

# What's My Land Worth?

A dive into the land residual model

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Residual land analysis is a method for calculating the value of development land and is done by subtracting all costs associated with development from the total value of a hypothetically complete development including profit but excluding the cost of the land. The amount left over is the residual land value — or the amount the developer is able to pay for the land given the assumed value of the “as complete” development, the assumed project costs, and the developer’s desired profit.

In its simplest form, residual land valuation follows the below formula:

**AS COMPLETE VALUE — COST OF DEVELOPMENT = LAND VALUE**

In other words, the land residual analysis answers the question: “What can I pay for land in order to maintain project feasibility?” It is important to note that this calculation is relevant and applicable in all types of project feasibility analyses (conversion, rehabilitation, renovation), not only land valuation.

The most understandable application of the land residual technique is with residential lots in a tract subdivision. This is due to the relatively small variations in completed home values in a developing subdivision, translating into more credible “as complete” value estimates. The residual land analysis will always begin with the “as complete” value of a proposed development alternative. For instance, in the case of a tract development, a custom homebuilder will offer a buyer seemingly endless upgrade options. Not all of these upgrade options will be financially feasible. Some will be, but most will not, as the upgrades — and more importantly, the combination of the upgrades — will not perfectly reflect



typical market desires. In essence, the combination of upgrades stems from personal preferences which are rarely consistent with typical market activity. In these cases, cost exceeds value added — a concept known as superadequacy.

Upgrades and alternatives for custom homes are not always limited to interior modifications; they can often include size and exterior building material modifications. For our discussion, we will focus on interior alternatives to communicate the concept of a residual land analysis. The land residual analysis based on three development alternatives is summarized below:

Analysis of Development Alternatives			
	Alternative 1	Alternative 2	Alternative 3
Site Acres	0.50	0.50	0.50
Property Type	Single-family home	Single-family home	Single-family home
Beds/Baths	4 bed/3 bath	4 bed/3 bath	4 bed/2.5 bath
Special Features	Carpet throughout	Hardwood throughout	Hardwood throughout
Estimated Approvable Building Sq. Ft.	2,500	2,500	2,500
1. Value of Brand New Construction*	\$600,000	\$625,000	\$575,000
Estimated Construction Costs, New**			
Hard Cost PSF	\$145.00	\$150.00	\$140.00
Estimated Approvable Building Sq. Ft.	<u>2,500</u>	<u>2,500</u>	<u>2,500</u>
Hard Cost (\$ PSF x Bldg SF)	\$362,500	\$375,000	\$350,000
Soft Cost @ 10% of Hard Cost	\$36,250	\$37,500	\$35,000
Incentive @ 20% of H&S	<u>\$79,750</u>	<u>\$82,500</u>	<u>\$77,000</u>
Replacement Cost, New	\$478,500	\$495,000	\$462,000
Site Improvements @ 10% of RCN	\$47,850	\$49,500	\$46,200
Site Infrastructure @ 5% of RCN	\$23,925	\$24,750	\$23,100
2. Total Construction Costs	<u>\$550,275</u>	<u>\$569,250</u>	<u>\$531,300</u>
<b>Residual Raw Land Value (1 - 2)</b>	<b>\$49,725</b>	<b>\$55,750</b>	<b>\$43,700</b>
Residual Raw Land Value (\$/FAR)	\$19.89	\$22.30	\$17.48
Residual Raw Land Value (\$/Acre)	\$99,450	\$111,500	\$87,400

\*Based on comparable sales or other market evidence

\*\*Based on construction cost comparables



Hard Costs include all labor and materials required for construction. In this case, vertical hard costs (building material and labor) and horizontal hard costs (site development material and labor) are itemized separately.

Soft Costs include architectural, planning and engineering fees. They also may include legal fees, permits, and taxes, property and construction insurance. Construction loan application fees/origination fees, interest payments and other related financing fees. Entrepreneurial incentive is the minimum amount of profit necessary to entice a developer to take on the time, effort and risk of a new development.

Site improvements are physical site improvements to the land that are depreciable components. Examples include sidewalks, driveways, curbing and landscaping.

Site infrastructure are physical site improvements to the land that are not depreciable. Examples include grading, storm basins, water & sewer line extension and connection and electrical line extension and connection.

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**Alternative 1:** 2,500-square foot single-family home with 4 bedrooms and 3 bathrooms with carpet throughout (with exception to kitchen and bathrooms). This home will be worth **\$600,000** when complete and costs **\$550,275** to develop — inclusive of hard costs, soft costs, entrepreneurial incentive, site improvements, and site infrastructure. The analysis translates into a residual land value of **\$49,725** (\$600,000 to \$550,275) for an *approvable* raw<sup>1</sup> lot.

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**Alternative 2:** 2,500-square foot single-family home with 4 bedrooms and 3 bathrooms with hardwood throughout (with exception to kitchen and bathrooms). This home will be worth **\$625,000** when complete and costs **\$569,250** to develop — inclusive of hard costs, soft costs, entrepreneurial incentive, site improvements and site infrastructure. The analysis translates into a residual land value of **\$55,750** (\$625,000 to \$569,250) for an *approvable* raw lot.

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**Alternative 3:** 2,500-square foot single-family home with 4 bedrooms and 2 ½ bathrooms with hardwood throughout (with exception to kitchen and bathrooms). This home will be worth **\$575,000** when complete and costs **\$531,300** to develop — inclusive of hard costs, soft costs, entrepreneurial incentive, site improvements and site infrastructure. The analysis translates into a residual land value of **\$43,700** (\$575,000 to \$531,300) for an *approvable* raw lot.

As is inferred via the analysis, hardwood costs more than carpet and bathrooms cost more than common areas. Bathrooms and hardwood also contribute more value to the property, all else being equal.



Based on the residual land analysis, a 4-bedroom, 3-bathroom home with hardwood throughout (Alternative 2) is the highest and best use for the vacant site because it produces the highest residual land value. Put another way, this is the development alternative that returns the most value to the land.

One weakness in the land residual approach is the sensitivity of the analysis. Limitations to this approach primarily include that value and costs are dynamic — which will change during course of development rather than a single period of time. For example, rising labor and material costs along with unforeseen expenses associated with site infrastructure could increase the final development costs, which in turn negatively impact the residual land value. This approach also does not explicitly consider holding costs<sup>2</sup> and time value of money<sup>3</sup>; therefore, it is important to consider land sales to support the conclusion.

In my experience, right of way appraisal — similar to appraisal for most purposes — place a heavy emphasis on the comparable land sales approach to determine land value. This is largely considered the most reliable approach on the basis of credibility. That is, within the land residual analysis, approvable building area, estimated cost to construct and overall

development risk are difficult to credibly project with a raw piece of land. Land acquisitions are often use based rather than market based. That is, real estate decisions made by owner users are often influenced by external factors that are not motivated by real estate financial feasibility, thus resulting in a wide range of potential land sale prices.

Despite weaknesses inherent in residual land analysis, we should acknowledge that valuing land on the basis on comparable sales has substantial weaknesses as well. In the absence of a site survey to locate easements and adverbs, or an engineer analysis of development potential based on zoning requirements, differences in development density between sites may significantly deviate, thus reducing the credibility of comparison between sites.

Ultimately, land receives value based on what you can build on it. This is difficult to assert via either approach but more directly addressed in the land residual analysis. Land residual analysis is also known as the developer's approach and right of way appraisers would be wise to familiarize themselves with the process as a check for reasonableness against alternate valuation methodologies for development land. 🌟

<sup>1</sup> In land development, the term “raw” refers to land that is not approved for development and does not have site improvements or site infrastructure — specifically utilities hooked up and available.

<sup>2</sup> Holding costs can include taxes, insurance, mortgage principal and interest, among others.

<sup>3</sup> The time value of money (TVM) is the concept that a sum of money is worth more now than the same sum will be at a future date due to its earnings potential in the interim i.e., you can invest the future value of the property at a safe rate while the building is being constructed.



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