

# Understanding Public Housing Across America

A Data-Driven Dashboard Analysis

---

Defang Eyong





# Executive Summary

This report synthesizes information from various screenshots and a summary document to provide a comprehensive overview of public housing in America, focusing on key performance indicators, demographic breakdowns, and household composition analyses.

## Key Findings



### National Scale

892,385 total housing units with 39,725 (4.4%) vacant units



### Financial Metrics

Average rent: \$412 | Median household income: \$18,254



### Demographics

62.2% minority representation (560,962 units)



### Household Composition

785,648 total households with average size of 2.02 people



### Vulnerable Populations



73.9% female-headed households



26.8% elderly residents



33.8% with disabilities



### Households with Children

Of households with children:

91%

headed by one adult

9%


headed by two adults



# Public Housing Dashboard Overview


## Key Performance Indicators

The public housing dashboard <https://edefang.shinyapps.io/House/> provides a high-level overview of the public housing landscape, presenting key metrics and allowing for state-level comparisons. These metrics offer a foundational understanding of the scale and operational aspects of public housing nationwide.



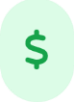
Total Units

892,385




Vacant Units

39,725




Average Rent

\$412



Median Income

\$18,254

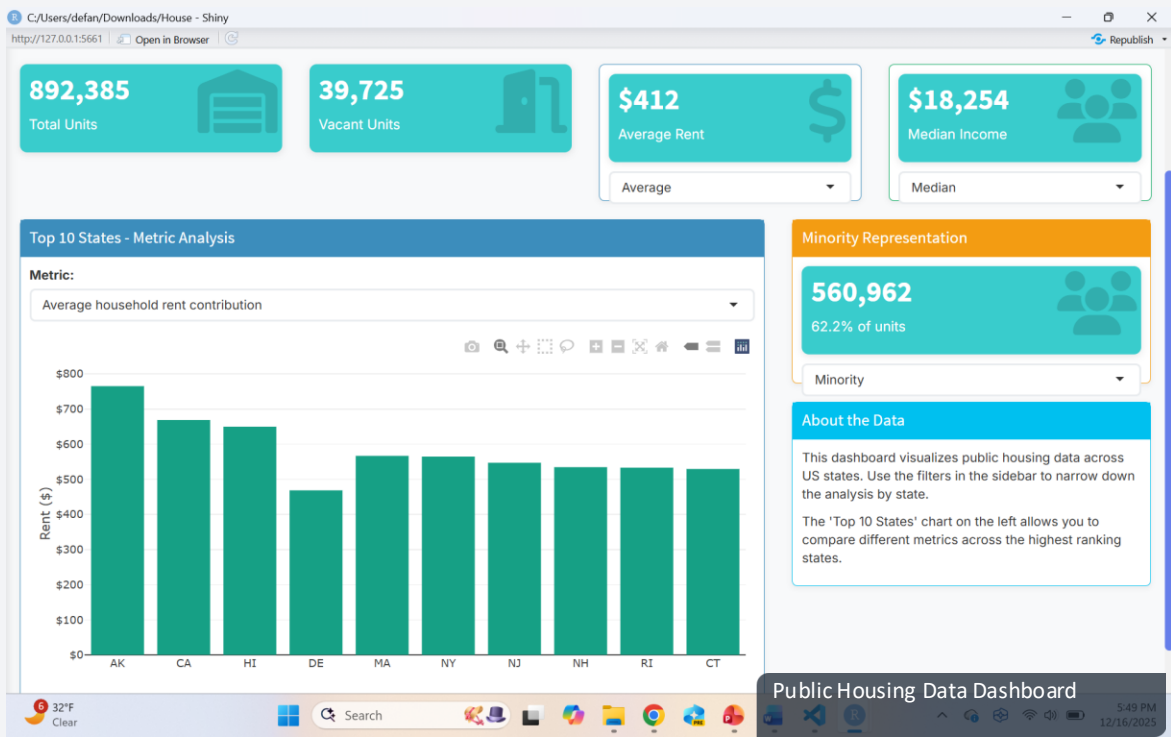


Minority Representation

62.2%

560,962 units

## Dashboard Visualization



### Key Features



State-level comparisons



Vacancy rate tracking



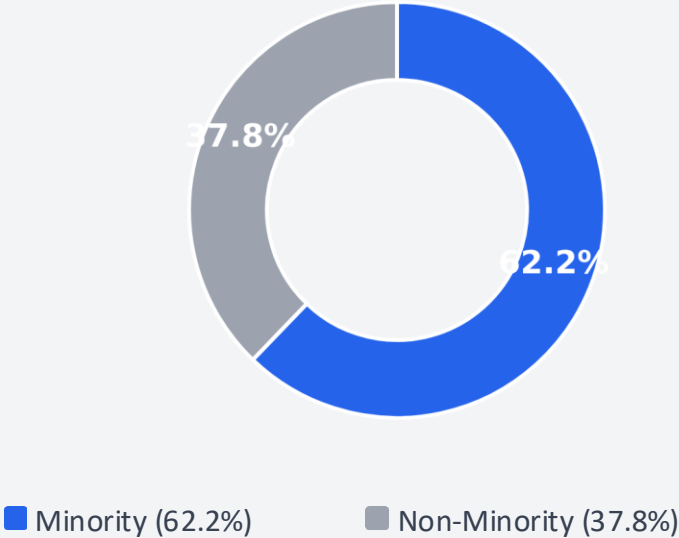
Top 10 states analysis



Rent contribution analysis





# Minority Representation in Public Housing






Minority households represent a significant majority of public housing residents, highlighting the need to address diverse demographic needs in policy.

### Key Statistics

-  62.2% of public housing residents are minority households
-  Total minority units: 560,962

### Racial Breakdown

-  Black residents: 41.7%
-  Hispanic residents: 26.1%
-  Other minority groups: 14.4%



# Top 10 States Analysis - Total Units

This analysis compares public housing unit distribution across the top 10 states, providing insights into regional variations and performance metrics.

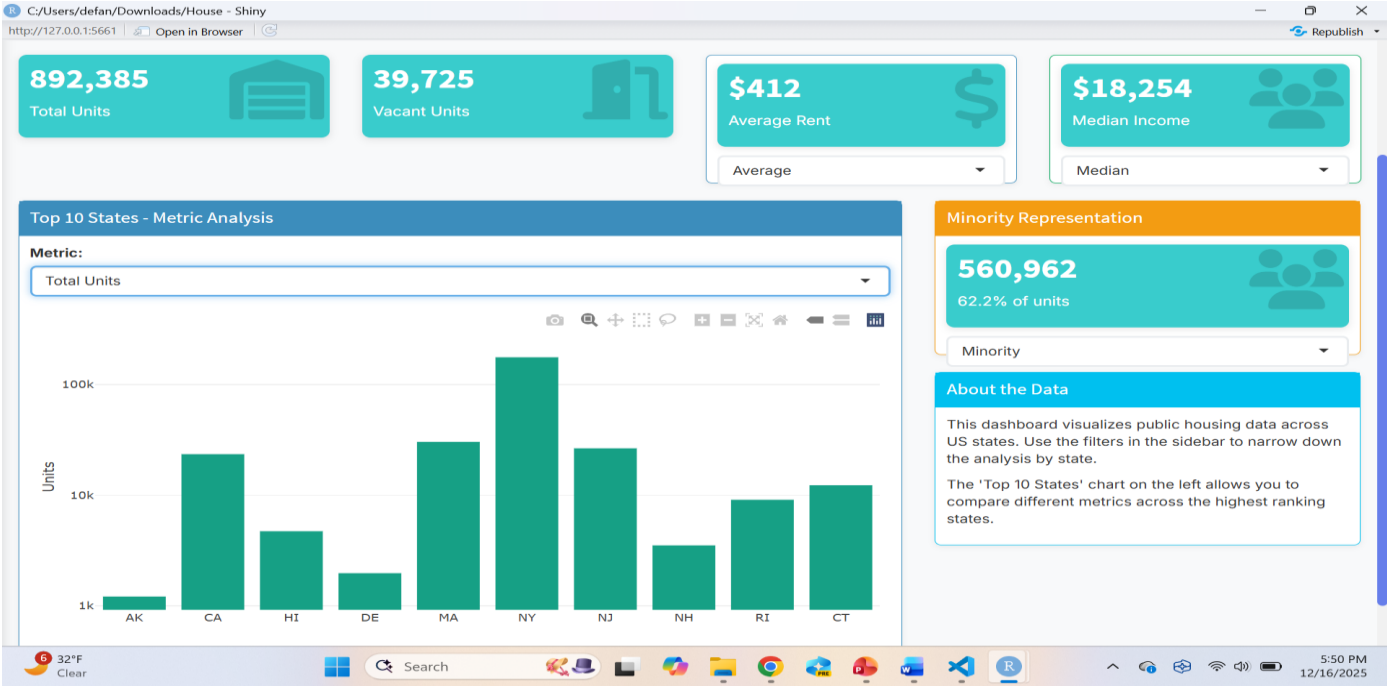
## Key Insights

- State-level comparison reveals regional disparities in public housing
- Unit distribution varies significantly across different states
- Top states account for a substantial portion of total public housing units

## Methodology

Analysis based on current public housing dashboard metrics, focusing on total units count and state-level comparisons.

## State-Level Comparison of Total Units



HIGHEST CONCENTRATION  
**NEWYORK**  
Dominant market share

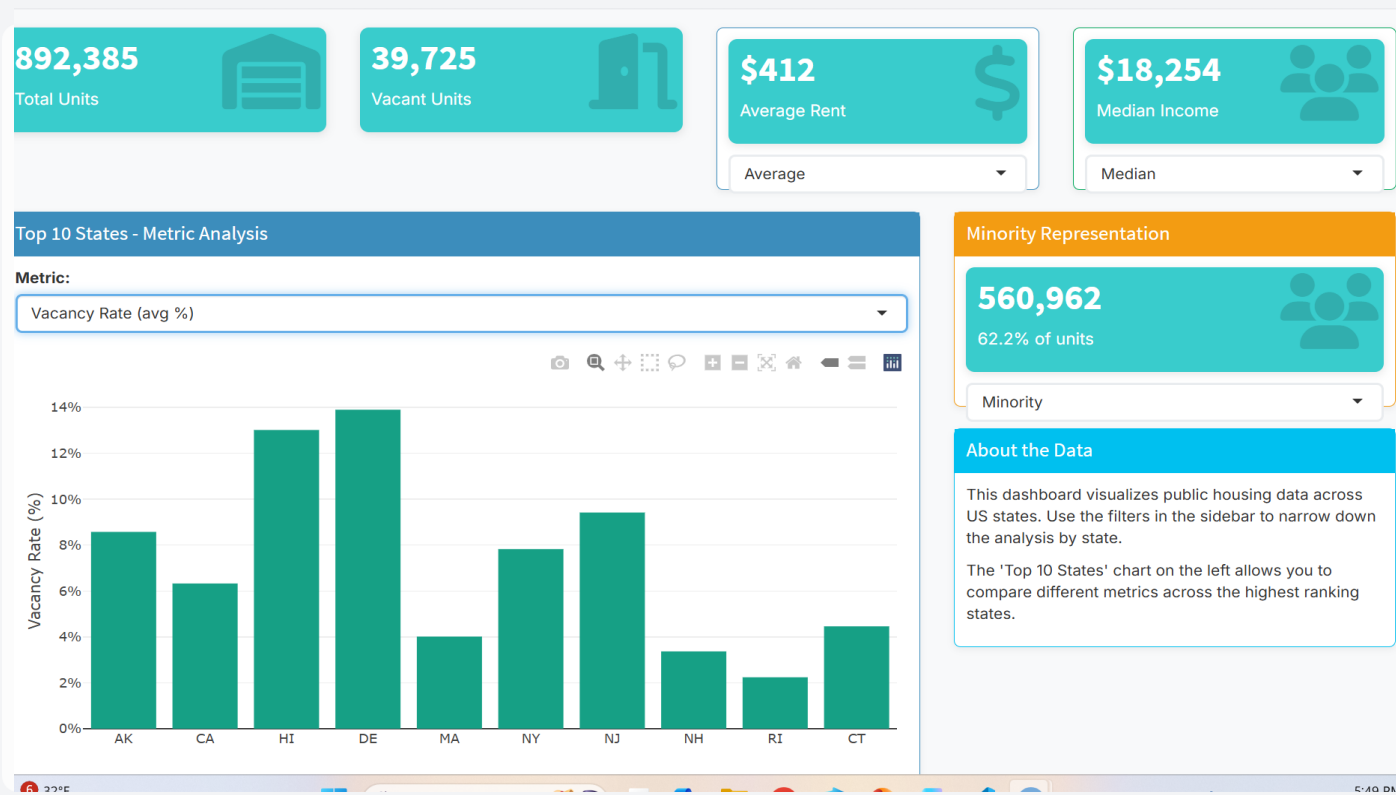
HIGHEST vacant unit  
**NEWYORK**  
Dominant market share

TOTAL UNITS NATIONWIDE  
**892,385**  
As of latest report



# Top 10 States Analysis - Vacancy Rates

Analysis of vacancy rates across the top 10 states, showing housing utilization efficiency and identifying states with the highest and lowest vacancy rates.



## Key Insights

- ✓ Hawaii has the lowest vacancy rate at 0%, indicating high housing utilization
- ✓ Delaware has the highest vacancy rate at 14%, suggesting potential oversupply or accessibility issues
- ✓ Seven of the top 10 states have vacancy rates between 5-10%, indicating moderate housing market balance

## Vacancy Rate Bar graph

- ℹ States with higher vacancy rates may indicate potential opportunities or challenges in housing market efficiency



# Demographic Profile of Public Housing Residents

The demographic analysis of public housing residents reveals key insights into household composition and racial distribution.



## Total Households

785,648



## Avg. Household Size

2.02

people per household

## Racial Composition

Minority households represent 71.7% of the total, with Black households making up 41.7% and Hispanic households 26.1% of all units.



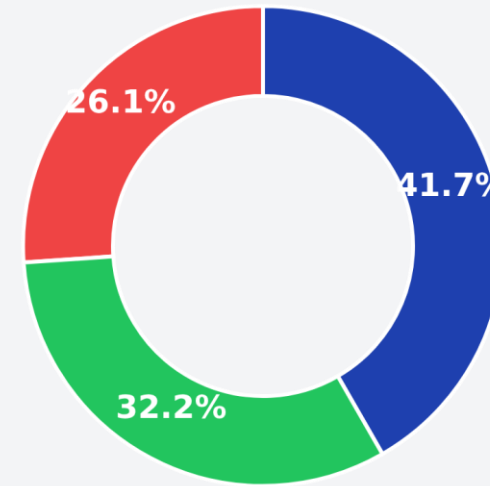
Black (41.7%)



Hispanic (26.1%)



Other (32.2%)



Minority households represent 71.7% of public housing units

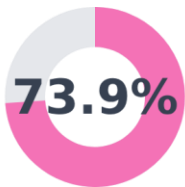


# Vulnerable Populations Analysis

Public housing serves diverse vulnerable populations requiring policy prioritization.



## Female-Headed Households



73.9%

of all households

30.9% are female-headed families with children



## Elderly Residents



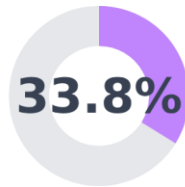
26.8%

of all residents

Percentage of elderly in population



## Disabled Population



33.8%

of non-elderly residents

Have disabilities requiring accessible housing

**i** These vulnerable populations should be prioritized in policy discussions and resource allocation.



# Household Income Statistics

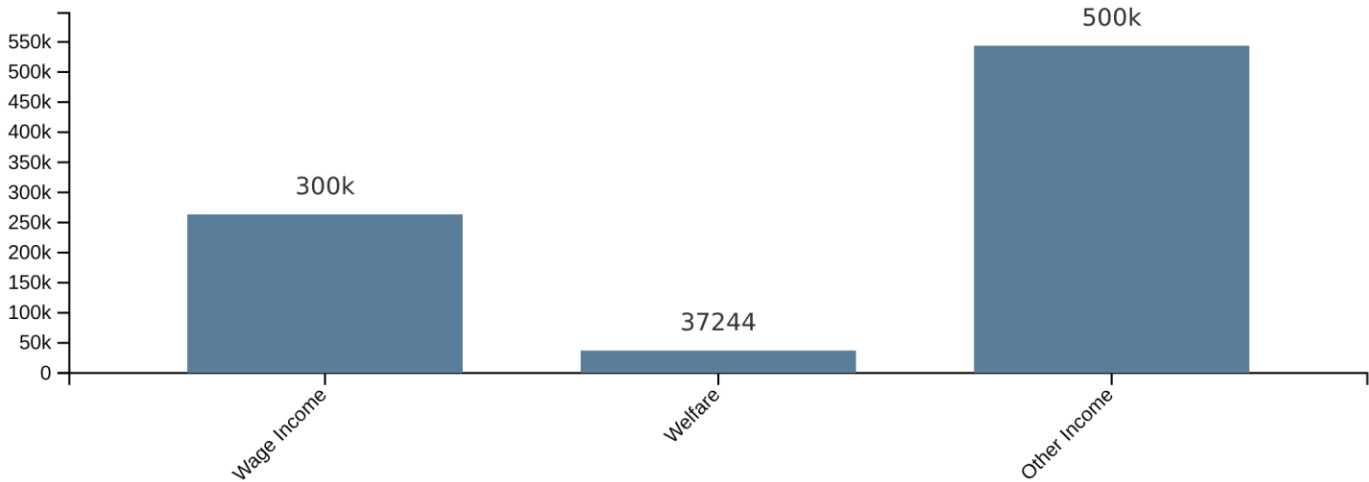
## \$ Average Household Income

**\$18,587**

Annual household income

i 474,659 households earn at least \$18,000 annually

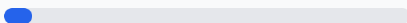
## Income Sources Breakdown



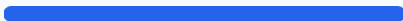
Wage  
Income **263,452**



Welfare **37,244**

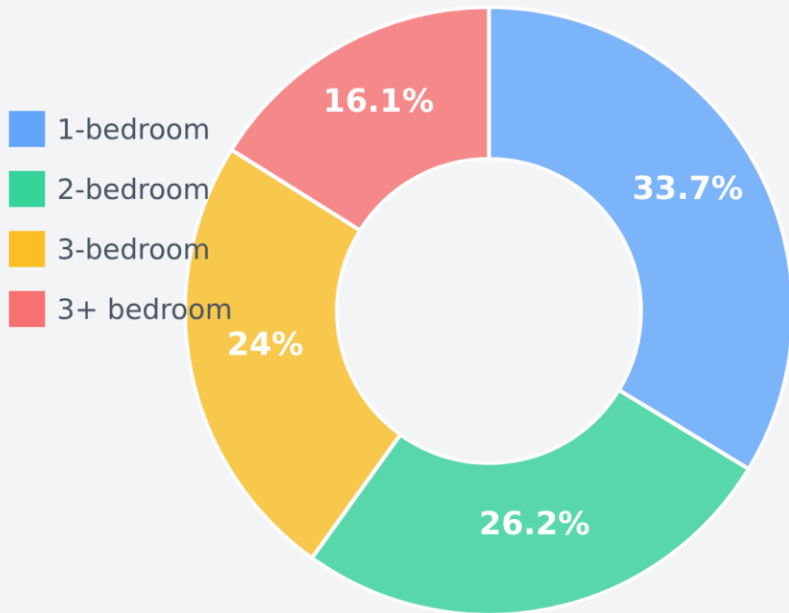


Other  
Income **543,678**





# Housing Unit Distribution by Size




*Distribution of public housing units by bedroom count*

## Unit Size Distribution

Public housing units are distributed across four bedroom categories, with clear preferences for certain unit sizes.

### Key Insights:

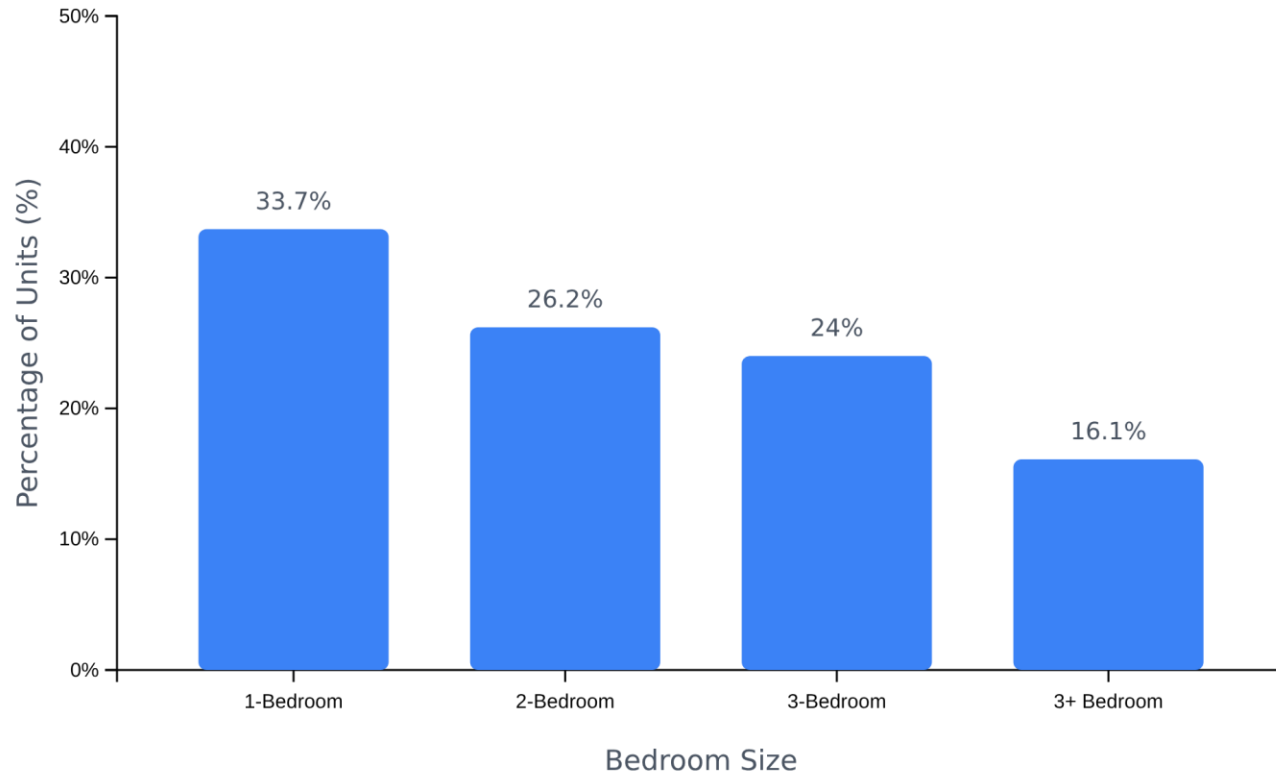
- ✓ 1-bedroom units are most common, representing **33.7%** of all units
- ✓ Combined 2 and 3-bedroom units represent **50.2%** of the inventory
- ✓ Large units (3+ bedrooms) make up **16.2%** of available housing

 The distribution suggests a higher demand for smaller units, which may indicate a higher proportion of single-person households or couples without children in the public housing population.



# Income Distribution Across Unit Types

Housing Unit Distribution by Bedroom Size



## \$ Average Household Income

**\$18,587**

Overall average household income

## Income Sources

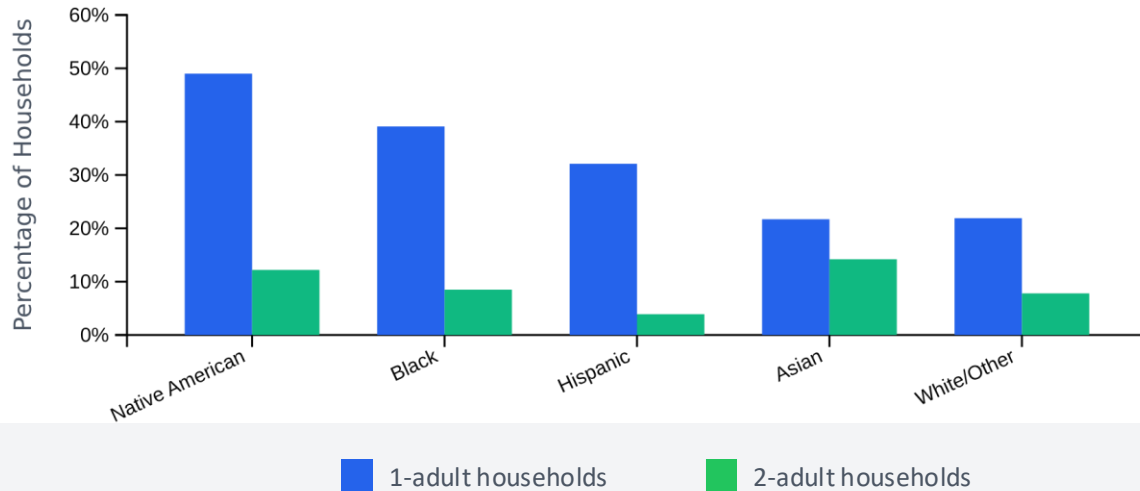
 Wages	263,452 households
 Welfare	37,244 households
 Other Income	543,678 households

**Key Insight:** 474,659 households earn at least \$18,000 annually, which is a significant portion of the public housing population.



# Household Composition by Race

Percentage of Households by Race and Adult Composition



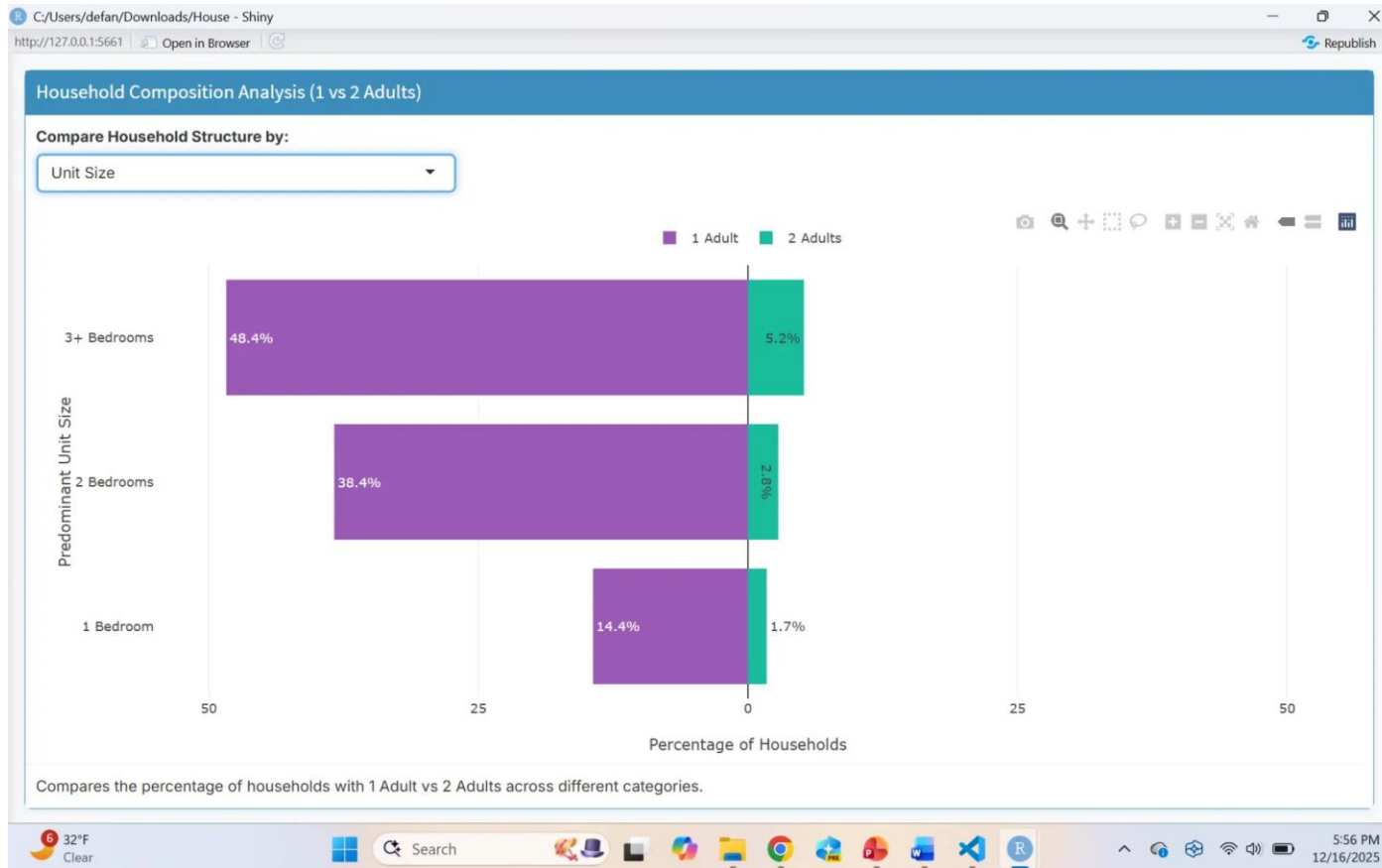
## Key Insights

- Native American households have highest 1-adult rate (49%)
- Asian households have highest 2-adult rate (14.2%)
- Hispanic households show second-highest 1-adult rate (32.1%)
- All racial groups show higher 1-adult rate than 2-adult





# Household Composition by Unit Size



## Key Insights

- ✓ 1-adult households are significantly more common across all unit sizes
- ✓ Both 1-adult and 2-adult households tend to reside in larger units
- ✓ Large units (3+ bedrooms) are more likely to be occupied by 1-adult households

### 1-Bedroom Units

**14.4%**  
1 Adult

**1.7%**  
2 Adults

### 2-Bedroom Units

**38.4%**  
1 Adult

**2.8%**  
2 Adults

### 3+ Bedroom Units

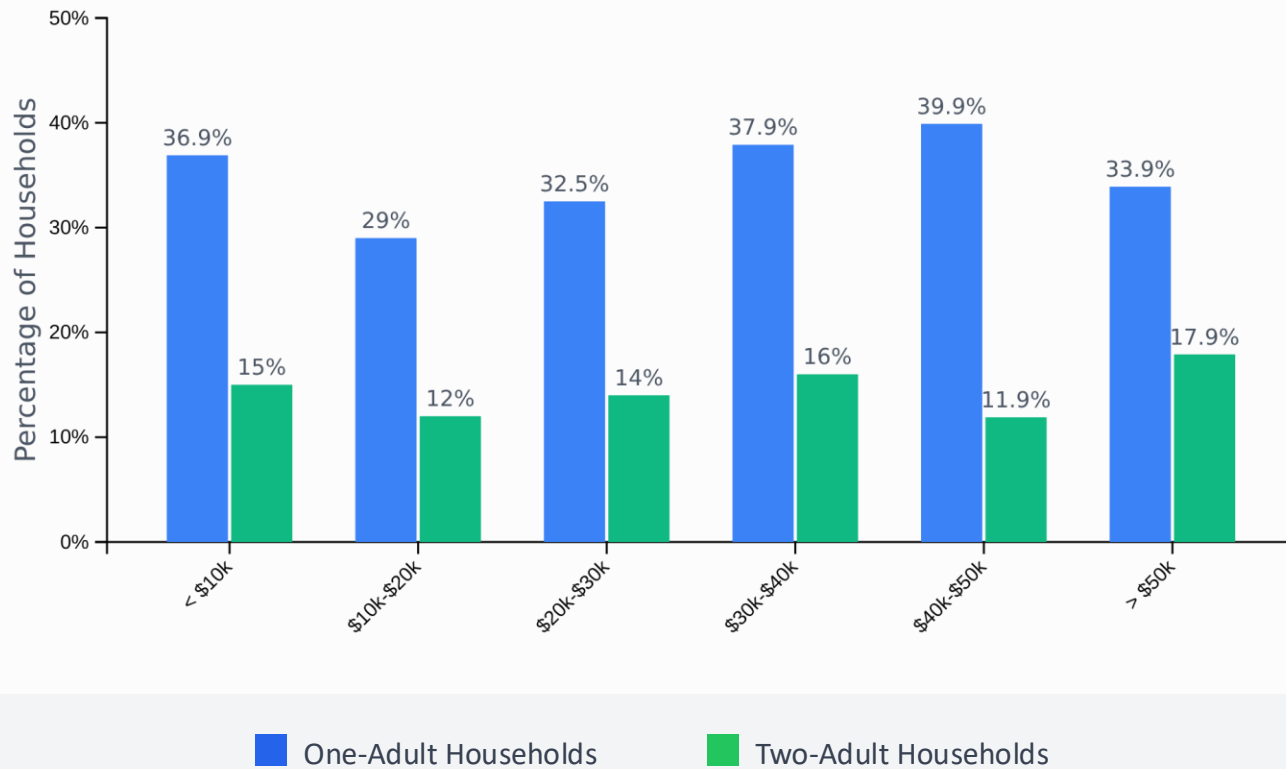
**48.4%**  
1 Adult

**5.2%**  
2 Adults



# Household Composition by Income Level

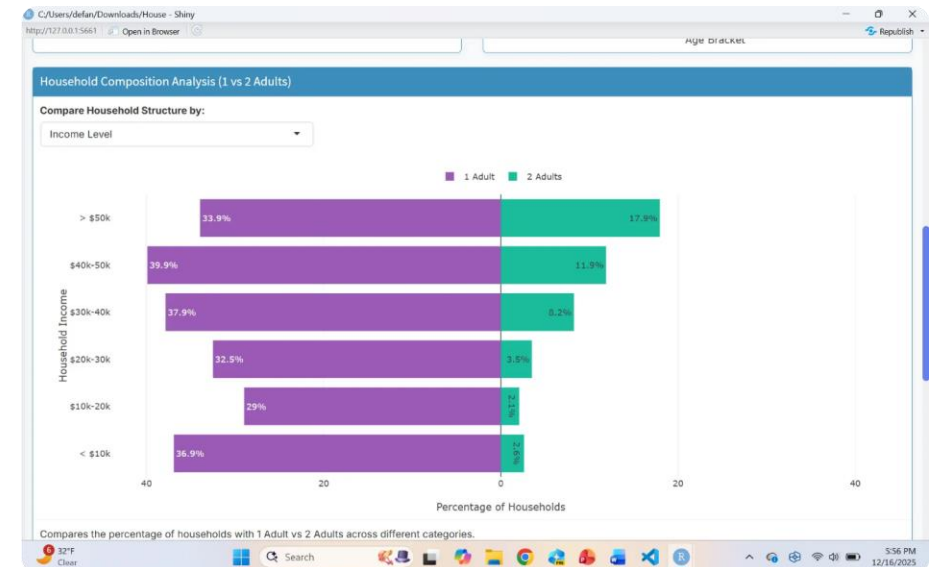
Analysis shows 1-adult households consistently exceed two-adult households across all income brackets, with the gap widening at lower income levels.



## Key Insights

- One-adult households dominate across all income levels
- Largest disparity in lower income brackets

## Income Distribution Data





# Households with Children Analysis

Analysis of household composition among families with children in public housing reveals important patterns about family structure and housing needs.



## Dominant Household Structure

A clear majority (91%) of households with children are headed by a single adult, highlighting the prevalence of single-parent households in the public housing system.



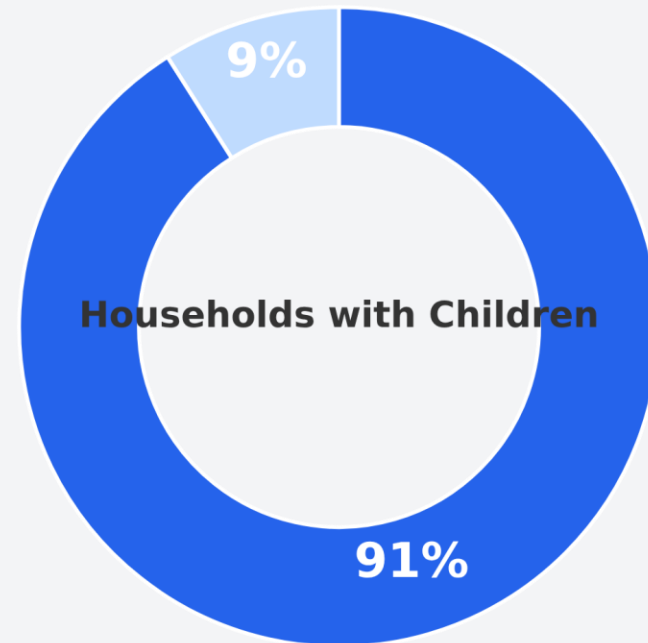
## Implications for Housing Policy

The high percentage of single-parent households suggests a need for housing policies that address the specific needs of these families, including larger unit sizes and support services.



## Comparative Analysis

The 9% of households headed by two adults represent an important minority group that often requires different housing considerations than single-parent households.



■ One Adult Head (91%)

■ Two Adult Heads (9%)



# Statistical Analysis of Rent Price Factors

## Regression Analysis Results

A multiple linear regression model and an OLS model was employed to identify key predictors of rent prices in public housing units.

### Model Performance

R-squared: 7.8%

Model has low explanatory power, capturing only 7.8% of rent variance

### Strongest Predictor

Overhoused Units (%)

Identified as the strongest predictor of rent prices

### Bedroom Size Impact

Explains only ~40% of rent price variance

Income is a stronger predictor than bedroom size

## Regression Output

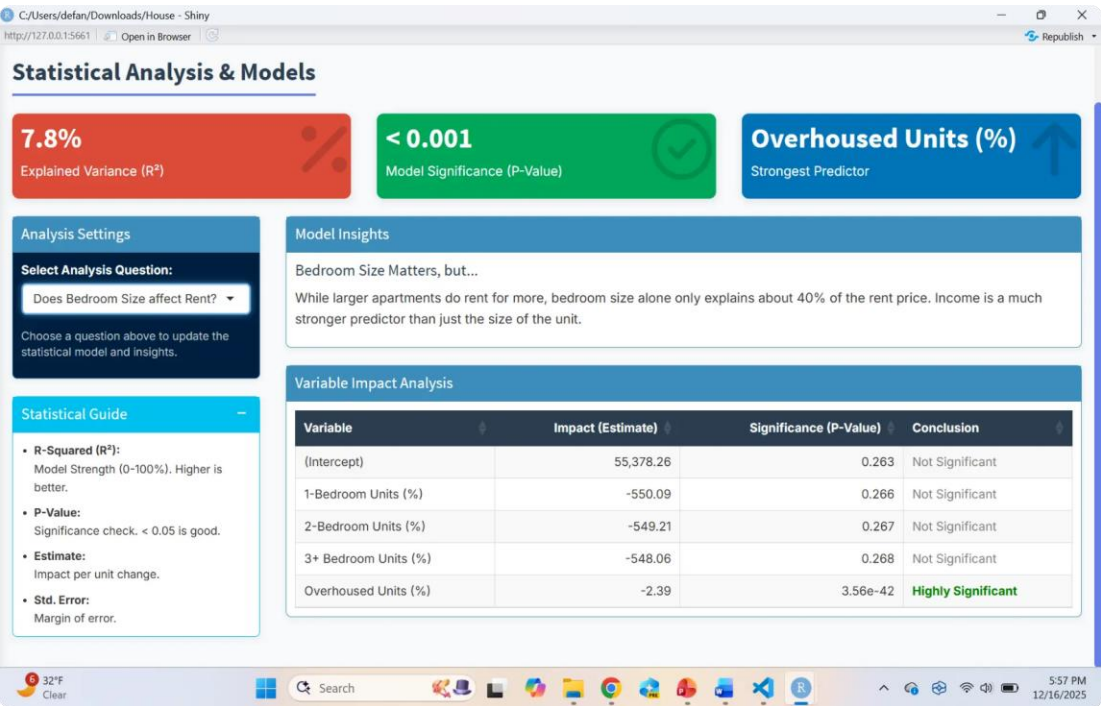


Figure 1: Statistical output from regression analysis

### Key Insight

Variables related to percentage of different bedroom unit types were not statistically significant ( $P > 0.05$ ).



# Model Performance and Significance

## Model Overview

Statistical analysis of factors affecting rent prices. R-squared = 0.078, explaining 7.8% of variance.

√x R-squared  
**7.8%**  
Low explanatory power

📊 P-value  
**< 0.001**  
High model significance

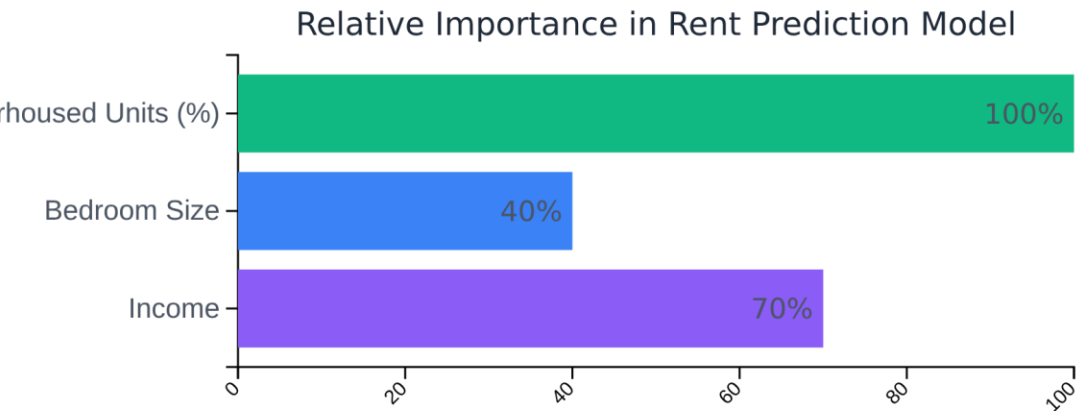
### 📈 Strongest Predictor

🏠 Overhoused Units (%)  
Identified as the strongest predictor

### ✅ Statistical Significance

- Model is statistically significant (P-value < 0.001)
- Income is a stronger predictor than bedroom size
- Percentage of bedroom unit types not significant

## Factor Importance in Rent Prediction



📌 Income shows stronger correlation with rent prices



# Key Findings and Insights

## Population & Demographics

- ✓ 785,648 total households with average size of 2.02 people
- ✓ 62.2% minority representation (560,962 units)
- ✓ 73.9% female-headed households (30.9% with children)

## Household Composition

- ✓ 1-adult households more prevalent across all demographic groups
- ✓ Native American households show highest percentage of 1-adult households (49%)
- ✓ Asian households have highest percentage of 2-adult households (14.2%)

## Financial Insights

- ✓ Average rent: \$412 | Median household income: \$18,254
- ✓ 474,659 households earning  $\geq$  \$18k
- ✓ Major income sources: Wage (263,452), welfare (37,244), other (543,678)

## Rent Price Factors

- ✓ "Overhoused Units (%)" strongest predictor (R-squared 7.8%)
- ✓ Bedroom size explains only ~40% of rent price variation
- ✓ Income is a stronger predictor of rent than unit size



# Policy Implications and Recommendations

Data-driven insights from the public housing dashboard analysis provide a foundation for targeted policy interventions. These recommendations aim to address key challenges and leverage opportunities identified in the data.



## Demographic Targeting

- ✓ Address disparity in minority representation (62.2%) through targeted funding
- ✓ Develop programs for female-headed households (73.9%)



## Income Support

- ✓ Strengthen rent assistance programs given median income of \$18,254
- ✓ Address financial vulnerability of households with children



## Housing Unit Distribution

- ✓ Address preference for larger units (33.7% 1-bedroom, 26.2% 2-bedroom)
- ✓ Encourage mixed-income developments to reduce concentration of poverty



## Family Structure

- ✓ Develop support programs for single-adult households (91% of households with children)
- ✓ Address needs of elderly residents (26.8%) and residents with disabilities (33.8%)



# Acknowledgments

Thank you to all the data sources and contributors who made this analysis possible



## Data Sources

- ✓ National Public Housing Database
- ✓ U.S. Census Bureau
- ✓ Department of Housing and Urban Development



## Professors

- Saidi Rachel
- Perine Lori
- Alraee Mais
- Mohamed Abdirisak



## Technical Support

- ⚙️ Data Visualization Libraries
- ⚙️ VS code
- ⚙️ All AI agents



## People

- Piushani Sandarekha
- Andre Warsaw
- Arash Nateghian