

MOODY'S
ANALYTICS

CRE

August 8, 2023

Tale of Two Cities

New York City and San Francisco

Tale of Two Cities: New York City and San Francisco

Authors



Anthony Spinelli
Associate Economist
Moody's Analytics CRE

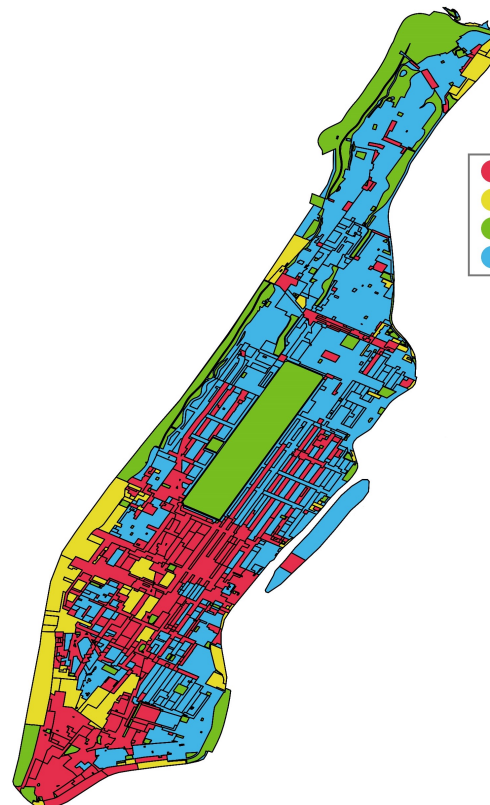


Lu Chen
Senior Economist
Moody's Analytics CRE



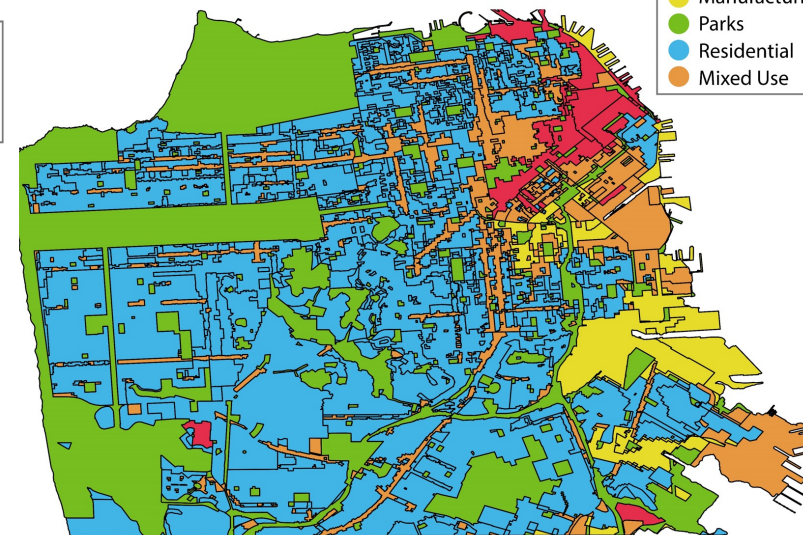
Thomas LaSalvia, Ph.D.
Head of Economics
Moody's Analytics CRE

Manhattan Zoning Map



- Commercial
- Manufacturing
- Parks
- Residential

San Francisco Zoning Map



- Commercial
- Manufacturing
- Parks
- Residential
- Mixed Use



Contact Us
General Inquiries
& Sales

cre.moodyanalytics.com
[855 702 2018](tel:8557022018)



Client Success

CREClientService@moodys.com
[212 553 1658](tel:2125531658)



Media Inquiries

julianne.wiley@moodys.com
[970 445 4768](tel:9704454768)

Tale of Two Cities: New York and San Francisco

One hugs the Atlantic Ocean's coast, known for its towering skyscrapers and symbolizing the hub of finance and boundless energy. The other nears the Pacific, known for its hilly streets and chilly air shrouding the brightest minds and newest ideas to reshape human history. The pandemic hit pause for both New York and San Francisco. Within months, commuting workers no longer rode trains or drove to the cities. Residents fled to neighboring metros or even states. Office lights were still on but street buzz was off. Stores and restaurants hung 'closed' signs that never flipped back to 'open'. Only lonely flights took off from international airports.

But that blackout did not last long. As concerns over the pandemic faded, each city tried to revive itself. In New York, people rushed back and refilled the apartments, streets, and subways. Restaurants and stores flooded with customers again. San Francisco, on the other end, battled safety concerns, homelessness, and population exodus which existed before but only became more obvious with barren neighborhoods. Offices sat empty in the once bustling downtown. Retailers and restaurants that used to rely on office workers were dead. This begs the question: What caused such a dichotomy?

San Francisco thrives on the boom of the tech industry. The Pandemic triggered a domino effect on the growth trajectory of tech tycoons, start-ups, and everything in between. Remote and hybrid work dried up foot traffic, which laid bare underlying issues such as crime, inefficient regulation, and lack of public support. In contrast, New York was able to adapt to the higher office vacancies and declining population due to its higher industry diversification, flexible regulation, and strong (in comparison) public infrastructure and amenities. All of which helped to move the city back on track faster than its counterpart in some respects. However, in contrast to San Francisco's anecdotal negativity is its surprisingly fast jobs recovery, resilient talent pool, and a bright future as Generative AI sparks many companies to move back in.

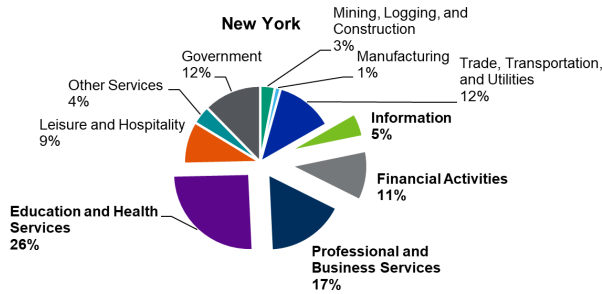
Anthony Spinelli lives and works in New York City. Lu Chen lives and works in San Francisco. In this report titled Tale of Two Cities, the two Moody's Analytics commercial real estate researchers teamed up to dive into both cities' economic and demographic foundations and bring their unique perspectives as both residents and analysts to break down the state of New York and San Francisco's commercial real estate now and what they expect for their futures.



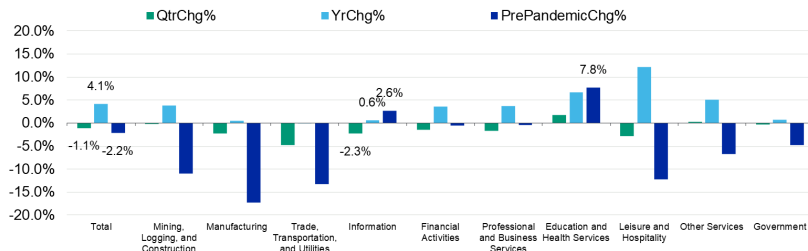
*“This land is your land, this land is my land
from California to the New York island
from the Redwood forest,
to the Gulf Stream waters
this land was made for you and me”*

New York Industry Diversification

Information (5%), Financial Activities (11%), Professional & Business Services (17%), and Education & Health Services (26%) make up nearly 60% of all the jobs in NYC. More diversified industries and a heavier weight in Education & Health Services allowed New York to weather through economic challenges even though Information, Financial Activities, and Professional & Business Services remain strained.



By May 2023, NYC's total employment was still 0.6% behind the pre-pandemic level even though Education & Health Services, Leisure & Hospitality, and Professional & Business Services collectively contributed to 80% of the employment gains over the past year (Q1 2022 – Q1 2023).

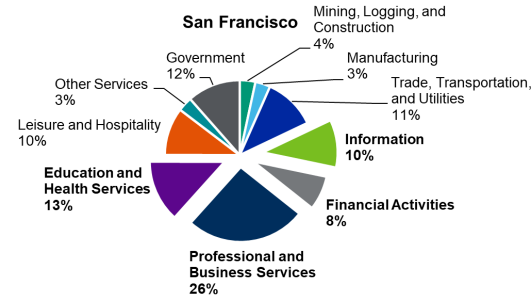


Notable organizations like Verizon, JPMorgan Chase, Pfizer, and IBM are headquartered in NYC, with offices located in the downtown Financial District or Midtown. YTD, the metro's total nonfarm employment has increased by 0.47% (or 22,000 jobs).

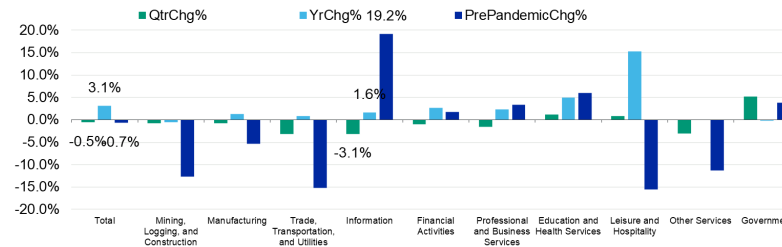
Source: BLS - <https://dol.ny.gov/current-employment-statistics-0>

San Francisco Industry Diversification

Information (10%), Financial Activities (8%), Professional & Business Services (26%), and Education & Health Services (13%) make up nearly 60% of all the jobs in San Francisco. However, heavy concentration in Information and Professional & Business Services exposed the city to higher growth volatility during an economic downturn.



As compared to NYC, San Francisco's employment was fully recovered since January this year. Accounting for a minor retreat in February and March from tech layoffs, employment quickly bounced back and is 0.7% above February 2020's level by May. Although the headline news showed major tech firms slashing workforce, the Information sector was still the main driving force of the city's total employment.



Wells Fargo, Salesforce, Uber, Twitter, and OpenAI among many others are headquartered in San Francisco. YTD, the metro has seen an increase in nonfarm employment of 2.06% (or 51,000 jobs).

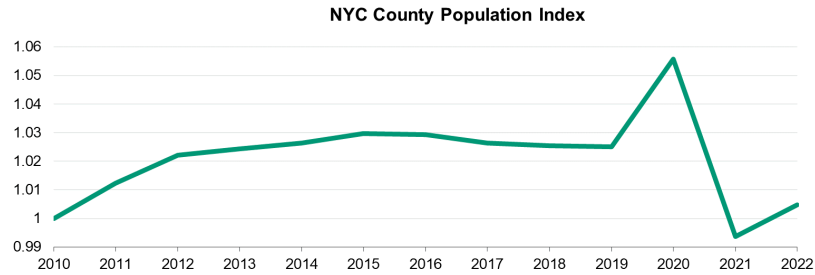
Source: BLS - https://www.bls.gov/eag/eag.ca_sanfrancisco_msa.htm



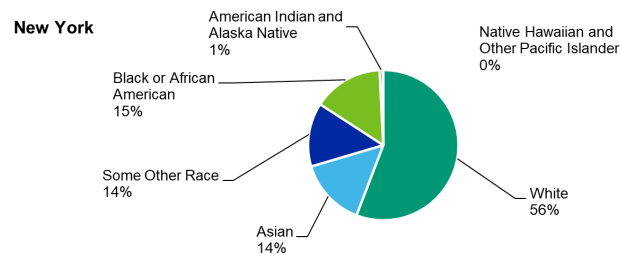
¹ <https://dol.ny.gov/current-employment-statistics-0>
² https://www.bls.gov/eag/eag.ca_sanfrancisco_msa.htm

New York's Population Losses and Migration Pattern

Total population for 2022 is down 4.8% from 2020 levels, ranking 1st in the nation for nominal population losses (-428,569 residents) between 2020 and 2022. Much of the decline comes from 2020 to 2021 with the loss of -305,465 residents. On a positive note, population ticked up 1.1% from 2021 to 2022.

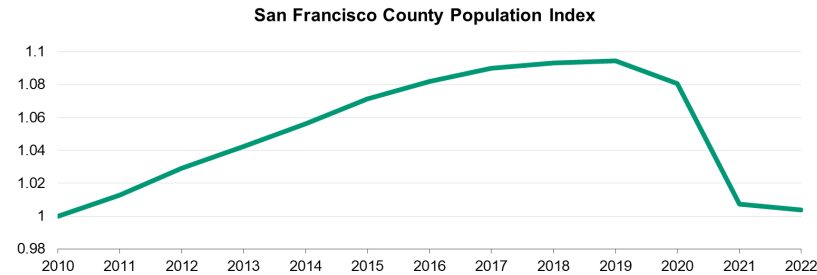


At the hands of the COVID-19 pandemic, many fled the city to less dense suburban areas of the metro, or even further to Long Island, New Jersey, or Connecticut. In the latest [US Census report](#), most counties in the New York metro area saw increases in their commuter-adjusted population between 2019 and 2021, led by Brooklyn. In contrast, Manhattan saw a strong opposite trend, suggesting many commuters or residents no longer lived there in 2021. This migration out of Manhattan can be explained by the prevalence of remote and hybrid work, as many workers no longer need to be close to the office. While the outer areas of the metro like Brooklyn and Queens have historically offered lower rents. The census also reports that the city's population increase was aided by a surge in international migration.

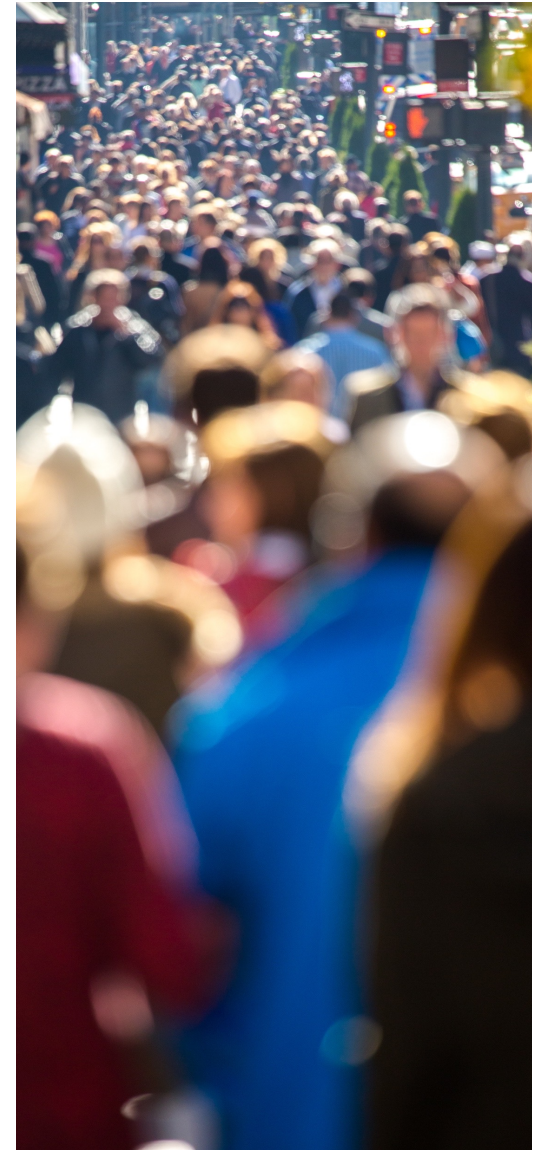
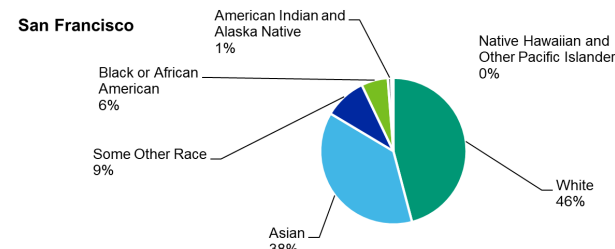


San Francisco Population Losses and Migration Pattern

With total population down 7.5% between 2020 and 2022, San Francisco ranked No. 1 in the rate of population loss among all US counties with more than 100,000 residents. Most of the exodus (-7.2%) happened between 2020 and 2021, while the rate of loss moderated to only -0.3% from 2021 to 2022.



COVID impacted residents' choice of living. Street safety, ample living spaces, and affordable housing prices outweighed proximity to offices or even slight weather advantages. Based on [Bay Area Economic Institute's resident survey](#), more wealthy residents left the area in 2021 than the year before, but the vast majority of people leaving (nearly 75%) were individuals who earn \$100k or less. Last year, slowing in domestic outmigration and a rebound in international immigration saved the city's population from sliding further. What seems more promising for the city's future prosperity was the 'surprising' swell of young population group. Based on Equifax data, there has been notably more young people between the ages of 25-34 who have moved into the city last year rather than moving out.



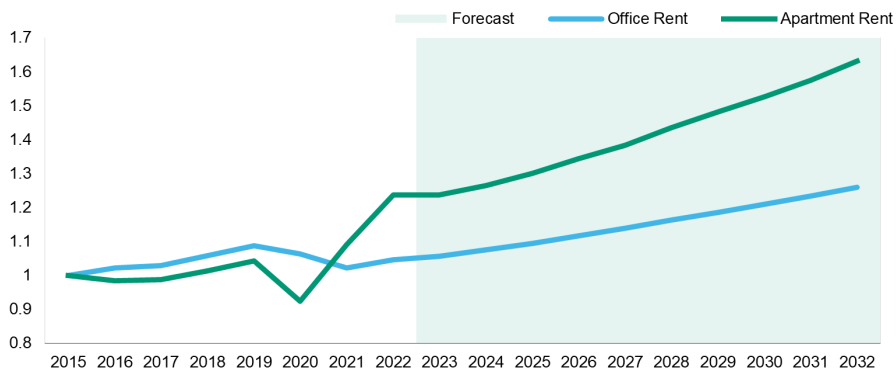
^{1,2} Census Bureau

New York's Downtown Recovery and Office Utilization Pattern

New York City ranked 17th among all major North American metros in its downtown foot traffic recovery, according to cellphone data collected by Safegraph. By March, the total cellphone count was 75% of its pre-pandemic level. MTA turnstile foot traffic data showed that subway ridership is still down 57% since February 2020, indicating that less people are commuting to work. A secondary adverse effect of the lack of commuters has been the disruption to the local small business economy, which has long supported and counted on the continued flow of commuters for lunch breaks and happy hours. A key driver of this decline in ridership comes from the extremely hot labor market which has continued the emphasis on hybrid and remote work, leading many businesses to downsize office space. The city saw large negative net absorption over the first two years of the pandemic, totaling 4.2M square feet (sqft). Another 1.7M sqft of net move-outs occurred earlier this year. This has pushed the average office vacancy to 12.2% by the first half of 2023, a total increase of nearly 4% since 2020 and the highest level since 1995. Asking rents have been trending down in five of the last 10 quarters, with the highest drop coming in Q4 2021 and Q1 2021. The strain on the office market has led to a wider bifurcation between Class A and B/C, as organizations who choose to have workers in offices are opting for luxurious spaces with the goal of enticing workers who would rather work from home. Since Q1 2021, Class A's asking rent and vacancy increased by \$1.70 and 2.4%, while Class B/C increased by \$0.31 and 3.2%.

Offering the majority of Class B/C options, downtown is feeling the brunt of the burden, with an average vacancy of 15.30%, which is 100 basis points higher than 2022. Midtown West follows the trend of a 100 basis point increase landing at 13.60%. The lowest vacancy comes from the Penn Station submarket at 7.10%. In February, the new Grand Central Long Island Rail Road terminal was opened, which may give this submarket a greater boost in demand later in the year

NYC Office vs Apartment Performance Index

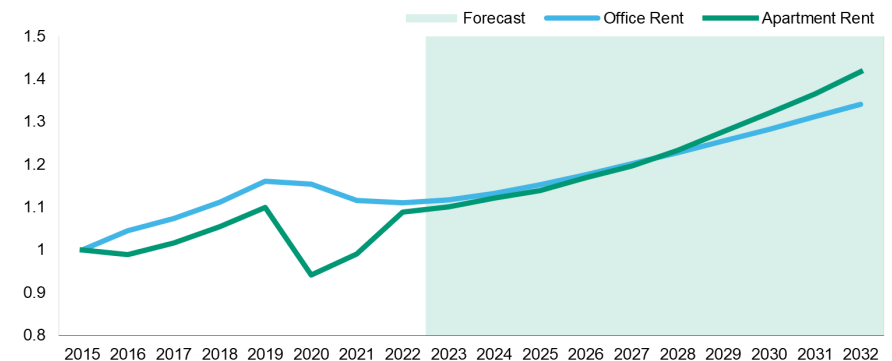


San Francisco's Downtown Recovery and Office Utilization Pattern

San Francisco, on the other hand, only recorded 32% of its pre-pandemic cell phone counts in its downtown. It ranked last among 62 cities with at least 350,000 people across the US and Canada. Empty offices and lack of commuting workers compounded with slow recovery in leisure and business travel were among the key reasons behind the sluggish revival in the downtown activities. High-tech companies were the first to provide remote/hybrid work since the onset of COVID but among the last to call their employees back. Start-ups, which previously kept the metro's economy vibrant, are facing headwinds from limited funding and longer fulfillment time. According to Pitchbook, San Francisco and San Jose combined had experienced the sharpest yearly decline in venture capital (VC) deals in 2022. The collapse of Silicon Valley Bank, whose clients span top tech firms, VC, and private equity firms, has re-enforced some of the negative rhetoric over San Francisco's doom and gloom. All of these factors weighed on San Francisco's office utilization rate and ultimately office occupancy. Since the beginning of 2023, net absorption remained negative for two quarters in a row and vacancy continued to climb to nearly 16% by the end of June, which was 7% higher than before the pandemic and the highest since 2010, inching closer to the peak of 22.1% from the Dotcom Bubble. Asking rent trended down in eight of the past 10 quarters, including a total of 0.8% decline over the past six months. Class A property performance exhibited more volatility than Class B/C, as tenants consolidated their office footprint by putting space up for sublease or moving out of older buildings altogether.

Salesforce and Visa put office space for sublease and the recent fire sale on 350 California Street are examples of troubled downtown and financial district office markets. Older and less amenity-loaded office space is especially under pressure, as tenants seek better deals as leases roll over. Newer buildings with collaborative spaces remain hot assets to attract talent who will continue to bolster and restore the city.

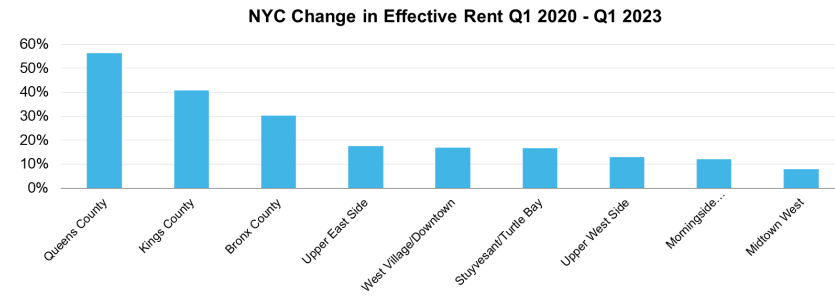
SF Office vs Apt Performance Index





New York's Multifamily Market

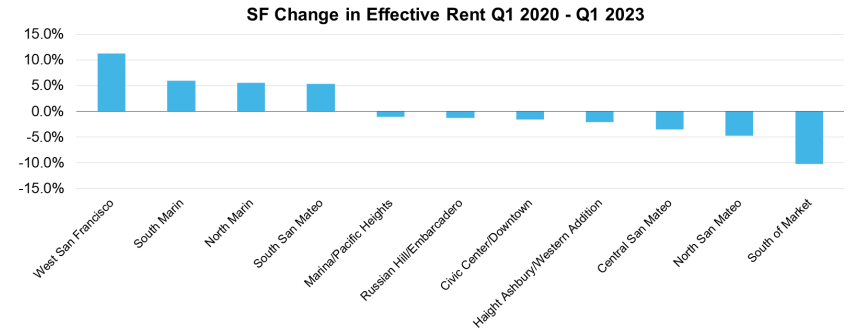
As illustrated in the performance index chart above, while office has been struggling to find proper footing, multifamily in New York has been making strides since 2020. Fueled by a lack of new and affordable housing, in-migration patterns, and the red-hot single-family market's substitution effect, effective rents in the metro rose 34% since the lows made in Q1 2021, while vacancies hover near 3.5%. A small number of new housing units may come from converted office buildings which have been gaining popularity given the divergence in performance between the two sectors. Since Q1 2020, the outer boroughs of Queens, Brooklyn, and The Bronx have seen the most gains in rent price, which was consistent with their relative lower price and strong population gains at the expense of Manhattan's population.



New York holds the highest rent-to-income ratio (RTI) at 66.9%, making it the most backbreaking place to live in terms of affordability. What's perpetuating this? A considerable lack of new housing due to high labor and construction costs. From 2001 - 2008, the city was producing 2.2 units of housing for every one job added. After the Great Recession, the city saw an influx of workers which outpaced the number of new housing built, and this number fell to just 0.5 new units per job added. Permitting for new construction is relatively quick at an average of 27 days according to Department of Buildings permit data, averaging 7,418 new units each year since 2015.

San Francisco's Multifamily Market

In stark contrast, San Francisco's multifamily market has been in a continued slump since pre-pandemic. The main culprit of this trend being out-migration to other metros, has led market rent nearly 4% lower than its pre-pandemic level. International migration to the city has helped the population numbers in recent months, however the zoning restrictions which often dissuade new multifamily complexes in favor of single-family homes keeps pressure on new construction. Bright spots do emerge in West San Francisco, South Marin, North Marin, and South San Mateo, while all other submarkets have seen rent price losses since Q1 2020.



San Francisco's RTI trails slightly below the "rent burdened" threshold of 30%, at 29.3%. However, lower income families are especially rent burdened due to a highly skewed income distribution and insufficient affordable living options. It is notoriously hard to construct new multifamily buildings in San Francisco, averaging 2,231 new units completed each year since 2015. Much of the problem stems from zoning regulations, as much of the city is zoned for buildings no higher than 40 feet, while the permitting process can stretch on to average 627 days according to Department of Buildings permit data.

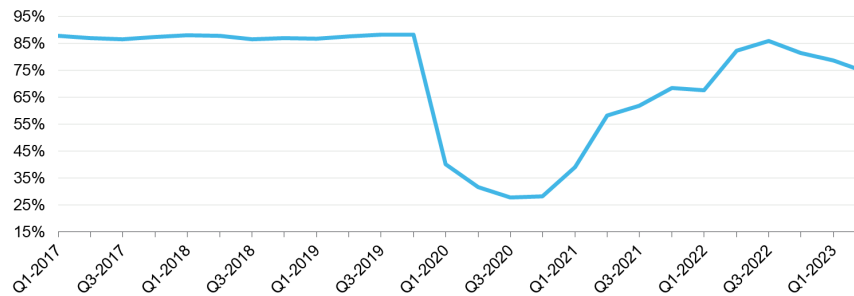


New York's Other Markets

Influenced by tourism, business travel, sport events, and concerts, NYC's hotel market has almost made a full recovery in terms of occupancy. After reaching a low of 28% in Q3 2020, Q1 2023 came in at 79%, while room rates now sit 27% above Q1 2019 levels. Foot traffic in 2022 at LGA and JFK are at 93% and 86% of 2019 totals respectively, with combined foot traffic at 89%. The hottest sector in the city continues to be warehouse and distribution, which held a vacancy below 2% for every quarter in 2022, and currently has a Q1 2023 vacancy of 2.1%. A new warehousing center in the Bronx came online to help with demand pressures and will be filling up over the coming months. In terms of mixed-use facilities, the city has been leading the charge with the Deutsche Bank Center at Columbus Circle. The pair of buildings has shared space for Class A office, apartments, retail shopping centers, and a five-star hotel.

The retail market in New York resurged since the trouble brought by COVID. Taxable retail sales reached peak levels during the 2023 tax season of \$66.6B, a 20% increase over 2020 levels, according to the state comptroller. In contrast to sales, retail employment is down 12% since January 2020, reflecting the shift towards online shopping, which skyrocketed out of necessity during the pandemic.

NYC Hotel Occupancy

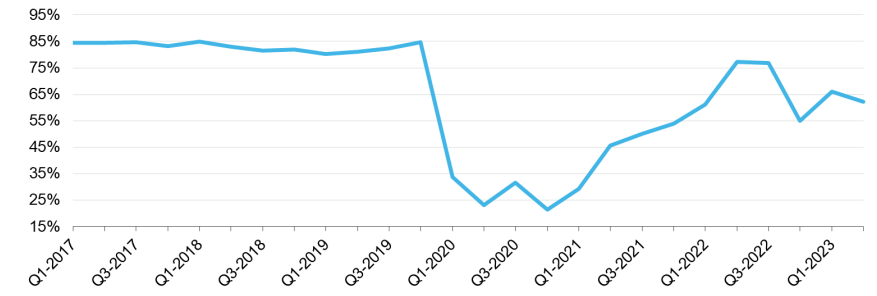


San Francisco's Other Markets

San Francisco's hotel performance remains volatile and below pre-pandemic levels. The sector is especially sensitive to multiple factors such as Asian-Pacific travel, corporate events, and tourism. With international and business/leisure travel lagging, SFO foot traffic was still around 85% of 2019 levels. This subdued hotel occupancy to the 60% range and 14% lower than the pre-pandemic level. Two recent hotel closures – Hilton San Francisco Union Square and the Parc 55 San Francisco – blamed a challenging operating environment such as street conditions, lower return-to-office rates, and a weaker-than-expected citywide convention calendar through 2027.

Retail's exodus has been top of mind in the sector, as the city has seen more closures specifically in the Union Square neighborhood. Overall retail vacancy in the city has climbed from 3.5% in 2019 to 9% in 2023 Q1. Community centers were hit hard in particular, with vacancy up from 2.6% to 10.7%. Whole Foods, T-Mobile's flagship store, and Nordstrom at Westfield mall are some of the latest to close their doors in the city. Many retail owners say safety and inadequate response to crime are to blame. Overall reduced domestic and international travel, more stringent COVID restrictions during the pandemic, and hybrid work have prevented San Francisco from stabilizing the retail market.

SF Hotel Occupancy





New York Outlook

The outlook for NYC burns bright, but warily. The city is shifting from a bustling hub of 9-5 commuters to a more vibrant metropolis of live-work-play, fueled by a diverse talent pool from universities like Columbia and NYU. Leading the way with conversions and mixed-use facilities, the office market is trying to find a new equilibrium which will be pivotal in the city's demand for the years to come. Fire sales did pop especially among older vacant office buildings but transaction volume remained muted. This could pick up if vacancies stay elevated over the short to medium term. The difference between office classes remains stark, and for B/C we would expect to see either renovations or transformations. The downtown submarket should continue to feel the brunt of vacancies with a higher concentration of B/C office.

Multifamily has been outperforming since the demand for rentals returned to the city post-pandemic, with the caveat that sky-high rents keep its RTI the highest in the country. Rising construction/labor costs and somewhat restrictive zoning practices are the keys to understanding this problem and inviting population back to the city. Detailed in the map of Manhattan's zoning districts there's a large portion carved out for office (25% of all land area), which may not be needed under current economic circumstances. Residential makes up 44.84% of all land area.

The hotel market, supported by events, business travel, and a newly renovated LaGuardia Airport, is getting back on track and growing, while also getting a boost from the focus on mixed use facilities. Retail being a key economic driver of the city has found new footing, as taxable volumes are reaching new heights. However, the decline in jobs caused by online shopping and automation is concerning, especially as population continues to lag. The warehouse and distribution centers remain a bright spot in the city, as continued demand for e-commerce keep vacancies low and rents high.

Barring any major recession-inducing hiccups, and if the high RTI can be tackled with new and affordable housing, over the medium term the city should continue to lure both residents and investors.

Strengths

- › Industry Diversification
- › Strong Talent Pool
- › Efficient Public Infrastructure

Struggles

- › Lack of New and Affordable Housing
- › High Office Vacancies
- › Highest Rent-to-Income Ratio in the Country



San Francisco Outlook

Despite recent distress, San Francisco is in a position to reinvent itself and support the shifting economic fundamentals it faces. Headquartered by OpenAI, emerging focus on generative artificial intelligence (GenAI) will give the city a much needed boost in popularity as companies begin to focus on the expanding new technology. According to Pitchbook, since the beginning of this year, half of all AI fundings went to San Francisco-based firms, which is on pace to break their 2021 funding record. Slumped productivity reignite the interest of in-person work and a few large office leases were signed or renewed over the past few months. Surrounded by Stanford, UC Berkeley, and other prestigious colleges and institutes, San Francisco will continue to attract talent to the established tech hub and financial center.

Faced by a combination of existing and emerging issues of the city, Mayor London Breed proposed measures to convert empty office buildings to residential, lower commercial property tax, increase police headcounts, and offer quality of life performance on the street in the hope of expediting the city's transformation.

Retail will benefit but in the meantime, malls or storefronts which failed to keep up with consumers' changing habits or were impacted by the lack of commuting workers and travelers will exit or give room to live-work-play communities.

The housing shortage and expensive single- and multifamily housing market will be an ongoing issue. Looking at the city's zoning map, much of the land use is for residential, but specifically single-family homes with height restrictions. This point is highlighted by San Francisco's density of 17,248 people per square mile versus New York's 69,950 people per square mile. Commercial zoning in the city makes up only 3.24% of all land area while residential makes up 51.12%. Adding onto the crowding, the second roadblock that needs to be addressed is the long permitting times which keep the city unable to quickly pivot with economic conditions. Regardless, San Francisco remained the nation's number 1 city in the size of tech talent pool. Renewed focus on GenAI serves the tailwind for the city's economic recovery and should attract more international and domestic travel to the city, which will inevitably support the hotel market. Overall San Francisco has a bright future, if it can prepare for it.

Strengths

- › GenAI Tailwinds
- › Strong Talent Pool
- › Strong Employment Recovery

Struggles

- › Lack of New and Affordable Housing
- › High Office Vacancies
- › Barrier for New Construction
- › Street Safety and Homelessness

© 2023 Moody's Corporation, Moody's Investors Service, Inc., Moody's Analytics, Inc. and/or their licensors and affiliates (collectively, "MOODY'S"). All rights reserved.

CREDIT RATINGS ISSUED BY MOODY'S CREDIT RATINGS AFFILIATES ARE THEIR CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND MATERIALS, PRODUCTS, SERVICES AND INFORMATION PUBLISHED BY MOODY'S (COLLECTIVELY, "PUBLICATIONS") MAY INCLUDE SUCH CURRENT OPINIONS. MOODY'S DEFINES CREDIT RISK AS THE RISK THAT AN ENTITY MAY NOT MEET ITS CONTRACTUAL FINANCIAL OBLIGATIONS AS THEY COME DUE AND ANY ESTIMATED FINANCIAL LOSS IN THE EVENT OF DEFAULT OR IMPAIRMENT. SEE APPLICABLE MOODY'S RATING SYMBOLS AND DEFINITIONS PUBLICATION FOR INFORMATION ON THE TYPES OF CONTRACTUAL FINANCIAL OBLIGATIONS ADDRESSED BY MOODY'S CREDIT RATINGS. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS, NON-CREDIT ASSESSMENTS ("ASSESSMENTS"), AND OTHER OPINIONS INCLUDED IN MOODY'S PUBLICATIONS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. MOODY'S PUBLICATIONS MAY ALSO INCLUDE QUANTITATIVE MODEL-BASED ESTIMATES OF CREDIT RISK AND RELATED OPINIONS OR COMMENTARY PUBLISHED BY MOODY'S ANALYTICS, INC. AND/OR ITS AFFILIATES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS DO NOT COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS, ASSESSMENTS AND OTHER OPINIONS AND PUBLISHES ITS PUBLICATIONS WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL, WITH DUE CARE, MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS, AND PUBLICATIONS ARE NOT INTENDED FOR USE BY RETAIL INVESTORS AND IT WOULD BE RECKLESS AND INAPPROPRIATE FOR RETAIL INVESTORS TO USE MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS OR PUBLICATIONS WHEN MAKING AN INVESTMENT DECISION. IF IN DOUBT YOU SHOULD CONTACT YOUR FINANCIAL OR OTHER PROFESSIONAL ADVISER.

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS ARE NOT INTENDED FOR USE BY ANY PERSON AS A BENCHMARK AS THAT TERM IS DEFINED FOR REGULATORY PURPOSES AND MUST NOT BE USED IN ANY WAY THAT COULD RESULT IN THEM BEING CONSIDERED A BENCHMARK.

All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. MOODY'S adopts all necessary measures so that the information it uses in assigning a credit rating is of sufficient quality and from sources MOODY'S considers to be reliable including, when appropriate, independent third-party sources. However, MOODY'S is not an auditor and cannot in every instance independently verify or validate information received in the rating process or in preparing its Publications.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability to any person or entity for any indirect, special, consequential, or incidental losses or damages whatsoever arising from or in connection with the information contained herein or the use of or inability to use any such information, even if MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers is advised in advance of the possibility of such losses or damages, including but not limited to: (a) any loss of present or prospective profits or (b) any loss or damage arising where the relevant financial instrument is not the subject of a particular credit rating assigned by MOODY'S.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability for any direct or compensatory losses or damages caused to any person or entity, including but not limited to by any negligence (but excluding fraud, willful misconduct or any other type of liability that, for the avoidance of doubt, by law cannot be excluded) on the part of, or any contingency within or beyond the control of, MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers, arising from or in connection with the information contained herein or the use of or inability to use any such information.

NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY CREDIT RATING, ASSESSMENT, OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.

Moody's Investors Service, Inc., a wholly-owned credit rating agency subsidiary of Moody's Corporation ("MCO"), hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by Moody's Investors Service, Inc. have, prior to assignment of any credit rating, agreed to pay to Moody's Investors Service, Inc. for credit ratings opinions and services rendered by it fees ranging from \$1,000 to approximately \$5,000,000. MCO and Moody's Investors Service also maintain policies and procedures to address the independence of Moody's Investors Service credit ratings and credit rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold credit ratings from Moody's Investors Service and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at www.moody.com under the heading "Investor Relations — Corporate Governance — Director and Shareholder Affiliation Policy."


Additional terms for Australia only: Any publication into Australia of this document is pursuant to the Australian Financial Services License of MOODY'S affiliate, Moody's Investors Service Pty Limited ABN 61 003 399 657AFSL 336969 and/or Moody's Analytics Australia Pty Ltd ABN 94 105 136 972 AFSL 383569 (as applicable). This document is intended to be provided only to "wholesale clients" within the meaning of section 761G of the Corporations Act 2001. By continuing to access this document from within Australia, you represent to MOODY'S that you are, or are accessing the document as a representative of, a "wholesale client" and that neither you nor the entity you represent will directly or indirectly disseminate this document or its contents to "retail clients" within the meaning of section 761G of the Corporations Act 2001. MOODY'S credit rating is an opinion as to the creditworthiness of a debt obligation of the issuer, not on the equity securities of the issuer or any form of security that is available to retail investors.

Additional terms for Japan only: Moody's Japan K.K. ("MJKK") is a wholly-owned credit rating agency subsidiary of Moody's Group Japan G.K., which is wholly-owned by Moody's Overseas Holdings Inc., a wholly-owned subsidiary of MCO. Moody's SF Japan K.K. ("MSFJ") is a wholly-owned credit rating agency subsidiary of MJKK. MSFJ is not a Nationally Recognized Statistical Rating Organization ("NRSRO"). Therefore, credit ratings assigned by MSFJ are Non-NRSRO Credit Ratings. Non-NRSRO Credit Ratings are assigned by an entity that is not a NRSRO and, consequently, the rated obligation will not qualify for certain types of treatment under U.S. laws. MJKK and MSFJ are credit rating agencies registered with the Japan Financial Services Agency and their registration numbers are FSA Commissioner (Ratings) No. 2 and 3 respectively.

MJKK or MSFJ (as applicable) hereby disclose that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MJKK or MSFJ (as applicable) have, prior to assignment of any credit rating, agreed to pay to MJKK or MSFJ (as applicable) for credit ratings opinions and services rendered by it fees ranging from JPY100,000 to approximately JPY550,000,000.

MJKK and MSFJ also maintain policies and procedures to address Japanese regulatory requirements.



 Find out more cre.moodyanalytics.com