

**Subject:** housing affordability from a ROI perspective  
**Attachments:** affordability analysis based on ROI for real estate.pdf

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**From:** J Adams  
**Sent:** Friday, June 20, 2025 1:59 PM  
**To:** Planning <Planning@a2gov.org>  
**Subject:** housing affordability from a ROI perspective

Hello,

Attached is my analysis of the affordability of new housing based on ROI for real estate.

Regards,

Jim Adams  
Fifth Ward

This analysis attempts to answer the following two questions. (1) What housing costs would make 2, 3 or 4 unit housing developments economically viable for developers in Ann Arbor? (2) Are these housing costs affordable for workers in Ann Arbor?

To answer question #1, monthly housing costs were calculated for several real estate development scenarios using simple formulas [1]. The monthly housing costs were directly related to the sale price (mortgage payment) or net operating expense (monthly rent) from the development scenarios. An affordable housing cost is defined as 30% of annual median household income. Using this definition, an affordable monthly housing cost was calculated. Question #2 was answered by comparing the monthly housing costs from the scenarios to affordable housing costs for workers in Ann Arbor. Details of the calculations that generated these costs are presented on the following pages.

The affordability of new housing in Ann Arbor is shown in Table 3. Only family households can afford to own or rent new housing; non-family households are simply priced out of this market. A single person requires a graduate degree to afford to own or rent new housing. A single person with a bachelor's degree or less cannot afford new housing. This means a single person working in an office, sales, restaurant, or medical assistant position cannot afford to live in Ann Arbor. Based on this analysis, only those that can already afford to own or rent in the city will benefit from new development. Everyone else will be economically excluded. Is this the result we hope the new comprehensive land use plan and zoning will deliver?

Table 3. Affordability of new housing in Ann Arbor.		
Household Type	Owning affordable?	Renting affordable?
Family	Yes	Yes
Non-family	No	No
Single person		
High school or less	No	No
Associates degree	No	No
Bachelor's degree	No	No
Graduate degree	Yes	Yes

No land use plan or zoning regulation can change the household incomes of workers. No land use plan or zoning regulation can lower housing costs; cost stabilization is the best case scenario. Therefore, no land use plan or zoning regulation can produce more affordable housing. It's time we paid attention to the existing economic realities. Thirty years as a research engineer has taught me that if a plan doesn't work on paper, it will never work in practice. If the current plan will not solve the affordability problem, we need to seek new solutions.

Jim Adams

Fifth Ward

### Details of Calculations

To answer question #1, monthly housing costs were calculated for several real estate development scenarios using simple formulas [1]. The monthly housing costs were directly related to the sale price (mortgage payment) or net operating expense (monthly rent) from the development scenarios. An affordable housing cost is defined as 30% of annual median household income. Using this definition, an affordable monthly housing cost was calculated. Question #2 was answered by comparing the monthly housing costs from the scenarios to affordable housing costs for workers in Ann Arbor.

### Calculation of Housing Costs

In order to simplify the calculations, the cash method was used, i.e., no financing. The return on investment (ROI) for the sale of a real estate project can be estimated by

$$ROI = \frac{(sale\ price - acquisition\ cost)}{acquisition\ cost}$$

The ROI for renting a real estate project can be estimated by

$$ROI = \frac{(operating\ income - expenses)}{acquisition\ cost}$$

Standard construction costs range from \$120-230/ft<sup>2</sup> [2]. Upper end construction costs range from \$400-600/ft<sup>2</sup> [3]. A low value of \$120/ft<sup>2</sup> was used in the calculations. Each housing unit has 2 bedrooms and 1000 ft<sup>2</sup>. The national average ROI of 10% for real estate [1] was used in all calculations. The housing costs calculated should be viewed as minimums, since expenses for items such as site preparation, insurance, architectural design and drawings, permits, legal fees, project management, and maintenance are not included. The monthly mortgage payment for purchasing a housing unit was estimated using an online calculator [4] with a 20% down payment, 6% interest, and a 50 mil property tax on the assessed value (50% of the per unit cost). Property tax was the only expense included in rent calculations.

The following development scenarios were used:

- a) Buy a house, tear it down, build a duplex for rent or sale of units
- b) Buy a house, remodel to a duplex for rent or sale of units
- c) Buy a house, remodel to a triplex for rent or sale of units
- d) Buy side-by-side houses, tear them down, build a 4 unit row house for rent or sale of units

Scenario a - Buy a house, tear it down, build a duplex for rent or sale of units

The purchase price of the house/land was estimated at \$300,000 (see purchase price for 209 N Seventh St. Ann Arbor). With 1000 ft<sup>2</sup>/unit, the construction cost is

$$construction\ cost = 2\ units \times \frac{1000ft^2}{unit} \times \frac{\$120}{ft^2} = \$240,000$$

The acquisition cost is then \$300,000 + \$240,000 = \$540,000.

The sale price for the duplex with a 10% ROI is then \$594,000, or \$297,000 per unit. The yearly property tax of \$7,400 per unit is calculated using an assessed value of \$149,000. Using the online calculator, the monthly mortgage payment for a unit is \$2,000.

If the duplex units are rented, property tax represents an expense of \$14,800 per year. The yearly operating income for a 10% ROI is \$68,800. The monthly unit rent is then \$2,900.

Scenario b) - Buy a house, remodel to a duplex for rent or sale of units

The median purchase price of a house in Ann Arbor is \$437,000. Assume the house has 1500 ft<sup>2</sup> and 500 ft<sup>2</sup> will be added to provide 1000 ft<sup>2</sup>/unit. The construction cost is

$$\text{construction cost} = 500 \text{ ft}^2 \times \frac{\$120}{\text{ft}^2} = \$60,000$$

The acquisition cost is then \$437,000 + \$60,000 = \$497,000.

The sale price for the duplex with a 10% ROI is then \$547,000, or \$273,000 per unit. The yearly property tax of \$6,800 per unit is calculated using an assessed value of \$137,000. The monthly mortgage payment for a unit is \$1,900.

If the duplex units are rented, property tax represents an expense of \$13,600 per year. The operating income for a 10% ROI is \$63,300. The monthly unit rent is then \$2,600.

Scenario c) - Buy a house, remodel to a triplex for rent or sale of units

The median purchase price of a house in Ann Arbor is \$437,000. Assume the house has 1500 ft<sup>2</sup> and 1500 ft<sup>2</sup> will be added to provide 1000 ft<sup>2</sup>/unit. The construction cost is

$$\text{construction cost} = 1500 \text{ ft}^2 \times \frac{\$120}{\text{ft}^2} = \$180,000$$

The acquisition cost is then \$437,000 + \$180,000 = \$617,000.

The sale price for the triplex with a 10% ROI is then \$680,000, or \$227,000 per unit. The yearly property tax of \$5,700 per unit is calculated using an assessed value of \$114,000. The monthly mortgage payment for a unit is \$1,600.

If the triplex units are rented, property tax represents an expense of \$17,100 per year. The operating income for a 10% ROI is \$78,800. The monthly rent is then \$2,200 per unit.

Scenario d) - Buy side-by-side houses, tear them down, build a 4 unit row house for rent or sale of units

The purchase price of the houses was estimated at \$300,000 x 2 = \$600,000 (see purchase price for 209 N Seventh St. Ann Arbor). With 1000 ft<sup>2</sup>/unit, the construction cost is

$$\text{construction cost} = 4 \text{ units} \times \frac{1000 \text{ ft}^2}{\text{unit}} \times \frac{\$120}{\text{ft}^2} = \$480,000$$

The acquisition cost is then \$600,000 + \$480,000 = \$1,080,000.

The sale price for the row houses with a 10% ROI is then \$1,200,000, or \$300,000 per unit. The yearly property tax of \$7,500 per unit is calculated using an assessed value of \$150,000. The monthly mortgage payment for a unit is \$2,100.

If the units are rented, property tax represents an expense of \$30,000 per year. The operating income for a 10% ROI is \$138,000. The monthly unit rent is then \$2,900.

The results of these calculations are summarized in Table 1.

Table 1. Monthly housing cost to own or rent.		
Scenario	Mortgage	Rent
A	\$2,000	\$2,900
B	\$1,900	\$2,600
C	\$1,600	\$2,200
D	\$2,100	\$2,900

### Affordability

The affordable monthly housing cost is calculated as follows

$$\text{affordable monthly housing cost} = \frac{\text{annual median income}}{12} \times 0.3$$

Because other expenses for a household such as student loan debt, car payments, health insurance, etc. are not deducted from the annual median income, the calculated affordable monthly housing cost represents a maximum.

The following income data were obtained from the American Community Survey (ACS) for Ann Arbor, MI [5]. Unless noted otherwise, all data are from the 2023 1-year estimates; the codes, e.g., CP04, refer to specific tables compiled from the survey data.

ACS divides household types into family and non-family. The annual median income of families is \$132,000, which corresponds to an affordable monthly housing cost of \$3,300. The annual median income of non-families is \$50,000, which corresponds to an affordable monthly housing cost of \$1,250.

Data for annual median income based on education level is shown in Table 2 (S2001), along with the affordable monthly housing cost.

Table 2. Income by Education Level (S2001).		
Education	Median Income	Affordable monthly housing cost
Less than high school graduate	\$23,777	\$590
High school graduate (includes equivalency)	\$33,276	\$830
Some college or associate's degree	\$38,373	\$960
Bachelor's degree	\$57,056	\$1,400
Graduate or professional degree	\$86,854	\$2,200

Housing affordability was determined by simply comparing the calculated monthly housing costs from the development scenarios with affordable monthly housing costs based on median income data for household types and education level. As shown in Table 3, only families, e.g., married couples, or a single person with a graduate degree can afford to own or rent housing in a new real estate development.

Table 3. Housing Affordability in Ann Arbor.		
Household Type	Owning affordable?	Renting affordable?
Family	Yes	Yes
Non-family	No	No
Single person		
High school or less	No	No
Associates degree	No	No
Bachelor's degree	No	No
Graduate degree	Yes	Yes

The calculated mortgages and rents should be considered conservative, minimum estimates of housing costs. If developers require a higher ROI for a project, the housing costs will increase. If the construction cost/ft<sup>2</sup> is higher, the housing costs will increase. When other development expenses such as insurance, project management, etc. are included in this analysis, the housing costs will increase. If less than a 20% down payment is made, the mortgage will increase. When other expenses such as insurance, closing costs, etc. are included, the mortgage will increase. This analysis suggests that new housing units will not be more affordable.

It should be emphasized that a single person with a bachelor's degree or less cannot afford to own or rent new housing. This means a single person working in an office, sales, restaurant, or medical assistant position cannot afford to live in Ann Arbor. Based on this analysis, only those that can already afford to own or rent in the city will benefit from new development. Everyone else will be economically excluded, just as they are today. Guess what neighbor, your new neighbor is probably going to be wealthier than you. Is this the result we hope the new comprehensive land use plan and zoning will deliver? What happened to the goals of affordability and equity?

This analysis, which is a SWAG at best, is at least a starting point to actually estimate the affordability of new housing in Ann Arbor. I would welcome any review and critique that would help refine this analysis. We need to pay more attention to detailed, data-based analysis of affordability, and less on wordsmithing a document.

A final bit of wisdom: "... between hope and result, there lies a line called attention." James Kernov

#### References

- [1] <https://www.bankrate.com/real-estate/roi-on-real-estate/>
- [2] <https://homeguide.com/costs/cost-to-build-a-house-in-michigan;>  
<https://www.homeblue.com/home-building/ann-arbor-mi-cost-to-build-a-house.htm;>  
<https://calculatoradam.com/residential-construction-cost-per-square-foot-by-zip-code-calculator/>
- [3] <https://www.houzz.com/professionals/home-builders/meadowlark-design-build-pfvwus-pf~662707912> and <https://planforward.net/design-matters/custom-home-cost-ann-arbor-mi>
- [4] <https://usmortgagecalculator.org/>
- [5] <https://www.census.gov/programs-surveys/acs/>