An aerial photograph of a suburban residential neighborhood, showing a mix of houses, trees, and streets. A prominent red rectangular overlay is centered on the image, containing white text. The text is arranged vertically, starting with a thin white horizontal line, followed by the words "Technical Report Series" in a serif font. Below this is the main title "WORKFORCE HOUSING" in a large, bold, sans-serif font. At the bottom of the red box, the words "METROPOLITAN PLANNING COMMISSION" are written in a smaller, all-caps, sans-serif font, with another thin white horizontal line below it.

Technical Report Series

WORKFORCE HOUSING

METROPOLITAN
PLANNING
COMMISSION

The Workforce Housing report examines challenges associated with providing adequate housing for Knox County’s working families. This assessment will characterize issues such as housing unit supply, affordability, condition, and transportation costs.

THE WORKFORCE HOUSING CHALLENGE

The ability to provide adequate housing for the working population is not a problem unique to Knox County, it is an issue across the country. Even with historically low mortgage rates and sufficient supply of housing units, workers are finding it difficult to purchase a suitable home or rent an affordable apartment close to their places of employment. Overall, employee wages are not growing fast enough to keep pace with the county’s rising housing costs.

AFFORDABLE HOUSING

According to the U.S. Department of Housing and Urban Development, a household is considered “cost burdened” when residents spend more than 30% of their monthly income on housing costs, including rent, mortgage payments, insurance, utilities, and taxes. But working families often overlook another important cost factor, transportation, when considering the true cost of a housing choice. When one or more members of the household must travel to work each day, transportation costs are an important consideration in a housing location.

Household Income and Housing Costs

From 2005 to 2015 home prices increased 9.8%, and rents grew 15.5% (Table 1). During the same time, household incomes rose only 2.3%. The disparity between household income and housing cost increases has led to more households considered “cost burdened.” In 2015, 20,156, or 17.4%, of Knox County owner-occupied households spent 30% or more of their monthly income on housing costs. Additionally, 27,119, or 46.2%, of renters spent 30% or more on housing.

Table 1.
Change in Household Income vs Change in Home Value and Gross Rent
Knox County, 2005-2015

Year	Median Household Income (2015 dollars)	Annual Change in Income (%)	Median Home Value (2015 dollars)	Annual Change in Home Value (%)	Median Gross Rent (2015 dollars)	Annual Change in Gross Rent (%)
2005	51,035		153,885		697	
2006	51,946	1.8	168,710	9.6	718	3.0
2007	51,396	-1.1	168,839	0.1	764	6.4
2008	50,279	-2.2	174,595	3.4	732	-4.2
2009	50,111	-0.3	172,899	-1.0	761	4.0
2010	47,402	-5.4	166,739	-3.6	766	0.7
2011	46,974	-0.9	161,742	-3.0	781	2.0
2012	47,690	1.5	162,489	0.5	789	1.0
2013	50,022	4.9	164,620	1.3	810	2.7
2014	46,916	-6.2	163,294	-0.8	791	-2.3
2015	52,229	11.3	168,900	3.4	805	1.8
2005-2015 Change		2.3		9.8		15.1

Source: MPC tabulations based on U.S. Census Bureau, 2015 American Community Survey 1-Year Estimates.

Figure 1.
Housing Costs as Percentage of Income

- Within HUD Standard (Affordable Housing)
- < 15%
- 15% - 30%

- Exceeds HUD Standard (Cost Burdened Housing)
- 31% - 45%
- 46% - 60%
- > 60%
- No Data

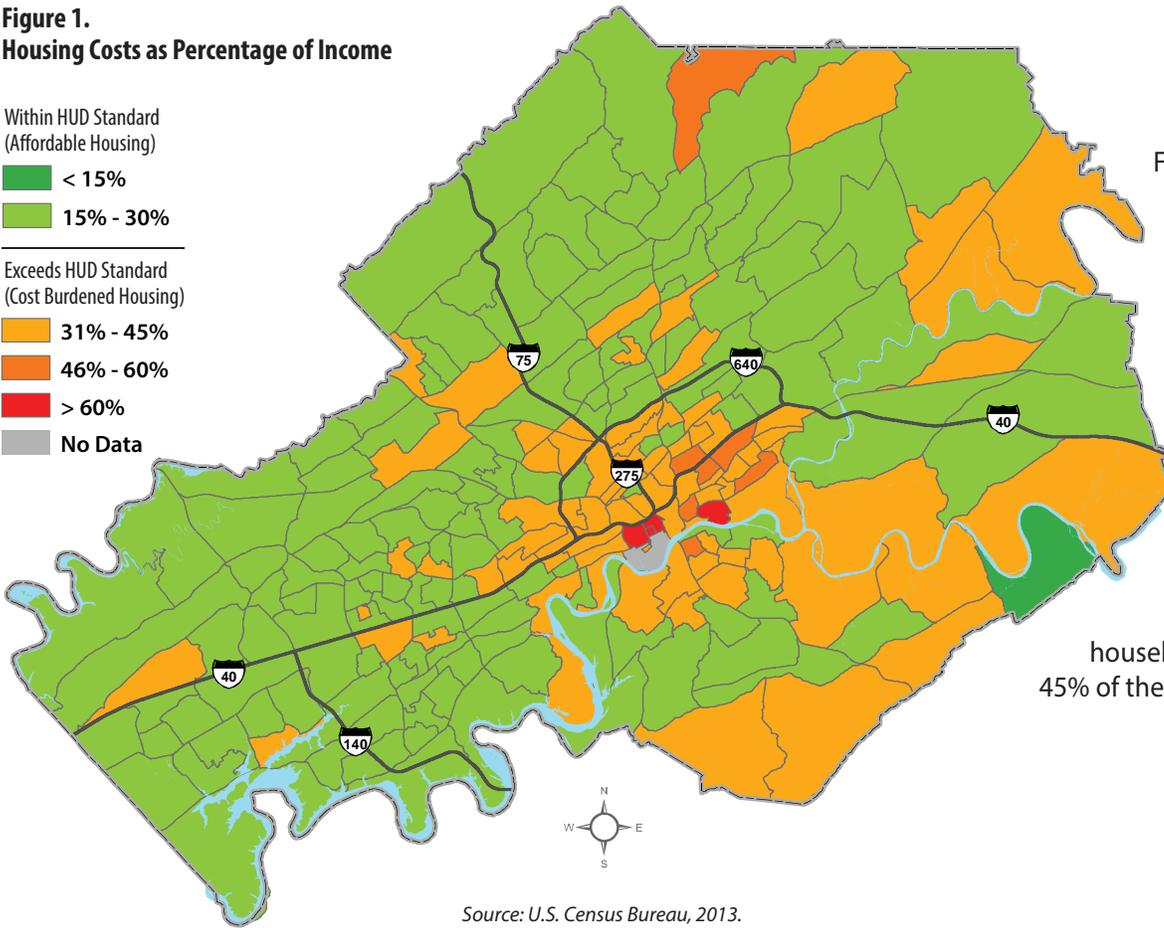
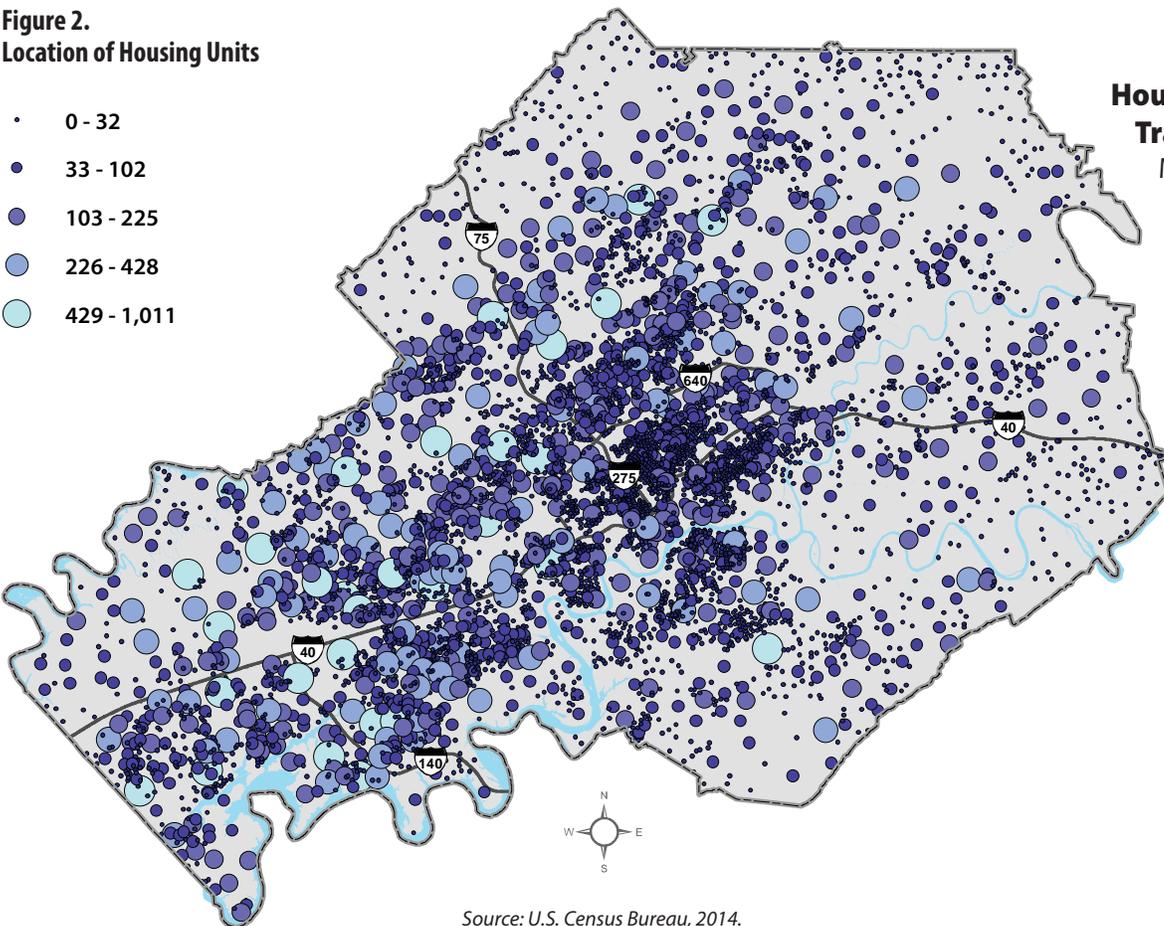


Figure 1 shows the location of the “cost burdened” households within Knox County, most of which are located in central and south portions of the county. The highest degree of burden can be seen in and around the center of Knoxville where many households spend more than 45% of their income on housing.

Source: U.S. Census Bureau, 2013.

Figure 2.
Location of Housing Units

- 0 - 32
- 33 - 102
- 103 - 225
- 226 - 428
- 429 - 1,011



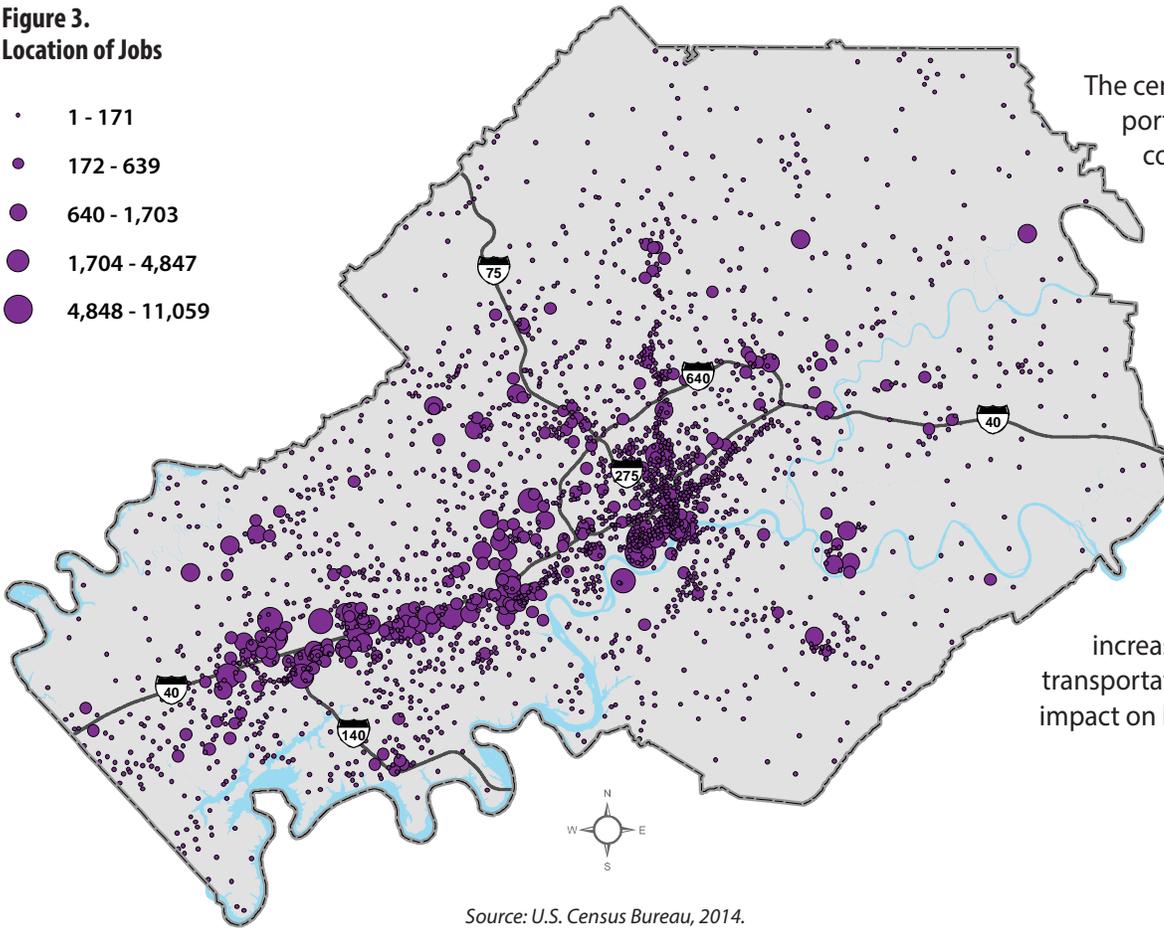
Household Income and Transportation Costs

Much of the residential development in Knox County has occurred in the central, north, and western parts of the county (Figure 2).

Source: U.S. Census Bureau, 2014.

Figure 3.
Location of Jobs

- 1 - 171
- 172 - 639
- 640 - 1,703
- 1,704 - 4,847
- 4,848 - 11,059



The central and western portions of the county also contain the most jobs (Figure 3). However, the employment centers are located closer to the interstate highways and major arterial roads, while housing is more dispersed. As more people move further away from employment centers, work commute distances increase, raising the cost of transportation and having an impact on housing affordability.

Source: U.S. Census Bureau, 2014.

Figure 4.
Transportation Costs as Percentage of Income

- Within CNT Standard
(Affordable Transportation)
- < 10%
 - 10% - 15%
-
- Exceeds CNT Standard
(Cost Burdened Transportation)
- 16% - 20%
 - 21% - 25%
 - > 25%

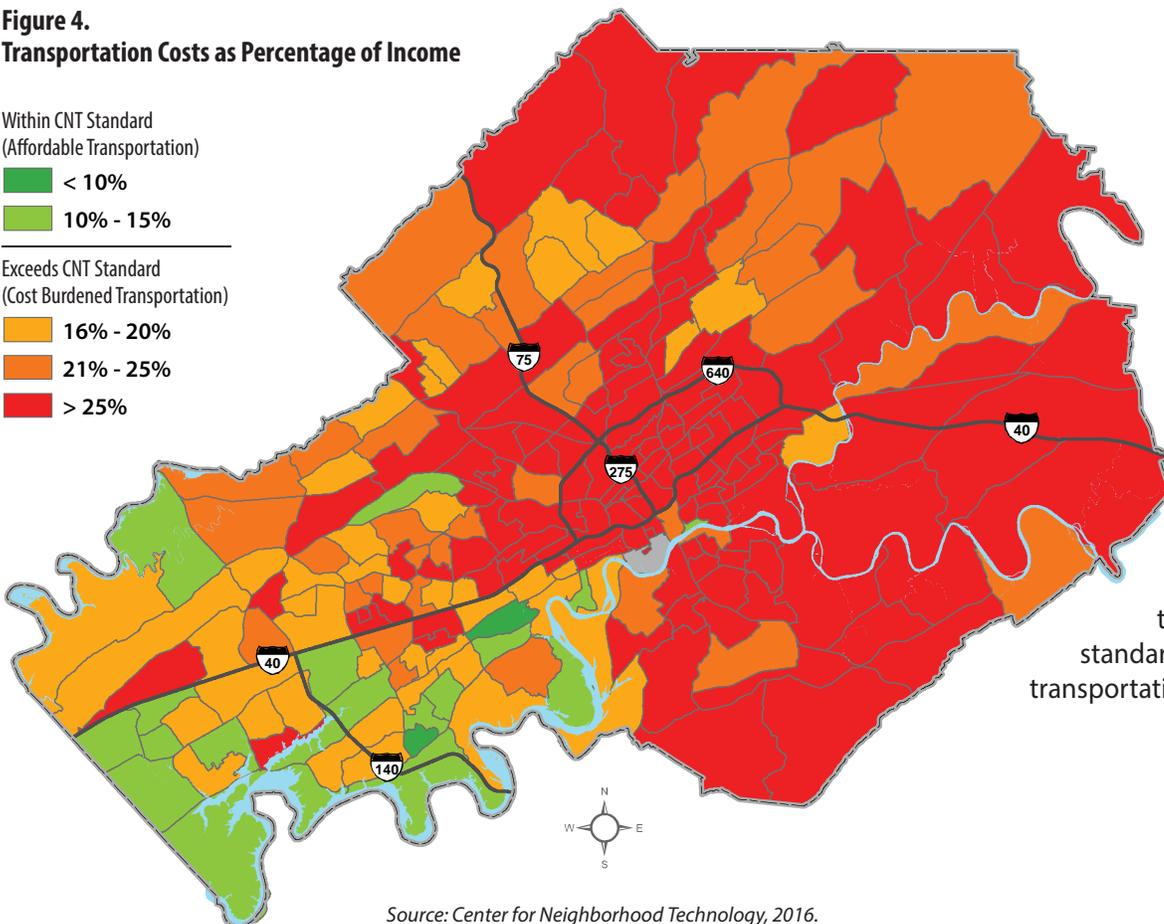


Figure 4 shows how much Knox County households spend on transportation as a percentage of income. Most households across the county, except more affluent neighborhoods in the southwest, spend much more than the recommended standard of 15% of income on transportation costs.

Source: Center for Neighborhood Technology, 2016.

HOW MUCH CAN HOMEOWNERS AND RENTERS AFFORD

One way to measure affordable housing is to apply a rule of thumb that recommends prospective homeowners aim for a house that costs 2 to 2.5 times gross annual salary (Sources: Mortgagecalculator.org, Investopedia.com, City-data.com). Applying the 2.5 multiplier guideline for owner occupied housing units and the 30% affordability rule for rentals, the local supply of affordable housing units is estimated (Table 2).

Table 2. Household Income and Available Housing - Knox County, 2015

Household Income Range	Affordable Purchase Price of Owner Occupied Unit	Affordable Monthly Rent of Renter Occupied Unit	Total Households	Supply of Owner Occupied Units	Supply of Renter Occupied Units	Total Supply of Housing Units	Deficit and Surplus
\$0 - \$9,999	\$0 - \$24,999	\$0 - \$249	14,368	2,534	3,117	5,651	-8,717
\$10,000 - \$19,999	\$25,000 - \$49,999	\$250 - \$499	16,804	2,121	5,938	8,059	-8,745
\$20,000 - \$29,999	\$50,000 - \$74,999	\$500 - \$749	21,067	6,532	15,568	22,100	1,033
\$30,000 - \$39,999	\$75,000 - \$99,999	\$750 - \$999	18,920	10,411	18,706	29,117	10,197
\$40,000 - \$49,999	\$100,000 - \$124,999	\$1,000 - \$1,249	15,099	11,178	10,011	21,189	6,090
\$50,000 - \$59,999	\$125,000 - \$149,999	\$1,250 - \$1,499	15,059	13,833	2,558	16,391	1,332
\$60,000 - \$74,999	\$150,000 - \$187,499	\$1,500 - \$1,874	18,842	20,290	2,267	22,557	3,715
\$75,000 - \$99,999	\$187,500 - \$249,999	\$1,875 - \$2,499	23,091	18,730	1,503	20,232	-2,859
\$100,000 - \$149,999	\$250,000 - \$374,999	\$2,500 - \$3,499	21,408	16,569	479	17,048	-4,361
\$150,000 and over	\$375,000 and over	\$3,500 and over	16,634	13,926	191	14,117	-2,518
Totals			181,292	116,122	*65,170	*181,292	

Notes: Rental affordability of households with \$149,999 income is \$3,749. Census data are not reported for that value. Next closest value is \$3,499.

*Total supply of renter occupied units includes inventory with no cash rent (4,832 units).

Source: MPC tabulations based on U.S. Census Bureau, 2015 American Community Survey 1-Year Estimates.

Table 2 shows there is a shortage of affordable housing supply for lower income groups (under \$19,999) and higher income groups (more than \$75,000). For lower income households, there are fewer affordable housing options, often leaving the only option to buy a more expensive house, requiring a higher portion of income dedicated to housing expenses. For highest income groups, the housing shortage is both a supply issue and a choice issue. They can afford more expensive housing if they choose (unlike lower income families that cannot afford to choose), but supply is short. Instead, they can

buy less expensive housing and thereby devote a lower percentage of income to housing costs.

For low and moderate income families homeownership provide a means of providing personal wealth. According to the National Association of Realtors, when families move into a dwelling unit that is energy efficient, structurally sound, and affordable, many positive changes occur: families frequently see improved health, higher educational attainment, and safety, in addition to accumulation of personal wealth.

Salaries of Working Families

Workforce housing is characterized as homes for families with one or more working adults. This includes housing for middle and moderate income residents, those earning between 60% and 120% of the area's median income, or \$31,337 and \$62,675 respectively. This covers a broad range of the workforce, like residents employed in education, healthcare, firefighting, law enforcement, and sales (Table 3). These workers play a pivotal role in the economic vitality and overall success of Knox County, but they often find that much of the existing housing stock in the county is priced beyond their financial means.

Table 3. Occupation by Median Earnings - Knox County, 2015

Occupation	Earnings
Education, training, and library occupations	\$40,689
Healthcare practitioners and technical occupations	\$46,314
Firefighting and prevention, and other protective service workers including supervisors	\$28,049
Law enforcement workers including supervisors	\$39,410
Sales and related occupations	\$23,352

Source: U.S. Census Bureau, 2015 American Community Survey 1-Year Estimates.

Local Supply and Demand Challenges

Knox County's housing inventory is not affordable to many working households because much of the supply is detached housing (133,882 units, or 66.8%) which tends to be more expensive. Developing new detached unit subdivisions, especially in greenfield areas, often leads to higher expenses associated with land acquisition, street construction, and utility extensions (Table 4).

Table 4. Units in Structure - Knox County, 2015

Units in Structure	Estimate	Share (%)
1-unit, detached	133,882	66.8
1-unit, attached	11,941	6.0
2 units	3,388	1.7
3 or more units	41,077	20.5
Mobile home, boat, RV, van, etc.	10,184	5.1
Total Housing Units	200,472	100

Source: U.S. Census Bureau, 2015 American Community Survey 1-Year Estimates.

As noted earlier, housing price increases have outpaced income gains. While Knox County's population has continued to grow over the past 15 years, resulting in increased demand for housing, delivery rates of new supply have not kept up. The imbalance between supply and demand has grown out of the housing crisis of 2008 and the very slow recovery in the housing construction and lending industries ever since. From 2005 to 2011 there was a decrease in building activity (Table 5). Since 2011, Knox County has seen only modest gains in new unit construction.

Table 5. Residential Building Permits by Type Knox County, 2000-2015

Year	Detached Dwelling	Multi Dwelling	Mobile Home	Attached Dwelling	Total
2000	1,924	869	321	403	3,517
2001	2,002	386	318	408	3,114
2002	2,122	516	362	478	3,478
2003	2,448	387	281	506	3,622
2004	2,494	1,092	225	656	4,467
2005	2,512	327	183	836	3,858
2006	2,402	833	187	763	4,185
2007	1,998	889	154	948	3,989
2008	1,127	613	102	290	2,132
2009	759	516	91	117	1,483
2010	781	818	97	80	1,776
2011	679	133	84	101	997
2012	867	562	88	72	1,589
2013	1,084	651	82	90	1,907
2014	1,113	1,112	93	125	2,443
2015	1,229	525	95	144	1,993

Source: Knoxville Knox County Metropolitan Planning Commission Development Activity Report, 2000-2015.

In 2010 Knox County experienced a disparity between the gain in housing units and growth in new household formation, marking the bottom of the detached dwelling unit building crash that began in 2008 (Table 6).

Table 6. Housing Units vs Household Formation Knox County, 2000-2015

Year	Housing Units	Households	Housing Units Gain	Households Gain	Difference
2000	171,439	157,872			
2005	186,871	169,413	15,432	11,541	3,891
2010	195,235	180,711	8,364	11,298	-2,934
2015	200,472	181,292	5,237	581	4,656

Source: U.S. Census Bureau, 2000 - 2015.

There is pent up demand for housing, as demonstrated in the area's low vacancy rates. In 2015, the vacancy rate for owner occupied housing was 2.3%, while the rate for rental housing was 6.4% (Table 7). Few vacancies in owner and renter occupied units reflect a market in which demand for units outpaces new supply delivery. As a result, the value of owner occupied units is climbing, as are monthly lease rates for apartments and other rental units.

Table 7. Housing Occupancy - Knox County, 2015

Housing Occupancy	2000	2010	2015
Total Housing Units	171,439	194,949	200,472
Occupied Housing Units	157,872	177,249	181,292
Vacant Housing Units	13,567	17,700	19,180
Homeowner Vacancy Rate (%)	2.5	3.1	2.3
Rental Vacancy Rate (%)	10.0	10.1	6.4

Source: U.S. Census Bureau, 2015 American Community Survey 1-Year Estimates.

Another contributing factor to local shortage of affordable housing is the fact that not all housing is suitable for human habitation. In 2015, more than 3,600 detached and condominium units in Knox County received an unsound/very poor/poor condition rating from the Property Assessor. Additionally, 37 local apartment buildings received such rating (Table 8).

Table 8. Residential Building Conditions - Knox County, 2015

Building Conditions	Detached and Condo Units	Apartment Buildings
Unsound/Very Poor/Poor	3,620	37
Fair/Average	56,490	2,207
Good/Very Good/Excellent	90,793	375

Source: Knox County Property Assessor, 2015.

THE NOT-SO-HIDDEN COSTS OF TRANSPORTATION AFFECT TOTAL HOUSING COST

Knox County comprises a large area, 526 square miles. Its dispersed housing development pattern results in an average commute of 22 minutes. Of those who commute daily to work, 92.8% do so in a privately owned vehicle (Table 9). Further, 84.9% of commuters drive alone to work. The costs of commuting alone are high. AAA estimates that the cost of owning and operating a personal automobile averages 58 cents per mile. That cost is comprised of fuel, insurance, maintenance, finance charges, and depreciation. Based on typical commuting habits, the average Knox area driver spends \$725 per month, or \$8,700 per year to operate a single vehicle. Double that for a family with two working adults, both driving alone to their jobs each day.

Table 9. Means of Transportation to Work - Knox County, 2015

<i>Means of Transportation</i>	<i>Workers</i>	<i>Share (%)</i>
Total Workers (16 years and over)	222,076	100.0
Car, truck, or van:	206,196	92.8
Drove alone	188,432	84.9
Carpooled	17,764	8.0
Public transportation	1,206	0.5
Other means	6,417	2.8
Worked at home	8,247	3.7

Source: 2015 American Community Survey 1-Year Estimates.



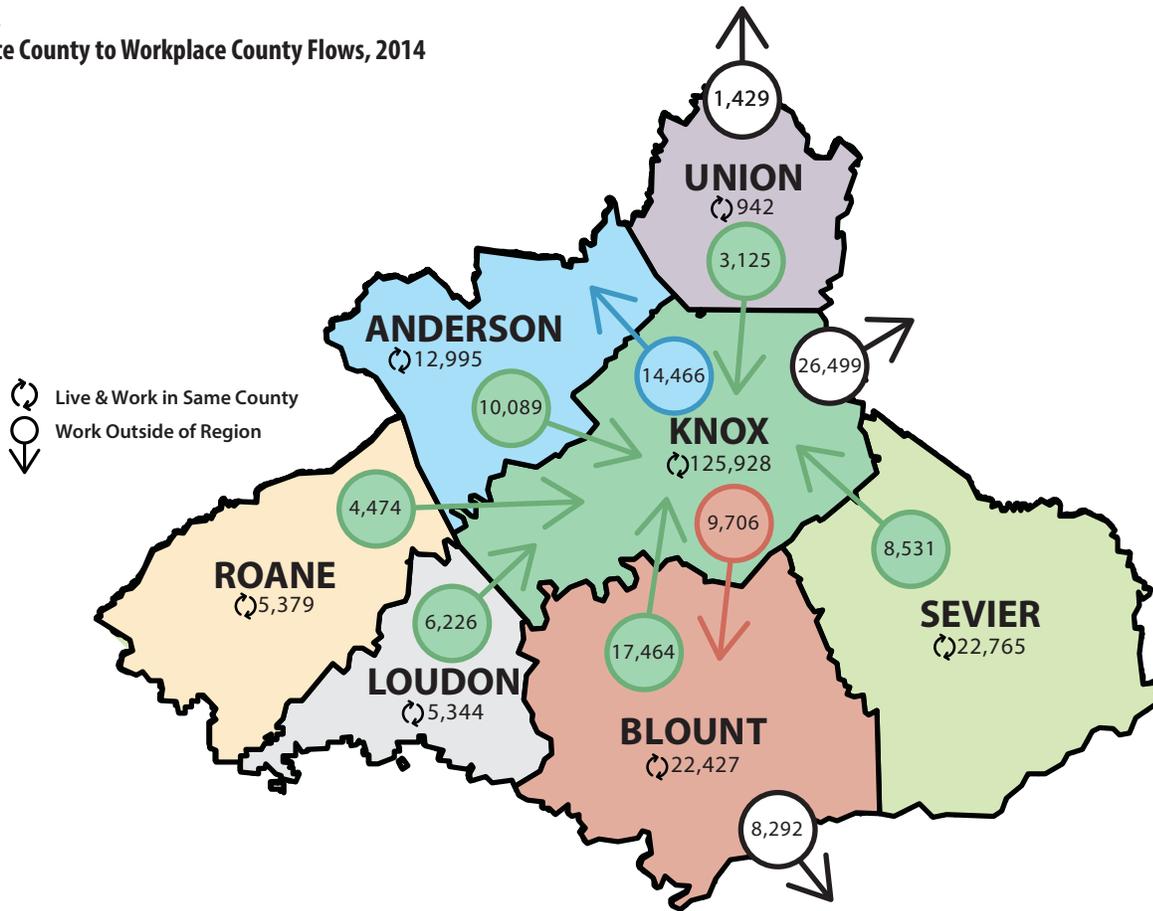
The estimated number of people that work in Knox County is 219,452 (Table 10). Of that total, 100,251, or 45%, live outside Knox County and commute into Knox to work each day. The top two counties generating commuting traffic into Knox are Blount (17,464) and Anderson counties (10,089) (Figure 5).

Table 10. Inflow/Outflow Job Counts (Primary Jobs) - Knox County, 2014

<i>Characteristic</i>	<i>Workers</i>	<i>Share (%)</i>
Employed in Knox County	219,452	100.0
Employed in Knox County but living outside Knox County	100,251	45.7
Employed in Knox County and living inside Knox County	119,201	54.3
Living in Knox County	178,544	100.0
Living in Knox County but employed outside Knox County	59,343	33.2
Living in and employed inside Knox County	119,201	66.8

Source: U.S. Census Bureau, OnTheMap, 2014 flow data, released 2016.

Figure 5.
Residence County to Workplace County Flows, 2014



Source: U.S. Census Bureau, OnTheMap, 2014 flow data, released 2016.

SUMMARY

In Knox County many working households are spending more money on housing and transportation than they can afford. The housing market is not supplying enough affordable units, so households have fewer choices and are often left spending more than 45% of their income on housing and transportation expenses.

Knox County is not alone in its workforce housing challenge. Other communities across the nation are confronting this issue by deploying planning and development tools. Urban Land Institute, for example, suggests measures such as encouraging below-market rate housing through tax incentive programs, planning new development closer to established employment centers, and promoting growth along transit corridors.