Conversions of Non-Residential Buildings to Residential Housing in Urban Areas*

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Abstract

Media discussions have highlighted the conversion of large, potentially stranded properties—offices, shopping centers, hotels, hospitals, and others—into residential units in dense urban areas. This study provides a comprehensive analysis of the conversion of stranded assets across urban areas in the United States from 1990 to 2024. Shifting work and shopping patterns, coupled with persistent housing shortages, are often cited as drivers of this repurposing trend. However, a comprehensive understanding of the scale and impact of these conversions has been lacking. The unique data used in this study allows us to fill this crucial gap by tracking the timing and geographic distribution of conversions, identifying the buyer and seller profiles involved, and measuring the associated financing. Furthermore, we investigate the factors that contribute to the varying impact of these conversions across different urban contexts.

Keywords: Adaptive Reuse, Commercial Real Estate, Housing Shortage, Economic Viability, Stranded Assets

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1 Objectives

The rapid shift towards remote work and online shopping triggered by the COVID-19 pandemic have led to increasing vacancies in offices, shopping centers, hotels, and other large buildings, raising concerns that these properties may become stranded assets. This phenomenon has become increasingly prominent, particularly within the non-residential buildings in urban areas.

A stranded asset refers to a property that has experienced a significant and often premature decline in value, rendering it economically unviable in its current form.[1] While reconversion into alternative uses, such as residential housing, presents a potential solution, it is often hampered by substantial financial obstacles.[2] Furthermore, the opportunity cost of investing in these conversions, when weighed against potentially more lucrative alternative investments, exacerbates the problem. Fundamentally, a stranded asset represents a scenario where the cost of revitalizing a property outweighs its potential returns, leaving it trapped in a state of diminished value.

Numerous studies and reports have highlighted the growing problem of stranded assets, particularly in the office sector, where declining demand is leading to obsolescence. For example, Putzier and Parker (2023) describe an 'office apocalypse' where vacancies in traditional office spaces are driving some assets toward obsolescence.[3] Meanwhile, various policy initiatives (see White House 2023) are being proposed to address the market constraints and fiscal challenges arising from these commercial real estate disruptions. These initiatives aim to facilitate adaptive reuse and commercial-to-residential conversions as a strategy to revitalize underutilized properties.

Early conversion initiatives documented by San Francisco Bay Area Planning and Urban Research Association (SPUR) and Urban Land Institute of San Francisco (2021) further suggest that even hotels and other large properties are being repurposed, highlighting a growing trend towards more flexible urban land use. Per Fannie Mae (2024), while commercial-to-residential conversions have contributed to housing supply in select markets, the nationwide conversion rate remains largely unknown.

Unlike past trends, the current conversions are driven by unique factors—remote work,

[1] This situation arises from a confluence of factors, including shifting market demands driven by evolving work and shopping patterns, rapid technological advancements, and escalating environmental concerns.

[2] The high costs associated with reconversion, encompassing labor, materials, and financing, coupled with uncertain returns in volatile markets, create a significant economic hurdle.

[3] Gupta, Mittal, and Van Nieuwerburgh (2025) develop a model that measures how remote work has led to substantial declines in lease revenues, occupancy, and market rents in the commercial office sector. Specifically, they revalue New York City office buildings—accounting for both cash flow reductions and discount rate adjustments—and project a 46% decline in long-term value. For all U.S. office markets combined, this amounts to approximately $556.8 billion in value destruction.

economic shifts, and 'carbon stranding'—resulting in an unprecedented scale. Therefore, comprehensive data analysis is essential for understanding and managing these changes. This knowledge gap limits the ability of policymakers and investors to make informed decisions.

This study conducts a comprehensive analysis of the conversion of stranded assets within urban areas of the United States from 1990 to 2024. Through systematic mapping, characterization, and explanation of this trend, this research yields valuable insights into its broader economic and social implications, thereby informing targeted policy interventions, urban planning strategies, and investment decisions. The availability of microdata from CoStar enables us to quantitatively measure the timing and geographic distribution of these commercial-to-residential conversions, map their spatial characteristics, and assess their direct impact on housing supply.[4] Specifically, this study will:

- Measure the magnitude and distribution of commercial-to-residential conversions across urban centers.
- Characterize the key players, financing mechanisms, and policy frameworks that influence the conversion process.
- Analyze the economic, regulatory, and social drivers behind these conversions.
- Assess the impact of conversions on housing supply, property prices, and overall real estate market dynamics.

By tracking commercial-to-residential conversions over more than three decades, the analysis provides evidence-based insights into the trends and drivers of these transformations. This data enables the identification of long-term patterns, distinguishing cyclical fluctuations from sustained shifts, while geographical dispersion reveals regional variations and the impact of local policies.

This approach enables the assessment of causal relationships, market cycle analysis, and the prediction of future conversion activity. As a result, our findings will empower urban planners, investors, and policymakers to adapt zoning, guide strategic decisions, and develop targeted interventions for managing stranded assets and optimizing housing supply. Furthermore, we will analyze the impact of these conversions on broader market property values and evaluate their effectiveness in mitigating housing shortages.

[4]CoStar, a commercial real estate data company, provides data and analytical tools, including feasibility assessments for office-to-multifamily conversions based on factors like floorplate size, vacancy, and acquisition costs. In addition, its lease management and rent payment streamlining solutions enable cash-flow analysis for building management and multifamily conversions.

2 Stranded Asset Conversion Model

This section presents a simplified model to analyze the economic decision of converting a stranded commercial asset into residential housing. The model aims to provide a clear framework for understanding the key factors influencing the viability of such conversions, particularly in scenarios where commercial properties have experienced significant value depreciation.

2.1 Model Setup

Consider a commercial property with current market value V_C. This property is facing a decline in its economic utility due to shifting market demands, technological obsolescence, or other factors, rendering it a potentially stranded asset. The property owner contemplates converting this asset into residential units, leveraging its existing structure for a new purpose. The conversion process incurs a cost C, encompassing construction, materials, labor, and regulatory compliance. The expected future value of the residential property upon completion of the conversion is V_R. We assume a discrete-time framework with a discount rate r, reflecting the opportunity cost of capital and the risk associated with the conversion project. The conversion process is assumed to take t periods, during which the asset generates no income.

Define the **net present value (NPV) of conversion** as

$$NPV = \frac{V_R}{(1+r)^t} - V_C - C.$$

This expression calculates the present value of the expected residential property value, discounted back to the present using the discount rate r over t periods, and subsequently subtracts the current commercial property value V_C and the conversion cost C. The NPV represents the net gain or loss from undertaking the conversion project.

The property owner will proceed with the **conversion** if and only if the NPV is non-negative, indicating that the project is expected to generate at least a return equivalent to the opportunity cost of capital:

$$\text{Convert if } NPV \geq 0.$$

Otherwise, if the NPV is negative, the conversion is not economically viable, as it would result in a loss or a return below the required rate.

The **stranded asset condition** is characterized by a significant decline in V_C and/or a substantial increase in C, such that even with a reasonable V_R, the NPV becomes negative or

marginally positive. This implies that the discounted future value of the residential property fails to cover the combined costs of the current commercial value and the conversion:

$$\frac{V_R}{(1+r)^t} < V_C + C.$$

This condition highlights the economic challenge of repurposing assets that have lost significant value.

2.2 Comparative Statistics

We can analyze the sensitivity of the NPV to changes in the model parameters, providing insights into how different factors influence the conversion decision.

1. **Discount Rate (r):** An increase in r decreases the discounted future value $\frac{V_R}{(1+r)^t}$, reducing the NPV. This reflects the increased opportunity cost of capital and the higher risk associated with the project.

2. **Conversion Cost (C):** An increase in C directly reduces the NPV, making the conversion less attractive. This highlights the importance of managing conversion costs to ensure project profitability.

3. **Current Commercial Value (V_C):** A decrease in V_C reduces the total costs, potentially increasing the NPV and making the conversion more viable. This underscores the role of market depreciation in driving conversion decisions.

4. **Future Residential Value (V_R):** An increase in V_R increases the discounted future value, increasing the NPV. This emphasizes the importance of accurate market projections and the potential for value creation through conversion.

5. **Time (t):** An increase in t decreases the discounted future value $\frac{V_R}{(1+r)^t}$, reducing the NPV. This reflects the impact of project duration on profitability and the time value of money.

This simplified model, while providing a foundational framework for analyzing stranded asset conversions, inherently carries several limitations. Firstly, it assumes a deterministic future residential value (V_C), neglecting the significant market volatility and uncertainty that characterize real estate. Secondly, it fails to incorporate dynamic market shifts, such as fluctuating interest rates, construction costs, and demand patterns, which can drastically alter conversion viability. Thirdly, the model disregards financing complexities, including

loan availability and interest rates, which directly impact conversion expenses. Fourthly, it omits the substantial influence of regulatory and zoning hurdles, which can substantially delay and increase project costs. Lastly, the model does not account for detailed cash flow analyses, which are crucial for assessing the long-term profitability of a conversion project, including operating expenses, rental income, and tax implications.

3 Dataset

The primary data set for this study was provided by CoStar and covers commercial real estate transactions from 1990 to the present. CoStar compiles its data from multiple sources, including agent reports, public property deeds, and its own proprietary analyses. Each transaction record contains detailed attributes—such as property type, location, transaction value, financing details, and occupancy rates—that form the basis for our quantitative analysis.

A key feature of the dataset is the inclusion of detailed transaction notes entered by field agents and subsequently verified by CoStar researchers. These notes offer rich qualitative insights into the nature of each transaction. For example, an agent's note might indicate that an office building is being converted into a multifamily apartment complex due to persistent vacancies and recent zoning changes, providing specific details on the conversion process. Such detailed annotations allow us to identify the scope and specific characteristics of each conversion.

To systematically identify conversion transactions, each record is assigned a dummy variable in the database that flags it as a conversion. We then leverage this indicator and apply textual analysis to the agent notes to extract additional details on the conversion type (e.g., office-to-residential), the process—including architectural modifications and regulatory constraints—and the underlying motivations driving the change.

Complementing the qualitative data, public records in the CoStar dataset supply comprehensive details on financing—such as loan amounts, interest rates, and other key financial terms—which highlight the economics of these adaptive reuse projects. The dataset also provides occupancy rates for properties across various urban centers, enabling us to accurately measure the number of new housing units created through these conversions. Given the complexity of the database we will start by the largest MSAs.

4 Methodology and Empirical Strategy

This study employs a systematic, multi-step process to evaluate the impact of converting large commercial buildings into residential units, focusing on the location, drivers, and effects

on housing supply.

1. Spatial and Temporal Mapping. Utilizing detailed CoStar data, spanning transactions from 1990 to the present and encompassing agent reports, public property deeds, and proprietary analyses, we will map the spatial distribution of commercial-to-residential conversions nationwide. This includes identifying converted property types (e.g., office buildings, shopping centers, hotels, hospitals) and their locations within key U.S. metropolitan areas. We will analyze conversion timing, highlighting periods of accelerated activity (e.g., post-pandemic), and quantify residential output by measuring multifamily units per conversion. This detailed mapping will provide insights into regional differences and the role of adaptive reuse in addressing housing supply challenges.

2. Stakeholder and Financing Characterization. Leveraging CoStar's transaction data, we will identify transaction types (e.g., individual investors, developers) and buyer-seller categories (regional, national, foreign). We will evaluate property holding periods and analyze financing structures, including leverage, using public record data. This step will reveal the agents driving conversions and their associated financing.

3. Drivers of repurpose of stranded assets. Employing econometric modeling, we will investigate the economic, social, and regulatory drivers of conversions. This includes analyzing the impact of low occupancy rates due to remote work, housing demand, and policy interventions. We will examine the urban environments and sublocalities impacted, assessing local demographic profiles and occupancy levels. By developing detailed profiles of conversion areas, we aim to understand the interaction of these factors in driving adaptive reuse.

4. Housing Supply Impact Assessment. We will evaluate the impact of conversions on housing supply, measuring changes in housing unit availability. We will assess the evolution of pricing and occupancy levels around converted buildings, measuring broader market impacts and evaluating the role of adaptive reuse in stabilizing property values. This analysis will leverage CoStar's comprehensive data to capture market dynamic changes.

This methodology provides a robust framework for understanding the scale, distribution, and impact of commercial-to-residential conversions, delivering evidence-based insights for urban planning, investment strategies, and policy interventions.

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