AN ASSESSMENT OF THE
MARGINAL IMPACT OF URBAN AMENITIES
ON RESIDENTIAL PRICING

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JOHNSON
GARDNER

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I. INTRODUCTION

JOHNSON GARDNER was retained by METRO to document the pricing effects of urban living infrastructure. The objectives of the work were as follows:

1. *Document current trends and development patterns in Districts where robust urban amenities exist and appear to have facilitated private mixed-use development. Determine extent, if any, that urban amenities have on housing prices and the extent to which the urban amenity mix influences pricing.*
2. *Determine if government can cost-effectively stimulate pricing effects that will allow for mixed use development by investing in enhancements to the urban living infrastructure.*

II. EXECUTIVE SUMMARY

An entire industry has arisen dedicated to the concept of "Placemaking", which recognizes that an agglomeration of activities and amenities is a critical aspect of an urban experience. Placemaking is a term that began to be used in the 1970s by architects and planners to describe the process of creating squares, plazas, parks, streets, and waterfronts that will attract people because they are pleasurable or interesting. While widely discussed with anecdotal evidence, to date there has been little if any substantive analysis of the marginal impact of the amenities associated with an urban experience on achievable pricing. This study addresses the missing substantive evidence of the relationship between a range of urban amenities and pricing.

Successful urban environments represent a marketable amenity, the value of which is reflected in higher effective pricing for residential units. This higher pricing is necessary to support the intensive and costly development forms associated with more urbanized areas. As achievable pricing is one of the key impediments to realizing higher density residential development, increasing the supply of urban amenities in a district can be an effective strategy to encourage targeted development forms.

Development of a greater number of residential units within walking distance of a commercial concentration increases the viability of that concentration, attracting a superior tenant mix that then increases the premium for residential uses. This virtuous cycle of investment and reinvestment has been seen in many of Portland's successful commercial districts. The benefit of this type of development pattern accrues not just to new construction, but to the broader neighborhood as a whole.

Hedonic statistical modeling of 2006 home transactions proximate to various urban amenities revealed a range of price premium estimates for recent home sales, all else equal. In general, we would consider the tenant types classified and evaluated in this study to represent desirable neighborhood amenities, and would expect them all to have a positive impact on values. The results of the study did not confirm this relationship for all categories

of tenants surveyed, which may be explained by the limited range of the study. Calculations of price premiums at the extreme ends of the amenity range expressed above are likely not robust and likely are sensitive to statistical specification. For a number of amenity types the sample size was limited, reducing the reliability of the indicated results.

The results also varied depending upon the type of residential product. The relationship between the tenant types identified was almost universally positive for condominium units, which offer a greater degree of separation from some of the negative externalities associated with these types of uses. It must be noted, however, that the sample of attached home sales in the study was not large (148 transactions) and estimated values of urban amenities (model coefficients) were rarely statistically significant.

Even so, attached projects tend to address their parking needs on-site, and have a greater degree of security and separation from street-level activity. As marginal new development activity in urban areas is likely to take the form of condominiums, the relationship between urban infrastructure and condominium pricing is probably more important from a policy perspective than the more general impact on residential pricing.

The results of the study indicate that the proximate availability of a range of urban amenities have a substantive impact on achievable residential pricing. Financial viability has been consistently identified as the primary obstacle to achieving higher density urban development forms in many markets. As achievable pricing is directly related to project viability, this study indicates that a strategy to support and expand the urban amenity base in an area is supportive of realizing more urban residential development patterns.

The primary benefit of urban amenities is related to convenience, often expressed in savings in time and travel cost. The ability to reach a number of amenities within a pedestrian range is of particular value. The aggregation of theses services provides an urban experience, allowing for residents to increase their "dwell time" in the area. While our analysis indicates that a priority should be placed on major amenities such as a cinema and specialty grocer, these amenities require a minimum threshold of market depth not found in all locations. An alternative strategy to attracting a tenant such as a specialty grocer is to attract a smaller-scale tenant providing a similar range of services. A specialty grocer may provide for grocery, butcher, bakery, card shop and florist services. An aggregation of tenants providing similar services can provide a comparable amenity base.

While amenities can add value, it should be noted that some tenant types can reduce values. Some of this is related to configuration, as parking conflicts appeared to impact residential values in areas with limited parking availability. As noted previously, this appears to primarily impact single family homes more than condominiums. A similar split impact is seen with bars and nightclubs, which can add a disamenity to single family residences within close proximity.

A range of urban amenities is a critical component of an "urban experience", which adds value to an area that can be realized in higher achievable pricing for residential development.

Our study identifies a substantive impact on achievable pricing associated with a range of tenant types. If it is public policy to encourage more urban residential development forms, encouragement of an urban amenity base is directly supportive of this policy. Developing a more marketable urban experience assists both new development, as well as providing significant marginal value to existing residents.

Metro's resources in the TOD and Centers program are quite limited, and investments should work with the market and leverage private investment with targeted public investments. We see two major roles for the program. The first of these would be what can be referred to as "proof of concept" investments, supporting projects that test and hopefully demonstrate market support and achievable pricing for a targeted development form. Examples of this type of intervention would be The Crossings at Gresham Station and North Main Village in Milwaukie, both of which demonstrated that a significant premium could be achieved for untested urban development forms in these markets.

The second type of investment would be related to increasing the attractiveness of a center, thereby generating a marketable premium that would be reflected in higher achievable pricing. This could include infrastructure investments (quite expensive), common area improvements (parks, plazas, streetscape), and active support for targeted "urban infrastructure" that have a demonstrated positive impact on achievable pricing (specialty grocers, theaters, etc.). An example of an investment type that this analysis would support would be providing funding to assist in the renovation and possible expansion of a theater, a restaurant, café, or bookstore within a center. Our analysis would indicate that this facility would increase achievable pricing in the area, directly impacting the viability and form of future residential development.

III. QUALITATIVE APPROACH

A. THEORY AND FINANCE

A number of communities have been pursuing a more urbanized development form outside of the traditional central business districts. A key challenge to this type of development is achieving the density of activity typically associated with urban living. In general, higher density development forms are more expensive to construct, and prove viable only in areas in which there is a relatively high location premium. In other words, an urbanized area can realize a pricing premium associated with localized amenities, which can then support a higher development density.

The premium associated with a specific location is a function of marketable amenities, which in a real estate context refers to a feature that increases attractiveness or value. Outside of the physical characteristics of the product itself, typical amenities include features such as views, park and trail systems, access to transit and school districts. A key characteristic of a locally-available amenity is savings in travel cost, with commonly utilized amenities such as groceries, coffee shops and bakeries having a greater marginal impact.

While competing with more suburban locations in terms of many of the aforementioned amenities, more urbanized areas tend to offer a greater array of convenience and lifestyle-related services within easy walking distance. The ability to reach a number of amenities within a pedestrian range is of particular value. The aggregation of theses services provides an urban experience, allowing for residents to increase their "dwell time" in the area. Providing a rich and active environment is the key to creating a successful urban concentration.

This summarizes the traditional anecdotal argument typically forwarded in planning and architectural concepts such as "placemaking" exercises. While largely asserted, there has been little serious effort to quantify the degree to which these amenity concentrations substantively impact achievable pricing, and subsequently development form. Section IV of this analysis presents an empirical evaluation of the impact of urban amenities on pricing.

B. DEVELOPER INTERVIEWS

As part of our analysis, we talked to a number of developers active in the Pacific Northwest about their perception of the impact of a range of urban amenities on residential development. While evidence has largely been anecdotal that urban amenities substantively impact pricing, the development community widely perceives this relationship to exist. The impact is seen not only on achievable pricing but also in higher absorption rates and lower perceived risk. This section summarizes the opinions of developers interviewed, which is largely consistent with the theory outlined in the previous section.

A key attraction for many developers of urban projects is barriers to entry. In other words, how easy is it for a competing project to enter the market. On a suburban greenfield site, the

locational characteristics of parcels can be very similar, making it more difficult to differentiate your project and sustain the type of competitive advantage that provide for pricing power. As urban districts vary significantly, and the location within these districts impacts pricing on a block by block basis, there is less likelihood for direct competition.

People are more focused on where they live, and whether they can walk to get coffee, a meal or a bagel. The most mentioned tenant perceived to be marketable is a specialty grocer such as Trader Joe's, Zupan's, New Seasons and Whole Foods. These tenants have the ability to significantly improve the living experience in the area, providing a needed amenity with grocery good, ready to eat foods, flowers and gifts. Cinema's are also seen as good, assuming they can resolve parking and not be configured with a giant parking lot. Specific instances cited included theaters on SE Hawthorne, SE Belmont and SE Milwaukie. Condominium projects are being considered near Bridgeport largely on the strength of the amenity mix, which includes theaters, specialty grocer and extensive restaurants.

Not all commercial uses provide an amenity for residential, with some tenants representing a conflicting use. Common issues in an urban environment that impact residential marketability are vandalism and loitering. Certain tenant types are associated with this more than others, and can negatively impact pricing, particularly if very close to a residential project. Nightclubs and bars with a loud and late night clientele are not seen as a positive for units in close proximity, but can provide an amenity for a district as a whole. You need to be careful regarding the impact of parking and loitering, as this type of use can be an amenity if you are two to three blocks away but a problem if you are closer. Public parking, either in lots or structures, can also attract loitering.

Parks and public investments can also serve as significant marketable amenities. Transit investment, such as light rail, is seen as highly advantageous. The availability of transit is clearly marketable, and the supply of rail station area sites is limited, providing the aforementioned barrier to entry.

While there is a symbiotic positive relationship between residential density and commercial tenants, there is some disagreement which needs to come first. Some developers feel that the residential density needs to be in place to support the commercial space, while others felt that the commercial space must stand on its own with density to follow and strengthen the space. This chicken and egg relationship is inherent in developing a more urbanized concentration, with many of Portland's most successful districts emerging over time with alternating commercial and residential developments.

An issue for rental developments is the actual realized experience in a district, not just the experience sold at initial lease up. Projects can successfully push the market and lease up based on the promise of a district, but if the tenant does not get the expected quality of the experience they will not renew.

IV. EMPIRICAL ANALYSIS OF URBAN AMENITY PRICE PREMIUMS

A. INTRODUCTION

As discussed in Section III above, there exists ample anecdotal evidence that urban amenities have distinct and significant value to homeowners, specifically in the Portland metro area. Based on individual residential developments or the experience of individual developers, households seemingly are willing to pay a higher price for a residence nearby or within a mixed-use project with a specific amenity, such as a specialty grocer and/or other types of retail and services all else equal. Such buyer behavior poses significant implications for private and public development interests, for example:

- Residential development, particularly new attached product construction, can realize greater market feasibility and return if proximate to the best retail and/or service offerings;

- New mixed-use development can enhance market feasibility and return by recruiting the most valuable individual or combination of retail and services amenities to buyers;

- Public jurisdictions encouraging higher-density and mixed-use development can better understand what amenities package will jointly best accomplish market feasibility and land-use planning goals; *and*

- Municipalities actively revitalizing their downtown areas can better understand the optimal mix of commerce that is necessary to attract urban residential development interest.

Anecdotes abound, but to date there has been little empirical or *measured* evidence of such demonstrated buyer behavior. More specifically, there has been little documented evidence that answers the following questions:

1. *Does Urban Amenity Matter?* - Has the existence of urban amenity nearby actually boosted the sales price of a home, or did some other factor, such as physical features of the home, actually explain the buyer's behavior?

2. *Does the Urban District or the Individual Amenity Matter?* – Was the buyer willing to pay more because of a specific restaurant nearby, or because of the combined appeal of the entire nearby district?

3. *What Specific Urban Amenities Matter?* – Did the bistro next door positively impact the price of the home, or was it the organic produce market across the street?

4. *How Valuable is the Amenity?* – Exactly *how much* sales price boost occurred due to the proximate urban amenity?

To answer these questions, a statistical process known as hedonic modeling was utilized to study home sales in various parts of the Portland metro area in 2006. Hedonic modeling

allows the measurement of observed behavior, in this case the price paid for a home, in terms of the many specific factors that likely influence that behavior. Findings that result from this statistical methodology help to provide specific and *measured* answers to the above urban amenity questions of *Whether*, *Which*, and *How Much*.

Following this Introduction (A), discussion of the study process follows the following sequence:
  B. Hedonic Modeling Explained
  C. Hedonic Modeling Literature Review
  D. Portland Metro Area Urban Amenity Study Methodology
  E. Study Findings
  F. Conclusions & Implications

B. HEDONIC MODELING EXPLAINED

Unfortunately for economists and statisticians, the behavior of consumers is frequently complex and, therefore, statistically "messy." A prime example is the topic of this study: residential choice behavior. More specifically:

- What and how many factors induce a buyer to pay a certain amount for a home?

- How much does each factor individually contribute to the willingness to pay that price?

- How can conclusions be drawn about the housing preference of a population of households when individual buyers' preferences will definitely vary and potentially significantly?

- How can conclusions be drawn from buyer behavior when no two homes are identical, thus making comparisons difficult?

Fortunately, over the last thirty years, statistical procedures have been developed and extensively refined that enable empirical explanation of complex consumer behavior, specifically where there are many factors jointly determining that behavior.

One of the most common statistical tools developed for measuring such complex behavior, with a reasonable level of certainty, is known as *hedonic modeling*. Precisely named, hedonic – or personal preference/pleasure - modeling seeks to explain observed behavior when there are likely numerous and widely varied personal preferences involved in that behavior.

It is by no coincidence that home values have been among the most widely studied of economic behavior utilizing hedonic modeling due to the many personal preference factors made in a home purchase as will be discussed in the literature review later in this document. This frequently includes a wide array of locational features, physical features, environmental features, economic factors, and notably the whims and preferences of individual households and their unique needs.

In mathematical notation, the relationship of interest in this analysis is between the observed behavior (purchase price of a home) and the potential factors that contributed to the willingness of the buyer to pay that price:

      (1)   Price = f (Locational, Physical, Environmental, Economic, Other)

or, Price is a function of Locational, Physical, Environmental, Economic and Other factors. Here, "Other" factors include those likely difficult to observe, specifically the unique tastes and residential requirements of individual households.

In statistical notation for hedonic modeling of home prices, Equation (1) is expressed as follows:

      (2) $P = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \ldots + \beta_n x_n + \varepsilon$

where:

P	=	Price
α	=	A fixed (constant) dollar figure independent of the value consumers place on factors described in Equation (1)
β	=	The dollar value that a buyer places on a specific home feature
x	=	An individual feature of a home that has a unique dollar value
n	=	The total number of home features that factor into the home price paid
ε	=	Unpredictable determinates of home value, or "random error"

Because α is fixed, it can be interpreted as the basic value a buyer places on ownership of a home regardless of all of its features and amenities. Otherwise stated, α is the minimum price a buyer will pay for a home before even considering all of the qualities and amenities that an individual home might feature.

Equation (2) can therefore be interpreted as follows:

<u>The price paid for a home can be expressed in terms of a the basic value for the ownership of any home in general (α), n different and unique features of a home (x), the dollar value that a home buyer places on each feature (β), and unpredictable personal taste (ε).</u>

For example, one of the many valuable features of a home may be the number of bathrooms it has. Supposing the number of bathrooms in a home is expressed as the first feature of a home (x_1) in Equation (2), the hedonic model process can estimate the value of each bathroom in a home (β_1). Therefore, if a home has two bathrooms and the statistical hedonic model estimates the value of a single bathroom as $8,000 of a total home price, the model predicts that bathrooms account for $16,000 of the purchase price expressed as:

$$(3) \qquad P = \alpha + (\$8{,}000 * 2 \text{ bathrooms}) + \beta_2 x_2 + \beta_3 x_3 + \ldots + \beta_n x_n + \varepsilon$$

With the price of a home expressed as such in Equation (2), hedonic modeling allows estimates of the intrinsic value of homeownership (α) as well as the dollar value (β) of each and every important feature of a unique home (x) the intrinsic value of homeownership) and each β (dollar value) for every unique feature of a home that has measurable value to a home buyer.

Therefore, the following summarizes the attractive power of hedonic modeling for understanding home prices and buyer behavior:

- The ability to measure many determinants of the price of a home; *and*

- The ability to understand the *marginal* or isolated value of an individual home feature, such as the value of two bathrooms to a homebuyer expressed in Equation (3) from the example above.

A detailed discussion of the statistical details of hedonic modeling is beyond the scope of this analysis. However, the review of hedonic modeling literature in the following section provides numerous resources for additional details. The reader is further invited to inspect an outstanding review of hedonic pricing methodology and history by Stephen Malpezzi of the University of Wisconsin.[1]

C.   HEDONIC MODELING LITERATURE REVIEW

Hedonic Modeling of Residential Pricing Background
There are countless economic studies and articles that have analyzed the extent to which various physical, environmental, and location characteristics are capitalized in housing prices. Specific studies have considered variables ranging from the advantage of nearby wetlands, golf courses, open space, and transit, to the disadvantage of locations close to landfills, airports and superfund sites to name a few. Nearly all of these studies utilize the hedonic pricing approach first articulated by Rosen.[2]

Despite the robust volume of the general literature, studies that have *directly* considered urban amenity premiums in the valuation of housing prices within a specific city are limited. Terry Nichols Clark[3] considers urban amenities in the evaluation of why people locate in

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[1]   *Hedonic Pricing Models: A Selective and Applied Review*, Stephen Malpezzi, The Center for Urban Land Economics Research, The University of Wisconsin, April 10, 2002.

[2]   Rosen, Sherwin. (1974). "Hedonic Prices and Implicit Markets: Product Differentiation in Perfect Competition." *Journal of Political Economy.*

[3]   Nichols, Terry C. "The City as an Entertainment Machine: Research in Urban Policy," Volume 9, 103–140

particular cities at a macro scale). We identified three main subsets in the broader hedonic literature that will be particularly useful in the analysis of the marginal contributions of urban amenity to residential pricing:

- Those that address the impact of nearby transit, in particular light rail stops; *and*

- Studies that have considered the affects of urban form.

- A set of environmental studies that focus on the PDX area.

The literature evaluating the impact of light rail development is particularly useful because of the methodological approach taken in the studies. In several different studies the authors have found positive impacts on housing prices around light rail stops. These studies often utilize dummy variable radii around specific stops to measure the impact as one moves outward from a light rail stop. Examples include:

- *A study in Atlanta found a $1,000 impact on housing prices for each 100 feet away from a light rail stop.[4]*

- *A study of San Diego found a 46% premium for condominiums and 17% premiums for single-family homes near commuter rail stations.[5]*

Other studies have shown positive impacts on commercial land prices and office space rent levels. In Washington DC light rail development projects added more than $3 per gross square foot to annual office rents.[6] Similar to these studies we suspect that as one moves away from a popular urban district housing prices will decline, though to date empirical literature provides no robust analysis or conclusions.

Recent studies evaluating the impact of urban form are also useful. This area of the literature is primarily focused on the price premiums that "new urbanism" developments have commanded. Although what constitutes a "new urban" neighborhood is somewhat vague and arbitrarily defined, many of the centers that have experienced mixed-use development in the Portland metro area have many of the characteristics typically associated with new urbanism as defined in existing studies.

Several relatively recent studies have found that in general people are willing to pay a premium for "new urbanism" and mixed-use neighborhoods.

- *Tu and Eppli have written two different articles in this vein. Their 1999 article[7] evaluates Kentlands, a new urbanism neighborhood in the DC metro area, and found a 12% premium relative to comparable neighborhoods lacking "new urbanism" features.*

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[4] Effects of Elevated Heavy-Rail Transit Stations on House Prices with Respect to Neighborhood Income," *Transportation Research Board*, 1992.

[5] Cevero, R., and Duncan, M. (2002) "Land value impacts of rail transit services in San Diego County."

[6] Cervero, Robert. (1994). "Rail transit and joint development: Land market impacts in Washington, DC and Atlanta."

[7] Tu, Charles C. and Mark J. Eppli. "Valuing New Urbanism: The Case of Kentlands." *Real Estate Economics* 27. 3 (1999): 425-51

▫ *In their more recent 2001 study[8] the authors broaden their analysis to include Laguna West near Sacramento, California, and Southern Village in Chapel Hill, North Carolina both of which are also "new urbanism" type neighborhoods. Using data on over 5,000 sales in the three different neighborhoods Tu and Eppli again find that home buyers are willing to pay a premium for housing in these neighborhoods.*

Published Analysis of Washington County, Oregon

Perhaps the most directly comparable analysis is Song and Knapp's 2003 article[9] on new urbanism neighborhoods in Washington County, Oregon. Song and Knapp examined the impact of new urbanism features on housing prices in 186 Census block-group neighborhoods of Washington County. New variables utilized in their analysis are by necessity both novel and somewhat arbitrary, with new urban features including:

▫ *Street Design and Circulation,*
▫ *Density;*
▫ *Land-Use Mix;*
▫ *Accessibility,*
▫ *Transportation Choice, and*
▫ *Pedestrian "Walkability".*

The authors also include numerous control variables for physical housing characteristics, public service levels, location characteristics, natural amenities, and socioeconomic characteristics. The finding in this study indicate that Washington County residents are willing to pay premiums for houses with more connective streets, more and smaller blocks, better pedestrian access to commercial uses, and proximity to light rail, all things equal.

Although these results are encouraging, the Song and Knapp article does have some shortcomings.

▫ *First, it is solely concentrated on Washington County which although relevant for our study, its findings may in fact have methodological limitations for other parts of the Portland metro area. For example, the variable they include on land use mix is negative which indicates that consumers prefer to have primarily residential uses in their neighborhoods. Although this makes sense in a suburban setting, in an urban setting this may not be the case.*

We expect that a variety of land uses, in particular commercial and residential mixed uses have a positive impact on prices in an urban setting.

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8   Tu, Charles C. and Mark J. Eppli. "An Empirical Examination of Traditional Neighborhood Development." *Real Estate Economics* 29. 3 (2001): 485-501

9   Song, Yan and Gerrit-Jan Knapp. "New Urbanism and Housing Values: A Disaggregate Assessment." *Journal of Urban Economics* 54. 2 (2003): 218-38

> □ *The study is also largely influenced by the Orenco Station neighborhood which may be somewhat of an outlier as it has a close location to several sizeable employers, including several Intel facilities.*

<u>Published Analysis of Other Portland Metro Areas</u>
There is also a set of useful studies that have measured the impact of primarily environmental variables on housing prices in the PDX area which will be useful for our analysis. Three such studies were identified:

> □ *A 2002 study by Bolitzer[10];*
> □ *A 1997 study by Mahan[11]; and*
> □ *A 2005 study by Netusil.[12]*

These studies specifically analyzed the impact of open spaces, wetlands, and environmental zoning and amenities on property values, respectively.

In the most comprehensive of the above mentioned studies Netusil considers environmental zoning and amenity factors including streams, rivers, canopy, golf courses, parks, wetlands, and trails. The data set contains sale price, physical, neighborhood, location, zoning, and amenity information for "arms-length" (recently recorded) single-family residential property sales in the study area from 1999 through 2001. Sales in Southeast Portland constituted 39.96% of all transactions, 31.93% were in Northeast Portland, 12.62% in North Portland and 12.93% in Southwest Portland. Northwest Portland had the fewest sales with 2.55%. The study finds positive and significant results for several of these environmental variables, the most significant of which is location near a river.

These studies, taken together with other studies we examined, highlight many of the important variables and methodologies that will likely be of value in analysis of urban amenities. The following figure outlines the main variables that we have found to have an impact in other studies and should inform the foundational independent variables that will serve the study of urban amenity pricing effects. We have broken the variables down into several different categories. A final determination of non-urban amenity variables will also be determined by data availability.

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[10]   Bolitzer, B., Netusil, N.R., (2000). "The Impact of Open Spaces on Property Values in Portland, OR. *Journal of Environmental Management.* 59 (3), 185-193.

[11]   Mahan BL, Polasky S., Adams R.M., (2000). "Valuing Urban Wetlands: A Property Price Approach." *Land Economics* 76. 100-113.

[12]   Netusil, N. R. (2005). The Effect of Environmental Zoning and Amenities on Property Values: Portland Oregon" *Land Economics* 81 (2): 227-246.

FIGURE 1: SAMPLE OF HEDONIC HOUSING PRICE VARIABLES

Category	Variables	Useful Studies
Physical Housing Characteristics:	Square Footage, Lot Size, Age, Age Square, Bedrooms, Bathrooms, Garage, Fireplace, Swimming Pool, AC.	The Value of Housing Characteristics: A Meta-Analysis. 2006. Sirmans, Stacy, G.)
Natural / Environmental Amenities:	Parks, Golf Course, View, Water, Paths, Open Space, Wetlands, Landfills, Superfund Sites, etc.	Boyle, M. A., & Kiel, K. A. (2001). A survey of house price hedonic studies of the impact of environmental externalities. Journal of Real Estate Literature, 9(2), 117-144.
Services:	School quality, property tax rate, distance to various services.	D.M. Grether, P. Mieszkowski, Determinants of Real Estate Values, Journal of Urban Economics. Song and Knapp, 2003.
Location / Proximity:	Distance to CBD, Distance to Employment Centers, Freeways, Access, Public Trasport, Distance to Airport.	For summary of Light Rail Impact see http://www.metrogoldline.org/about.html. Most studies include these variables as controls.
Neighborhood / Demographic Controls:	Per Capita Income, Education, Age, Race	Most studies provide some type of control for neighborhood demographic characteristics.
Urban Amenities:	Commercial Space, Mixed-uses, walkability, restaurants, libraries, museums, book stores, cafes, grocery stores, boutiques, pubs, etc.	Song and Knapp (2003). Tu and Eppli (1999, 2001). These studies focus on new urbanism. Terry Nichols Clark addresses urban amenities at a macro level. Finds evidence of location in certain cities based off of urban amenities.

SOURCE : Johnson Gardner

However, during the study process no analysis was identified that provides direct guidance or precedence for the undertaking of measuring the dollar value of individual urban retail and service amenities to answer the *Whether*, *Which* and *How Much* questions raised in the hedonic modeling Introduction section.

- ▫ *Local studies have not specifically tried to isolate the value of individual urban retail and service amenities;*

□ *Local studies have been more interested in conclusions about broader individual geographic areas (county level) or aggregations across broad subregional groupings (northeast Portland, southwest Portland, etc.) within the Portland metro area – which raises complicated statistical problems due to the likelihood that different areas have very different "unpredictable" buyer behavior;[13]*

□ *Local studies have included analysis of multiple time periods, which introduces statistical difficulties beyond the scope of this study, as well as impractical precedence for this analysis – for example, it is highly improbable that a home sale two years ago can reflect the value of a specialty grocer that opened nearby 18 months after the home transaction; and*

□ *Finally, local studies do not focus on mixed-use projects or urban districts with a variety of mixed uses, attached and detached residential product as a model for future potential attached and mixed-use development.*

A full discussion of the resulting methodology utilized in this analysis is found in the following section, reflecting the strengths of the existing body of hedonic modeling literature and topics where the literature is largely silent.

D.   URBAN AMENITY STUDY METHODOLOGY

The purpose of this study is a hedonic modeling process that seeks to answer the following previously discussed questions:

1. *Does Urban Amenity Matter?*

2. *Does the Urban District or the Individual Amenity Matter?*

3. *What Specific Urban Amenities Matter?*

4. *How Valuable is the Amenity?*

The study is, therefore, interested in measuring the value – if measurable – of individual urban commercial amenities for the buyer of a nearby residence within the Portland metropolitan area. The specific components of this analysis for determining the value of individual urban amenities are discussed separately on the following pages.

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[13]   Referred to by the intimidating statistical term heteroskedasticity, this problem is inherent most any time two or more distinct geographic areas are jointly, statistically analyzed. Greater discussion of this issue is reserved for the following Urban Amenity Study Methodology section.

The Study Area: Five Portland Metropolitan Area Urban Centers

To understand the value of urban commercial amenities, particularly for helping to inform public policy and potential community development initiatives, the sample of residential prices and urban amenities for study required the following:

- □ *A robust selection of different urban amenities in the Portland metro area;*

- □ *A robust sample of both single-family and attached homes, new and resale;*

- □ *Urban and suburban locations in east and west metro area locations; and*

- □ *The absence of nearby physical or economic features that would be difficult or impossible to duplicate in other centers or by individual projects elsewhere (large nearby employer, large-scale retail center, unusual transportation infrastructure such as freeway interchange, etc.)*

In coordination with Metro Transit-Oriented Development (TOD) Program and Data Resource Center staff, the following five Portland metro area districts were identified for inclusion in the statistical analysis of amenity values:

1. *Southeast Division/Southeast Clinton* – Businesses bound to the north by SE Caruthers Street, to the west by SE 19th Avenue, to the south by SE Taggart Street, and to the east by SE 27th Avenue.

2. *Sellwood* – Businesses along the SE Milwaukie Boulevard & SE 17th Avenue corridor bound to the north SE Ramona Street, and to the by SE Linn Street. Also included were businesses along the SE 13th Avenue corridor bound to the north by SE Malden Street and to the south by SE Tenino Street.

3. *Multnomah Village* – Business bound to the north by SW Canby Street and SW Capital Highway, to the west by SW 40th Avenue, to the south by SW Multnomah Boulevard, and to the east by SW 31st Avenue.

4. *Downtown Lake Oswego* – Business bound to the north by C Avenue and D Avenue, to the west by Sixth Street, to the south by Evergreen Road, with commercial development along N State Street extending no further south than Leonard Street, and to the east by the N State Street corridor.

5. *Southwest Murray/Southwest Scholls Ferry* (Beaverton) – Business bound to the north by SW Osprey Drive, to the west by SW Osprey Drive and Murrayhill Park, to the south by SW Scholls Ferry Road, and to the east by SW Murray Boulevard.

Following selection of the above five urban districts, JOHNSON GARDNER set out on site visits to inventory all individual businesses and their location within each district as described above. All establishments were then categorized by specific business type with enough generality to not single-out the identity of an individual proprietor. A discussion of urban commercial amenities identified and their inclusion in the statistical analysis is reserved for later in this document.

The Hedonic Model Equation Specified

Earlier in this study, a general hedonic model equation for home prices as a function of numerous individual factors was expressed as Equation (2). Rewriting that equation for the purposes of this specific Portland metro area urban amenity value study is as follows:

$$(4) \qquad P = \alpha + \beta_F F + \beta_U U + \varepsilon$$

where:

P	=	Observed home sale price
α	=	A fixed (constant) dollar figure independent of the value a home buyer places on other variable factors
β_F	=	A group (vector) of dollar values that correspond to all non-urban amenity features of a home that affected the price willingly paid by the buyer
F	=	A group (vector) of specific features of a home, not including nearby urban amenities, that in part determined the price a buyer was willing to pay for a home
β_U	=	A group (vector) of dollar values that correspond to all proximate urban amenity features of a home that affected the price willingly paid by the buyer
U	=	A group (vector) of specific urban amenity qualities (existence or distance) that in part determined the price a buyer was willing to pay for a home
ε	=	Unpredictable determinates of home value, or "random error"

It is important to note that if urban amenities actually do not matter at all to the sales price of a home, or $\beta_U U = 0$, the statistical model is over-specified (too many variables included), but the true equation is:

$$(5) \qquad P = \alpha + \beta_F F + \varepsilon$$

which resembles the traditional hedonic model expression of home prices in terms of traditional locational, physical, environmental and economic features that determine the sales price of a home in the existing body of literature.

Finally, as described repeatedly in the home price hedonic modeling literature, home prices have a non-linear relationship to different variables that a buyers consider when negotiating a price. For example, the second and third bedrooms in a home have much more *marginal* (or additional) value than a sixth or seventh bedroom. Likewise, the second 1,000 square feet of a home have much more marginal value than the fifth 1,000 square feet of a home. Accordingly, Equation (4) that expresses the sales price of a home in terms of all urban

amenities and non-urban amenities important to the buyer is transformed to a "semi-log" form of the equation by taking the natural logarithm of home sales prices. This is expressed as:

$$(6) \qquad ln(P) = \alpha + \beta_F F + \beta_U U + \varepsilon$$

where:

$ln(P)$ = The natural log of the observed home sale price

α = A fixed (constant) *percentage* of the home sales price independent of the value a home buyer places on other variable factors

β_F = A group (vector) of *percentages* of the total home price that correspond to each non-urban amenity feature valued by a home buyer

F = A group (vector) of specific features of a home, not including nearby urban amenities, that in part determined the price a buyer was willing to pay for a home

β_U = A group (vector) of *percentages* of the total home price that correspond to each proximate urban amenity feature valued by a home buyer

U = A group (vector) of specific urban amenity qualities (existence or distance) that in part determined the price a buyer was willing to pay for a home

ε = Unpredictable determinates of home value, or "random error"

The coefficients β_F and β_U for non-urban amenity features F and urban amenity features U, respectively, are now calculated as the *percentage of the home sale price* attributable to a specific amenity.

Equation (6) is the equation estimated in this statistical analysis of home prices. Below is a sequential discussion of each variable included in the hedonic model, followed by the Study Findings section.

The Dependent Variable (P): Home Price

The topic of interest is the value to a homeowner of being nearby a specific commercial urban amenity, i.e. shops, services, etc. within the Portland metro area. Such amenities are typically smaller in size, such as a restaurant, bakery, or bicycle shop, and are frequently locally-owned and operated. Accordingly, such businesses are more likely to close and be replaced by another small business than a larger national chain retailer over an extended period of time. Modeling home prices over multiple years, therefore, will not be indicative of the higher probability of business turnover across that period of time.

Accordingly, we define Home Price (the "dependent variable") in this analysis as the following:

Home Price: The sale price of a residence that occurred during the 2006 calendar year

▫ "Arm's-length" transactions over a recent 12-month period help to ensure that the current inventory of area businesses has seen little turnover, or in limited cases where turnover has occurred, it is likely that the new business was announced and/or anticipated by the buyer over the short-term.

▫ It is also important to note that we <u>do not</u> attempt to model home value in terms of either real market value or assessed value according to calculation methodology under State of Oregon Measure 50 property tax rules.

Furthermore, observations of home sales are also delineated as follows:

Residential Sales: 2006 transactions that occurred within one quarter-mile of the nearest commercial establishment within the district.

Assuming a city block equal to 220 feet, residential sale observations occur within six blocks of the proximate commercial district.

This definition has a self-selecting effect upon the sample, or in other words the study reflects home sales biased towards purchases by households that clearly have an expressed preference for urban amenity. However, the topic of this study is exactly how much, if any, a home buyer is willing to pay to be proximate to a specific urban amenity.

Accordingly, it is this exact population – homeowners with some demonstrated preference for proximate urban commercial offerings in general – that is of interest for future community development policy consideration. Therefore, sample bias is not of concern. Alternatively, homeowners who have clearly exercised their lack of preference for proximate urban amenity by locating greater distances from specific amenities are not of interest; these households have a demonstrated lack of interest in urban center residential choices that will in part be shaped by mixed-use and urban center development public policy considerations.

Independent Variables (F): Residence-Specific Features

Guided by the established body of literature for hedonic home price analysis and input by Metro Data Services staff, numerous independent variables representing traditional features and amenities of residences were utilized for analysis. Figure 2 provides the name, source and description of each non-urban amenity independent variable candidate utilized in the analysis.

FIGURE 2: NON-URBAN AMENITY INDEPENDENT VARIABLES

#	Variable	Type	Source	Description
1	sqft100	Value	1	Building square footage in 100s of square feet
2	lot100	Value	1	Lot size in 100s of square feet
3	age	Value	3	Age of the unit (since 2007)
4	unit	Indicator	1, 2	Condominium unit or not
5	price	Value	1, 2	Sale price
6	attach	Indicator	2	Unit attached or not
7	stories	Value	2	Number of floors in the unit
8	baths	Value	2	Number of baths
9	garage	Value	2	Size of garage (no. of cars)
10	basement	Indicator	2	Presence of a basement
11	fireplaces	Value	2	Number of fireplaces
12	renovate	Indicator	1, 2	Unit has had significant renovation before new owner
13	conversion	Indicator	2	Unit is a condominium conversion
14	finish	Indicator	2, 3	Unit has quality modern finishes (particularly kitchen and bath)
15	view	Indicator	2, 3	Unit has an appreciable view amenity
16	divis_clint	Indicator	3	Clinton-Division
17	lake_oswego	Indicator	3	Downtown Lake Oswego
18	waterfront	Indicator	3	Unit is 300 feet or less from a natural water amenity
19	mult_village	Indicator	3	Multnomah Village
20	mrry_schlls	Indicator	3	Murray Scholls - NOTE: 0 value denotes Sellwood
21	distance	Value	3	Distance (in city blocks) to nearest urban amenity

SOURCE:

1   Clackamas, Multnomah & Washington County Assessors' data (2007)

2   Regional Multiple Listing Service

3   Calculated or specified by Johnson Gardner, LLC

There are generally two types of variables or factors utilized to model home prices in this analysis: value variables and indicator variables.

- *Value Variables:* Variables that are expressed in terms of an actual quantity or order of magnitude, i.e. the age of a home or its size in hundreds of square feet.

- *Indicator Variable (aka "Dummy" Variables):* Variables that express a quality in terms of yes (variable=1) or no (variable=0). For example, a recently renovated house near Multnomah Village would be assigned a value of 1 (yes) for both the variables "renovate" and "mult_village."

To avoid the so-called "dummy variable trap" of over-specified indicator variables, there is not an explicit indicator variable for home sales near the Sellwood district.

Descriptive statistics for variables will be provided in the Study Findings section of this document.

<u>A Word about District-Specific Indicator Variables</u>

As described in the hedonic modeling literature review, it is generally recognized that the natural or environmental attributes nearby a home affect the value of that home in distinct ways. In an urban environment, parks, greenbelts, recreation opportunities and other similar public amenities are typically important to include as variables in a home price hedonic model.

Such amenities have not been included in this analysis, nor have other types of locational variables sometimes found in hedonic modeling:

- Differences in local property tax burden;
- Levels of public service provision; are frequently included as variables;
- Distance to the nearest major employment center(s);
- Quality difference in local elementary schools; and
- Availability of public transit.

These factors are, however, *implicitly* modeled via the district-specific indicator variables included in the analysis. Because home sales have been defined somewhat narrowly with regard to distance from an urban commercial center, it is significantly less likely that sales observations will have significant variation explained by the variables mentioned immediately above as omitted.

For instance, all homes within six blocks of a district share the following highly similar qualities:

- *Within the same elementary school boundary;*
- *Similar bicycle or pedestrian access to sizeable parks or open space;*
- *Same property tax rates and primary municipality;*
- *Similar distance to major employment centers; and*
- *Similar access to public transit stops along the primary arterial through the urban center.*

Accordingly, district-specific indicator variables should describe homogenous traits of homes nearby a district. However, should any of the above locational qualities not *explicitly* modeled prove to have significant individual explanatory power, "omitted variable bias" is introduced. The issue is discussed further in the Study Findings section of this document.

Independent Variables ($\mathcal{U}$): Urban Amenities

Following visual inspection and detailed inventory of all business and services within the five districts of interest, sixteen distinct urban amenities were identified and included in this analysis. Each is named and described in Figure 3 below.

FIGURE 3: DISTINCT URBAN AMENITIES IDENTIFIED

#	Observed Urban Amenity	Description
1	Bakery	Gourmet or organic bakery for on-site or off-site consumption
2	Bar or Pub	A bar, pub or tavern specifically for on-site alcoholic beverages
3	Bicycle Shop	A retailer of new, used, and specialty bicycles and repair services
4	Book Shop	Independent or specialty secular bookshop possibly with café
5	Boutique Shop	Specialty/boutique retailer, typically clothes, baby items, or personal care
6	Brewpub	Alcoholic beverages served with on-site beer and/or spirits made
7	Bistro	Bistro or small sit-down restaurant - desserts and coffee featured
8	Coffee/Espresso	Coffee and espresso drinks with some on-site pastry/food sales
9	Fitness Gym	Private membership fitness/training centers or gyms
10	Garden Store	Garden supply, flower sales and garden art
11	Cinema	Single-screen downtown marquee cinema
12	Music Shop	Local/independent music shop, typically non-mainstream music
13	Gourmet/Exotic Restaurant	Unique full-service restaurant with specialty/chef-driven cuisine
14	Spa	Full-service spa, typically offering massage, aromatherapy, etc.
15	Specialty Grocer	Grocers with mix of traditional, organics, specialty, and deli/prepared
16	Wine Bar or Shop	On-site wine consumption, extensive selection for off-site, limited food

To model the potential value of each urban amenity retailer or service to the price of a home, thirty-two variables were constructed and specified to measure either the existence or the proximity of a specific amenity to the location of the observed home sale. The resulting pool of urban amenity indicator variables are named and described in Figure 4 on the following page.

Urban amenity variables in Figure 4 fall into two different categories:

▫ Amenity "Dummies": Indicator variables that are assigned a yes (value=1) or no (value=0) depending on whether the district has the specific amenity, such as "cinema_dummy."

▫ Proximity "Dummies": Indicator variables that are assigned a yes (value=1) or no (value=0) depending on whether the observed home sale was located within 330 feet, or 1.5 blocks, from the amenity of interest.

1.5 blocks was not selected arbitrarily for the proximity "dummy" variables. GIS analysis and visual inspection indicated that within 330 feet of a home there are typically no more than two distinct store types. Beyond 330 feet, as many as four to five different stores can be proximate to a home, rendering it extremely difficult to isolate the possible value of an individual amenity. Furthermore, 1.5 blocks also corresponds to a homeowner likely not crossing more than one street to access the store or service, potentially isolating the value of easy pedestrian convenience and mirroring the convenience of a retail amenity in the ground floor of a mixed-use residential development.

FIGURE 4: URBAN AMENITY INDEPENDENT VARIABLES

#	Variable	Type	Source	Description
1	bake_dummy	Indicator	3	Gourmet bakery in the district
2	bakery	Indicator	3	Home sale within 1.5 blocks of a gourmet bakery
3	bar_pub_dummy	Indicator	3	Bar/pub in the district
4	bar_pub	Indicator	3	Home sale within 1.5 blocks of a bar/pub
5	bikeshop_dummy	Indicator	3	Bicycle shop in the district
6	bikeshop	Indicator	3	Home sale within 1.5 blocks of a bicycle shop
7	bookshop_dummy	Indicator	3	Independent bookshop in the district
8	bookshop	Indicator	3	Home sale within 1.5 blocks of an independent bookshop
9	boutique_dummy	Indicator	3	Boutique shop in the district
10	boutique	Indicator	3	Home sale within 1.5 blocks of a boutique shop
11	brew_pub_dummy	Indicator	3	Brewpub in the district
12	brew_pub	Indicator	3	Home sale within 1.5 blocks of a brewpub
13	bistro_dummy	Indicator	3	Bistro/small meal cafe in the district
14	bistro	Indicator	3	Home sale within 1.5 blocks of a bistro/small meal café
15	coffee_dummy	Indicator	3	Coffee/espresso in the district
16	coffee	Indicator	3	Home sale within 1.5 blocks of coffee/expresso
17	fitness_dummy	Indicator	3	Fitness gym in the district
18	fitness	Indicator	3	Home sale within 1.5 blocks of fitness gym
19	garden_dummy	Indicator	3	Gardening shop in the district
20	garden	Indicator	3	Home sale within 1.5 blocks of a gardening shop
21	cinema_dummy	Indicator	3	Cinema in the district
22	cinema	Indicator	3	Home sale within 1.5 blocks of a cinema
23	musicshop_dummy	Indicator	3	Music shop in the district
24	musicshop	Indicator	3	Home sale within 1.5 blocks of a music shop
25	restaurant_dummy	Indicator	3	Gourmet/exotic restaurant in the district
26	restaurant	Indicator	3	Home sale within 1.5 blocks of a gourmet/exotic restaurant
27	spa_dummy	Indicator	3	Spa in the district
28	spa	Indicator	3	Home sale within 1.5 blocks of a spa
29	spclty_grocer_dummy	Indicator	3	Specialty grocer in the district
30	spclty_grocer	Indicator	3	Home sale within 1.5 blocks of a specialty grocer
31	wineshop_bar_dummy	Indicator	3	wine bar or shop in the district
32	wineshop_bar	Indicator	3	Home sale within 1.5 blocks of a wine bar or shop

SOURCE:
1   Clackamas, Multnomah & Washington County Assessors' data (2007)
2   Regional Multiple Listing Service
3   Calculated or specified by Johnson Gardner, LLC

Heteroskedasticity

As is common with data sets that include observations from potentially greatly different geographic areas, the data set utilized in this analysis demonstrates heteroskedasticity. In other words, the variance of observations for the Sellwood district differ from variance in observations in the Lake Oswego downtown area. To correct for this common problem, the cluster-robust-variance-covariance matrix estimator approach was utilized to produce revised, robust covariance estimates weighted by the relative differences in variance between each district.

The resulting correction for differing variance among sample groups produces the following:

- Larger variance terms, which in turn likely understate the statistical significance of variable coefficient estimates;

- No change in estimated coefficient magnitudes as compared to Ordinary Least Squares methodology.[14]

All study findings reflect this variance-covariance matrix recalculation to provide conservative variance corrections.

E.   STUDY FINDINGS

Final Model Specification

Through an extensive process of trail and error, a 32-variable statistical hedonic model corresponding to Equation (6) was estimated given the 415 home sales observations identified via the methodological process described in Urban Amenity Study Methodology subsection D. Variables finally selected and estimated in the final analysis were required to help the overall statistical model meet several criteria, each discussed below in order of seriousness.[15]

1. *Avoided Under-Specification Problems*

2. *Avoided Collinearity Problems*

3. *Avoided the Dummy Variable Trap*

Under-Specification Problems

As a general rule, it is better to over-specify the model (include too many variables) than to under-specify it (omit important variables). Omitted Variable Bias, introduced when key variables that should be included are not, leads to results that over-express the importance of an included independent variable's explanatory power for the dependent variable.

Here, under-specification would lead to two problems:
- The level of certainty about whether or not the urban amenity is even significant to a home owner; and
- The possible over-estimation of the importance of an urban amenity in determining home prices, i.e. overestimation of β.

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[14] Greater detail about the statistical derivation of this methodology is provided by Baum in *An Introduction to Modern Econometrics Using Stata* (2006), Stata Press, StataCorp, LP, College Station, Texas.

[15] A detailed treatment of the econometric technicalities leading to these criteria is beyond the scope of this analysis. The reader is instead invited to review resources utilized by the author, including *Learning & Practicing Econometrics* by Griffiths, Hill & Judge (1993), published by John Wiley & Sons, Inc., New York, New York, and *An Introduction to Modern Econometrics Using Stata* by Baum (2006), published by Stata Press, StataCorp LP, College Station, Texas.

Accordingly, analysis errs on the side of including a variable rather than excluding it.

Over-Specification Problems

Alternatively, including too many variables introduces the problem of collinearity. In order for a statistical model to be useful for explaining something, in this case home prices, the best-suited independent variables are those that demonstrate maximum correlation with the dependent variable (price) while showing minimal correlation with one another. If several variables are included in a model that strongly correlate – are collinear - their inclusion does not add new explanatory power. To the contrary, their inclusion actually leads to under-estimates of the explanatory variable of each that is included.

To the extent that variables are clearly collinear and their removal from the model helped or did not reduce explanatory power, those variables were finally excluded from consideration. A good example of such a variable "renovate," the indicator variable for whether or not a significant renovation of the home had recently occurred. The variable was highly collinear with the condo "conversion" indicator variable, the home "age" variable, and the home "finish" variable, which explicitly indicated whether bathrooms and kitchens had recent, modern finishes.

Dummy Variable Trap

The "dummy variable trap" occurs when too many indicator variables are included to explain too few qualitative variations. The result is either key variables "dropped" from estimation in the model or over-specification of the model as already described.

The best example of the dummy variable trap occurring in this analysis has to do with nearly all urban amenity indicator variables described in Figure 4, such as "spclty_grocer_dummy" and "bistro_dummy." Nearly every district had one of each urban amenity modeled in this study. Most commonly, each district lacks one urban amenity that all of the others have. The result is that each urban amenity indicator variable acts like a district-specific indicator variable, thus creating unnecessary over-specification and dropped variable problems.

Accordingly, the final statistical model eschews urban amenity indicator variables ("bistro_dummy") in favor of district-specific indicators and amenity distance variables.

Descriptive Statistics

Figure 4 on the following page provides a summary of the descriptive statistics for all variables finally utilized in the statistical model. In total, there were 415 home sale observations over the course of 2006 as described, with an average home sale price of $343,192 and a range from $132,000 to $852,000.

FIGURE 4: STUDY VARIABLE DESCRIPTIVE STATISTICS

Variable	Observations	Mean	Std. Deviation	Min	Max
saleprice	415	343192	12306.4	132000	852000
attach	415	0.3566	0.34796	0	1
sqft100	415	14.4621	5.5611	6.48	35.56
lot100	415	38.5273	25.4669	0.6763	101.1348
garage	415	0.9663	0.7856	0	4
baths	415	1.8867	0.8101	0	4
fireplaces	415	0.6217	0.5848	0	3
age	415	56.2554	35.9837	0	122
stories	415	2.0386	0.8126	1	4
finish	415	0.4458	0.4977	0	1
conversion	415	0.2217	0.4159	0	1
divis_clin	415	0.1446	0.3521	0	1
lake_oswego	415	0.1277	0.3342	0	1
waterfront	415	0.012	0.1092	0	1
mult_village	415	0.2361	0.4252	0	1
mrry_schlls	415	0.0602	0.2382	0	1
distance	415	-3.7472	1.7964	-8.6462	-0.2486
bakery	415	0.012	0.1092	0	1
bar_pub	415	0.4337	0.2039	0	1
bikeshop	415	0.0096	0.0978	0	1
bistro	415	0.0337	0.1808	0	1
bookshop	415	0.0024	0.0491	0	1
boutique	415	0.4578	0.2093	0	1
brew_pub	415	0.12	0.1092	0	1
cinema	415	0.1446	0.1195	0	1
coffee	415	0.0265	0.1608	0	1
fitness	415	0.0169	0.1289	0	1
garden	415	0.0169	0.1289	0	1
musicshop	415	0.0048	0.0693	0	1
restaurant	415	0.0675	0.2511	0	1
spa	415	0.0289	0.1678	0	1
spclty_grocer	415	0.0024	0.049	0	1
wineship_bar	415	0.0096	0.0978	0	1

Model Results Overview

Figure 5 in this section provides a detailed summary of statistical findings for this hedonic modeling assignment. Estimates of independent variable coefficients and 95% confidence intervals are provided for two distinct home price model assumptions:

1. Residence-Specific Features Only Matter (β_F); and

2. Both Residence-Specific Features and Urban Amenities Matter (β_F & β_U)

Reported coefficients, with the sole exception of the Constant (α), should be interpreted as the percentage an individual factor contributes to the overall price of a home. Put another way, all things equal the coefficient can also be interpreted as the price premium that a particular amenity earns by itself. For example, the coefficient for "sqft100" of 0.024 (No Urban Amenities model) indicates that all else equal, each additional 100 square feet of space in a home equates to a 2.4% increase in the price of the home.

Reported confidence intervals have similar interpretation to coefficient point estimates described immediately above. The confidence interval reported simply indicates the minimum and maximum coefficient value estimated by the model with at least 95% statistical certainty.

Results and their statistical significance are summarized in response to the four *Whether*, *What* and *How Much* questions.

1. *Does Urban Amenity Matter?*

2. *Does the Urban District or the Individual Amenity Matter?*

3. *What Specific Urban Amenities Matter?*

4. *How Valuable is the Amenity?*

FIGURE 5: PORTLAND METRO AREA URBAN CENTERS HEDONIC HOME PRICE MODEL RESULTS

	HEDONIC HOME PRICE MODEL			
	Coefficients		95% Confidence Intervals	
	Include Urban Amenities?		Include Urban Amenities?	
Variable	No	Yes	No	Yes
attach	- 0.011	- 0.035	- 0.204 - 0.181	- 0.222 - 0.153
sqft100	0.024**	0.023**	0.012 - 0.036	0.011 - 0.035
lot100	0.003	0.003	- 0.001 - 0.007	- 0.002 - 0.008
garage	0.032	0.031	- 0.002 - 0.658	- 0.005 - 0.067
baths	0.059*	0.067*	0.008 - 0.109	0.011 - 0.124
fireplaces	0.035	0.018	- 0.011 - 0.082	- 0.010 - 0.046
age	0.001	0.001	- 0.000 - 0.002	- 0.001 - 0.002
stories	0.018	0.019	- 0.067 - 0.104	- 0.071 - 0.110
finish	0.088**	0.092**	0.042 - 0.134	0.053 - 0.132
conversion	- 0.188*	- 0.185	- 0.332 - - 0.045	- 0.391 - 0.021
divis_clint	0.008	0.014	- 0.017 - 0.033	- 0.006 - 0.034
lake_oswego	0.229***	0.211**	0.171 - 0.288	0.111 - 0.310
waterfront	0.367***	0.376**	0.265 - 0.470	0.218 - 0.535
mult_village	- 0.107	- 0.118	- 0.216 - 0.001	- 0.237 - 0.002
mrry_schlls	- 0.216***	- 0.231**	- 0.277 - - 0.155	- 0.310 - - 0.152
distance	0.006	0.003	- 0.012 - 0.236	- 0.008 - 0.014
bakery		- 0.006		- 0.138 - 0.125
bar_pub		- 0.104		- 0.253 - 0.045
bikeshop		0.034*		0.013 - 0.055
bistro		- 0.118		- 0.399 - 0.164
bookshop		0.123*		0.476 - 0.199
boutique		0.008		- 0.167 - 0.183
brew_pub		- 0.018		- 0.207 - 0.172
cinema		0.299		- 0.011 - 0.609
coffee		0.045		- 0.214 - 0.303
fitness		0.081*		0.013 - 0.149
garden		0.188		- 0.199 - 0.396
musicshop		- 0.377**		- 0.525 - - 0.229
restaurant		0.023		- 0.086 - 0.132
spa		- 0.063*		- 0.113 - - 0.012
spclty_grocer		0.175*		0.058 - 0.293
wineshop_bar		0.208*		0.013 - 0.402
Constant	12.013***	12.026***	11.775 - 12.251	11.845 - 12.207
Adj. R^2	0.830	0.842		

SOURCE: Johnson Gardner, LLC

Key - Probability of Statistical Certainty: ***99%   **95%   *90%

Does Urban Amenity Matter?

Results expressed in Figure 5 indicate that urban amenities *do indeed measurably* matter to home buyers. This finding can be based on a comparison of coefficient estimates and their statistical significance (existence and number of asterisks) whether urban amenities are considered ("Yes" column) or not ("No" column).

□ **Urban Amenity Variables are Statistically Significant:** When the sixteen urban amenity variables are added to the model, seven urban amenities are indicated as statistically significant. In other words, we can be at least 95% certain that proximity to one urban amenity (music shops) has measurable impact on home prices and at least 90% certain that six other urban amenities have measurable impact on home prices (bike shops, book shops, fitness centers, spas, specialty groceries, and wine bars/shops).

□ **Addition of Urban Amenity Variables Does Not Diminish Explanatory Power of the Other Variables:** If the sixteen non-urban amenity variables are considered by themselves, seven demonstrate strong statistical significance – in descending order, location in Lake Oswego, location near the waterfront, location near Murray/Scholls, home size and quality of home finish, number of bathrooms, and whether or not the unit is a condo conversion. The addition of the urban amenity variables to the model does not significantly change the value of the coefficients and does not remarkably change the statistical significance of variable explanatory power.

□ **Urban Amenity Variables Contribute to Goodness-of-Fit:** The addition of the urban amenity variables increases the model's power of explaining home prices from 83.0% efficiency to 84.2% efficiency (Adjusted-R^2 scores) while statistical significance and coefficient values are largely unchanged.

In other words, urban amenities do matter <u>and</u> contribute measurable impacts, or price premiums, for nearby home buyers based on the findings of this analysis.

Does the Urban District or the Urban Amenity Matter?

To answer this question, it must simply be understood whether or not individual urban amenities demonstrate statistically significant coefficient estimates while accounting for the proximity of the home to the broader commercial district itself.

As the results express, the variable "distance" has been included in the model as well as the various urban amenity variables. This indicates that the analysis has accounted for the value of a home simply being near the district. All things equal, including the shortest distance from the home to the district itself ("distance"), being nearby individual urban amenities still matters in a measurable way for seven specific amenities – five demonstrate positive price premiums for homes and two represent negative price effects for nearby homes.

What Specific Urban Amenities Matter?

A review of the results in Figure 5, all else equal, indicates that:

- □ **Food & Dining Amenity:** Specialty grocers and wine bars and shops demonstrate statistically significant positive price premiums for homes nearby;

- □ **Recreation/Wellness Amenities:** With statistical confidence, bike shops and fitness centers demonstrate positive price premiums for homes nearby, while results indicate that spas are considered a disamenity by home buyers (-6.3%).

- □ **Other Retail:** Bookshops demonstrate statistically significant positive price premiums for homes, while music shops demonstrate negative price premiums that are both significant statistically and in order of magnitude (-37.7%).

In other words, all else equal and controlling for the general proximity of homes to urban districts, seven urban amenities measurably matter to nearby home prices: five amenities positively impact home prices, while two types of businesses were considered disamenities by home buyers in terms of sales price: music shops and spas.

How Valuable is the Amenity?

Figure 6 provides a summary of price premiums that individual urban amenities are estimated to contribute to the sale of a nearby home[16], all else equal. Results are sorted by coefficient value, or price premium, in descending order.

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[16] A separate analysis of the value of urban amenities was attempted for attached residences only. Unfortunately, with only 148 observed transactions in the sample, model results were highly sensitive to specification and unreliable. Even with 148 observations, many attached sales were in the same buildings, thus providing even less unique distance measurements for independent variables, i.e. a third floor unit and a second floor unit sold, but both were across the street from a bistro. Even so, coefficients (amenity premiums) that were possible to estimate were generally positive in magnitude, if not consistent with the positive or negative nature of values estimated for the entire sample.

FIGURE 6: PRICE PREMIUMS FOR NEARBY URBAN AMENITIES BY ORDER OF MAGNITUDE

Urban Amenities	HEDONIC HOME PRICE MODEL		
	Coefficients	95% Confidence Intervals	
Cinema	0.299*	- 0.011	- 0.609
Wine Bar/Shop	0.208**	0.013	- 0.402
Garden/Yard Art	0.188*	- 0.199	- 0.396
Specialty Grocer	0.175**	0.058	- 0.293
Book Shops	0.123**	0.048	- 0.199
Fitness	0.081**	0.013	- 0.149
Coffee/Espresso	0.045	- 0.214	- 0.303
Bike Shop	0.034**	0.013	- 0.055
Gourmet/Exotic Restaurant	0.023	- 0.086	- 0.132
Boutique Shop	0.008	- 0.167	- 0.183
Gourmet Bakery	- 0.006	- 0.138	- 0.125
Brewpub	- 0.018	- 0.207	- 0.172
Spa	- 0.063**	- 0.113	- - 0.012
Bar/Pub	- 0.104	- 0.253	- 0.045
Bistro/Café	- 0.118	- 0.399	- 0.164
Music Shops	- 0.377***	- 0.525	- - 0.229

SOURCE: Johnson Gardner, LLC

Key - Probability of Statistical Certainty: ***99% **95% *90%

Because the magnitude of individual coefficients are sensitive to potential model misspecification, interpretation of specific point-estimate coefficient estimates must be carefully undertaken. As caveats to this model have already indicated:

- *The sample of home sales observations is large (over 400) but may still not be providing enough statistical certainty for the many variables being considered. The sample of homes within 1.5 blocks of an urban amenity is dramatically smaller, largely due to the inherently small nature of a sample of residences next door to or across the street from a specific urban amenity.*

- *Because the scope of this study is a focus on urban amenities, attention to natural and environmental amenities such as proximity to parks, open space, and other amenities traditionally modeled have been downplayed and analyzed with district-specific indicator variables. Omitted variable bias may be present in this model as a result.*

Even so, seven urban amenities are estimated to demonstrate statistically significant positive home price premiums, while two demonstrate negative price premiums. To determine whether or not statistically significant estimates of price premiums are vulnerable to unknown model misspecifications, JOHNSON GARDNER proposes the following three tests for the "reasonableness" of coefficient estimates:

1. *Is the estimate supported by qualitative, anecdotal evidence documented elsewhere in this analysis?*

2. *Is statistical confidence robust?* – Is the probability that the coefficient estimate is actually zero (P>|t|) sufficiently low? A P-value near or less than 0.01 likely indicates robustness that will hold up to corrections of possible model shortcomings.

3. *Is it the amenity alone or the amenity in concert with others that explains the premium?* – Smaller stores, such as book stores and cafes, can be more densely configured, thus increasing the chance that they individually do not create premiums, but rather contribute to a larger premium for the cluster of amenities combined. This can be detected by estimating the correlation of each amenity variable with one another.

Given these tests, all else equal:

▫ **Cinema/Movie Theater: (+29.9% / +14.4% Conservative):** Price premiums on home sales within 1.5 blocks of a movie theater in urban districts were statistically estimated to average 29.9%. Estimated premiums ranged, however, between a low of -1.1% (reflecting the possibility that non-resident traffic to the theater may be a modest disamenity to some) and a high of 60.9%. Statistical confidence is not completely certain at the 90% level. Furthermore, in many districts, the movie theater is somewhat central and highly proximate to other commercial offerings. Therefore the premium likely reflects not only the amenity value of the theater itself, but also the strength of a movie theater as an "anchor" with other commerce nearby. Accordingly, a conservative price premium estimate for movie theaters would be 14.4%, the mid-point between the estimated 29.9% premium and -1.1%, the low-end of the estimated range.

▫ **Wine Bars & Shops (+20.8% / +11.1% Conservative):** Home sales within 1.5 blocks are estimated to demonstrate price premiums ranging from as little as 1.3% to as high as 40.2%. Statistical confidence for the 20.8% premium estimate, however, is only reaosnably robust. P>|t|=0.041, indicating the estimate is significant with 95% confidence. A conservative estimate would be the mid-point between 1.3% and the 20.3% point estimate, yielding a revised 11.1% premium for proximity to wine bars. Nothing anecdotally would contradict such an estimate.

▫ **Garden/Yard Art (+18.8% / +8.4% Conservative):** Homes that sold within 1.5 blocks of smaller, neighborhood garden and yard art stores demonstrated surprising statistical price premiums of 18.8%. The range of estimated price premiums, however, were from as low as -2.0% to as high as 39.6%. Of the seven amenities identified as positive for residential pricing, we qualify findings for Garden/Yard Art as likely subject to the least observed sales nearby this amenity in the sample. Furthermore, the amenity itself will only having observable price premiums if new, attached residential development allows residents outdoor space for private gardening and art display, i.e. townhouse

units and/or condo flats with sizeable patio space. A conservative estimate, therefore, would be +8.4%, the mid-point between the estimated 18.8% statistical premium and the low-end of the premium range at -2.0%.

▫ **Specialty Grocers (+17.5%):** Price premiums for being nearby a specialty grocer are estimated to range from as low as 5.8% to as high as 29.3%. Unlike wine bars and shops, the specialty grocery price premium is more statistically robust (P>|t|=.014 vs. .041 for wine bars). This would indicate that if the model is currently mis-specified, revision via a larger sample or inclusion of an omitted variable would not likely change the coefficient estimate for specialty grocers. Accordingly, the calculated 17.5% premium is likely robust, as anecdotal evidence is strongest for specialty grocers.

▫ **Book Shops (+12.3%):** Price premiums for nearby homes are estimated to range from between 4.8% to 19.9%. Like specialty grocers, book shops enjoy strong statistical robustness (P>|t|=.011 vs. .014 for specialty grocers). A review of correlation among amenity variables indicates book shops are not significantly correlated with other amenities, by far the largest of which is spas at only 0.28. Anecdotal information has not strongly indicated book shops, therefore it is probably conservative to state that price premiums for homes near bookshops are probably no more than 12.3%.

▫ **Fitness Centers (+8.1%):** Price premiums are estimated to range between 1.3% and 14.9%. P>|t|=0.024, indicating measured robustness that has room to lose statistical significance with any corrections to possible model misspecifications. Although no other single amenity stands out as highly correlated with fitness centers (>.5), six other amenities have locational correlation in excess of 0.2 – bars/pubs, bakeries, cinemas, boutique stores, and coffee/espresso. This would indicate that fitness centers alone may not be creating the 8.1% premium, but they may in fact be attractive as "anchor" tenants that create locational interest for other retailers. Indirectly, therefore, the premium could reasonably be attributable to a nearby fitness center for its retail "gravity."

▫ **Bike Shops (+3.4%):** Price premiums are estimated between 1.3% and 5.5%, a tight confidence interval. P>|t|=0.011, or nearly 99% confidence that the estimate is correct. Locational correlation with other amenities is minor. Anecdotal information does not contradict the notion that urban residents would value bicycle amenities, quite the contrary. We view the 3.4% amenity estimate to likely be robust.

Two urban amenities, all things equal, have statistically significant price impacts that are negative, indicating that buyers view this type of service or retail as a disamenity and prefer to be further away from rather than nearby.

▫ **Spas:** Price premiums for spas are estimated to range from as low as -11.3% to no more than -1.2%. P>|t|= 0.026, indicating that these estimates may be more sensitive to specification than others. Locational correlation with other amenities is not broadly based, however there is fair correlation (0.36) with bars/taverns,

which the model estimates to be a significant disamenities (-10.4%), though with no statistical confidence. Anecdotal evidence does not corroborate spas as a disamenity, therefore its coincidental locational correlation with bars may be a factor. We find that negative premiums for spas are likely overexpressed due to locational coincidence in the sample. However, as a service not likely visited often such a specialty grocer, the time/transportation cost saving of living nearby a spa is not likely as significant. Home buyer indifference, if not slight avoidance, is more likely.

▫ **Music Shops:** Proximity to a music shop is statistically estimated to reduce the price of a residential sale by 22.9% to 52.5% based on model results. Review of sales observations indicates that there was only one recorded home sale within 1.5 blocks of a music shop in 2006 among the districts studied in this analysis. However, sample limitations for this amenity indicate that results may not be robust to specification and may be skewed subject to greater observation counts.

V.   CASE STUDIES

As part of our analysis, we have developed case studies of three centers, which identify existing gaps in the current urban infrastructure of each area. In addition, we discuss what the market is likely to do without public involvement and assess the opportunities available for investment in the areas.

A.   MILWAUKIE

The Milwaukie center is roughly bounded by Highway 224 to the north and east, Highway 99E to the west and Kellogg Lake and SE Washington to the south.

Area Overview
While the two highways bounding the district provide for good regional access and exposure, they also isolate the center from much of the area's demographic strength. Major employers in the area include the City of Milwaukie, the Ledding Library, Dark Horse Comics, Milwaukie Lumber and a range of office and retail uses. In addition, the area boasts The Portland Waldorf School, offering K-12 education. A summer concert series is offered in Scott Park, and the Milwaukie Farmer's Market is held on Sundays from May through October. Milwaukie has recently made substantive improvements to its waterfront park on the Willamette, improving the linkages across Highway 99E to downtown.

Existing Amenity Mix
Milwaukie's City Center currently has a limited range of urban amenities. The current amenity mix includes several restaurants, coffee shops, a fitness club, and a bar/pub. The area also includes the Milwaukie Cinemas, which shows second run films as well as offering a video arcade.   The area is proximate to more extensive amenities offered in the Sellwood/Moreland district, roughly three minutes to the northwest of the area. Major retail concentrations are located on Highway 224 and Highway 99E, with the limited natural trade area of the center precluding a number of amenity types that would require a more extensive population base.

Current Market Expectations
Achievable pricing in the area is largely consistent with suburban pricing, although the recently completed North Main Village demonstrating some market support for a more urban pricing model for residential product in the area. Current listed sales prices for residential development at North Main Village area range from between $180 to $190 per square foot for townhomes, and average approximately $260 per square foot for condominiums. At these price levels, the market would be expected to deliver the townhome units with limited assistance. The condominium flats would be difficult to deliver at the current pricing, with similar product requiring sales prices closer to $350 per square foot in other parts of the metropolitan area.

Rent levels in the area are seen to be well below what is necessary to support mid-rise construction. As seen in North Main Village, affordable housing receiving tax credits represent the most viable development form in the current market.

Retail space in downtown Milwaukie is currently leasing from between $12 and $16 per square foot triple net. The highest retail lease rates in the area are immediately north of the Center, with Gramor quoting rent levels of $32 per square foot at Oak Street Square at the intersection of Highway 224 and SE Oak Street. The recently completed North Main Village retail space is being listed at $16 per square foot. The Center is currently realizing a discount vis-à-vis proximate locations with direct access from Highway 224 and Highway 99E. At the current rates, marginal retail development is expected to provide a limited return as a single land use unless oriented to capitalize on the trip counts along one of the two adjacent highways.

Office space in the area has been largely limited to owner-occupied space, limiting the availability of comparables to establish achievable lease rates. Peripheral locations providing speculative office space are listing space at $12 to $17 per square foot annually. At these rent levels, the market would be expected to deliver space in a one to three story configuration with surface parking.

Potential Areas of Opportunity
Milwaukie enjoys a strong regional location, but the local highway and arterial network isolates the area from the demographics of the proximate trade area. Metro has provided assistance in the development of North Main Village, which has provided for a localized population base and increased the amount and continuity of ground floor retail in the area. The City's recent moves to more tightly incorporate the waterfront into the downtown area can be seen as increasing the available amenities in the area.

The key challenge for the Milwaukie Center will be to find ways to capitalize on its regional location and the energy associated with traffic on the adjacent highways. The interface with Highway 99E is seen as particularly important, with redevelopment of the former Texaco site providing a critical opportunity to provide an appealing entry into the area. While the area is never expected to have the critical mass necessary to support an amenity such as a specialty grocer due to its limited size, a mix of uses providing a similar range of services is possible over time. Increasing the local population base and better facilitating the capture of drive-by trips will be critical in boosting retail viability.

Until the local amenity base increases to a level consistent with more urbanized areas such as Sellwood/Moreland, we would expect that downtown Milwaukie will trade at a discount relative to more urban areas. The planned Portland-Milwaukie light rail project would represent an amenity that could bridge some of that gap. An incremental approach to encourage the ongoing development of local density (residential and office uses), as well encouragement of support retail and service industry are seen as moving the center towards the desired development patterns.

B.   HILLSBORO

The Hillsboro center is roughly bounded by Lincoln to the north, Oak to the south, Ebberts Avenue to the west and 14th to the east.

Area Overview
The City of Hillsboro has experienced dramatic growth in the last two decades, led by rapid expansion in the area's technology sector. Housing growth has also been robust, with residential development primarily located to the north and east of downtown. Recent expansions to the urban growth boundary will increase the residential base of the area, primarily to the southeast of downtown. While development has been robust in the broader community, downtown development has lagged somewhat. The City has recently increased its focus on the area, and is currently funding the Hillsboro Renaissance Project to encourage arts-based development. This increased commitment is reflected in the Hillsboro Civic Center, which was completed in 2004. This project spans three large city blocks, and includes a 120,000-square foot city hall, a 99-unit affordable rental housing project, and two adjoining plazas. The first floor of City Hall contains a 250-seat public auditorium connected to 3,500 square feet of conference rooms. In addition, Pacific University presently expanding its Health Professionals Campus nearby on 8th Street, with roughly 2,300 students, faculty, and staff on-site at full build-out.

Downtown Hillsboro has outstanding demographics and employment characteristics in the surrounding areas, but to-date has seen limited new development. The retail focus of the City is to the east, including along centers along Cornell Road, the Tualatin Valley Highway and the major retail concentration at 185th. To the west, the area is limited by the Urban Growth Boundary, with additional population base concentrated along the Tualatin Valley corridor in Cornelius and Forest Grove. Downtown is well south of Highway 26, and not in the path of most commuting activity. The area does boast Tuality Hospital, a rare amenity for a historic downtown area without a freeway interchange. With the hospital, as well as City and County services, downtown Hillsboro has a relatively strong employment base.

Existing Amenity Mix
The downtown Hillsboro area has a mix of restaurants, coffee shops and various service industries. The Hillsboro Saturday Farmers' Market is located at the intersection of Main Street and 2nd Avenue, and takes place every Saturday from May through October. Light rail service is located downtown, with four stops in the downtown area. The area currently does not have a movie theater or brewpub, or a specialty grocer.

Current Market Expectations
As with Milwaukie, achievable pricing in the area is largely consistent with suburban pricing. This level is higher than Milwaukie's, as the suburban rates in Washington County are higher than those in East Clackamas and Multnomah Counties. Downtown retail space is currently listed for approximately $12 per square foot net, while rates in more suburban location such as Tanasbourne are in the $36 to $38 range.

Condominium development in the area has been largely suburban in nature, much of it found in the Orenco Station area east of downtown. The "Q" Condominiums at Orenco have been selling at a range of between $185 to $229 per square foot, at a pace of 3.5 per month. These reflect the current top pricing on a per square foot basis in the area, but not truly urban product. As with Milwaukie, downtown Hillsboro is currently leasing at a discount vis-à-vis proximate suburban locations. At the current rates, marginal retail development is expected to provide a limited return as a single land use, and will be lucky to break even as opposed to contributing to the project's overall yield.

As with the condominiums, the urban market for rental apartments remains untested in Hillsboro. Current lease rates at higher-quality rental apartment projects in the area approach $1.00 per square foot, but this reflects wood-frame construction. Parking is typically free, with additional charges for garages.

At current demonstrated pricing, based on available comparables, it would be difficult to justify urban form housing development in the downtown Hillsboro area. As noted in the Milwaukie discussion, mid-rise condominium development has been seen in other areas but with sales prices closer to $350 per square foot. Rent levels in the area are seen to be well below what is necessary to support mid-rise construction as well. Affordable housing receiving tax credits represent the most viable development form in the current market.

Potential Areas of Opportunity

Among regional centers, the Hillsboro area enjoys an enviable position within the path of growth. Employment growth has been robust, which should support a commensurate level of household growth and residential demand. The area is also widely considered the most constrained with respect to the ability to deliver housing relative to projected demand, which should lead to above-average housing appreciation and increased pressure for redevelopment in the older areas of town.

We view downtown Hillsboro as having strong upside potential, and the City has recently become more aggressive in actively promoting the area. Local demographics are quite strong, but retail and residential energy to-date has been focused to the east in the Orenco Station and Tanasbourne areas. What the downtown area has to offer is a more authentic downtown feel vis-à-vis these more established retail areas, with good physical stock still available.

To-date, the lack of an urban form project in downtown Hillsboro provides no market comparables that establish achievable pricing in the area. As a result, the market will be reluctant to take on the risk associated with a first project. Initial developments are expected to include higher-density townhome projects on redevelopment lots on the periphery of the downtown area. While not truly urban, they will help serve to increase localized demographics and provide support for an increase in local retail and service uses. We would

expect some level of public participation to be necessary to induce downtown residential housing in a more urban form, which will establish some reliable pricing guidelines for the area. Over time, development of a more comprehensive set of urban amenities will be likely necessary to help the area transition into a viable urban setting.

C.   GRESHAM REGIONAL CENTER

Area Overview
The Gresham Regional Center is located near the center of the city and consists of Gresham's Historic Downtown area and the more recently developed Civic Neighborhood area (sometimes called "Gresham Station"). The area lies between major east/west routes of Powell, Division, and Burnside Streets, and is traversed by the light rail line. The eastside MAX line terminates in the Center.

The Regional Center has experienced a range of development in recent years. The master-planning and development of the Civic Neighborhood with housing and commercial space over the last decade makes it the newest district in the Center, with more development to come. The Civic Neighborhood was founded around city government buildings, followed by improved light rail facilities and the development of the Gresham Station shopping center. Multi-family housing options have also developed in the neighborhood, including apartment complexes, senior housing, and town homes.

In contrast to this relatively new neighborhood, the other component of the Regional Center is Downtown Gresham, which is anchored by a Historic Main Street which dates back more than 100 years. Activity on Main Street is concentrated on roughly four blocks of storefront retail and commercial space just north of Powell Boulevard.

To the east of Main Street is a mixture of recent mixed-use and residential redevelopment, as well as older single-family homes. There are multiple examples of new transit-oriented projects in the Downtown area including a vertical mixed-use project, town homes and apartments. A second vertical mixed-use project is under development.

Overall, the Downtown is characterized by gradual redevelopment intermixed with older real estate in a variety of conditions. Due to the history of low-intensity development, there's ample opportunity for redevelopment at higher residential and commercial densities over time.

This study examined the marginal impact of certain urban amenities on residential pricing within walking distance of the commercial core. The size and bifurcated layout of Gresham's Regional Center mean that for our purposes there are really two commercial cores. Housing within the Civic Neighborhood is within walking distance of the Gresham Station shopping center, and other limited retail along Civic Drive. A different residential district is located within walking distance of Historic Main Street.

As the majority of recent investment has been in the Civic Neighborhood, which calls for mixed use and transit-oriented development, this case study focuses on development challenges in that area.

Existing Amenity Mix

The Gresham Civic Neighborhood is surrounded by a mixture of commercial and multifamily residential uses including a recently-built community shopping center. The area's existing retail mix includes a Best Buy, a Cost Plus World Market, and an Old Navy store. There is also a wide variety of local and national chain restaurants in close proximity. The area is in the process of being intensely developed and will include a new lifestyle center on the site to the north of the MAX station with discussion of future residential towers. The area has two light rail stations, providing convenient transit access to downtown Portland and the Portland International Airport. To-date, the most conspicuous absence in this area is a grocery store. With the closure of the QFC at Civic Neighborhood, the closest grocery stores lay almost a mile away on Burnside.

Current Market Expectations

The Civic Neighborhood area lies at a crux between more upscale neighborhoods to the south, and middle-income to low-income neighborhoods to the north and west. Urban-form residential development has been very limited in the Gresham area. We would consider two Peak Development projects to be the best indicators of achievable pricing in the Gresham Station market, The Crossings for rental apartments and The Beranger for condominiums. Both of these projects were largely unprecedented in the Gresham area, and have established achievable pricing beyond what was generally expected in the market.

The Crossings has a mix of three unit types, with average rent levels ranging between $1.12 and $1.45 per square foot. These rates remain below achievable levels in closer in locations such as the Lloyd District, but are well in excess of the $0.85 to $1.05 range historically seen in Gresham's higher-end projects. The site of this project is central to the Civic Neighborhood, but suffers from a lack of development to-date to the north of the site. With the exception of the light rail station, amenities are concentrated to the south of the site.

The Beranger Condominiums are a 24-unit mixed-use project located in downtown Gresham, Oregon. The first floor is comprised of seven for-sale retail spaces and structured parking. The upper three levels will contain the residential units. This project is the first attempt at upscale attached for-sale housing in downtown Gresham. There are twelve units on each of floors two and three with the fourth floor consisting of lofts for the third-floor units. Units went on sale on February of this year and thus far, they have been selling at a rate of roughly 1.5 units per month. Units at the development range in size from 680 to 2,044 square feet in size averaging 1,029 square feet. Reserved units range in price from $182,000 to an estimated $450,000, averaging approximately $238 per square foot. Actively listed units range in price from $182,000 to $330,000, averaging $245 per square foot. The project received preliminary approval for a 10-year tax abatement, which would be passed through to the residential condominium owners.

Potential Areas of Opportunity
The Gresham Civic Neighborhood area has strong arterial access, but the proximate demographics are currently weak. Public ownership of major parcels within the Center is seen as a key opportunity, allowing for a greater scale of development. Recent investment patterns make this area the likely preferred location for most regional-draw retail uses considering the Gresham area.

Research done by Johnson Gardner in 2005 indicates that the Gresham Regional Center has the potential to support a specialty grocer. We would expect that the likely preferred location for a new tenant of this type would likely be in the Gresham Station area. Much of the indicated demand for this type of use is expected to come via automobile, and for non-pedestrian trips the greater retail scale of the Gresham Station area will likely be seen as more attractive.

Key investments have already been made in the Civic Neighborhood area, and recent projects have demonstrated a market premium associated with the area. As the urban amenity mix strengthens, we would expect to see achievable pricing in the area rise commensurately. At this point in time, short-term opportunities would include development of available publicly-owned properties, with a focus on attracting the urban amenity types outlined with a significant demonstrable impact on achievable pricing. Over time, redevelopment of the underutilized properties in the northeast portion of the Civic Neighborhood can further strengthen the area, and capitalize on the mix of uses and investment already on the ground.

While pricing has been increasing, it is still below the threshold necessary to support mid-rise and high-rise development without some level of assistance. Over the short-term, public intervention will be required if more urban densities are seen as desirable.

VI. FINANCIAL IMPLICATIONS

Financial viability remains the primary obstacle to achieving many of the development forms envisioned by the 2040 growth concept. Assuming that zoning is not serving as a limit, achievable pricing in terms of sales prices or rent levels is the primary determinant of the form of residential development. Higher density development forms tend to cost more per square foot to build, and require higher pricing to make them viable.[17] If pricing is adequate, the market would be expected to deliver higher priced development forms as they will represent the highest and best use. In other words, when achievable pricing is adequate, the market will transition to higher density development types and the supportable land value will be higher.

Developers serve as the primary drivers of the development process, typically initiating land development. The developer makes a living through managing risk, evaluating the probable financial return on a project in light of assumed risk. Developers cannot be expected to initiate a development in which the risk-to-return ratio is not compelling. Both lenders and equity contributors will also evaluate any development opportunity proposed by a developer using similar criteria. Development typically occurs when the development of an allowed use yields an adequate return to attract a developer and equity source. The final development form will typically represent what is viewed as the "highest and best use" of the property from a development perspective, which reflects the development type and timing yielding the greatest risk adjusted return to the developer. The assessment of these risks and returns typically requires substantial analysis by the developer, equity source and lenders.

Land values are a function of achievable pricing, and reflect what is commonly referred to as a "residual land value". Developers solve backwards to determine what they can pay for site acquisition. Factors such as achievable pricing, construction costs, financing terms and return parameters are viewed as givens, with site acquisition representing the sole variable input. When achievable pricing increases, the supportable land value increases commensurately.

A. PROTOTYPICAL PRO FORMAS

Private sector development activity reflects the management of perceived risks and returns. Anticipated return rates are typically generated using pro forma financial analyses, which forecast costs and revenues associated with specific developments. Developers use a broad range of approaches in preparing their financial analyses, with a number of financial return measures commonly used to evaluate the viability of projects.

Financial feasibility represents the most reliable predictor of developer activity, but by no means a perfect one. As a result, financial viability is the principal focus of our analysis,

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[17]   Significantly higher costs per square foot are typically seen when residential development shifts to mid-rise or high-rise construction. The cost of two- to three-story wood frame construction with surface parking is typically less than single family construction.

which includes the use of prototypical pro forma analysis applied to specific examples to evaluate financial feasibility of certain densities and land uses under a range of market conditions.

A series of prototypical pro formas were generated to model the development form that would represent the highest and best use under a range of achievable pricing assumptions. The model evaluates only three development permutations, which represent only a sample of the range of potential forms. We focus on residential development, as our modeling in this exercise evaluated the marginal impact on achievable residential pricing.

General Assumptions

Within this analysis, we have modeled both rental apartments and condominiums units assuming three alternative development forms: low-rise wood frame construction, mid-rise lightweight steel construction and high-rise concrete construction. Cost estimates were based on data from R.S. Means. These numbers appear low based on our recent experience, particularly for mid- and high-rise construction, but were used for consistency.

PORTLAND METROPOLITAN AREA
Low-, Mid- and High-Rise Apartment and Condominium Development Construction Costs
2006 - Union Wages

Apartments	Units	Average Sq. Ft./Unit	Total Space	Project Cost	Cost/Unit	Cost/Sq. Ft.
Low-Rise	100	1,000	100,000	$9,711,000	$97,110	$97
Mid-Rise	100	935	110,000	$14,268,000	$142,680	$130
High-Rise	250	850	250,000	$37,480,000	$149,920	$150

Condo	Units	Average Sq. Ft./Unit	Total Space	Project Cost	Cost/Unit	Cost/Sq. Ft.
Low-Rise	100	1,000	100,000	$11,653,000	$116,530	$117
Mid-Rise	100	935	110,000	$15,695,000	$156,950	$143
High-Rise	250	850	250,000	$41,228,000	$164,912	$165

Source:R.S. Means, Inc. and Johnson Gardner, LLC

The rate of return necessary to facilitate development was assumed to be an 8.0% return on cost for rental apartments, and a 15% return on cost for condominium units.

Pro Forma Results

We have evaluated a series of cost estimates for alternative market-rate rental apartment development forms. The evaluation, summarized includes a calculation of threshold rent levels necessary to support this type of construction using a range of assumed land values. [Figure 6.01]

<div align="center">

FIGURE 6.01

GENERAL COST CHARACTERISTICS OF RENTAL APARTMENTS

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Building Type Land Value-S.F.	Land Cost	Construction Cost 1/	Total Cost	Cost/ Unit	Rent Threshold 2/
Low Rise (100 units @ 30 per acre)					
$7.00	$1,016,400	$8,254,350	$9,270,750	$92,708	$1.12
$75.00	$10,890,000	$8,254,350	$19,144,350	$191,444	$2.31
$200.00	$29,040,000	$8,254,350	$37,294,350	$372,944	$4.50
Mid-Rise (100 units @ 200 per acre)					
$7.00	$152,460	$12,127,800	$12,280,260	$122,803	$1.48
$75.00	$1,633,500	$12,127,800	$13,761,300	$137,613	$1.66
$200.00	$4,356,000	$12,127,800	$16,483,800	$164,838	$1.99
High Rise (250 units @ 500 per acre)					
$7.00	$152,460	$38,229,600	$38,382,060	$153,528	$1.85
$75.00	$1,633,500	$38,229,600	$39,863,100	$159,452	$1.92
$200.00	$4,356,000	$38,229,600	$42,585,600	$170,342	$2.06

1/ RS Means, with an additional 17.6% for other soft costs.

2/ Rent necessary for 8.0% return on cost w/ 35% operating cost ratio.
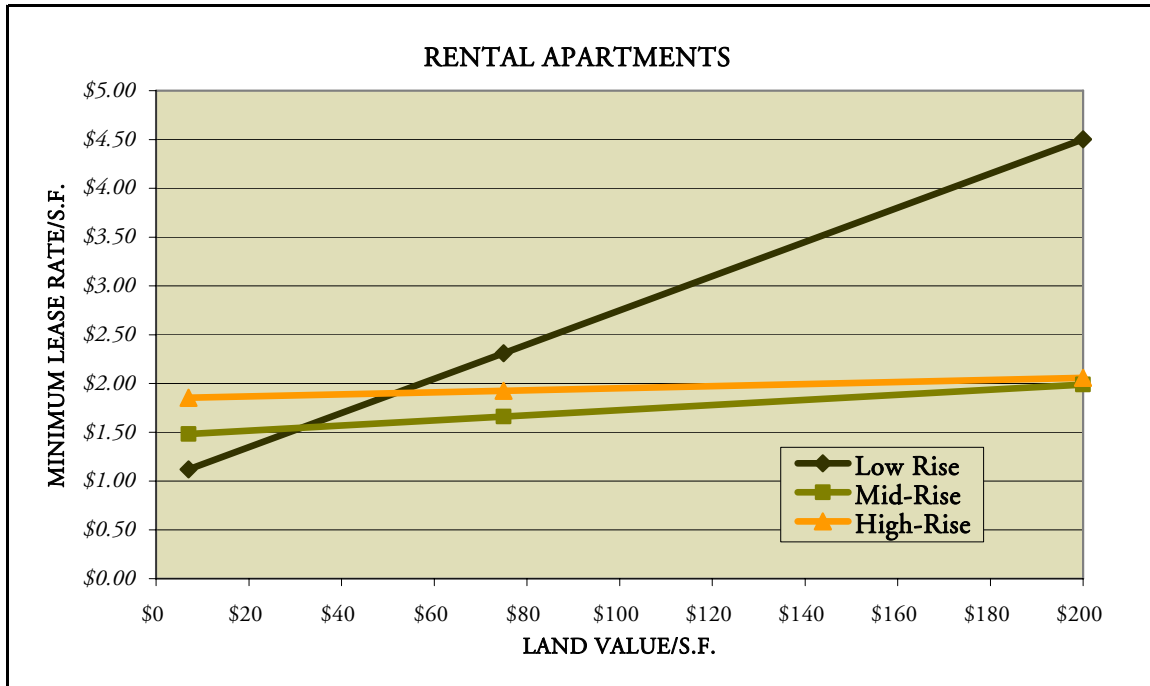
Source: Johnson Gardner

The costs presented for a low-rise rental apartment building reflect garden apartments, with a typical density of between 22 and 30 units per acre. These projects are wood frame construction, are between two and three stories, and provide surface parking.

The costs for mid-rise development represent lightweight steel frame construction above a concrete parking podium. This is a common development form, seen in early Pearl District projects and current projects in the Close-In Eastside. High-rise construction (seven or more stories) is seen primarily in the Pearl and South Waterfront Districts, which have the highest supportable rent levels and land values.

Under the assumptions used, garden apartments are able to pay the highest land values when the achievable rent levels are $1.55 per square foot or below. When rents rise above this level, mid-rise housing delivers the highest residual land values up to about $2.10 per square foot, when high-rise development becomes the highest and best use. [Figure 6.02]

FIGURE 6.02
RENT MINIMUMS ($/SQ. FT./MO.) BY LAND VALUE AND BUILDING TYPE

RENTAL APARTMENTS

Source: Johnson Gardner

The results of this analysis are consistent with observed development patterns within the metropolitan area. Non-subsidized mid-rise construction becomes the market choice where achievable rent levels are adequate to make this the highest and best use of the property.

A similar analysis was done for condominium development, using the same three broad construction types. [Figure 6.03]

FIGURE 6.03
**GENERAL COST CHARACTERISTICS OF CONDOMINIUMS**

Building Type Land Value-S.F.	Land Cost	Construction Cost 1/	Total Cost	Cost/ Unit	Price/SF Threshold 2/
Low Rise (100 units @ 30 per acre)					
$7.00	$1,016,400	$14,566,250	$15,582,650	$155,827	$188.42
$75.00	$10,890,000	$14,566,250	$25,456,250	$254,563	$329.21
$200.00	$29,040,000	$14,566,250	$43,606,250	$436,063	$620.33
Mid-Rise (100 units @ 200 per acre)					
$7.00	$152,460	$19,618,750	$19,771,210	$197,712	$239.07
$75.00	$1,633,500	$19,618,750	$21,252,250	$212,523	$274.84
$200.00	$4,356,000	$19,618,750	$23,974,750	$239,748	$341.06
High Rise (250 units @ 500 per acre)					
$7.00	$152,460	$56,688,500	$56,840,960	$227,364	$274.93
$75.00	$1,633,500	$56,688,500	$58,322,000	$233,288	$301.70
$200.00	$4,356,000	$56,688,500	$61,044,500	$244,178	$347.36
1/ RS Means, with an additional 18.75% for other soft costs.					
2/ Pricing necessary for a 15% return on cost.					

Source: Johnson Gardner

Under the assumptions used, wood-frame condominium units are able to pay the highest land values when the achievable sales prices are $260 per square foot or below. When pricing rises above this level, mid-rise housing delivers the highest residual land values up to about $350 per square foot, when high-rise development becomes the highest and best use. [Figure 6.04]

FIGURE 6.04
PRICING MINIMUMS ($/SQ. FT.) BY LAND VALUE AND BUILDING TYPE

CONDOMINIUMS
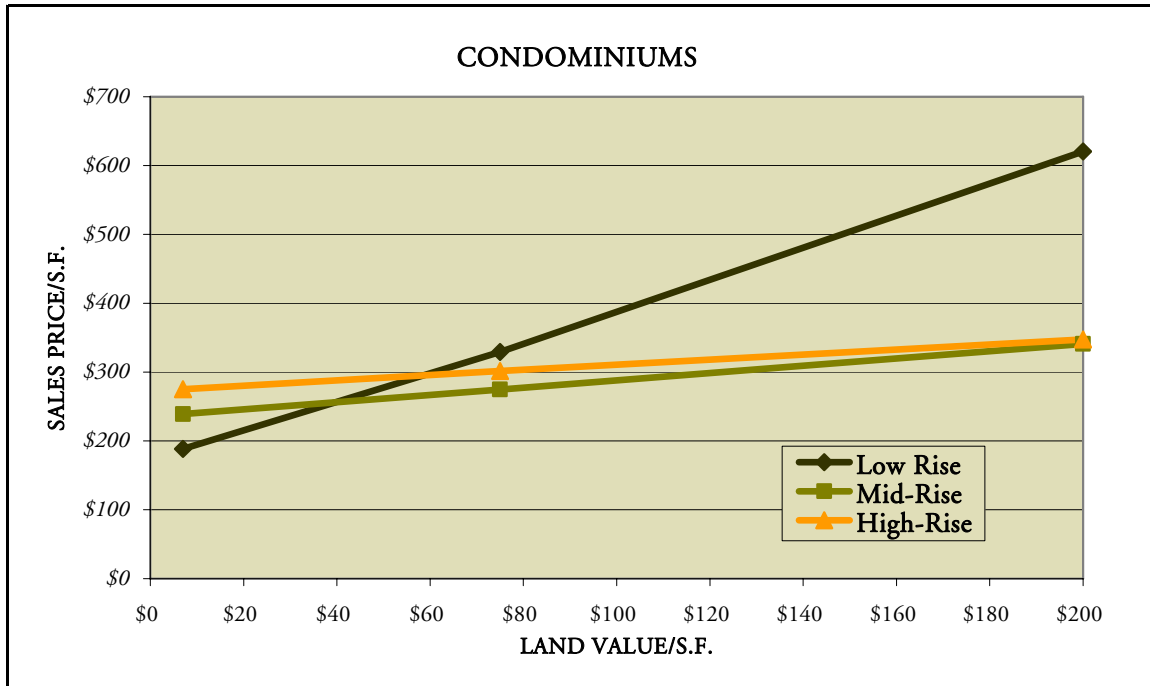
Source: Johnson Gardner

As with the rental apartments, as land values rise, the construction cost advantage of lower density construction is offset by the higher land costs associated with lower intensity of use. Construction costs per square foot tend to increase as densities increase, with higher costs associated with shifts to concrete and steel construction. In general, the increase in either sales price or achievable lease rates associated with alternative construction type is insufficient to offset the higher costs. The key benefit from a financial perspective of changing densities through construction type is a higher yield, in terms of leasable square footage or units, associated with a particular land parcel. As a result, higher underlying land values can change the financial equation to favor higher density development forms.

The key challenge illustrated by this analysis that the development of mid-rise residential project in most suburban areas would require pricing not currently attainable in these markets. While a regulatory action setting minimum densities that precluded low-rise apartments would make mid-rise construction the highest and best use of the property, no development activity would be expected to occur without substantive subsidy. Rising achievable lease rates or sales prices would cause mid-rise development to make financial sense, but precluding development until achievable rent levels rise would not support the development necessary to provide the amenity level required for higher rents.

Marginal Impact of Urban Amenity Premiums

A summary pro forma evaluation was completed to evaluate the marginal impact of the shift in pricing associated with the urban amenity mix. In this exercise, we model a mid-rise and high-rise condominium project, using the premiums associated with a specialty grocer and book shop identified in the hedonic modeling. Land acquisition was assumed at $40 per square foot, while construction costs were based on R.S. Means average estimates. Baseline sales were assumed at $225 per square foot, which is roughly equivalent to marginal demonstrated achievable pricing in the case study areas.

FIGURE 6.05
STATIC PRO FORMA EVALUATION OF CONDOMINIUM DEVELOPMENTS

	Mid-Rise		High-Rise	
	Baseline	W/Premium	Baseline	W/Premium
PROJECT DETAILS				
Number of Units:	100	100	250	250
LAND ACQUISITION				
Assumed Density (Units/Acre):	200	200	500	500
Land Price/SF:	$40	$40	$40	$40
Land Acquisition:	$871,200	$871,200	$871,200	$871,200
Construction Cost/Unit:	$196,188	$196,188	$226,754	$226,754
Construction Cost/Total:	$19,618,750	$19,618,750	$56,688,500	$56,688,500
Overall Project Cost:	$20,489,950	$20,489,950	$57,559,700	$57,559,700
INCOME				
Number of Units:	100	100	250	250
Average Sales Price	$191,250	$248,243	$191,250	$248,243
Average Unit Size/S.F.:	850	850	850	850
Average Base Price/S.F.:	$225	$225	$225	$225
Specialty Grocer Premium @ 17.5%	$0	$39	$0	$39
Book Shop @ 12.3%	$0	$28	$0	$28
Gross Sales Income:	$19,125,000	$24,824,250	$47,812,500	$62,060,625
Total Income	$19,125,000	$24,824,250	$47,812,500	$62,060,625
EXPENSES				
Sales Costs @ 5@	$956,250	$1,241,213	$2,390,625	$3,103,031
Total Expenses	$956,250	$1,241,213	$2,390,625	$3,103,031
NET PRE-TAX PROFIT	-$2,321,200	$3,093,088	-$12,137,825	$1,397,894
VIABILITY GAP ANALYSIS				
Return on Cost	-11.3%	15.1%	-21.1%	2.4%
Threshold Return	15.00%	15.00%	15.00%	15.00%
Indicated Gap	$5,394,693	-$19,595	$20,771,780	$7,236,061
SOURCE: Johnson Gardner				

The analysis indicates that the incremental gain in achievable pricing of $67 per square foot associated with the urban amenities can negate an over $5.0 million indicated viability gap on a mid-rise project. Even with the premium, the high-rise development remains not viable, although the gap is greatly reduced.

Other Issues Impacting Viability

Urban and redevelopment projects are perceived to have a greater level of risk, necessitating a higher level of return for some developers. Particular problems cited included difficulty in construction (staging, conflict with existing uses) and relatively high soft costs associated with complex projects with limited scale. In addition, developers cited interaction with jurisdictional planning efforts as sometimes representing an additional layer of entitlement risk and bureaucracy. There are developers willing to accept lower initial rates of return for urban projects, on the anticipation that barriers to entry in these areas will allow for better long-term returns.

The primary impact of a relatively high perceived level of risk is the resulting impact on acceptable rate of return. Increasing the return threshold can dramatically impact development activity. Risk is also a particular concern when dealing with redevelopment, where construction cost estimates and timing are less predictable. In addition, the scale of most infill and redevelopment opportunities is limited, while the complexity is substantially higher. This increases soft costs relative to the overall level of investment, decreasing yield.

Policy Implications

As demonstrated in the pro formas, the highest and best use determination resembles a step function in terms of the development form that supports the highest underlying land values. If achievable sales prices are below $200 per square foot, the development form capable of bidding the greatest value for the property is wood frame construction with surface parking. As pricing increases to $300 per square foot, mid-rise construction over a concrete podium become the land use that supports the highest values. High-rise construction becomes the highest and best use only when pricing rises above $450 per square foot under these assumptions.

It should be noted that these types of prototypical pro formas imply a level of precision that is unrealistic. Developers use a range of return parameters and yield requirements in making decisions, costs can vary substantively, and assumptions with respect to the market area can also vary. As a result, a series of developers looking at the same project may have sharply divergent views as to what development form represents the highest and best use for that site and the associated supportable land value. Nonetheless, the general relationship remains a constant. The physical form of residential development is determined primarily by achievable pricing.

While the focus of this study has been on the marginal impact of a range of urban amenities on achievable pricing, it should also be noted that expectations of pricing and perceived market risk also have a significant impact on the determination of highest and best use. To the extent that a project can "prove" or demonstrate that a market exists for an untested

product and that certain pricing levels are achievable, the project can increase expectations and/or reduce perceived risk. This shifts the market further along the path towards more intensive development forms.

VII. FINDINGS AND RECOMMENDATIONS

From a policy perspective, the results of our analysis clearly indicate that a range of urban amenities can have a substantive impact on achievable pricing. As pricing is the primary determinant of development form, developing urban amenities that increase achievable pricing in a district would be directly supportive of achieving higher density development forms. Alternatively stated, making an area more attractive for residents supports higher pricing which then supports more intensive development. This can trigger a virtuous cycle of development, in which the more intensive development supports a more marketable development mix, further increasing the amount of proximate development.

The ability of other centers in Portland to support a transition to higher density development patterns over time is a function of their ability to provide an "urban experience" that delivers a marketable amenity consistent with what is needed to achieve the desired development forms. While short-term market realities should not be viewed as necessarily precluding longer-term visions, they do provide an indication of how far away or close an area may be from supporting a transition to more intensive development forms.

While each center will have specific challenges and opportunities, there are some characteristics we see as supportive of the development of a robust urban center. These include the following:

- *Good transportation infrastructure, providing for convenient commutes and the ability to draw from a wider trade area;*
- *Existing commercial structures, providing for affordable commercial space, or sites of an adequate scale to generate a critical mass of activity;*
- *Proximate residential and employment densities to support services in the center;*
- *Available developable parcels, and willing property owners;*
- *Active developer interest in an area;*
- *Current achievable pricing approaching the threshold for higher intensity development patterns; and*
- *A jurisdiction actively supporting the intensification of development, through entitlements (zoning), infrastructure investments, site acquisition and/or other forms of encouragement.*

Metro's resources in the TOD and Centers program are quite limited, and investments should work with the market and leverage private investment with targeted public investments.

We see two major roles for the program. The first of these would be what can be referred to as "proof of concept" investments, supporting projects that test and hopefully demonstrate

market support and achievable pricing for a targeted development form. Examples of this type of intervention would be The Crossings at Gresham Station and North Main Village in Milwaukie, both of which demonstrated that a significant premium could be achieved for untested urban development forms in these markets.

The second type of investment would be related to increasing the attractiveness of a center, thereby generating a marketable premium that would be reflected in higher achievable pricing. This could include infrastructure investments (quite expensive), common area improvements (parks, plazas, streetscape), and active support for targeted "urban infrastructure" that have a demonstrated positive impact on achievable pricing (specialty grocers, theaters, etc.). An example of an investment type that this analysis would support would be providing funding to assist in the renovation and possible expansion of a theater, a restaurant, café, or bookstore within a center. Our analysis would indicate that this facility would increase achievable pricing in the area, directly impacting the viability and form of future residential development.