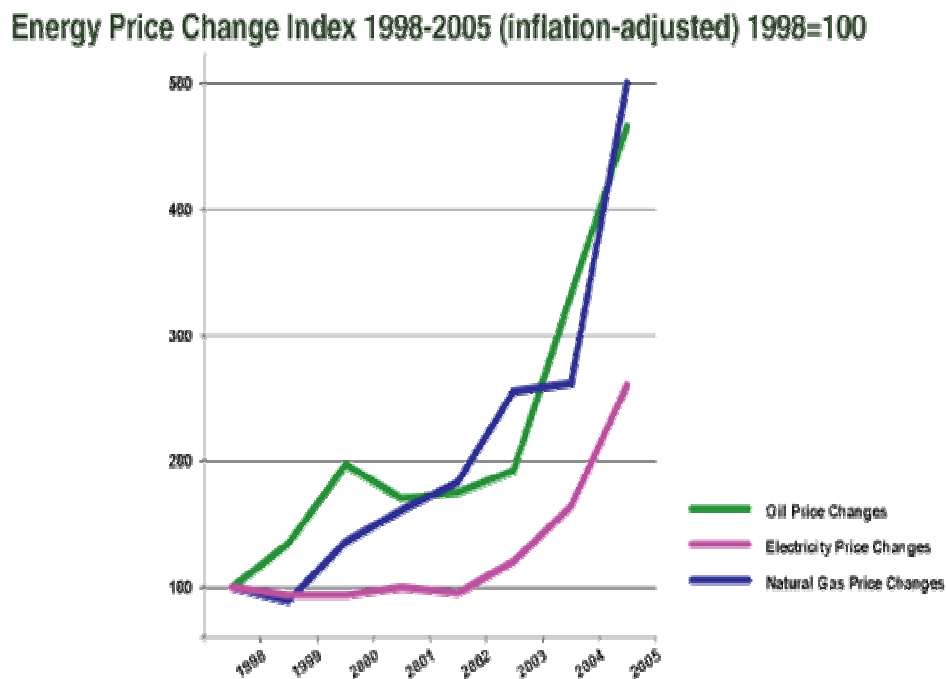
Unlike gas or oil, electricity cannot be stored for any length of time. Electricity must be generated on demand. Blackouts and higher than average prices occur when electrical infrastructure cannot generate enough power to meet peak demand. Often, this occurs on extremely hot summer afternoons during prolonged periods of extreme weather. Global warming will continue to cause more volatile weather patterns and extreme temperature variations. This will lead to the need to upgrade power equipments and distribution grids to enhance system reliability, the costs of which will likely be passed on to consumers.

Disruptions in production through catastrophes such as war or hurricanes obviously impact energy prices, but the impacts are incident specific and cannot be generalized. Our focus in this paper is to talk about the very real known events that are causing the general trend upward and therefore can be addressed directly or indirectly; larger homes, more demand, older poorly maintained buildings, more sprawl, more extreme weather volatility.

The United States also regulates utility prices at the state level, which has created a patchwork quilt of policies. Some states have deregulated both natural gas and electricity, some states just one, and some states both. As a result, the extent to which consumers see prices change varies greatly. Additional factors that impact the cost of natural gas and electricity will be specific utility company business practices, and the regional variation in types of fuels used.

From 2000-2005 the average natural gas price has increased 65 percent and ranged from 5.73 in Alaska to 30.94 in Hawaii in 2005.<sup>12</sup> Electricity prices also vary greatly regionally, by utility not just by state. Prices ranged in July 2006 from 5.87 cents/kWh from Dalton Utilities in Georgia to 21.15 cents/kWh from San Diego Gas and Electric.<sup>13</sup> Approximately 50 percent of households use natural gas as their primary fuel, 38 percent of households use electricity and the 12 percent use fuel oil, kerosene or liquid propane gas.

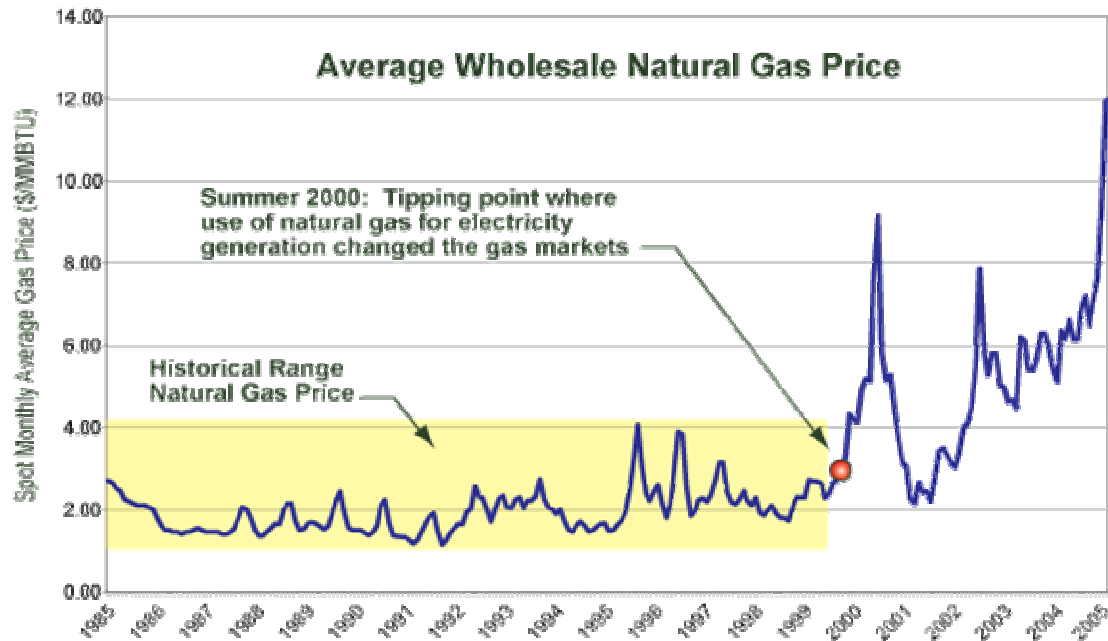
**Figure 7**



<sup>12</sup> 2005 prices not available for Utah and Delaware. Energy Information – need full reference

<sup>13</sup> JEA Residential Retail Survey, Restructuring Today, July 27, 2006.

Figure 8



### Rising Use Combined with Rising Prices Results in Higher Bills

Rising energy prices have a significant impact on working families. For example, in the Chicago region, where 1.4 million households earn less than \$50,000 per year, rising energy prices plus stagnant wages effectively acted as a pay cut over the last 3 years. From 2002 to 2005, workers earning approximately \$35,000 in the Chicago region saw pay increases of approximately \$500-\$600. At the same time however, natural gas and electricity prices increased \$825, or 2.3 percent more income. The net result was a pay decrease of \$242.

Table 4

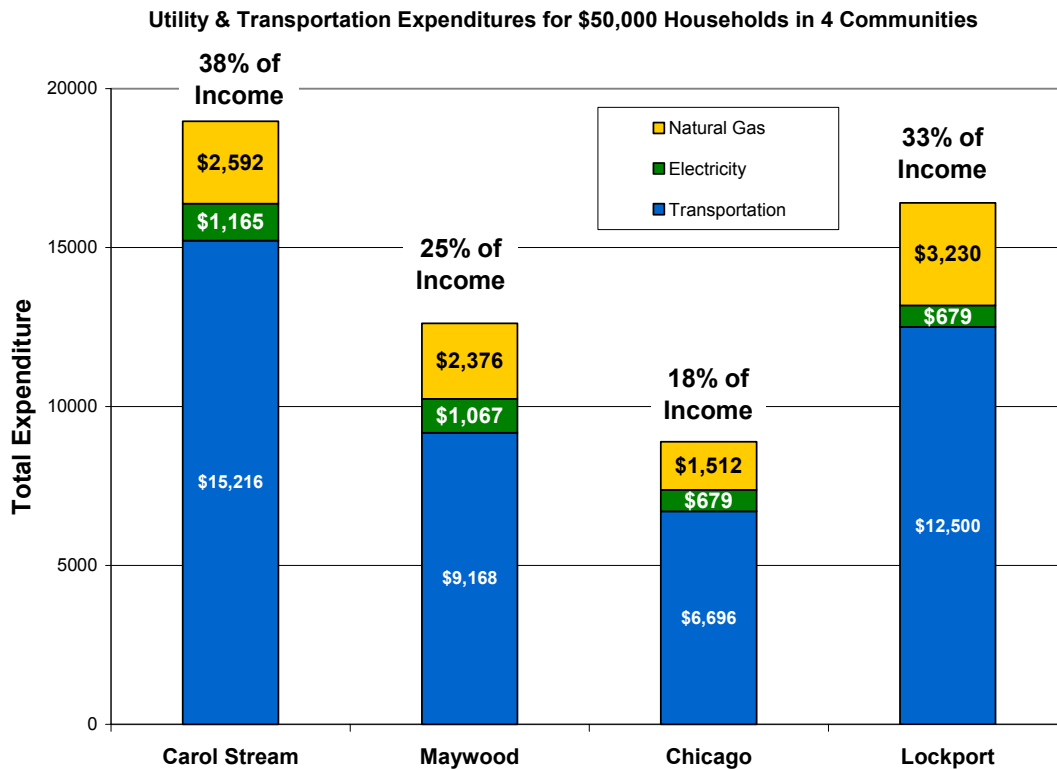
Year	Before Tax Annual Wage	Energy Expenses (natural gas, electricity)	Energy Costs as a % of Income	Wages After Energy Bills
2002	\$35,214	\$1,706	4.8%	\$33,508
2004	\$35,506	\$2,053	5.8%	\$33,453
2005	\$35,797	\$2,531	7.1%	\$33,266
Change 2002-2005	+\$583	+825	+2.3%	-\$242

Source:

## Housing, Transportation and Energy

Adding the energy cost of gasoline again links increased energy costs to how and where we live. Compare the energy costs for a household of three with two workers earning \$50,000 per year in four types of cities in the Chicago region.<sup>14</sup> Carol Stream is a middle-ring suburb with higher household incomes and little transit, Maywood is an older inner ring suburb with commuter rail and good connecting bus service, Lockport is a growing community in one of the fastest growing counties in the country, and the city of Chicago has a mix of neighborhoods and housing prices, but generally very good public transit and the highest densities of all four places.

Figure 9



<sup>14</sup> 80 percent of AMI

## **Impacts on the Environment**

The proliferation of high transportation cost neighborhoods is in essence the proliferation of sprawl and inefficient development because of a lack of affordable and moderately priced new construction in developed areas, just as the maintenance of high expenditure neighborhoods, as a percentage of incomes, in inner-ring areas is the maintenance of disinvestment and concentrated poverty and a missed opportunity for realizing more efficient development.

The environmental impact of energy use from homes comes in many ways. The generation of electricity in the United States varies by region, but the dominant fuels used are coal, nuclear, natural gas and hydroelectric. Each has its own environmental issues. Coal contributes to a variety of greenhouse gases and mercury output. While new generations of coal plants are envisioned that will be much cleaner, such technology is still in its infancy and has not yet been proven to be environmentally friendly or cost effective. Nuclear power on the other hand does not have the same air quality impacts, but the hazards of radioactive materials, problems in its disposal, and the risk of accidents are all open issues, generating much debate. Natural gas is arguably the cleanest of fossil fuels and is used for both electricity generation and for heating. When used in peaker plants to generate power during hot summer afternoons, it is typically burned very inefficiently, leading to excess consumption. An additional issue with natural gas is the ongoing controversies over where it can be drilled for.

Beyond the obvious impact of reducing consumption as a means to reduce pollution, an additional environmental impact of housing is the materials used, and their overall life cycle. New construction may be somewhat more efficient in energy use per square foot, but since new homes are larger than the home replace, and almost always use new materials, they create an environmental strain on our forests and other sources of raw materials.

Looking ahead, if the low housing costs/high transportation costs keep growing and more households take on daily 20 mile commutes, from larger homes while energy sources decline, prices will continue to rise and factors contributing to global warming will only increase.

## **II. Seeking Change**

### ***Barriers***

The trends described in the first section are a result of many factors that present barriers to change; inadequate funding for community reinvestment and energy rehab, market forces for business and housing growth operating independently from the separate silos of energy planning, air travel planning, and other modes of transportation; lack of real-time and complete information on total costs and potential savings, and the perpetual motion of providing short term fixes on annual appropriations rather than long term savings.

We've outlined specific barriers to reducing household transportation costs and energy costs according to these factors, as well as hopeful signs that the market, public sector, and consumers are ready for programs that could be taken to scale that would have both economic and environmental benefits.

## Lack of Funding for Community Reinvestment

Like many local governments, inner-ring and older suburbs are strapped for cash. Additionally, because they're not growing like the outer suburbs, and likely haven't had the opportunity of updating zoning codes and impact fees with the latest smart growth codes, or to reverse changes many inner-ring suburbs made in the 1970s to feel even more suburban, such as increasing parking ratios and lowering residential densities, these communities are also less equipped to respond to or to solicit developers. Many don't employ full-time planners, and they lack the cash to hire planning firms to help them update their codes, market their cities, do a land inventory, or even to write grants for environmental cleanup. Developers and large retailers or employers that are used to meeting with cities at the national shopping center conferences in Las Vegas and other major cities each year, and that can generally find what they want and need to know, e.g. land available, costs, impact and hook-up fees, etc. on most cities websites, aren't as in tune with these older cities as they are with the towns or places in the fastest growing counties on the outer edges of regions. As a result, the new towns continue to see development and the tax revenue that comes with it while the older communities lose businesses, residents, and employers.

Yet, there are numerous examples of inner ring cities like Evanston and Oak Park in Illinois, Silver Spring, Maryland and Royal Oak, Michigan that have shown inner-ring suburbs are still viable, can be revived, have more room for development, and can even have stable city finances to fund schools, infrastructure improvements, affordable housing, and good planning. But of course, these are the exception. Most others lack the capacity to plan and many do not have sophisticated finance departments. Recognizing the fiscal crises of local governments, and the need for public financing to accompany planning and economic development plans, the Government Finance Officers Association (GFOA) is launching a campaign to make Public Finance be a key component of economic development.<sup>15</sup> Their goal is to be involved in the early stages of economic development plans so more plans have adequate funding to actually become a reality. Groups like GFOA and the Urban Land Institute can provide some technical assistance to cities and neighborhoods in need, but they still need a long-term source of funding to ensure they have the capacity to implement economic development plans, which can take ten years or more.

## Lack of Funding for Energy Rehab

Because funding for energy rehab has few dedicated sources, there are many split incentives and disincentives for implementing them, a few of these follow.

### *Split incentives for developers and owners – private market*

Improving the energy efficiency performance in the multifamily housing market is complicated, especially in the rental market. Builders and owners may find it difficult to justify the incremental cost of adding efficiency measures. Or, owners whose tenants pay utility costs realize no gain from making improvements. Residents with short-term tenure have little interest and long-term residents often lack the financial means to improve a property's energy performance.

### *Unrecoverable costs in subsidized markets*

In subsidized markets, utility costs are often treated as project expenses and energy efficiency investment costs are often unrecoverable because as operating costs decrease, subsidies also decrease. Efficiency investments are often part of budgets which face many financing restrictions.

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<sup>15</sup> Interview with Executive Director, Illinois GFOA – need citation of initiative

*Incentives are fuel specific*

Many efficiency programs are funded and run through the local utilities. Therefore, a building manager or developer may be forced to apply to separate programs to implement energy efficiency improvements. The extra work of applying for each fuel deters many from bothering.

*Split incentives for utilities*

In some utility markets efficiency program costs are only recoverable through increased sales to cover their costs, so the utility has little incentive to encourage decreased customer energy consumption.

*Lack of uniformity in energy, building and zoning codes*

Building, zoning and energy efficiency codes are often under the purview of local municipalities that often lack the capacity to implement and enforce standards that would improve the energy performance of their building stock and economically benefit their residents.

*Cost-benefit analyses focus on first costs instead of long term costs*

- First costs of rehab make many rehabbers leave out energy efficiency components. The longer payback period for some efficiencies also makes them appear less cost efficient. As a result, multi-family buildings get rehabbed and the insulation is bad, the boilers aren't tuned, radiators are too large for rooms, windows are cheap without extra glazing, and the energy costs of the building – which get passed on to tenants, end up being much higher than necessary.<sup>16</sup>

## **Market Forces Independent of Energy Planning and Transportation Planning**

Job growth in the suburbs is a continual driving force of suburban development. It's not clear which moves further out first in every instance, but in the 28-region study 90 percent of the neighborhoods in the highest transportation cost areas were not near an employment center. This statistic implies that housing is preceding the jobs and the jobs that are created in these areas are dispersed, with fewer jobs at each site, making it difficult to plan transportation between these work sites and neighborhoods.

However, there are some major job centers that are concentrated and have hundreds if not thousands of workers but that cover massive areas and therefore are moving or planning to move to less dense areas, these include airports and large logistic facilities. As our demand for travel and imported goods grow, the demand for both of these facilities increase. However, there is little attention to how the growth and placement of airports and logistics parks affect energy consumption and other modes of travel. More and more regions are planning to expand their airports, build second or third airports, or move and expand their major airport, while they are also planning to build more highways or expand existing.<sup>17</sup> Yet, few regions are planning to improve their Amtrak service or to build high speed rail as a companion mode that could offload traffic from airports and roads. If airports continue to operate independently, they will seek larger footprints farther from city centers and without bus or rail connections. The 29 Large hub airports in the U.S.

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<sup>16</sup> Home Energy magazine, study of 402 rehabbed buildings in NYC of which only a few had energy improvements, 1999. A survey of New York City's low income multifamily buildings reveals distressingly high fuel uses for heating and domestic hot water. About 5% of these buildings had been recently rehabilitated--but not with energy conservation in mind. (HOME Magazine, 1999, F.L. Andrew Padian)

<sup>17</sup> cite – National airport plan NPAIS

on average occupy 3837 acres and are on average 10-15 miles from the central business district. When they need to expand or relocate, they're often looking for 4,000 acre sites – places really only available in places even further from central business districts.

Airport Hub Size and Count in U.S.	Average Total Acres
Small Hub (59)	1354
Medium Hub (39)	2263
Large Hub (29)	3837

While some argue that stalling airport growth would cause major lost economic opportunities some regions are seeing the benefit of diverting both road and air travel to high, or higher, speed rail, such as California, the Northeast Corridor, Florida, Ohio, and the Pacific Northwest. Currently, at least 40 percent of flights at commercial airports are under 400 miles.<sup>18</sup> These are trips that could be diverted from airports and highways, freeing up gate space at airports and lane miles on roads. At scale, high speed rail could reduce the need to expand some if not all airports as well as major highways. Rail is also much more energy efficient and contributes less to green house gases per passenger than auto and plane. High Speed Rail efforts in more regions need greater support to build more diverse memberships, lobby congress, and to move their feasibility analysis to the EIS and engineering phase so they can compete with the better funded and institutionalized long-range planning for airports.

### Lack of Real-time Information

Many consumers simply don't pay attention to things in their home and how they could reduce their energy costs, which would also reduce the rate of energy consumption and coal burning. In the 1970s, people seemed to be more energy conscious and children grew up knowing to "turn off the lights." Today, households and building managers don't have the right and current information to perform the basic maintenance checks around their homes and buildings to ensure optimal efficiency, such as checking the HVAC system regularly, changing filters, and repairing seals around doors and windows.

Except for the price of gas, which is updated everyday on signs everywhere, most households don't add up their total transportation costs or equate them with household location when they're planning to move. Instead, households focus on time of travel and the characteristics of housing.

### Hopeful Signs

For each of these barriers, though, there are programs and trends starting to move in the opposite direction. "First suburbs" coalitions<sup>19</sup> are addressing the needs of inner-ring suburbs through technical assistance and advocacy, some cities are considering revenue sharing from new development, and retailers and homebuilders are looking inward to cities and inner suburbs as new markets. Innovative state-led energy funds are providing assistance and funding that removes the split incentives. Transit is in a building boom and responding to a growing share of the population demanding more travel choice. Rising energy prices and consumer demand for environmentally conscious products are influencing building standards and products. New information tools on transportation costs and energy costs are getting enthusiastic responses.

<sup>18</sup> OAG database by CNT for Reconnecting America

<sup>19</sup> A term coined by a series of Brookings Institution studies ... need full cite

## Retailers and Home Builders Looking Back to Cities and Inner-ring Suburbs

According to some industry experts on retail development, the Home Depots, and Bed Bath & Beyond retailers, a.k.a. “The Big Box” retailers, have, in many places, exhausted the supply of greenfield sites for development.<sup>20</sup> As a result, they’re scouting central cities and inner-ring suburbs for old industrial areas, or defunct strip malls in search of “new” sites. This is good for greenfield and farm preservation, and potentially for inner ring suburbs, but there are some challenges. 1) Many inner-ring suburbs and cities, starved for sales tax dollars and jobs, are not prepared to negotiate with the retailers to get a good product that is more fitting to their urban form. As a result, the retailers will build the same model that they put in elsewhere; cheap materials, seas of parking in the front, and huge footprints that make it virtually impossible to walk to. 2) By locating on land that was industrial, it decreases or eliminates the chance the land could be returned to manufacturing or assembly jobs that pay higher wages than most retail jobs. 3) Many of the sites will have high costs to develop and it’s not always clear who will shoulder the cost of assembling the land, environmental remediation, and updating the infrastructure if necessary. With guidance, however, on how to negotiate better and more efficient building design, green parking lots, and even higher wages or community benefits agreements that require existing residents get first preference, inner-ring suburbs could use this new interest to their advantage.

The towns of Mount Pleasant and Racine, Wis., are working together to develop the unincorporated land nearby in order to plan their area more efficiently. Although Mt. Pleasant will actually annex the land, the two cities have a revenue sharing agreement on the new development that will occur. As such, they’re sharing resources for the planning effort, which includes where truck traffic is routed through each community, etc.

### *First Suburbs Coalitions – Kansas City Home Builders*

Fueled by reports from the Brookings Institution and Myron Orfield, inner-ring suburbs in multiple regions have formed coalitions to address their needs collaboratively. An interesting example exists in the Kansas City region where the planning departments and the Home Builders Association created a first suburbs coalition to rehab post-war II housing from 3 bedrooms with 1 small bath and few closets to 2 bedrooms, 2-bath, including master baths plus updated kitchens, and are teaching small builders how to do this affordably. They’re hoping to attract empty nesters, single first time home buyers, and small families to these areas in an effort to revitalize these areas and to reduce sprawl.

## Market Forces - Public Transit is Gaining Ground

Fueled by congestion, gas prices, and more and more households seeking convenience, a shorter commute, and more livable communities, in the last decade or more, transit has been in a building boom and ridership is on the rise. In 2000, there were 3,252 fixed-guideway transit stations in 25 regions in the United States.<sup>21</sup> By 2005, there were already close to 100 more stations in an additional 7 regions, and the growth isn’t over. At least an additional 720 stations and 10 new transit systems are being proposed for the coming years. These stations are a part of mass transit network stretching from coast to coast, in what will be 42 regions of the country.

<sup>20</sup> Presentation to Blue Island Plan Commission by ULI panel members, July 2006.

<sup>21</sup> Fixed-guideway stations are those that are a part of rail and bus rapid transit and streetcar systems. Typical bus systems are not included.

The presence of transit stations, and households living in the ½ mile zones around them (transit zones) are a hopeful sign and a strategy worth promoting. The travel behaviors and the housing density is much more sustainable and affordable than neighborhoods outside these zones. When we measure the “performance” of these zones, in terms of their economic and environmental impact, we look at things like the number of households that commute by transit, walking or biking, the number of households that live in the half mile area, or the density, the range of incomes and racial diversity and how well it represents the income and racial diversity in the region, the value of property, and the mix of uses.

Not surprising, commuting to work by transit is significantly different for transit zone households than for all households in regions: 45 percent of workers in transit zones commute by transit compared to 14 percent of workers in the regions, and in many zones the difference is even greater. Households in transit zones also own very few cars: over three-fourths of households have one car or less. This could be attributed to lower incomes and smaller households sizes, which are characteristics of many transit zone households, but not completely. The households in the transit zones are not three-fourths low income, so many moderate and high income households are getting by without a car, or just one car. Additionally, households of one or two working adults, demographics that are common in transit zones, often own one or two cars, respectively, if they are *not* living near transit but these same households often own 0 or 1 car if they live in a transit zone.

The size of the transit system in a region matters however. The larger it is, the more connecting bus service it has, and the more households that live near transit, the better the performance. The number of workers commuting by transit, walking or biking is highest in the five “Extensive” transit systems at an average of 49 percent. In New York, 61 percent of workers in transit zones overall commute by public transit, walking or biking. The area with the next greatest percentage of workers commuting by non-auto means is Washington, D.C., with 41 percent. Medium transit systems have the lowest average of non-auto commuters—19 percent—compared to 25 percent in the small systems and 30 percent in the medium systems.

### **Market Forces are Driving Energy Codes and Voluntary Standards**

California was the first state to enact energy code legislation in 1978 and its customized Title 24 requirements are recognized as the most stringent and effective standards nationally. Its building efficiency standards (along with those for energy efficient appliances) have saved more than \$56 billion in electricity and natural gas costs since 1978. It is estimated the standards will save an additional \$23 billion by 2013.<sup>22</sup>

Voluntary standards such as the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) Rating System and ENERGY STAR are improving building performance in both the public and private markets. More than 2,500 office buildings, schools, hospitals, and public buildings, earned EPA’s ENERGY STAR for superior energy and environmental performance in 2005.<sup>23</sup> According to the New York Times, there are more than 4600 LEED registered projects. Both these rating systems are voluntary and often increase project costs but builders and companies are following them knowing that they’ll reduce energy costs in the long run, provide better environments for building occupants, and act as an additional feature when selling the building.

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<sup>22</sup> <http://www.energy.ca.gov/title24/>

<sup>23</sup> [http://www.energystar.gov/index.cfm?c=news.nr\\_news](http://www.energystar.gov/index.cfm?c=news.nr_news)

## State Led Energy Efficiency Programs

Oregon and Vermont are models for producing high performance energy efficient buildings because each of these states combines codes and voluntary standards for building construction into an integrated energy efficiency strategy. They combine policies with innovative programming made possible through consistent energy efficiency funding mechanisms.

### *Efficiency Vermont: Multifamily Low-Income Program - Vermont*

Initially developed in 1997 through a Rebuild America grant from the DOE, since March, 2000 the program has been operating from an Energy Efficiency Utility (EEU) charge on all Vermont electric bills. The program is operated by an independent, non-profit organization under contract to the Vermont Public Service Board and targets low-income multifamily buildings (both new and existing) of 5 units or more under a single owner.

The program provides education, financial and technical assistance, including energy audits, appliance/lighting/HVAC rebates, design checklist for construction or rehab, and interim and post-construction inspections.

### *Multifamily Home Energy Savings Program - Oregon*

The program is managed in partnership with the Energy Trust of Oregon and targets Multifamily dwellings of five or more units on a single site and PGE, Pacific Power or NW Natural customers. The program provides property owners with cash incentives for purchasing and installing energy efficient weatherization measures, such as upgraded HVAC, new energy efficient windows; ceiling, floor and wall insulation. From the start of the program 1997-2003, program has addressed 6,000 residential units.

## Information Driving Change

### *Information on neighborhood household transportation costs*

A new tool, the Housing and Transportation Affordability Index, funded by Brookings Institution Urban Markets Initiative and created by Center for Neighborhood Technology and Center for TOD has been received with remarkable enthusiasm. Urban and Transportation Planners, from the private and public sectors and non-profit community developers are seeing the value of having both transportation costs and housing costs at the neighborhood level. The tool will be released for 50 regions via the web by March 2007. Regions are encouraged to use the information to better plan the location of affordable housing, as additional selection criteria for transit route planning, e.g. will the new line reduce household transportation costs, and as information provided by realtors and apartment finders.

### *Giving consumers access to information and competitive market efficiencies*

As energy prices rise steadily or when prices are volatile, households, especially lower income households, typically lack the information and tools to control their energy costs. Unlike almost every other product we consume, the quantity of energy we consume use unseen and is not paid for at the time of use. Currently, energy bills are the main source of information consumers have about their energy usage and this disconnect makes it difficult for households to understand what could be done to change energy usage to control costs. In addition, most electric bills are hard to read and contain obscure line items, and are in units of measurement that are not familiar. Energy bills also

change because of weather in ways that are not well understood by most people. As a result bills are almost useless as a tool for customers who want to change their usage. Additionally, many households are not paying the market cost of energy because utilities in many states are either regulated or in varying state of deregulation.<sup>24</sup> But as more states enter a deregulated energy market, consumer access to timely, accurate and pertinent energy cost information is vital to help households manage their energy use and costs.

Innovative tools and programs already exist to give households access to pertinent information allowing them to make individual energy saving decisions. Some of these tools use technology such as two-way communicating thermostats and meters, which have shown to be effective, but implementing advanced technologies at scale requires time and making them cost-effective remains a challenge. An innovative program in northern Illinois uses price signals to give residential electricity consumers incentives to cut electricity use during periods of high peak demand.<sup>25</sup>

The Energy-Smart Pricing Plan<sup>SM</sup> (ESPP), launched in 2003 by the Community Energy Cooperative in Chicago is the nation's first residential, market-based, hourly electricity pricing program. Third party evaluations of this program have found significant demand response. While this is typically measured as an elasticity of demand to price, it is more easily understood in illustrative examples. Last summer on the hottest weekday, July 25, participants as a group cut their peak demand by 15 percent. For ESPP participants who were equipped with central air conditioner cycling switches that controlled the air conditioner compressors for short periods of time, peak demand was cut by over 20 percent. Participants find value in ESPP because they receive access to lower priced power during off peak times, and even during on-peak times when demand is relatively low and prices stay low. The combined value of those prices plus the impact of demand response has led to savings for participants and at scale will make the electric system operate more efficiently, reliably and at lower costs. Pending the result of ongoing state ratemaking proceedings, the program will continue and expand statewide beginning in January of 2007 and is expected to grow to 70,000 households over the next three years.

#### *Information on Transit*

The City of Portland conducted the demonstration of an individualized marketing campaign to promote transit, TravelSmart. The TravelSmart premise is that with targeted customized information and training, consumers will change their travel patterns. Findings indicate that the program has been a success. While transit trips increased 24 percent in the control area, they increased 44 percent in the TravelSmart area. Trips also became more focused on the local areas with 10 percent more trips within the target area, meaning that more people stayed within their local neighborhood. Auto trips declined 9 percent in focus area.<sup>26</sup>

<sup>24</sup> Insert more info about deregulation in states and examples.

<sup>25</sup> Many energy efficiency experts and economists recommend price signals as a strategy to link access to information and behavior change. Needs references

<sup>26</sup> <http://www.portlandonline.com/transportation/index.cfm?c=dgdha>

### III. Taking Advantage of the Desire for Change

We laid out two typologies that drive transportation and energy costs:

Transportation	Energy
Household Density Proximity to Jobs Proximity to services and amenities Walkability of a neighborhood Availability of transit	Weather Regulation Use Efficiencies of home systems (envelope, HVAC, lighting, electronics, etc.)

Of the above items, only weather is out of everyone's control. A few others would take intensive sources, mainly weather, and other's are up to the individual, e.g. energy use and making use of transit when it exists, but other items can be improved through innovative programs and with more funding and policy advocacy, e.g. planning for and attracting jobs and services to disinvested areas to reduce household's needs to make long trips outside of neighborhood for daily needs and work, improving the walkability of neighborhoods and allowing greater densities and a mix of uses, and increasing transit. On the energy side, improving efficiencies in existing buildings through simple low cost improvements to the building envelope and HVAC systems as well as more advanced higher cost technologies. Even use can be influenced by innovative programs that help to change individuals behaviors, as the Portland TransitSmart study and the ESPP programs have shown.

#### **Recommendations**

There is no shortage of possible solutions to the housing/transportation/energy problem. Despite the variety of strategies and programs that have been tried in the past, the question that practitioners constantly struggle with, as do grantmakers, is scale. How do we really make a large-scale difference? Given limited resources, of both money and capacity why invest here and not there? The most promising programs to date can be grouped into four categories:

1. **Advocacy for Policy Change:** Fund advocacy efforts for policy changes that will increase or change government expenditures that will make long term improvements to household costs and the environment
2. **Repair existing structures and neighborhoods:** Fund smart growth planning efforts in inner-ring suburbs and central cities and the planning and creation of State led Energy Efficiency Programs like the Vermont Energy Fund as a compliment to annual energy subsidy programs that help to pay energy bills
3. **Information:** Fund social marketing and information programs so all market actors and the public sector has the right information to make informed choices

The following table lists some specific examples of programs that fall into the above areas.

**Table 5**

	<b>Regulated or Encouraged by Govt.</b>	<b>Example</b>	<b>Market and Non-Profit</b>	<b>Example</b>
<b>Subsidized</b>	Utility Bill Payment Assistance fuel funds	LIHEAP	Brownfield redevelopment to mixed-use	Atlantic Station, Atlanta
	Subsidized mass transit (on both employee and employers sides)	Federal Tax-free transit and Transit Checks programs	Home renovation in inner-ring suburbs with tax incentives	KC 1 <sup>st</sup> Suburbs Coalition
	Improve quality and reach of mass transit	FTA New Starts Denver FasTracks program	Foundation funding for neighborhood and community planning	LISC New Communities Program, GVF CNT Blue Island/Harvey
			High Speed Rail Coalitions	All Aboard Ohio
<b>Performance Based</b>	Zoning, building codes to promote lower costs	CA Title 24	Group/cooperative purchasing for bulk discounts or insurance—is this H, T, or E related?	
	Regulatory mechanisms to promote housing/transport/energy synergies	Smart growth codes paired with efficient building codes and incentives for building near transit- MASS 40B and CA HIPS	Efficient Mortgage products	LEM, EEM
	Weatherization programs, e.g., Weatherization Assistance Program	Preservation Compact in IL  Vermont Residential Energy Efficiency Program (REEP)	Price Incentives	Chicago's Energy-Smart Pricing Plan
	Flexible state-level discretionary spending		Social Marketing	Portland's TravelSmart program
	Impact fees based on detailed cost of development studies	Impact fee consultants Robert Burchell at Rutgers	Jurisdictional incentive programs to reduce system marginal costs	
	Community College training programs on energy efficiency		Trade and Professional Associations assisting communities	ULI TAP, APA Task forces, GFOA
			Market first suburbs	Kansas City 1 <sup>st</sup> Suburbs Coalition

### Concluding Observations

The future for all households, and particularly low income households, holds an uncertain housing market, and rising energy prices. It is important to underscore this last point. Households—all of them, but especially lower-income ones—are not prepared for a world of high energy prices. While energy prices have spiked as result of Hurricane Katrina, the long-term forecast for gas, natural gas, and electricity does not hold a lot of promise for household economics. There is broad agreement by the experts that while prices may come down some in the near term once the situation in the Louisiana-Mississippi region stabilizes, high energy prices, relative to what we have come to enjoy in the last two decades, are here to stay. This threatens to increase our cost of living substantially and wipe out any gains in purchasing capacity we have also made in recent years.

Lowering transportation, energy and housing costs for households must have a locational component. This is especially obvious regarding transportation. Until we coordinate the siting of jobs, housing and, transportation, we'll continue to develop housing in places far from jobs and with little or no transportation options, thereby increasing dependence on autos and oil and the

development of undeveloped land. Cheaper land will also promote the development of larger homes, which cost more to heat, cool, light, and maintain and divert resources away from maintaining and reinvesting in existing buildings.

Funders interested in the economic security of households and/or the protection of our natural resources should find common cause in working together to lower household energy and transportation costs by supporting strategies that have economic and environmental benefits.