Metro Single Family Home Price Trends: Donuts Without Holes and Turnips Without Blood

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Some of you may recall Portland during the recession (read depression here) of the early 80's. In case you cannot or just don't want to, it was a time when the only thing higher than the unemployment rate was the interest rate. Housing prices of course headed in the opposite direction. Real housing prices plummeted 37% between 1979 and 1988. However, that wasn't the real land use story. What was happening at the jurisdiction and neighborhood scale was the most disturbing. In the inner city prices dropped precipitously, vacancy and mortgage delinquency rates climbed while at the urban edge real estate performed much better. In 1982– 83 the region lost 8,300 people but still constructed 3,700 new housing units mostly built in newly forming suburbs. Partially offsetting this meagerly growth, about 2,000 units within the City of Portland fell into the vacant and dilapidated category. To many of us observing the trends of the time, visions of eastern and mid-west urban blight came to mind. We foresaw the potential of the region becoming two entities – an expanding outer ring characterized by growth and prosperity and a declining middle, increasingly poorer and depressed. Figuratively speaking, the region would look like a donut with the central city comprising the "hole in the donut".

As most of us are aware, that didn't happen. Just what has happened, why it happened and where we go from here are really the points we want to make for this article. From the mid-1990's onward Metro has periodically monitored and analyzed single family home sales prices throughout the region. Using county assessor data we comb through the data base tax lot by tax lot, selecting recently sold single family homes . We then further divide that selection into sales of newly constructed homes and sales of existing (vintage) homes. In this way we can use new home sales data to analyze how developers are responding to market prices and regulatory changes. At the same time, vintage sales gives a more comprehensive picture of how consumers are valuing neighborhoods, access and attributes, such as house and lot size. Exhibits One and Two display regional averages of some of these characteristics for new and vintage housing.

The Whole Donut: Region-Wide Home Price Trends

Exhibit One indicates a trend of increasing new home prices since 1995 that began leveling out in 1999.

Exhibit One – New Home Sales Attributes: 1997 – 2001

Year	Median Price	Median Size	Median Lot Size
1995	169,000	1,858	6,738
1996	179,000	1,896	6,698
1997	191,000	1,957	6,481
1998	192,000	1,882	5,996
1999	204,000	1,958	6,151
2000	204,000	1,982	5,857
2001	187,000	1,792	5,132

Source: Metro Data Resource Center, County Assessors

The apparent drop in 2001 owes to the decline in home size – more on this later. Also, we see a stabilizing of and perhaps a decline in median home size and a consistent drop in lot size. Moving now to Exhibit Two, we look at comparable data for sales of vintage homes with construction dates going back as far as the 1870's.

Exhibit Two: Existing Home Sales: 1997 – 2001

Year	Median Price	Median Size	Median Lot Size	Age
1997	149,000	1,497	7,423	34
1998	158,000	1,570	7,731	32
1999	166,000	1,576	7,543	34
2000	169,000	1,592	7,390	36
2001	173,000	1,600	7,340	36

Source: Metro Data Resource Center, County Assessors

Here we see a median lot size that is relatively constant at about 7,500 sq. ft., a median home size at about 1,500 – 1,600 sq. ft. and a median age of about 34- 36 years. Vintage home prices like newly constructed home prices, grew rapidly during the 90's and leveled out in 1999, but unlike new home prices continue to increase slowly through 2001.

The comparison of Exhibits One and Two grows a little "meatier" if we keep in mind that new home construction is heavily concentrated in a few areas. In these areas developers are aggressively looking for the best mix of lot size, house type and size that gives them maximum profits. Exhibit Two on the other hand represents sales fairly evenly distributed across the region proportional to housing density. The mix of lot size, house size and type reflects the land use regulations and market conditions at the time the housing was built.

In this context we note that present day lot sizes are about 33% smaller than vintage housing, though house sizes are larger. Also intriguing is that attached housing comprised over 18% of the sample of new homes and only 3.5% of the sample of vintage homes. The new home data for 2001 also suggest a drop in home size, but that may be a sample quirk. With 2002 data, we will feel more comfortable about which way home size trends are going. At any rate, in response to a decade of rising home prices the private market is taking full advantage of land use regulatory changes made during the 90's to arrive at a different mix of lot size, home size and type than was the past practice. This market response to regulatory flexibility appears to have dampened price increases of new homes below those of vintage homes.

The Donut Hole: Spatial Patterns of Home and Land Values

While the regional data are certainly informative, the spatial patterns are astounding! The hole in the donut is gone. What replaces it looks more like a flying saucer. By and large, the areas of greatest value on a sq. ft. basis are in the center with values declining as you move farther away from the central city. Using a well known statistical technique called "hedonic regression" (see Figure 1 inset) we have constructed an index of neighborhood values that we display in the map below (Chart One).

Figure 1 gives an example of a statistical technique we call "hedonic regression". Our example is home sales from the Buckman and Happy Valley neighborhoods. In Buckman in 2001 homes sold for an average of about $205,000; in Happy Valley for an average of $275,000. But in Buckman the average home was 1,800 sq. ft. on 3,900 sq. ft. lot and 91 years old. In Happy Valley the average home was 2,900 sq. ft. on an 19,000 sq. ft. lot and 19 year old. Hedonic regression allows us to statistically estimate the value of the home size, lot size, age and other attributes such as access and neighborhood quality. Once we have those estimates we compare housing in different neighborhoods, holding such factors as lot size, building size and age constant. Figure 1 shows that if we plopped the average Happy Valley home in Buckman it would sell for nearly $400,000. Conversely, if we moved the average Buckman home to Happy Valley it would sell for about $145,000.

Figure 1: Example of "Hedonically" Adjusted Sales Prices - Effect of House Size, Lot Size, Age and Neighborhood

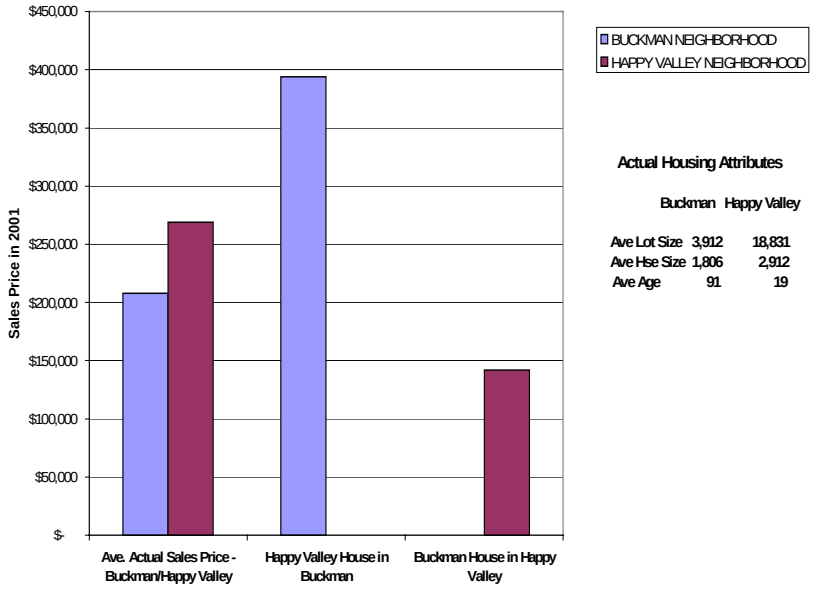
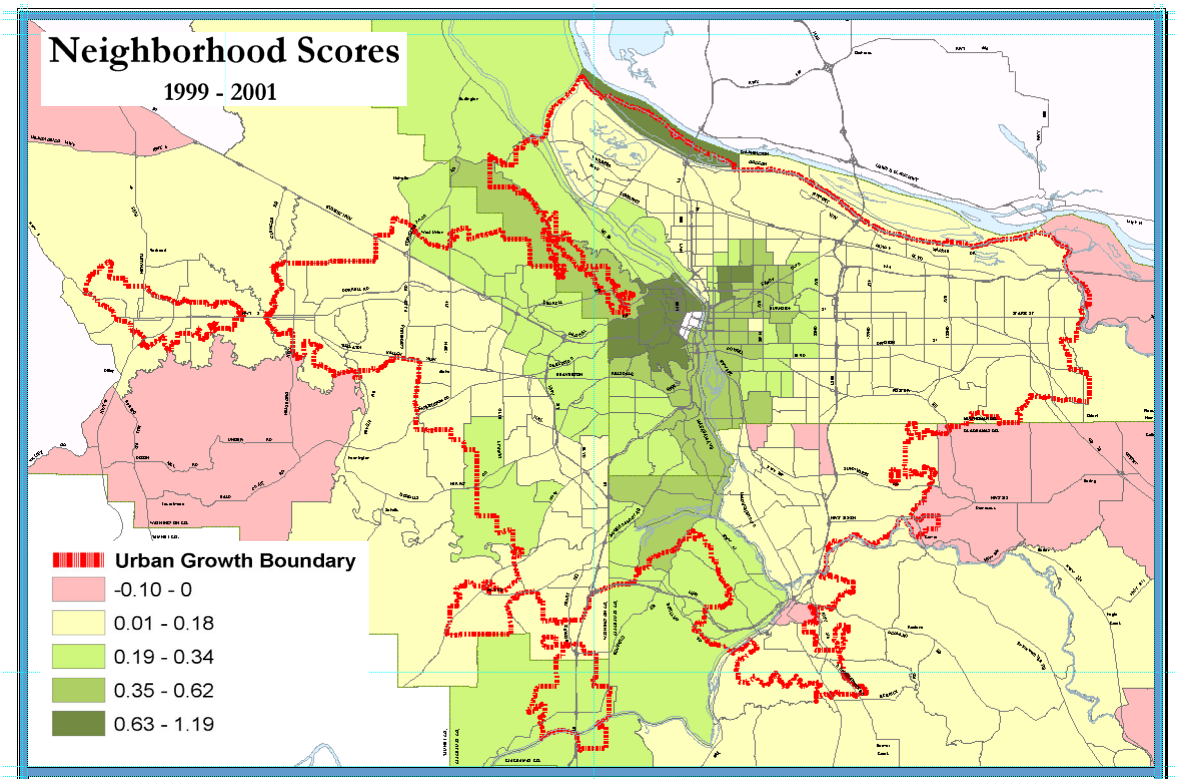
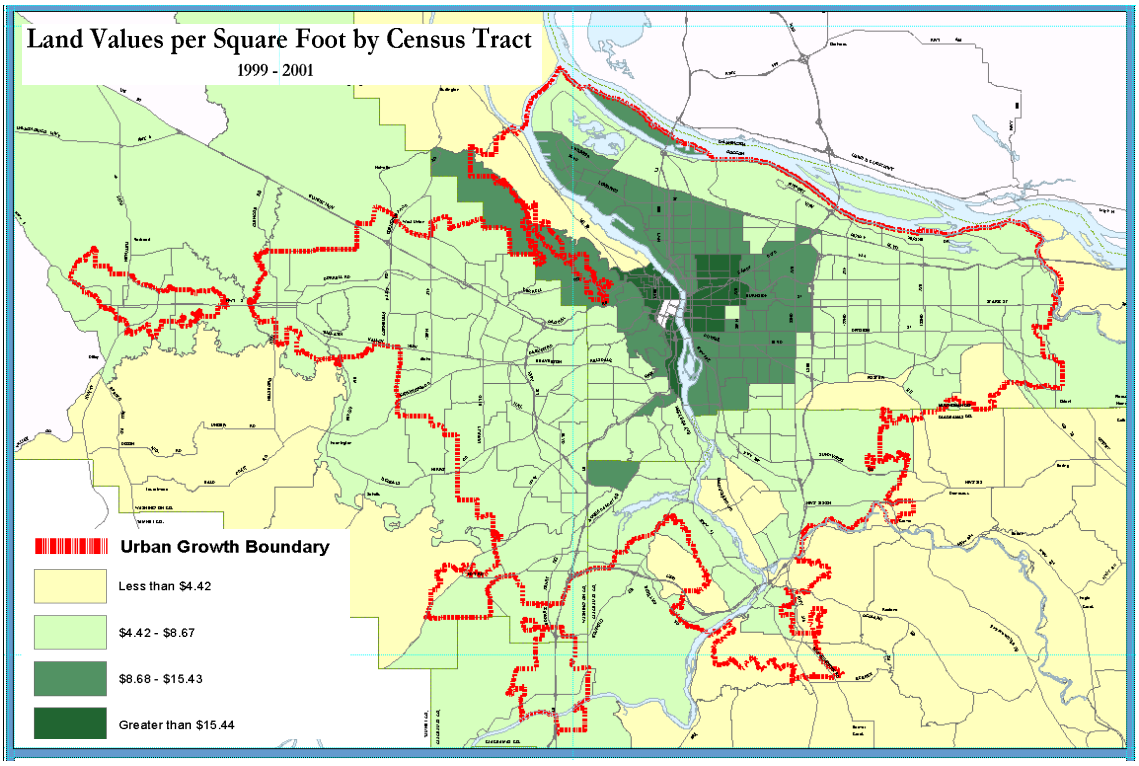


Chart One displays the pattern of property value after we account for the fact that every neighborhood differs in terms of housing size, lot size, access and age. When we standardize the data to account for these differences, we get an estimate of how much a particular location is worth in terms of consumer demand (i.e. how much we are willing to pay to be there).

We can also transform the statistical data into land value per sq. ft. Chart Two presents that data. We note that some areas on Portland's west side have small lots with high value, so sq. ft. prices approach almost $25 (about $1,000,000 per acre) for single family residential land. In contrast many remote rural locations without urban infrastructure are characterized by very large lots of low value, so land values fall below $2 per sq. ft. ($80,000 - $90,000 per acre).

The primary significance of Charts One & Two is that they profile consumer demand for the period 1999 – 2001. It shows that far more housing consumers voting with their wallets by looking inward for housing locations rather than outward. Over simplifying somewhat, we end up with far more housing demand in the region's central areas than we can accommodate within a short period of time. The result is that housing prices go up in the central areas to the point that many housing consumers are pushed outward (say to Clark County). This phenomenon brings us to our second food metaphor: turnips without blood.





More Blood from the Turnip: Squeeze Demand into Supply or Supply into Demand?

Remember the trend of decreasing lot sizes that we saw in Exhibit 1? Along with enabling local regulatory changes, this represents developer response to the economic realities of the land value map we just looked at. Developers are using less land in the central areas and putting larger improvements on small lots. In addition, they are offering a wider variety of housing products, with almost 20% of recent single family housing production in attached or very small lot (less than 3,500 sq. ft.) housing types. Metaphorically, the market is getting blood out of the turnip; putting more and more supply into high demand areas. So just how much blood is left in the turnip?

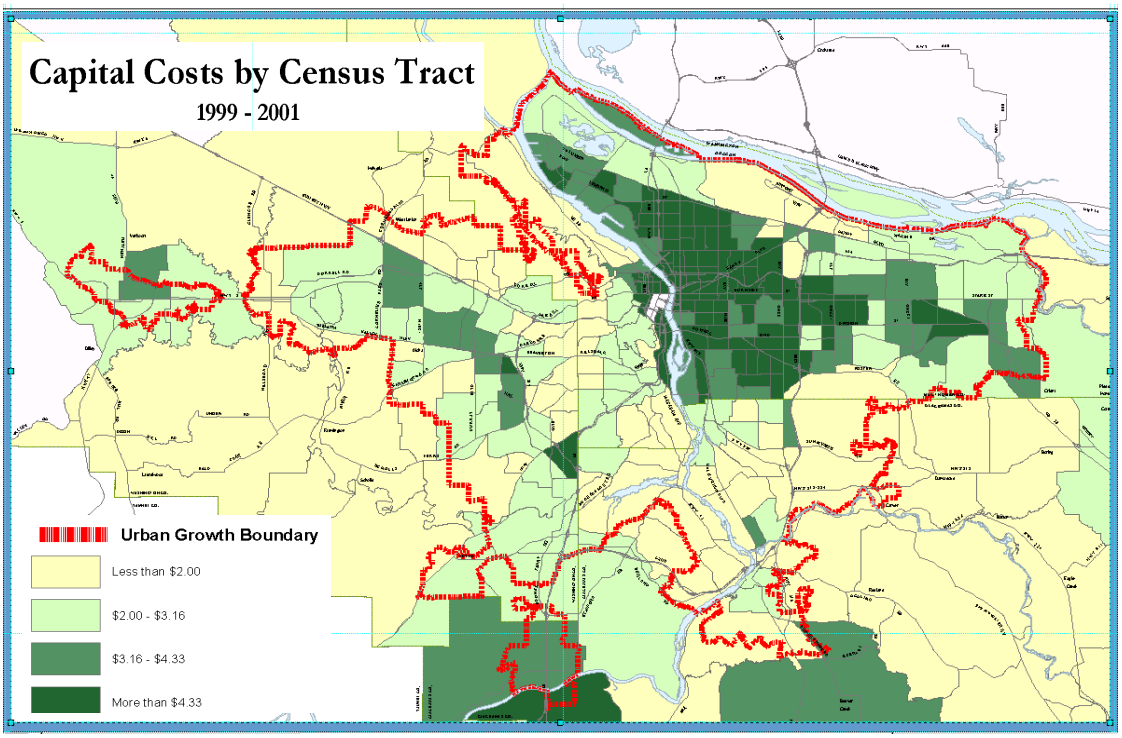


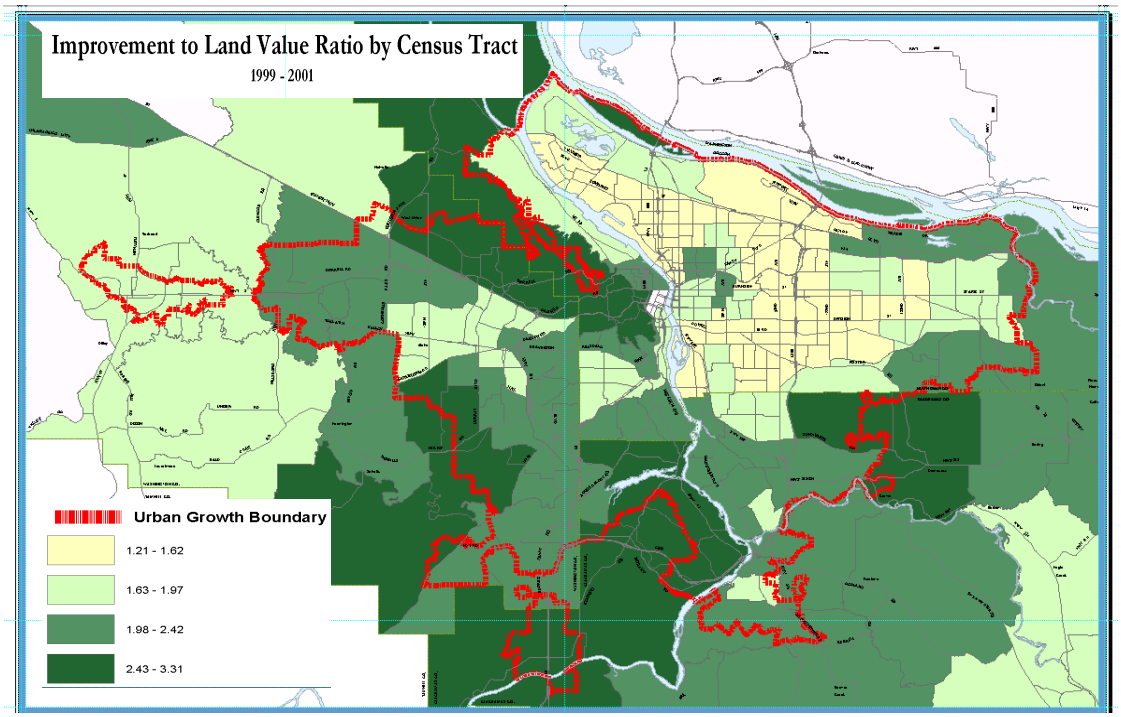
Chart 3 (Map 3) displays our best estimate of the relative cost of constructing a sq. ft. of housing throughout the region. Even for single family homes limited to 1 – 3 floors, capital costs per sq. ft. vary considerably over the region. The reason is parcel size and economies of scale. If a developer is limited to 1 or 2 houses at a time on widely scattered lots, most of his time will be spent finding more lots to build on and traveling between scattered sites. Most cogently, he will also be very limited in his ability to get competitive bids from building subcontractors. Conversely, a builder developing 20 homes on one parcel can spend most of his time on site and obtain very competitive bids from subcontractors eager to work on 20 homes in one place rather than 2 or 3 spread over the landscape. Our more technical analysis validates for this region what has been found most everywhere for single family housing production: over a wide range single family housing production becomes more efficient with increasing scale.[1]

The pattern in Map 3 looks alot like a flying saucer again. Unlike Map 1, this is not good news. In general, in most areas where consumer demand is the largest, construction costs are also the highest. Or, more clearly stated: the places people want to locate are already filled up. What is left are a few scattered parcels with limited residential capacity. In contrast, areas with larger amounts of vacant land in larger parcels tend to be located in areas of lower consumer demand. The market resolves this conundrum fairly simply; housing prices increase in the center to the point where demand is squeezed outward to where greater supply exists because available supply is being wrung out of the high demand areas in the center. Hence, demand has squeezed the blood out of the turnip.

However, the solution is not quite so simple, particularly from a regional policy perspective. Chart 4 (Map 4) plots averages of improvement value per sq. ft. divided by lot value per sq. ft. If the score is low for a developed area, it means there is a much

[1] We use a translog cost function approach to estimate a returns to scale index of 1.04 – 1.08 for newly constructed housing within the region; meaning total housing output (units x sales price) goes up 4 – 8% faster than production costs as production scale increases.

higher likelihood of infill and redevelopment (together- "refill"). A low score in an undeveloped area means there is a high likelihood that developers will build on the vacant land if allowed to do so. High scores (those over 1.6 – 1.8) indicate areas where there is a good match between the improvement values and the land values and there is a much lower chance for additional development unless land values increase dramatically or improvement values decline.

What we see from Map 4, is that we have only a few remaining areas where housing supply will readily appear. Peripheral areas with lower land values already have fairly expensive houses (big houses on large lots) so they will not readily develop. Consequently, for the region to realize a large increase in housing supply, it will be necessary to substantially invest in additional access and infrastructure and further alter land use regulations to increase capacity. In this way, land values will increase and provide present property owners an incentive to develop. Looking toward the direction of the central city we see a similar pattern of medium to large improvement to land ratios; meaning the additional housing capacity of existing residential land will be quite limited. Achieving substantial increases in capacity in these areas may involve substantial government intervention, in particular public subsidy, and re-zoning of areas not presently designated for higher density residential development.

At any rate, donuts without holes and turnips without blood poses an interesting challenge to the region's planning community as it prepares to accommodate upwards of an additional 360,000 housing units over the next 25 years.