

HOUSING AFFORDABILITY IN CORVALLIS, OREGON

By

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INTRODUCTION

The subject of this paper is the affordability of housing in greater Corvallis. Its purpose is to draw attention to the effect real estate taxes and fees -- taxes cleverly disguised as user fees and inserted in water bills -- have on the affordability of homes. This paper contains two analyses.

The first analysis is limited to improved residential property (class 1-0-1) using 2016 sales data¹. Multiple family dwellings, manufactured housing, or rentals -- both apartments and houses -- are not included.

The second analysis uses data from National Low Income Housing Coalition² on the affordability of apartment rentals.

The first section is the summary and conclusions. The second section contains the supporting details.

SUMMARY AND CONCLUSIONS

The household income in 2016 required to buy the median residential improved property sold in 2016 was \$73,043 without being "house-poor" -- housing costing more than 30% of household income. In 2016, the median household income in the Corvallis metro area was \$55,459³. A household with the median income could only have purchased about 17% of the houses sold that year and not be house-poor. A household with the 2016 median income, with an eyeball adjustment for inflation to 2018, could only rent a zero, one, or two-bedroom apartment and maybe a three-bedroom apartment without being house-poor. If property taxes, or fees, are increased, the fraction of houses that one could have bought, without being house-poor decreases. Moreover, increases in taxes or fees have the same effect on the apartment rental market. Obviously, people have to live somewhere. I expect that many people who live in Corvallis are either house-poor, live in manufactured homes or are homeless.

The more we raise taxes or fees, the more unaffordable housing becomes, a situation at odds with our elected officials and the public complaining about the unaffordability of housing in Corvallis.

¹ Data source: Benton County Assessor website.

² Data source: 2018 National Low Income Housing Coalition 1000 Vermont Avenue, Suite 500, Washington, DC 20005 Phone +1 (202) 662 1530 Fax +1 (202) 393 1973

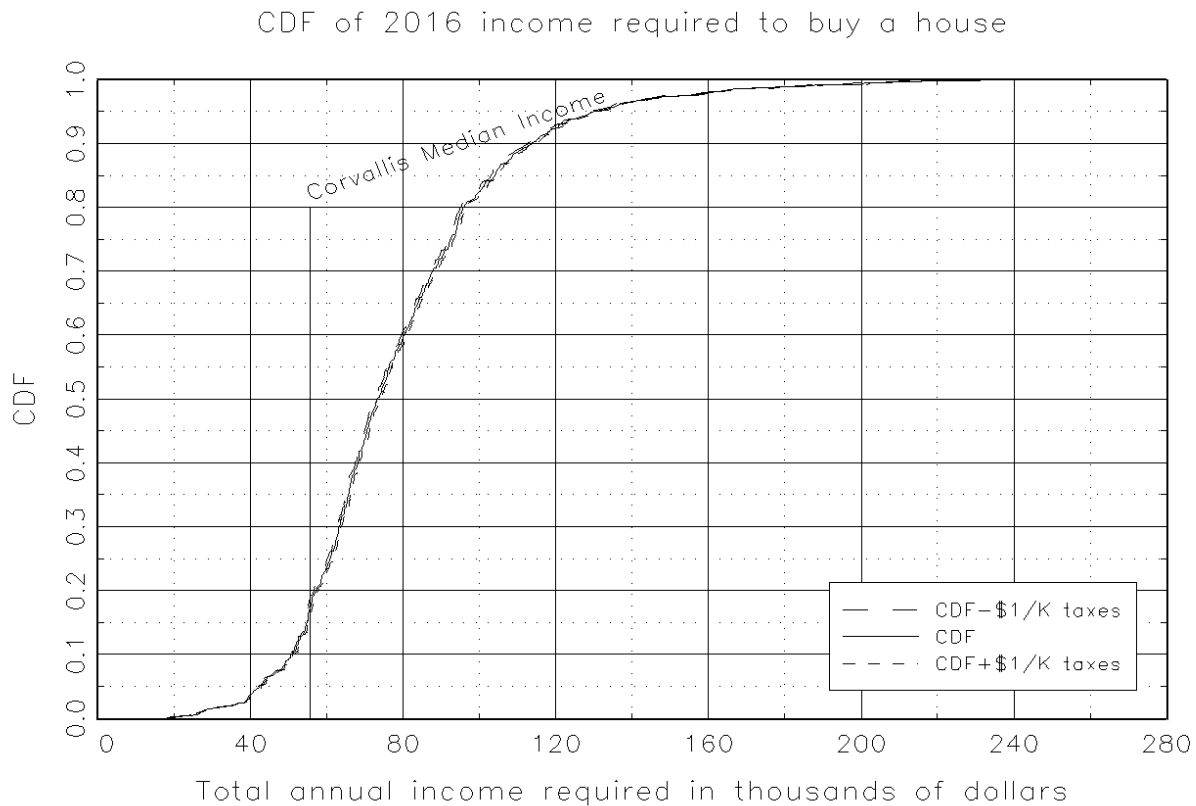
³ Data source: U.S. Census Bureau, 2016 American Community Survey 1-Year Estimates

SUPPORTING DETAILS

ANALYSIS OF IMPROVED RESIDENTIAL PROPERTY (class 1-0-1)

Real estate data from 2016 was used because 2016 was the latest set of Corvallis household income statistics⁴ at the time of this writing. Multiple family dwellings, manufactured housing and rentals were excluded because I could not find any usable sales data on these properties. The Cumulative Density Function (CDF) of the total income required to buy a house is shown in the graph below.

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As the graph shows, the income required to buy the median house that sold in Corvallis in 2016 was \$73,043 while the median Corvallis income was \$55,459. A household with the median income could have only bought about 17% of the houses sold that year. In addition, as can be seen, raising the real estate taxes – or user fees -- decreases the number of houses that the median income household could have bought by moving the CDF to the right. Notice that there are many houses – about 40% of the houses sold in 2016 -- between the Corvallis median income and the mean -- \$79,085 -- income required to buy a house. Many people are pushed into housing unaffordability as taxes and user fees are increased.

⁴ Data source: U.S. Census Bureau, 2016 American Community Survey 1-Year Estimates

The following table will help in reading the graph of CDF required to buy a house.

number of points =		690	
	Estimated - \$1/K	Estimated	Estimated + \$1/K
minimum	\$18,181	\$18,963	\$19,746
maximum	\$242,313	\$244,728	\$247,143
mean	\$78,361	\$79,085	\$79,809
median	\$72,398	\$73,044	\$73,745
standard dev.	\$28,670	\$28,891	\$29,113
skewness	1.5396	1.5456	1.5514
kurtosis	7.3945	7.4120	7.4294

The annual payment required to buy a given house is the sum of the utilities (including user fees), taxes, principal and interest. Insurance was not included.

I estimated utilities by assuming that a house was a cube with the edges being the square root of the finished floor space. I assumed that electricity, gas, water, and trash were equal to factors multiplied by the cube of the edge, the area of five sides of the cube, the square of the cube edge, and the square of the cube edge respectively. I estimated the factors from my own house. The factor for water includes the user fees that Corvallis is currently charging on our water bills.

I estimated taxes, again, from my own house. The sales data includes a column for the Real Market Value (RMV), as computed by Benton County. The sales data does not include the Assessed Value (AV) so I used the ratio of assessed value and real market value by property class for class 101 for tax year 2017-18, which can be found on the Benton County Assessor's web site.

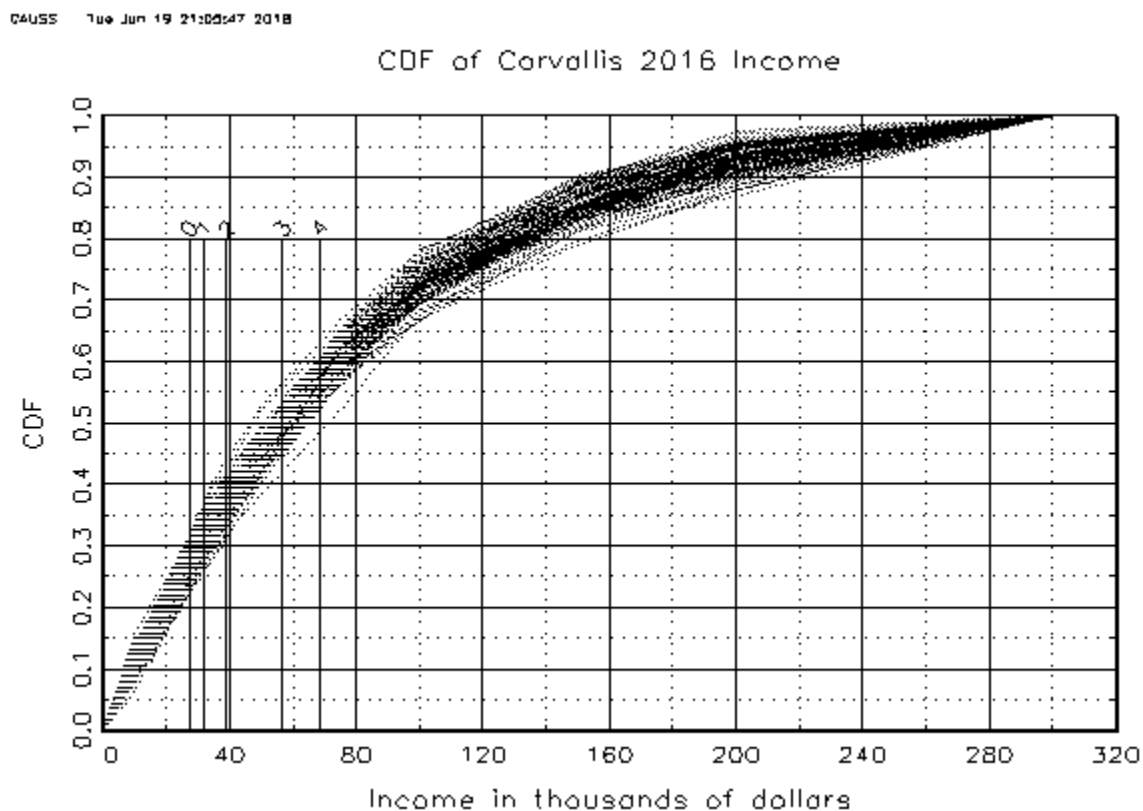
I estimated the annual house payment – principle and interest with no down payment – by computing the (annual) annuity factor for 30 years for an interest rate of 4.22%, the average interest rate since 9/1/17, and dividing the annuity factor into the sale price.

AFFORDABILITY OF APARTMENT RENTALS

The below table shows the income required to rent an apartment of various sizes without being house-poor⁵.

Annual Income Needed to Afford	
ZERO-BEDROOM	\$27,200
ONE-BEDROOM	\$32,040
TWO-BEDROOM	\$39,040
THREE-BEDROOM	\$56,800
FOUR-BEDROOM	\$68,760

The numbers of bedrooms and the annual income needed to afford are shown in the below graph of income in Corvallis in 2016.



The CDF of the income of households⁶ was plotted from the Census Bureau data. The data were presented as the fraction of observations and their margin of error that were in bins – less than \$10,000, \$10,000 to 14,999 ... \$150,000 to \$199,999, and \$200,000 or more⁷. I assumed that the bin

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⁶ Data source: U.S. Census Bureau, 2016 American Community Survey 1-Year Estimates

⁷ I plotted the last bin as observations between \$200,000 and an upper limit of \$300,000.

measurements were multivariate normal and that the correlation coefficients between any two bins were equal and solved for that coefficient assuming that the sum of the variances and covariances equaled zero. I performed a Monte Carlo simulation of the CDF in an attempt to set confidence intervals. However, CDFs crossed each other making setting confidence intervals impossible. Therefore, I plotted an envelope of 100 CDFs, the notion being that the center of the envelope estimates the true CDF.

As can be seen, about 26% of Corvallis cannot afford a zero bedroom apartment without being house-poor. About 30%, 37%, 50%, 57% of Corvallis cannot afford a one, two, three, or four-bedroom apartment respectively without being house-poor. According to 2018 National Low Income Housing Coalition data, 43% of households are renters. If the 43% who are renters have relatively lower incomes, those households renting three and four bedrooms are house-poor. Moreover, I would expect rents to increase as taxes and user fees increase making more people house-poor. Housing is in high demand in Corvallis so I doubt the property owners will eat the tax and user fee increases.