**Raj Shah**

**School of Communication and Information  
 Rutgers University–New Brunswick  
Information Visualization Section 7 (04:547:321:G7)  
Professor: Jennifer Silvia Muller  
June 18, 2025**

**Critique and Redesign of “Visualizing the Size of Half a Million Dollar House in Every State”**

This project analyzes and improves the “How Much Square Footage Can $500K Buy?” housing affordability chart originally published by *HowMuch.net*. The chart aims to show how much house $500,000 can buy in each U.S. state, but its design introduces several issues that undermine its effectiveness. One of the most significant flaws lies in its use of color. As shown in **Figure 1**, the chart is bathed in hot pink and maroon, colors that carry no intuitive meaning. Color is a powerful tool in visual communication, and when misapplied, it can obscure more than it reveals. As Schwabish (2021) notes, “tiring fluorescent hues and perceptually ambiguous color schemes” should be replaced with gradients that enhance meaning, typically through dark-to-light or diverging color scales (p. 270). The pink gradient lacks any semantic link to affordability, forcing viewers to rely heavily on the numerical labels within each square. Ideally, A screenshot of a computer

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F**igure 1:** Original Visualization: Misleading color scheme and distorted geography make housing affordability hard to compare across states.

color should guide the eye toward patterns and outliers—but here, it creates confusion. The legend reflects price per square foot, while the squares display square footage purchasable,

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**Figure 2:** How Much Space Can $500K Buy? Square Footage by State (Mainland U.S.)

To address these problems, I redesigned the visualization in Tableau using a diverging blue-to-orange color scale. In the new version (Figure 2), blue represents a lower price per square foot (greater affordability), while orange signals a higher price (less affordability). This strategy follows Schwabish’s (2021) advice to “start with gray” and build contrast to direct attention (p. 42). I also separated Alaska and Hawaii into their own frames (Figures 3 and 4) to fix geographic distortion in the original. These updates restore spatial accuracy and ensure fair state representation. As Tufte (2006) emphasizes, visualizations should clarify data, not merely

decorate it (p. 129), and Katz (2017) recommends diverging gradients to enable accurate numeric comparisons (p. 352). Together, these redesigns improve interpretability and trust, helping viewers more easily compare housing affordability across all 50 states.

A map of the state of hawaii

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**Figure 3:** *How Much Space Can $500K Buy? Square Footage in Hawaii*

A map of the state of alaska

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**Figure 4:** *How Much Space Can $500K Buy? Square Footage in Alaska*

Another critical issue with the original visualization is its inconsistent and unclear labeling of numeric values. Although the chart aims to communicate how many square feet $500,000 can purchase in each U.S. state, it does so through a combination of box size and color shading, with numeric labels either missing, misaligned, or inconsistently applied. This ambiguity places an unnecessary burden on the viewer. Rather than presenting the data clearly and directly, the visualization forces the audience to rely on visual cues and estimations to

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AI-generated content may be incorrect.interpret quantitative information. This compromises both accessibility and interpretability. Edward Tufte (2006) emphasized the importance of maximizing the “data-ink ratio,” where all graphical elements should serve the direct

purpose of communicating data, rather than acting as visual clutter or distractions (p. 127). The chart’s inconsistent labeling fails to meet this standard, using space inefficiently while offering little concrete information. Additionally, Jonathan Schwabish (2021) recommends “redundant encoding,” which means using multiple modes—like color, shape, and text—to convey the same information, helping ensure clarity and accuracy (p. 38). In this case, the reliance on only color and area, without reliable numerical labeling, creates a visualization that lacks the necessary transparency for meaningful comparisons.

A map of the state of texas

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**Figure 6:** Square Footage and Price per Sq. Ft. in the West Region

To directly address these labeling inconsistencies, I implemented a small multiples strategy with four region-specific maps based on U.S. Census regions — Midwest, South, West, and Northeast. This redesign reduces visual clutter while allowing uniform placement of labels. Each state is tagged with a two-line label that clearly shows both square footage and price per square foot, giving users a complete and immediate understanding of affordability. For example, the Northeast (Fig. 5), West (Fig. 6), South (Fig. 7), and Midwest (Fig. 8) maps each provide clear and legible displays without overcrowding. By splitting the data into regional maps, I avoided the overlapping label problem seen in the national layout, which improved legibility without compromising scope. I also applied a consistent diverging color palette across all maps to reinforce the connection between value and color. This redesign not only enhances usability and trust but also more fully delivers on the chart’s original purpose enabling accurate, regionally informed comparison of home-buying power across the United States.

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**Figure 7:** Square Footage and Price per Sq. Ft. in the Southern Region

A graph of numbers and letters

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**Figure 9:** Housing Affordability by State: Square Footage and Price per Sq.Ft. for $500K

A third major issue with the original visualization is its use of a square grid map that eliminates geographic context. Each U.S. state is represented as an identically sized pink square arranged in a rigid grid layout, which fails to reflect actual geographic positions, relative sizes, or regional groupings. While grid maps offer design balance and equal visual weight across states, they often result in a loss of geographic literacy. Viewers are unable to detect regional housing disparities—such as the contrast between high-cost coastal states like California and lower-cost Southern states like Mississippi—because the spatial cues that support such insights are missing. Tufte (1990) refers to this kind of oversimplification as the “Flatland” problem: when complex, multivariate data are reduced to two-dimensional representations that strip away meaningful structure (p. 15). The grid layout misleadingly flattens highly diverse housing markets—treating geographically and economically distinct states like New York and Wyoming as if they offer equivalent affordability, which they do not. This creates an inaccurate impression that all states are equal in cost and opportunity, undermining the purpose of a comparative map. Additionally, without a geographic reference frame, viewers cannot connect the data to broader spatial narratives such as urbanization, population density, or regional economic development. As Berinato (2023) argues, effective visualizations should prioritize “context first,” allowing viewers to ground abstract values in recognizable real-world structures (p. 41).

To resolve this issue, I adopted a dual-chart strategy in Tableau. First, I created a traditional filled map of the United States using a diverging orange-blue color scale to visualize how much square footage $500,000 can purchase in each state. This geographic approach reinforces spatial logic and allows users to quickly identify regional patterns. Second, I developed a horizontal bar chart that ranks all 50 states by square footage purchasable, sorted from least to most affordable. This chart complements the map by emphasizing precise rankings and comparative values. Together, the two visuals provide both context and clarity, enhancing the overall interpretability of the data. This approach aligns with Schwabish’s (2021) guidance to use “multiple graphs” for layered insights (p. 42).

In conclusion, by incorporating the principles of Tufte, Schwabish, and Berinato, the redesigned visualizations enhance clarity, spatial coherence, and trust, embodying the core values of ethical and effective data storytelling.

**References**

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