

Housing-Affordability Wage: A Data-Driven Framework Using Congressional District Rental Data to Estimate Housing-Affordability Wages

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Executive Summary

Problem

Housing costs vary substantially across the United States, yet discussions of wage adequacy are often framed around a single national figure. As a result, measures of affordability may overlook significant differences in local housing markets.

Proposed Framework

This paper introduces the Housing-Affordability Wage (HAW), a metric designed to estimate the hourly wage required for a worker employed 40 hours per week to afford a median one-bedroom rental unit while keeping housing costs within a commonly accepted affordability threshold.

Methodology

$$HAW = \frac{3 \text{ (Median Monthly Gross Rent)}}{173.33}$$

Key Findings

Housing-Affordability Wages ranged from \$8.86 per hour to \$52.58 per hour across Congressional Districts, reflecting wide differences in housing affordability requirements nationwide. The national median Housing-Affordability Wage was \$19.68 per hour, while the national mean was \$20.94 per hour. The highest Housing-Affordability Wage districts were concentrated within a small number of major metropolitan housing markets, particularly in California and New York. State-level analysis further revealed that substantial affordability differences may exist not only between states, but also among Congressional Districts within the same state.

Conclusion

Housing affordability is widely recognized as one of the most significant economic challenges facing many households across the United States. The framework presented in this paper offers a simple, transparent, and data-driven method for relating local housing costs to local wage levels. By grounding the discussion in publicly available data and clearly stated assumptions, the Housing-Affordability Wage model provides a common reference point for evaluating wage adequacy across different communities and over time.

Because the framework relies upon publicly available Census data and a documented methodology, future updates can be produced as new ACS 5-Year Estimates become available.

The results demonstrate that housing affordability requirements differ significantly across the United States. By applying a consistent methodology to publicly available rental data, the Housing-Affordability Wage framework provides a practical benchmark for evaluating

and comparing housing affordability across Congressional Districts, states, and regions.

Understanding Housing-Affordability Wage Values

Example

HAW	Interpretation
\$10/hr	Lower-cost rental market
\$20/hr	Near national median*
\$30/hr	High-cost rental market
\$50/hr	Among the highest-cost districts in the nation*

* Relative to the ACS dataset used for this analysis.

1. Introduction

Housing has long been recognized as one of the largest recurring expenses faced by households in the United States. While the cost of food, transportation, healthcare, and other necessities can vary by region, housing often represents the single largest component of a household's monthly budget. As a result, the relationship between wages and housing costs plays an important role in determining overall economic affordability and financial stability.

Discussions surrounding wage adequacy are frequently framed around a single national figure. However, housing costs vary substantially across the country. A wage level that may provide adequate housing affordability in one region may be insufficient in another, while the same wage may exceed local housing affordability requirements elsewhere.

This paper proposes a Housing-Affordability Wage (HAW) framework that estimates the hourly wage required for a worker employed 40 hours per week to afford a median one-bedroom rental unit while maintaining housing costs at or below a commonly accepted affordability threshold.

To account for geographic variation, the framework uses Congressional Districts as its primary unit of analysis. Congressional Districts provide a practical geographic boundary that is already widely used for demographic, economic, and governmental reporting.

The objective of this paper is not to prescribe a specific wage level or policy outcome. Instead, it seeks to establish a consistent methodology for estimating Housing-Affordability Wages using publicly available rental data and clearly stated assumptions.

2. Assumptions & Methodology

Housing-Affordability Wage (HAW)

The hourly wage required for a worker employed 40 hours per week to afford the median one-bedroom rental unit while keeping housing costs at or below one-third of gross income.

2.0 Housing Affordability Threshold

Housing affordability has been examined extensively by federal agencies, academic researchers, and housing policy organizations. Relevant contributions include analyses published by the Congressional Research Service (CRS), the Joint Center for Housing Studies (JCHS) of Harvard University, and the National Low Income Housing Coalition.¹

The Housing-Affordability Wage framework assumes that housing costs should not exceed one-third (33%) of a worker's gross income. This assumption provides a simple and transparent affordability benchmark while remaining broadly consistent with the 30% housing affordability standard commonly used by housing researchers, government agencies, and housing policy organizations to identify housing cost burdens.²

The HAW framework adopts a one-third (33%) affordability threshold rather than the traditional 30% benchmark for practical and computational simplicity. The difference between the two thresholds is modest, and both represent similar housing affordability concepts. Because one-third can be expressed directly as a simple ratio between housing costs and income, it provides a transparent and easily reproducible calculation framework while remaining broadly consistent with the long-established 30% housing affordability standard used throughout housing research and policy analysis.

Under this convention, households spending more than approximately one-third of their income on housing are generally considered to experience increasing financial pressure from housing costs, while households spending substantially more than this threshold are often classified as housing cost-burdened.

The purpose of this threshold is not to define an ideal household budget or estimate the full

¹ U.S. Congressional Research Service, *Housing Affordability in the United States: Trends and Policy Considerations* (Washington, DC: Congressional Research Service, 2024); Joint Center for Housing Studies of Harvard University, *America's Rental Housing 2024* (Cambridge, MA: Harvard University, 2024); National Low Income Housing Coalition, *Out of Reach 2024: The High Cost of Housing* (Washington, DC: National Low Income Housing Coalition, 2024)

² See U.S. Department of Housing and Urban Development (HUD), National Low Income Housing Coalition (NLIHC), and Joint Center for Housing Studies of Harvard University for discussion of the 30 percent housing affordability benchmark.

cost of living. Rather, it establishes a consistent basis for relating local housing costs to local wage levels within the Housing-Affordability Wage framework.

2.1 Housing Unit Selection

The Housing-Affordability Wage (HAW) framework uses the median monthly rent of a one-bedroom apartment as its primary housing metric. The framework adopts a median one-bedroom rental unit as a practical baseline housing reference. While commonly used housing affordability standards are generally applied to households regardless of housing type, the use of a one-bedroom unit provides a consistent and widely available housing metric that minimizes assumptions regarding household size, dependents, or shared living arrangements.

Several alternative housing measures were considered. Studio apartments may provide a lower-cost housing option in some markets but are not consistently available across all regions and may vary substantially in size, availability, and amenities. Larger housing units, such as two-bedroom or three-bedroom apartments, introduce assumptions regarding family size, dependents, or other household characteristics that fall outside the scope of this framework.

A one-bedroom apartment represents an independent housing unit that is commonly available in most housing markets and does not require assumptions regarding roommates, spouses, dependents, or other household members. This allows the framework to evaluate housing affordability using a single, measurable housing reference that can be applied consistently across different geographic regions.

The HAW framework uses median rental rates rather than average rental rates whenever possible. Median values are generally less affected by unusually high or unusually low rental prices and therefore provide a more representative measure of typical market conditions within a given area.³

Selecting a median one-bedroom apartment does not define an ideal housing outcome or establish a minimum housing standard. Rather, it provides a practical, transparent, and reproducible reference point for estimating Housing-Affordability Wages across Congressional Districts and over time.

³ Median values are frequently used in housing market analysis because they are less sensitive to extreme observations than arithmetic averages and therefore often provide a more representative measure of typical conditions. See U.S. Census Bureau, *American Community Survey Design and Methodology*.

2.2 Standardized Work-Hour Assumption

The Housing-Affordability Wage (HAW) framework assumes a full work week schedule of 40 hours per week. To convert weekly earnings into a monthly equivalent, the framework uses the average number of weeks in a calendar year divided by twelve months:

$$40 \text{ hours/week} \times 52 \text{ weeks/year} = 2,080 \text{ hours/year}$$

$$\frac{2,080 \text{ hours/year}}{12 \text{ months/year}} = 173.33 \text{ hours/month}$$

As a result, the HAW framework assumes 173.33 working hours per month when estimating the hourly wage required to support a given level of housing affordability.

A simplified monthly work-hour assumption is sometimes calculated as:

$$40 \text{ hours/week} \times 4 \text{ weeks/month} = 160 \text{ hours/month}$$

While this approach is easy to calculate, it understates the average number of working hours in a calendar month because most months contain more than exactly four weeks. Using 173.33 hours per month more accurately reflects a full calendar year of work distributed evenly across twelve months.

The HAW framework does not attempt to account for overtime, seasonal employment, unpaid leave, variable schedules, or differences in labor force participation. Instead, the 40-hour workweek is used as a standardized work-hour assumption that can be applied consistently across geographic regions and time periods.

The purpose of this assumption is not to represent every worker's individual circumstances. Rather, it establishes a common and reproducible basis for comparing housing affordability and wage adequacy across Congressional Districts. By applying a consistent 40-hour workweek assumption, differences in Housing-Affordability Wages are driven primarily by differences in local housing costs rather than differences in work-hour assumptions.

2.3 Geographic Unit Selection

Congressional Districts were selected as the primary geographic unit because they provide a direct connection between housing affordability conditions and federal representation. Each district is represented by a single elected member of the United States House of Representatives, allowing Housing-Affordability Wage (HAW) estimates to be associated with a clearly defined constituency and its representative within the federal legislative process.

In addition to their representational significance, Congressional Districts provide a

standardized geographic framework that exists nationwide and can be compared consistently across states and regions. Because districts are designed to contain roughly similar population sizes, district-level comparisons may provide a more uniform basis for analysis than many alternative geographic units.

The use of Congressional Districts also allows HAW estimates to be communicated in a manner that is familiar to policymakers, researchers, journalists, and constituents. By providing district-level estimates derived from a consistent methodology, the framework enables housing affordability conditions to be evaluated and compared across Congressional Districts throughout the United States.

Alternative geographic units were considered, including ZIP codes, counties, and Metropolitan Statistical Areas (MSAs). While these geographic units may offer advantages for certain types of economic or housing-market analysis, they do not consistently provide a direct relationship between a population and a single federal representative. ZIP codes may span multiple political jurisdictions, while metropolitan areas frequently encompass multiple Congressional Districts and representatives.

Because one of the objectives of the HAW framework is to provide a consistent and comparable measure of housing affordability that can be associated with a clearly defined constituency and its representative, Congressional Districts were selected as the primary geographic unit of analysis.

2.4 Data Sources

The Housing-Affordability Wage (HAW) framework prioritizes transparent, reproducible, and nationally available data sources. Preference is given to federal data sources whenever practical in order to maximize accessibility, methodological consistency, long-term availability, and independent verification. A fundamental objective of the framework is that readers should be able to obtain the underlying data, reproduce the calculations, and independently verify the results.

Primary Rental Data Source

The primary rental data source for the HAW framework is the U.S. Census Bureau American Community Survey (ACS) 5-Year Estimates Detailed Table B25031, "Median Gross Rent by Bedrooms."⁴ This table provides median gross rent estimates for rental units categorized by bedroom count, including studio, one-bedroom, two-bedroom, three-bedroom, and four-or-more-bedroom units.

⁴ U.S. Census Bureau, American Community Survey (ACS) Detailed Table B25031, "Median Gross Rent by Bedrooms," 2020–2024 5-Year Estimates.

The ACS 5-Year Estimates⁵ were selected because they provide nationwide geographic coverage, publicly available methodology, long-term consistency, and sufficient sample sizes for both urban and rural geographies. Congressional Districts are a supported reporting geography within the ACS program, allowing rental estimates to be obtained directly from Census products without requiring additional geographic interpolation, statistical estimation, or boundary conversion methods.

The use of ACS 5-Year Estimates also reduces the influence of short-term market fluctuations and improves estimate stability for less densely populated districts. The framework intentionally prioritizes data stability and methodological consistency over short-term market responsiveness. As a result, the HAW framework is intended to reflect underlying housing affordability conditions rather than temporary year-to-year market movements.

For purposes of the HAW framework, the median gross rent value reported for one-bedroom rental units is used as the primary housing-cost input. The framework's selection of a one-bedroom apartment as its baseline housing unit aligns directly with the bedroom-specific data available within ACS Table B25031.

Readers may independently obtain the source data through the U.S. Census Bureau's data portal using ACS 5-Year Estimates Detailed Table B25031 and reproduce the calculations presented within this framework.

Gross Rent Methodology

The HAW framework utilizes median gross rent values rather than contract rent values. Gross rent includes both contract rent and applicable tenant-paid utilities and therefore provides a more comprehensive measure of housing cost burden.

Gross rent is the housing-cost measure reported directly by ACS Table B25031 and therefore allows the framework to utilize published Census estimates without requiring additional housing-cost adjustments or assumptions.

The framework evaluates housing affordability rather than lease affordability. As a result, gross rent is considered the more appropriate housing-cost metric because it more closely reflects the total recurring housing expense experienced by renters. The use of gross rent also aligns with commonly used housing affordability measures and provides a more consistent basis for comparison across geographic regions.

Validation and Comparison Sources

While ACS Table B25031 serves as the primary rental data source, additional housing datasets may be used for validation and comparison purposes.

⁵ The ACS 5-Year Estimates combine five years of survey responses to improve statistical reliability and geographic coverage, particularly for smaller populations and geographies. See U.S. Census Bureau, *American Community Survey Design and Methodology*.

HUD Fair Market Rent (FMR) estimates⁶ provide a widely recognized federal housing benchmark and may be used to compare district-level rental values against established housing policy metrics. However, HUD Fair Market Rent estimates are not used as the primary rental input for the HAW framework because they represent a housing policy benchmark rather than a median market rent measure.

The National Low Income Housing Coalition (NLIHC) Housing Wage⁷ may also be used as a comparative affordability benchmark. Because the NLIHC Housing Wage utilizes a different affordability threshold and housing cost methodology, it serves as an independent point of comparison rather than a direct component of the HAW calculation process.

The inclusion of HUD Fair Market Rent and NLIHC Housing Wage data as comparison benchmarks allows readers to cross-reference HAW calculations against other widely recognized housing affordability measures while preserving the distinct methodology and objectives of the HAW framework.

Data Vintage Identification

All HAW calculations should identify the ACS 5-Year dataset used (e.g., ACS 2020–2024 5-Year Estimates) to ensure transparency regarding the underlying data vintage. Identifying the specific ACS dataset allows readers to verify calculations, assess the timeliness of the underlying information, and reproduce results using the same source data.

Data Update Frequency

The HAW framework is intended to be updated following the release of new American Community Survey (ACS) 5-Year Estimates. Because the framework relies upon ACS 5-Year Estimates Detailed Table B25031 as its primary rental data source, each new ACS 5-Year release provides the basis for a corresponding update of Housing-Affordability Wage calculations.

The use of ACS 5-Year Estimates prioritizes estimate stability and nationwide geographic coverage over short-term market responsiveness. As a result, the framework is intended to reflect underlying housing affordability conditions rather than year-to-year market fluctuations.

At the time of publication, the framework utilizes the most recent ACS 5-Year Estimates available from the U.S. Census Bureau. Users of the framework should identify both the ACS dataset used and the anticipated release of the subsequent ACS 5-Year dataset in order to evaluate data freshness and determine when updated HAW calculations may be appropriate.

⁶ Fair Market Rents (FMRs) are published annually by the U.S. Department of Housing and Urban Development and are widely used in federal housing programs as housing cost benchmarks

⁷ The National Low Income Housing Coalition's Housing Wage estimates the hourly wage required to afford rental housing at established affordability thresholds and serves as a commonly referenced housing affordability benchmark.

Reproducibility

The HAW framework is designed to be fully reproducible using federal data sources. By documenting both the rental data source and the calculation methodology, researchers, policymakers, journalists, and members of the public can independently verify the framework's results and update calculations as new ACS data become available.

The framework intentionally relies upon data sources that are nationally available, transparent, and supported by established methodologies. This approach minimizes dependence upon proprietary datasets, encourages independent verification, and supports long-term maintenance of the framework as new housing data become available.

2.5 HAW Calculation Methodology

The assumptions established in Sections 2.0 through 2.4 provide the inputs necessary to calculate a Housing-Affordability Wage (HAW). Specifically, the framework utilizes:

- A housing affordability threshold of one-third (33%) of gross income.
- A median one-bedroom gross rent value.
- A standardized 40-hour workweek assumption of 173.33 hours per month.
- Rental data obtained from ACS 5-Year Estimates Detailed Table B25031.

The Housing-Affordability Wage (HAW) represents the hourly wage required for a worker employed 40 hours per week to afford a median one-bedroom rental unit while maintaining housing costs at or below one-third of gross income.

The calculation begins with the median gross monthly rent for one-bedroom rental units reported by ACS Table B25031.

Because housing costs are assumed to represent one-third of gross income, the monthly income required to support a given rent level is calculated as:

$$\text{Required Monthly Income} = 3 \times \text{Median Monthly Gross Rent}$$

The framework then converts required monthly income into an hourly wage equivalent using the standardized 40-hour workweek assumption of 173.33 working hours per month.

The Housing-Affordability Wage is therefore calculated as:

$$HAW = \frac{3R}{173.33}$$

Where:

HAW	Housing-Affordability Wage (hourly wage)
R	Median gross monthly rent for one-bedroom rental units reported by ACS Table B25031
173.33	Average monthly working hours based on a 40-hour workweek and 2,080 annual working hours

Supporting Measures

In addition to the Housing-Affordability Wage itself, the framework produces two related supporting measures:

Required Monthly Income

$$\text{Required Monthly Income} = 3 \times \text{Median Monthly Gross Rent}$$

Required Annual Income

$$\text{Required Annual Income} = \text{Required Monthly Income} \times 12$$

These values are calculated directly from the underlying affordability methodology and may provide additional context for readers who are more familiar with monthly earnings or annual salaries than hourly wage rates.

Annual income also provides a useful reference for evaluating both hourly and salaried compensation against the HAW framework. While Housing-Affordability Wages are expressed as hourly rates for consistency, many occupations and compensation packages are commonly discussed in terms of annual salary. Reporting both annual income and hourly wage equivalents allows a broader range of workers, employers, researchers, and policymakers to compare compensation levels against the framework's affordability benchmark.

Example Calculation

Assume that ACS Table B25031 reports a median gross rent of \$1,500 per month for one-bedroom rental units within a Congressional District.

Step 1: Calculate Required Monthly Income

$$\text{Required Monthly Income} = 3 \times \$1,500$$

$$\text{Required Monthly Income} = \$4,500 \text{ per month}$$

Step 2: Calculate Required Annual Income

$$\text{Required Annual Income} = \$4,500 \times 12$$

$$\text{Required Annual Income} = \$54,000 \text{ per year}$$

Step 3: Convert Monthly Income to Hourly Wage

$$HAW = \frac{\$4,500}{173.33}$$

$$HAW = \$25.96 \text{ per hour}$$

Under the assumptions of the HAW framework, a worker would require approximately \$54,000 in annual gross income.

Interpretation

The Housing-Affordability Wage is not intended to prescribe a specific wage level. Rather, it represents a calculated affordability benchmark derived from local housing costs and a standardized set of assumptions.

Differences in Housing-Affordability Wages across Congressional Districts are therefore driven primarily by differences in local housing costs rather than differences in work-hour

assumptions, household composition, or affordability thresholds.

As a result, the HAW framework provides a consistent measurement basis for comparing housing affordability conditions across geographic regions and over time while maintaining a transparent and reproducible methodology.

2.6 Scope & Limitations

The Housing-Affordability Wage (HAW) framework is intended to provide a transparent, reproducible, and geographically comparable measure of housing affordability. The limitations described below define the scope within which HAW estimates should be interpreted.

Housing Affordability vs. Total Cost of Living

The HAW framework measures housing affordability rather than total cost of living. While housing represents one of the largest recurring expenses faced by many households, other expenses such as transportation, healthcare, childcare, food, tax obligations, and regional price differences may also influence overall economic affordability. As a result, HAW should be interpreted as a housing affordability benchmark rather than a comprehensive cost-of-living measure.

Median Rent and Individual Circumstances

The framework utilizes median gross rent values as a representative measure of typical housing costs within a Congressional District. Individual housing circumstances may differ substantially due to variations in housing quality, location, household composition, rental arrangements, housing subsidies, homeownership, or other factors. Consequently, HAW estimates should be interpreted as district-level affordability measures rather than estimates for any specific individual or household.

Congressional District Geography

Congressional Districts were selected because they provide a consistent and nationally recognized geographic unit associated with direct federal representation. However, housing markets do not necessarily align with Congressional District boundaries. In addition, Congressional District boundaries may change over time through the redistricting process. Readers comparing HAW estimates across multiple time periods should consider the potential impact of geographic boundary changes on district-level comparisons.

ACS Estimates and Sampling Error

The HAW framework relies upon American Community Survey (ACS) 5-Year Estimates as its primary data source. As with all survey-based estimates, ACS data are subject to sampling error⁸ and associated margins of error reported by the U.S. Census Bureau. While

⁸ As a survey-based product, ACS estimates include margins of error that reflect statistical uncertainty. The use of ACS 5-Year Estimates improves estimate stability relative to shorter survey periods. See U.S. Census Bureau, *American Community Survey Design and Methodology*.

the use of ACS 5-Year Estimates improves statistical stability, reported rental values remain estimates rather than direct measurements of every rental unit within a district.

Compensation and Benefits

The HAW framework evaluates wage income and does not attempt to quantify the value of employer-provided benefits or non-wage compensation. Health insurance, retirement contributions, paid leave, bonuses, housing assistance, and other forms of compensation may affect an individual's overall economic circumstances but are not incorporated into HAW calculations.

Gross Income Assumption

The HAW framework is based upon gross income rather than after-tax income. Federal, state, and local tax obligations can vary substantially across jurisdictions and may also differ based on filing status, deductions, credits, and other individual circumstances. The use of gross income provides a consistent and comparable measurement basis across Congressional Districts while avoiding assumptions regarding individual tax situations. Tax-adjusted affordability measures may be developed as supplemental analyses but are not incorporated into the core HAW calculation.

Data Stability and Responsiveness

The framework intentionally prioritizes data stability and methodological consistency through the use of ACS 5-Year Estimates. This approach reduces the influence of short-term market fluctuations and improves geographic coverage, particularly in less populated areas. However, it may also reduce sensitivity to rapid changes in local housing markets. As a result, HAW estimates should be interpreted as measures of underlying housing affordability conditions rather than real-time housing market indicators.

3. Dataset Construction & Data Collection

The Housing-Affordability Wage (HAW) framework utilizes publicly available American Community Survey (ACS) 5-Year Estimates to construct a geographically comparable dataset of housing affordability metrics for Congressional Districts throughout the United States.

This section describes the process used to assemble the dataset, apply the HAW calculation methodology, and prepare the resulting affordability measures for analysis and comparison.

3.1 Dataset Scope

The dataset consists of Congressional District-level housing affordability measurements derived from the most recent available American Community Survey (ACS) 5-Year Estimates.

The dataset contains all Congressional District geographies reported by the ACS 2020–2024 5-Year Estimates, plus the District of Columbia. Although the District of Columbia does not have voting representation in the House of Representatives, it maintains representation through a congressional delegate and is included for completeness within the dataset.

Each district is assigned a Housing-Affordability Wage (HAW) estimate based upon the methodology described in Section 2.

The resulting dataset provides a standardized affordability measurement that can be compared across Congressional Districts, states, and regions.

All calculations should identify the ACS 5-Year dataset used (e.g., ACS 2020–2024 5-Year Estimates) to ensure transparency regarding the underlying data vintage and reporting period.

3.2 Data Extraction

Rental data are obtained from American Community Survey (ACS) 5-Year Estimates Detailed Table B25031, "Median Gross Rent by Bedrooms."

For each Congressional District, the median gross rent value reported for one-bedroom rental units is extracted and used as the primary housing-cost input for the HAW calculation.

Because Congressional Districts are supported directly within ACS reporting geographies, rental data can be obtained without requiring geographic interpolation, estimation techniques, or boundary conversion procedures.

The use of a single nationally available data source promotes consistency, transparency, and reproducibility throughout the dataset construction process.

3.3 Application of the HAW Methodology

Once rental data have been extracted, the Housing-Affordability Wage calculation described in Section 2.5 is applied to each Congressional District.

For each district, the following values are calculated:

- Median One-Bedroom Gross Rent
- Required Monthly Income
- Required Annual Income
- Housing-Affordability Wage (HAW)

The same calculation methodology is applied uniformly to every district within the dataset. As a result, differences in Housing-Affordability Wage estimates arise from differences in the underlying rental data rather than differences in calculation procedures.

These calculations produce a standardized set of affordability measures that can be compared directly across Congressional Districts.

3.4 Data Validation

The HAW framework emphasizes transparency and reproducibility. As a result, validation procedures focus primarily on confirming the accuracy of source data extraction and calculation methodology.

Validation may include:

- Verification of ACS Table B25031 rental values.
- Independent recalculation of HAW estimates using documented formulas.
- Comparison against HUD Fair Market Rent (FMR) estimates.
- Comparison against National Low Income Housing Coalition (NLIHC) Housing Wage estimates.

These comparison datasets are not used in the HAW calculation itself but may provide useful context and reasonableness checks for observed affordability patterns.

3.5 Reproducibility

A central objective of the HAW framework is that all calculations should be independently reproducible using publicly available data sources and documented formulas.

Readers should be able to obtain the underlying ACS data, apply the methodology described in Section 2, and reproduce the resulting Housing-Affordability Wage estimates without reliance upon proprietary datasets or undisclosed calculation methods.

This emphasis on reproducibility promotes transparency, facilitates independent verification, and supports future updates as new ACS data become available. With the dataset constructed and validated, the next section applies the Housing-Affordability Wage framework to Congressional District geographies and examines the resulting affordability patterns across the United States

4. Congressional District Analysis

The Housing-Affordability Wage (HAW) framework is designed primarily around Congressional Districts as its principal geographic unit of analysis. Congressional Districts provide a nationally consistent framework that preserves meaningful local variation while maintaining direct comparability across states and regions.

Applying the HAW methodology to Congressional District rental data produces a geographically detailed view of housing affordability conditions throughout the United States. This district-level perspective allows affordability patterns to be examined beyond national and statewide averages, revealing differences that may otherwise remain hidden within broader geographic aggregations.

The sections that follow examine national Housing-Affordability Wage statistics, identify districts exhibiting the highest and lowest affordability requirements, evaluate districts near the national median, and explore geographic and statistical patterns present within the overall distribution. Together, these analyses provide the foundation for understanding how housing affordability conditions vary across Congressional Districts and why geographic scale plays an important role in affordability analysis.

4.1 National Overview

The Housing-Affordability Wage (HAW) framework was applied to all Congressional District geographies reported by the ACS 2020–2024 5-Year Estimates, plus the District of Columbia. The resulting dataset provides a national view of housing affordability conditions using a consistent methodology based upon median one-bedroom gross rent and the affordability assumptions described in Section 2.

Across the dataset, the mean Housing-Affordability Wage was \$20.94 per hour, while the median Housing-Affordability Wage was \$19.68 per hour. The minimum observed Housing-Affordability Wage was \$8.86 per hour, while the maximum observed Housing-Affordability Wage was \$52.58 per hour.

The difference between the mean and median values suggests that the national distribution of Housing-Affordability Wages is positively skewed. In practical terms, a relatively small number of high-cost districts increase the national average above the affordability conditions experienced by the typical Congressional District.

The range of observed Housing-Affordability Wages was substantial. The highest Housing-Affordability Wage was approximately 5.9 times greater than the lowest Housing-Affordability Wage. The 10th percentile Housing-Affordability Wage was \$12.71 per hour, while the 90th percentile Housing-Affordability Wage was \$29.82 per hour. These results indicate substantial differences in Housing-Affordability Wages across Congressional Districts.

State-level analysis further suggests that housing affordability differences exist not only between states but also within states. For example, New York exhibited a Housing-Affordability Wage range of approximately \$40.47 per hour between its lowest-cost and highest-cost Congressional Districts. California exhibited a range of approximately \$31.55 per hour. These findings suggest that statewide measures may not fully capture local affordability conditions.

The national statistics presented in this section establish the overall scale and distribution of Housing-Affordability Wage estimates across the United States. Subsequent sections provide additional detail through district-level rankings, percentile analysis, and geographic comparisons, revealing the finer structure of housing affordability conditions both within states and between Congressional Districts.

4.2 Highest Housing-Affordability Wage Districts

The highest Housing-Affordability Wage (HAW) estimates were concentrated within a relatively small number of Congressional Districts located in major metropolitan housing markets. These districts exhibited affordability requirements substantially above both the national mean and national median Housing-Affordability Wage values.

Table 4.1 presents the ten Congressional Districts with the highest Housing-Affordability Wage estimates within the ACS 2020–2024 dataset.

Table 4.1 – Top 10 Housing-Affordability Wage Districts (ACS 2020–2024)

Rank	Congressional District	Housing-Affordability Wage (\$/hr)
1	New York CD-12	\$52.58
2	California CD-17	\$46.78
3	New York CD-10	\$43.10
4	California CD-15	\$43.05
5	California CD-11	\$42.87
6	California CD-14	\$42.06
7	California CD-18	\$41.99
8	California CD-16	\$40.17
9	California CD-12	\$39.95
10	Massachusetts CD-7	\$39.74

Source: Author calculations using ACS 2020–2024 5-Year Estimates, Detailed Table B25031 (Median Gross Rent by Bedrooms). Housing-Affordability Wage calculated according to the methodology described in Section 2. (ACS 2020–2024)

The highest observed Housing-Affordability Wage was \$52.58 per hour in New York Congressional District 12. This value was approximately 2.7 times greater than the national median Housing-Affordability Wage of \$19.68 per hour. Several additional districts within New York and California also ranked among the highest Housing-Affordability Wage estimates, indicating that elevated housing affordability requirements are concentrated

within a limited number of geographic regions rather than distributed uniformly across the United States. Nine of the ten highest Housing-Affordability Wage districts were located in either California or New York, indicating a substantial geographic concentration of the highest affordability requirements within a limited number of metropolitan housing markets.

The concentration of high Housing-Affordability Wage districts within the New York City and San Francisco Bay Area regions is notable because these metropolitan areas contain multiple Congressional Districts ranking among the highest affordability requirements in the nation. While the HAW framework applies a consistent methodology nationwide, variation in local housing costs results in significant differences in the income required to meet the affordability threshold established in Section 2.

The concentration of high Housing-Affordability Wage districts within a limited number of metropolitan regions highlights the localized nature of the nation's highest housing affordability requirements.

4.3 Congressional Districts Closest to the National Median Housing-Affordability Wage

The national median Housing-Affordability Wage (HAW) within the ACS 2020–2024 dataset was \$19.68 per hour. While no Congressional District exactly matched the national median value, several districts exhibited Housing-Affordability Wage estimates that were very close to the center of the national distribution.

Table 4.2 presents the Congressional Districts nearest to the national median Housing-Affordability Wage. These districts provide a useful representation of typical housing affordability conditions within the dataset and offer a point of comparison between the highest- and lowest-ranked districts discussed in Sections 4.2 and 4.4.

Table 4.2 – Congressional Districts Closest to the National Median Housing-Affordability Wage (ACS 2020–2024)

Relative Position	Congressional District	Housing-Affordability Wage (\$/hr)
Median -5	Florida CD-2	\$19.51
Median -4	Texas CD-36	\$19.52
Median -3	South Carolina CD-6	\$19.58
Median -2	Maine CD-1	\$19.61
Median -1	Connecticut CD-2	\$19.66
Median +1	Texas CD-18	\$19.70
Median +2	Texas CD-23	\$19.90
Median +3	North Carolina CD-7	\$19.92
Median +4	Virginia CD-3	\$19.94
Median +5	California CD-20	\$19.96

Source: Author calculations using ACS 2020–2024 5-Year Estimates, Detailed Table B25031 (Median Gross Rent by Bedrooms). Housing-Affordability Wage calculated according to the methodology described in Section 2.

Note: Relative position indicates a district’s rank relative to the national median Housing-Affordability Wage. "Median -1" represents the district immediately below the national median value, while "Median +1" represents the district immediately above the national median value. No Congressional District exactly matched the national median Housing-Affordability Wage of \$19.68 per hour.

Unlike the highest-ranked districts, which were heavily concentrated within California and New York, the districts nearest the national median were distributed across multiple regions of the country. This geographic diversity suggests that housing affordability conditions near the center of the national distribution are not dominated by a single state or metropolitan region.

The Housing-Affordability Wage estimates within the median group cluster closely around the national median value of \$19.68 per hour, indicating that a substantial portion of Congressional Districts experience housing affordability conditions near the center of the national distribution. This contrasts with the relatively small number of districts occupying the highest and lowest ends of the affordability spectrum.

These districts provide a useful reference point for understanding housing affordability conditions near the center of the national distribution and serve as a practical comparison between the highest- and lowest-ranked districts discussed elsewhere in this section.

4.4 Lowest Housing-Affordability Wage Districts

The lowest Housing-Affordability Wage (HAW) estimates represent Congressional Districts where median one-bedroom rental housing can be afforded at comparatively lower wage levels under the assumptions of the HAW framework. These districts occupy the lower end of the national affordability distribution and provide a useful point of comparison to both the highest-ranked districts presented in Section 4.2 and the median districts presented in Section 4.3.

Table 4.3 presents the ten Congressional Districts with the lowest Housing-Affordability Wage estimates within the ACS 2020–2024 dataset.

Table 4.3 – Lowest Housing-Affordability Wage Districts (ACS 2020–2024)

Rank	Congressional District	Housing-Affordability Wage (\$/hr)
1	Kentucky CD-5	\$8.86
2	Arkansas CD-1	\$9.40
3	Missouri CD-8	\$9.69

4	North Carolina CD-1	\$9.97
5	Oklahoma CD-2	\$10.25
6	Illinois CD-12	\$10.25
7	Arkansas CD-4	\$10.44
8	Kentucky CD-1	\$10.45
9	Missouri CD-6	\$10.68
10	Illinois CD-15	\$10.73

Source: Author calculations using ACS 2020–2024 5-Year Estimates, Detailed Table B25031 (Median Gross Rent by Bedrooms). Housing-Affordability Wage calculated according to the methodology described in Section 2.

The lowest Housing-Affordability Wage districts were distributed across multiple states, including Kentucky, Arkansas, Missouri, North Carolina, Oklahoma, and Illinois. Unlike the highest-ranked districts, which exhibited substantial concentration within California and New York, the lowest-ranked districts were spread across several regions of the country. This broader geographic distribution suggests that comparatively low housing affordability requirements occur across a wider range of housing markets than the highly concentrated affordability pressures observed at the upper end of the distribution.

Unlike the highest-ranked districts, which were concentrated within a limited number of major metropolitan regions, the geographic distribution of the lowest Housing-Affordability Wage districts provides insight into where the lowest housing affordability requirements occur. Examination of these districts helps identify regions where housing costs remain comparatively low relative to the national distribution.

4.5 Geographic Patterns

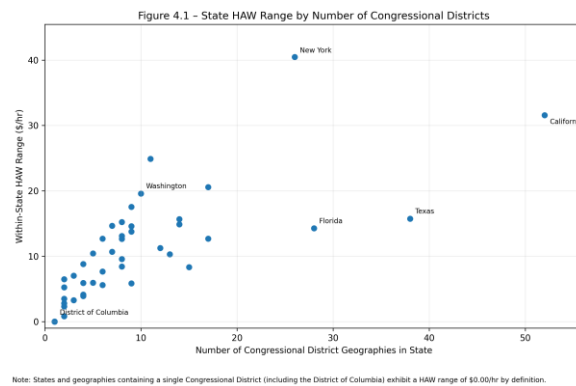
The Housing-Affordability Wage (HAW) dataset reveals several geographic patterns that are not immediately apparent from national summary statistics alone. Examination of district-level results suggests that housing affordability conditions are influenced not only by differences between states, but also by substantial variation within states.

One of the most prominent patterns observed within the dataset is the geographic concentration of the highest Housing-Affordability Wage estimates. As discussed in Section 4.2, nine of the ten highest-ranked Congressional Districts were located in either California or New York. Several of these districts were concentrated within the New York City and San Francisco Bay Area metropolitan regions, indicating that the highest housing affordability requirements are clustered within a relatively small number of major housing markets.

In contrast, Congressional Districts nearest the national median Housing-Affordability Wage were distributed across multiple regions of the United States. The median group included districts located in the Northeast, South, Mid-Atlantic, Texas, and California. This broader geographic distribution suggests that housing affordability conditions near the center of the

national distribution are not dominated by a single state, metropolitan area, or geographic region.

Figure 4.1. State Housing-Affordability Wage Range by Number of Congressional Districts



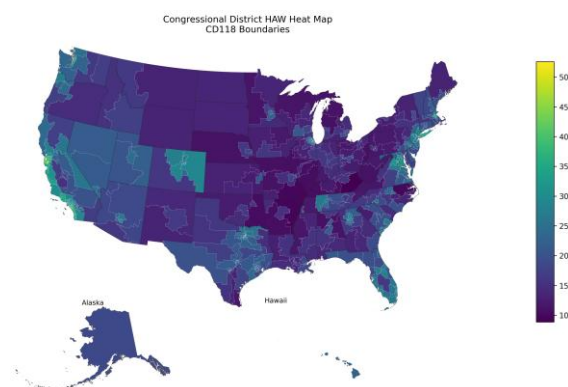
Source: Author calculations using ACS 2020–2024 5-Year Estimates, Detailed Table B25031

The lowest Housing-Affordability Wage districts also exhibited greater geographic dispersion than the highest-ranked districts. Districts within the lowest-ranked group were located across multiple states, including Kentucky, Arkansas, Missouri, North Carolina, Oklahoma, and Illinois. This pattern indicates that comparatively low housing affordability requirements occur across a wider range of housing markets than the highly concentrated affordability pressures observed at the upper end of the distribution.

State-level analysis further revealed substantial differences in district-to-district variation. New York exhibited a Housing-Affordability Wage range of approximately \$40.47 per hour between its lowest-cost and highest-cost Congressional Districts, while California exhibited a range of approximately \$31.55 per hour. In contrast, multi-district states such as Rhode Island and West Virginia exhibited district-to-district ranges of less than \$1.00 per hour. These results suggest that housing affordability conditions are relatively uniform within some states while varying dramatically within others.

Figure 4.2 illustrates the geographic distribution of Housing-Affordability Wage estimates across Congressional Districts. The visualization highlights several regional affordability patterns discussed throughout this section, including concentrations of higher Housing-Affordability Wages in major metropolitan regions and comparatively lower values across much of the interior United States.

Figure 4.2. Congressional District Housing-Affordability Wage (HAW) Heat Map (ACS 2020–2024)



Source: Author calculations using ACS 2020–2024 5-Year Estimates, Detailed Table B25031.

A general relationship was also observed between the number of Congressional Districts within a state and the amount of district-level variation. States containing larger numbers of Congressional Districts often exhibited greater Housing-Affordability Wage ranges, likely reflecting a broader mix of urban, suburban, and rural housing markets. Although notable exceptions exist, this pattern further supports the use of Congressional Districts as the primary unit of analysis because state-level averages may conceal meaningful affordability differences within individual states.

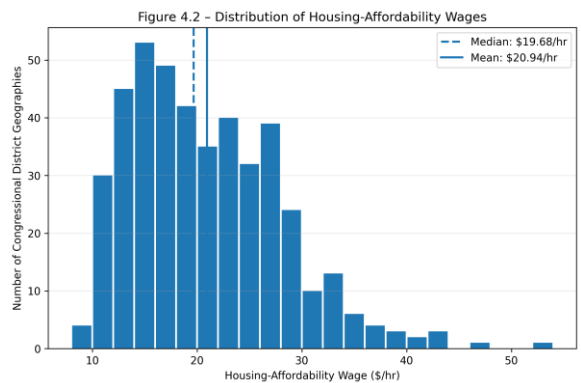
Taken together, these geographic patterns suggest that housing affordability conditions in the United States are characterized by both regional concentration and substantial local variation. While some affordability pressures are concentrated within a limited number of metropolitan regions, significant differences may also exist between Congressional Districts located within the same state. The district-level approach used by the HAW framework helps reveal patterns that may not be visible within broader geographic summaries.

4.6 Distribution Analysis

While the district rankings and geographic patterns discussed in previous sections illustrate where housing affordability conditions occur, examination of the overall distribution provides additional insight into how Housing-Affordability Wage estimates are structured across Congressional Districts.

Figure 4.3 presents the distribution of Housing-Affordability Wage estimates for all Congressional District geographies included in the dataset. The distribution exhibits a positive skew, with a relatively large concentration of districts clustered near the center of the distribution and a smaller number of districts extending into substantially higher Housing-Affordability Wage values. This pattern is reflected in the relationship between the national mean Housing-Affordability Wage of \$20.94 per hour and the national median Housing-Affordability Wage of \$19.68 per hour. Because the mean exceeds the median, higher-cost districts exert a disproportionate influence on the overall average.

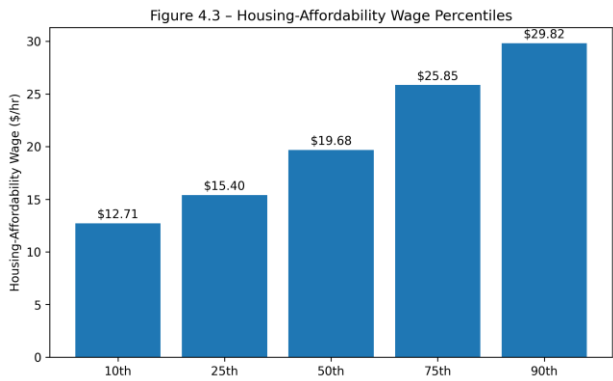
Figure 4.3. Distribution of Housing-Affordability Wages



Source: Author calculations using ACS 2020–2024 5-Year Estimates, Detailed Table B25031

The percentile distribution further illustrates the range of affordability conditions observed across the dataset. As shown in Figure 4.3, the 10th percentile Housing-Affordability Wage was \$12.71 per hour, while the 90th percentile was \$29.82 per hour. The national median Housing-Affordability Wage of \$19.68 per hour falls between these values, indicating that the middle eighty percent of Congressional District geographies span a range of approximately \$17.11 per hour. These results demonstrate that housing affordability conditions vary substantially across districts even outside the highest- and lowest-ranked examples discussed in previous sections.

Figure 4.4. Housing-Affordability Wage Percentiles

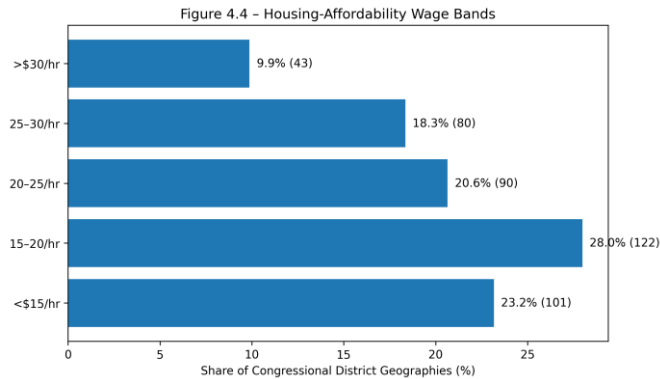


Source: Author calculations using ACS 2020–2024 5-Year Estimates, Detailed Table B25031

To provide a more intuitive interpretation of the distribution, Housing-Affordability Wage estimates were grouped into affordability bands. Figure 4.4 summarizes the proportion of Congressional District geographies falling within each range. Approximately 23.0 percent of districts exhibited Housing-Affordability Wage estimates below \$15.00 per hour, while 27.8 percent fell between \$15.00 and \$20.00 per hour. An additional 20.5 percent of districts fell

between \$20.00 and \$25.00 per hour, and 18.2 percent fell between \$25.00 and \$30.00 per hour. Only 9.8 percent of districts exhibited Housing-Affordability Wage estimates exceeding \$30.00 per hour.

Figure 4.5. Housing-Affordability Wage Bands



Source: Author calculations using ACS 2020–2024 5-Year Estimates, Detailed Table B25031

These affordability bands reveal that the majority of Congressional District geographies are concentrated within a relatively narrow range of Housing-Affordability Wage values. Nearly half of all districts fall between \$15.00 and \$25.00 per hour, while districts exceeding \$30.00 per hour represent a comparatively small share of the national distribution. Despite their limited number, many of these higher-cost districts are located within some of the nation’s largest metropolitan housing markets and therefore receive substantial public attention.

Taken together, the distribution analysis demonstrates that Housing-Affordability Wage estimates are not evenly distributed across Congressional Districts. Instead, the distribution is characterized by a large concentration of districts near the national median and a smaller number of districts occupying the highest-cost end of the affordability spectrum. These findings complement the district-level and geographic analyses presented in previous sections and provide additional context for understanding housing affordability conditions across the United States. While Congressional Districts remain the primary unit of analysis within the HAW framework, state-level aggregation provides an additional perspective on regional affordability patterns. The following section examines how district-level results combine to form broader state-level affordability measures.

5. State-Level Analysis

The Congressional District analysis presented in Section 4 provides the primary geographic perspective used throughout this study. Congressional Districts offer a consistent and nationally comprehensive framework for examining housing affordability conditions while preserving local variation that may be obscured by larger geographic units.

While district-level analysis provides the greatest level of geographic detail used in this framework, state-level aggregation remains a useful complementary perspective. State-level summaries allow broad comparisons among states, facilitate the identification of regional patterns, and provide a familiar reference point for policymakers, researchers, and the general public.

However, aggregation introduces tradeoffs. Combining multiple Congressional Districts into a single statewide measure may conceal important differences among districts within the same state. As a result, state-level statistics should be viewed as a supplement to, rather than a replacement for, district-level analysis.

The following sections examine state-level Housing-Affordability Wage (HAW) statistics, identify states with the highest and lowest affordability requirements, evaluate variation among districts within each state, and compare statewide averages to the district-level distributions from which they are derived.

5.1 State-Level Summary Statistics

While Congressional District analysis provides the highest level of geographic detail used in this study, state-level aggregation offers an additional perspective on regional housing affordability patterns. Aggregating Congressional District Housing-Affordability Wage (HAW) estimates to the state level allows broad comparisons among states while also providing context for the district-level findings presented in Section 4.

State-level statistics were calculated using all Congressional District geographies contained within each state. For states containing only a single Congressional District geography, the state-level value is identical to the district-level value. States containing multiple Congressional Districts reflect the combined characteristics of their constituent districts.

The resulting state-level estimates reveal substantial variation across the United States. States with higher housing costs generally exhibit higher average Housing-Affordability Wages, while states with lower housing costs generally exhibit lower average HAW values. However, state averages alone do not fully capture the distribution of affordability conditions within a state. As demonstrated in Section 4, some states contain large differences among Congressional Districts, while others exhibit relatively uniform affordability conditions across all districts.

Table 5.1 summarizes key state-level statistics, including average HAW, median HAW, minimum district HAW, maximum district HAW, and within-state HAW range. Together, these measures provide a framework for understanding both the typical affordability conditions within a state and the degree of variation that exists among its Congressional Districts.

Several states emerge as notable outliers within the national distribution. High-cost states, including California, New York, Hawaii, and the District of Columbia, exhibit some of the highest state-level HAW values observed in the dataset. Conversely, states such as West Virginia, Arkansas, Kentucky, and South Dakota exhibit some of the lowest state-level HAW values. These observations are descriptive and do not imply causal relationships; rather, they provide context for the more detailed state-level comparisons that follow.

The state-level perspective serves as a useful complement to Congressional District analysis. While district-level estimates reveal local variation, state-level summaries provide a broader view of regional affordability patterns and establish a foundation for examining how much information is retained—or obscured—when district-level data are aggregated into statewide averages.

5.2 Highest State Housing-Affordability Wages

State-level Housing-Affordability Wage (HAW) estimates reveal substantial differences in the income required to afford housing across the United States. Several states and the District of Columbia exhibit average HAW values that are significantly above the national median, indicating that workers in these locations generally require higher wages to afford the median one-bedroom rental unit.

Among all state-level geographies analyzed, the District of Columbia exhibits the highest average Housing-Affordability Wage. Other states with notably high average HAW values include California, New York, Colorado, and Hawaii. These jurisdictions consistently appear near the upper end of the state-level distribution and represent some of the highest housing affordability requirements observed in the dataset.

The presence of these states near the top of the distribution is not unexpected given their well-documented housing costs and concentration of major metropolitan areas. However, the degree to which high state-level averages reflect uniform conditions across all Congressional Districts varies considerably. Some states exhibit relatively consistent affordability conditions among districts, while others contain substantial differences between high-cost and lower-cost districts.

California and New York provide illustrative examples. Both states exhibit high average Housing-Affordability Wages while also containing substantial variation among Congressional Districts.

Hawaii also appears among the highest state-level HAW values. As a geographically distinct state with unique housing market characteristics, Hawaii represents an important outlier within the national distribution. While the present analysis does not attempt to identify causal factors, the state's elevated HAW values highlight the diversity of housing affordability conditions that exist across the United States.

Taken together, the high-HAW states demonstrate that elevated statewide affordability requirements are not confined to a single region of the country. Rather, they occur across a variety of geographic, economic, and demographic contexts. Examining the states occupying the opposite end of the distribution provides additional context for understanding the full range of housing affordability conditions observed across the United States.

5.3 Lowest State Housing-Affordability Wages

At the opposite end of the state-level distribution, several states exhibit substantially lower Housing-Affordability Wage (HAW) requirements than the national median. These states represent locations where workers generally require lower hourly wages to afford the median one-bedroom rental unit under the assumptions defined by the HAW framework.

Among the states analyzed, West Virginia exhibits the lowest average Housing-Affordability Wage. Other states appearing near the lower end of the distribution include Arkansas, Kentucky, South Dakota, and Wyoming. These states consistently demonstrate some of the lowest housing affordability requirements observed within the dataset.

As with the high-HAW states, the presence of these states near the lower end of the distribution should not be interpreted as evidence of universally favorable housing conditions. Lower Housing-Affordability Wage estimates indicate that housing costs are lower relative to the framework's assumptions; they do not necessarily reflect broader measures of economic well-being, household income, employment opportunities, or quality of life. The HAW framework is designed specifically to evaluate rental affordability requirements and should be interpreted within that context.

Several of the low-HAW states also exhibit relatively limited variation among Congressional Districts. In states containing only a small number of districts, statewide averages often provide a reasonable approximation of district-level conditions. In larger states, however, even relatively low statewide averages may conceal meaningful differences among individual districts.

The states occupying the lower end of the distribution illustrate an important characteristic of the national housing affordability landscape: variation exists not only among regions with high housing costs but also among regions with comparatively low housing costs. Consequently, examining both the level of Housing-Affordability Wages and the distribution of those wages within states is necessary to fully understand geographic affordability patterns.

Together, the high-HAW and low-HAW states define the broad range of affordability conditions observed across the United States. The following section examines the extent of variation among Congressional Districts within individual states and evaluates how effectively statewide averages represent the underlying district-level distributions.

5.4 Within-State Variation

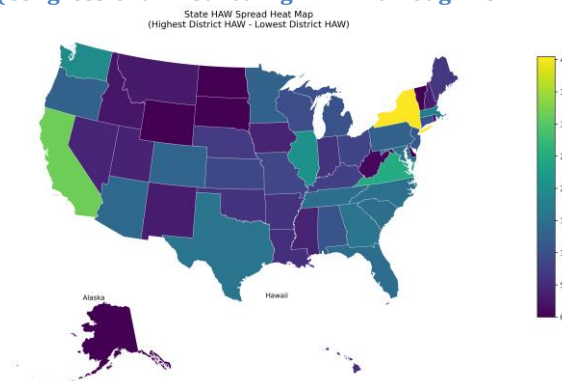
Statewide Housing-Affordability Wage (HAW) averages provide a useful summary of affordability conditions, but they do not capture the full range of variation that may exist among Congressional Districts within a state. Examining the spread of district-level HAW values within each state provides additional insight into the geographic distribution of housing affordability and helps identify states where statewide averages may obscure substantial local differences.

Within-state variation can be measured in several ways. For the purposes of this analysis, the primary measure is the range between the highest and lowest Congressional District HAW values observed within a state. Larger ranges indicate greater differences in housing affordability requirements among districts, while smaller ranges suggest more uniform affordability conditions throughout a state.

The results reveal considerable diversity among states. Some states exhibit relatively small differences between districts, indicating that housing affordability conditions are broadly similar across the state. Other states contain districts with substantially different affordability requirements, reflecting the presence of diverse housing markets within a single state boundary.

Several large and economically diverse states demonstrate particularly high levels of within-state variation. California and New York, for example, contain Congressional Districts spanning a broad range of Housing-Affordability Wage values. In these states, district-level affordability conditions may differ substantially from one region to another, even though all districts contribute to a single statewide average.

**Figure 5.1. State Housing-Affordability Wage Spread by State
(Congressional District High-HAW through Low-HAW)**



Other states exhibit much smaller district-level ranges. In states with relatively uniform housing markets, statewide averages often provide a reasonable approximation of district-level conditions. Consequently, the degree of within-state variation can be as important as the statewide average itself when evaluating housing affordability patterns.

These findings suggest that statewide Housing-Affordability Wage estimates should be interpreted alongside measures of district-level variation. States with similar average HAW values may nevertheless exhibit very different internal affordability structures. A state characterized by a narrow range of district values may be represented reasonably well by a single statewide measure, while a state exhibiting a large district-level range may require more detailed analysis to fully understand local affordability conditions.

These findings demonstrate that statewide averages and district-level measures provide different perspectives on housing affordability conditions. Aggregation provides useful summaries, but important information may be lost when local affordability conditions are combined into broader geographic averages.

5.5 State Averages vs. District Variation

Statewide Housing-Affordability Wage (HAW) averages provide a useful summary of housing affordability conditions, but they do not fully describe how affordability is distributed within a state. The results presented in Section 5.4 demonstrate that states exhibiting similar average HAW values may nevertheless contain very different district-level affordability structures.

This distinction is important because statewide averages compress multiple Congressional District housing markets into a single value. While aggregation simplifies comparison among states, it also reduces visibility into the variation that may exist among districts within the same state. As a result, states with similar average Housing-Affordability Wages may not necessarily provide similar affordability experiences across all regions of the state.

Several states illustrate this phenomenon particularly well. Illinois, for example, exhibits an average Housing-Affordability Wage that is relatively close to the national median. However, the state also contains substantial variation among Congressional Districts. Housing affordability requirements within districts associated with the Chicago metropolitan region differ markedly from those observed in many downstate districts. A single statewide average therefore captures only part of the affordability conditions experienced throughout the state.

Texas provides a similar example. Despite containing thirty-eight Congressional Districts and representing one of the largest and most geographically diverse states in the nation, its average Housing-Affordability Wage remains relatively close to the national median. However, the state's district-level distribution encompasses a broad range of housing markets, including large metropolitan areas, suburban districts, smaller cities, and rural regions. Consequently, statewide averages provide useful context but cannot fully characterize local affordability conditions.

By contrast, some states exhibit relatively limited district-level variation. In such cases, statewide averages may provide a reasonably accurate representation of affordability conditions throughout the state. When district-level Housing-Affordability Wage estimates cluster closely together, aggregation results in comparatively little information loss.

A special case exists for states and geographies represented by a single Congressional District. In these instances, the statewide Housing-Affordability Wage is identical to the district-level Housing-Affordability Wage because no additional districts exist for comparison. Consequently, measures of within-state variation are, by definition, equal to zero. Examples include Alaska, Delaware, North Dakota, South Dakota, Vermont, Wyoming, and the District of Columbia.

While single-district geographies provide useful state-level observations, they do not permit evaluation of internal district-to-district variation. As a result, statewide measures in these locations cannot reveal potential metropolitan, suburban, or rural differences in housing affordability because such distinctions are not represented by separate Congressional Districts within the dataset. This limitation should be considered when comparing single-district states to larger states containing numerous Congressional Districts and more diverse housing markets. The District of Columbia represents a particularly unique case because it functions as a single urban congressional district rather than a state containing multiple housing markets. As a result, its Housing-Affordability Wage reflects the affordability conditions of a concentrated metropolitan environment rather than an aggregation of multiple Congressional Districts.

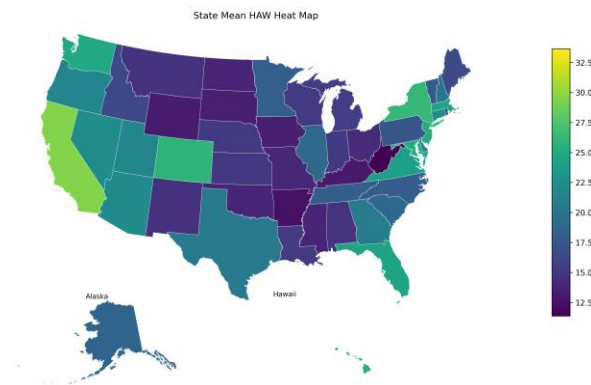
These comparisons highlight an important methodological finding of the HAW framework: the usefulness of a statewide average depends in part upon the degree of variation that exists among the districts from which that average is derived. States with limited district-level variation can often be described adequately by statewide measures. States with substantial district-level variation may require more geographically granular analysis to accurately represent local affordability conditions.

The distinction between statewide averages and district-level distributions reinforces the rationale for selecting Congressional Districts as the primary unit of analysis within the HAW framework. State-level measures remain valuable for broad comparisons and regional analysis; however, district-level estimates reveal affordability patterns that may otherwise remain hidden within aggregated statistics. Together, the two perspectives provide a more complete understanding of housing affordability conditions across the United States.

5.6 State-Level Geographic Patterns

Examination of state-level Housing-Affordability Wage (HAW) estimates reveals several broad geographic patterns that are not immediately apparent from state rankings alone. While individual states may occupy unique positions within the national distribution, neighboring states often exhibit similar affordability characteristics, suggesting the presence of larger regional housing affordability patterns.

Figure 5.2. State Mean Housing-Affordability Wage Heat Map



Source: Author calculations using ACS 2020–2024 5-Year Estimates, Detailed Table B25031

Figure 5.2 illustrates the geographic distribution of average state-level Housing-Affordability Wages. Several regions exhibit elevated HAW values relative to the national median. One of the most prominent concentrations occurs along the Pacific Coast, where California, Washington, and Oregon collectively form a region characterized by comparatively high housing affordability requirements. California occupies the highest position within this western cluster, while neighboring states also exhibit elevated HAW values relative to much of the interior United States.

A second concentration of elevated Housing-Affordability Wage values is visible within the Northeast Corridor. States extending from the Mid-Atlantic through New England, including the District of Columbia, Maryland, New Jersey, New York, Connecticut, and Massachusetts, generally exhibit higher affordability requirements than many other regions of the country. These states form a largely contiguous geographic cluster of elevated HAW values rather than isolated high-cost observations.

In contrast, several regions exhibit comparatively lower Housing-Affordability Wage values. States within portions of Appalachia, the lower Midwest, and the central United States generally occupy the lower end of the state-level distribution. West Virginia, Kentucky, Arkansas, and neighboring states form a broad region characterized by lower average affordability requirements relative to the national median.

Additional patterns emerge within the Northern Plains and portions of the Mountain West, where states frequently exhibit moderate-to-low Housing-Affordability Wage values and comparatively limited district-level variation. Although individual state conditions differ, these regions generally display greater affordability consistency than many of the high-cost coastal regions.

Not all states fit neatly within these regional patterns. Several states occupy transitional positions between larger affordability regions and often exhibit substantial internal variation among Congressional Districts. Illinois, Pennsylvania, Virginia, and Texas provide notable examples. In these states, statewide averages frequently mask meaningful differences among metropolitan, suburban, and rural housing markets. As a result, these states function as important reminders that geographic proximity alone does not fully explain housing affordability conditions.

Taken together, the state-level geographic patterns suggest that housing affordability conditions are influenced by factors operating across multiple geographic scales. Regional clustering is evident in both high-cost and low-cost areas of the country, yet significant local variation may still exist within individual states. These findings reinforce the value of examining housing affordability through both state-level and Congressional District-level perspectives. While state-level analysis highlights broad regional patterns, district-level analysis reveals the finer geographic structure that may otherwise remain hidden within statewide averages. Together, the district-level and state-level analyses provide the empirical foundation for evaluating the broader implications, applications, strengths, and limitations of the Housing-Affordability Wage framework.

6. Discussion and Applications

The preceding sections presented the Housing-Affordability Wage (HAW) framework, described the methodology used to construct the dataset, and analyzed affordability patterns across Congressional Districts and states. Together, these analyses revealed substantial variation in housing affordability conditions across the United States and highlighted the importance of geographic scale when interpreting affordability measures. The discussion that follows focuses not only on what the framework measures, but also on why those measurements may be useful for interpreting housing affordability conditions across different geographic scales.

This section discusses the broader implications of the findings, examines the strengths and limitations of the HAW framework, considers potential applications of the methodology, and identifies opportunities for future development. While the framework is intentionally simple and transparent, the results demonstrate that geographically comparable affordability measures can provide useful insights into housing affordability conditions at multiple scales.

The following discussion focuses not only on what the HAW framework reveals, but also on how the framework may be interpreted, applied, and expanded in future research and analysis.

6.1 Summary of Findings

Application of the Housing-Affordability Wage (HAW) framework to Congressional District rental data revealed substantial variation in housing affordability requirements across the United States. While the framework utilizes a single methodology nationwide, the resulting HAW estimates varied considerably among Congressional Districts, states, and regions, demonstrating the importance of geographic context when evaluating housing affordability conditions.

One of the most significant findings is the magnitude of variation observed across Congressional Districts. The highest Housing-Affordability Wage estimates were several times greater than the lowest observed values, indicating that housing affordability conditions differ substantially throughout the country. High-HAW districts were concentrated within a relatively small number of major metropolitan regions, while Low-HAW districts were distributed across a broader geographic area.

The broader distribution of Housing-Affordability Wages further illustrates this variation. While the national median HAW was \$19.68 per hour, the middle eighty percent of Congressional Districts ranged from approximately \$12.71 per hour at the 10th percentile to \$29.82 per hour at the 90th percentile. In addition, fewer than ten percent of districts exhibited HAW values above \$30.00 per hour, indicating that the highest affordability requirements were concentrated within a relatively small number of districts rather than distributed uniformly across the nation.

The analysis also revealed that state-level averages, while useful, do not always capture the full structure of housing affordability within a state. Several states exhibited substantial differences among Congressional Districts despite maintaining average HAW values near the national median. Conversely, other states exhibited relatively uniform affordability conditions across their districts. These findings suggest that statewide averages may conceal important local variation and should be interpreted alongside measures of district-level distribution.

Geographic patterns emerged at multiple scales. District-level analysis identified concentrated clusters of elevated Housing-Affordability Wage estimates within a limited number of metropolitan regions. State-level analysis revealed broader regional patterns, including elevated affordability requirements along portions of the Pacific Coast and Northeast Corridor, as well as comparatively lower affordability requirements throughout portions of Appalachia, the Midwest, and the central United States. Together, these patterns suggest that housing affordability conditions are influenced by both local and regional factors.

The analysis further demonstrated the value of Congressional Districts as a geographic unit of study. Congressional Districts provide greater geographic detail than statewide averages while maintaining a nationally consistent framework that can be compared across the United States. By examining affordability conditions at both the district and state levels, the HAW framework reveals patterns that may not be visible when using either geographic scale alone.

Taken together, the findings demonstrate that housing affordability requirements differ meaningfully across local housing markets and that aggregated measures may not fully represent local conditions. The Housing-Affordability Wage framework provides a transparent and reproducible method for measuring these differences and establishing a common affordability benchmark that can be compared across geographic areas and over time. Collectively, these findings suggest that the geographic scale selected for affordability analysis can substantially influence the conclusions drawn from housing affordability data.

6.2 Why Geographic Scale Matters

One of the central findings of this study is that geographic scale significantly influences the interpretation of housing affordability conditions. The choice of geographic unit affects not only the values that are observed, but also the patterns that become visible within the data. As a result, different geographic scales may reveal different aspects of housing affordability while simultaneously obscuring others.

National-level statistics provide useful context regarding overall affordability conditions in the United States. Measures such as the national mean and national median Housing-Affordability Wage (HAW) establish reference points against which individual Congressional Districts and states can be compared. However, national averages alone

provide limited insight into the substantial variation that exists among regions, states, and local housing markets.

State-level analysis provides a more detailed perspective and reveals important regional differences in housing affordability conditions. Statewide averages facilitate broad comparisons among states and help identify geographic clusters of relatively high and relatively low Housing-Affordability Wage values. However, the analysis presented in Section 5 demonstrated that statewide averages may conceal substantial variation among Congressional Districts within the same state.

Several states illustrate this limitation clearly. California and New York exhibit high average Housing-Affordability Wage values, yet both contain Congressional Districts spanning a wide range of affordability conditions. Similarly, states such as Illinois and Texas maintain average HAW values near the national median while containing districts with markedly different housing affordability requirements. In these cases, statewide averages provide useful summaries but do not fully represent the diversity of affordability conditions present within the state.

Congressional Districts occupy a useful middle ground between national and state-level measures on one hand and highly localized geographic units on the other. Districts provide greater geographic detail than statewide averages while maintaining a nationally standardized framework that can be compared consistently across the United States. Because Congressional Districts are associated with direct federal representation, they also provide a practical connection between housing affordability conditions and a clearly defined constituency.

The analysis conducted in this study suggests that no single geographic scale is sufficient for understanding housing affordability conditions across the United States. National measures provide broad context, state-level measures reveal regional patterns, and Congressional Districts expose local variation that may otherwise remain hidden within aggregated statistics. Each geographic scale contributes a different perspective, and together they provide a more complete understanding of housing affordability conditions.

The Housing-Affordability Wage framework therefore benefits from the use of multiple geographic perspectives while maintaining Congressional Districts as its primary unit of analysis. By preserving meaningful local variation within a nationally consistent framework, the district-level approach helps reveal affordability patterns that may not be visible when examining state or national averages alone.

6.3 Potential Applications

The Housing-Affordability Wage (HAW) provides a standardized framework of transparent, reproducible, and geographically comparable measure of housing affordability. While the framework is not designed to prescribe specific policy outcomes or wage targets, it may

serve as a useful benchmark for a variety of audiences seeking to evaluate housing affordability conditions across geographic areas and over time.

Policymakers and Public Administration

Because HAW estimates are calculated at the Congressional District level, the framework provides policymakers with a geographically specific affordability benchmark that can be compared across districts, states, and regions. HAW estimates may be used to identify districts exhibiting comparatively high or low housing affordability requirements, evaluate changes in affordability conditions over time, and provide context for broader discussions regarding housing markets and economic conditions. The framework does not identify causes of affordability outcomes, nor does it prescribe policy responses; rather, it provides a consistent measurement basis for comparison and evaluation.

Researchers and Analysts

Researchers may use Housing-Affordability Wage estimates as a standardized affordability metric that can be compared against other demographic, economic, and geographic indicators. Potential applications include examining relationships between HAW values and measures such as median income, poverty rates, unemployment, educational attainment, migration patterns, housing supply, and homeownership rates. Because the methodology relies upon publicly available data and transparent calculations, the framework can be reproduced, tested, and incorporated into future research efforts.

Journalists and Public Communication

Housing affordability is frequently discussed using rental costs, income levels, or cost-of-living measures that may vary considerably in methodology and geographic scope. The HAW framework provides journalists and public communicators with a consistent benchmark that translates local housing costs into an hourly wage equivalent that may be more readily understood by a broad audience. As a result, HAW estimates may serve as a useful reference point when reporting on housing affordability conditions within specific Congressional Districts, states, or regions.

Employers and Workforce Planning

Employers, workforce planners, and economic development organizations may find HAW estimates useful as one of several indicators describing local affordability conditions. Housing affordability can influence recruitment, retention, workforce mobility, and geographic expansion decisions. While HAW is not intended to determine compensation levels or business strategy, it may provide contextual information regarding the relationship between local housing costs and wage requirements across different labor markets.

Public Use

Members of the public may use HAW estimates to compare housing affordability conditions across Congressional Districts, states, and regions. Because the framework expresses housing affordability in terms of an hourly wage requirement, it provides an alternative perspective through which individuals can evaluate local housing costs relative to a

standardized affordability benchmark. The framework may also assist readers in understanding how housing affordability conditions differ geographically and how those differences compare to national and state-level patterns.

Taken together, these applications illustrate the flexibility of the Housing-Affordability Wage framework. By providing a common methodology and geographic reference point, HAW estimates enable diverse audiences to discuss housing affordability using a shared benchmark while preserving the geographic detail necessary to identify meaningful local variation.

6.4 Framework Strengths and Limitations

Like any analytical framework, the Housing-Affordability Wage (HAW) methodology possesses both strengths and limitations. Understanding these characteristics is important for interpreting the results appropriately and identifying areas where future refinement may be beneficial.

One of the primary strengths of the HAW framework is its simplicity and transparency. The methodology relies upon publicly available rental data and a clearly defined affordability assumption, allowing calculations to be reproduced and verified by other researchers. Because the framework utilizes a consistent methodology across all Congressional Districts, states, and regions, HAW estimates can be compared directly across geographic areas and over time.

A second strength is the use of Congressional Districts as the primary geographic unit of analysis. Congressional Districts provide greater geographic detail than statewide averages while maintaining a nationally standardized geography that is directly relevant to federal representation. This geographic scale allows the framework to identify affordability patterns that may be obscured when analysis is limited to broader state-level measures.

The framework also benefits from its interpretability. Housing costs are frequently reported in terms of rents, percentages, or other measures that may be difficult for some audiences to evaluate. By expressing affordability conditions as an hourly wage requirement, the HAW framework translates housing costs into a benchmark that can be more readily understood and compared across geographic areas.

Despite these strengths, several limitations should be considered. First, the HAW framework is designed specifically to evaluate housing affordability requirements and does not attempt to measure overall cost of living. Other household expenses, including transportation, healthcare, childcare, food, and taxes, are not incorporated into the calculation. As a result, HAW should not be interpreted as a comprehensive measure of economic well-being.

Second, the framework relies upon median gross rent estimates derived from the American Community Survey (ACS). While these data provide national consistency and broad

geographic coverage, they remain statistical estimates subject to sampling variability and periodic revision. Additionally, ACS data may not fully capture short-term changes in housing market conditions.

Third, the framework utilizes a standardized housing unit and affordability threshold in order to maintain comparability across all geographic areas. Individual households may experience housing affordability differently depending upon household size, housing preferences, local market conditions, and personal financial circumstances. Consequently, HAW estimates should be interpreted as benchmark measures rather than precise representations of individual affordability experiences.

Finally, Congressional District boundaries are periodically modified through the redistricting process. Although Congressional Districts provide a useful and nationally consistent geographic framework at a given point in time, changes to district boundaries may affect direct comparisons across different redistricting cycles. Researchers utilizing historical analyses should account for these geographic changes when comparing results over extended periods.

Taken together, these strengths and limitations suggest that the Housing-Affordability Wage framework is best understood as a transparent affordability benchmark rather than a comprehensive measure of housing or economic conditions. The framework acknowledges that housing affordability is influenced by many factors beyond those incorporated into the HAW methodology while still providing a consistent basis for comparison across geographic areas.

6.5 Future Development

The Housing-Affordability Wage (HAW) framework was intentionally designed to emphasize transparency, reproducibility, and geographic comparability. While the methodology presented in this study provides a standardized benchmark for evaluating housing affordability across Congressional Districts, several opportunities exist for future refinement and expansion.

One area of future development involves historical analysis. Because the HAW framework is derived from publicly available American Community Survey (ACS) data, prior ACS releases may be used to construct historical Housing-Affordability Wage datasets. Such analyses would allow researchers to examine long-term affordability trends, evaluate changes in geographic affordability patterns over time, and assess the extent to which affordability conditions have converged or diverged across regions of the United States.

Future research may also examine the effects of Congressional redistricting on Housing-Affordability Wage estimates. Congressional District boundaries are periodically modified through the redistricting process and, in some instances, may change between decennial census cycles. While housing market conditions may remain relatively stable, changes in

district boundaries can alter the geographic composition of a district and therefore affect measured HAW values. The development of geographic crosswalk methodologies may support more consistent comparisons across Congressional sessions and over extended historical periods.

Additional geographic perspectives may provide further insight into housing affordability conditions. While Congressional Districts were selected as the primary unit of analysis because of their connection to federal representation and national consistency, future studies may apply the HAW methodology to alternative geographic units such as counties, Metropolitan Statistical Areas (MSAs), census tracts, or state legislative districts. Comparisons among geographic scales may improve understanding of how housing affordability patterns change when data are aggregated or disaggregated.

Future work may also expand the framework beyond the median one-bedroom rental unit used in this study. Alternative housing types, including studio, two-bedroom, and three-bedroom rental units, could be incorporated to evaluate how affordability requirements vary among different housing needs and household compositions. Such analyses would extend the framework while maintaining consistency with the underlying methodology.

Additional statistical measures may further enhance interpretation of Housing-Affordability Wage estimates. Measures of affordability dispersion, inequality, clustering, and population weighting could provide complementary perspectives beyond simple averages and rankings. These approaches may help quantify the degree to which affordability conditions vary within and between geographic regions.

Visualization methods also present opportunities for future development. The maps presented in this study utilize political and administrative boundaries to communicate affordability conditions. Future visualization efforts may explore the creation of continuous Housing-Affordability Wage surfaces and contour maps that represent affordability conditions independent of political boundaries. Similar to topographic or meteorological contour maps, such visualizations could reveal regional affordability zones, identify affordability corridors, and provide additional insight into the geographic structure of housing affordability across the United States.

Finally, future expansions of the HAW framework may incorporate additional geographic areas and datasets, including U.S. territories and future ACS releases. Maintaining a consistent methodology while expanding geographic coverage would allow the framework to continue serving as a transparent benchmark for comparing housing affordability conditions across both space and time.

Taken together, these opportunities suggest that the Housing-Affordability Wage framework should be viewed as an evolving analytical platform rather than a static dataset. The methodology presented in this study establishes a foundation upon which future researchers may build additional analyses, visualizations, and comparative measures while preserving the transparency and reproducibility that form the core of the HAW framework.

Although future refinements and additional analyses may further expand the framework, the results presented in this paper demonstrate that a transparent and reproducible methodology can provide meaningful insight into housing affordability conditions across the United States.

7. Conclusion

This study introduced a reproducible framework that uses Congressional District rental data to estimate Housing-Affordability Wages (HAW), demonstrates substantial geographic variation in affordability requirements, and illustrates how geographic scale can materially influence the interpretation of housing affordability measures.

Housing affordability is frequently discussed at the national level despite the fact that housing costs vary considerably across the United States. As a result, a wage that may provide adequate housing affordability in one location may be insufficient in another. The Housing-Affordability Wage framework was developed to provide a geographically comparable method nation-wide for relating local housing costs to local wage requirements using publicly available data and clearly defined assumptions.

Using median one-bedroom gross rent data from the American Community Survey (ACS) 2020–2024 5-Year Estimates and a standardized affordability threshold, Housing-Affordability Wage estimates were calculated for all Congressional District geographies and the District of Columbia. The resulting dataset revealed substantial differences in housing affordability requirements across the United States. Housing-Affordability Wage estimates ranged from less than ten dollars per hour in some districts to more than fifty dollars per hour in others, demonstrating the magnitude of geographic variation that exists within the national housing market.

Analysis of the results identified several important patterns. High Housing-Affordability Wage districts were concentrated within a limited number of major metropolitan regions, particularly within portions of California and New York, while lower Housing-Affordability Wage districts were distributed across a broader range of states and regions. State-level analysis further demonstrated that statewide averages often conceal meaningful differences among Congressional Districts. Several states exhibited substantial internal variation despite maintaining average Housing-Affordability Wage values near the national median. These findings reinforce the importance of geographic scale when evaluating housing affordability conditions.

The use of Congressional Districts as the primary geographic unit of analysis provided a useful balance between geographic detail and national comparability. Congressional Districts preserve local variation that may be obscured by statewide averages while maintaining a standardized framework that can be applied consistently across the United States. By examining affordability conditions at both the district and state levels, the framework revealed patterns that may not be visible when using either geographic perspective alone.

The Housing-Affordability Wage framework is intended to function as a measurement tool rather than a policy prescription. The framework does not determine what wages should be, nor does it identify the causes of housing affordability conditions. Instead, it provides a common standardized affordability benchmark that may be used by policymakers, researchers, journalists, employers, and the public to compare housing affordability

conditions across geographic areas and over time. By relying upon publicly available federal data and transparent calculations, the framework also supports independent verification, reproducibility, and future updates as new data become available.

Several limitations should be considered when interpreting Housing-Affordability Wage estimates. The framework measures housing affordability rather than total cost of living, relies upon median rental values rather than individual housing circumstances, and utilizes Congressional District boundaries that can change through the redistricting process. Nevertheless, the framework provides a consistent and reproducible basis for comparing housing affordability conditions across the United States.

Future development may expand the framework through historical analysis, alternative geographic units, additional affordability metrics, and spatial affordability mapping techniques. Such extensions may provide further insight into the geographic structure and evolution of housing affordability conditions while preserving the transparency and reproducibility that form the foundation of the Housing-Affordability Wage framework.

Housing affordability is ultimately experienced locally. By providing a transparent, reproducible, and geographically comparable affordability benchmark standard, the Housing-Affordability Wage framework offers a foundation for measuring, understanding, and discussing housing affordability conditions across Congressional Districts, states, regions, and the nation as a whole.

Appendix A – Glossary

ACS (American Community Survey)

An ongoing survey conducted by the U.S. Census Bureau that provides demographic, economic, housing, and social data for geographic areas throughout the United States.

ACS 5-Year Estimates

A dataset produced by combining five years of ACS survey responses. The larger sample size improves statistical reliability, particularly for smaller geographic areas.

Affordability Benchmark

A standardized measure used for comparison. Within this study, the Housing-Affordability Wage serves as an affordability benchmark for comparing housing affordability conditions across geographic areas.

Affordability Threshold

The percentage of gross income allocated to housing costs. The HAW framework assumes housing costs should not exceed one-third (33%) of gross income.

Congressional District

A geographic area represented by a single member of the United States House of Representatives.

Data Vintage

The specific period represented by a dataset. For example, ACS 2020–2024 5-Year Estimates refers to data collected between 2020 and 2024.

Geographic Aggregation

The process of combining smaller geographic units into a larger geographic unit, such as combining Congressional District data into statewide averages.

Geographic Crosswalk

A method used to translate or compare data between different geographic boundary systems or between geographic boundaries that have changed over time.

Geographic Scale

The level of geographic detail used in an analysis, such as national, state, Congressional District, county, or census tract.

Geographic Interpolation

A statistical process used to estimate values for one geographic boundary using data collected for another geographic boundary.

Gross Income

Income before taxes and other deductions.

Gross Rent

Monthly housing cost including contract rent and applicable tenant-paid utilities, as reported by the American Community Survey.

HAW (Housing-Affordability Wage)

The hourly wage required for a worker employed 40 hours per week to afford the median one-bedroom rental unit while keeping housing costs at or below one-third of gross income.

Median

The middle value within an ordered dataset. Half of observations fall above the median and half fall below it.

Metropolitan Statistical Area (MSA)

A geographic region defined by the U.S. Office of Management and Budget that consists of a population center and the surrounding communities economically connected to it.

Percentile

A statistical measure indicating the relative position of an observation within a distribution. For example, the 90th percentile represents a value greater than 90 percent of observations.

Positive Skew

A distribution in which a relatively small number of high values extend the upper tail and increase the average above the median.

Redistricting

The process of redrawing Congressional District boundaries, typically following the decennial census.

Reproducibility

The ability of independent researchers to obtain the same results using the same data, assumptions, and methodology.

Statewide Average

A value calculated by combining data from all Congressional Districts within a state.

Validation Dataset

An independent dataset used to compare or verify results produced by another methodology.

Appendix B – State-by-State Housing-Affordability Wage Reference Tables

This appendix provides state-level Housing-Affordability Wage (HAW) summary statistics derived from Congressional District calculations presented throughout the paper. The tables are intended to serve as a quick-reference resource for readers seeking to compare state-level affordability conditions and evaluate the degree of variation that exists among Congressional Districts within each state.

Table B.1. Presents state-level Housing-Affordability Wage rankings based upon mean HAW values.

National Rank	State	Mean HAW	Equivalent Annual Income	Median HAW	District Count
1	District of Columbia	\$33.65	\$69,992.00	\$ 33.65	1
2	California	\$29.52	\$61,401.60	\$28.52	52
3	New York	\$26.25	\$54,600.00	\$27.27	26
4	Colorado	\$25.86	\$53,788.80	\$27.27	8
5	Hawaii	\$25.34	\$52,707.20	\$25.34	2
6	New Jersey	\$25.33	\$52,686.40	\$25.69	12
7	Maryland	\$25.12	\$52,249.60	\$25.44	8
8	Washington	\$24.81	\$51,604.80	\$23.93	10
9	Florida	\$24.37	\$50,689.60	\$25.56	28
10	Massachusetts	\$24.35	\$50,648.00	\$21.74	9
11	Virginia	\$23.91	\$49,732.80	\$24.11	11
12	Connecticut	\$22.22	\$46,217.60	\$20.30	5
13	Nevada	\$22.22	\$46,217.60	\$21.48	4
14	Arizona	\$22.05	\$45,864.00	\$22.03	9
15	Utah	\$21.64	\$45,011.20	\$ 21.16	4
16	Oregon	\$21.62	\$44,969.60	\$23.37	6
17	Delaware	\$20.67	\$42,993.60	\$20.67	1
18	Georgia	\$20.55	\$42,744.00	\$20.49	14
19	Texas	\$20.50	\$42,640.00	\$21.30	38
20	New Hampshire	\$20.15	\$41,912.00	\$20.15	2
21	South Carolina	\$18.81	\$39,124.80	\$19.38	7
22	Illinois	\$18.78	\$39,062.40	\$17.45	17
23	Alaska	\$18.54	\$38,563.20	\$18.54	1
24	Minnesota	\$18.04	\$37,523.20	\$18.95	8
25	North Carolina	\$17.91	\$37,252.80	\$17.03	14
26	Tennessee	\$17.90	\$37,232.00	\$17.74	9
27	Vermont	\$17.64	\$36,691.20	\$17.64	1
28	Pennsylvania	\$17.44	\$36,275.20	\$17.29	17
29	Rhode Island	\$17.03	\$35,422.40	\$17.03	2

30	Maine	\$16.37	\$34,049.60	\$16.37	2
31	Idaho	\$16.17	\$33,633.60	\$16.17	2
32	Michigan	\$15.40	\$32,032.00	\$15.61	13
33	Louisiana	\$15.26	\$31,740.80	\$14.82	6
34	Wisconsin	\$15.24	\$31,699.20	\$14.69	8
35	Indiana	\$15.09	\$31,387.20	\$15.72	9
36	Nebraska	\$15.06	\$31,324.80	\$16.04	3
37	Kansas	\$14.96	\$31,116.80	\$13.26	4
38	Alabama	\$14.73	\$30,638.40	\$14.11	7
39	Montana	\$14.67	\$30,513.60	\$14.67	2
40	New Mexico	\$14.52	\$30,201.60	\$13.86	3
41	Ohio	\$14.12	\$29,369.60	\$13.73	15
42	Missouri	\$13.82	\$28,745.60	\$13.78	8
43	Oklahoma	\$13.76	\$28,620.80	\$14.24	5
44	Mississippi	\$13.70	\$28,496.00	\$13.96	4
45	North Dakota	\$13.64	\$28,371.20	\$13.64	1
46	Iowa	\$13.40	\$27,872.00	\$13.00	4
47	South Dakota	\$13.40	\$27,872.00	\$13.40	1
48	Wyoming	\$13.14	\$27,331.20	\$13.14	1
49	Kentucky	\$12.98	\$26,998.40	\$13.32	6
50	Arkansas	\$12.34	\$25,667.20	\$12.33	4
51	West Virginia	\$11.37	\$23,649.60	\$11.37	2

Table B.2. Summarizes within-state variation by reporting the lowest district HAW, highest district HAW, and resulting HAW range observed within each state.

State	Lowest HAW	Highest HAW	Range HAW	District Count
New York	\$12.12	\$52.58	\$40.47	26
California	\$15.23	\$46.78	\$31.55	52
Virginia	\$11.53	\$36.40	\$24.87	11
Illinois	\$10.25	\$30.79	\$20.54	17
Washington	\$16.04	\$35.62	\$19.58	10
Massachusetts	\$15.37	\$32.90	\$17.53	9
Texas	\$11.73	\$27.47	\$15.73	38
Georgia	\$13.24	\$28.90	\$15.66	14
Maryland	\$16.88	\$32.11	\$15.23	8
North Carolina	\$9.97	\$24.84	\$14.87	14
South Carolina	\$12.46	\$27.10	\$14.64	7
Tennessee	\$11.80	\$26.39	\$14.59	9
Florida	\$16.17	\$30.43	\$14.26	28
Arizona	\$15.73	\$29.48	\$13.74	9

Colorado	\$15.78	\$28.87	\$13.08	8
Oregon	\$14.37	\$27.04	\$12.67	6
Pennsylvania	\$11.51	\$24.18	\$12.67	17
Minnesota	\$11.28	\$23.94	\$12.65	8
New Jersey	\$18.50	\$29.75	\$11.25	12
Alabama	\$10.85	\$21.53	\$10.68	7
Connecticut	\$18.92	\$29.34	\$10.42	5
Michigan	\$10.8	\$21.08	\$10.28	13
Wisconsin	\$11.41	\$20.98	\$9.57	8
Kansas	\$12.27	\$21.06	\$8.79	4
Missouri	\$9.69	\$18.12	\$8.43	8
Ohio	\$10.83	\$19.16	\$8.33	15
Kentucky	\$8.86	\$16.51	\$7.65	6
Nebraska	\$11.06	\$18.07	\$7.01	3
Maine	\$13.14	\$19.61	\$6.47	2
Oklahoma	\$10.25	\$16.18	\$5.94	5
Arkansas	\$9.40	\$15.30	\$5.90	4
Indiana	\$11.86	\$17.71	\$5.85	9
Louisiana	\$12.88	\$18.45	\$5.57	6
Hawaii	\$22.73	\$27.95	\$5.23	2
Nevada	\$20.89	\$25.03	\$4.14	4
Iowa	\$11.82	\$15.78	\$3.96	4
Mississippi	\$11.46	\$15.42	\$3.96	4
Utah	\$20.18	\$24.08	\$3.89	4
New Hampshire	\$18.4	\$21.89	\$3.50	2
New Mexico	\$13.21	\$16.48	\$3.27	3
Montana	\$13.28	\$16.06	\$2.79	2
Idaho	\$15.02	\$17.33	\$2.30	2
West Virginia	\$10.96	\$11.79	\$0.83	2
Rhode Island	\$16.62	\$17.45	\$0.83	2
District of Columbia	\$33.65	\$33.65	\$ -	1
Delaware	\$20.67	\$20.67	\$ -	1
Vermont	\$17.64	\$17.64	\$ -	1
Alaska	\$18.54	\$18.54	\$ -	1
North Dakota	\$13.64	\$13.64	\$ -	1
South Dakota	\$13.40	\$13.40	\$ -	1
Wyoming	\$13.14	\$13.14	\$ -	1

All values are derived from the ACS 2020–2024 5-Year Estimates and were calculated according to the methodology described in Section 2.

Appendix C – Congressional District Housing-Affordability Wage Dataset Summary

This appendix provides a summary of the Congressional District Housing-Affordability Wage (HAW) dataset used throughout this study. The appendix is intended to serve as both a reference and a record of the underlying district-level calculations derived from the methodology presented in Section 2. All values are derived from the ACS 2020–2024 5-Year Estimates and were calculated according to the methodology described in Section 2.

Table C.1 presents summary statistics for the complete Congressional District dataset used in this analysis.

Table C.1. Congressional District Dataset Summary

States represented	50
Congressional Districts	435
District of Columbia	1
Total geographies	436
Mean HAW (\$/hr)	\$20.94
Median HAW (\$/hr)	\$19.68
Minimum HAW (\$/hr)	\$8.86
Maximum HAW (\$/hr)	\$52.58
Standard deviation HAW (\$/hr)	\$7.22
Mean median 1BR rent (\$/month)	\$1,209.61
Median 1BR rent (\$/month)	\$1,137.00
Congressional Districts	435
District of Columbia	1
Total Geographies	436
Mean HAW	\$ 20.94
Median HAW	\$ 19.68
Minimum HAW	\$ 8.86
Maximum HAW	\$ 52.58
Standard Deviation	\$ 7.22

Table C.2 provides district-level Housing-Affordability Wage estimates for all Congressional Districts and the District of Columbia, including national ranking, median one-bedroom gross rent, Housing-Affordability Wage, and required annual income. Districts are presented alphabetically by state and Congressional District designation to facilitate geographic lookup, while national rankings are based upon Housing-Affordability Wage values ordered from highest to lowest.

Table C.2. Congressional District Housing-Affordability Wage Reference Table

National Rank	State	District	Median 1BR Rent (\$/Month)	HAW (\$/hr)	Required Annual Income (\$)
361	Alabama	AL-01	\$799.00	\$13.83	\$28,764.00
354	Alabama	AL-02	\$815.00	\$14.11	\$29,340.00
419	Alabama	AL-03	\$648.00	\$11.22	\$23,328.00
424	Alabama	AL-04	\$627.00	\$10.85	\$22,572.00
295	Alabama	AL-05	\$936.00	\$16.20	\$33,696.00
188	Alabama	AL-06	\$1,244.00	\$21.53	\$44,784.00
328	Alabama	AL-07	\$889.00	\$15.39	\$32,004.00
245	Alaska	AK-AL	\$1,071.00	\$18.54	\$38,556.00
93	Arizona	AZ-01	\$1,539.00	\$26.64	\$55,404.00
244	Arizona	AZ-02	\$1,079.00	\$18.68	\$38,844.00
177	Arizona	AZ-03	\$1,273.00	\$22.03	\$45,828.00
107	Arizona	AZ-04	\$1,501.00	\$25.98	\$54,036.00
48	Arizona	AZ-05	\$1,703.00	\$29.48	\$61,308.00
252	Arizona	AZ-06	\$1,051.00	\$18.19	\$37,836.00
315	Arizona	AZ-07	\$909.00	\$15.73	\$32,724.00
151	Arizona	AZ-08	\$1,356.00	\$23.47	\$48,816.00
251	Arizona	AZ-09	\$1,057.00	\$18.29	\$38,052.00
435	Arkansas	AR-01	\$543.00	\$9.40	\$19,548.00
332	Arkansas	AR-02	\$884.00	\$15.30	\$31,824.00
352	Arkansas	AR-03	\$822.00	\$14.23	\$29,592.00
430	Arkansas	AR-04	\$603.00	\$10.44	\$21,708.00
274	California	CA-01	\$988.00	\$17.10	\$35,568.00
144	California	CA-02	\$1,373.00	\$23.76	\$49,428.00
108	California	CA-03	\$1,501.00	\$25.98	\$54,036.00
71	California	CA-04	\$1,614.00	\$27.94	\$58,104.00
182	California	CA-05	\$1,258.00	\$21.77	\$45,288.00
111	California	CA-06	\$1,484.00	\$25.69	\$53,424.00
129	California	CA-07	\$1,429.00	\$24.73	\$51,444.00
47	California	CA-08	\$1,704.00	\$29.49	\$61,344.00
170	California	CA-09	\$1,301.00	\$22.52	\$46,836.00
10	California	CA-10	\$2,226.00	\$38.53	\$80,136.00
5	California	CA-11	\$2,477.00	\$42.87	\$89,172.00
22	California	CA-12	\$1,959.00	\$33.91	\$70,524.00
285	California	CA-13	\$960.00	\$16.62	\$34,560.00
11	California	CA-14	\$2,172.00	\$37.59	\$78,192.00
4	California	CA-15	\$2,487.00	\$43.05	\$89,532.00
7	California	CA-16	\$2,368.00	\$40.99	\$85,248.00
2	California	CA-17	\$2,703.00	\$46.78	\$97,308.00
36	California	CA-18	\$1,804.00	\$31.22	\$64,944.00

21	California	CA-19	\$1,960.00	\$33.92	\$70,560.00
214	California	CA-20	\$1,153.00	\$19.96	\$41,508.00
278	California	CA-21	\$979.00	\$16.94	\$35,244.00
333	California	CA-22	\$880.00	\$15.23	\$31,680.00
213	California	CA-23	\$1,157.00	\$20.03	\$41,652.00
41	California	CA-24	\$1,748.00	\$30.25	\$62,928.00
286	California	CA-25	\$960.00	\$16.62	\$34,560.00
17	California	CA-26	\$2,035.00	\$35.22	\$73,260.00
52	California	CA-27	\$1,683.00	\$29.13	\$60,588.00
38	California	CA-28	\$1,776.00	\$30.74	\$63,936.00
69	California	CA-29	\$1,615.00	\$27.95	\$58,140.00
25	California	CA-30	\$1,938.00	\$33.54	\$69,768.00
76	California	CA-31	\$1,593.00	\$27.57	\$57,348.00
18	California	CA-32	\$1,987.00	\$34.39	\$71,532.00
156	California	CA-33	\$1,339.00	\$23.18	\$48,204.00
100	California	CA-34	\$1,520.00	\$26.31	\$54,720.00
59	California	CA-35	\$1,644.00	\$28.45	\$59,184.00
8	California	CA-36	\$2,305.00	\$39.89	\$82,980.00
106	California	CA-37	\$1,504.00	\$26.03	\$54,144.00
58	California	CA-38	\$1,652.00	\$28.59	\$59,472.00
87	California	CA-39	\$1,565.00	\$27.09	\$56,340.00
9	California	CA-40	\$2,250.00	\$38.94	\$81,000.00
105	California	CA-41	\$1,510.00	\$26.14	\$54,360.00
77	California	CA-42	\$1,590.00	\$27.52	\$57,240.00
95	California	CA-43	\$1,532.00	\$26.52	\$55,152.00
120	California	CA-44	\$1,453.00	\$25.15	\$52,308.00
31	California	CA-45	\$1,876.00	\$32.47	\$67,536.00
35	California	CA-46	\$1,815.00	\$31.41	\$65,340.00
6	California	CA-47	\$2,418.00	\$41.85	\$87,048.00
44	California	CA-48	\$1,727.00	\$29.89	\$62,172.00
13	California	CA-49	\$2,131.00	\$36.88	\$76,716.00
15	California	CA-50	\$2,059.00	\$35.64	\$74,124.00
27	California	CA-51	\$1,915.00	\$33.14	\$68,940.00
66	California	CA-52	\$1,626.00	\$28.14	\$58,536.00
57	Colorado	CO-01	\$1,654.00	\$28.63	\$59,544.00
75	Colorado	CO-02	\$1,595.00	\$27.61	\$57,420.00
312	Colorado	CO-03	\$912.00	\$15.78	\$32,832.00
55	Colorado	CO-04	\$1,668.00	\$28.87	\$60,048.00
137	Colorado	CO-05	\$1,391.00	\$24.08	\$50,076.00
90	Colorado	CO-06	\$1,556.00	\$26.93	\$56,016.00
56	Colorado	CO-07	\$1,661.00	\$28.75	\$59,796.00
104	Colorado	CO-08	\$1,514.00	\$26.20	\$54,504.00
210	Connecticut	CT-01	\$1,173.00	\$20.30	\$42,228.00

219	Connecticut	CT-02	\$1,136.00	\$19.66	\$40,896.00
161	Connecticut	CT-03	\$1,323.00	\$22.90	\$47,628.00
49	Connecticut	CT-04	\$1,695.00	\$29.34	\$61,020.00
238	Connecticut	CT-05	\$1,093.00	\$18.92	\$39,348.00
206	Delaware	DE-AL	\$1,194.00	\$20.67	\$42,984.00
24	District of Columbia	DC-AL	\$1,944.00	\$33.65	\$69,984.00
201	Florida	FL-01	\$1,216.00	\$21.05	\$43,776.00
223	Florida	FL-02	\$1,127.00	\$19.51	\$40,572.00
227	Florida	FL-03	\$1,119.00	\$19.37	\$40,284.00
224	Florida	FL-04	\$1,126.00	\$19.49	\$40,536.00
154	Florida	FL-05	\$1,341.00	\$23.21	\$48,276.00
239	Florida	FL-06	\$1,092.00	\$18.90	\$39,312.00
81	Florida	FL-07	\$1,582.00	\$27.38	\$56,952.00
193	Florida	FL-08	\$1,235.00	\$21.38	\$44,460.00
73	Florida	FL-09	\$1,599.00	\$27.68	\$57,564.00
115	Florida	FL-10	\$1,476.00	\$25.55	\$53,136.00
78	Florida	FL-11	\$1,590.00	\$27.52	\$57,240.00
236	Florida	FL-12	\$1,097.00	\$18.99	\$39,492.00
146	Florida	FL-13	\$1,366.00	\$23.64	\$49,176.00
122	Florida	FL-14	\$1,450.00	\$25.10	\$52,200.00
163	Florida	FL-15	\$1,316.00	\$22.78	\$47,376.00
112	Florida	FL-16	\$1,483.00	\$25.67	\$53,388.00
114	Florida	FL-17	\$1,477.00	\$25.56	\$53,172.00
299	Florida	FL-18	\$934.00	\$16.17	\$33,624.00
63	Florida	FL-19	\$1,635.00	\$28.30	\$58,860.00
110	Florida	FL-20	\$1,493.00	\$25.84	\$53,748.00
96	Florida	FL-21	\$1,529.00	\$26.46	\$55,044.00
64	Florida	FL-22	\$1,635.00	\$28.30	\$58,860.00
40	Florida	FL-23	\$1,758.00	\$30.43	\$63,288.00
83	Florida	FL-24	\$1,578.00	\$27.31	\$56,808.00
80	Florida	FL-25	\$1,583.00	\$27.40	\$56,988.00
117	Florida	FL-26	\$1,459.00	\$25.25	\$52,524.00
68	Florida	FL-27	\$1,617.00	\$27.99	\$58,212.00
101	Florida	FL-28	\$1,519.00	\$26.29	\$54,684.00
237	Georgia	GA-01	\$1,096.00	\$18.97	\$39,456.00
376	Georgia	GA-02	\$765.00	\$13.24	\$27,540.00
291	Georgia	GA-03	\$949.00	\$16.43	\$34,164.00
113	Georgia	GA-04	\$1,483.00	\$25.67	\$53,388.00
97	Georgia	GA-05	\$1,525.00	\$26.39	\$54,900.00
67	Georgia	GA-06	\$1,626.00	\$28.14	\$58,536.00
54	Georgia	GA-07	\$1,670.00	\$28.90	\$60,120.00
363	Georgia	GA-08	\$796.00	\$13.78	\$28,656.00
178	Georgia	GA-09	\$1,272.00	\$22.02	\$45,792.00

282	Georgia	GA-10	\$971.00	\$16.81	\$34,956.00
118	Georgia	GA-11	\$1,456.00	\$25.20	\$52,416.00
353	Georgia	GA-12	\$820.00	\$14.19	\$29,520.00
149	Georgia	GA-13	\$1,358.00	\$23.50	\$48,888.00
347	Georgia	GA-14	\$832.00	\$14.40	\$29,952.00
70	Hawaii	HI-01	\$1,615.00	\$27.95	\$58,140.00
166	Hawaii	HI-02	\$1,313.00	\$22.73	\$47,268.00
335	Idaho	ID-01	\$868.00	\$15.02	\$31,248.00
269	Idaho	ID-02	\$1,001.00	\$17.33	\$36,036.00
283	Illinois	IL-01	\$971.00	\$16.81	\$34,956.00
309	Illinois	IL-02	\$920.00	\$15.92	\$33,120.00
202	Illinois	IL-03	\$1,214.00	\$21.01	\$43,704.00
266	Illinois	IL-04	\$1,008.00	\$17.45	\$36,288.00
65	Illinois	IL-05	\$1,631.00	\$28.23	\$58,716.00
175	Illinois	IL-06	\$1,280.00	\$22.15	\$46,080.00
37	Illinois	IL-07	\$1,779.00	\$30.79	\$64,044.00
150	Illinois	IL-08	\$1,358.00	\$23.50	\$48,888.00
160	Illinois	IL-09	\$1,324.00	\$22.92	\$47,664.00
198	Illinois	IL-10	\$1,219.00	\$21.10	\$43,884.00
152	Illinois	IL-11	\$1,348.00	\$23.33	\$48,528.00
431	Illinois	IL-12	\$592.00	\$10.25	\$21,312.00
356	Illinois	IL-13	\$814.00	\$14.09	\$29,304.00
308	Illinois	IL-14	\$922.00	\$15.96	\$33,192.00
427	Illinois	IL-15	\$620.00	\$10.73	\$22,320.00
385	Illinois	IL-16	\$753.00	\$13.03	\$27,108.00
404	Illinois	IL-17	\$692.00	\$11.98	\$24,912.00
317	Indiana	IN-01	\$908.00	\$15.72	\$32,688.00
350	Indiana	IN-02	\$825.00	\$14.28	\$29,700.00
370	Indiana	IN-03	\$774.00	\$13.40	\$27,864.00
313	Indiana	IN-04	\$912.00	\$15.78	\$32,832.00
294	Indiana	IN-05	\$942.00	\$16.30	\$33,912.00
296	Indiana	IN-06	\$936.00	\$16.20	\$33,696.00
262	Indiana	IN-07	\$1,023.00	\$17.71	\$36,828.00
408	Indiana	IN-08	\$685.00	\$11.86	\$24,660.00
342	Indiana	IN-09	\$844.00	\$14.61	\$30,384.00
380	Iowa	IA-01	\$761.00	\$13.17	\$27,396.00
409	Iowa	IA-02	\$683.00	\$11.82	\$24,588.00
314	Iowa	IA-03	\$912.00	\$15.78	\$32,832.00
391	Iowa	IA-04	\$741.00	\$12.83	\$26,676.00
383	Kansas	KS-01	\$758.00	\$13.12	\$27,288.00
398	Kansas	KS-02	\$709.00	\$12.27	\$25,524.00
200	Kansas	KS-03	\$1,217.00	\$21.06	\$43,812.00
371	Kansas	KS-04	\$774.00	\$13.40	\$27,864.00

429	Kentucky	KY-01	\$604.00	\$10.45	\$21,744.00
403	Kentucky	KY-02	\$693.00	\$11.99	\$24,948.00
289	Kentucky	KY-03	\$954.00	\$16.51	\$34,344.00
341	Kentucky	KY-04	\$846.00	\$14.64	\$30,456.00
436	Kentucky	KY-05	\$512.00	\$8.86	\$18,432.00
329	Kentucky	KY-06	\$889.00	\$15.39	\$32,004.00
247	Louisiana	LA-01	\$1,066.00	\$18.45	\$38,376.00
277	Louisiana	LA-02	\$982.00	\$17.00	\$35,352.00
344	Louisiana	LA-03	\$837.00	\$14.49	\$30,132.00
389	Louisiana	LA-04	\$744.00	\$12.88	\$26,784.00
334	Louisiana	LA-05	\$875.00	\$15.14	\$31,500.00
366	Louisiana	LA-06	\$785.00	\$13.59	\$28,260.00
220	Maine	ME-01	\$1,133.00	\$19.61	\$40,788.00
381	Maine	ME-02	\$759.00	\$13.14	\$27,324.00
280	Maryland	MD-01	\$975.00	\$16.88	\$35,100.00
141	Maryland	MD-02	\$1,378.00	\$23.85	\$49,608.00
53	Maryland	MD-03	\$1,680.00	\$29.08	\$60,480.00
88	Maryland	MD-04	\$1,562.00	\$27.04	\$56,232.00
43	Maryland	MD-05	\$1,739.00	\$30.10	\$62,604.00
169	Maryland	MD-06	\$1,303.00	\$22.55	\$46,908.00
228	Maryland	MD-07	\$1,118.00	\$19.35	\$40,248.00
33	Maryland	MD-08	\$1,855.00	\$32.11	\$66,780.00
330	Massachusetts	MA-01	\$888.00	\$15.37	\$31,968.00
231	Massachusetts	MA-02	\$1,114.00	\$19.28	\$40,104.00
183	Massachusetts	MA-03	\$1,256.00	\$21.74	\$45,216.00
204	Massachusetts	MA-04	\$1,208.00	\$20.91	\$43,488.00
32	Massachusetts	MA-05	\$1,870.00	\$32.37	\$67,320.00
102	Massachusetts	MA-06	\$1,516.00	\$26.24	\$54,576.00
28	Massachusetts	MA-07	\$1,901.00	\$32.90	\$68,436.00
30	Massachusetts	MA-08	\$1,888.00	\$32.68	\$67,968.00
264	Massachusetts	MA-09	\$1,019.00	\$17.64	\$36,684.00
420	Michigan	MI-01	\$644.00	\$11.15	\$23,184.00
426	Michigan	MI-02	\$624.00	\$10.80	\$22,464.00
261	Michigan	MI-03	\$1,024.00	\$17.72	\$36,864.00
305	Michigan	MI-04	\$924.00	\$15.99	\$33,264.00
388	Michigan	MI-05	\$745.00	\$12.89	\$26,820.00
199	Michigan	MI-06	\$1,218.00	\$21.08	\$43,848.00
320	Michigan	MI-07	\$902.00	\$15.61	\$32,472.00
375	Michigan	MI-08	\$766.00	\$13.26	\$27,576.00
340	Michigan	MI-09	\$847.00	\$14.66	\$30,492.00
257	Michigan	MI-10	\$1,032.00	\$17.86	\$37,152.00
240	Michigan	MI-11	\$1,091.00	\$18.88	\$39,276.00
300	Michigan	MI-12	\$933.00	\$16.15	\$33,588.00

355	Michigan	MI-13	\$815.00	\$14.11	\$29,340.00
357	Minnesota	MN-01	\$810.00	\$14.02	\$29,160.00
173	Minnesota	MN-02	\$1,289.00	\$22.31	\$46,404.00
139	Minnesota	MN-03	\$1,383.00	\$23.94	\$49,788.00
207	Minnesota	MN-04	\$1,188.00	\$20.56	\$42,768.00
194	Minnesota	MN-05	\$1,234.00	\$21.36	\$44,424.00
268	Minnesota	MN-06	\$1,002.00	\$17.34	\$36,072.00
418	Minnesota	MN-07	\$652.00	\$11.28	\$23,472.00
368	Minnesota	MN-08	\$779.00	\$13.48	\$28,044.00
369	Mississippi	MS-01	\$778.00	\$13.47	\$28,008.00
416	Mississippi	MS-02	\$662.00	\$11.46	\$23,832.00
326	Mississippi	MS-03	\$891.00	\$15.42	\$32,076.00
346	Mississippi	MS-04	\$835.00	\$14.45	\$30,060.00
318	Missouri	MO-01	\$905.00	\$15.66	\$32,580.00
254	Missouri	MO-02	\$1,047.00	\$18.12	\$37,692.00
338	Missouri	MO-03	\$850.00	\$14.71	\$30,600.00
421	Missouri	MO-04	\$640.00	\$11.08	\$23,040.00
258	Missouri	MO-05	\$1,028.00	\$17.79	\$37,008.00
428	Missouri	MO-06	\$617.00	\$10.68	\$22,212.00
390	Missouri	MO-07	\$742.00	\$12.84	\$26,712.00
434	Missouri	MO-08	\$560.00	\$9.69	\$20,160.00
301	Montana	MT-01	\$928.00	\$16.06	\$33,408.00
374	Montana	MT-02	\$767.00	\$13.28	\$27,612.00
302	Nebraska	NE-01	\$927.00	\$16.04	\$33,372.00
255	Nebraska	NE-02	\$1,044.00	\$18.07	\$37,584.00
422	Nebraska	NE-03	\$639.00	\$11.06	\$23,004.00
205	Nevada	NV-01	\$1,207.00	\$20.89	\$43,452.00
187	Nevada	NV-02	\$1,246.00	\$21.57	\$44,856.00
123	Nevada	NV-03	\$1,446.00	\$25.03	\$52,056.00
191	Nevada	NV-04	\$1,236.00	\$21.39	\$44,496.00
180	New Hampshire	NH-01	\$1,265.00	\$21.89	\$45,540.00
249	New Hampshire	NH-02	\$1,063.00	\$18.40	\$38,268.00
195	New Jersey	NJ-01	\$1,232.00	\$21.32	\$44,352.00
246	New Jersey	NJ-02	\$1,069.00	\$18.50	\$38,484.00
127	New Jersey	NJ-03	\$1,430.00	\$24.75	\$51,480.00
130	New Jersey	NJ-04	\$1,410.00	\$24.40	\$50,760.00
45	New Jersey	NJ-05	\$1,719.00	\$29.75	\$61,884.00
82	New Jersey	NJ-06	\$1,581.00	\$27.36	\$56,916.00
103	New Jersey	NJ-07	\$1,515.00	\$26.22	\$54,540.00
61	New Jersey	NJ-08	\$1,637.00	\$28.33	\$58,932.00
119	New Jersey	NJ-09	\$1,454.00	\$25.17	\$52,344.00
185	New Jersey	NJ-10	\$1,253.00	\$21.69	\$45,108.00

50	New Jersey	NJ-11	\$1,693.00	\$29.30	\$60,948.00
85	New Jersey	NJ-12	\$1,568.00	\$27.14	\$56,448.00
290	New Mexico	NM-01	\$952.00	\$16.48	\$34,272.00
378	New Mexico	NM-02	\$763.00	\$13.21	\$27,468.00
359	New Mexico	NM-03	\$801.00	\$13.86	\$28,836.00
23	New York	NY-01	\$1,946.00	\$33.68	\$70,056.00
20	New York	NY-02	\$1,967.00	\$34.04	\$70,812.00
26	New York	NY-03	\$1,927.00	\$33.35	\$69,372.00
42	New York	NY-04	\$1,745.00	\$30.20	\$62,820.00
91	New York	NY-05	\$1,553.00	\$26.88	\$55,908.00
39	New York	NY-06	\$1,773.00	\$30.69	\$63,828.00
12	New York	NY-07	\$2,171.00	\$37.58	\$78,156.00
125	New York	NY-08	\$1,438.00	\$24.89	\$51,768.00
72	New York	NY-09	\$1,611.00	\$27.88	\$57,996.00
3	New York	NY-10	\$2,490.00	\$43.10	\$89,640.00
74	New York	NY-11	\$1,598.00	\$27.66	\$57,528.00
1	New York	NY-12	\$3,038.00	\$52.58	\$109,368.00
92	New York	NY-13	\$1,549.00	\$26.81	\$55,764.00
62	New York	NY-14	\$1,637.00	\$28.33	\$58,932.00
153	New York	NY-15	\$1,346.00	\$23.30	\$48,456.00
46	New York	NY-16	\$1,705.00	\$29.51	\$61,380.00
51	New York	NY-17	\$1,685.00	\$29.16	\$60,660.00
164	New York	NY-18	\$1,316.00	\$22.78	\$47,376.00
324	New York	NY-19	\$892.00	\$15.44	\$32,112.00
232	New York	NY-20	\$1,113.00	\$19.26	\$40,068.00
379	New York	NY-21	\$763.00	\$13.21	\$27,468.00
336	New York	NY-22	\$854.00	\$14.78	\$30,744.00
401	New York	NY-23	\$700.00	\$12.12	\$25,200.00
392	New York	NY-24	\$738.00	\$12.77	\$26,568.00
275	New York	NY-25	\$986.00	\$17.07	\$35,496.00
322	New York	NY-26	\$898.00	\$15.54	\$32,328.00
433	North Carolina	NC-01	\$576.00	\$9.97	\$20,736.00
134	North Carolina	NC-02	\$1,404.00	\$24.30	\$50,544.00
367	North Carolina	NC-03	\$784.00	\$13.57	\$28,224.00
145	North Carolina	NC-04	\$1,372.00	\$23.75	\$49,392.00
343	North Carolina	NC-05	\$841.00	\$14.56	\$30,276.00
273	North Carolina	NC-06	\$996.00	\$17.24	\$35,856.00
216	North Carolina	NC-07	\$1,151.00	\$19.92	\$41,436.00
242	North Carolina	NC-08	\$1,085.00	\$18.78	\$39,060.00
304	North Carolina	NC-09	\$925.00	\$16.01	\$33,300.00
281	North Carolina	NC-10	\$972.00	\$16.82	\$34,992.00
292	North Carolina	NC-11	\$947.00	\$16.39	\$34,092.00
126	North Carolina	NC-12	\$1,435.00	\$24.84	\$51,660.00

377	North Carolina	NC-13	\$764.00	\$13.22	\$27,504.00
192	North Carolina	NC-14	\$1,236.00	\$21.39	\$44,496.00
365	North Dakota	ND-AL	\$788.00	\$13.64	\$28,368.00
331	Ohio	OH-01	\$888.00	\$15.37	\$31,968.00
397	Ohio	OH-02	\$710.00	\$12.29	\$25,560.00
241	Ohio	OH-03	\$1,089.00	\$18.85	\$39,204.00
402	Ohio	OH-04	\$700.00	\$12.12	\$25,200.00
406	Ohio	OH-05	\$688.00	\$11.91	\$24,768.00
425	Ohio	OH-06	\$626.00	\$10.83	\$22,536.00
306	Ohio	OH-07	\$924.00	\$15.99	\$33,264.00
311	Ohio	OH-08	\$913.00	\$15.80	\$32,868.00
399	Ohio	OH-09	\$701.00	\$12.13	\$25,236.00
360	Ohio	OH-10	\$800.00	\$13.85	\$28,800.00
349	Ohio	OH-11	\$827.00	\$14.31	\$29,772.00
394	Ohio	OH-12	\$722.00	\$12.50	\$25,992.00
386	Ohio	OH-13	\$753.00	\$13.03	\$27,108.00
364	Ohio	OH-14	\$793.00	\$13.73	\$28,548.00
235	Ohio	OH-15	\$1,107.00	\$19.16	\$39,852.00
316	Oklahoma	OK-01	\$909.00	\$15.73	\$32,724.00
432	Oklahoma	OK-02	\$592.00	\$10.25	\$21,312.00
396	Oklahoma	OK-03	\$716.00	\$12.39	\$25,776.00
351	Oklahoma	OK-04	\$823.00	\$14.24	\$29,628.00
297	Oklahoma	OK-05	\$935.00	\$16.18	\$33,660.00
89	Oregon	OR-01	\$1,562.00	\$27.04	\$56,232.00
348	Oregon	OR-02	\$830.00	\$14.37	\$29,880.00
133	Oregon	OR-03	\$1,405.00	\$24.32	\$50,580.00
272	Oregon	OR-04	\$997.00	\$17.26	\$35,892.00
140	Oregon	OR-05	\$1,383.00	\$23.94	\$49,788.00
162	Oregon	OR-06	\$1,317.00	\$22.79	\$47,412.00
143	Pennsylvania	PA-01	\$1,375.00	\$23.80	\$49,500.00
211	Pennsylvania	PA-02	\$1,169.00	\$20.23	\$42,084.00
167	Pennsylvania	PA-03	\$1,310.00	\$22.67	\$47,160.00
135	Pennsylvania	PA-04	\$1,397.00	\$24.18	\$50,292.00
189	Pennsylvania	PA-05	\$1,239.00	\$21.44	\$44,604.00
158	Pennsylvania	PA-06	\$1,327.00	\$22.97	\$47,772.00
234	Pennsylvania	PA-07	\$1,108.00	\$19.18	\$39,888.00
358	Pennsylvania	PA-08	\$805.00	\$13.93	\$28,980.00
393	Pennsylvania	PA-09	\$731.00	\$12.65	\$26,316.00
288	Pennsylvania	PA-10	\$958.00	\$16.58	\$34,488.00
243	Pennsylvania	PA-11	\$1,083.00	\$18.74	\$38,988.00
271	Pennsylvania	PA-12	\$999.00	\$17.29	\$35,964.00
400	Pennsylvania	PA-13	\$701.00	\$12.13	\$25,236.00
415	Pennsylvania	PA-14	\$665.00	\$11.51	\$23,940.00

405	Pennsylvania	PA-15	\$691.00	\$11.96	\$24,876.00
413	Pennsylvania	PA-16	\$676.00	\$11.70	\$24,336.00
325	Pennsylvania	PA-17	\$892.00	\$15.44	\$32,112.00
287	Rhode Island	RI-01	\$960.00	\$16.62	\$34,560.00
267	Rhode Island	RI-02	\$1,008.00	\$17.45	\$36,288.00
86	South Carolina	SC-01	\$1,566.00	\$27.10	\$56,376.00
226	South Carolina	SC-02	\$1,120.00	\$19.38	\$40,320.00
395	South Carolina	SC-03	\$720.00	\$12.46	\$25,920.00
233	South Carolina	SC-04	\$1,110.00	\$19.21	\$39,960.00
225	South Carolina	SC-05	\$1,123.00	\$19.44	\$40,428.00
221	South Carolina	SC-06	\$1,131.00	\$19.58	\$40,716.00
345	South Carolina	SC-07	\$836.00	\$14.47	\$30,096.00
372	South Dakota	SD-AL	\$774.00	\$13.40	\$27,864.00
410	Tennessee	TN-01	\$682.00	\$11.80	\$24,552.00
293	Tennessee	TN-02	\$945.00	\$16.36	\$34,020.00
298	Tennessee	TN-03	\$935.00	\$16.18	\$33,660.00
259	Tennessee	TN-04	\$1,027.00	\$17.78	\$36,972.00
148	Tennessee	TN-05	\$1,364.00	\$23.61	\$49,104.00
229	Tennessee	TN-06	\$1,117.00	\$19.33	\$40,212.00
98	Tennessee	TN-07	\$1,525.00	\$26.39	\$54,900.00
407	Tennessee	TN-08	\$688.00	\$11.91	\$24,768.00
260	Tennessee	TN-09	\$1,025.00	\$17.74	\$36,900.00
339	Texas	TX-01	\$848.00	\$14.68	\$30,528.00
147	Texas	TX-02	\$1,366.00	\$23.64	\$49,176.00
109	Texas	TX-03	\$1,495.00	\$25.88	\$53,820.00
124	Texas	TX-04	\$1,440.00	\$24.92	\$51,840.00
184	Texas	TX-05	\$1,254.00	\$21.70	\$45,144.00
172	Texas	TX-06	\$1,300.00	\$22.50	\$46,800.00
176	Texas	TX-07	\$1,277.00	\$22.10	\$45,972.00
171	Texas	TX-08	\$1,301.00	\$22.52	\$46,836.00
248	Texas	TX-09	\$1,065.00	\$18.43	\$38,340.00
196	Texas	TX-10	\$1,222.00	\$21.15	\$43,992.00
279	Texas	TX-11	\$977.00	\$16.91	\$35,172.00
165	Texas	TX-12	\$1,315.00	\$22.76	\$47,340.00
307	Texas	TX-13	\$923.00	\$15.98	\$33,228.00
250	Texas	TX-14	\$1,058.00	\$18.31	\$38,088.00
387	Texas	TX-15	\$749.00	\$12.96	\$26,964.00
337	Texas	TX-16	\$854.00	\$14.78	\$30,744.00
253	Texas	TX-17	\$1,051.00	\$18.19	\$37,836.00
218	Texas	TX-18	\$1,138.00	\$19.70	\$40,968.00
323	Texas	TX-19	\$898.00	\$15.54	\$32,328.00
230	Texas	TX-20	\$1,116.00	\$19.32	\$40,176.00
186	Texas	TX-21	\$1,252.00	\$21.67	\$45,072.00

142	Texas	TX-22	\$1,377.00	\$23.83	\$49,572.00
217	Texas	TX-23	\$1,150.00	\$19.90	\$41,400.00
121	Texas	TX-24	\$1,452.00	\$25.13	\$52,272.00
208	Texas	TX-25	\$1,188.00	\$20.56	\$42,768.00
99	Texas	TX-26	\$1,521.00	\$26.33	\$54,756.00
263	Texas	TX-27	\$1,023.00	\$17.71	\$36,828.00
319	Texas	TX-28	\$904.00	\$15.65	\$32,544.00
270	Texas	TX-29	\$1,001.00	\$17.33	\$36,036.00
79	Texas	TX-30	\$1,587.00	\$27.47	\$57,132.00
190	Texas	TX-31	\$1,239.00	\$21.44	\$44,604.00
155	Texas	TX-32	\$1,340.00	\$23.19	\$48,240.00
179	Texas	TX-33	\$1,267.00	\$21.93	\$45,612.00
412	Texas	TX-34	\$678.00	\$11.73	\$24,408.00
168	Texas	TX-35	\$1,308.00	\$22.64	\$47,088.00
222	Texas	TX-36	\$1,128.00	\$19.52	\$40,608.00
94	Texas	TX-37	\$1,537.00	\$26.60	\$55,332.00
132	Texas	TX-38	\$1,406.00	\$24.34	\$50,616.00
209	Utah	UT-01	\$1,181.00	\$20.44	\$42,516.00
212	Utah	UT-02	\$1,166.00	\$20.18	\$41,976.00
181	Utah	UT-03	\$1,264.00	\$21.88	\$45,504.00
138	Utah	UT-04	\$1,391.00	\$24.08	\$50,076.00
265	Vermont	VT-AL	\$1,019.00	\$17.64	\$36,684.00
136	Virginia	VA-01	\$1,393.00	\$24.11	\$50,148.00
131	Virginia	VA-02	\$1,409.00	\$24.39	\$50,724.00
215	Virginia	VA-03	\$1,152.00	\$19.94	\$41,472.00
197	Virginia	VA-04	\$1,221.00	\$21.13	\$43,956.00
276	Virginia	VA-05	\$983.00	\$17.01	\$35,388.00
327	Virginia	VA-06	\$890.00	\$15.40	\$32,040.00
84	Virginia	VA-07	\$1,577.00	\$27.29	\$56,772.00
19	Virginia	VA-08	\$1,969.00	\$34.08	\$70,884.00
414	Virginia	VA-09	\$666.00	\$11.53	\$23,976.00
34	Virginia	VA-10	\$1,833.00	\$31.73	\$65,988.00
14	Virginia	VA-11	\$2,103.00	\$36.40	\$75,708.00
16	Washington	WA-01	\$2,058.00	\$35.62	\$74,088.00
128	Washington	WA-02	\$1,430.00	\$24.75	\$51,480.00
174	Washington	WA-03	\$1,288.00	\$22.29	\$46,368.00
303	Washington	WA-04	\$927.00	\$16.04	\$33,372.00
284	Washington	WA-05	\$967.00	\$16.74	\$34,812.00
157	Washington	WA-06	\$1,335.00	\$23.11	\$48,060.00
29	Washington	WA-07	\$1,897.00	\$32.83	\$68,292.00
159	Washington	WA-08	\$1,327.00	\$22.97	\$47,772.00
60	Washington	WA-09	\$1,641.00	\$28.40	\$59,076.00
116	Washington	WA-10	\$1,462.00	\$25.30	\$52,632.00

423	West Virginia	WV-01	\$633.00	\$10.96	\$22,788.00
411	West Virginia	WV-02	\$681.00	\$11.79	\$24,516.00
310	Wisconsin	WI-01	\$916.00	\$15.85	\$32,976.00
203	Wisconsin	WI-02	\$1,212.00	\$20.98	\$43,632.00
384	Wisconsin	WI-03	\$756.00	\$13.08	\$27,216.00
321	Wisconsin	WI-04	\$901.00	\$15.59	\$32,436.00
256	Wisconsin	WI-05	\$1,033.00	\$17.88	\$37,188.00
373	Wisconsin	WI-06	\$771.00	\$13.34	\$27,756.00
417	Wisconsin	WI-07	\$659.00	\$11.41	\$23,724.00
362	Wisconsin	WI-08	\$797.00	\$13.79	\$28,692.00
382	Wyoming	WY-AL	\$759.00	\$13.14	\$27,324.00

Note: Districts are presented alphabetically by state and Congressional District designation. National Rank reflects each district's position when all Congressional Districts and the District of Columbia are ranked from highest to lowest Housing-Affordability Wage (HAW). Required Annual Income represents the annual gross income necessary to maintain housing costs at or below the affordability threshold defined in Section 2.

Appendix D – Statistical Distribution Analysis

Appendix D provides supplemental statistical tables supporting the analyses presented in Sections 4 and 5. These tables summarize the distribution of Housing-Affordability Wage (HAW) estimates across Congressional Districts and states, provide additional descriptive statistics, and document key characteristics of the dataset.

The purpose of this appendix is to provide readers with a concise statistical reference that complements the district-level and state-level analyses presented in the main body of the paper. While Sections 4 and 5 discuss the principal findings, the tables presented here provide the numerical summaries underlying those observations.

Unless otherwise noted, all statistics are derived from the ACS 2020–2024 5-Year Estimates and were calculated according to the methodology described in Section 2.

Table D.1 presents summary statistics describing the national distribution of Congressional District Housing-Affordability Wage estimates.

Table D.1. National HAW Percentile Distribution

Percentile	HAW (\$/hr)
10th Percentile	\$12.71
25th Percentile	\$15.40
50th Percentile (Median)	\$19.68
75th Percentile	\$25.85
90th Percentile	\$29.82

The 10th and 90th percentile values provide a measure of the spread of Housing-Affordability Wages across Congressional Districts. The difference between these values may be interpreted as a national affordability dispersion indicator, illustrating the degree to which housing-cost-driven wage requirements vary across geographic regions.

Table D.2 summarizes the distribution of Congressional Districts across selected Housing-Affordability Wage bands. Housing-Affordability Wage bands are intended to provide a simplified view of the national distribution of affordability requirements. Band thresholds were selected for interpretability and do not represent policy targets or affordability classifications

Table D.2. Congressional Districts by HAW Band

HAW Range (\$/hr)	District Count	Percent of Districts
< \$15	101	23%
\$15 - \$20	122	28%
\$20 - \$25	90	21%
\$25 - \$30	80	18%

> \$30	43	10%
Total	436	100

Percentages are calculated using the 436 Congressional District and District of Columbia geographies included in the primary analysis dataset.

Appendix E – Excluded Territorial Geography Summary

Appendix E documents territorial geographies identified during the construction and audit of the Housing-Affordability Wage (HAW) dataset. The ACS 2020–2024 5-Year Estimates Congressional District extract used in this study contained one territorial congressional geography: the Resident Commissioner District (at Large) of Puerto Rico.

The Housing-Affordability Wage framework presented in this paper utilizes Congressional Districts within the fifty states and the District of Columbia as its primary unit of analysis. For methodological consistency, the Puerto Rico record was separated from the primary dataset and excluded from the national Congressional District analysis presented throughout the paper. However, the record is retained and reported separately to preserve the completeness of the underlying source data and to provide transparency regarding all geographies included in the original ACS extract.

Maintaining this record separately also provides a consistent historical reference for future editions of the Housing-Affordability Wage framework. While not included in the primary analysis, the Puerto Rico record may be useful for future comparisons of housing affordability conditions across United States jurisdictions.

Table E.1 presents summary statistics for the excluded territorial geography dataset.

Table E.1. Excluded Territorial Geography Dataset Summary

Metric	Value
Geographies Included	1
Mean HAW (\$/hr)	\$6.77
Median HAW (\$/hr)	\$6.77
Minimum HAW (\$/hr)	\$6.77
Maximum HAW (\$/hr)	\$6.77

Table E.2 provides the Housing-Affordability Wage estimate for the excluded territorial congressional geography identified within the source dataset.

Table E.2. Excluded Territorial Geography Reference Table

Geography	Median 1BR Rent (\$/Month)	HAW (\$/hr)	Required Annual Income (\$)
Resident Commissioner District (at Large) – Puerto Rico	\$391.00	\$6.77	\$14,076.00

Note: The ACS Congressional District extract used in this study contained one territorial congressional geography, the Resident Commissioner District (at Large) of Puerto Rico. Other United States territories were not present within the Congressional District geography extraction utilized for this analysis.

Appendix F – Reproducibility & Framework Maintenance

Appendix F documents the data sources, processing workflow, calculations, and dataset construction procedures used to develop the Housing-Affordability Wage (HAW) framework presented in this paper. The purpose of this appendix is to provide sufficient methodological detail to allow future researchers to reproduce, verify, or update the framework using subsequent releases of the American Community Survey (ACS).

F.1 Data Sources

The primary data source utilized in this study was the United States Census Bureau American Community Survey (ACS) 2020–2024 5-Year Estimates.

The principal dataset used was:

ACS Detailed Table B25031 – Median Gross Rent by Bedrooms

Congressional District geographies were selected as the primary unit of analysis. The dataset was downloaded through the Census Bureau's data portal and included all Congressional District geographies available within the ACS 2020–2024 5-Year Estimates.

Median gross rent values for one-bedroom housing units were extracted from Table B25031 and used as the basis for all Housing-Affordability Wage calculations presented in this study.

Additional reference datasets, including HUD Fair Market Rent estimates and National Low Income Housing Coalition (NLIHC) Housing Wage calculations, were reviewed for contextual comparison but were not used directly in the calculation of Housing-Affordability Wage estimates.

The ACS 5-Year Estimates are updated annually using a rolling multi-year sample. As a result, a new Congressional District dataset suitable for Housing-Affordability Wage calculations becomes available each year. Future editions of the HAW framework may therefore be updated annually while maintaining methodological consistency. Because each release incorporates five years of survey responses, year-to-year changes should generally be interpreted as gradual shifts in housing affordability conditions rather than abrupt annual changes.

F.2 Data Acquisition

Data acquisition consisted of the following steps:

1. Access the United States Census Bureau data portal.
2. Select ACS 2020–2024 5-Year Estimates.
3. Select Detailed Table B25031 – Median Gross Rent by Bedrooms.
4. Select Congressional District geographies.

5. Download the resulting dataset in CSV format.
6. Verify record completeness and geographic coverage.

The downloaded dataset contained Congressional District geographies for the fifty states, the District of Columbia, and the Resident Commissioner District (at Large) of Puerto Rico.

F.3 Data Processing Workflow

The following workflow was used to construct the Housing-Affordability Wage dataset:

1. Import the ACS Congressional District dataset.
2. Extract the median gross rent value for one-bedroom housing units.
3. Verify geographic identifiers and Congressional District designations.
4. Separate the Puerto Rico Resident Commissioner District record from the primary analysis dataset.
5. Calculate required monthly income using the affordability threshold defined in Section 2.
6. Calculate required annual income.
7. Calculate the Housing-Affordability Wage (HAW).
8. Generate Congressional District rankings.
9. Aggregate Congressional District values to produce state-level summary statistics.
10. Generate tables, figures, and supporting statistical summaries.

All calculations were performed using the methodology described in Section 2.5.

F.4 Housing-Affordability Wage Calculations

Housing-Affordability Wage calculations were derived from median one-bedroom gross rent values using the affordability framework described in Section 2.

Monthly income required to satisfy the affordability threshold was calculated as:

$$\text{Required Monthly Income} = \frac{\text{Median Monthly Rent}}{0.33}$$

Required annual income was calculated as:

$$\text{Required Annual Income} = \text{Required Monthly Income} \times 12$$

Housing-Affordability Wage was calculated as:

$$HAW = \frac{\text{Required Annual Income}}{2080}$$

where 2,080 represents a full-time work year consisting of forty hours per week for fifty-two weeks.

All monetary values are expressed in nominal dollars corresponding to the ACS 2020–2024 5-Year Estimates.

F.5 Dataset Construction Notes

The primary analysis dataset consisted of 436 geographies, including all Congressional Districts and the District of Columbia.

The Resident Commissioner District (at Large) of Puerto Rico was identified within the source dataset and separated from the primary analysis for methodological consistency with the Congressional District framework.

Congressional District rankings presented in Appendix C were ordered by Housing-Affordability Wage from highest to lowest.

State-level estimates presented in Appendix B were derived from Congressional District Housing-Affordability Wage values and should be interpreted as summary measures rather than direct ACS state-level calculations.

All calculations were performed using publicly available data and reproducible mathematical procedures.

F.6 Framework Update Procedure

Future editions of the Housing-Affordability Wage framework may be generated by repeating the data acquisition and processing workflow using subsequent ACS 5-Year Estimate releases.

Researchers updating the framework should:

1. Download the most recent ACS 5-Year Estimate release.
2. Select Table B25031 and Congressional District geographies.
3. Apply the affordability methodology described in Section 2.
4. Calculate updated Housing-Affordability Wage estimates.
5. Generate updated Congressional District rankings.
6. Recalculate state-level summary statistics.
7. Update figures, tables, and appendices accordingly.

Because the framework relies on publicly available ACS data and transparent calculations, future updates may be produced without modification to the underlying methodology, allowing direct comparison across time periods and geographic regions.

F.7 Framework Configuration & Version Control

To ensure consistency across future updates, the Housing-Affordability Wage (HAW) framework should maintain a documented set of core configuration parameters. Changes to any of these parameters should be identified explicitly in future editions because they may affect comparability across time periods.

At the time of publication, the Housing-Affordability Wage (HAW) framework utilizes the following baseline configuration parameters

Parameter	Value
Primary Data Source	ACS 5-Year Estimates
ACS Table	B25031 – Median Gross Rent by Bedrooms
Housing Unit	Median One-Bedroom Rental Unit
Rent Metric	Median Gross Rent
Affordability Threshold	33% of Gross Income
Monthly Work Hours	173.33 Hours
Annual Work Hours	2,080 Hours
Primary Geography	Congressional District
District of Columbia	Included
Puerto Rico	Reported Separately
Remaining Territories	Not Included
Wage Basis	Gross Income
State Statistics	Derived from District-Level Values
Monetary Precision	Two Decimal Places

Framework updates generally fall into one of three categories: (1) Data Updates, consisting of new ACS data releases while maintaining existing methodology; (2) Methodology Updates, involving changes to framework assumptions, formulas, or geographic definitions; and (3) Publication Updates, consisting of editorial corrections, formatting revisions, or clarifications that do not affect calculated Housing-Affordability Wage estimates. Distinguishing between these update types improves transparency and helps preserve comparability across framework versions.

Future framework updates should identify any changes to these parameters and document the rationale for those changes. Maintaining a consistent configuration allows Housing-

Affordability Wage estimates to be compared across ACS releases, Congressional District boundary revisions, and future editions of this framework.

The procedures documented throughout this appendix are intended to ensure that the Housing-Affordability Wage framework remains transparent, reproducible, and maintainable over time. By documenting data sources, calculation methods, update procedures, and configuration controls, future researchers may independently verify prior results, reproduce published calculations, and update the framework as new data become available while preserving methodological consistency across releases.

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About the Author

Brian van Kuik is an independent researcher and the developer of the Housing-Affordability Wage (HAW) framework. The framework was developed to provide a transparent, reproducible, and geographically comparable measure of housing affordability using publicly available rental data.

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