

CHILD POPULATION IN LOCAL HOUSING UNITS

The Relationship between Housing Characteristics and Rates of Child Population Growth

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For more information:

MPC Contact Person:

Terry Gilhula

215-2500

MPC Website and e-mail

www.knoxmpc.org

contact@knoxmpc.org

INTRODUCTION

Anyone who has ever attended a local planning commission meeting has heard the argument that new residential development will result in the addition of many children to a neighborhood, potentially straining public school resources. Sometimes that argument has merit, other times it may be overstated. While the construction of homes will attract new people, both from within and outside the community, the number of children will vary from case to case.

At the same time that new homes are going up, many existing units are bought and sold. Like new construction, the turnover of existing housing has an impact on population size and complexion as families move about the area. Again, the effects are often evaluated in terms of child population, especially those of school age. Home-sale flyers and real estate classified ads demonstrate the connection, often listing selected school zones among the selling points for homes.

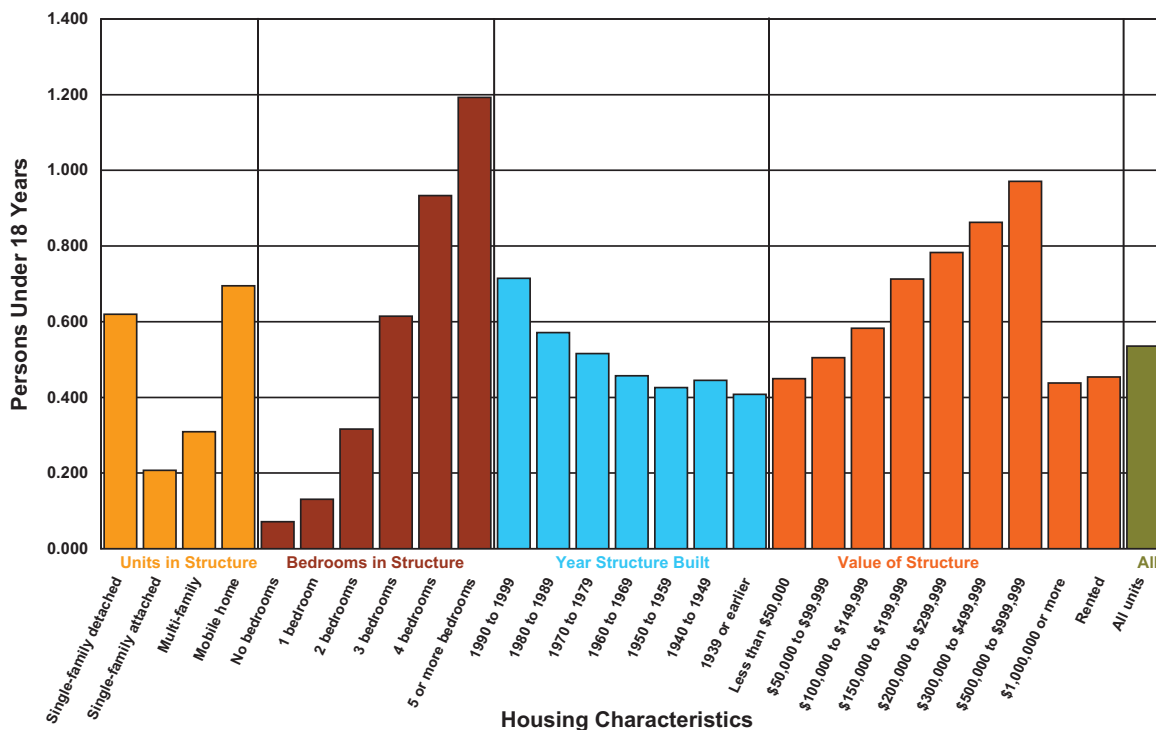
This report will examine housing characteristics that have an impact on child population generation rates in Knox County. Variables such as the number of units in a structure, the number of bedrooms in units, the age of units, and the value of units will be cross-tabulated with counts of the area's population under 18 years of age.

THE BIG PICTURE:

SUMMARY LOOK AT HOUSING CHARACTERISTICS AND CHILD POPULATION

Presented in Figure 1 is a summary of selected housing characteristics and associated child population generation rates.

Figure 1. CHILDREN PER HOUSING UNIT • KNOX COUNTY • 2000

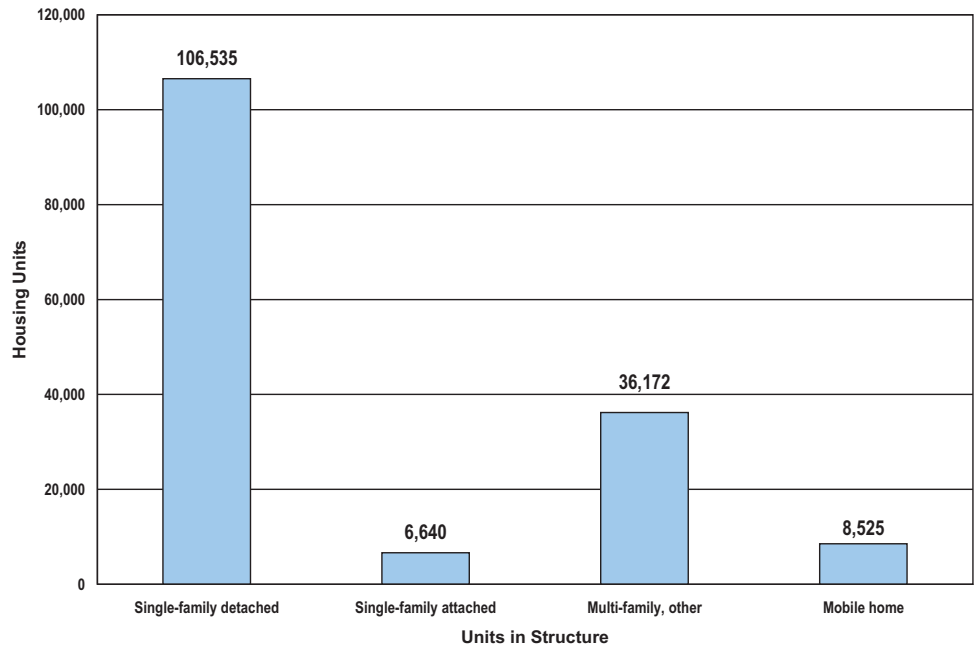


Units in Structure

Four housing types were examined: single-family detached homes, single-family attached units (townhouses and condominiums), multi-family units (apartments), and mobile homes. Single-family detached houses and mobile homes are the favorite housing options among families with children, sharply leading all other types in the number of residents under 18 years of age (Figure 1). Detached units attract an average of 0.620 children per household, while mobile homes report nearly 0.700 per unit. Detached housing has a much greater impact on the residential landscape, however, representing more than two-thirds of all occupied units in Knox County. Mobile homes comprise only five percent of the county's housing stock (Figure 2).

The geographic distribution of child population and single-family detached homes confirms the positive correlation between the two variables (Maps 1 and 2). Areas with the largest numbers of single-family houses are the same as those with the highest child population, namely northwest, southwest, northeast, and east portions of Knox County. Central Knoxville, especially downtown and the Fort Sanders/UT campus neighborhoods, shows the fewest children and smallest inventory of single-family homes.

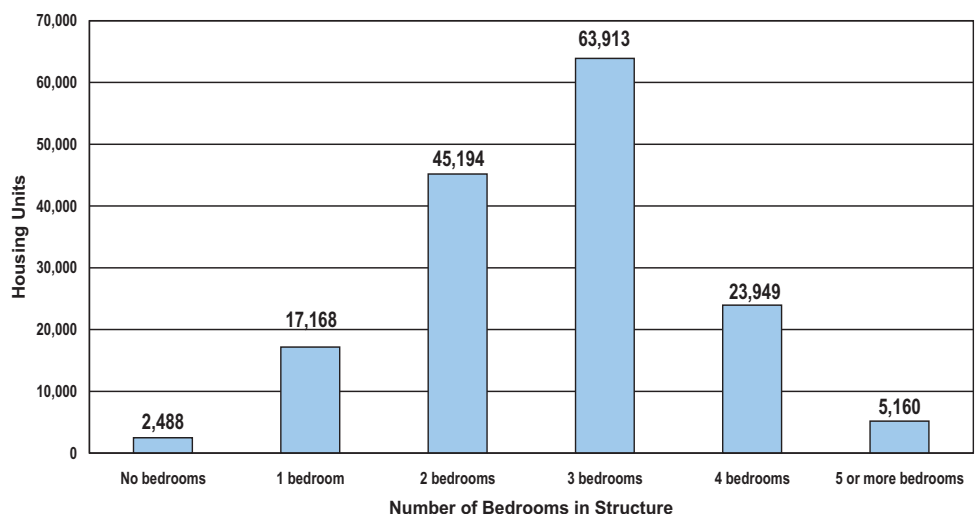
Figure 2.
OCCUPIED HOUSING UNITS BY UNITS IN STRUCTURE
KNOX COUNTY • 2000



INTERPRETING THE NUMBERS

It may be difficult to visualize a family comprised of a mother, a father, and seven-tenths of a child, so to eliminate any confusion: the figures for number of children per household in Knox County are calculated by dividing the total number of persons under the age of 18 years by the total number of occupied housing units. The resultant figures are reported to three decimal places to allow more detailed calculations. Keep in mind that the generation rates are averages for Knox County as a whole – there will be variations from neighborhood to neighborhood and project to project.

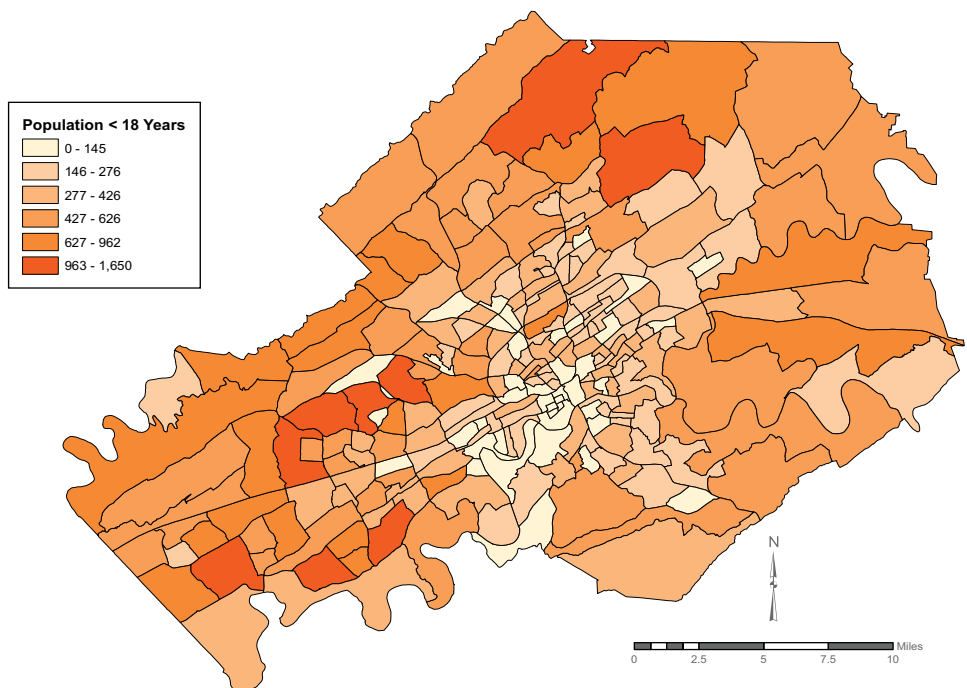
Figure 3.
OCCUPIED HOUSING UNITS BY NUMBER OF BEDROOMS
IN STRUCTURE • KNOX COUNTY • 2000



Bedrooms in Structure

No surprises here – the more children per family, the greater the number of bedrooms in the home (Figure 1). Values range from a low of 0.072 children in efficiency units, to a high of 1.193 in homes with five or more bedrooms. Housing units with three bedrooms are the most commonly found configuration in Knox County, representing about 40 percent of the areawide inventory (Figure 3). Two-bedroom houses are second-most popular, holding a 29 percent share. Areas with the most three bedroom houses are also those having the highest population under 18 years of age (Maps 1 and 3).

Map 1.
PERSONS UNDER 18 YEARS OF AGE
KNOX COUNTY • 2000



Year Structure Built

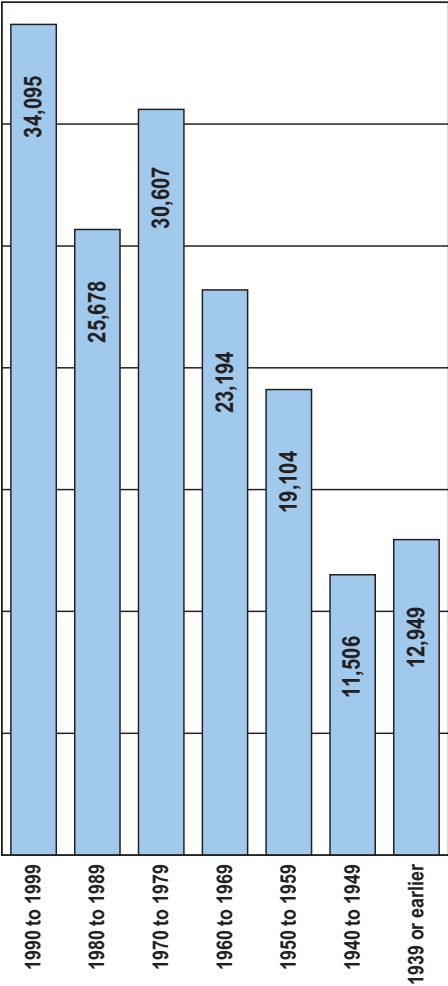
Families with larger numbers of children are found in Knox County's newest homes. Units built during the 1990s have 0.714 children on average, and the number gradually drops as the age of housing increases, the only exception found among homes built during the 1940s (Figure 1). The inverse relationship between housing age and population under 18 years is evident on the local landscape. Knoxville's central city is home to the area's oldest houses but fewest children, while newer stock and highest population under 18 are found in outlying county suburbs (Maps 1 and 4).

Map 2.
SINGLE-FAMILY DETACHED HOUSING UNITS
KNOX COUNTY • 2000

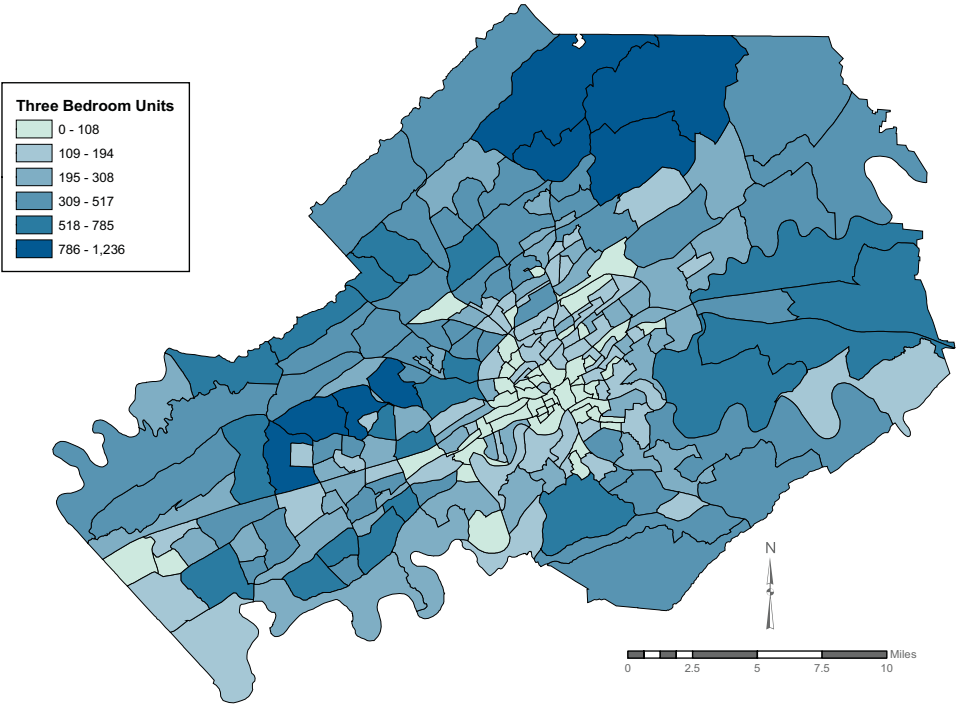


Knox County witnessed a residential building boom during the 1990s with the construction of 34,095 new homes, representing a 22 percent share of the areawide supply. Houses built during the 1970s comprise the next largest share (19.5 percent). Oldest stock is in smaller supply because fewer homes were built several decades ago, and many have been demolished or converted to non-residential use.

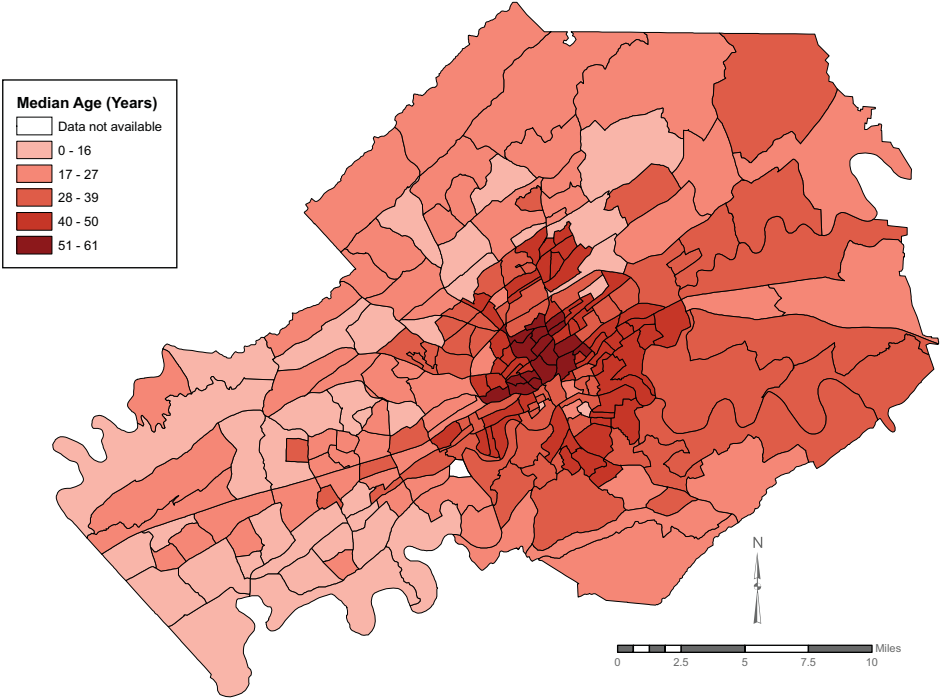
Figure 4.
OCCUPIED HOUSING UNITS
BY DECADE OF CONSTRUCTION



Map 3.
OCCUPIED THREE-BEDROOM HOUSING UNITS
KNOX COUNTY • 2000



Map 4.
MEDIAN AGE OF OCCUPIED HOUSING UNITS
KNOX COUNTY • 2000



Value of Structure

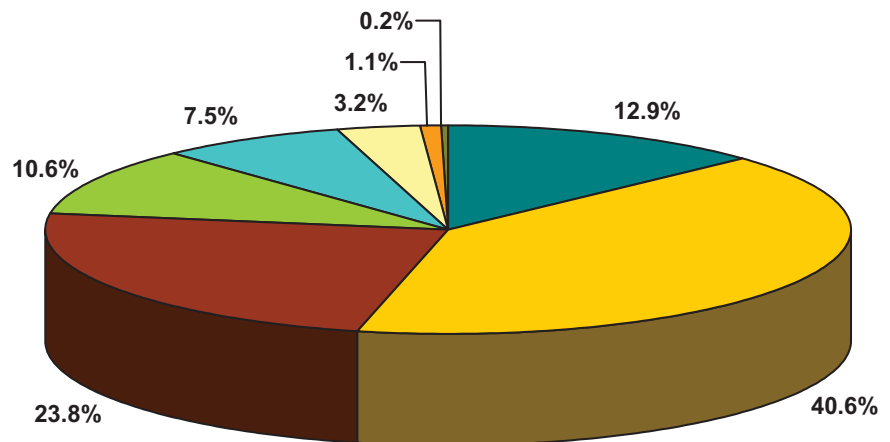
Families living in more expensive housing have more children on average (Figure 1). Family size steadily increases with home value, from a low of 0.450 children per household in houses priced below \$50,000, to a high of 0.971 children per household in residences ranging from \$500,000 to \$999,999. An exception occurs among the most costly homes, those above the \$1 million mark, where only 0.438 children per unit are found. The positive correlation between family size and home value is readily seen in southwest, northwest, and northeast Knox County which include the highest priced single-family homes and the most child population (Maps 1 and 5).

Although the highest rate of children per unit is found among homes in the \$500,000 to \$999,999 range, that segment of the residential real estate market comprises only 1.1 percent of all homes in Knox County (Figure 5). The county's median home value was \$98,500 in 2000, and, accordingly, the largest shares of local housing inventory fall in the \$50,000 to \$99,999 and \$100,000 to \$149,999 ranges. (As points of comparison, the median value of homes in the City of Knoxville was \$78,000 in 2000, while Farragut topped the area at \$192,800.)

**Map 5.
MEDIAN VALUE OF OWNER-OCCUPIED HOUSING UNITS
KNOX COUNTY • 2000**



**Figure 5.
VALUE OF OCCUPIED HOUSING UNITS
KNOX COUNTY • 2000**



Excludes renter-occupied units and vacant units.

■ Less than \$50,000
 ■ \$50,000 to \$99,999
 ■ \$100,000 to \$149,999
 ■ \$150,000 to \$199,999
■ \$200,000 to \$299,999
 ■ \$300,000 to \$499,999
 ■ \$500,000 to \$999,999
 ■ \$1,000,000 or more

A CLOSER LOOK: COMBINING HOUSING CHARACTERISTICS TO EXAMINE CHILD POPULATION RATES

Presented in the following tables and graphs are combinations of housing characteristics and population counts showing a more detailed picture of the relationship between housing and child population rates. Brief highlights accompany each section.



■
Condominiums and townhouses attract the fewest families with children.

■
There are 21 five-bedroom mobile homes in Knox County, each with about five children in the family.

■
Three-bedroom apartments have more children on average (1.078 children per unit) than single-family homes with the same number of bedrooms (0.582). There are 3,300 three-bedroom apartments in Knox County, housing 3,500 children, but there are nearly 55,000 three-bedroom single-family detached homes with 32,000 children.

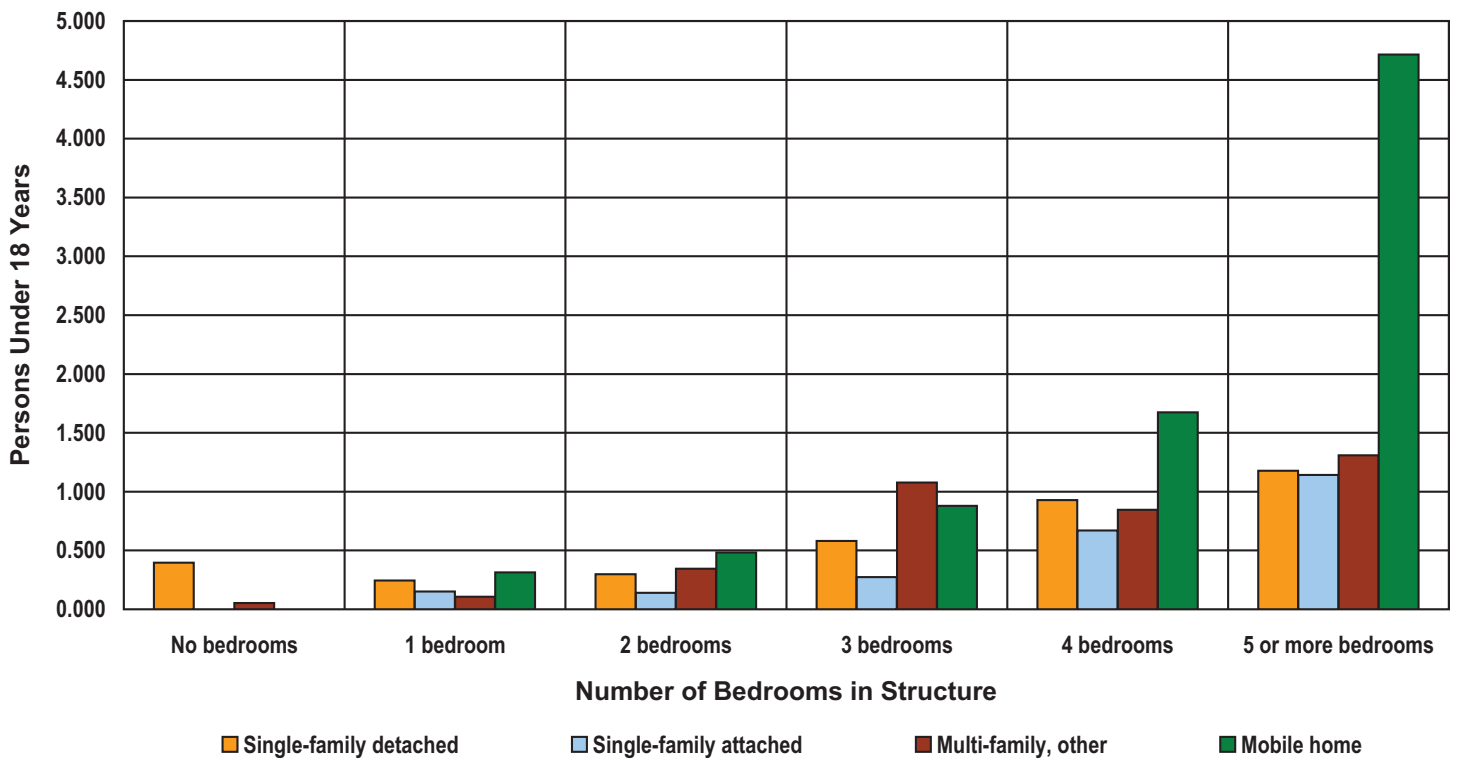
**Table 1. CHILDREN IN HOUSING UNITS
BY UNITS IN STRUCTURE BY NUMBER OF BEDROOMS
KNOX COUNTY • 2000**

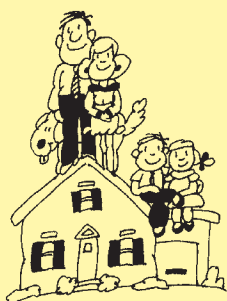
Units in Structure	Bedrooms	Occupied Housing Units	Persons Under 18	Persons Per Housing Unit Under 18
Single-family detached	No bedrooms	126	50	0.397
	1 bedroom	2,151	527	0.245
	2 bedrooms	21,582	6,448	0.299
	3 bedrooms	54,858	31,914	0.582
	4 bedrooms	22,802	21,188	0.929
	5 or more bedrooms	5,016	5,902	1.177
	TOTAL	106,535	66,029	0.620
Single-family attached	No bedrooms	7	0	0.000
	1 bedroom	164	25	0.152
	2 bedrooms	4,139	582	0.141
	3 bedrooms	2,052	562	0.274
	4 bedrooms	236	158	0.669
	5 or more bedrooms	42	48	1.143
	TOTAL	6,640	1,375	0.207
Multi-family, other	No bedrooms	2,349	128	0.054
	1 bedroom	14,307	1,519	0.106
	2 bedrooms	15,522	5,350	0.345
	3 bedrooms	3,294	3,550	1.078
	4 bedrooms	619	523	0.845
	5 or more bedrooms	81	106	1.309
	TOTAL	36,172	11,176	0.309
Mobile home	No bedrooms	6	0	0.000
	1 bedroom	546	171	0.313
	2 bedrooms	3,951	1,905	0.482
	3 bedrooms	3,709	3,258	0.878
	4 bedrooms	292	489	1.675
	5 or more bedrooms	21	99	4.714
	TOTAL	8,525	5,922	0.695
All units	No bedrooms	2,488	178	0.072
	1 bedroom	17,168	2,242	0.131
	2 bedrooms	45,194	14,285	0.316
	3 bedrooms	63,913	39,284	0.615
	4 bedrooms	23,949	22,358	0.934
	5 or more bedrooms	5,160	6,155	1.193
	TOTAL	157,872	84,502	0.535

Source: U.S. Census Bureau, Census 2000 Sample Data File.



Figure 6.
CHILDREN PER HOUSING UNIT BY UNITS IN STRUCTURE BY NUMBER OF BEDROOMS
KNOX COUNTY • 2000





■
In a neighborhood of \$50,000 houses, six in ten will have no children. Among half-million dollar houses though, expect to find at least one child in each.

■
Within the condominium, townhouse, and apartment markets, the number of children per unit is consistent across all price ranges, and overall, fewer children per unit are found, regardless of value.

■
In the mobile home category, \$300,000 to \$500,000 units have the most children per household, a 2.188 average. (A mobile home priced at \$300,000 seems contrary to the notion of mobile homes as an affordable housing option – the value of the land on which residential structures sit is included in the overall price of housing reported by the Census Bureau.)

■
The relationship between home value and number of children per unit is not as neatly predictable in the mobile home category as it is in other housing types.

**Table 2. CHILDREN IN HOUSING UNITS
BY UNITS IN STRUCTURE BY HOUSING UNIT VALUE
KNOX COUNTY • 2000**

Units in Structure	Value	Occupied Housing Units	Persons Under 18	Persons Per Housing Unit Under 18
Single-family detached	Less than \$50,000	8,760	3,209	0.366
	\$50,000 to \$99,999	37,116	19,501	0.525
	\$100,000 to \$149,999	23,041	14,254	0.619
	\$150,000 to \$199,999	10,663	7,890	0.740
	\$200,000 to \$299,999	7,611	6,190	0.813
	\$300,000 to \$499,999	3,289	2,879	0.875
	\$500,000 to \$999,999	1,068	1,073	1.005
	\$1,000,000 or more	188	85	0.452
	Rented	14,799	10,948	0.740
	TOTAL	106,535	66,029	0.620
Single-family attached	Less than \$50,000	52	13	0.250
	\$50,000 to \$99,999	2,990	532	0.178
	\$100,000 to \$149,999	1,508	210	0.139
	\$150,000 to \$199,999	387	65	0.168
	\$200,000 to \$299,999	279	35	0.125
	\$300,000 to \$499,999	79	0	0.000
	\$500,000 to \$999,999	29	4	0.138
	\$1,000,000 or more	0	0	0.000
	Rented	1,316	516	0.392
	TOTAL	6,640	1,375	0.207
Multi-family, other	Less than \$50,000	221	35	0.158
	\$50,000 to \$99,999	1,183	159	0.134
	\$100,000 to \$149,999	480	100	0.208
	\$150,000 to \$199,999	116	19	0.164
	\$200,000 to \$299,999	57	9	0.158
	\$300,000 to \$499,999	19	0	0.000
	\$500,000 to \$999,999	12	0	0.000
	\$1,000,000 or more	0	0	0.000
	Rented	34,084	10,854	0.318
	TOTAL	36,172	11,176	0.309
Mobile home	Less than \$50,000	4,609	2,878	0.624
	\$50,000 to \$99,999	1,599	1,455	0.910
	\$100,000 to \$149,999	135	94	0.696
	\$150,000 to \$199,999	47	18	0.383
	\$200,000 to \$299,999	18	0	0.000
	\$300,000 to \$499,999	32	70	2.188
	\$500,000 to \$999,999	0	0	0.000
	\$1,000,000 or more	6	0	0.000
	Rented	2,079	1,407	0.677
	TOTAL	8,525	5,922	0.695
All units	Less than \$50,000	13,642	6,135	0.450
	\$50,000 to \$99,999	42,888	21,647	0.505
	\$100,000 to \$149,999	25,164	14,658	0.582
	\$150,000 to \$199,999	11,213	7,992	0.713
	\$200,000 to \$299,999	7,965	6,234	0.783
	\$300,000 to \$499,999	3,419	2,949	0.863
	\$500,000 to \$999,999	1,109	1,077	0.971
	\$1,000,000 or more	194	85	0.438
	Rented	52,278	23,725	0.454
	TOTAL	157,872	84,502	0.535

Source: U.S. Census Bureau, Census 2000 Sample Data File.

Figure 7.
CHILDREN PER HOUSING UNIT BY VALUE OF UNIT BY UNITS IN STRUCTURE
KNOX COUNTY • 2000

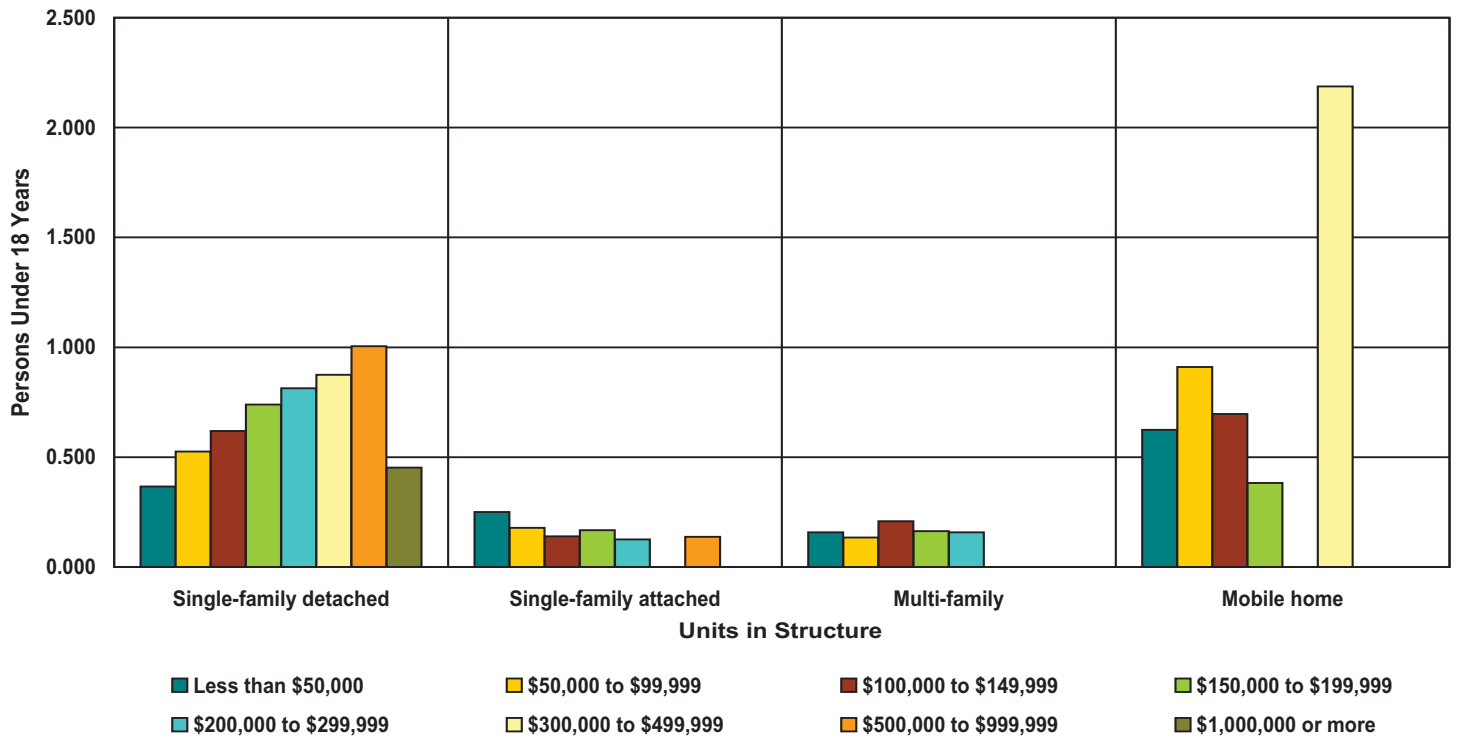
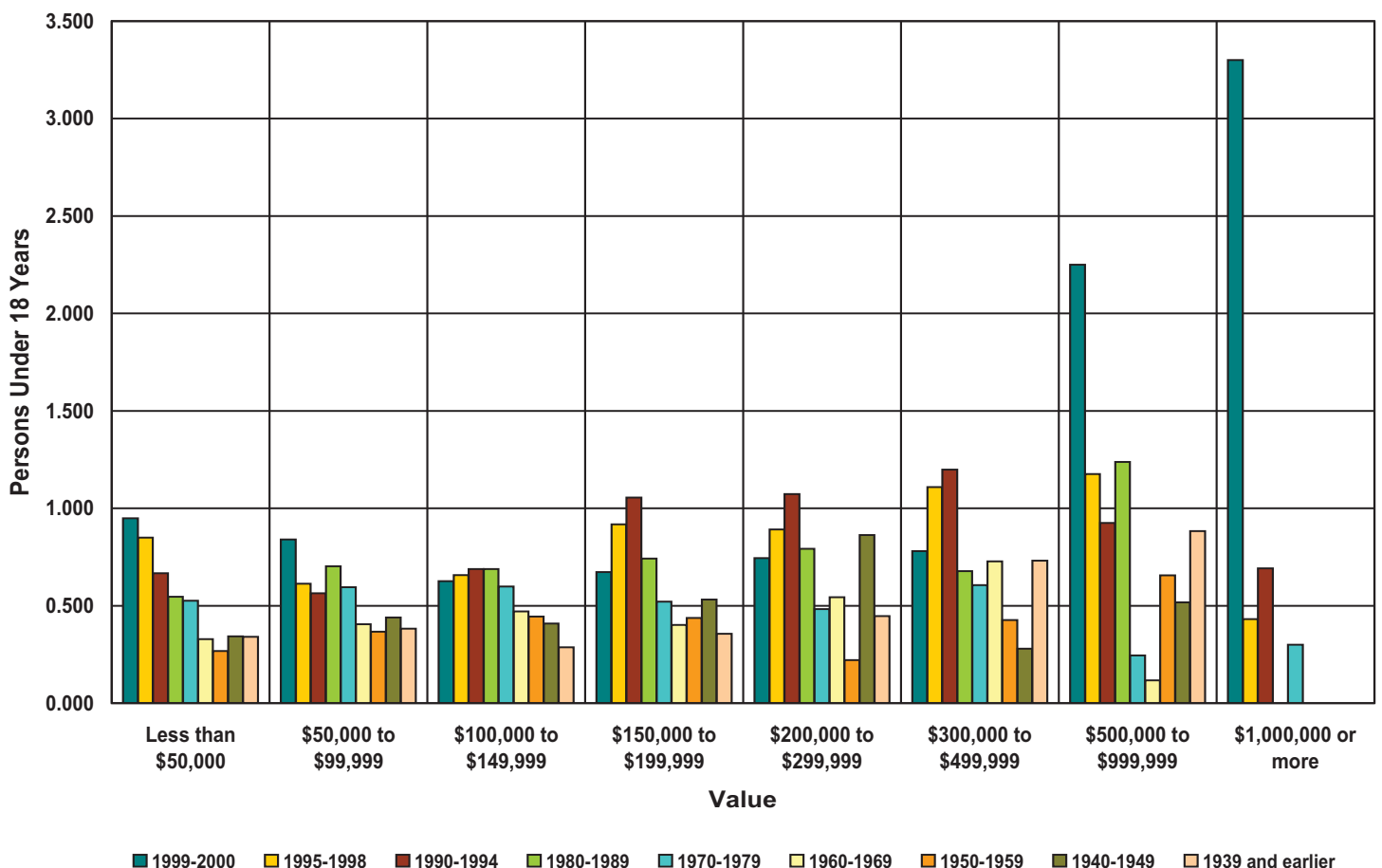
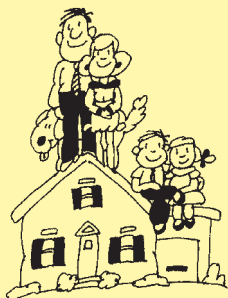


Figure 8.
CHILDREN PER HOUSING UNIT BY YEAR OF CONSTRUCTION BY VALUE OF UNIT
KNOX COUNTY • 2000





■
Across nearly all value categories, highest rates of children per household are found in Knox County's homes built during the 1990s.

■
On average, expect more than three children in each of Knox County's million-dollar homes built in the past couple of years.

■
Brand new (1999-2000) entry-level homes (those priced at or below Knox County's median value of \$98,500) attract slightly more children per unit than mid-priced homes. However, among residences built earlier in the 1990s and into the 1980s, mid- and high-priced units outpace entry-level homes in per household children.

**Table 3. CHILDREN IN HOUSING UNITS
BY AGE OF UNIT BY HOUSING UNIT VALUE
KNOX COUNTY • 2000**

Year Structure Built	Value	Occupied Housing Units	Persons Under 18	Persons Per Housing Unit Under 18
1999 to 2000	Less than \$50,000	276	262	0.949
	\$50,000 to \$99,999	721	606	0.840
	\$100,000 to \$149,999	778	487	0.626
	\$150,000 to \$199,999	468	315	0.673
	\$200,000 to \$299,999	477	355	0.744
	\$300,000 to \$499,999	209	163	0.780
	\$500,000 to \$999,999	56	126	2.250
	\$1,000,000 or more	10	33	3.300
	Rented	701	340	0.485
	TOTAL	3,696	2,687	0.727
1995 to 1998	Less than \$50,000	1,186	1,007	0.849
	\$50,000 to \$99,999	3,127	1,918	0.613
	\$100,000 to \$149,999	2,922	1,920	0.657
	\$150,000 to \$199,999	1,873	1,719	0.918
	\$200,000 to \$299,999	1,514	1,349	0.891
	\$300,000 to \$499,999	841	933	1.109
	\$500,000 to \$999,999	296	348	1.176
	\$1,000,000 or more	44	19	0.432
	Rented	3,738	1,831	0.490
	TOTAL	15,541	11,044	0.711
1990 to 1994	Less than \$50,000	945	630	0.667
	\$50,000 to \$99,999	3,530	1,992	0.564
	\$100,000 to \$149,999	3,275	2,255	0.689
	\$150,000 to \$199,999	2,163	2,283	1.055
	\$200,000 to \$299,999	1,904	2,042	1.072
	\$300,000 to \$499,999	668	801	1.199
	\$500,000 to \$999,999	134	124	0.925
	\$1,000,000 or more	39	27	0.692
	Rented	2,939	1,012	0.344
	TOTAL	15,597	11,166	0.716
1980 to 1989	Less than \$50,000	1,736	947	0.546
	\$50,000 to \$99,999	5,370	3,771	0.702
	\$100,000 to \$149,999	4,576	3,150	0.688
	\$150,000 to \$199,999	2,113	1,568	0.742
	\$200,000 to \$299,999	1,797	1,423	0.792
	\$300,000 to \$499,999	580	393	0.678
	\$500,000 to \$999,999	202	250	1.238
	\$1,000,000 or more	20	0	0.000
	Rented	9,284	3,162	0.341
	TOTAL	25,678	14,664	0.571
1970 to 1979	Less than \$50,000	1,294	680	0.526
	\$50,000 to \$99,999	7,344	4,366	0.594
	\$100,000 to \$149,999	5,788	3,464	0.598
	\$150,000 to \$199,999	1,846	962	0.521
	\$200,000 to \$299,999	871	420	0.482
	\$300,000 to \$499,999	406	246	0.606
	\$500,000 to \$999,999	98	24	0.245
	\$1,000,000 or more	20	6	0.300
	Rented	12,940	5,625	0.435
	TOTAL	30,607	15,793	0.516

Table 3. continued . . .

Year Structure Built	Value	Occupied Housing Units	Persons Under 18	Persons Per Housing Unit Under 18
1960 to 1969	Less than \$50,000	1,491	490	0.329
	\$50,000 to \$99,999	7,347	2,976	0.405
	\$100,000 to \$149,999	3,884	1,830	0.471
	\$150,000 to \$199,999	1,235	496	0.402
	\$200,000 to \$299,999	508	276	0.543
	\$300,000 to \$499,999	209	152	0.727
	\$500,000 to \$999,999	60	7	0.117
	\$1,000,000 or more	20	0	0.000
	Rented	8,440	4,382	0.519
	TOTAL	23,194	10,609	0.457
1950 to 1959	Less than \$50,000	2,397	643	0.268
	\$50,000 to \$99,999	7,717	2,830	0.367
	\$100,000 to \$149,999	2,032	903	0.444
	\$150,000 to \$199,999	596	261	0.438
	\$200,000 to \$299,999	430	95	0.221
	\$300,000 to \$499,999	183	78	0.426
	\$500,000 to \$999,999	61	40	0.656
	\$1,000,000 or more	24	0	0.000
	Rented	5,664	3,285	0.580
	TOTAL	19,104	8,135	0.426
1940 to 1949	Less than \$50,000	2,187	750	0.343
	\$50,000 to \$99,999	4,041	1,776	0.439
	\$100,000 to \$149,999	838	342	0.408
	\$150,000 to \$199,999	344	183	0.532
	\$200,000 to \$299,999	160	138	0.863
	\$300,000 to \$499,999	118	33	0.280
	\$500,000 to \$999,999	56	29	0.518
	\$1,000,000 or more	0	0	0.000
	Rented	3,762	1,869	0.497
	TOTAL	11,506	5,120	0.445
1939 or Earlier	Less than \$50,000	2,130	726	0.341
	\$50,000 to \$99,999	3,691	1,412	0.383
	\$100,000 to \$149,999	1,071	307	0.287
	\$150,000 to \$199,999	575	205	0.357
	\$200,000 to \$299,999	304	136	0.447
	\$300,000 to \$499,999	205	150	0.732
	\$500,000 to \$999,999	146	129	0.884
	\$1,000,000 or more	17	0	0.000
	Rented	4,810	2,219	0.461
	TOTAL	12,949	5,284	0.408
All Units	Less than \$50,000	13,642	6,135	0.450
	\$50,000 to \$99,999	42,888	21,647	0.505
	\$100,000 to \$149,999	25,164	14,658	0.582
	\$150,000 to \$199,999	11,213	7,992	0.713
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	\$1,000,000 or more	194	85	0.438
	Rented	52,278	23,725	0.454
	TOTAL	157,872	84,502	0.535

Source: U.S. Census Bureau, Census 2000 Sample Data File.

HOW TO USE THE NUMBERS

Example 1

To illustrate the use of the average number of children per household, consider a sample proposal: a land developer has presented a new residential subdivision comprised of 100 single-family detached homes. Based on Knox County's average of 0.620 children per detached unit, about 62 children (100 units X 0.620 children per unit) can be expected among the families that move into the new subdivision.

**Table 2. CHILDREN IN HOUSING UNITS
BY UNITS IN STRUCTURE BY HOUSING UNIT VALUE
KNOX COUNTY • 2000**

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	\$300,000 to \$499,999	3,289	2,879	0.875
	\$500,000 to \$999,999	1,068	1,073	1.005
	\$1,000,000 or more	188	85	0.452
	Rented	14,799	10,948	0.740
	TOTAL	106,535	66,029	0.620

Example 2

A closer estimate of children added by a new subdivision can be made as more information about the project is known. If the same single-family proposal will be comprised of units marketed around \$175,000, expect an average of 0.740 children per unit, or about 74 new children (100 units X 0.740 children per unit) over the course of the build-out period.

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	\$200,000 to \$299,999	7,611	6,190	0.813
	\$300,000 to \$499,999	3,289	2,879	0.875
	\$500,000 to \$999,999	1,068	1,073	1.005
	\$1,000,000 or more	188	85	0.452
	Rented	14,799	10,948	0.740
	TOTAL	106,535	66,029	0.620

FINAL COMMENTS

A few cautions about the use of these figures are in order: First, per household child population rates are areawide averages – actual development projects can result in fewer or more children. Second, remember that larger subdivisions can take several years to build out, so the addition of children will be incremental over the course of the construction phases. Third, when considering impacts on the area's schools, keep in mind that not all children go to public school. Locally, about 13 percent of children attend private school or are home-schooled each year. Finally, while not an exact science, average population rates provide a good starting point for estimating growth and its potential impacts on local infrastructure and services.