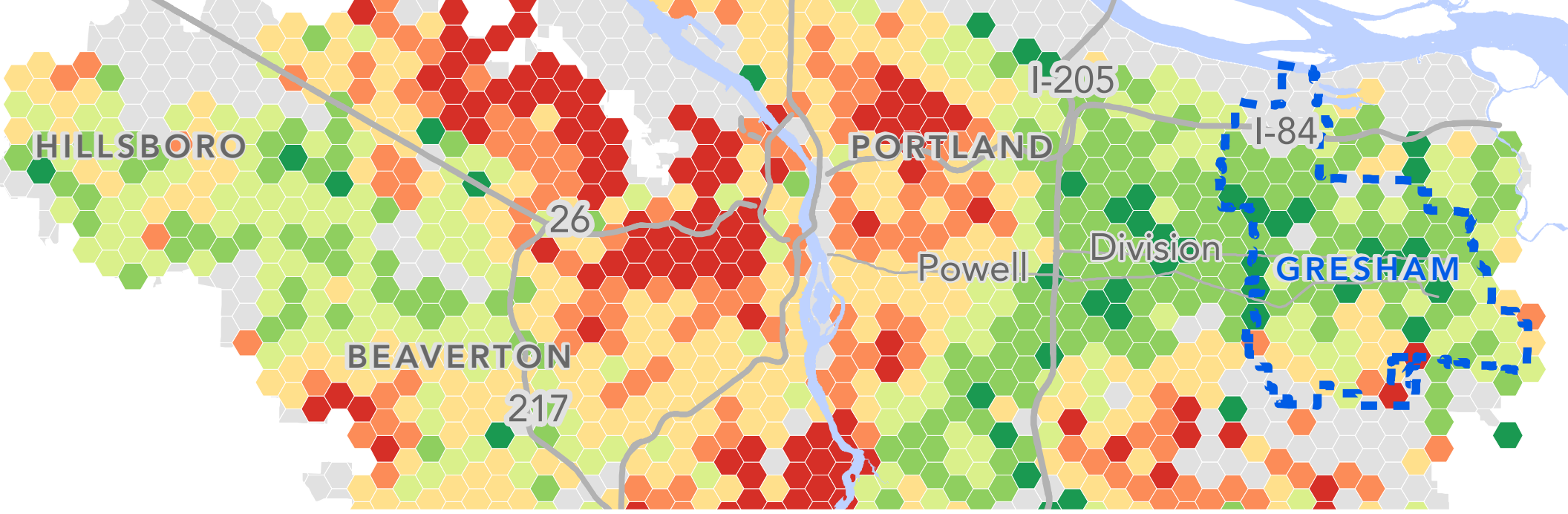

GRESHAM NEIGHBORHOOD CHANGE ANALYSIS

May 2015

PREPARED BY:

ECONorthwest

ECONOMICS • FINANCE • PLANNING

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Introduction

Rising prices in the Portland region housing market are resulting in regional conversations and analysis regarding policy tools to address housing affordability and community stabilization. A City of Portland analysis documented the very real problem of gentrification and displacement within its city boundaries, and found that large areas of the City had risk factors that suggest displacement is occurring: increasing median household income, increasing population with a bachelor's degree, a change in percentage of renters, and decreasing percentage of nonwhite residents.

As people are displaced from higher-cost central Portland, what might the impacts be in markets where housing is currently relatively affordable, and limited new development of any type is occurring? And, to what extent will a significant new public investment in infrastructure (such as high-capacity transit) contribute to worsening housing affordability? These questions are at the heart of the analysis contained in this report.

The questions are especially urgent for Gresham, given the City's goal to provide affordable housing options for people at all incomes, and a development context in which new market rate housing development is likely to need support to be feasible in the near-term. The Powell-Division Transit and Development Project is a regional project that aims to bring more rapid and reliable bus transit to the Division Street corridor in Gresham as well as to the employment campuses in its northeast corner, including Mt. Hood Community College. The City wants to understand potential neighborhood change in Gresham and along the study corridor that could result from these improvements.

KEY TERMS

Displacement is the process where increasing rents cause lower-income households to move from their current neighborhood to a new neighborhood where they can afford to live. This study is focused on issues of displacement, which is an attribute related to but different from the term gentrification.

Gentrification often includes broader changes in neighborhood character related to demographics, income levels, public investments, and local businesses.

Affordable Housing. Definitions for "affordable housing" that is permanently subsidized can vary greatly, and are often tied to estimates of median family income. This study defines affordability as the relationship between market housing price and income, as follows: single-family or apartment where the monthly housing cost (including utilities and other costs) for either type is less than 30% of the household's gross income. Transportation costs are not included in our definition of affordability. This is an imperfect, but frequently-used definition.

Bus Rapid Transit (BRT) is a high capacity bus transit system. Characteristics are similar to light-rail including frequent service, unique station amenities, signature transit vehicle branding and design that provide comfort, ease of boarding/alighting, and other amenities that improve identification of the transit vehicle and route. Routes often have their own dedicated lane separate from traffic for parts of the route.

Housing Affordability is a function of income and housing costs for each individual household, which can vary substantially given the unique circumstances of a household and housing unit. This study generalizes these factors to assess affordability at different levels of income for the average housing cost.

Median Family Income is a standard measure of income that varies depending on the geographic area used and the size of the family, based on US Census data. The Department of Housing and Urban Development (HUD) establishes median family income thresholds dependent on the size of the household for programs it administers.

Single-family Housing Affordability. The costs of owning a single-family home, townhome, or condominium include a number of costs in addition to a mortgage payment. These costs include a down payment, utilities, property taxes, and insurance. This study uses a geospatial housing database of home sales based on assessor data and regional multiple listing service (RMLS) data to determine home prices for different areas at different point in time.

Multifamily Housing Affordability. Multifamily housing for this study includes only market rate rental housing. Subsidized housing has been removed to avoid skewing average rental rates. Rental housing costs include utilities in addition to rent. This study uses a geospatial housing database of multifamily apartment rents going back to the year 2000 based on REIS and CoStar data, two independent data sources for tracking real estate pricing. Housing costs are not adjusted for inflation, to allow for comparison with historical median family income in nominal (non-inflation adjusted) values.

To address these questions, this report provides a data-driven, market-based look at how changing regional housing prices and new public investments might affect Gresham residents. It presents findings on 1) demographic characteristics and real estate market trends in Gresham and the region and 2) the impact of recent MAX light-rail construction on development and rents. Based on the findings, the study outlines strategies for the City to pursue to foster mixed-income communities and mitigate against future involuntary displacement.

Study Approach

The City of Gresham wants to encourage communities that are affordable at all incomes, while working proactively to mitigate the potential for involuntary, market-driven displacement of vulnerable populations. The logic model (Appendix A) illustrates a framework for assessing vulnerability to displacement, and describes how local housing market conditions in Gresham may change with enhanced transit. The neighborhood change study has three main components:

1. Risk of Displacement. This component adapts the methodology from the City of Portland's 2013 Gentrification and Displacement Study[1] to identify risk factors for involuntary, market-driven displacement in neighborhoods based on demographics and changes in housing costs. The analysis identifies areas with concentrations of demographic characteristics that suggest vulnerability to involuntary displacement, overlaid with areas that are experiencing increases in housing costs.

This study uses a geospatial housing database of single-family home sales and multifamily apartment rents going back to the year 2000 as the foundation for its analysis of housing costs. The data allows the study to look at changes in housing costs throughout the entire Portland region. Housing costs are not adjusted for inflation, so that housing costs can be compared to historical median family income values, which are not available in inflation-adjusted values.

2. Impacts of Transit on Risk of Displacement. The housing database allows the study to quantify the impact of large transit improvements on rent on nearby properties outside of other broad market changes. This analysis used the construction of the Yellow and Green MAX lines, in 2004 and 2009 respectively, to look at rent levels before construction and after construction relative to the broader areas. This analysis, along with a literature review of relevant research, provides the foundation for understanding the effects of bus rapid transit (BRT) improvements in Gresham on housing costs near BRT.

3. Action Plan. The action plan uses the findings from the two analytical components to identify near- and long-term actions that the City of Gresham can pursue to mitigate the risk of displacement for vulnerable populations.

Portland MSA: Income increased 29%, while single-family housing costs increased 77%, and multifamily increased 79%.

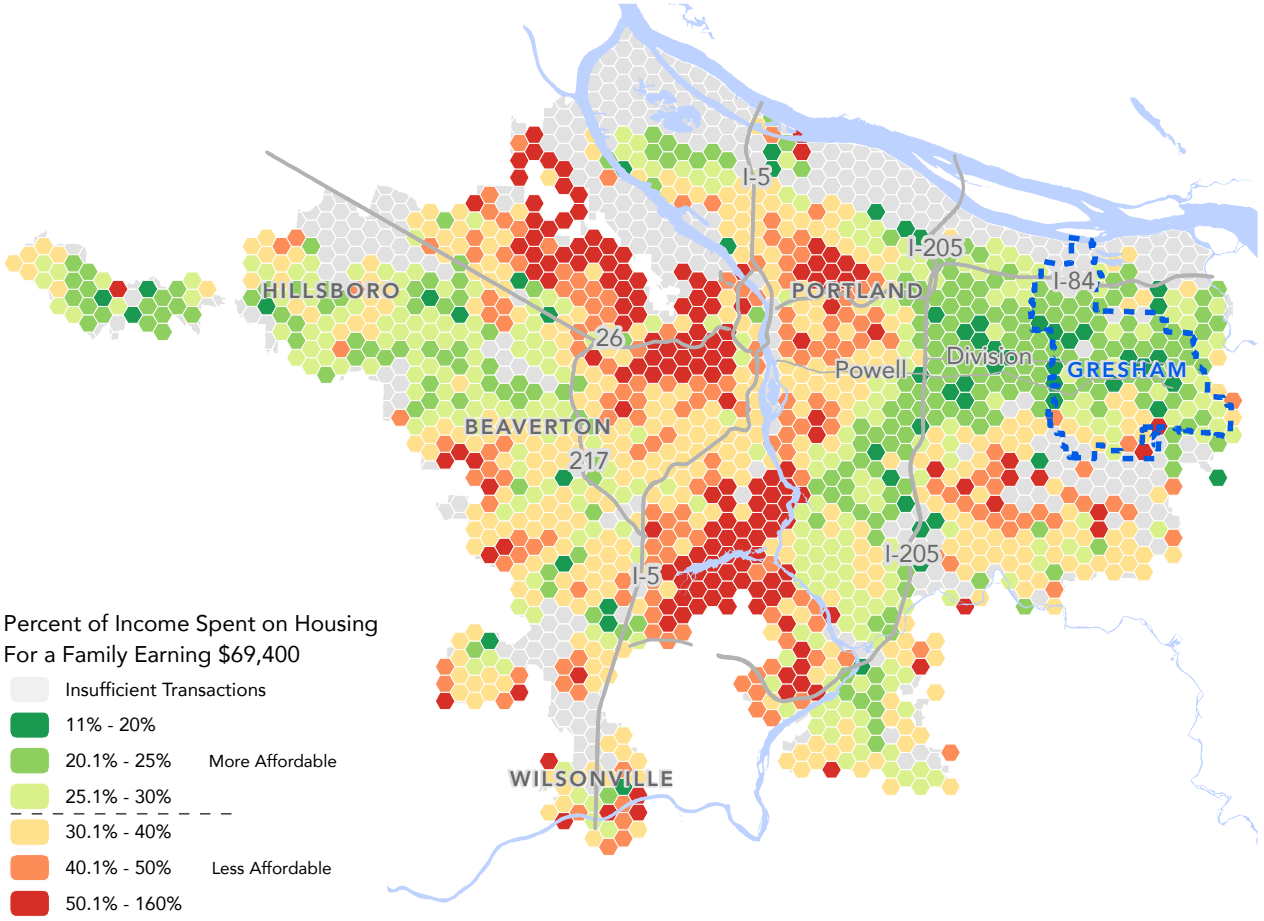
Gresham: Income increased 8%, while single-family housing costs increased 43%, and multifamily increased 40%.

[1]http://www.portlandoregon.gov/bps/article/454027

KEY MEASURES: COMPARING PORTLAND AND GRESHAM, 2000 AND 2014

*For Gresham Median Family Income "2014", the 4-person MFI in 2013 according to 5-year estimates is displayed.

Single-Family Affordability, 2014



Source: ECONorthwest, Metro RLIS, US Department of Housing and Urban Development

Gresham's single-family housing stock is relatively affordable.

Single-family home affordability is based on a number of factors in addition to the actual sales price for a home. These factors include the household's income, the down payment required, and current interest rates. The map shows the percent of a household's income spent on housing for a household earning the region's median family income of $69,400. Areas shaded in green are considered affordable for these households.

Gresham and east Portland are the most affordable areas in the region for single-family housing. In most Gresham neighborhoods, the average cost of owning a single-family home requires a family making the regional median family income to spend less than 25 percent of gross income on housing. These price points will be attractive to many who cannot afford to purchase a home in more expensive parts of the region.

ASSUMPTIONS

STRUCTURE TYPE:
Single-Family Homes and Owned Condominiums and Townhouses

INCOME:
4 person household
MFI: $69,400

AFFORDABILITY:
Affordable: Housing Costs=30% or less of gross family income
Down Payment: 20%
Mortgage: 30-year amortizing principal interest
Interest Rate: 4.17%

Property Tax Change Ratio: 64%
Property Tax Rate: $18 per $1,000
Insurance: Sales Price/1,000 * 03.5
Utilities: $250 per month

GEOGRAPHY
Portland Urban Growth Boundary (UGB)

CALCULATION:
Percent of MFI spent on Housing=Yearly Housing Costs [Mortgage Payment + Monthly Utilities]+Property Tax+Home Insurance] / MFI

Change in Single-Family Affordability, 2004-2014

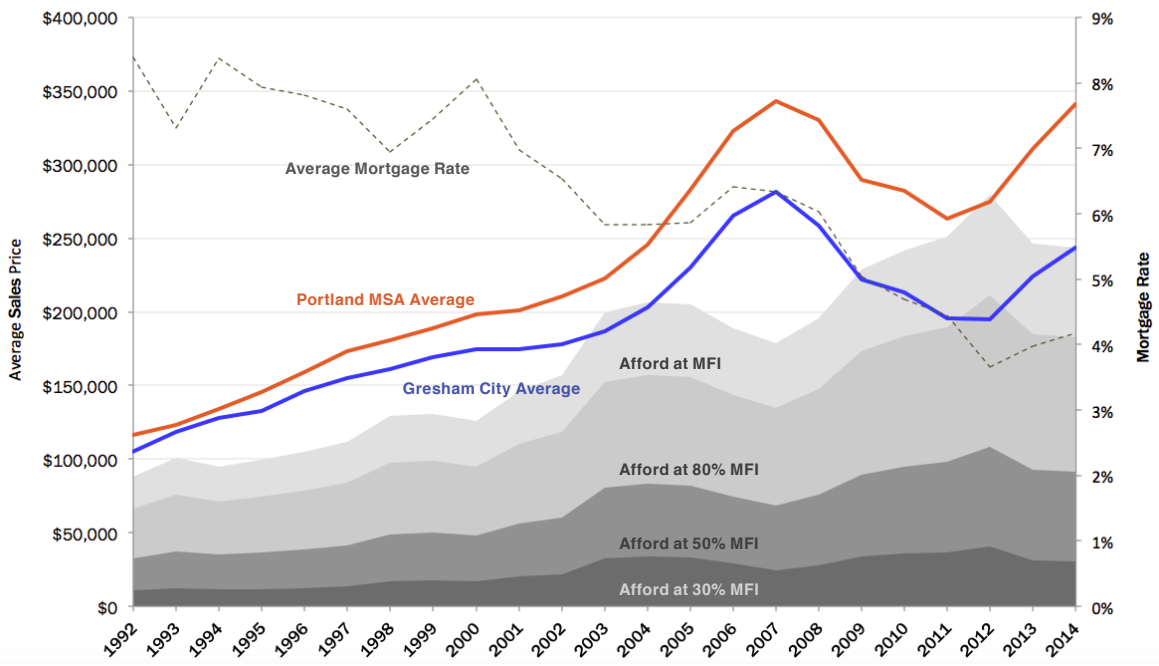
Single-family homes have consistently been more affordable in Gresham than in the Portland region on average, but are still unattainable for many.

The average price for a single-family house in the Portland region has increased faster than in Gresham. In the early 1990s, the average price for a house in Gresham was similar to the region. By 2014, the average price for a house in the Portland region was almost $100,000 more than in Gresham. Over this time period, median incomes have increased more slowly than housing prices. Between 2000 and 2014, for example, the regional median family income increased 29 percent, while single-family home prices increased 58 percent.

The average house in the Portland region is no longer affordable to households at or below the region's median family income. The average house in Gresham is still affordable to a household making the median family income. The steady decrease in interest rates has played an important role in maintaining housing affordability in Gresham as housing prices have increased.

Over the last 20 years, owning a single-family house has never really been affordable for households below 80 percent of the median family income in Gresham. Lack of access to single-family homes creates pressure on rental housing prices.

SINGLE-FAMILY AVERAGE SALES PRICE AND AFFORDABILITY, 1992-2014



ASSUMPTIONS

STRUCTURE TYPE:
Single-Family Homes and Owned Condominiums and Townhouses

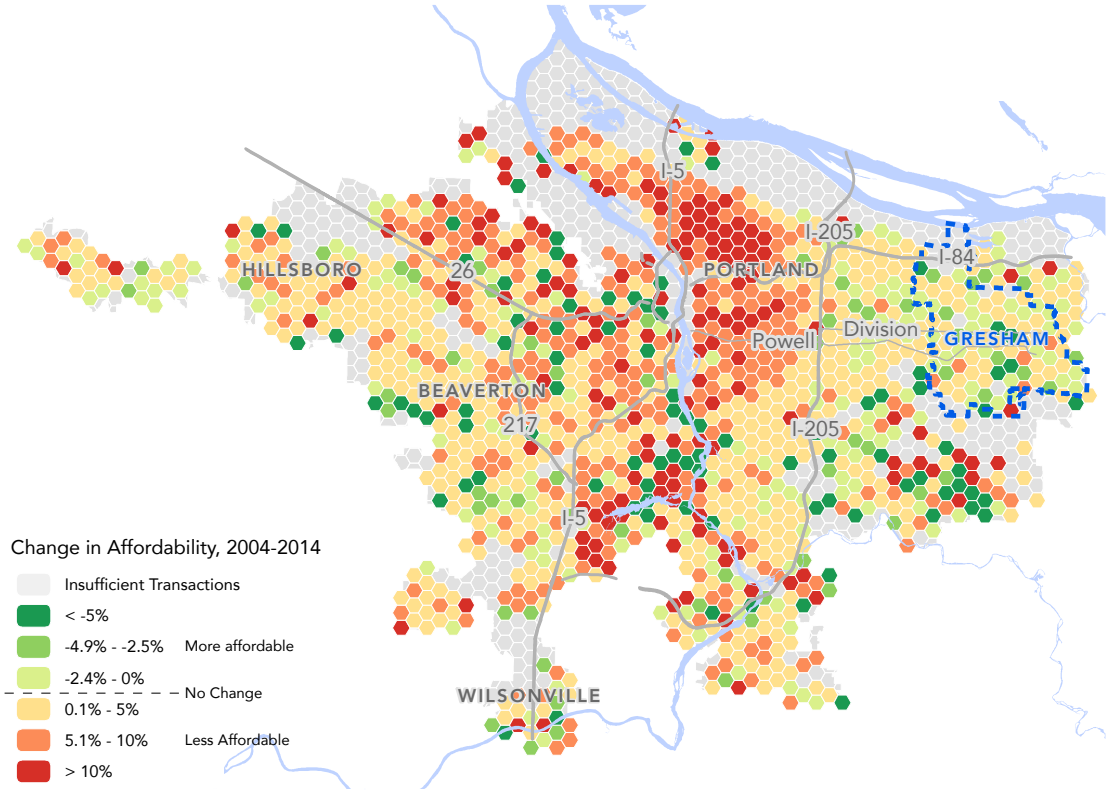
INCOME
4 person household
2014 MFI: $69,400 (HUD)
2004 MFI: $67,900 (HUD)

AFFORDABILITY:
Affordable: Housing Costs = 30% or less of gross family income
Down Payment: 20%
Mortgage: 30-year amortizing principal interest
Interest Rate: 5.84% (2004), 4.17% (2014)
Property Tax Change Ratio: 69% (2004), 64% (2014)
Insurance: Sales Price/1,000 * 0.35
Utilities: $250 per month

GEOGRAPHY:
Portland Urban Growth Boundary (UGB).

CALCULATION:
Change in Affordability=
Percent of MFI spent on Housing, 2014 -
Percent of MFI spent on Housing, 2004

Change in Single-Family Affordability, 2004-2014



Source: ECONorthwest, REIS, Metro RLIS, US Census, US Department of Housing and Urban Development

Over the last decade, single-family homes in Gresham have become slightly *more* affordable for those making the region's median family income, but remain unattainable for many making Gresham's median income.

The map shows the change in the share of the median family income needed to own a single-family home over the last ten years. For example, an increase of five percent indicates that a household earning the median income that spent 30 percent of their income on housing costs in 2004 would be spending 35 percent of their income if they were to buy the same house in 2014.

The map shows that affordability levels in Gresham overall have stayed about the same or improved. Much of Portland, especially neighborhoods closer the city center, has become increasingly less affordable; middle-income home buyers are pushed further from the central city.

While Gresham remains relatively affordable for homebuyers making the regional median family income of about $69,400, for those making Gresham's much lower median income ($55,000), buying a home is much less attainable. For many Gresham residents, multifamily rental housing is a more accessible choice.

ASSUMPTIONS

STRUCTURE TYPE:
Single-Family Homes and Owned Condominiums and Townhouses

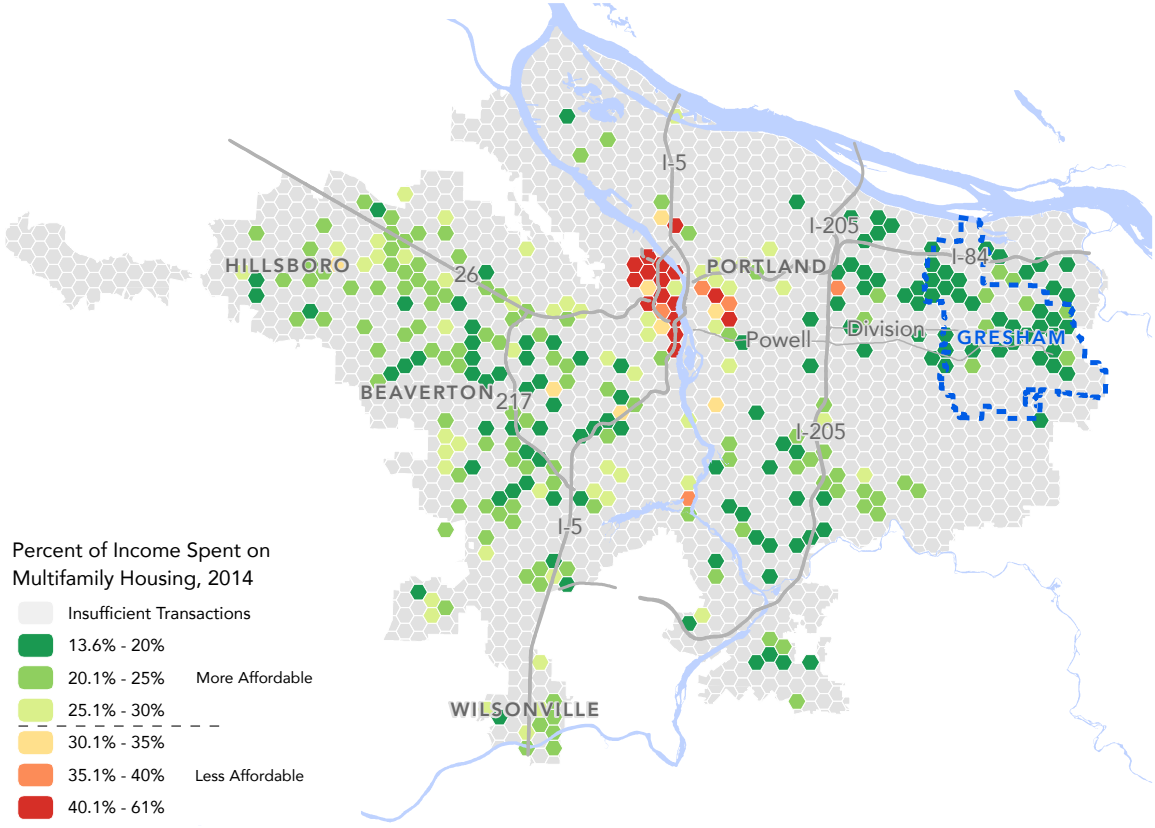
INCOME
4 person household
2014 MFI: $69,400 (HUD)
2004 MFI: $67,900 (HUD)

AFFORDABILITY:
Affordable: Housing Costs = 30% or less of gross family income
Down Payment: 20%
Mortgage: 30-year amortizing principal interest
Interest Rate: 5.84% (2004), 4.17% (2014)
Property Tax Change Ratio: 69% (2004), 64% (2014)
Property Tax Rate: $18 per $1,000 (2004), $20 per $1,000 (2014)
Insurance: Sales Price/1,000 * 3.5
Utilities: $250 per month

GEOGRAPHY:
Portland Urban Growth Boundary (UGB)

CALCULATION
Change in Affordability=
Percent of MFI spent on Housing, 2014 -
Percent of MFI spent on Housing, 2004

Multifamily Affordability, 2014



Source: ECONorthwest, REIS, Metro RLIS, US Department of Housing and Urban Development

Gresham's multifamily rental units are currently relatively affordable for those making regional median family incomes.

This map shows the percent of household income spent on two-bedroom apartments in areas with existing multifamily housing.

- Multifamily apartments are more affordable to households earning the regional median family income than buying a home.
- Gresham and east Portland are again the more affordable areas within the region for renting a two-bedroom apartment.
- Downtown Portland, Northwest Portland, and the inner-eastside of Portland are the most expensive areas in the region.
- For one-bedroom apartments, Gresham is still more affordable than most of the region, but affording these units is more of challenge for smaller households with less household income.[2]

[2]Assumes a 1.5-person household. See Appendix 3 for map of one-bedroom apartment affordability.

ASSUMPTIONS

STRUCTURE TYPE:
2 bedroom unit
Rented Apartments, Townhouses, and Duplexes

INCOME:
3 person household (90% of MFI)
MFI: $62,460 (HUD)

AFFORDABILITY:
Affordable: Housing Costs = 30% or less of gross family income
Utilities: $125 per month

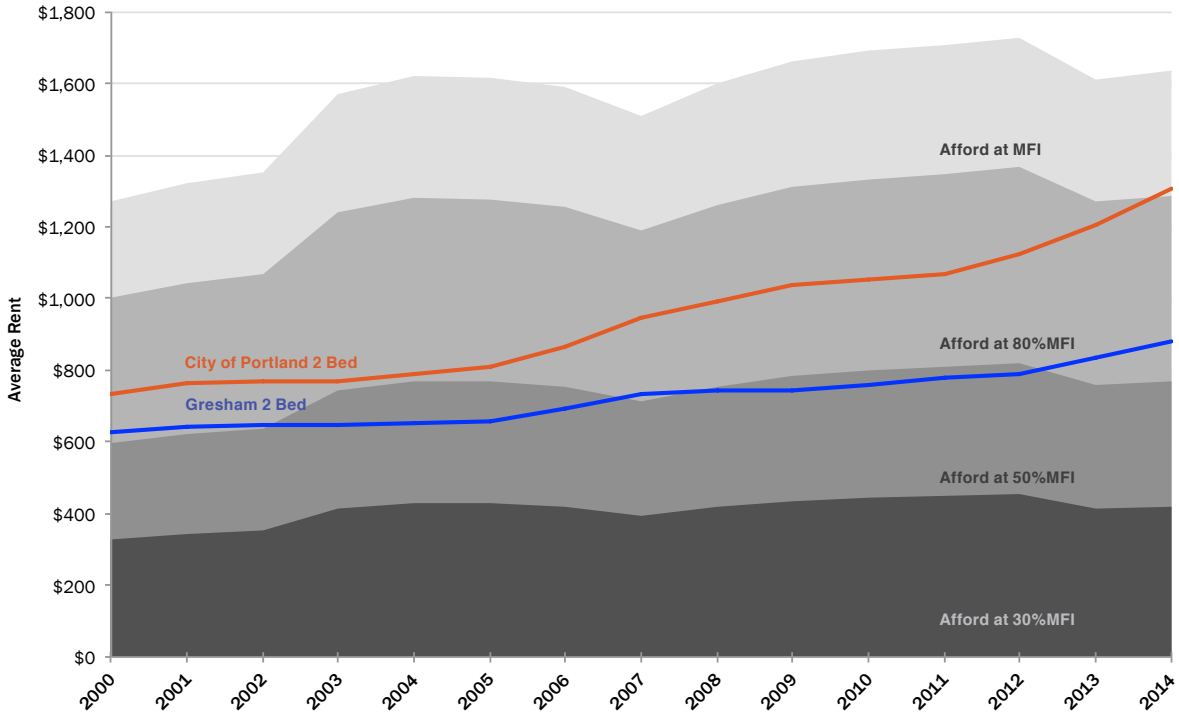
GEOGRAPHY
Portland Urban Growth Boundary (UGB).

CALCULATION:
Percent of MFI spent on Housing = Yearly Housing Costs, (Rent + Utilities) / MFI

Multifamily units are becoming less affordable, in the City of Portland and in Gresham.

The average two-bedroom apartment in Portland is still affordable to households earning 80 percent or more of the regional median family income. However, since 2000, the cost of renting a two-bedroom apartment in the City of Portland is increasingly less affordable compared to Gresham. Due to the recent increase in rents since 2012, the average two-bedroom apartment in Gresham is no longer affordable to a household earning 50 percent or less than median family income.

AVERAGE MULTIFAMILY RENT AND AFFORDABILITY IN THE CITY OF PORTLAND AND GRESHAM, 2000 TO 2014



ASSUMPTIONS

STRUCTURE TYPE:
2 bedroom unit
Rented Apartments, Townhouses, and Duplexes

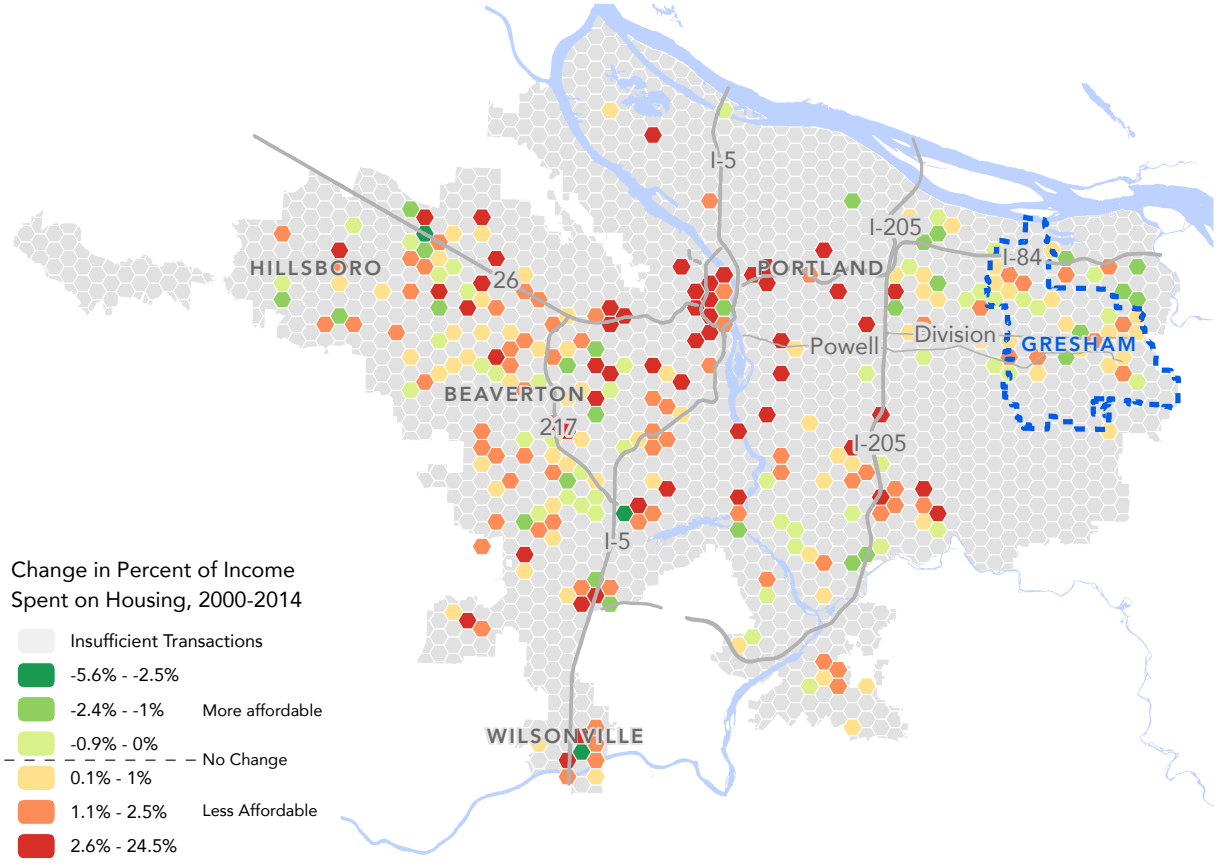
INCOME:
3 person household (90% of MFI)
MFI. 2014: $62,460 (HUD)
MFI, 2000: $48,330 (HUD)

AFFORDABILITY:
Affordable: Housing Costs = 30% or less of gross family income
Utilities: $125 per month

GEOGRAPHY:
Portland Urban Growth Boundary (UGB)

CALCULATION:
Change in Affordability= Percent of Income Spent on Housing, 2014 - Percent of Income Spent on Housing, 2000

Change in Multifamily Affordability, 2000-2014



Source: ECONorthwest, REIS, Metro RLIS, US Department of Housing and Urban Development

Over the last decade, the affordability of Gresham's multifamily units has decreased in some areas and increased in others, relative to regional median family incomes.

The map to the left shows the change in multifamily affordability for a two-bedroom apartment since 2000. Areas within Gresham are a little less affordable than in 2000. A few areas in Gresham saw no or little change in affordability level. Most of the Portland region experienced a decrease in affordability levels.

ASSUMPTIONS

STRUCTURE TYPE:
2 bedroom unit
Rented Apartments, Townhouses, and Duplexes

INCOME:
3 person household (90% of MFI)
MFI. 2014: $62,460 (HUD)
MFI, 2000: $48,330 (HUD)

AFFORDABILITY:
Affordable: Housing Costs = 30% or less of gross family income
Utilities: $125 per month

GEOGRAPHY:
Portland Urban Growth Boundary (UGB)

CALCULATION:
Change in Affordability= Percent of Income Spent on Housing, 2014 - Percent of Income Spent on Housing, 2000

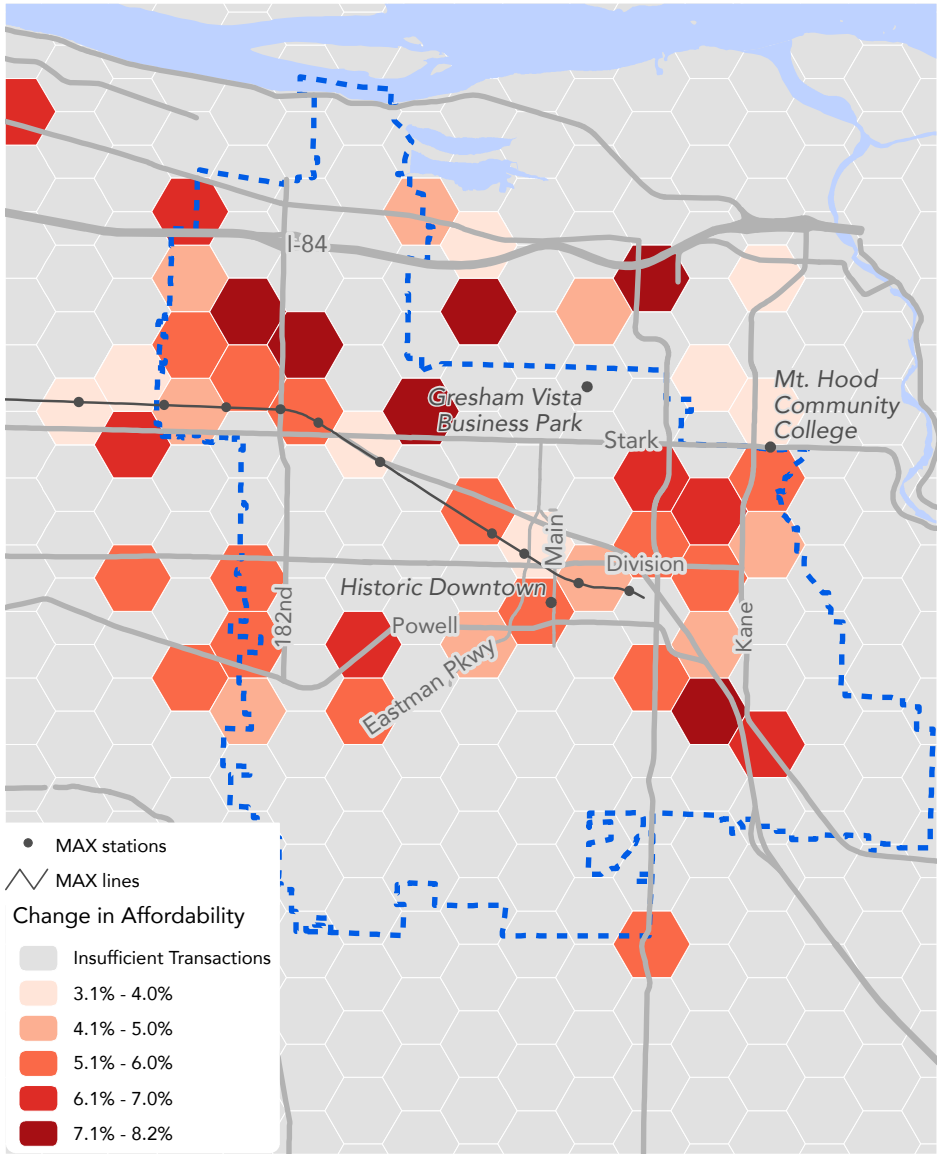
Change in Gresham Multifamily Affordability, 2000-2014

Gresham's multifamily units have become much less affordable for people who live in Gresham and make the Gresham's median family income.

This map shows the same change in affordability as the previous map, but relative to Gresham's median family income instead of the region's median family income. In 2013, Gresham's median family income was $49,379 for a three-person household, which is well below the region's median of $62,460 in 2014.

Recognizing the lower city median income shows that all areas have become less affordable since 2000 for those living in Gresham. The smallest change for any area in the city was three percent. Particularly, some areas north of Burnside Street and east of Downtown Gresham have become increasingly less affordable. While a three percent change in affordability may not seem important, for a family making median family income, this change translates to about $123 per month in additional housing costs.

Overall, multifamily housing in Gresham is more affordable than many areas in the region, and rents have not increased as much as other parts of the region. However, lower incomes in Gresham mean that even a moderate increase in housing costs is difficult for households to absorb and limits affordable locations.



Source: ECONorthwest, REIS, Metro RLIS, US Census

ASSUMPTIONS

STRUCTURE TYPE:
2 bedroom unit
Rented Apartments, Townhouses, and Duplexes

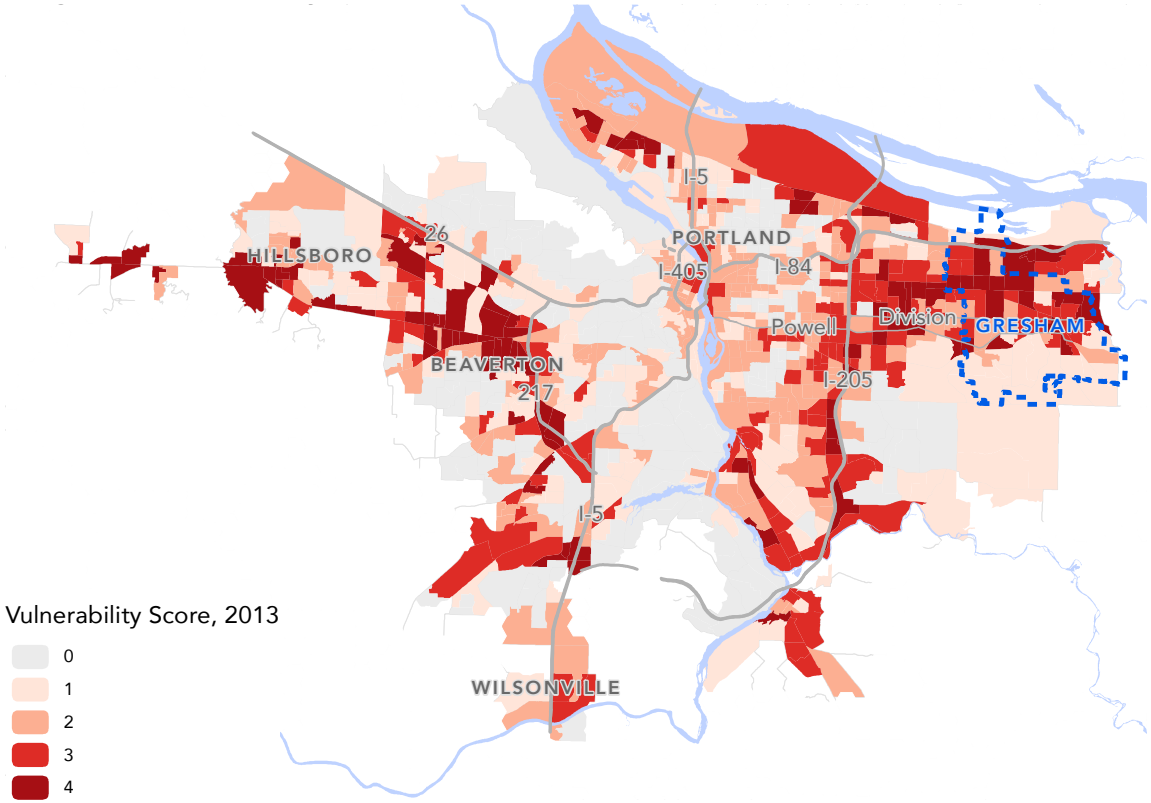
INCOME:
3 person household (90% of MFI)
Gresham MFI, 2013: $49,379 (US Census)
Gresham MFI, 2000: $46,013 (US Census)

AFFORDABILITY:
Affordable: Housing Costs = 30% or less of gross family incomeUtilities: $125 per month, $91 in 2000

GEOGRAPHY:
City of Gresham

CALCULATION;
Change in Affordability = Percent of Income Spent on Housing, 2014 - Percent of Income Spent on Housing, 2000

Geography of Vulnerability



Source: Portland Bureau of Planning and Sustainability, ECONorthwest, Metro RLIS, US Department of Housing and Urban Development, US Census

Gresham's population has a greater concentration of people who are vulnerable to displacement.

Given findings from the previous analysis, which suggests that most of Gresham is becoming less affordable for people who live in Gresham, understanding more about the demographics of Gresham's population is critical. To complete this analysis, this study adapted the City of Portland's methodology for defining concentration of vulnerability, replicating it in Gresham.

This map shows the results, highlighting Census Block Groups with higher-than-average populations that are the least likely to absorb the impact of increasing housing costs. Consistent with the City of Portland's methodology, vulnerable population are defined as: households renting versus owning, belonging to communities of color, not having a college degree, and being lower income. Fourteen block groups with 29 percent of the population in Gresham had at least three of the four factors.

Block Groups with three or four of the risk factors are considered at risk for housing displacement. A number of these at-risk Block Groups are in Gresham, primarily concentrated along Burnside Street and east of Downtown Gresham. Regionally, areas with the highest concentration are in east Portland, Gresham, along Interstate 205, and west of Highway 217.

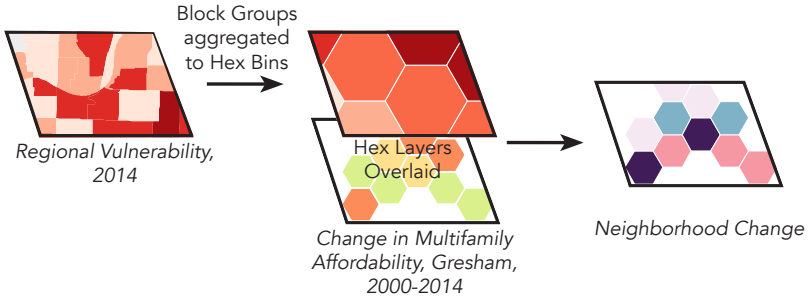
VULNERABILITY SCORE METHODOLOGY:
Data on the following four risk factors was gathered from the 2013 5-year ACS for the Three-County Area. Estimates were adjusted to the lower boundary of the given margin of error. Every block group was scored based on the following system:

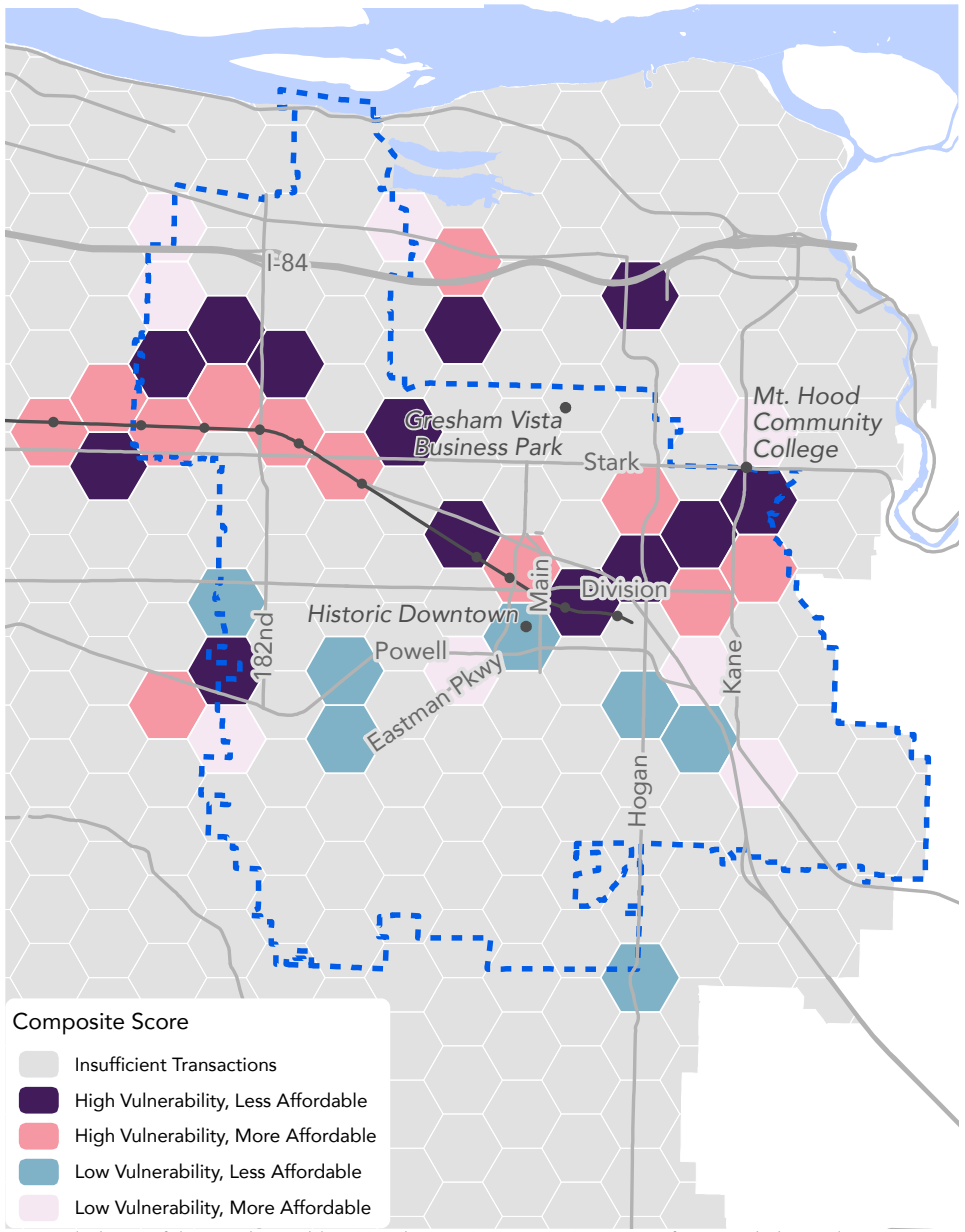
Risk Factor	Evaluation Criteria
% Renters	Is the proportion of renters greater than 39.06%?
% Non-White	Is the proportion of non-white individuals greater than 24.57%?
% without Bachelor's degree	Is the proportion of population 25+ without a bachelor's degree greater than 64.04%?
% Households with income at or below 80% Median Family Income	Is the proportion of households with income at or below 80% of median family income greater than 46.38%?

Putting the pieces together: many parts of Gresham have concentrated vulnerability factors and rising rents; individuals living in these area are the most likely to be displaced.

To identify the areas most susceptible to neighborhood change and displacement, the analysis overlaid the vulnerable population findings (page 10) with the change in affordability in Gresham (page 9). Generally, these areas in Gresham are clustered together east of Downtown, north of Burnside Street, and along 182nd Avenue.

In Gresham, there are a few areas susceptible to experiencing neighborhood change along the study corridor. One small area is the area west of 182nd Avenue, and the other area is the east end of Division Street around where it intersects with Burnside Street. Other areas include the areas around the Gresham Central Transit Center (north of the Division and Hogan Intersection) and near Mt. Hood Community College. The following section analyzes the potential impacts that bus rapid transit development may have on rents and affordability, how that could potentially contribute to neighborhood change.





Source: Portland Bureau of Planning and Sustainability, ECONorthwest, REIS, Metro RLIS, US Department of Housing and Urban Development, US Census

High-Capacity Transit

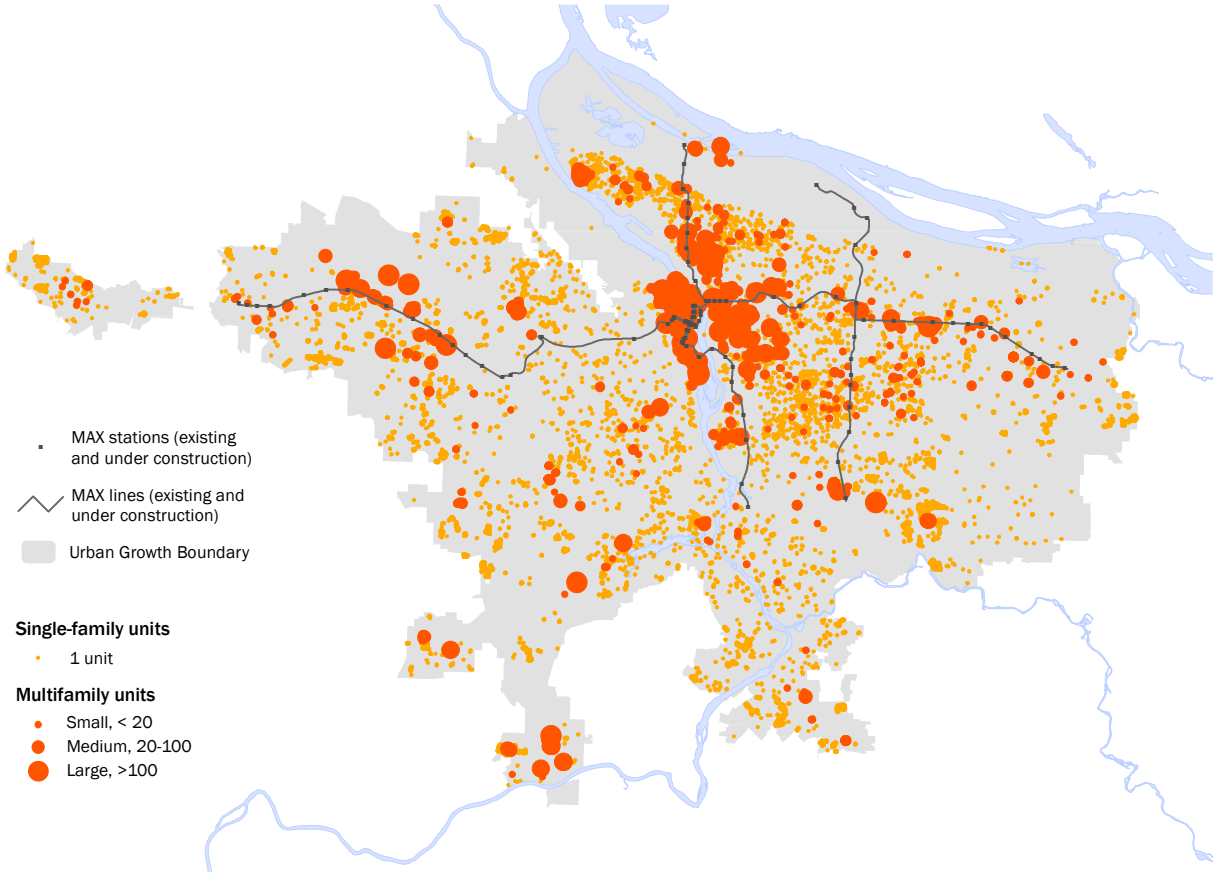
Rents may be higher near a new high capacity transit line on Powell / Division, but should not increase faster than rent in the region as a whole.

To ensure a responsive action plan, the City of Gresham is interested in understanding how a planned BRT line on the Powell / Division corridor might affect real estate economics, and whether this public investment could lead to additional displacement by increasing residential rents in the corridor. A review of literature (summarized on page 14) regarding the impact of transit improvements on land values indicates that transit improvements do often coincide with higher land values. However, the role of the transit component, relative to other changes in the real estate market and land use policies, is not always clear.

While there is little research on the role of BRT investments (as opposed to light-rail or heavy passenger rail), researchers typically assume that BRT investments would have a similar impact if travel times are similar to light-rail. As a result, if land values are sometimes higher near transit investments, might a new BRT line lead to increased displacement? **The short answer from this analysis: not in the near-term.** The role of the regional housing market, described in earlier parts of this report, will play a much bigger role.

To evaluate the potential impacts of a new BRT line on rents, the study analyzed changes in rent in areas near new MAX lines built between 2000 and 2014 (years for which real estate data were available and in areas with consistent development types adjacent to the lines.)

NEW PERMITTED CONSTRUCTION, 2007-2014



ECONorthwest, Construction Monitor, and Metro RLIS.

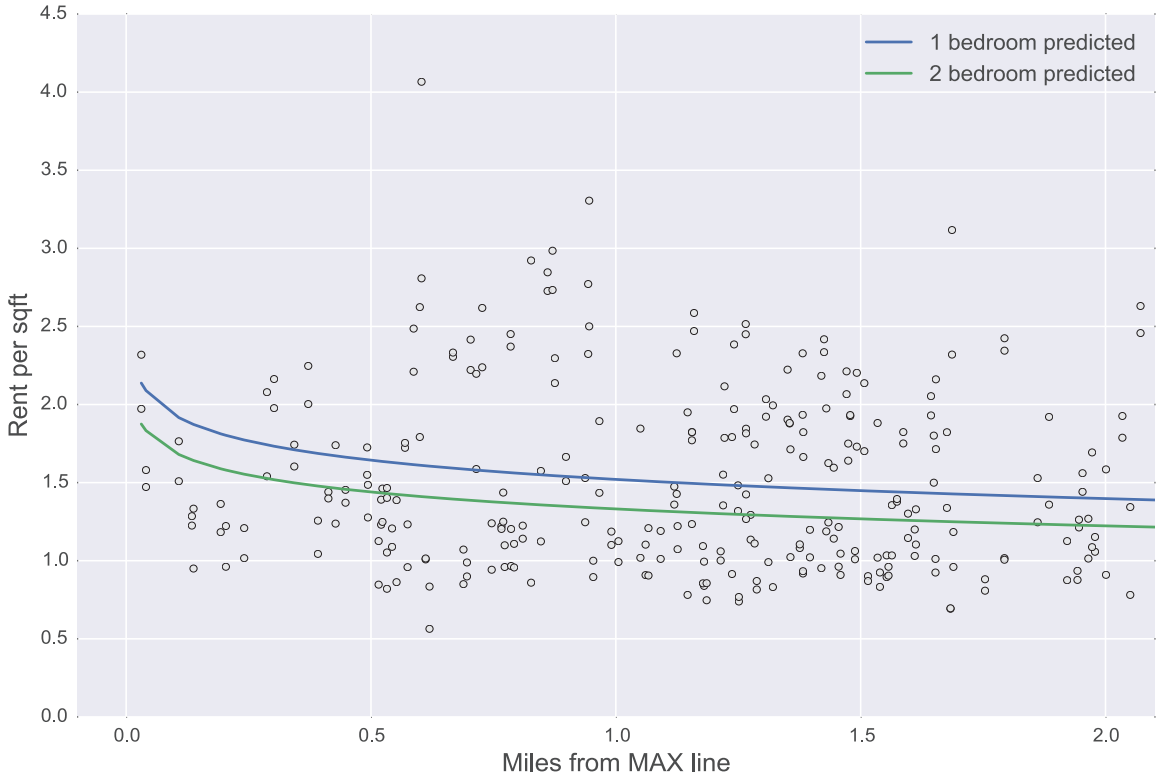
Recent development patterns clearly show a concentration of new multifamily units along light-rail lines. Since 2007, approximately **40 percent of new units** were constructed within one-quarter mile of a light-rail station. Only a limited amount of new market rate multifamily development has occurred in Gresham as the economy has recovered from the Great Recession. Gresham has realized **one new unit per 429 people**, compared to **one new unit per 127 people** in the Portland MSA (according to CoStar).

The study looked at the Red Line (just the Parkrose Station, which opened in 2002), the Yellow Line (from the Rose Quarter to Expo Center, opened in 2005), and Green Line (just the Interstate 205 section, which opened in 2010). While existing light-rail lines and a new BRT line may not have the same impact on rents and sales prices, the analysis gives us a starting point for understanding how major transportation infrastructure investments might affect development feasibility.

This chart shows the 2014 average rent per square foot for 650 multifamily apartment buildings and their distance to the nearest MAX station. The fitted lines show that the highest rental rates are for buildings within one-quarter mile of a station. Controlling for year built, we estimate that rents are $0.16 per square foot higher for every 100 percent change in distance up to 1.25 miles. For example, an apartment unit 0.25 miles away from a MAX Station will rent for an estimated $0.16 per square foot more than an equal apartment 0.5 miles away. (See Appendix B.)

The study evaluated the change in average rent near MAX stations relative to timing of construction and to changes in regional rents. The analysis found that while rents in units closest to a MAX station increased faster than some surrounding areas, they did not increase any faster than the regional average. This implies that rents were already higher in locations closest to the corridors before MAX lines were built. The role of MAX in the change in rents was not statistically significant.

RENT PER SQUARE FOOT OVER DISTANCE WITH PREDICTED VALUES, 2014



The implication from this finding is that the current rent trajectory in the Powell/Division corridor is likely to be similar with or without bus rapid transit improvement along Division Street. However, the starting rent for new construction may be higher than the current average rent in the corridor.

Based on preliminary review, the rent difference appears insufficient to affect near-term development feasibility. For Gresham, pressures associated with regional growth and changes in the regional housing market will have a much larger impact on displacement than the construction of a new BRT line.

IMPACTS OF TRANSIT ON LAND COSTS

The effect of transit on land costs is based on the idea that the benefits to transit patrons eventually get converted to higher rents for land. In other words, property owners and developers see that certain locations provide transit benefits to users, and that they can raise property values, rents, or sales prices to capture some of those benefits. However, it is more difficult to differentiate the effect of transit benefits on land costs compared to other improvements in the built environment that accompany transit improvements.

ECONorthwest reviewed many studies that show empirical support for property value increases relative to proximity to transit stations. A summary of literature (Bartholomew and Ewing 2011) found that the introduction of transit service is associated with higher land values. A study of the Hiawatha Light-Rail line opened in 2004 in Minneapolis (Goetz et al. 2010) showed that single-family homes within a half mile of a station area sold for 4.2 percent more than homes in the comparison area.

However, most of these studies were not designed (or designed well enough) to definitively address two important questions:

- Multiple effects. Are the observed effects the result of just the transit itself, or can the effects be attributed to other significant public improvements or a policy change to allow higher densities?
- Causality. Would the observed changes have happened even if the transit service had not been built? In other words, transit was sited where growth was going to go and where it was most effective, but did not cause most of that growth to occur.

This causality question is a relevant issue for this study given the findings that apartments closer to the alignment had higher rents before MAX was constructed.

There is less research on the impacts of bus rapid transit, specifically. A 2008 study on BRT and transit-oriented developed (TOD) (Vincent and Callaghan 2008) selected six cities to evaluate TOD in BRT corridors. The results of surveys to developers and governmental agencies indicated that they generally felt positively towards development and investment near BRT.

HOW HOUSING MARKETS SUPPLY AFFORDABLE HOUSING

Much of Gresham's supply of affordable housing is provided through the private market, rather than as publicly subsidized, controlled, and permanently-affordable housing units. The primary way housing markets provide affordable housing is through a process known as "filtering", in which market-rate rental housing filters down from higher-income households to lower-income households over time. This is due to the depreciation of housing value over time and a result of household preferences for higher value, updated housing as household income increases. Housing value depreciation is only part of the dynamics of housing filtering. The rate at which housing stock turns over from higher income households to lower income households is primary determinant of the filtering process.

As a result, a successful market rate affordable housing strategy must involve developing new multifamily rental housing stock, especially in lower cost neighborhoods to maintain a pipeline of new housing so lower income households do not have to compete for older and less expensive units with households that have higher incomes. In the short-term, increasing housing supply also drives up vacancies and puts downward pressure on rent increases.

However, there is a limit to this dynamic. The supply of affordable housing is a product of the existing stock plus the net new affordable housing supply that gets added directly to that stock without waiting for the filtering process to run its course. As the older stock of housing depreciates in value, it reaches a point where it will be susceptible to redevelopment or renovation.

As a result, in the short-term, an affordable housing strategy will also need to add new affordable (likely subsidized) units to the existing stock of affordable housing. Another short-term need will be ensuring a safety net, including shelters and temporary housing, for the lowest income households displaced from their current housing and unable to find affordable housing.

Summary of Findings

- Relative to the region, Gresham is relatively affordable, especially for multifamily rentals. The average rent for a two-bedroom unit in Gresham is affordable to a three-person household making a little less than 60 percent of the median family income, or approximately $41,600 per year. At the same time, only a limited amount of new market rate multifamily development has occurred in Gresham as the economy has recovered from the Great Recession: one unit per 429 people in Gresham, compared to one unit per 127 people in the region as a whole (according to CoStar).
- At the same time, housing costs in Gresham have been rising; the City is becoming less affordable for low-income households. While rent for a two-bedroom apartment has increased by 40 percent since 2000, incomes have increased only seven percent over the same time period.[3] Even small increases in rent can be very difficult for low-income populations. Given regional trends, affordability it likely to be more of a challenge for Gresham in the future.
- Gresham has a higher concentration of populations with demographic factors that make them vulnerable to displacement than other parts of the region.[4] This research defines populations at risk of displacement consistent with other research completed in the region as renters who are people of color with low income and educational attainment. Fourteen block groups with 29 percent of the population in Gresham had at least three of the four factors.
- A number of areas in Gresham have a high risk of displacement. Some areas, particularly the Rockwood area and Downtown, have both a concentration of vulnerability factors AND rising rents, creating a high risk of displacement. As prices in Gresham and the region increase, it is these individuals who are most likely to be displaced.
- Regional population growth causes changes in the housing market that are the primary driver of increases in housing costs in Gresham. Increasingly, close-in neighborhoods in Portland are affordable only to those in the top half of the income spectrum. Housing markets are regional, and renters will move to more affordable markets, creating market pressures that, in turn, increase rents in those markets as well.
- The addition of high capacity transit is unlikely to have a sizable short-term impact on development patterns in the corridor. Analysis of recent MAX expansions shows that growth rate in multifamily residential rents are not likely to be altered after the addition of new high-capacity transit.
- New development near new transit corridors achieves a premium on rent compared to the broader market. As a result, new development near the corridor will have a higher starting price point. If new development occurs, the addition of higher rent units could start to change the housing stock of the neighborhood, which could place additional upward pressure on rents.

Overall, the findings of this study show that housing displacement locally in Gresham is indicative of changes in the regional housing market. Regional solutions will be critical to addressing what is fundamentally a regional problem. At the same time, displacement in Gresham could become an increasing challenge, and Gresham should evaluate its role in preventing and/or mitigating displacement.

[3]In real dollars, not inflation adjusted.
[4]Specifically, an analysis of gentrification and displacement completed by the Bureau of Planning and Sustainability. Methods described in detail in the appendices.

Implications: Approach to Mitigating Displacement and Encouraging Mixed-Income Communities

The analysis of affordability in this document highlights the role that Gresham's housing stock plays in a regional market. The City's housing is affordable relative to regional incomes, but is becoming less so over time. And, for many of the people who currently live in Gresham, affordability is a real challenge in the current market. Mitigating the effects of displacement will require new affordable housing development in the region as a whole. At the same time, Gresham should consider providing for housing at all income levels now, and more affordable housing in the future.

Gresham wants to encourage communities that are affordable for all incomes, working proactively to mitigate the potential for displacement of vulnerable populations as markets evolve. Doing so requires a long-term, holistic approach to planning for housing that recognizes the role of the regional housing market, identifies options for providing new market-rate housing, and prepares the City to provide high-quality affordable housing in the future as Gresham becomes less affordable. Strategies for accomplishing this goal are outlined below.

SUPPORT CONSTRUCTION OF NEW HOUSING

New construction, even if it is market rate construction, is an important part of a long-term strategy for housing affordability and creating mixed-income neighborhoods (see description of "filtering" on page 14.). In the near-term adding new rental stock can drive up vacancies rates, helping to keep overall average rent increases in check.

CURRENT GRESHAM ACTIVITIES:

Gresham is already actively engaged in supporting vulnerable populations and providing housing affordable at a range of incomes through a variety of approaches, which are listed below. Any new activity focused on mitigating the effects of displacement will build upon these actions.

- Land use regulatory changes: Station area planning for Powell-Division transit project will study potential obstacles to development and consideration of zoning changes that support dense development near stations.
- Incentives for market rate development:
  - Tax abatements are available for mixed-use buildings in Downtown and Civic Neighborhood.
  - Predevelopment Service Grants in Rockwood-West Gresham Urban Renewal Area.
- Rental assistance: The City leverages funding for these programs through HOME Partnership grants from HUD.
- Homeownership assistance: The City provides this assistance through Community Development Block Grants.
- Code enforcement: The rental housing inspection program seeks to maintain safety and quality of the affordable housing stock.

Over the longer-term, today's new construction ages into tomorrow's workforce and affordable housing stock.

A focus on new construction is particularly important in lower cost locations like Gresham, where the cost of newly constructed rental units will be lower than more expensive locations due to lower land costs. Some households in the City will be able to pay the relatively higher rents and move from older units into newly constructed housing, freeing up older units for other families. In addition, new housing near high-capacity transit will reduce transportation costs and increase mobility for residents of new buildings. In Gresham, where limited new market rate construction has occurred, re-investment in the community in the form of new construction is important for many reasons, including community revitalization and revenues for the City's tax base. Support for new construction is a longer-term strategy that does not sufficiently address near-term affordable housing needs.

Implications: Approach to Mitigating Displacement and Encouraging Mixed-Income Communities

Additional subsidized units will also likely be needed, which is addressed as part of the other strategies.

Examples could include a range of incentives and strategic investments, streamlined permitting, and zoning changes.

MITIGATE DISPLACEMENT FOR LOW-INCOME HOUSEHOLDS

The region's existing housing affordability problems stem not simply from high housing costs, but also result from the far-reaching effects of poverty, wage stagnation, and inequity in access to economic opportunities. For Gresham's populations vulnerable to displacement now, even small rent increases can result in serious housing disruptions. A number of households, particularly the lowest income and most vulnerable households, need a wider range of support.

Examples could include a range of expanded and new housing stabilization tools, some of which are City-controlled and some of which are coordinated with partners, are needed. These could include changes in regulations around eviction, improved coordination of public and social services, and targeted workforce development. Commercial stabilization actions (such as technical assistance, financial advising, microlending, design assistance, and storefront improvements) could support small and minority-owned businesses.

COORDINATE WITH REGIONAL PARTNERS TO FUND FOR AFFORDABLE HOUSING

More affordable housing units (especially permanently affordable units) are needed in all parts of the region, but especially in areas where the market is least likely to produce unsubsidized affordable housing such as Portland's neighborhoods near Downtown. The region is at risk of exacerbating the concentration of poverty if it does not create a coordinated and proactive strategy that brings new financial resources to the table. Gresham should actively work with community, non-profit and for-profit housing developers and jurisdictional partners to identify new funding sources to implement a regional strategy.

Actions: The City will be a partner on emerging coalitions to coordinate and find funding sources for new affordable housing development throughout the region.

PREPARE FOR FUTURE HOUSING NEEDS IN GRESHAM

Trends suggest that, as the region grows, Gresham will experience continued pressure on its housing prices that may result in decreased affordability. Now is the time to target locations for future affordable housing projects and prepare to develop them. This will require aligning incentive and funding programs to support future affordable housing development and exploration of possible new tools, such as land banking.

Appendices

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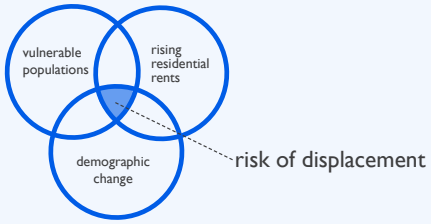
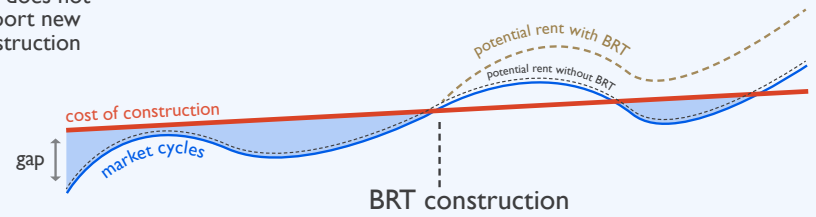
Appendix D. Methodology 30

	Project Goals	Methods	Activities

Analysis	1. Identify Gresham residents at risk of displacement	• Demographic Analysis
		  • income
		  • tenure
		  • communities of color
		  • educational attainment
		• Market Analysis
		  • regional price index
		  • affordability index
			Areas Vulnerable To Residential Displacement
			 
			Causes of Residential Displacement
			• New higher-rent redevelopment replaces existing housing
			• Rent increases cause existing tenants to relocate

Analysis	2. Identify impact of BRT construction on risk of displacement	• Literature review • Identify rent increases near new transit lines • Proforma analysis– coordinated with station area planning	Current state: rent does not support new construction 
Strategy	3. Initiate actions to mitigate risk	• Advisory committee • Tool kit	**Near-term actions** ↓ **Long-term actions** ↓
Strategy	4. Integrate findings with City and region plans		Transit → City Service Provision → Affordable Housing → Land Use →

Appendix B: High-Capacity Transit: Proximity Effect Modeling

INTRODUCTION

For the Gresham, OR housing transit impacts work, regression modeling was used to calculate the effects of distance from MAX stops upon the observed multifamily rental rates. Several models were created to answer different questions posed by the project. This technical memo describes these models, the related assumptions, and conclusions that result from the modeling process. Before the modeling process could begin, the project needed to formulate a set of well-defined questions that could be answered. The questions posed are the following:

1. Do we observe rental rates as a function of distance from MAX lines, when controlling for market trajectory?

2. How do individual properties differ from the 2-mile average rental rate?

3. How does the opening of a new MAX line affect existing properties as a function of distance?

The common factor of interest in all of these questions is the effect of proximity to MAX lines on the observed rental rates. Consequently, most of the modeling effort is centered on modeling the effects of proximity. While there are many other factors that can and do influence rental rates, the scope of this modeling effort is focused on determining the effect of proximity/distance from a MAX line.

CONSTRUCTION OF DATASETS

In preparation for the regression modeling, a dataset was constructed to meet the anticipated modeling needs. The data consists of Portland MAX network structure (stops and lines) obtained from Portland Metro's Regional Land Information System.[1] The network structure is combined using a GIS with REIS multifamily property data obtained through a special agreement between REIS and ECONorthwest. The REIS multifamily data span from 2000 to 2014 and contain locations of properties along with characteristics such as rental rates, total floor area by unit type, as well as a range of other amenities.[2]

Using multifamily properties within the Portland urban growth boundary as the base unit of observation, the distance to the nearest MAX stop was calculated. The nearest MAX stop line then designated the corridor to which the property was assigned. MAX lines used in the study include the lines constructed since 2000 when corresponding multifamily housing data was data became available. These include the Red line, Yellow line, and Green Line. Only segments of these lines that do not overlap with other existing lines were used. This includes the Parkrose Station of the Red line, the Yellow lines along Interstate Avenue, and the Interstate-205 section of the Green line. This dataset was constructed to answer questions one and three.

Another dataset was constructed to answer question two. This alternative dataset was constructed by first calculating the pairwise distances between all multifamily properties and MAX stops. Then using each MAX stop as the unit of observation all properties within the distance of two miles were kept and assigned to the corresponding MAX stop. In both cases, the datasets are panel data for the years 2000 through 2014, with observed rental rates by unit type, at each property location and year.

MODEL SPECIFICATIONS AND DIAGNOSTICS

Question #1: Do we observe rental rates as a function of distance from MAX lines?

A model was constructed and specified as:

$$\text{nomial\_rent/sqft.} = ß0 + ß1*\log(\text{distance}) + ß2*\text{year\_built} + \text{error}$$

The following regression diagnostics are the corresponding output for the one-bedroom rental type. The ßetas in the above equation correspond to the estimated coefficients in the output below. For each ßeta the t-statistic is given along with the corresponding probability that we can reject the null hypothesis (that ß = 0). Generally, if the absolute value of a t-statistic is greater than two, then we can reject the null hypothesis and conclude that the coefficient is indeed non-zero, as the proposed model hypotheses.

[1]Metro. RLIS Discovery. Light Rail Stops and Lines. "http://rlisdiscovery.oregonmetro.gov/". accessed: 2/16/15.
[2]REIS. www.reis.com.

Adjusted R^2 is another commonly reported regression diagnostic that either indicates in the case of OLS, the percentage of observed variation that can be explained using the model after adjusting for the degrees of freedom. In the more general case, R^2 is the square of the Pearson correlation coefficient, or also can represent the square of the correlation coefficient between the original and modeled data values. Taken as a whole it provides a measure of the "goodness of fit" that the model provides. Both the coefficients of log of distance and the year built are statistically significant in the resulting fit.

```
Results: Ordinary least squares
=================================================================
Model:              OLS              Adj. R-squared:     0.226
Dependent Variable: rent_psf_1b      AIC:                413.0947
Date:               2015-03-18 13:08 BIC:                426.1578
No. Observations:   575              Log-Likelihood:     -203.55
Df Model:           2                F-statistic:        84.67
Df Residuals:       572              Prob (F-statistic): 6.18e-33
R-squared:          0.228            Scale:              0.11947
-----------------------------------------------------------------

                 Coef.  Std.Err.    t     P>|t|   [0.025   0.975]
-----------------------------------------------------------------
Intercept       -8.0146   1.5008  -5.3402 0.0000 -10.9623 -5.0668
np.log(dist)    -0.1810   0.0156 -11.5744 0.0000  -0.2117 -0.1502
year_built       0.0048   0.0008   6.3543 0.0000   0.0033  0.0063
--------------------------- ==-------------------------------------
```

For the two-bedroom rental types, a model with the same specification was fit with the following output. Again all the coefficients are statistically significant in the resulting fit with a similar R2 as the one-bedroom model.

```
Results: Ordinary least squares
=================================================================
Model:              OLS              Adj. R-squared:     0.220
Dependent Variable: rent_psf_2b      AIC:                344.7015
Date:               2015-03-18 13:08 BIC:                357.7646
No. Observations:   575              Log-Likelihood:     -169.35
Df Model:           2                F-statistic:        82.09
Df Residuals:       572              Prob (F-statistic): 4.55e-32
R-squared:          0.223            Scale:              0.10608
-----------------------------------------------------------------

                 Coef.  Std.Err.    t     P>|t|   [0.025   0.975]
-----------------------------------------------------------------
Intercept       -8.7965   1.4141  -6.2204 0.0000 -11.5740 -6.0190
np.log(dist)    -0.1602   0.0147 -10.8716 0.0000  -0.1891 -0.1312
year_built       0.0051   0.0007   7.1629 0.0000   0.0037  0.0065
-----------------------------------------------------------------
```

Since these specifications are a Linear-Log functional form in terms of distance, we can calculate the marginal effect of distance from MAX line stops as follows:

Because

$$\frac{\mathrm{d}}{\mathrm{d}x}\ln x = \frac{1}{x}$$

We can calculate the marginal effect of distance as:

$$\Delta\text{nominal\_rent/sqft.} = ß1/100[100\Delta\text{distance/distance}]$$

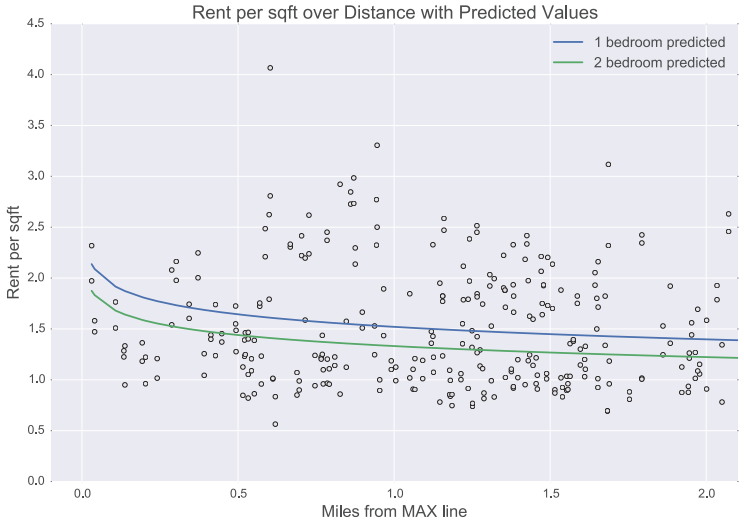
Said another way, a 1 percent change in distance will induce a ß1/100 unit change in rent/sqft[3]. This relationship can be observed in the following table, which provides a trivial example using the estimated coefficients from the model. Both the rent per square foot and the rent per 1000 square feet are calculated for each change in distance given in the table. It is shown that the increase in observed rental rates increases by the same amount each time we move 50 percent closer to a MAX line.

[3]Asteriou, Hal, Applied Econometrics, p. 181, Table 8.1, Palgrave Macmillan, 2011.

Change in rents over -50% distance increments, using distance coefficient estimates

		1 Bedroom		2 Bedroom	
Starting distance (miles)	Δ in distance (miles)	Δ rent per sqft.	Δ rent per 1000 sqft.	Δ rent per sqft.	Δ rent per 1000 sqft.
2	-1	$0.09	$90.48	$0.08	$80.08
1	-0.5	$0.09	$90.48	$0.08	$80.08
0.5	-0.25	$0.09	$90.48	$0.08	$80.08
0.25	-0.125	$0.09	$90.48	$0.08	$80.08

The chart below shows levels of rent per square foot at each property observation with the predicted values of the linear-log specification overlaid. The effect of distance can clearly be seen decreasing as distance increases in the chart.



Since there is no transformation on the year built right hand side variable, the marginal effect is simply the coefficient from the regression fit. Therefore the marginal effect of year built is:

$$m = \beta 2$$

For the one- and two-bedroom models, the coefficients were 0.0048 and 0.0051 respectively, which indicate the intuitive relationship that new properties receive higher rents than older properties is indeed observed. In this modeling application, we are using year built as a proxy for general market trajectory. We can conclude that new properties will receive a rental premium at baseline levels multiplied by the distance coefficient and the number of years from baseline. Therefore over a 10 year timeframe, rents if they follow the observed trajectory should receive a ~5 percent higher rent than units 10 years ago.

Question #2: Do individual properties differ from the two-mile market average rental rates as a function of distance?

The second question was posed to determine if the relative rents in a two-mile "buffer" around corridors, are a function of distance. The underlying dataset was structured as the pairwise distances from each MAX stop to all properties observed in the year 2014, with an upper distance bound of 2 miles. The market relative rental rate was calculated for each of the observations as the observed rent minus the market average for each unit type.

A model was constructed and specified for each unit type as:

$$relative\_rent/sqft. = \beta 0 + \beta 1 distance + error$$

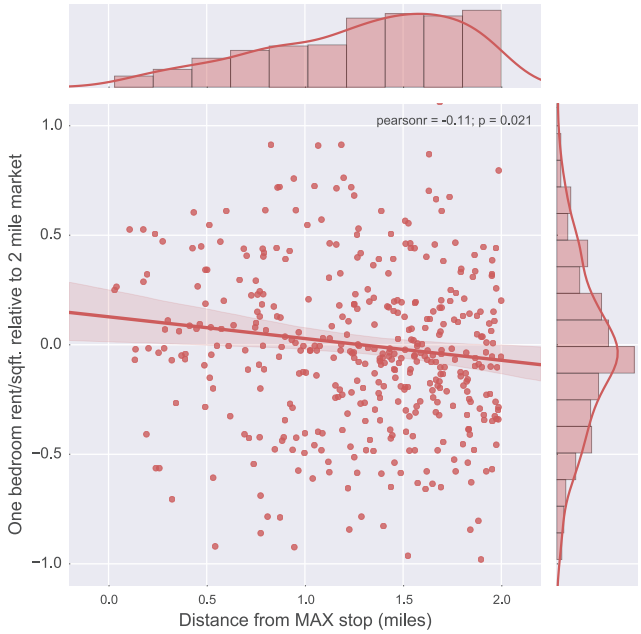
Below are the regression diagnostics for the one bedroom model. Of note is that both the intercept and coefficient on distance were statistically significant at the 95 percent confidence level. The adjusted R^2 indicates that 1 percent of the variation can be explained.

Results: Ordinary least squares

Model:	OLS	Adj. R-squared:	0.010
Dependent Variable:	rel_rent_1b	AIC:	481.1150
Date:	2015-03-26 03:33	BIC:	489.2003
No. Observations:	421	Log-Likelihood:	-238.56
Df Model:	1	F-statistic:	5.397
Df Residuals:	419	Prob (F-statistic):	0.0207
R-squared:	0.013	Scale:	0.18272

	Coef.	Std.Err.	t	P>|t|	[0.025	0.975]
Intercept	0.1277	0.0588	2.1724	0.0304	0.0122	0.2433
dist	-0.0994	0.0428	-2.3231	0.0207	-0.1834	-0.0153

Below is a plot of the results of this uni-variate regression of relative one-bedroom on distance with the marginal distributions of each variable displayed.



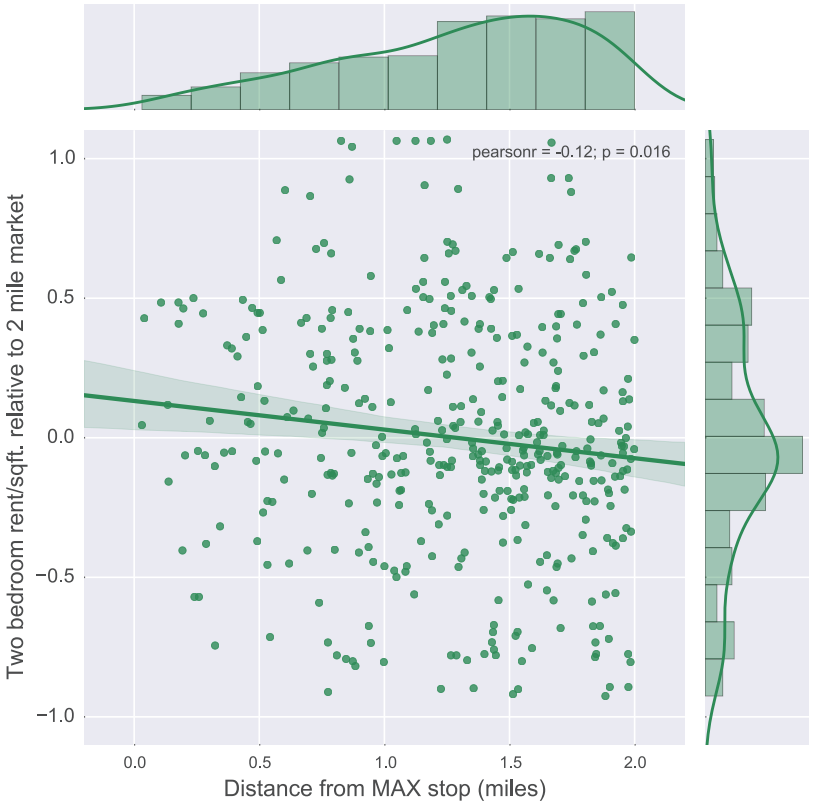
The following regression diagnostics pertain to the two-bedroom relative rent model. Regression diagnostics are similar in levels to the one-bedroom model.

Results: Ordinary least squares

Model:	OLS	Adj. R-squared:	0.011
Dependent Variable:	rel_rent_2b	AIC:	475.2931
Date:	2015-03-26 03:34	BIC:	483.3784
No. Observations:	421	Log-Likelihood:	-235.65
Df Model:	1	F-statistic:	5.827
Df Residuals:	419	Prob (F-statistic):	0.0162
R-squared:	0.014	Scale:	0.18021

	Coef.	Std.Err.	t	P>|t|	[0.025	0.975]
Intercept	0.1318	0.0584	2.2573	0.0245	0.0170	0.2466
dist	-0.1025	0.0425	-2.4139	0.0162	-0.1860	-0.0190

The plot of the two-bedroom relative rent model follows.



The intercept coefficient can be interpreted as the observed rental premium seen in immediate proximity to a MAX line stop relative to the surrounding two-mile market rate. The coefficient on the distance parameter is negative and in both cases approximately (-.10) for the one and two bedroom models. Both the one- and two-bedroom models are statistically significant at the 95 percent confidence level and have a meaningful intercept coefficient. We can infer that rental rates drop at $0.10 per mile from the premium observed in immediate proximity to a MAX line stop. The "distance premium" reaches zero out near 1.25 miles for both the one- and two-bedroom unit types.

The relative rent modeling is similar to the observed rent, except that observations are bounded by an arbitrary two-mile upper bound, as well as being de-meaned from the surrounding market average.

Question #3: How does the opening of a new MAX line affect existing properties as a function of distance?

To answer this final question we started with the dataset from Question #1, additional calculation and structuring was performed to create a differences-in-differences type of structure. This additional structuring is described as follows. Each observation is assigned to the nearest MAX stop line as its corridor. Then a pre and post period are created from the panel data. The pre and post periods time windows are designated by the opening dates of each observations MAX line corridor.

- Red MAX Line — Opened in 2001
- Yellow MAX Line — Opened in 2004
- Green MAX Line — Opened in 2009

After applying a lag of a single year to help adjust for the small pre opening window size of the Red line, the additional growth compared to the market was calculated for each property within the pre and post periods. Finally, the difference between the pre and the post periods were taken from this additional growth calculation. The difference-in-difference type output value we coined the name "rental delta diffs."

A model was constructed and specified as:

delta_diff = ß0 + ß1distance + error

Results: Ordinary least squares

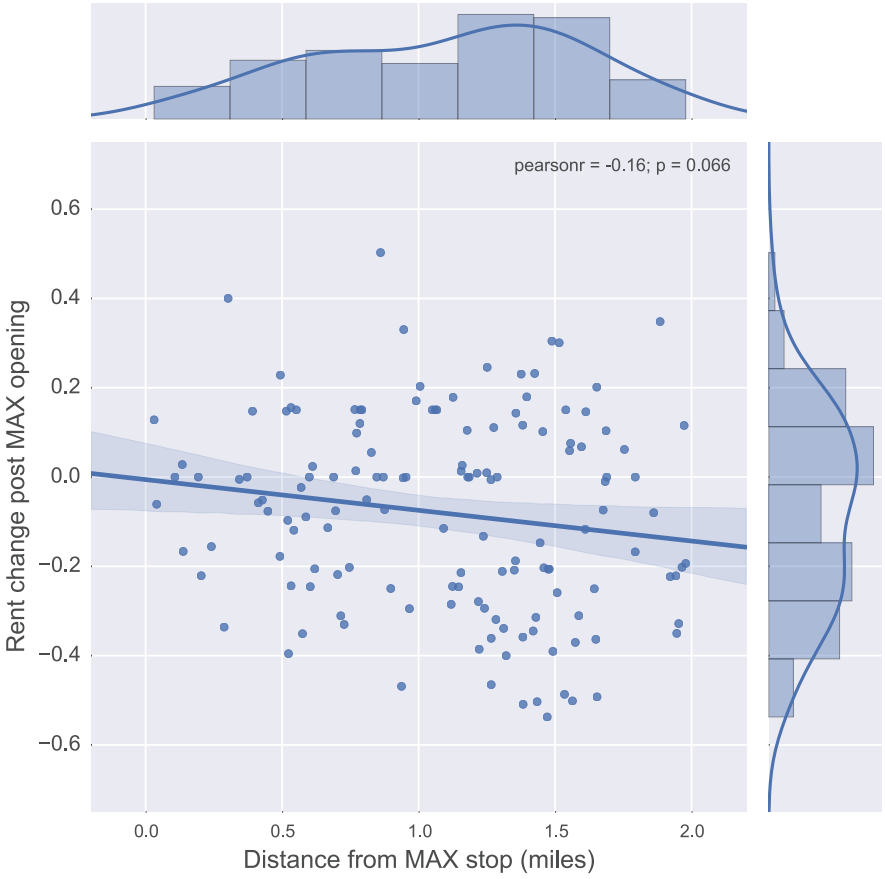
Model:	OLS	Adj. R-squared:	0.017
Dependent Variable:	deltdiff	AIC:	-28.5505
Date:	2015-03-26 02:47	BIC:	-22.6530
No. Observations:	141	Log-Likelihood:	16.275
Df Model:	1	F-statistic:	3.437
Df Residuals:	139	Prob (F-statistic):	0.0659
R-squared:	0.024	Scale:	0.047149

	Coef.	Std.Err.	t	P>|t|	[0.025	0.975]
Intercept	-0.0057	0.0446	-0.1283	0.8981	-0.0939	0.0825
dist	-0.0688	0.0371	-1.8539	0.0659	-0.1422	0.0046

Although the coefficient on distance is significant at the 90 percent confidence level and has a negative sign, which is intuitive. The intercept coefficient is slightly negative and statistically insignificant in addition to the fact that, the model only explains 1.7 percent of the observed variance. As a result, we conclude that distance to a MAX line stop does not have a substantial effect on rental rates after a new MAX line stop has opened.

During the modeling process, many other functional forms for the relationship between delta diffs and distance were explored, yet none resulted in a better fitting model than the linear one. Therefore, we conclude that relative to the region, rents did not increase (or decrease) after the MAX was constructed as a function of the proximity to the newly opened line.

The chart below is a scatter plot of the delta diffs over distance with the predicted values from the model are overlaid along with the marginal distributions of each variable.



TAKEAWAY AND FURTHER RESEARCH REFINEMENT

In this work, we find that:

1. Rent per square foot is a function of log of distance and the year that the multifamily building was built.

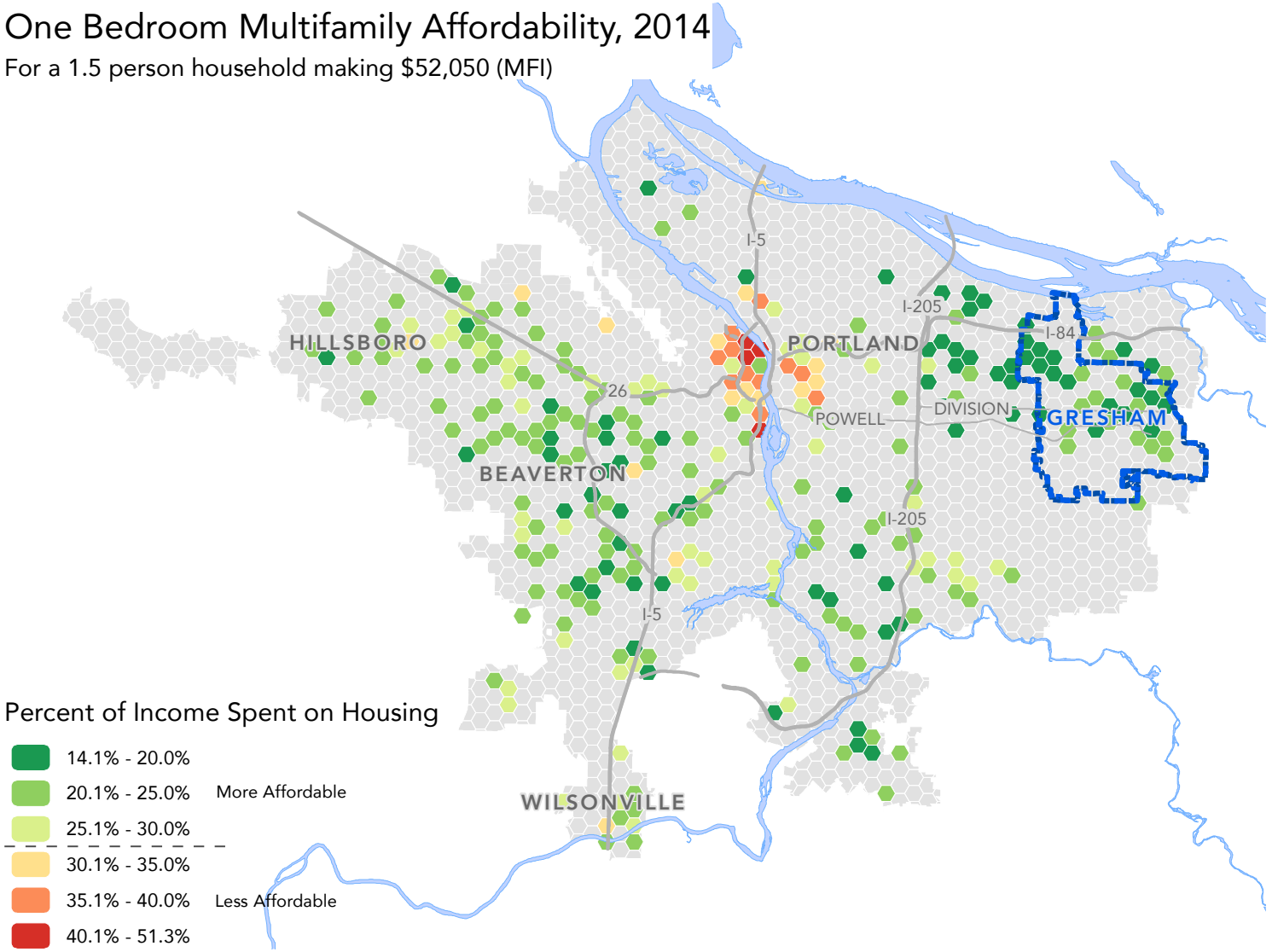
2. Relative to the surrounding market, proximity to a MAX line stop introduces a premium in current (2014) rent per square foot levels.

3. There is no pre/post MAX-opening premium observed.

Together these questions and answers provide a preliminary framework for understanding how proximity to MAX lines affects the observed rental rates in one- and two-bedroom multifamily units in Portland. While many of these specifications could be improved by adding additional variables, that work is left for another effort, as this scope was intended to provide a simple look into the effects of distance on rental rates. Some paths to explore for future research could include, developing a more accurate distance measure such as walking distance from properties to MAX stops, flushing out the rental characteristics that would improve the regression fit, as well as increasing the sample size. Other more exotic efforts could include a machine learning model, or spatial interpolation.

One Bedroom Multifamily Affordability, 2014

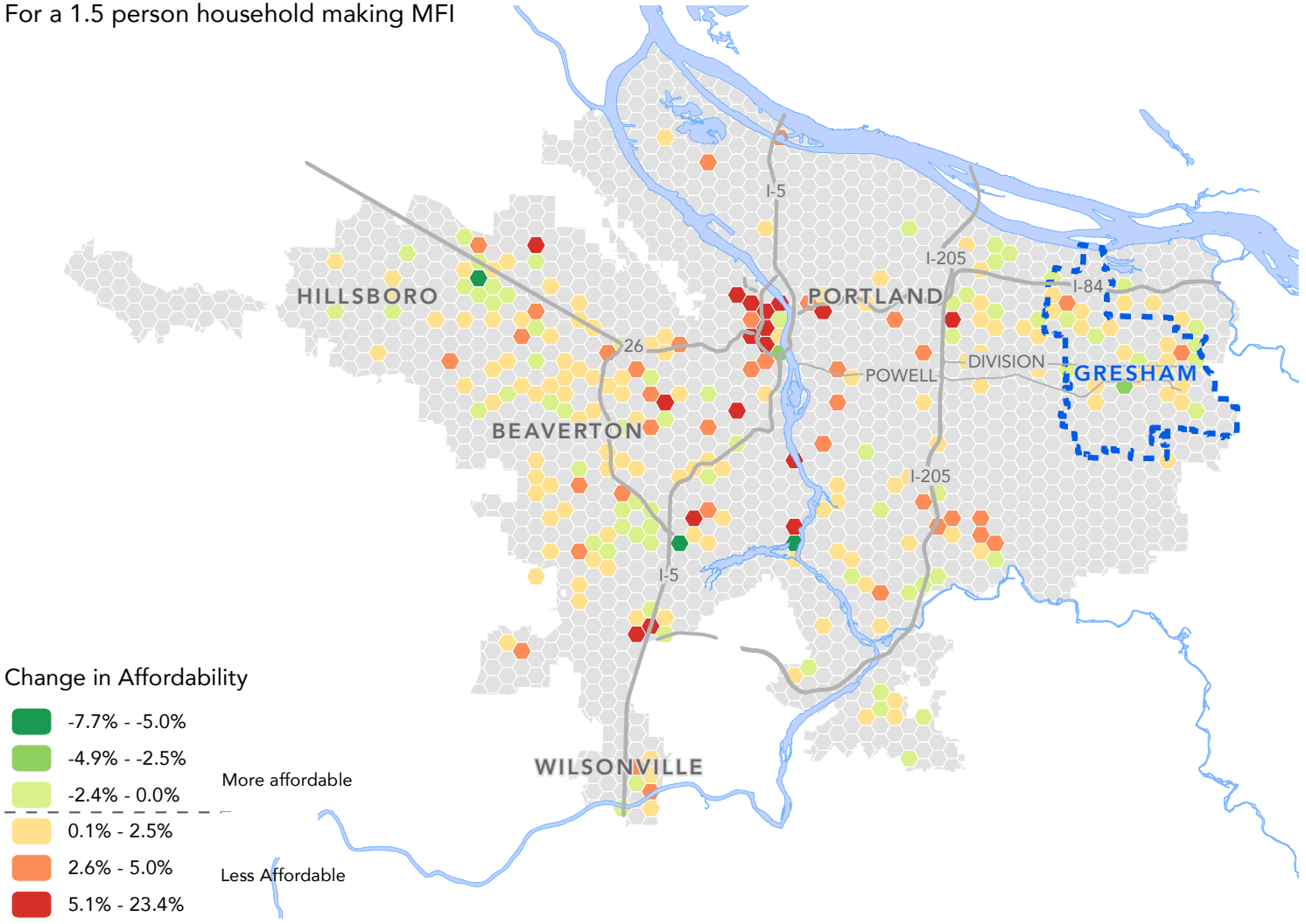
For a 1.5 person household making $52,050 (MFI)



Source: ECONorthwest, REIS, Metro RLIS, US Department of Housing and Urban Development

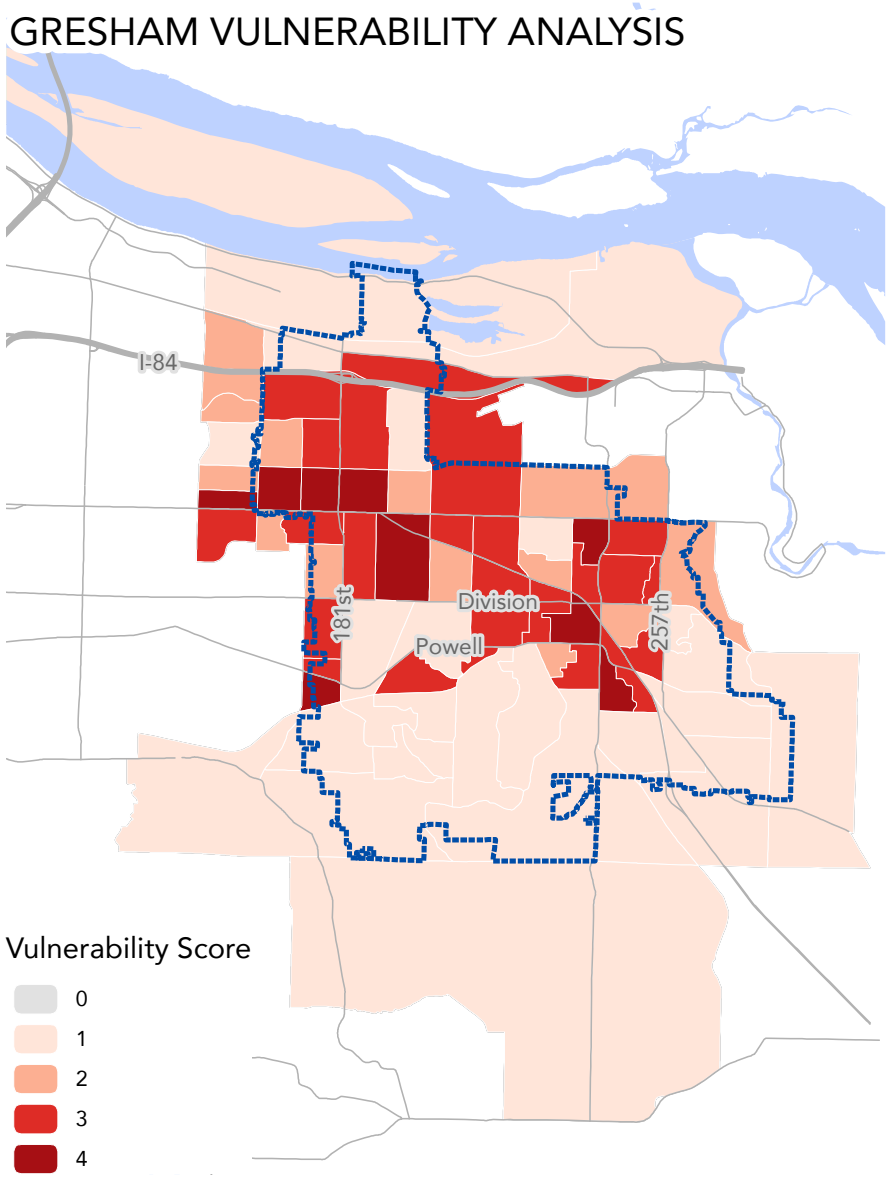
Change in One Bedroom Multifamily Affordability, 2000-2014

For a 1.5 person household making MFI



Source: REIS, Metro RLIS

GRESHAM VULNERABILITY ANALYSIS



Appendix D: Methodology

METHODOLOGY FOR SINGLE-FAMILY AFFORDABILITY ASSESSMENT

Data for Single-Family Affordability came from the Metro RLIS tax lot shapefile, which included the last known sales price and the month and year of the sale. Using the 2015 quarter one data, ECONorthwest:

1. Selected all parcels with a sale date of 2014 within the Portland urban growth boundary that were classified as owned single-family homes, townhouses or condominiums based on their RLIS property class.

    a. Property Classes included: 101, 102, 122, 701

    b. Dropped properties sold for less than $75,000, likely not arms length transactions

    c. Dropped transactions that were for more than one unit, for example a multifamily building, or several single-family parcels sold at one price.

2. Calculated the percent of their income a four-person family making $69,400 [2014 Median Family Income (MFT), according to HUD] would have to spend on housing for each identified parcel. Homes that cost 30% or less of median family income were considered affordable.

3. Joined affordability data to parcel data in GIS.

4. Summarized selected parcels by a hex grid. We calculated the mean affordability of all parcels which intersected a hex bin and assigned that value to said hex bin.

To calculate the change in affordability from 2004 to 2014, the process above was repeated using the 2005 Metro RLIS tax lot shapefile and assuming the HUD median family income of $67,900 for 2004. Next, ECONorthwest:

1. Overlaid 2004 with 2014 hex grids and selected only those bins which had at least one sale observation in both 2004 and 2014.

2. Calculated the change in affordability (2014 percent of MFI spent on housing – 2004 percent of MFI spent on housing).

Single-Family Affordability Assumptions

ECONorthwest calculated Single-Family Affordability based on the following cost assumptions:

- Down Payment: 20 percent of the Sales Price
- Mortgage: 30 year amortizing principal interest
- Interest Rate: 5.84 percent in 2004 and 4.17 percent in 2014, according to Freddie Mac
- Property Tax Change Ratio (Assessed Value/Market Value): 69 percent in 2004 and 64 percent in 2014
- Property Tax Assessment: $18 per $1,000 in 2004 and $20 per $1,000 in 2014 (calculated based on sales price deflated by the change ratio)
- Insurance: Sales Price divided by 1,000 multiplied by 0.35
- Utilities: $200 per month in 2004, $250 per month in 2014 (2000 values calculated based on CPI deflator)

Calculation:

Yearly Housing Costs = (Mortgage Payment + Monthly Utlities) * 12 + Proporty Tax + Home Insurance

Percent of MFI Spent on Housing = Yearly Housing Costs / MFI

METHODOLOGY FOR MULTIFAMILY AFFORDABILITY ANALYSIS

Data for Multifamily Affordability came from the commercial real estate data company REIS. Each multifamily building within the Portland metro area included current rental rates for several different unit types. Using two-bedroom unit rental data, ECONorthwest:

1. Plotted given latitude and longitude coordinates for every multifamily building within the Portland metro area.

2. Selected multifamily units within the Portland urban growth boundary.

3. Calculated the percent of their income a three-person family making $62,460 (90 percent of 2014 Median Family Income, using HUD methodology) would have to spend on housing for each identified building. Two-bedroom units which cost 30 percent or less of median family income were considered affordable.

4. Summarized selected units by a hex grid. We calculated the mean affordability of all buildings within a hex bin and assigned that value to said hex bin.

To calculate the change in affordability from 2000 to 2014, the same process was repeated using the buildings built during or before 2000 and assuming a median family income of $48,330 (90% of $53,700 MFI, using HUD methodology). Next, ECONorthwest:

1. Overlaid 2000 with 2014 hex grids and selected only those bins which had at least one two-bedroom rent observation in 2004 and 2014.

2. Calculated the change in affordability (2014 percent of MFI spent on housing – 2000 percent of MFI spent on housing).

Multifamily Affordability Assumptions

ECONorthwest calculated Multifamily Affordability based on the following cost assumptions:

- Utilities: $91 per month in 2000, $125 per month in 2014 (calculated based on sales price deflated by the change ratio)

Calculation:

Percent of MFI spent on Housing = ((Rent + Monthly Utilities)*12) / MFI

METHODOLOGY FOR VULNERABILITY RISK ASSESSMENT

Data for the first three risk factors was drawn from block group level 2009-2013 American Community Survey (ACS) estimates. Non-Whites are defined as all residents except for Non-Hispanic Whites. The percentage of households with incomes at or below 80 percent of the HUD-adjusted MFI was calculated from the 2009-2013 ACS estimates. Because income is measured in $10,000 increments, we assumed that the number of households between $50,000 and $59,999 was evenly distributed and estimated the proportional estimate and margin of error. For fiscal year 2014 HUD-adjusted MFI for the Portland-Vancouver-Hillsboro, OR-WA area was $69,400. So, 80 percent MFI is equal to $55,520 for a four-person household. We then adjusted for inflation to arrive at a MFI of $54,633.74 in 2013 dollars. Based on our ACS calculations, 46.38 percent of the population had an income at or below 80 percent MFI.

Every block group was evaluated based on the following criteria. Scores for each vulnerability risk factor were summed to get total vulnerability scores. We considered block groups to be at risk for gentrification if they received a score of at least three out of four for the following:

EXHIBIT 1. VULNERABILITY RISK ANALYSIS TOOL, FOUR COUNTY AREA, 2013

Risk Factor	Evaluation Criteria	Vulnerability Score: Yes (1)	Vulnerability Score: No (0)
% Renters	Is the proportion of renters greater than 39.06%?	1	0
% Non-White	Is the proportion of non-white individuals greater than 24.57%?	1	0
% without Bachelor's degree	Is the proportion of the population 25+ without a bachelor's degree greater than 64.04%?	1	0
% Households with income at or below 80% Median Family Income	Is the proportion of households with income at or below 80% of median family income greater than 46.38%?	1	0

Source: Portland Bureau of Planning and Sustainability Gentrification and Displacement Study, 2012; US Census American Community Survey 5-year Estimates, Tables DP05, S1501, B25003, B19001; Portland Housing Bureau, 2014 Median Income for a Family of Four.

Calculation of Threshold

EXHIBIT 2. CALCULATION OF THRESHOLD, FOUR COUNTY AREA, 2013

Vulnerability Variable	Four County Proportion	Margin of Error for given Estimate (MoE)	Calculation of threshold (adjusted to the lower bound of MoE)
% Renters	39.4%	+/- 0.34%	39.06%
% Non-White	24.6%	+/- 0.03%	24.57%
% without Bachelor's degree	64.48%	+/- 0.44%	64.04%
% Households with income at or below 80% Median Family Income	46.74%	+/- 0.36%	46.38%

Source: Portland Bureau of Planning and Sustainability Gentrification and Displacement Study, 2012; US Census American Community Survey 5-year Estimates, Tables DP05, S1501, B25003, B19001; Portland Housing Bureau, 2014 Median Income for a Family of Four.

Margins of error for aggregated values (for example, the number of renters in all four counties) were calculated using the following formula based on methodology laid out by US Census:

$$\text{Aggregated MoE} = \sqrt{(\text{MoE a})^2 + (\text{MoE b}^2) + \ldots (\text{MoE n}^2)}$$

Source: U.S. Census, "A Compass for Understanding and Using American Community Survey Data", October 2008.

Thresholds were then adjusted by the calculated margin of error to the lower bound for a more sensitive cutoff.

NEIGHBORHOOD CHANGE METHODOLOGY

Neighborhood change was calculated by combining the change in two-bedroom multifamily affordability in Gresham with regional vulnerability scores. In order to create a final composite score, ECONorthwest:

1. Selected all block groups from the regional vulnerability analysis that intersected Gresham city limits.

2. Summarized selected block groups by a hex grid. We calculated the mean vulnerability score of all block groups that intersected a hex bin and assigned that value to said hex bin.

3. Calculated the mean change in affordability in two-bedroom rents in Gresham from 2000-2014. Multifamily developments which experienced a greater than average change in affordability were considered "Less Affordable", while developments which experiences a lesser than average change in affordability were considered "More Affordable".

4. Overlaid the regional vulnerability and Gresham change in affordability hex grids and selected only those bins which had at least one affordability and one vulnerability observation.

5. Classified hexes into the following categories:

    a. High Vulnerability, Less Affordable

    b. High Vulnerability, More Affordable

    c. Low Vulnerability, Less Affordable

    d. Low Vulnerability, More Affordable