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SUBJECT: task 2: methods for evaluating housing affordability

# Introduction

The purpose of this document is to outline ECONorthwest’s methods for creating an interactive mapping tool of housing affordability in the Portland Region from 2000 to 2020. The methodology is broken up into three main sections corresponding to the tool’s three map pages as follows:

* Home ownership rates
* Vulnerability risk assessment
* Single-family affordability

# Home Ownership Rates

Data on home ownership rates will be gathered at the census tract level and summarized into a hex grid. We will calculate the home ownership rate of the census tract which falls in the hex bin’s centroid.

## Data

Data will come from the U.S. Census for 2000 and 2009 to 2014 at the census tract level.



## Trending forward

ECONorthwest will calculate home ownership rates from 2015 to 2020 based on historic trends over the 2009 to 2014 period. Because of the gap in data from 2000 to 2009, year 2000 values will not be included. Instead, we will calculate the slope of a linear line of best fit for each hex bin value from 2009 to 2014 and use that slope to calculate 2015 to 2020 values.

# Vulnerability Risk Assessment

For the assessment, ECONorthwest will create an index measuring vulnerability to displacement based on the Portland Gentrification and Displacement Study’s methodology. The index is composed of the following demographic factors compiled at the census tract level:

* *Tenure.* The proportion of occupied housing units that are rented.
* *Racial/ethnic composition.* The proportion of residents who are non-white (including Hispanic whites).
* *Educational attainment.* The proportion of residents with a bachelor’s degree or higher.
* *Household income.* The proportion of households with a median household income at or below 80% of regional median family income.

Results of the vulnerability assessment will be summarized into a hex grid of the region. We will calculate the home ownership rate of the census tract which falls in the hex bin’s centroid.

## Data

Data will come from the U.S. Census and the U.S. Department of Housing and Urban Development (HUD) for 2000 and 2009 to 2014. U.S. Census data will be gathered at the census tract level and compared to HUD regional data for the Portland‐Vancouver‐Hillsboro, OR‐WA MSA.



## Assumptions

* *Household income.* The Census reports household income in $10,000 increments. In order to calculate the percentage of households with incomes at or below 80% of the HUD‐adjusted regional MFI, we assume that households are evenly distributed within that interval and will calculate estimates and margins of error proportionally.

## Evaluation

Each census tract will be evaluated based on the following criteria. Scores for each vulnerability risk factor will be summed to get total vulnerability scores. We consider census tracts to be at risk for gentrification if they receive a score of at least 3 out of 4 for the following:

|  |  |  |  |
| --- | --- | --- | --- |
| Risk Factor | Evaluation Criteria | Vulnerability Score: Yes (1) | Vulnerability Score: No (0) |
| % Renters | Is the proportion of renters greater than X%? | 1 | 0 |
| % Non-White | Is the proportion of non-white individuals greater than X%? | 1 | 0 |
| % without Bachelor’s degree | Is the proportion of the population 25+ without a bachelor’s degree greater than X%? | 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 X%? | 1 | 0 |

Source: Portland Bureau of Planning and Sustainability Gentrification and Displacement Study.

### Calculation of Threshold

|  |  |  |  |
| --- | --- | --- | --- |
| Vulnerability Variable | Three 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.

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



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

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

## Trending forward

ECONorthwest will assess displacement vulnerability from 2015 to 2020 based on historic trends over the 2009 to 2014 period. Because of the gap in data from 2000 to 2009, year 2000 values will not be included. Instead, we will calculate the slope of a linear line of best fit for each hex bin value from 2009 to 2014 and use that slope to calculate 2015 to 2020 values.

# Single Family Affordability

ECONorthwest will assess single-family affordability from 2000 to 2015 and project affordability from 2016 to 2020 by calculating the percentage of regional median family income spent on housing. The map will also have an option to display affordability rates assuming 5% down payment or 20% down payment.

## Data

Housing data will come from Metro RLIS tax lot shapefiles and median family income will come from the Department of Housing and Urban Development’s estimates for the Portland-Vancouver-Hillsboro OR-WA MSA. Using quarter 2 data from a given year, ECONorthwest will:

1. Select all parcels with a sale date in the given year within the Portland urban growth boundary that are classified as owned single family homes, townhouses, or condominiums based on their RLIS property class.
   1. Include property classes 101, 102, 122, 701.
   2. Drop properties sold for less than $75,000, as they are likely not arms length transactions.
   3. Drop properties sold for more than $3 million, as they are likely for more than one unit: for example a multifamily building, or several single family parcels sold at one price.
2. For each identified parcel, calculate the percent of HUD’s Median Family Income a four-person family would have to spend on housing. Homes that cost 30% or less of median family income are considered affordable.
3. Summarize selected parcels by a hex grid. We will calculate the median affordability of all parcels which intersected a hex bin and assign that value to said hex bin. Hex bins with fewer than 3 transactions in a given year will not be shown.

## Single Family Affordability Assumptions

ECONorthwest will calculate single family affordability based on the following cost assumptions:

* *Down payment*: 5% or 20% of the sales price.
* *Mortgage:* 30 year amortizing principal interest.
* *Interest rate:* Based on Annual Average Commitment Rates on 30-Year Fixed-Rate Mortgage from Freddie Mac.
* *Property Tax Change Ratio*: Based on Residential Changed Property Ratios for Multnomah County as reported by the Multnomah County Assessor.
* *Property tax assessment:* Calculated as a property’s sale price deflated by the change ratio.
* *Insurance:* sales price divided by 1,000 multiplied by 0.35.
* *Utilities:* $250 per month in 2015, inflated from 2016 to 2020 and deflated from 2000 to 2014 using the U.S. Bureau of Labor Statistics (BLS) Consumer Price Index (CPI) Inflation Calculator.

Calculation:



## Trending forward

ECONorthwest will assess single family housing affordability from 2016 to 2020 based on historic trends over the 2000 to 2015 period. For each hex bin we will calculate the slope of a linear line of best fit based on values from 2000 to 2015 and use that slope to calculate 2016 to 2020 values.