Exploring the Relationship Between Density, Population Growth and Housing Affordability in 8 Cities in Washington State Between 1990 and 2020

By Bertwocane Adera, Devlin Higgins, and Aditi Teriar

Background

Exclusionary zoning

- Determines how a specific land is developed and used
- Which means it can designate certain areas to single family homes or a combination of single and multi family homes

It is postulated that zoning plays an integral role in housing affordability for the average American resident

Zoning is often used as a means to keep lower income residents, often racial minorities, out of wealthy neighborhoods

Our group is studying how zoning laws have an effect on housing affordability in Washington state
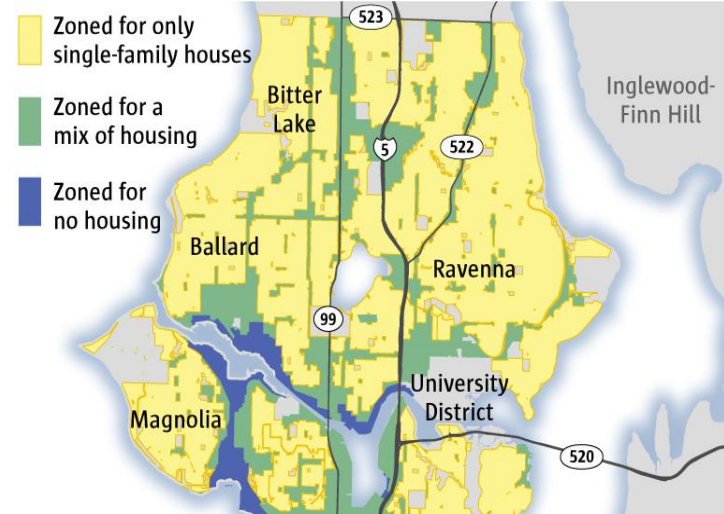
Deliverable

Sponsor: Northwest Justice Project

- Examine 8 different cities in Washington state throughout the time period between 1990 and 2020
- Spokane, Seattle, Tacoma, Vancouver, Everett, Pasco, Bellingham and Federal Way
- Provide a visualization of the data for housing affordability in relation to exclusionary zoning laws and population density
- Use these trends to create projections for the next 10 to 20 years

Methodology

1) Produce individual maps for the eight cities
2) Each map consists of a layer showing the general land use, which includes different types of residential information: traditional single family residential, residential, large lot residential, very large lot residential
3) Each map also has Housing and Rental Affordability
   a) Calculated Housing Affordability Index for 1990, 2000, 2010-2018
   b) Housing Affordability

$$\left(\frac{Median\ Household\ Income}{(20\%\ of\ median\ house\ price) + (median\ select\ monthly\ owner\ cost\ \times 12)} \right) * 100$$

- HAI 100 = a family earning median income has exactly enough money to qualify for a mortgage on a median priced home
- HAI > 100 = family earning the median income has more than enough income to qualify for a mortgage loan on a median-priced home
- HAI <100 = family earning the median income does not have enough income to qualify for a mortgage loan on a median-priced home

Methodology

4) Rental Affordability

$$\left(\frac{30\% \text{ of Annual Median Income}}{\text{Fair Market Rent} * 12}\right) * 100$$

5) Created charts to demonstrate the relationship between median income and fair market rent for a one bedroom home and a two bedroom home, for each individual city

6) Used this data and the current trends between these variables to create projections for these cities for the year 2030, and then again for the year 2040

7) Input this information into a dashboard and create a story map to display our research and findings
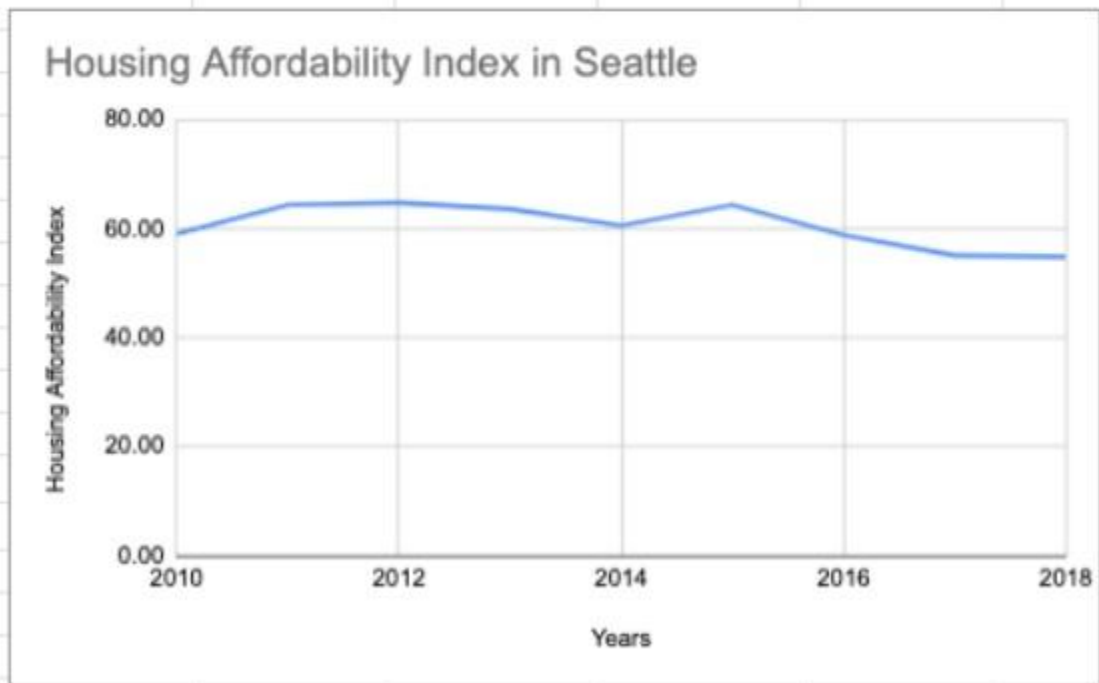
Results

Individual Maps
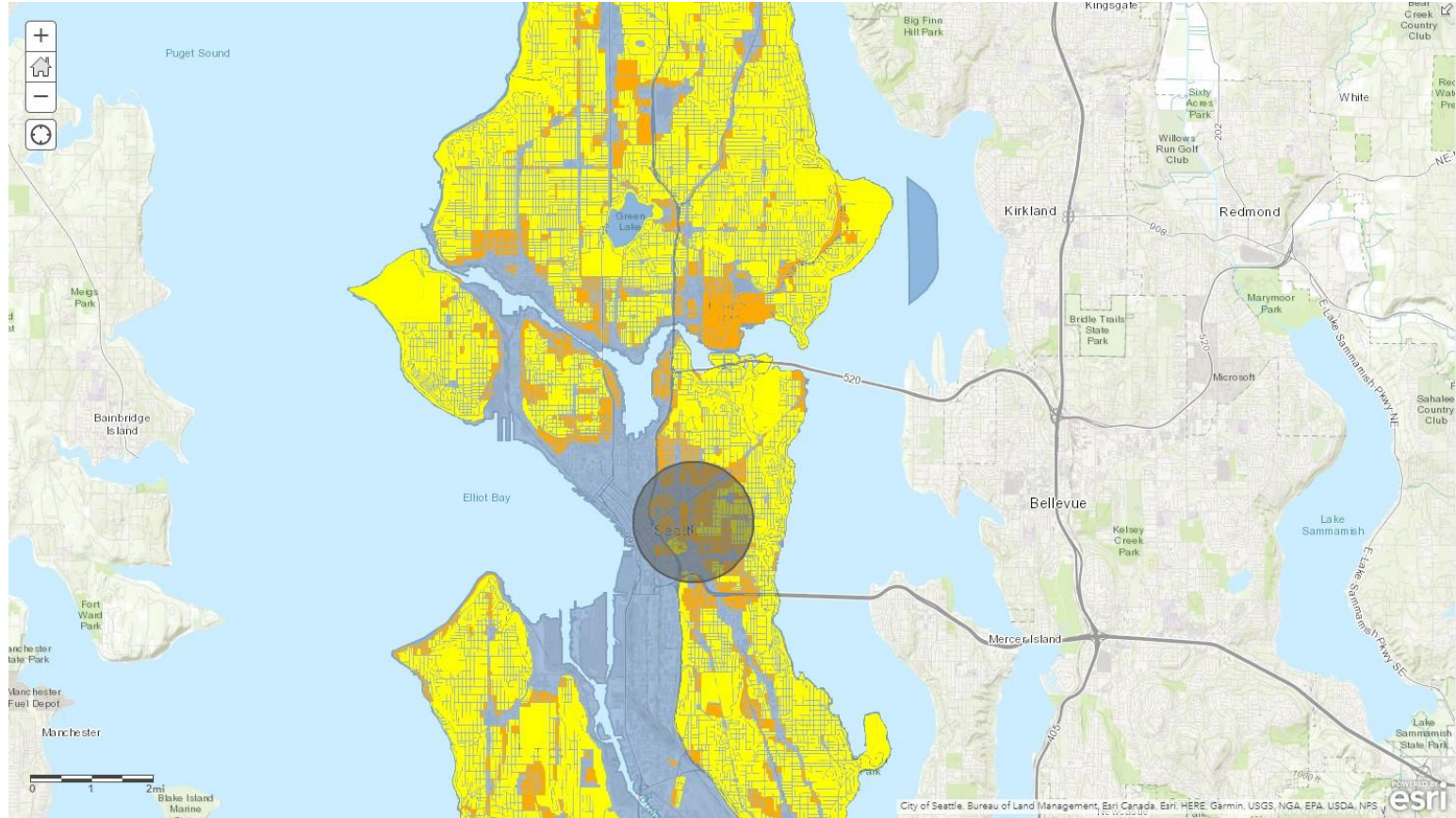
Housing Affordability

Seattle

Years	Housing Affordability Index
1990	95.68
2000	84.60
2010	59.07
2011	64.30
2012	64.72
2013	63.58
2014	60.53
2015	64.30
2016	58.79
2017	55.05
2018	54.84

Seattle HAI Projections

Years	Housing Affordability Index
2030	45.7
2040	36.41

Housing Affordability Index in Seattle

Rental Affordability

Seattle

Years	Seattle Rental Affordability Index	Population	Change per Year	Percent Single Units in Structure	Margin of Error
2010	202.7	608,660	10,121	50.1%	± 1.2%
2011	184.5	612,100	3,440	49.7%	± 1.3%
2012	200.4	616,500	4,400	49.9%	± 1.3%
2013	196.3	626,600	10,100	49.3%	± 1.2%
2014	196.3	640,500	13,900	47.8%	± 1.2%
2015	158.3	662,400	21,900	48.7%	± 1.3%
2016	148.2	686,600	24,200	48.7%	± 1.3%
2017	155.4	713,700	27,100	48.7%	± 1.4%
2018	137.6	730,400	16,700	46.8%	± 1.0%
2019	143.0	747,300	16,900	46.1%	± 1.3%
2020	134.9	761,100	13,800	42.5%*	± 1.3%*

Seattle RAI Projections

Years	RAI Projection Linear Trendline
2030	80.3
2040	22.3

Seattle Rental Affordability Chart

$y = -7.4845x + 213.78$
$R^2 = 0.8317$

— Seattle Rental Affordability Index   — RAI Projection Line
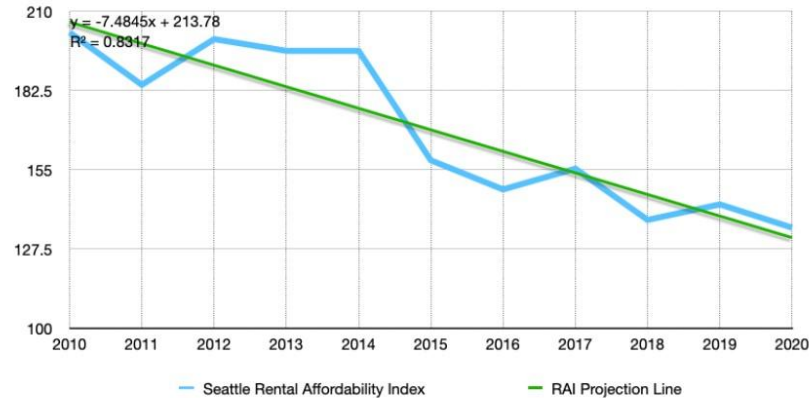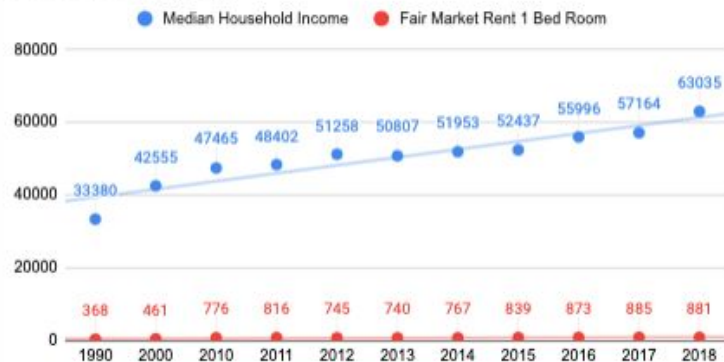
Fair Market Rent and Median Household Income

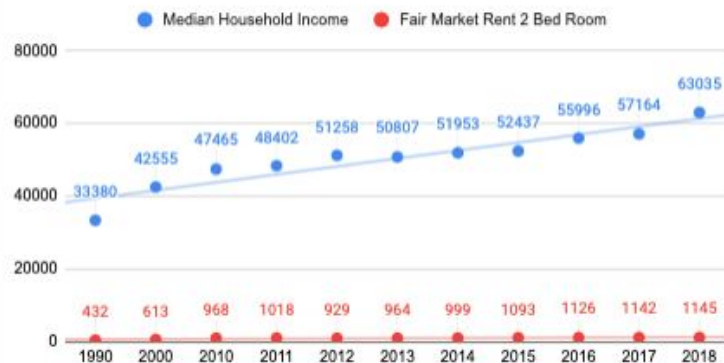Seattle, Fair Market Rent (1 Bed Room) Vs. Median Household Income
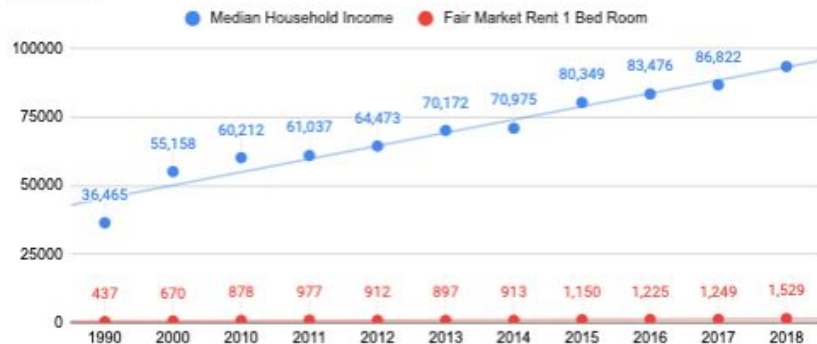
Tacoma, Fair Market Rent (1 Bed Room) Vs. Median Household Income

Seattle, Fair Market Rent (2 Bed Room) Vs. Median Household Income

Tacoma, Fair Market Rent (2 Bed Room) Vs. Median Household Income

Projections

Zoom to   Pan   •••   ◁ 1 of 32 ▷

Seattle Affordability ✕

Current Rental Affordability Index: 134.9
Projection for 2030 RAI: 80.3
Projections for 2040 RAI: 22.3

Seattle Housing Affordability
Current Housing Affordability Index: 54.84
Projection for 2030 HAI: 45.7
Projections for 2040 HAI: 36.41

Dashboards and Storymap

Housing Affordability in Washington State

Draft