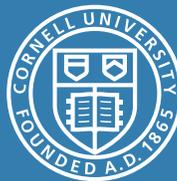


NAVIGATING THE FUTURE OF REAL ESTATE

REVIEW 2022



Cornell
Baker Program
in Real Estate



ARTICLES INCLUDE

Baker Program Trek:
Miami, FL

Innovation District Models:
Examining the 21st Century
Innovation Labs

How to End Greenwashing in
U.S. Real Estate

REVIEW²⁰²²

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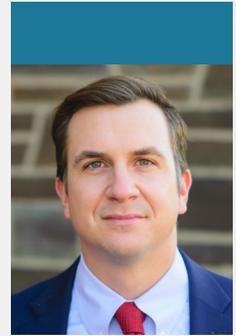
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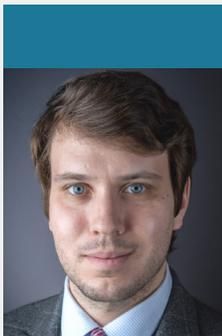


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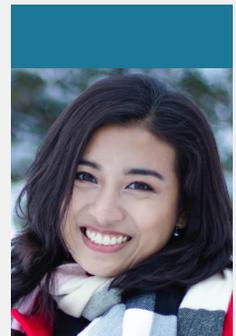
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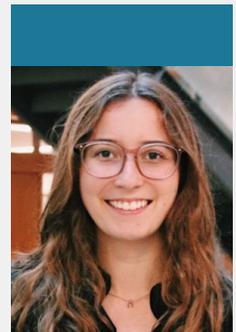
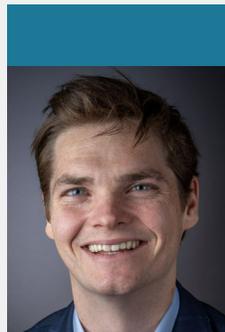


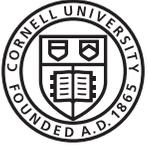
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**Cornell
Baker Program
in Real Estate**



LETTER FROM THE EDITORS

On behalf of the entire Cornell Real Estate Review Editorial Board, we are pleased to present Volume 20 (2022) of the Cornell Real Estate Review. A student-run publication founded in 2002, the Review chronicles the achievements, activities, and scholarship of students in Cornell's Baker Program in Real Estate.

The 2021-2022 academic year provided students with opportunities to return to some semblance of normalcy in the wake of the COVID-19 pandemic. The return of universal in-person teaching, campus visits from alumni and distinguished speakers, and the highly anticipated return of the Baker Program Trek were greatly appreciated as students grappled with how real estate will adapt to an everchanging world.

Students in the Baker Program secured jobs and internships at a variety of real estate firms around the world and will continue the legacy of shaping the built environment in a thoughtful and informed manner.

For additional content, we encourage you to continue interacting with us online by visiting our blog and following our daily lives as students via Instagram or LinkedIn. We enjoy interacting with our readers and followers year-round as we cover the latest news, trends, and developments affecting the real estate industry.

The editorial board is immensely grateful for the continued support and guidance of our faculty advisor, Dr. Michael Tomlan. His efforts elevate the Review – and the Baker Program – to ever greater heights are appreciated.

We hope that you enjoy this edition of the Review and will continue to remain engaged with the Baker Program.

Best,

KATHERINE SELCH, BLAKE SMITH & ADAM WELCH



ACKNOWLEDGEMENTS

The Baker Program in Real Estate would like to thank the following individuals who participated in the 2021 - 2022 academic year's Cornell Real Estate Distinguished Speaker Series:

Every week during the school year, the Cornell Real Estate Seminar Series attracts global industry leaders to campus to share insights and discuss industry trends and issues in the field. Speakers also explore current projects, tips for career advancement, and the paths that led them to success. Many students cite this exclusive opportunity to interact with recognizable figures from the industry as one of the most valuable aspects of the program. If you would like to participate in a future Distinguished Speaker Series, please contact Kathy Terry, Baker Program in Real Estate Program Assistant, at 607-255- 7110 or kcr2@cornell.edu.

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Head of Alternative Investments, US Steel Corporation



BAKER PROGRAM TREK: MIAMI, FL



INTRODUCTION

For the first time since January of 2020, the Baker Program in Real Estate embarked on a trek. Instead of the tradition of first year students visiting a domestic market and second year students visiting an international market, the entire program traveled together to Miami, Florida for four days of immersion into one of the most international cities in the United States. The trek focused on the topics of transit-oriented development, urban growth and adaptation in the face of a changing climate, public-private partnerships, and mixed-use development.

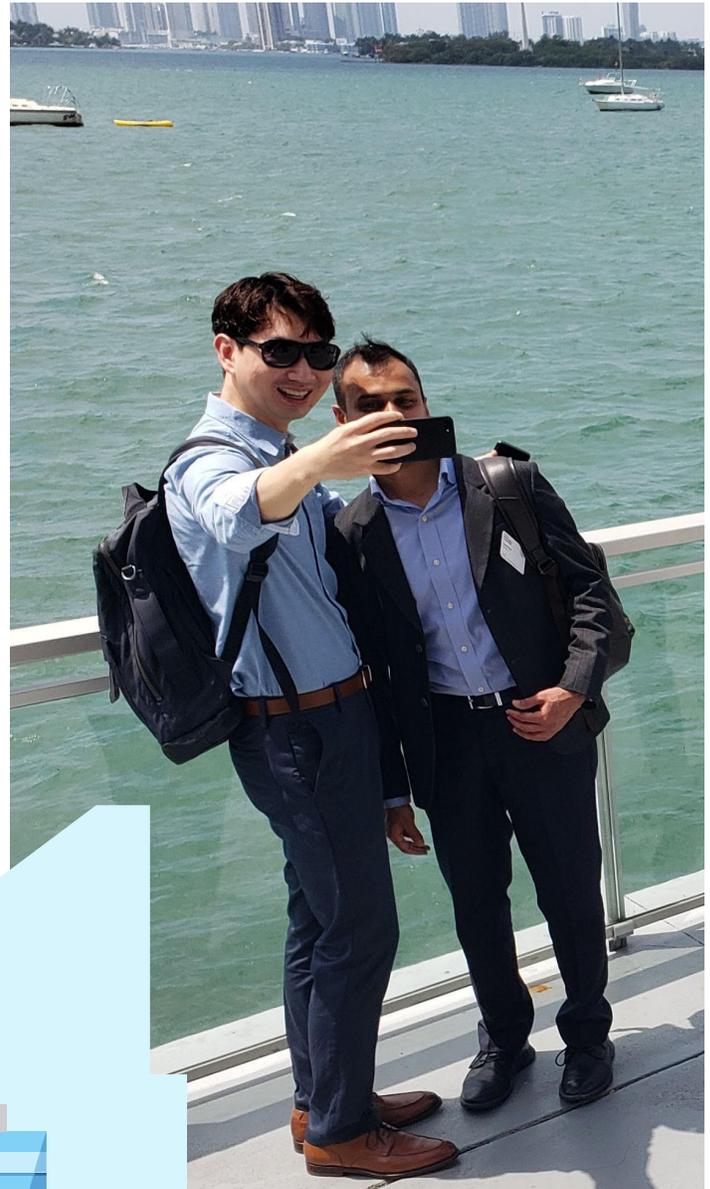
Students had the opportunity to tour the new Miami Central Station, home to the new Brightline train system with Jose Gonzalez of Florida East Coast Industries before riding the train up to Fort Lauderdale, where they discussed the importance of public-private partnerships and community development surrounding transit with Jenni Morejon, President and CEO of the Fort Lauderdale Downtown Development Authority and James Carras, Principal of consulting firm Carras Community Investment, Inc. After riding back to Miami Central, having observed the planned and in process development surrounding the rail corridor, students were treated to a presentation with the architects of Miami Central, Bernard Zyscovich and Suria Yaffar. The afternoon was spent touring the upcoming Magic City Innovation District, an exciting new master planned development with Tony Cho.

The next day was spent discussing resilience and climate change adaptation with a panel of esteemed experts ranging from the public sector to academia to private developers. Special thanks to meteorologist John Morales (CALS '84) for moderating and Jim Murley (Chief Resilience Officer, Miami Dade County), Sonia Chao (Co-Director, Master of Professional Science in Urban Sustainability and Resilience at University of Miami), and David Martin (CEO, Terra Group) for their insights into what each sector is doing to address how the built environment can and should adapt to a changing climate.

Public-private partnerships were further discussed with a panel of diverse participants in a variety of sectors. The Baker Program appreciates Michael Liu (Director, Miami-Dade County Public Housing and Community Development Department), Albert Milo, Jr. (President, Related Urban Development Group), James McQueen (Interim Director of Community Redevelopment Agency), and Andy Ingraham (Founder and CEO of the National Association of Black Hotel Owners, Operators, and Developers) for their insights into the world of PPP's.

In the afternoon, students had the choice of touring Miami World Center and meeting with real estate finance professionals from DRA Advisors and Rialto, or touring various properties under construction with Russell Galbut (SHA '74), co-founder and partner of Crescent Heights and GFO Investments. Special thanks to Mr. Galbut as well as Nitin Motwani (Managing Principal of Miami Worldcenter Associates), Matthew Shore (SHA '00, CIO of DRA Advisors), Jay Mantz (President of Rialto Capital Management), and Angelo Bianco (Managing Partner of CP Group).

The immersive and dynamic week wrapped up with a career fair organized by the Hotel School's Office of Career Services and featuring a range of employers from developers to financiers and consultants.



Extra special thanks to Dylan Fonseca (Johnson MBA '12) for his participation and help organizing a variety of events, David Rupert (Cornell '79) and the Cornell Real Estate Council, and all other Cornellians who joined any of the lively receptions held throughout the week. The Program would also like to thank Professors Brad Wellstead and Daniel Lebet, and Samara Seldon, Assistant Director of Graduate Programs, for their organization of and participation in a trip that will certainly be remembered as one of the highlights of the students' time at Cornell.





NAVIGATING

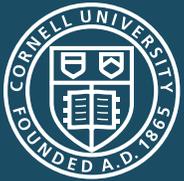


OF REAL

ARTICLES



THE FUTURE ESTATE



**Cornell
Baker Program
in Real Estate**



INFLATION NATION:

HEDGING WITH REAL ESTATE

INTRODUCTION

For the past twenty to thirty years, US capital markets have largely benefitted from exceptionally low rates of inflation, low-interest rates across the yield curve, and unprecedented monetary and fiscal stimulus. Overall financial conditions have been well below the 2002 and 2009 peaks, even during the worst stages of the Covid-19 pandemic in 2020. In fact, throughout 2018 and 2019 the Federal Reserve Open Market Committee struggled to boost inflation to their symmetric 2% target and openly admitted that they no longer fully understood the inflation mechanism given that the US had been at full employment for some time, yet inflation remained muted.



AUTHOR:
BLAKE SMITH



A few years later, the state of the world is much different. The economic impact of Covid-19 caused a 3.5% GDP loss in 2020 which rebounded dramatically into 5.7% growth in 2021. This growth was supported by incredible levels of fiscal and monetary stimulus only years after significant fiscal stimulus via the Tax Cuts and Jobs Act. Blackrock estimates that economic losses due to Covid-19 in 2020 and 2021 were less than a quarter of the losses realized in the 2008-2009 GFC. However, the fiscal response to Covid-19 alone was five times the response to the GFC. Furthermore, the Federal Reserve's cumulative bond purchases in response to the GFC were \$300 billion of US Treasuries, \$175 billion of agency debt, and \$1.25 trillion of agency MBS. In response to the Covid-19 pandemic, the Federal Reserve expanded into new asset classes including unsecured debt, equity indices, and other forms of non-agency securitized debt. From March 2020 to March 2022 the Federal Reserve balance sheet expanded by \$4.6 trillion. Note that purchases would significantly exceed this number due to bond maturities.

Combine incredible levels of monetary and fiscal stimulus with supply chain disruptions, accelerated technological adoption, productivity growth at or near the highest levels since 2009, nationwide labor shortages, and a strong economy and the result is the highest levels of inflation since the 1980s.

Real assets have traditionally been considered a strong inflation hedge, but, among the various asset classes, which have historically exhibited superior hedging characteristics? Of course, there are multiple ways to gain exposure to real estate, including through public and private markets, so which method of investment is superior for hedging? Finally, is there a difference in inflation hedging characteristics when inflation levels are largely unexpected versus expected?

INTUITION

As mentioned previously, real estate returns can be decomposed into current income and capital appreciation. The intuition behind inflation driving capital appreciation is that as material and labor costs increase, replacement costs for new construction increase, and the higher prices that an investor will pay for an existing product rather than a new development. Of course, it is also possible that rising inflation and interest rates could lead to capitalization rate (cap rate) widening due to higher opportunity costs which could have the opposite effect on capital appreciation.

On the current income side, as inflation raises operating costs, landlords can pass along these increased costs to their tenants. Rising interest rates and inflation, again, mean higher opportunity costs for investors so they may try to raise rents as inflation increases.

REAL ESTATE/LEASE CHARACTERISTICS INTUITION

Given this set of intuition for why real estate is considered a relatively good inflation hedge, what are the characteristics of real estate and leases that should improve the quality of inflation hedging? First is the ability to mark rents to market. Short lease terms are typically associated with asset classes like multi-family which generally offer 1-year leases or hotels which offer nightly rates. The faster the lease turnover of the property, the quicker landlords will be able to mark their rents up to the market. Other lease mechanisms that contribute to inflation hedging are CPI-linked rent escalations and percentage rent. While CPI-linked rent escalations are less commonly used today, CPI or other inflation indexed rent escalations would provide a near-perfect inflation hedge. As the cost of goods increases, so should sales and the percentage of rent received from retail leases. Finally, NNN leases should provide a limited inflation hedge as the tenants are responsible for rising operating costs.

From a capital appreciation perspective, buildings with longer construction timelines, and greater overall costs are likely to benefit more from inflation. For example, office towers in Midtown Manhattan should provide a superior capital gains inflation hedge versus warehouse property in rural Pennsylvania because the inflation risk for a larger, longer-term project is significantly higher. Furthermore, in cases of inflation where rents are unable to keep up with construction costs, there is likely to be a decrease in supply for properties like office towers as the economics are not viable from a developer's perspective. This decrease in supply could result in a greater supply/demand mismatch once rents catch up due to the long construction timeline.

While intuition provides a general basis for investors, the actual hedging characteristics of various real estate asset classes in both public and private markets need to be analyzed to truly understand how investors can protect themselves from high levels of inflation.

PRIVATE MARKETS

Overall Inflation

To get an initial understanding of the general relationship between quarterly NCREIF index returns and inflation, a simple regression is conducted with no lag using quarterly returns for the Consumer Price Index (CPI). As evidenced by the F-statistics in Figure 1 below, each of the regressions was statistically significant at the 95% confidence level with the sole exception of the hotel asset class. Furthermore, each of the statistically significant regressions had a positive Beta coefficient as well as a positive correlation, so each asset class,

except for the hotel, seems to have at least some inflation hedging characteristics. As expected, multifamily seems to have one of the highest adjusted R2 and beta coefficients likely driven by the multifamily asset class's typical annual leases. More surprisingly, industrial not only has the highest Adjusted R2, but also CPI beta, and correlation. With industrial/warehouse's typically short construction timelines and relatively lower construction costs coupled with the medium to long-term lease lengths, intuition says this should not be the case. However, there are other factors not included in this initial regression that may be obscuring the picture.

To control for general economic conditions, NCREIF index returns were regressed against CPI, quarterly GDP growth, and the quarterly change in the Bank of America investment-grade option-adjusted credit spread index. In this case, each of the regressions was statistically significant at all confidence levels. Again, against the grain of intuition, the industrial asset class exhibited the best inflation hedging characteristics followed by multifamily. After industrial and multifamily, offices exhibited the next best inflation hedging characteristics likely driven by their longer construction times and higher costs.

The hotel asset class's lack of inflation hedging ability is surprising given the asset class has the greatest ability to adjust rates. However, business and leisure travelers might reduce their travel, and therefore, hotel expenditures in the presence of inflationary pressures. This result is partially substantiated by the hotel class having the highest beta to GDP and credit spreads. Finally, retail exhibited the worst inflation hedge characteristics. Similar to the hotel, consumers may reduce their spending in an inflationary environment, though retail had some of the lowest beta coefficients with respect to GDP growth and credit spreads. The poor inflation hedging characteristics are instead

FIGURE 1 - NO LAG SIMPLE REGRESSION Q3 1988-Q4 2021

	Adj R ²	CPI Beta	F Stat	Correlation
NCREIF Cumulative	0.1409	1.338	0.0000	0.373
NCREIF Industrial	0.2127	2.047	0.0000	0.432
NCREIF Hotel	-0.0088	0.080	0.8988	0.222
NCREIF Retail	0.0409	0.715	0.0174	0.229
NCREIF Office	0.0679	1.089	0.0030	0.289
NCREIF Multifamily	0.2053	1.781	0.0000	0.358

FIGURE 2 - NO LAG MULTIPLE REGRESSION Q4 1996-Q4 2021

	Adj R ²	CPI	GDP	Credit Spread	F Stat
NCREIF Cumulative	0.2522	0.721	0.382	1.173	8.45E-07
NCREIF Industrial	0.2696	1.153	0.443	1.140	2.81E-07
NCREIF Hotel	0.1606	0.346	0.926	1.800	1.82E-04
NCREIF Retail	0.1334	0.257	0.410	0.805	7.82E-04
NCREIF Office	0.1840	0.582	0.307	1.460	4.93E-05
NCREIF Multifamily	0.2160	0.748	0.376	1.084	7.66E-06

FIGURE 3 - 1Q LAG MULTIPLE REGRESSION Q4 1996-Q4 2021

	Adj R ²	CPI	GDP	Credit Spread	F Stat
NCREIF Cumulative	0.2539	0.760	0.482	0.897	8.79E-07
NCREIF Industrial	0.2687	1.184	0.604	0.716	3.47E-07
NCREIF Hotel	0.1609	0.359	0.972	1.672	1.94E-04
NCREIF Retail	0.1374	0.310	0.446	0.687	6.79E-04
NCREIF Office	0.1805	0.518	0.390	1.287	6.60E-05
NCREIF Multifamily	0.2429	1.003	0.472	0.686	1.73E-06

FIGURE 4 - 1Q LAG MULTIPLE REGRESSION (EXPECTED VS. UNEXPECTED INFLATION) Q2 2006-Q4 2021

	Adj R ²	Expected	Unexpected	GDP	Credit Spread	F Stat
NCREIF Cumulative	0.2811	2.381	-0.139	0.280	0.716	1.06E-04
NCREIF Industrial	0.2990	3.052	0.673	0.460	0.308	5.32E-05
NCREIF Hotel	0.3729	3.226	-0.858	0.754	1.113	2.49E-06
NCREIF Retail	0.1629	1.112	-0.750	0.257	0.861	6.08E-03
NCREIF Office	0.2580	2.609	-0.759	0.115	1.064	2.49E-04
NCREIF Multifamily	0.2462	2.413	0.294	0.301	0.534	3.80E-04



potentially driven by the decreased use of inflation indexing in calculating rent increases.

Finally, given that real estate is an illiquid asset class, particularly when it comes to private real estate markets, quarterly NCRFEIF returns are regressed against CPI with a one quarter lag while controlling for GDP and credit spreads with no lag. The order of inflation hedging ability remains with industrial best, followed by multifamily, office, hotel, and finally retail. However, in each case except for office, the return sensitivity to inflation increased a modest amount. Given that the intuition suggests office inflation hedging characteristics are likely driven by its capital appreciation and not by current income, it seems reasonable the office returns may be driven by an even longer lag.

Expected vs Unexpected

So far, it seems that the industrial and multifamily provide the best inflation hedges while the hotel and retail classes perform the worst. However, since expected inflation is easier to anticipate and hedge by definition, the strength of an inflation hedge ultimately depends on how well it performs in periods of unexpected inflation.

Expected inflation was proxied using one-year breakevens or the spread between the nominal rate on a one-year treasury note over the rate on one-year TIPS. Unexpected inflation was measured using the difference between actual CPI and the corresponding breakeven rate for the time. Note that due to limited availability of breakeven data, these regressions only cover the period from Q2 2006-Q4 2021, a period largely with very low rates of inflation.

The regressions summarized in figure 4 below display a much different image of real estate's inflation hedging ability. In the case of the hotel, office, and retail class, the beta coefficient for unexpected inflation is significantly negative suggesting these assets are a relatively poor inflation hedge, at least in

FIGURE 5 - PRE-COVID-19 NCREIF INDUSTRIAL

Regression Statistics					
Multiple R	0.761				
R Square	0.579				
Adjusted R Square	0.546				
Standard Error	0.018				
Observations	55				

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	0.022330439	0.00558261	17.21206982	6.15553E-09
Residual	50	0.0162171369	0.000324343		
Total	54	0.038547575			

	Coefficients	Standard Error	t Stat	P-value
Intercept	-0.003	0.004	-0.723	0.473
Expected Inflation	1.129	0.793	1.423	0.161
Unexpected Inflation	-0.148	0.521	-0.285	0.777
GDP q/q	2.682	0.440	6.095	0.000
Credit Spd q/q	0.86	0.475	1.805	0.077

FIGURE 6 - PRE-COVID-19 NCREIF MULTIFAMILY

Regression Statistics					
Multiple R	0.727				
R Square	0.529				
Adjusted R Square	0.491				
Standard Error	0.019				
Observations	55				

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	0.020801708	0.005200427	14.03984056	9.51377E-08
Residual	50	0.018520249	0.000370405		
Total	54	0.039321957			

	Coefficients	Standard Error	t Stat	P-value
Intercept	-0.009	0.004	-1.956	0.056
Expected Inflation	0.636	0.848	0.750	0.457
Unexpected Inflation	0.231	0.557	0.414	0.681
GDP q/q	2.755	0.470	5.859	0.000
Credit Spd q/q	0.79	0.507	1.566	0.124

the case of unexpected inflation. Hotels are the best hedge for expected inflation in line with the intuition that the nightly rate changes would provide an excellent inflation hedge. Again, this is somewhat counterintuitive as the hotel

and multifamily class should perform best in periods of unexpected inflation due to the faster lease turnover, but it may be that inflation depresses spending on travel even when controlling for GDP growth. Office also surpasses multifamily as a hedge for expected inflation. In periods of high expected inflation, investors may anticipate rising replacement costs and therefore value office buildings higher.

On the other hand, industrial and multifamily seem to exhibit the best hedge against unexpected inflation. These results should be taken with some skepticism given the relatively short period of the data used for the regression. (Data for breakevens only extended back to 2006.) Industrial and multifamily were the best performing real estate asset classes over this period with industrial returning 413% and multifamily at 193% so the positive beta to unexpected inflation may be that these asset classes have had relatively straight-line positive returns with very strong returns starting in 2020 at a similar time that unexpected inflation spiked higher for the first time in more than a decade. If we run the same regression stopping at Q4 2019, the inflation hedging characteristics of industrial look much worse.

Figure 5 shows that if we remove the period of incredible returns industrial real estate experienced since early 2020, the beta for unexpected inflation is negative alongside the hotel, retail, and office assets. Industrial returns have been driven by immense demand for warehouse space from e-retailers such as Amazon, supply chain disruption, and cap rate compression driven by both end-user and investor demand for the asset class. This was true to a lesser extent before Covid-19 as well and might be driving the appearance of industrial real estate as a strong inflation hedge despite the intuition that would say otherwise.

On the other hand, running the same regression for multifamily yields results that are in line with the regression that includes the Covid-19 period. The beta for unexpected inflation only decreases by .063 versus a .821 decrease for industrial. Note that this period includes a period of

**FIGURE 7 - NAREIT-NCREIF MULTIPLE REGRESSION
NO LAG Q4 1996-Q4 2021**

	Adj R ²	CPI	GDP	Credit Spread
Cumulative	0.145	1.404	0.393	-12.598
Industrial	0.153	4.063	0.375	-14.081
Hotel	0.408	-1.677	1.373	-25.973
Retail	0.301	2.401	-0.003	-15.847
Office	0.225	1.487	0.394	-13.996
Multifamily	0.024	1.615	0.074	-9.265

**FIGURE 8 - 1Q LAG MULTIPLE REGRESSION
(EXPECTED VS. UNEXPECTED INFLATION) NAREIT Q2 2006-Q4 2021**

	Adj R ²	Expected	Unexpected	GDP	Credit Spread	F Stat
NAREIT US TR	0.4340	2.791	-5.770	0.793	-13.670	1.27E+01
NAREIT Industrial	0.4424	6.857	-6.795	1.060	-16.371	1.31E+01
NAREIT Hotel	0.5783	1.971	-5.577	1.879	-25.142	2.19E+01
NAREIT Retail	0.4412	3.955	-4.533	0.501	-17.064	1.30E+01
NAREIT Office	0.4433	1.206	-6.175	0.865	-14.967	1.31E+01
NAREIT Multifamily	0.2505	1.792	-4.677	0.585	-10.263	6.10E+00

**FIGURE 9 - NAREIT-dNCREIF 1Q LAG MULTIPLE REGRESSION
(EXPECTED VS. UNEXPECTED INFLATION) NAREIT Q2 2006-Q4 2021**

	Adj R ²	Expected	Unexpected	GDP	Credit Spread
Cumulative	0.153	0.410	-5.631	0.513	-14.385
Industrial	0.143	3.804	-7.467	0.600	-16.680
Hotel	0.205	-1.255	-4.719	1.124	-26.254
Retail	0.278	2.843	-3.783	0.243	-17.925
Office	0.185	-1.403	-5.416	0.750	-16.031
Multifamily	0.004	-0.621	-4.971	0.284	-10.798

significant distress for residential real estate through the GFC so these results make a relatively compelling case for multifamily real estate as an inflation hedge.

Overall, multifamily appears to provide a strong inflation hedge in both periods of expected and unexpected inflation in line with our intuition and with less sensitivity to the regression time-period than industrial. The regression results seem to position industrial as the best inflation hedge, however, it seems likely that these results are driven by the steady and highly positive returns of industrial over this period. Recall that industrial returned more than twice as much as the next best returning asset class over 2006-2021. Hotel initially appeared to be a poor inflation hedge, but it seems that in periods of rising expected inflation hotel performs the best of all asset classes. However, under

periods of unexpected inflation hotels exhibited a strongly negative beta alongside office and retail.

Direct investments in private real estate are not the only way to gain exposure to real estate. While not the only other way to gain exposure, the next most common way to get relatively direct exposure to real estate is through real estate investment trusts (REITs) in the public markets.

COMPARISON TO PUBLIC MARKETS

While public REITs ultimately own much of the same types of real estate as private real estate funds, the risk profile of the investment has some differences. For one, since REITs are marked to market on an intraday basis versus quarterly marks for private funds, their reaction time to changes in inflation or other market information is likely to be much faster and more volatile. The standard deviation of quarterly REIT returns is more than 4x the standard deviation for private real estate at 10.1% versus 2.36%. This is also driven by NAREITs inclusion of leverage while the NCREIF NPI is an unlevered index. However, as a tradeoff, REIT investments offer much more liquidity since investors are not subject to divestment restrictions. They also have historically offered higher rates of return with a quarterly average of 2.81% versus the NCREIF average of 1.98% per quarter since Q2 1989, possibly due to their more efficient fee structure.

At first glance, Figure 7 paints a strong picture in favor of publicly listed real estate as an inflation hedge versus private real estate. In every case except for the hotel assets, the NAREIT beta coefficient to CPI exceeded that of NCREIF, in some cases by a substantial amount. Recall, however, that the NAREIT index is significantly more volatile than the NCREIF index. However, when CPI is decomposed into expected and unexpected inflation it is evident that this is primarily driven by the expected inflation component. On the other hand, publicly listed real estate is completely ineffective as a hedge for unexpected inflation. While the NCREIF industrial and multifamily sectors had positive unexpected inflation betas from 2006 to 2021, the industrial assets coefficient turns negative if 2020 and 2021 are removed. No NAREIT sectors had a positive unexpected inflation coefficient. Figure 9 shows that the unexpected inflation coefficients for NCREIF far exceed those for NAREIT in every sector. It seems unusual that NAREIT could largely outperform NCREIF as a hedge for overall CPI but underperform so drastically as a hedge for unexpected inflation. This is because unexpected inflation as a percentage of expected inflation averages just 4.2%—though this percentage is highly volatile from quarter to quarter.

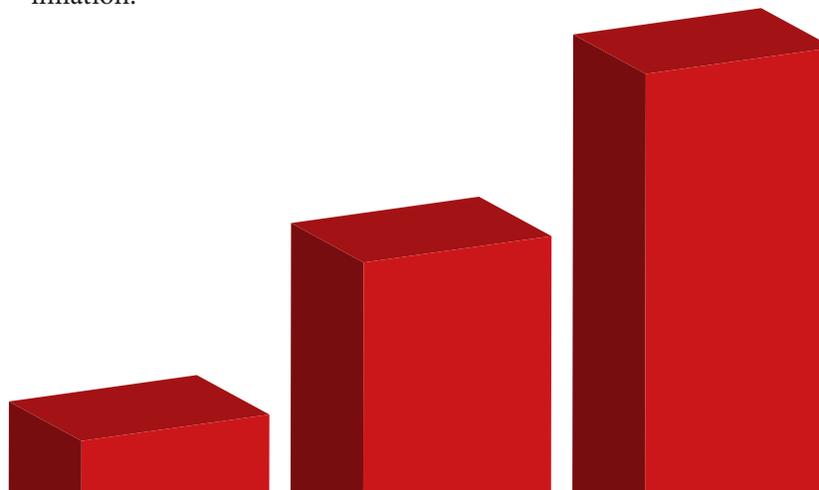
Overall, public real estate proxied by the NAREIT indices appears to be a superior hedge in periods of expected inflation while private real estate proxied by the NCREIF indices appears to outperform on a relative basis in periods of unexpected inflation. Again, while the real estate underlying these two sets of indices is largely comparable, the differing liquidity characteristics of public versus private real estate funds and the inclusion of leverage in NAREIT are likely the primary drivers of the differential performance between these markets.

CONCLUSION AND QUESTIONS FOR FURTHER RESEARCH

Across both public and private markets, all sectors of real estate are a statistically significant hedge to inflation proxied by CPI except for the hotel REIT index. Furthermore, there appears to be a lagged relationship between CPI and real estate total returns. This is good news for investors, particularly public market investors, as this allows some time to reposition their portfolios in periods of changing inflation.

In the private markets, industrial was the best overall inflation hedge followed closely by multifamily with office, hotel, and retail rounding out the pack respectively. Overall CPI performance obfuscates some of the important hedging characteristics of real estate which was seen after decomposing CPI into its expected and unexpected components. Here, the hotel class performed best in periods of expected inflation while industrial and multifamily appeared to be the best hedge for unexpected inflation. However, multifamily is a much more stable unexpected inflation hedge over time versus industrial in line with intuition.

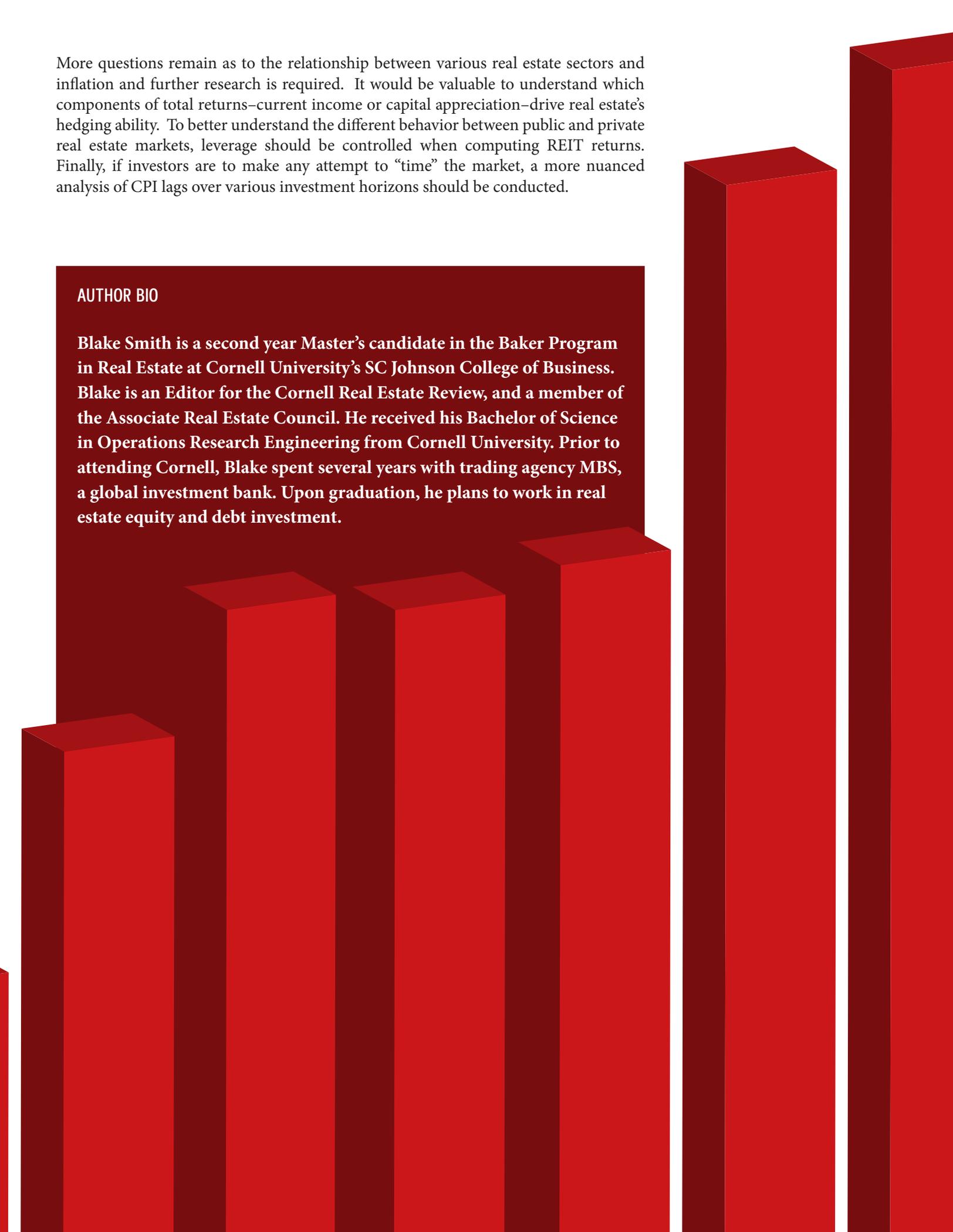
When comparing public and private markets, differences in average total returns and return volatility were likely driven by differing liquidity characteristics, fee structures, and the inclusion of leverage in the NAREIT indices. That said, public REITs were a superior hedge for expected inflation except for the hotel sector while private real estate outperformed on a relative basis in periods of unexpected inflation.



More questions remain as to the relationship between various real estate sectors and inflation and further research is required. It would be valuable to understand which components of total returns—current income or capital appreciation—drive real estate’s hedging ability. To better understand the different behavior between public and private real estate markets, leverage should be controlled when computing REIT returns. Finally, if investors are to make any attempt to “time” the market, a more nuanced analysis of CPI lags over various investment horizons should be conducted.

AUTHOR BIO

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HOW TO END GREENWASHING IN U.S. REAL ESTATE



INTRODUCTION

With the rise of environmentalism came the introduction of the term “greenwashing.” First coined to call out the misleading hotel industry’s practice of promoting the reuse of towels to save water, today, greenwashing is more broadly defined as the act of misleading the public with claims that a company’s products, policies, or goals are environmentally friendly¹.

¹ <https://www.forbes.com/sites/enriquedans/2021/03/23/its-time-to-bring-greenwashing-undercontrol/?sh=38127a334f06>

What initiated this practice of greenwashing in the real estate industry? Sustainable developments and investment managers with a commitment to Environmental, Social, and Governance (ESG) practices are seeing more investment than their non-ESG counterparts. In the year 2020, mutual funds and exchange-traded funds nearly doubled their investment in sustainable assets from the previous \$300 billion.² Additionally, sustainable buildings have been experiencing lower tenant turnover and earning almost 10% higher rents.³ Real estate assets are being praised for increasing sustainable initiatives and disclosures, but older buildings that have made no efforts to lower their carbon footprint are seeing the negative impacts of a “brown haircut” in the form of depreciating value.⁴

Real estate is the largest contributor to global carbon emissions accounting for 40%,⁵ and investors are calling on real estate developers and managers to make a change, and many are rising to the challenge valiantly and effectively.

Greenwashing is fuelled by a preconceived notion of trust. Consumers and investors are predisposed to trust corporate advertising because of the Federal Trade Commission Act that requires that advertising “tell the truth and not mislead customers.”⁶ Yet, vague sustainability claims by real estate developers can often go unchecked. To gain the trust of stakeholders, many real estate developers and managers have started securing third-party certifications such as those of the U.S. Green Building Council. The increase in demand for certified buildings, however, has led to the invention of new certification methods sponsored by other organizations. These certifications often lack transparency and consistency across this self-regulation of the real estate industry. They sometimes lead to confusion and reduced confidence among stakeholders. In addition, misleading metrics are affecting the entire industry. For example, concepts like “net-zero” and “carbon offsets” are mentioned in the media but can take on different meanings that are often poorly communicated.⁷

THE RACE TO ZERO

2 <https://www.nytimes.com/2021/10/26/business/climate-change-sustainable-real-estate.html>

3 <https://www.nytimes.com/2021/10/26/business/climate-change-sustainable-real-estate.html>

4 <https://www.nytimes.com/2021/10/26/business/climate-change-sustainable-real-estate.html>

5 <https://kleinmanenergy.upenn.edu/research/publications/climate-tech-for-real-estate-the-elephant-in-the-room/>

6 <https://www.justia.com/business-operations/managing-your-business/growing-your-business/advertising/#:~:text=The%20Federal%20Trade%20Commission%20Act,truth%20and%20not%20mislead%20consumers.>

7 <https://www.forbes.com/sites/enriquedans/2021/03/23/its-time-to-bring-greenwashing-undercontrol/?sh=38127a334f06>

“ REAL ESTATE IS THE LARGEST CONTRIBUTOR TO GLOBAL CARBON EMISSIONS ACCOUNTING FOR 40%,1 AND INVESTORS ARE CALLING ON REAL ESTATE DEVELOPERS AND MANAGERS TO MAKE A CHANGE”

With the rise in popularity of ESG disclosures for marketing purposes, important milestones and complex instruments that make positive strides towards achieving sustainable real estate have been reduced to “buzz words”. The environmental movement in the real estate world has become as much about marketability as making meaningful changes.⁸ The United Nations Framework Convention on Climate Change created the Race to Zero to build momentum around shifting to a decarbonized economy.⁹ Net Zero, or Carbon Neutrality, is the state of balance where either no new greenhouse gases enter the atmosphere or the amount of greenhouse gases is balanced by the amount being removed from the atmosphere.¹⁰ In theory, this is the state where global warming comes to a halt.

The concept of Net Zero is sound yet has been misconstrued in real estate in three ways: only considering some types of emissions when targeting this goal, relying too heavily on carbon offsets or negative emission technologies (NETs), and the lack of accountability in long-term goals.

Operational versus Embodied Emissions

The real estate industry has two methods of classifying emissions for real estate projects: operational and embodied. Operational emissions include the CO₂e¹¹ expelled from energy used to heat, cool, ventilate, light, and power the built environment. It does not consider the construction materials, processes, transportation costs, and demolition. Operational uses include natural gas, electricity, and sometimes fuel oil, propane, and wood.¹² By comparison,

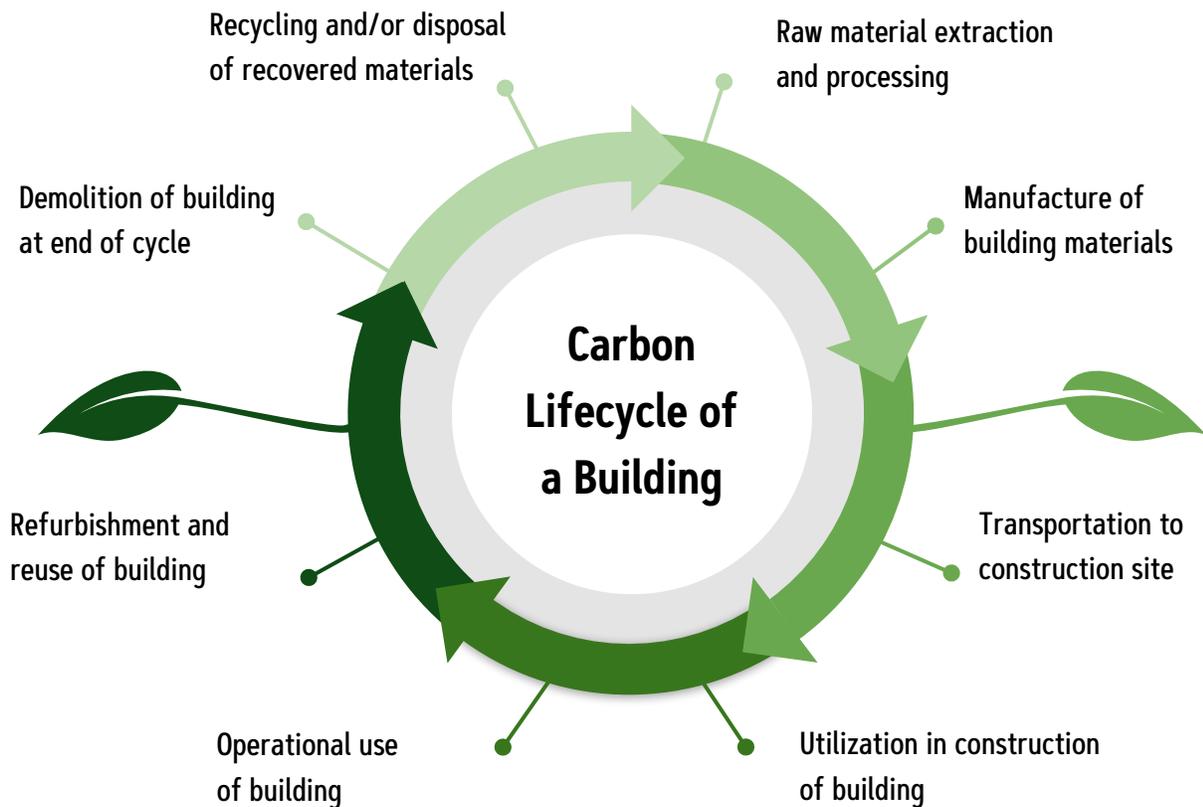
8 <https://www.sharplaunch.com/blog/green-building-certifications>

9 <https://unfccc.int/climate-action/race-to-zero-campaign#eq-2>

10 <https://netzeroclimate.org/what-is-net-zero/>

11 CO₂e, or carbon dioxide equivalent, over-weights greenhouse gas emissions that have more greenhouse potential than CO₂, such as methane, in proportion to their impact: <https://sustainablebrands.com/read/product-service-design-innovation/operating-vs-embodied-carbon-in-the-built-environment-the-difference-and-why-it-matters>

12 <https://sustainablebrands.com/read/product-service-design-innovation/operating-vs-embodied-carbon-in-the-built-environment-the-difference-and-why-it-matters>



embodied carbon is the total emissions from energy used in the construction process, including the energy to mine, log, harvest, extract, and transport materials to the construction site plus the emissions from the assembly of the building.¹³ If a previous building on the property was demolished, embodied emissions would also include any CO₂e from energy used to demolish and dispose of or recycle old materials.¹⁴ The image below shows the portions of the carbon lifecycle of a building that are part of embodied emissions in orange, which is all aspects but the operational use of the building.¹⁵

Real estate net-zero goals, including the ULI Greenprint many developers are pledging to use, are largely based only on operational emissions.¹⁶ For new buildings that are designed 30% more efficient than average, the savings from operational efficiency can still take from 10-80 years to pay back the emissions derived from the construction process

that would be taken to account as embodied emissions.¹⁷ As the most important portion of the construction process is embodied emissions, if the global concrete industry were its own country it would be the third-largest emitter of greenhouse gases in the world after China and the United States.¹⁸

As of 2021, operational carbon represents about 28% of U.S. greenhouse gases, and embodied carbon represents about 11%.¹⁹ While operational emissions do account for a larger percentage of emissions from real estate, current targets are still largely ignoring a source of emissions that represents over one-tenth of all greenhouse gas emissions in the country. The World Green Building Council estimates that embodied emissions will be the cause of half of the carbon footprint of new buildings between now and 2050.²⁰ With operational emissions already on the decline as the grid decarbonizes,

13 <https://sustainablebrands.com/read/product-service-design-innovation/operating-vs-embodied-carbon-in-the-built-environment-the-difference-and-why-it-matters>

14 [https://www.imt.org/should-i-stay-or-should-i-go-the-embodied-carbon-of-new-and-existing-buildings/#:~:text=Since%20the%20majority%20of%20a, and%20air%20pollution\)%20and%20rebuild.](https://www.imt.org/should-i-stay-or-should-i-go-the-embodied-carbon-of-new-and-existing-buildings/#:~:text=Since%20the%20majority%20of%20a, and%20air%20pollution)%20and%20rebuild.)

15 [https://www.imt.org/should-i-stay-or-should-i-go-the-embodied-carbon-of-new-and-existing-buildings/#:~:text=Since%20the%20majority%20of%20a, and%20air%20pollution\)%20and%20rebuild.](https://www.imt.org/should-i-stay-or-should-i-go-the-embodied-carbon-of-new-and-existing-buildings/#:~:text=Since%20the%20majority%20of%20a, and%20air%20pollution)%20and%20rebuild.)

16 <https://americas.uli.org/research/centers-initiatives/greenprint-center/greenprint-resources-2/uli-greenprint-goals/>

17 [https://www.imt.org/should-i-stay-or-should-i-go-the-embodied-carbon-of-new-and-existing-buildings/#:~:text=Since%20the%20majority%20of%20a, and%20air%20pollution\)%20and%20rebuild.](https://www.imt.org/should-i-stay-or-should-i-go-the-embodied-carbon-of-new-and-existing-buildings/#:~:text=Since%20the%20majority%20of%20a, and%20air%20pollution)%20and%20rebuild.)

18 <https://sustainablebrands.com/read/product-service-design-innovation/operating-vs-embodied-carbon-in-the-built-environment-the-difference-and-why-it-matters>

19 <https://sustainablebrands.com/read/product-service-design-innovation/operating-vs-embodied-carbon-in-the-built-environment-the-difference-and-why-it-matters>

20 <https://www.us.jll.com/en/trends-and-insights/cities/how-is-real-estate-innovating-to-cut-embodied-carbon/#:~:text=Unlike%20operational%20carbon%2C%20which%20can, construction%20between%20now%20and%202050.>

embodied emissions do not decline at the same rate because only a portion is electricity-related emissions. Embodied emissions are being forgotten despite being the more critical measurement to consider when looking to reduce the overall carbon footprint of a building.²¹

Negative Emissions Technologies

Researchers have been discussing the issues regarding carbon removal technologies even before the widespread use of carbon neutrality as a corporate and political goal. This emphasis has not only been placed on technologies to actively remove carbon from the atmosphere, but also by counteracting the release of greenhouse gas emissions through financing, reforestation, or forest protection programs while the processes releasing emissions into the atmosphere remain the same.²² Focusing on negative emissions technologies, such as bioenergy with carbon capture and storage (BECCS) and natural climate solutions²³, rather than the reduction or termination of the release of greenhouse gases into the atmosphere could lead to harmful outcomes. Carbon absorbed by forests, soil, or geological stores can and does leak back into the atmosphere.²⁴ The technology that is relied upon to remove this carbon from the atmosphere does not yet exist for large-scale deployment, and it is dangerous to assume it will be successfully developed to make a difference before the target year for the bulk of goals is reached.²⁵ In addition, the reliance on carbon removal technologies could introduce other environmental and social risks such as a further increase in the competition for land, since technologies like BECCS would require a land area of up to five times the size of India to grow the required biomass for its mass deployment by 2100.^{26,27} Relying on these technologies is taking a large gamble on our future, especially since there is no confirmation that these technologies will be able to scale up the way net-zero targets would depend on them too.

A widely used financial mechanism that counts to counteract a real estate owner or manager's emissions

21 https://www.buildingenergymagazine-digital.com/eneb/0218_fall_2018/MobilePagedArticle.action?articleId=1422002#articleId1422002

22 <https://www.forbes.com/sites/enriquedans/2021/03/23/its-time-to-bring-greenwashing-undercontrol/?sh=38127a334f06>

23 <https://www.carbonbrief.org/analysis-how-natural-climate-solutions-can-reduce-the-need-for-beccs>

24 <https://www.carbonbrief.org/guest-post-the-problem-with-net-zero-emissions-targets>

25 <https://www.carbonbrief.org/guest-post-the-problem-with-net-zero-emissions-targets>

26 <https://www.carbonbrief.org/guest-post-the-problem-with-net-zero-emissions-targets>

27 <https://www.carbonbrief.org/analysis-how-natural-climate-solutions-can-reduce-the-need-for-beccs>

AS OF 2021, OPERATIONAL CARBON REPRESENTS ABOUT 28% OF U.S. GREENHOUSE GASES, AND EMBODIED CARBON REPRESENTS ABOUT 11%.

contributions into the atmosphere is carbon offsets. Carbon offsets are acquired through the carbon trading market, where carbon allowances can be bought and sold like any other commodity.²⁸ The European Union created its carbon trading market in 2005 in tandem with its climate policy.²⁹ The problem is that many carbon offset schemes are not properly regulated due to a lack of established carbon trading markets worldwide. For example, an entire system of carbon offsets used by major airlines to counteract the massive emissions of the air travel industry was recently discovered to be based on an entirely flawed system.³⁰ The accounting underlying these systems is largely criticized, and in the case of the airline scandal, there were highly inconsistent uses of predictive tools to determine the actual number of credits that financial providers could be awarded.³¹ The carbon offset market in 2019 was only worth about \$300 million; estimates claim that the carbon offset market would have to grow to almost fifty times its current size to meet 2050 net-zero goals.³² Market Reports World projects that the Global Voluntary Carbon Offsets market size will have a compounded annual growth rate of 11.7% between 2021-2027.³³ If that rate is extrapolated through to 2050, the market could only grow to about 25 times its current size, half of what would be required. Already a tenuous system based on inconsistent practices with no international standardization, the ability for this market to not just solve the problems it currently faces but also grow to the required levels is almost impossible. As a result, piles of net-zero commitments with 2050 timelines that rely

28 <https://www.theguardian.com/environment/2021/nov/03/can-carbon-trading-reduce-global-emissions>

29 <https://www.theguardian.com/environment/2021/nov/03/can-carbon-trading-reduce-global-emissions>

30 <https://www.theguardian.com/environment/2021/may/04/carbon-offsets-used-by-major-airlines-based-on-flawed-system-warn-experts>

31 <https://www.theguardian.com/environment/2021/may/04/carbon-offsets-used-by-major-airlines-based-on-flawed-system-warn-experts>

32 <https://www.cnn.com/2021/09/27/bank-of-america-carbon-offset-market-to-x-50-to-meet-net-zero-goals.html>

33 <https://www.globenewswire.com/news-release/2022/02/03/2378160/0/en/Voluntary-Carbon-Offsets-Market-Size-2022-2027-is-Projected-to-Reach-USD-700-5-Million-with-11-7-CAGR-Growth-Rate-Share-Emerging-Technologies-Key-Players-Regional-and-Global-Indust.html#:~:text=%E2%80%9CGlobal%20Voluntary%20Carbon%20Offsets%20market,%25%20during%202021%2D2027.%E2%80%9D>

on carbon offsets will not be met.³⁴ University of Oxford researcher Thomas Hale stated “If every company and country rely on offsets and not enough on actual emission cuts, we simply won’t be able to accommodate these globally.”³⁵ Greenpeace itself has labeled carbon offsets a “scam” and the “next big thing in greenwashing.”³⁶ Carbon trading markets are allowing major polluters in the real estate industry and other industries worldwide to continue their current emissions patterns while feigning progress by injecting money into a carbon offset system that is largely unregulated and not built to handle the scale of capital ready to be flushed in its direction.

Goal Accountability

As of 2021, over one-fifth of the world’s largest companies, representing \$14 trillion in global sales, had created net-zero pledges.³⁷ However, recent studies show that countries, companies, and other actors are failing to make the progress required to attain these lofty goals. An evaluation completed

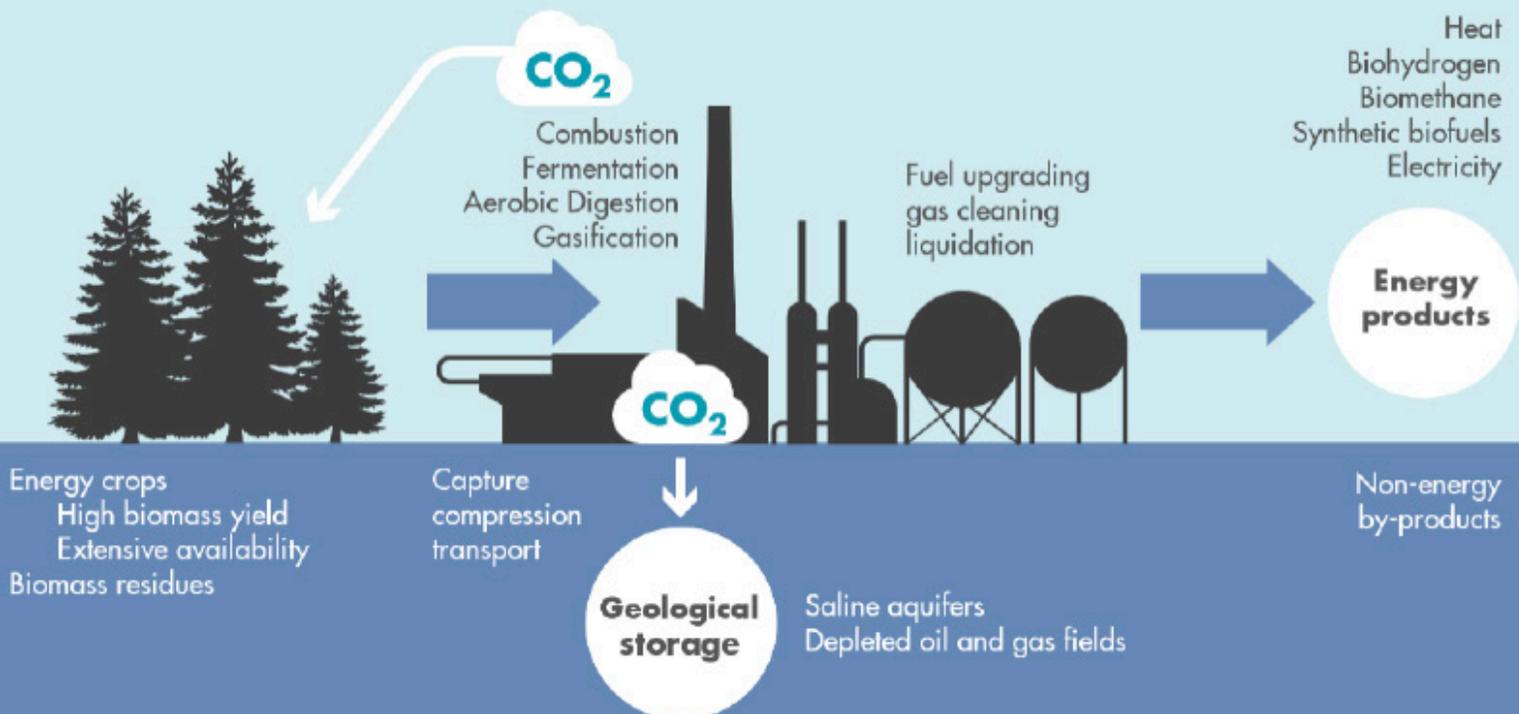
by non-profit and corporate social responsibility advisor, You Sow, demonstrated that out of 55 major U.S. companies with net-zero targets only three companies received an A grade on their efforts.³⁸ The study revealed how companies have missed the mark in aligning their strategies to reach emissions targets with those that Science Based Targets, an organization of climate science experts that aligns net-zero goals with current climate research³⁹, have identified as necessary.

Evidence shows that net-zero goals are being based too far into the future to inspire the immediate action necessary to achieve them.⁴⁰ Of the 137 countries that have committed to net-zero pledges, only six of them have set their targets for before the year 2050.⁴¹ The goals set by nations worldwide are serving as the basis of industry-specific goals. The ULI Greenprint for the real estate industry, designed based on the Paris Agreement, has challenged its members to bring their buildings to *operational* net zero by the year 2050.⁴²

34 <https://www.cnbc.com/2021/09/27/bank-of-america-carbon-offset-market-to-x-50-to-meet-net-zero-goals.html>
 35 <https://www.forbes.com/sites/dishashetty/2021/03/24/a-fifth-of-worlds-largest-companies-committed-to-net-zero-target/?sh=9e542d9662ff>
 36 <https://www.greenpeace.org/international/story/50689/carbon-offsets-net-zero-greenwashing-scam/>
 37 <https://www.forbes.com/sites/dishashetty/2021/03/24/a-fifth-of-worlds-largest-companies-committed-to-net-zero-target/?sh=9e542d9662ff>

38 <https://www.fastcompany.com/90727013/a-large-number-of-big-corporations-just-flunked-an-assessment-of-their-net-zero-progress>
 39 An initiative evaluating corporate goals in reducing emissions: <https://sciencebasedtargets.org/net-zero>
 40 <https://www.fastcompany.com/90727013/a-large-number-of-big-corporations-just-flunked-an-assessment-of-their-net-zero-progress>
 41 <https://www.visualcapitalist.com/race-to-net-zero-carbon-neutral-goals-by-country/>
 42 <https://americas.uli.org/research/centers-initiatives/greenprint-center/greenprint-resources-2/uli-greenprint-goals/>

Illustration of BECCS technology by Shell Climate Change, not illustrating the issues related to its land-use such as food insecurity, displacement, air pollution, and more.



To give the Greenprint credit, it goes one step further to establish a 50% greenhouse gas emission reduction by 2030, which has helped to keep its pledged members accountable to this goal. Overall, however, there are several problems when it comes to real estate players setting goals even that far into the future.

First, these goals are set by individuals in executive roles who will not be the ones liable for the results. There is much less incentive to work towards achieving these long-term goals if those responsible won't be credited with the success if reached.

Second, the long-term horizon of these goals allows real estate owners and operators to hesitate before acting, leading to an abundance of emissions that could be avoided with accelerated mitigation. The chart below shows an approximation of two scenarios based on the UN's Intergovernmental Panel on Climate Change (IPCC) 2018 report, representing the difference in total emissions per year if the 2050 goal is met but the 2030 goal is either met or not met.⁴³ Even if the final goal is achieved, the timeline risk of the long-term goal makes a vast difference in the emissions going into the environment in the meantime, represented by the space between both lines.

Another convenient aspect of setting goals so far into the future involves the cost of those goals. Long-term negative emissions appear cheaper than accelerated emission mitigation because of how these costs are discounted over the years.⁴⁴ This can lead to models focusing on delayed action and solutions, such as CO₂ removal, that occur decades into the future.⁴⁵

Solutions

While it is important to identify areas in which greenwashing can happen regarding net-zero goals, it is even more important to highlight solutions. Real estate owners and operators can counteract greenwashing within net-zero goals and ensure the maximum commitment to sustainability by taking four actions:

1. Separating negative emissions targets and emission reduction targets

By creating a distinction between these two types of targets, real estate owners and operators will not be able to rely on unreliable negative emissions

43 <https://www.russvernonjones.org/problems-with-net-zero-by-2050/>

44 <https://www.carbonbrief.org/guest-post-the-problem-with-net-zero-emissions-targets>

45 <https://www.carbonbrief.org/qa-how-integrated-assessment-models-are-used-to-study-climate-change>

OF THE 137 COUNTRIES THAT HAVE COMMITTED TO NET-ZERO PLEDGES, ONLY SIX OF THEM HAVE SET THEIR TARGETS FOR BEFORE THE YEAR 2050.

technologies and carbon offsets to claim a commitment to reducing their carbon footprint. This will force the real estate industry to also prioritize reducing current emissions, which are goals that can be achieved much sooner and have a more positive effect on our environment. A push from key stakeholders such as investors and lenders could inspire real estate developers to make this an industry standard.

2. Measuring and disclosing embodied emissions when creating these targets to create strategies to minimize them

Unless real estate owners and operators are making the effort to be aware of their embodied emissions, they have no hope of reducing them. These types of emissions are not measured nearly as widely as the more commonly reported ones, despite representing a large portion of total emissions. Technologies and materials are currently available that could reduce embodied carbon emissions by 20-30%, and with more awareness brought to these types of emissions the real estate industry could make a significant dent in its carbon footprint.⁴⁶ Industry leaders, like Microsoft in the construction of its Seattle campus, are using tools such as Skanska's embodied carbon tracker to keep tabs on these metrics, so the tools are becoming more widely available for more developers to follow suit.⁴⁷ The green building certification GRESB has introduced all of the emissions in its certification processes which could influence the real estate industry more quickly than individual developers.

46 [https://www.imt.org/should-i-stay-or-should-i-go-the-embodied-carbon-of-new-and-existing-buildings/#:~:text=Since%20the%20majority%20of%20a,and%20air%20pollution\)%20and%20rebuild.](https://www.imt.org/should-i-stay-or-should-i-go-the-embodied-carbon-of-new-and-existing-buildings/#:~:text=Since%20the%20majority%20of%20a,and%20air%20pollution)%20and%20rebuild.)

47 [https://www.imt.org/should-i-stay-or-should-i-go-the-embodied-carbon-of-new-and-existing-buildings/#:~:text=Since%20the%20majority%20of%20a,and%20air%20pollution\)%20and%20rebuild.](https://www.imt.org/should-i-stay-or-should-i-go-the-embodied-carbon-of-new-and-existing-buildings/#:~:text=Since%20the%20majority%20of%20a,and%20air%20pollution)%20and%20rebuild.)



ESG BUILDING CERTIFICATIONS

One way that real estate developers have been trying to corroborate the sustainability of developments is through ESG building certifications. These are almost always independently developed and monitored, apart from EnergyStar and Fitwel in the U.S. and others internationally. In the 21st century, the number of certifications in existence has grown significantly, but the most famous in the U.S. remains the Leadership in Energy and Environmental Design or LEED certification.⁴⁹ In the last five years, and most significantly in 2019, stakeholders began pushing investors to pursue green-certified buildings, with LEED coming forward as the most popular choice.⁵⁰ A report by the World Green Building Council in 2013 found that green buildings can be sold for a 5-30% premium and realize rental premiums of 0-17%.⁵¹ While most building certifications are focused on energy or environmental sustainability, the COVID-19 pandemic has introduced an onslaught of certifications related to indoor environment quality and health and wellness such as WELL and Fitwel.⁵² Building owners have always been invested in the environmental portion of ESG certifications, but investors have recently put increased emphasis on the social aspect.⁵³

3. Prioritizing retrofitting over new construction across the industry

Retrofitting an existing building can save 50-75% of embodied carbon emissions.⁴⁸ It should be industry-standard to conduct retrofits over demolition and new construction whenever possible, and developers need to be vocal about the benefits of doing so to spur an industry-wide priority change.

4. Setting shorter-term, immediately actionable goals

By setting shorter-term goals, real estate owners and operators can put their money where their mouth is. Hiding behind goals that may not come to fruition until 2050 is a huge contributor to greenwashing in the industry and is stagnating actual environmental action. By breaking up goals into shorter-term pieces, the real estate industry can be increasingly aware of its progress on the way to net zero and make more meaningful changes.

It is important to point out that “building a green building is not the same as certifying that a building is green”.⁵⁴ There is no standardization across any ESG

49 <https://sigearth.com/top-12-green-building-rating-systems/>

50 Information gathered through interview with commercial real estate LP investor

51 <https://stonemarkcm.com/blog/pros-and-cons-of-green-building-certification/>

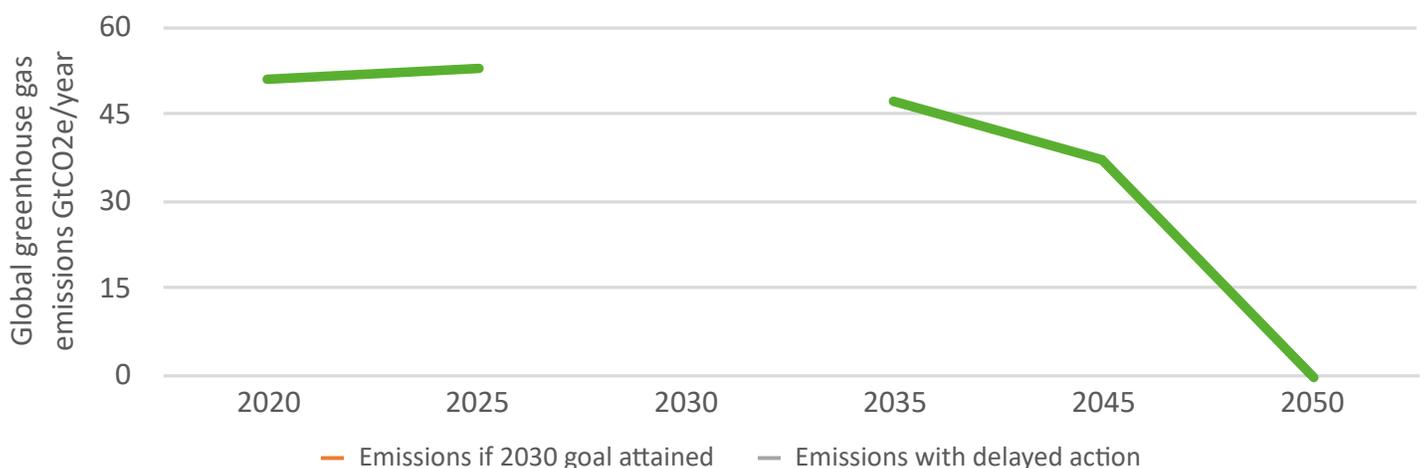
52 <https://www.callan.com/blog-archive/green-building-certifications/>

53 Information gathered through interview with commercial real estate LP investor

54 <https://stonemarkcm.com/blog/pros-and-cons-of-green-building-certification/>

48 [https://www.imt.org/should-i-stay-or-should-i-go-the-embodied-carbon-of-new-and-existing-buildings/#:~:text=Since%20the%20majority%20of%20a,and%20air%20pollution\)%20and%20rebuild.](https://www.imt.org/should-i-stay-or-should-i-go-the-embodied-carbon-of-new-and-existing-buildings/#:~:text=Since%20the%20majority%20of%20a,and%20air%20pollution)%20and%20rebuild.)

COMPARISON OF TRAJECTORIES: ADDITIONAL CO2 EMISSIONS IF CUTS ARE DELAYED



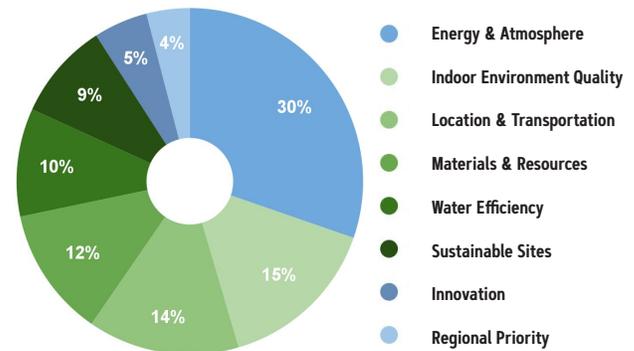
building certifications, with some being far more scrutinous and verifiable than others. While the increased competition of other certifications has pushed some to become more stringent, there are downsides to these certifications that are helping to enable greenwashing in the real estate industry in the U.S. contrary to the initial goal of the process.

Certification Efficacy

A large topic of debate is how effective the components of these certifications are in meeting their environmental goals. Even LEED, the most popular rating system in the country, is being criticized for only saving roughly half as much energy as predicted.^{55,56} Due to the nature of the point system that serves as the foundation of the LEED and several other certifications, real estate developers can target the low-hanging fruit like posting educational signage and offering electric cars priority parking and still garner enough points to earn a LEED certification.⁵⁷ While LEED and most other certifications such as BREEAM, Green Globes, and WELL have a tiered system with various levels of certification, investors do not easily distinguish between those doing the bare minimum to earn the stamp and those who have truly built efficient and sustainable buildings. Plus, while studies by the U.S. Green Building Council (USGBC) which founded LEED claim that LEED-certified buildings use 25-30% less energy than others, LEED critics object to the calculation of those results and point out irregularities in the underlying assumptions.⁵⁸ A physics professor at Oberlin College used the same dataset and found that LEED-certified buildings consumed more energy per square foot than non-LEED comparable properties.⁵⁹ The professor identifies some explanations for this including the “opt-in” nature of the data the USGBC used, the attempt to directly compare the mean of one data set with the median of the other, and the tendency for LEED-certified buildings to neglect certain efficient design aspects to prioritize completing their LEED checklist.⁶⁰ Another issue with many certifications, including LEED, is that there is a lack of discrimination between different point-earning actions. For example, actions of extremely different difficulty and effectiveness levels earn the same number of points, such as installing a bike rack

and redeveloping a brownfield site.⁶¹ There are also rarely considerations for location, so energy-efficient buildings in remote areas cannot earn points for factors like public transit and might earn a worse rating than far less sustainable buildings as a result.⁶²

CRITERIA DISTRIBUTION IN LEED BUILDING CERTIFICATION



63

The takeaway from these contradictory studies is that there is not enough regulation for the level of influence these certifications have on the market. These ESG building certifications are granted based on building owners self-reporting their data. While many have third-party certifiers or assessors corroborate information, not all offer this increased level of scrutiny, and investors are often not performing the due diligence to distinguish which certifications are effective.⁶⁴ In 2013, the U.S. Secretary of Energy, the General Services Administration (GSA), and the Department of Defense (DOD) sought to determine which third-party certification offered the most environmentally sound approach to certification.⁶⁵ The GSA recommended that federal agencies achieve at least LEED Silver or Two Green Globes.⁶⁶ This is reassuring that these certifications have held up to the scrutiny of the evaluation by the U.S. government, but it begs the question of why the lowest tiers, LEED Certified or One Green Globe, are in existence if they did not hold up to governmental analysis.

55 <https://www.bloomberg.com/news/articles/2018-06-05/reconsidering-leed-buildings-in-the-era-of-climate-change>

56 <https://www.greenbiz.com/article/do-green-buildings-really-save-energy-look-facts>

57 <https://www.bloomberg.com/news/articles/2018-06-05/reconsidering-leed-buildings-in-the-era-of-climate-change>

58 <https://www.bloomberg.com/news/articles/2018-06-05/reconsidering-leed-buildings-in-the-era-of-climate-change>

59 <https://www.bloomberg.com/news/articles/2018-06-05/reconsidering-leed-buildings-in-the-era-of-climate-change>

60 <https://www.bloomberg.com/news/articles/2018-06-05/reconsidering-leed-buildings-in-the-era-of-climate-change>

61 <https://leanurbanism.org/wp-content/uploads/2014/06/Orr-LEED.pdf>

62 Information gathered through interview with real estate developer

63 Kurnaz, Ahmet. (2021). GREEN BUILDING CERTIFICATE SYSTEMS AS A GREENWASHING STRATEGY IN ARCHITECTURE. *International Journal of Natural and Applied Sciences*. 4. 73-88.

64 Information gathered through interview with commercial real estate LP investor

65 42 U.S.C. §6834(a)(3)(D)(i)(III)

66 https://www.everycrsreport.com/reports/R40147.html#_Toc491879960

Solutions

ESG building certifications are well-intentioned and have led to positive change in the built environment. There are very powerful certifications in existence that are helping real estate developers build remarkable projects. These solutions could help reduce how these certifications unintentionally assist greenwashing in real estate and have a real impact on the environment and ESG targets:

1. Raising awareness of more stringent certification programs

Certain programs, such as the Living Building Challenge and Passive House Certification, have stricter requirements than the most popular building certifications but enable the creation of remarkably sustainable buildings.⁶⁷ For example, Living Buildings must produce more energy than they consume, must have net positive water, and must have net positive waste metrics for over 12 months before they can be certified.⁶⁸ If developers rose to these challenges more often, ESG goals could be attained much sooner than current projections.

2. Requiring governmental review of certification elements

The U.S. Secretary of Energy, the GSA, and the DOD have already established processes to review building certifications for federal buildings.⁶⁹ If certifiers had to meet the standards required for federal buildings to be deemed a valuable certification and be able to place their stamp on real estate developments, it would challenge the validity of the certifications that are more about marketing than making meaningful changes.

3. Implementing the most effective portions of certifications into building codes

The Energy Policy Act of 1992 established a baseline for energy efficiency in building codes.⁷⁰ If these requirements were reviewed and made stricter to align with targets necessary to mitigate catastrophic global environmental impacts, then the need for certifications would be reduced because the standard of building for new construction would be in-

herently elevated nationwide. If the federally mandated minimum requirements were elevated, then state and local governments could be motivated to go further above and beyond in establishing building codes that make their regions greener than their neighbors.

REGULATION THROUGH PUBLIC POLICY

Current U.S. policy has measures in place to prohibit unfair or deceptive marketing measures. The main federal regulatory measures that currently exist to control greenwashing and other forms of deceptive marketing are Section 5 of the Federal Trade Commission Act (FTCA), the 1992 FTC Guides for the Use of Environmental Marketing Claims which are often referred to as the Green Guides⁷¹, and the federal Lanham Act⁷². This policy has either been enhanced by or adapted from international policy, with examples of policy on an international level being Article 6 of the 2015 Paris Agreement and new measures from the Glasgow Climate Pact developed at the COP26 UN Climate Change Conference 2021.⁷³ However, all these policies are rife with controversy and have a serious lack of enforcement.⁷⁴

Section 5 of FTCA

Section 5(a) of the FTCA is the principal consumer protection statute in the United States which gives the Federal Trade Commission (FTC) enforcement authority over unfair or deceptive acts within commerce.⁷⁵ According to this regulation, the act must be likely to cause “substantial injury to consumers which is not reasonably avoidable by consumers themselves...”⁷⁶

The FTC can enforce these laws either through administrative or judicial processes. Through administrative enforcement, the FTC may pursue additional civil penalties in a district court after determining in the administrative proceeding that the unlawful act caused injury to consumers.⁷⁷ The FTC can also pursue judicial measures directly in district court if there are violations of given cease and desist orders, under Section 13(b) of the FTCA.⁷⁸

71 16 C.F.R. § 260 (2010)

72 15 U.S.C. § 1125 (2010)

73 <https://ukcop26.org/>

74 Lorange, Ashley, "An Assessment of U.S. Responses to Greenwashing and Proposals to Improve Enforcement" (2010). Hofstra Law Student Works. Paper 3.

75 15 U.S.C. § 45

76 Lorange, Ashley, "An Assessment of U.S. Responses to Greenwashing and Proposals to Improve Enforcement" (2010). Hofstra Law Student Works. Paper 3.

77 Lorange, Ashley, "An Assessment of U.S. Responses to Greenwashing and Proposals to Improve Enforcement" (2010). Hofstra Law Student Works. Paper 3.

78 15 U.S.C. § 53(b); FTC Overview, *supra* note 24.

67 <https://www.bloomberg.com/news/articles/2018-06-05/reconsidering-leed-buildings-in-the-era-of-climate-change>

68 <https://living-future.org/lbc/>

69 https://www.everycrsreport.com/reports/R40147.html#_Toc491879960

70 https://www.everycrsreport.com/reports/R40147.html#_Toc491879960

The FTCA has several shortcomings that prevent its ability to be an effective combatant to greenwashing in the U.S. First, it is rarely ever used. In the early 2000s, almost an entire decade went by without the FTC filing a single claim under this Act.⁷⁹ The limited number of actions brought forth by the FTC in contrast to the independent research that has revealed the depth of greenwashing in the U.S. proves that the FTCA is insufficient in enforcing green claims.⁸⁰ This lack of enforcement can be attributed to a lack of budget and personnel to tackle the mass of greenwashing material that is published each day.

FTC Green Guides

The Green Guides serve as industry guidance on environmental marketing claims, including everything from symbols, labeling, and logos to depictions and brand names.⁸¹ These guides are administrative and serve as an interpretation of the law, not as the law itself.⁸² Despite not having the force and effect of law, if a claim is made that is inconsistent with the Guides the FTC can take legal action based on the rules of the FTCA.⁸³

The Green Guides were last updated in 2012⁸⁴, but the FTC intends to initiate another review of the Green Guides in 2022.⁸⁵ With the previous update adding more depth to not only the Green Building and Textiles guidance but also the Carbon Offsets and Renewable Energy Certificates guidance, the upcoming renewal of the Green Guides and the review process will be extremely relevant to the real estate industry in the U.S.⁸⁶ The additional section added regarding carbon offsets in 2012 updated Green Guides emphasizes the requirement that any carbon offset claims must be supported by reliable evidence and accounting standards to ensure that no offset is being double-counted.⁸⁷ However, as previously discussed in this report and based on

numerous other sources⁸⁸, double counting of carbon offsets and poor accounting standards are still a highly prevalent problem.

The main downside of the Green Guides is that they are not pieces of legislation.⁸⁹ They can be used to bring forward any legislative action or have any effect on the law. The only way the FTC can bring an enforcement action forth is by using Section 5 of the FTCA discussed above.

Federal Lanham Act

Section 43 of the Federal Lanham Act deals with false advertising, including greenwashing, and has been used as a method to combat deceptive claims.⁹⁰ However, the Lanham Act has limited enforcement capacity and is generally only enforceable by a company's competitors rather than an individual consumer.⁹¹ This has occasionally even backfired to have the competitor raising the action's advertising under scrutiny by counterclaim.⁹² While the number of false advertising cases brought forward under the Act is increasing, it has many shortcomings that are leading to its failure as a reliable method of combatting greenwashing.⁹³

The Act provides less guidance than the FTC Green Guides on how to calculate misrepresentations and is seen as being full of conflicting case law and unclear language. The Act is supposed to be a method that provides a civil penalty for greenwashing but has not been as effective as hoped.

Moving Toward Solutions

Based on the controversy and lack of confidence surrounding the international policy developed in the Paris Agreement and at the COP26 climate summit, it is insufficient to attempt to combat greenwashing through U.S. policy. However, the adoption of certain concepts into U.S. policy would help combat greenwashing across all industries in the U.S., not just real estate. Two methods that could be adopted into public policy to help reduce greenwashing include:

79 [https://content.next.westlaw.com/Document/I633129bae82f11e398db8b09b4f043e0/View/FullText.html?transitionType=Default&contextData=\(sc.Default\)&firstPage=true](https://content.next.westlaw.com/Document/I633129bae82f11e398db8b09b4f043e0/View/FullText.html?transitionType=Default&contextData=(sc.Default)&firstPage=true)

80 Lorange, Ashley, "An Assessment of U.S. Responses to Greenwashing and Proposals to Improve Enforcement" (2010). Hofstra Law Student Works. Paper 3.

81 16 C.F.R. § 260.2 (2010). The scope of the Guides is extremely broad—they apply to all claims for all products for all consumer uses.

82 16 C.F.R. § 260.2; Rosch, Responsible Green Marketing Remarks, *supra* note 14, at 12 n.2.

83 16 C.F.R. § 260.1.

84 <https://www.ftc.gov/legal-library/browse/federal-register-notice/guides-use-environmental-marketing-claims-green-guides>

85 <https://www.jdsupra.com/legalnews/ftc-intends-to-initiate-review-of-green-2192324/>

86 Federal Trade Commission, Eco in the Market: Green Guide Review, http://www.ftc.gov/bcp/edu/microsites/energy/about_guides.shtml.

87 16 CFR 260.5.

88 <https://theconversation.com/double-counting-of-emissions-cuts-may-undermine-paris-climate-deal-125019>

89 <https://connect.michbar.org/blogs/environmental-law-journal/2020/05/14/environmental-marketing-claims-and-the-ftcs-revise>

90 15 U.S.C.A. § 1125(a) (2010)

91 Lorange, Ashley, "An Assessment of U.S. Responses to Greenwashing and Proposals to Improve Enforcement" (2010). Hofstra Law Student Works. Paper 3.

92 [https://content.next.westlaw.com/Document/I633129bae82f11e398db8b09b4f043e0/View/FullText.html?transitionType=Default&contextData=\(sc.Default\)&firstPage=true](https://content.next.westlaw.com/Document/I633129bae82f11e398db8b09b4f043e0/View/FullText.html?transitionType=Default&contextData=(sc.Default)&firstPage=true)

93 Lorange, Ashley, "An Assessment of U.S. Responses to Greenwashing and Proposals to Improve Enforcement" (2010). Hofstra Law Student Works. Paper 3.

1. Introducing international standardized language in Green Guides

The current language in the Green Guides is limited and sometimes vague, leading to many interpretations and potential manipulations of the text. The accounting standards the Guides advise and other definitions relating to environmental claims need to be more standardized to reduce variances from them. One way to improve this standardization is by adopting International Standards Office (ISO) language into the Guides based on the ISO 14000 series environmental guidelines.⁹⁴ ISO guidelines are widely recognized internationally across many industries and could have beneficial effects on making the Guides language when it comes to environmental claims in the built environment more stringent and clearer.

2. Enacting a citizen suit provision within the FTCA

The current FTC enforcement authority is broad, but there are not many enforcement actions being brought forward. By enabling citizen suits, individuals can bring forward claims of greenwashing and recover damages instead of the current requirement for competing corporations or the FTC itself to enforce the FTCA regulations.⁹⁵ Citizen suits will allow the FTC to minimize costs, and it will create more agents of change actively fighting against greenwashing in the U.S.

CONCLUSION

After reviewing ways in which greenwashing has been allowed to prevail in the U.S. real estate industry, including shortcomings with net-zero goals, ESG building certifications, and current public policy, a list of actionable items has been developed to help end this harmful greenwashing.

To combat the shortcomings of net-zero goals, industry leaders should be more stringent with emissions targets, including starting to separate negative emissions targets and emissions reduction targets and measuring and disclosing embodied emissions. There should also be a prioritization of retrofits over new construction and an emphasis on shorter-term immediate action items.

To address the issues with ESG building certifications, there

should be a greater emphasis on more stringent certification programs such as Passive House and Living Building, a governmental review element of certification components, and an implementation of the premium certification components directly into building codes.

Methods that public policy can implement to help end greenwashing in U.S. real estate include introducing international standardized language in the FTC Green Guides and enacting a citizen suit provision with the FTCA. The solutions provided above can help the U.S., as one of the largest global contributors to greenhouse gas emissions, pave the way for clean real estate and make strides towards reaching the nation's goals as part of the 2015 Paris Agreement. Research has shown that the world is falling behind in meeting its environmental targets. There is no time to waste and should be no patience for malicious or unintentional greenwashing practices.



AUTHOR BIO

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94 Lorance, Ashley, "An Assessment of U.S. Responses to Greenwashing and Proposals to Improve Enforcement" (2010). Hofstra Law Student Works. Paper 3.

95 Lorance, Ashley, "An Assessment of U.S. Responses to Greenwashing and Proposals to Improve Enforcement" (2010). Hofstra Law Student Works. Paper 3.

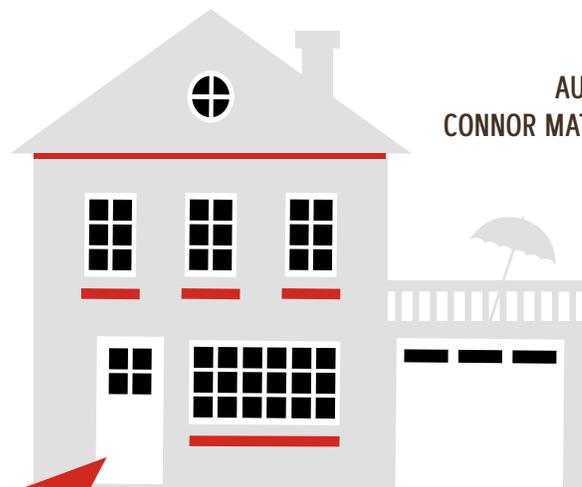
CAN INCLUSIONARY HOUSING FEES

FIX THE AFFORDABLE HOUSING CRISIS

IN SAN FRANCISCO?

**AN ANALYSIS OF THE CHALLENGES AND OPPORTUNITIES
FACING THE CITY'S HOUSING MARKET**





INTRODUCTION

The lack of availability of affordable housing in San Francisco has been a problem for many years. Home prices and rents continue to increase, and the lack of supply entering the market has exacerbated the difficulty. Beginning in 2002, San Francisco enacted an inclusionary housing program that requires new residential developments of ten or more units to pay an affordable housing fee or meet the inclusionary housing requirement by providing a percentage of the units as affordable for low- or middle-income households, either “on-site” within a development, or “off-site” at another location within the city. This article takes a focused look at the inclusionary housing fee program, the types of projects that are funded by these fees, and the challenges the program is currently facing in the market. Understanding how these fees are collected, monitored, and delivered highlights the complexity and importance of the program in the development of 100% affordable projects in San Francisco. Special thanks go to Todd David, Executive Director of San Francisco Action Coalition (SFHAC), Benjamin McCloskey, Deputy Director of Finance and Administration at the Mayor’s Office of Housing and Community Development (MOHCD), as well as Sam Moss, Executive Director at Mission Housing Development Corporation, for helping elucidate the inclusionary housing fee program within the city and other affordable housing structures.

WHAT IS THE SCALE OF THE AFFORDABLE HOUSING CRISIS IN SAN FRANCISCO?

According to the most recent (2019) study from the National Low Income Housing Coalition, the San Francisco-Oakland-Hayward metro area has 187,458 households qualified as extremely low-income renters (earning 30% or less of AMI) but only 66,214 affordable and available rental units, resulting in a deficit of 121,244 units. San Francisco publicly announced the affordable housing shortage as a “housing crisis” in 2014 when mayor Ed Lee proposed a plan to develop or preserve 30,000 units by 2020. As of the date of this article, San Francisco has preserved or produced 23,762 since the plan was announced. As part of the Mayor Lee’s initiative, 10,000 of the total 30,000 units were set aside to be developed or preserved for low income and working-class families, which the city has accomplished, based on the 2019-2020 annual progress report from San Francisco Mayor’s Office of Housing and Community Development (MOHCD). To reach the goal of 10,000 affordable units by 2020, San Francisco utilizes many approaches but a main driver of affordable development is the inclusionary housing program. Developers are given three options to satisfy their inclusionary housing developments.

WHAT IS INCLUSIONARY ZONING IN SAN FRANCISCO?

There are three ways multifamily housing developments in San Francisco are able to fulfill their inclusionary housing requirements. The first option is to build the units on-site as part of the larger development. The current percentage of on-site requirement in San Francisco is 25% of the total units in a project with 15% of this set aside for households earning no more than 55% of the Area Median Income (AMI), and 10% set aside for households earning no more than 110% of AMI. The remaining units at a development can then be developed as market rate housing.

The second option is to build the affordable units “off-site”, which gives the developer the option to pay for the affordable units at a project separate from the one they are developing. At times, the off-site requirement is satisfied by developers donating land to MOHCD for the development of 100% affordable projects.

The third option developers have is paying an inclusionary housing fee. The funds generated from these fees are overseen by MOHCD and are utilized toward the development of 100% affordable projects within the City. For multifamily projects proposed for 25 units or more, a \$199.50 per square foot of gross floor area is applied to 30% of the projects size. As noted, funds gained from the program are utilized for the construction of 100% affordable projects which means wrap around services typically seen with 100% affordable projects are likely implemented, which is not usually the case for affordable units built on-site. However, to create 100% affordable projects, a combination of public and private capital is required in order to finance the projects. In addition, developers of 100% affordable housing projects are typically interacting with local stakeholders and community members to build relationships and determine what types of additional services can be housed within the development. As is the case, pre-development timelines for a 100% affordable project are much more time consuming and complex, which can cause many developers to focus on on-site affordable units in their larger market rate projects. The result of less developers building 100% affordable housing projects means the deficit of moderate- and low-income housing units continues to grow. Over the last several years, San Francisco has responded with state and local incentives, including Senate Bill 35 (SB-35), to incentive and help alleviate economic and timeline pressures on affordable housing developers.



FIGURE 1: INCLUSIONARY PROGRAM FEES

Inclusionary Program Fees		
Year	Fees Collected	Fees Expended
FY 2014-2015	\$29,911,959	\$11,569,631
FY 2015-2016	\$25,541,071	\$39,885,500
FY 2016-2017	\$93,817,252	\$32,740,989
FY 2017-2018	\$39,354,125	\$41,047,735
FY 2018-2019	\$14,477,961	\$43,872,129
Total	\$203,102,368	\$169,115,984

Source: City and County of SF - Office of the Controller Budget & Analysis Division

WHAT IS THE SCALE AND SIZE OF INCLUSIONARY HOUSING FEES?

Based on data from City and County of San Francisco Office of the Controller Budget & Analysis Division, \$169,115,984 fees have been disbursed for the development of 100% affordable projects from 2014 through 2019, which is the most recent data available. These expenditures have resulted in the development of 96 projects totaling 6,112 units, but it should be noted that not all of these units have completed construction and are available for rent. The amount of fees collected by the program are directly affected by the amount of market rate developments that are being proposed. According to Benjamin McCloskey, Deputy Director of Finance and Administration with MOHCD, fees decreased significantly during the 2020 and 2021 fiscal years due to Covid-19 and therefore the collected fees over the past two years are anticipated do decrease dramatically.

Developers looking to access inclusionary housing fee funds interact directly with MOHCD that issues a competitive Notice of Funding Availability (NOFA) with specific criteria to select a housing developer, typically a non-profit corporation responsible for developing, owning and operating the housing units. The NOFAs target specific populations such as very low-income seniors or families and describe the terms under which funds will be provided. To the awarded developer, MOHCD then provides a 55-year, low-interest loan with annual loan repayments sized according to the projects operating expenses and reserves.



LA FENIX AT 1950

Depending on the availability and terms of non-City funding, MOHCD's share of the cost to build the 100% affordable projects ranges from 25% to 50% of the total project cost. In addition, MOHCD places restrictions on the deed of trust to ensure the property remains affordable to low-income residents in the long run. Some of the largest non-profit developers utilizing inclusionary fee funds include Mission Housing Development Corporation, BRIDGE Housing, and Mercy Housing California. A highlight of some of their most recent projects are outlined below.

- **Year Built:** 2021
- **Address:** 1950 Mission Street, San Francisco, CA 94103
- **Developer:** Mission Housing Development Corporation and BRIDGE Housing
- **Income Set Asides:** Households earning 45% and 60% of AMI with 25% of units set aside for formerly homeless families

FIGURE 2: PROJECTS AND UNITS DEVELOPED AND PROPOSED FROM INCLUSIONARY FEES

Number of Projects and Units Developed Through Inclusionary Fees		
Year	Number of Project	Number of Units
FY 2014-2015	7	538
FY 2015-2016	16	813
FY 2016-2017	20	1,023
FY 2017-2018	27	1,986
FY 2018-2019	26	1,752
Total	96	6,112

Source: City and County of SF - Office of the Controller Budget & Analysis Division



BILL SORRO COMMUNITY

- **Services:** Rooftop garden, community room with kitchen, and a bike workshop that focuses on training youth from the property and the surrounding communities on bike maintenance. Neighborhood-serving retail space is available for local nonprofits and entrepreneurs. In addition, the development offers art studios, as well as a art gallery highlighting the Mission District artist community.
- **Year Built:** 2018
- **Address:** 1009 Howard Street, San Francisco, CA 94103
- **Developer:** Mercy Housing California
- **Income Set Asides:** Households earning 40% and 50% of AMI with 14 units set aside for adults with developmental disabilities.



PROPERTY NAME: TBD

- **Services:** South of Market Child Care offers parenting classes and family case management services. In addition, The Arc of San Francisco provides supportive services for the developments disabled residents.
- **Property Name:** TBD
- **Year Built:** Proposed
- **Address:** 4840 Mission Street, San Francisco, CA 94112

- **Developer:** BRIDGE Housing
- **Income Set Asides:** 30%, 40%, 50%, and 95% of AMI.
- **Services:** Computer room, public art center, 10,000 square foot space for the Mission Neighborhood Health Center, which will provide on-site affordable medical, behavioral health and dental services.

IN WHAT PARTS OF SAN FRANCISCO ARE THESE PROJECTS BEING BUILT?

A growing body of research documents the positive outcomes associated with living in resource rich areas. These neighborhoods typically offer access to quality schools, public libraries, and other assets that set the stage for educational achievement. In resource rich areas, streets and parks are free from violence and provide safe places for people to live, work, and play. However, areas that offer characteristics that make resource rich neighborhoods attractive increase demand and housing costs. As a result, affordable housing developers are typically priced out resource rich areas due to high land prices. Affordable housing developers are in most cases unable to compete on land prices when compared to market rate developers, which limits the expansion of affordable housing to resource rich neighborhoods. In addition, community resistance and zoning controls have historically limited the expansion of affordable housing projects to neighborhoods with increased amenities, access, and resources. The map below outlines the recently completed and under construction affordable housing projects in San Francisco (shown by the yellow dots), based on data from the 2018 and 2019 fiscal year report from the City and County of San Francisco Office of the Controller Budget & Analysis Division.

As shown in the previous map, the most recently completed and proposed affordable projects in San Francisco are located in the eastern sections of the San Francisco. Additionally, the majority of these locations are in lower income areas ranging from a median household income of \$24,000 to \$102,000. Based on conversations with Benjamin McCloskey, Deputy Director of Finance and Administration at the Mayor's Office of Housing and Community Development, as well as Todd David, Executive Director with San Francisco Housing Coalition (SFHAC), local agencies have been working to implement plans to build affordable units in the western parts of San Francisco. As illustrated, the western neighborhoods experience higher median household income levels. One of the biggest challenges for multifamily development in general, but especially affordable housing development on the west side of the city, is related to zoning restrictions.

HOW DOES ZONING PLAY A ROLE IN THE LOCATION OF AFFORDABLE PROJECTS IN SAN FRANCISCO?

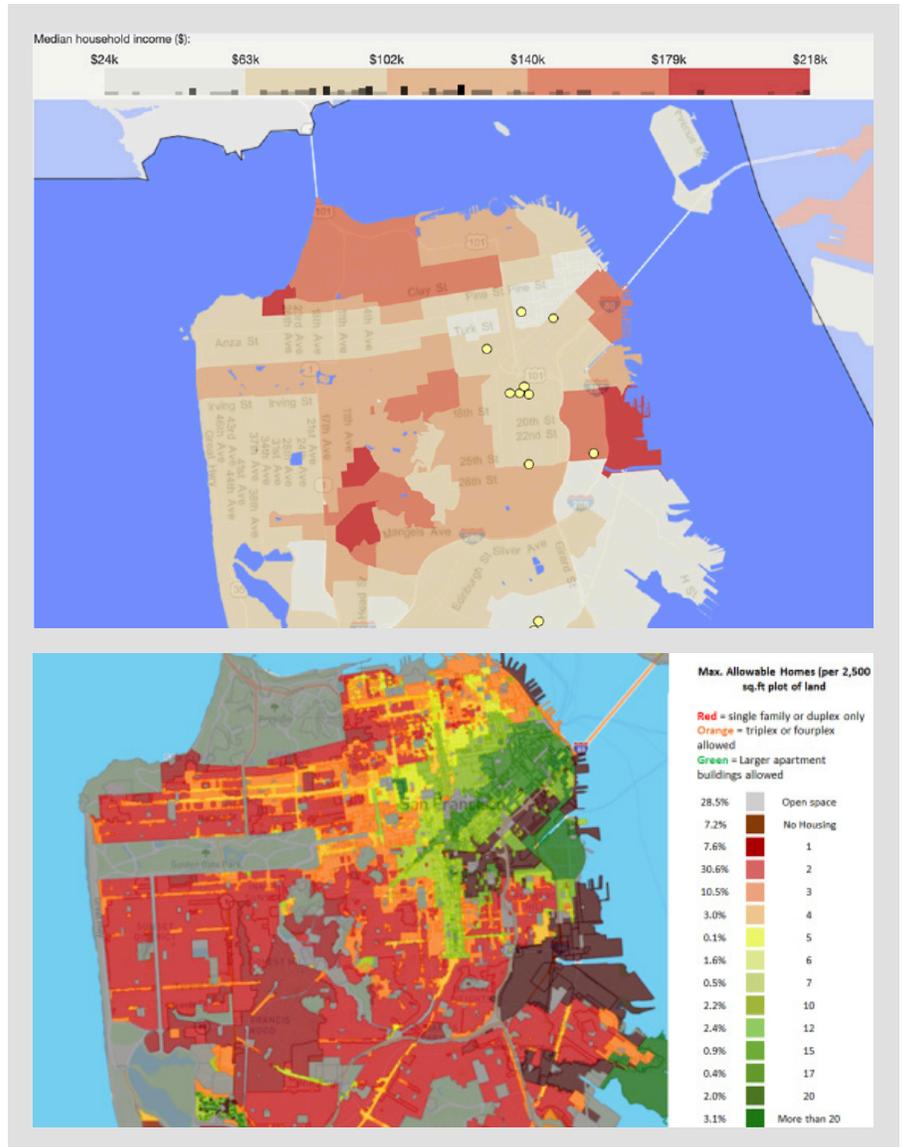
In order to receive funding from MOHCD, 100% affordable developments are typically rented to households earning between 40% and 80% of AMI. Due to the rents being capped well below market rate levels, 100% affordable housing projects require an amount of scale in order to be profitable. Based on discussions with local affordable housing developers in San Francisco, including Sam Moss, Executive Director at Mission Housing Development Corporation, most 100% affordable properties need to be at least 50 units in order for the complex capital stack to work. As is the case, developers like Mr. Moss need to identify sites that are zoned for high density multifamily uses allowing 50 or more units. The map below highlights the density zoning map in San Francisco.

As outlined in the previous map, the majority of zoning in San Francisco is for single-family and duplex low-density units. Further, only 26.5% of San Francisco is zoned for multifamily uses of five or more units. For high density projects of 20 or more units, only 3.1% of the city is zoned to allow this many units. Of the 3.1% of the city that is zoned for multifamily buildings of 20 or more units, the majority of the land is located on the east side of the city, in neighborhoods with some of the lowest median household incomes. Developers like Mr. Moss at Mission Housing Development Corporation, as well as Mr. David at SFHAC, are in constant discussions with local zoning administrators to push for increased density on the western. However, as of the date of this article, San Francisco has made no plans for a comprehensive zoning shift in the western half. Without major zoning reform, it is likely that high density multifamily projects will remain clustered in the western portions.

Community Involvement for Affordable Housing Projects

For many years, multifamily developers in San Francisco have become increasingly frustrated with utilizing inclusionary housing fee funds to build 100% affordable housing projects, due to the prolonged construction times. According to Mr. McCloskey, MOHCD doesn't fund a project until construction starts. In San Francisco, pre-

APARTMENT BUILDINGS ZONED FOR 20 OR MORE UNITS CAN ONLY BE BUILT IN 3.1% OF SAN FRANCISCO



development and the permitting process for 100% affordable projects can take up to ten years, especially for developments that require extensive community involvement during the predevelopment stages. In order to speed up this process and incentive 100% affordable developments within San Francisco and California at large, senator Scott Weiner introduced Bill 35, which was enacted in 2017. The bill covers many housing initiatives within the state but a major highlight for 100% affordable projects that came out of the bill was changing all 100% affordable projects to be by-right housing. By-right housing approval deems a development to begin construction without requiring it to acquire discretionary approvals from the planning commission. In San Francisco, this was a major change in the approval process because built into San Francisco's charter is that every permit in the City is discretionary. In San Francisco, the majority of developers building 100% affordable projects

now use SB-35 applications to speed up the pre-development processes.

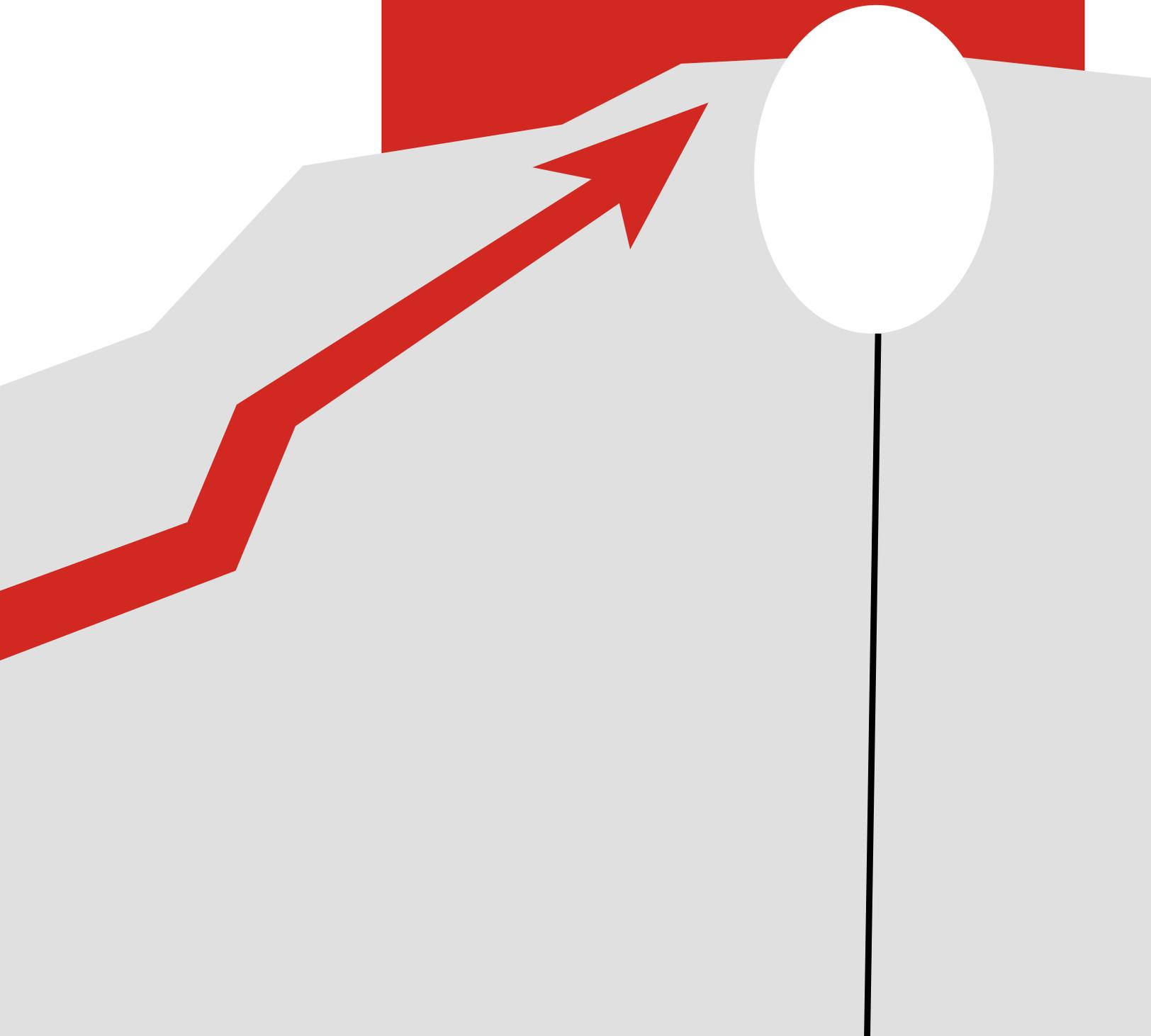
When speaking to Mr. David, he noted the current challenge SFHAC faces working with some 100% affordable developers is getting them to change their thinking on the extent of community involvement when it comes to their developments. Further, community involvement through the pre-development process has always been extremely time consuming for 100% affordable projects in San Francisco. Community concerns range from legitimate traffic and parking concerns but also highlight the not in my backyard (NIMBY) mindset that is far from absent in San Francisco. A recent example of affordable developers trying to find the right amount of community involvement in the SB-35 projects is a proposed 91-unit development in the Sunset neighborhood. The Sunset neighborhood is located on the western side of the city and would be the first 100% affordable development built on the west side of San Francisco in over a decade. The non-profit developer, Tenderloin Development Corporation, chose to hold many community involvement meetings from the Mid-Sunset Neighborhood Association, which was formed to combat the development from being built. The proposed development utilized an SB-35 application and was thus under no requirement to hold the community meetings with Mid-Sunset Neighborhood Association, who ultimately filed a losing injunction against the developer. According to Mr. David, who represents many 100% affordable housing developers, the amount of community involvement with 100% affordable projects utilizing SB-35 applications is a fine line that needs to be considered. The role of the community in an affordable housing development is very important but there is also a dire need to build affordable units in San Francisco at a much faster rate than is currently being developed.

How Can San Francisco Improve

The challenges facing San Francisco's affordable housing industry are unlikely to be solved by a single housing program, but rather by a combination. As noted, the inclusionary housing fee funds have generated multiple 100% affordable housing projects over the years. However, the amount of funds generated for inclusionary housing fees are directly related to the amount of market rate housing being built, which means more housing at all income levels will benefit inclusionary housing fee funds. A potential solution to speed up and incentivize developments at all income levels would be to make all high-density developments (20+) units by-right developments, eliminating the requirements for discretionary approvals. California has considered the idea of making high density developments by-right, however; as of the date of this report, no proposals have been made. A potential downside of allowing the by-right nature for high-density development throughout the city would be the dramatic visual change to the built environment, especially on the west side. However, the dire need for increased housing, especially at affordable income levels means a dramatic change to the landscape is necessary. Additionally, the majority of 100% affordable developments in San Francisco have been successful of fitting themselves into the surrounding built environment to the point where they become part of the neighborhood. As advocates and developers of affordable housing continue to create successful projects that blend themselves into the fabric of San Francisco neighborhoods, it is the hope of developers like Mr. Moss that pushback from neighborhood groups will lessen and serious zoning change will build momentum.

AUTHOR BIO

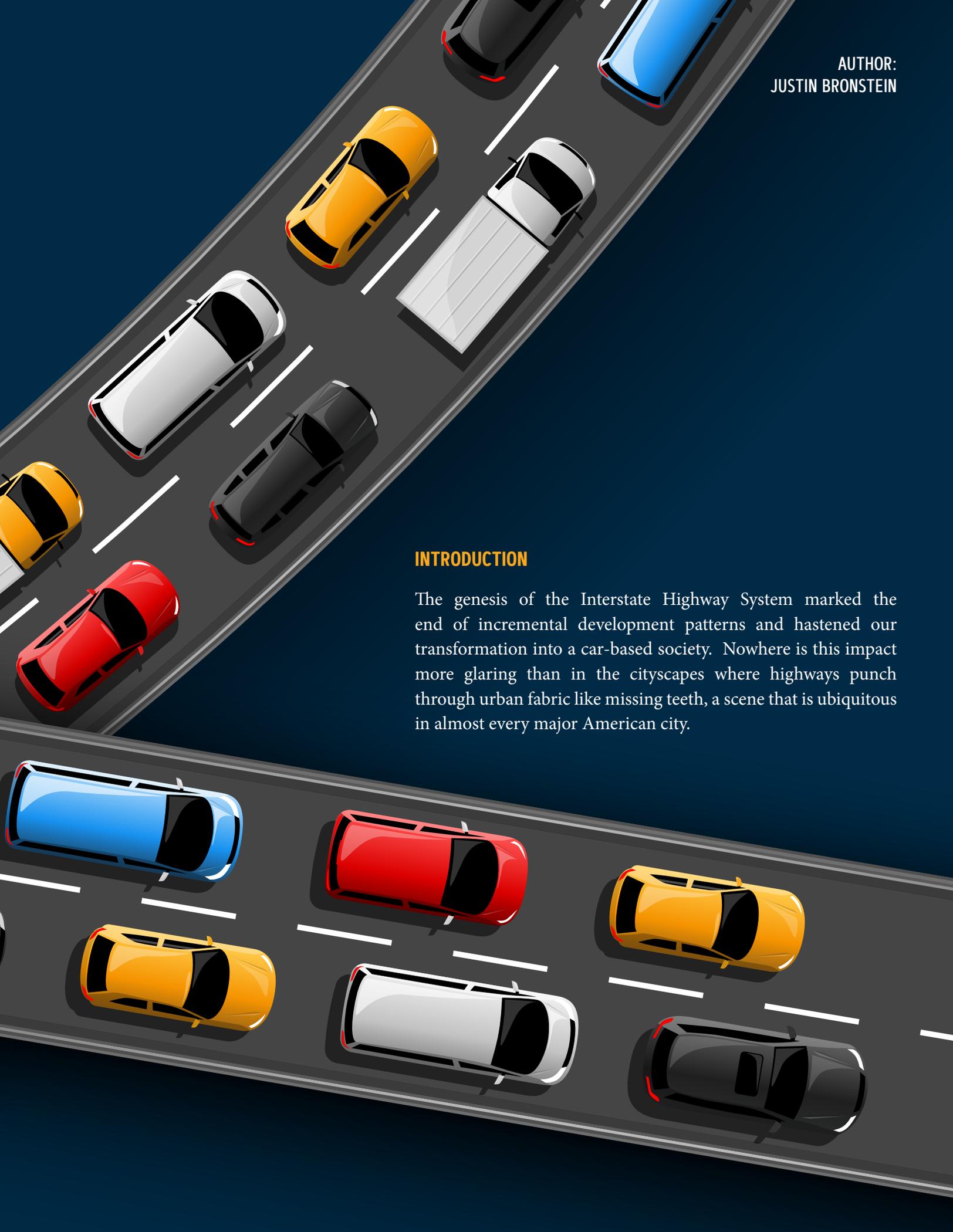
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HEALING THE
WOUNDS OF
URBAN RENEWAL

BY DISMANTLING A DALLAS FREEWAY



An aerial, top-down view of a multi-lane highway. The road is dark grey with white dashed lane markings. Several vehicles are shown from above, including a blue car, a yellow car, a white car, a black car, a red car, and a white truck. The vehicles are arranged in a way that suggests traffic flow. The background is a dark blue gradient.

AUTHOR:
JUSTIN BRONSTEIN

INTRODUCTION

The genesis of the Interstate Highway System marked the end of incremental development patterns and hastened our transformation into a car-based society. Nowhere is this impact more glaring than in the cityscapes where highways punch through urban fabric like missing teeth, a scene that is ubiquitous in almost every major American city.



Between 1950 and the present over one million people were forced from their homes to make way for the construction of the federal highway system and, coupled with misguided urban renewal efforts, cities were left denuded and desiccated.¹

The construction of the Interstate System and urban renewal went hand in hand, with municipalities using it as a convenient excuse to clear large swathes of urban neighborhoods deemed “blighted.” While urban cores have seen a resurgence in recent years, economic rebirth has been an uneven process. Vast swaths of inner cities have been left behind and municipal leaders are left navigating the twin crises of disinvestment and gentrification. As urban highways now approach the end of their useful lifespans, freeway removal has gained a degree of prominence as a potential remedy for some of these problems. This effort is furthest along in Dallas, Texas where a freeway removal project has the potential to unlock billions of dollars in development and heal some of the wounds created generations ago. If the effort is successful in car-obsessed Texas it could serve as a template for cities across the country.

Dallas, in many regards, represents the culmination of flawed central planning efforts, ranking first among all North American CBDs for land dedicated to highway infrastructure with 384 acres.² Today, the inner-city population is 60% smaller than it was in 1950 and this is reflected in the absolute decline in density that almost every single urban core census tract has faced. As if the hangover from highway construction was not enough, a significant number of the most ornate and architecturally significant buildings were speculatively demolished in the early 1980’s. The onset of the Savings and Loan Crisis caused development plans to evaporate overnight and many of the lots are still vacant today. In fact, the Downtown was so moribund that in 2000 when Boeing executives were searching for a new corporate headquarters, they famously snubbed the region after spending a few nights and remarking that there was nothing to do.³

1 Evans, Farrell. (2020, October 20). “How Interstate Highways Gutted Communities—and Reinforced Segregation.” Retrieved May 4, 2022. <https://www.history.com/news/interstate-highway-system-infrastructure-construction-segregation>.

2 CityNerd. (2021, December 8). “The Most Freeway-Heavy Downtowns in the US: 10 Cities With Huge Downtown Freeways and Interchanges” [Video]. Retrieved April 30, 2022. <https://www.youtube.com/watch?v=WYsJx1urS3Y>.

3 Salchert, Ryan. (2021, 6 September). “The wake-up call: How Boeing’s rejection of Dallas 20 years ago might have been the best thing for downtown”. Retrieved April 30, 2022. <https://www.bizjournals.com/dallas/news/2021/09/06/boeing-relocation.html>.

Interstate Highway (IH)-345 is a monument to the misplaced aspirations of urban freeway construction, a prominent elevated structure that separates the two most popular neighborhoods. Slicing through the middle of what would be a contiguous urban street wall, the placement of the structure forces visitors to navigate a series of depressing underpasses and disappearing sidewalks. The elevated highway is also surrounded by a sea of vacant land and parking lots, with the warren of frontage roads and onramps creating oblong lots that are difficult to access. It is no surprise that the Dallas CBD contains almost 80 acres of vacant land, as developers are simply unable to make projects “pencil” in the shadows of decaying concrete highways.

IH-345 was built in 1973, barreling right through the middle of Dallas’ historic nightlife neighborhood, Deep Ellum. While the neighborhood has experienced ebbs and flows ever since it was founded around the old Texas and Pacific Railroad yards, it has always been the locus of the creative community. In the 1920’s it was a center of the jazz movement and a refuge from the segregation of the Jim Crow South, serving black and white club-goers alike. The construction of the elevated highway was intended to provide the missing link to form a ring road around the CBD and it involved the clearance of 54 city blocks, carving a 1.75 mile path of destruction.⁴ By the 1970’s many cities had experienced “Freeway Revolts,” leading to the cancellation of projects that would have irreparably defaced some the country’s most beloved neighborhoods. However, since Deep Ellum was not a residential neighborhood and was undergoing a cycle of decline there was minimal documented resistance. In addition to the physical destruction of Deep Ellum, IH-345 reinforced a physical and psychological divide between the shiny downtown with its corporate headquarters and the largely Black neighborhoods to the South and East. Today, this is reflected in the economic gap between North and South Dallas, with South Dallas accounting for 40% of the city’s population while constituting only 15% of its tax base.⁵

The vision to remove IH-345 was pioneered by Patrick Kennedy, an urban planner who moved to Dallas around the turn of the Millennium and embraced a largely car-free lifestyle at the absolute nadir of the inner-city. Kennedy is something of an urban evangelist and etched out his vision while walking from his apartment to work, a path that took him under IH-345 and past boarded-up buildings in Deep Ellum. Initially he published a blog to share his ideas and it eventually came to the attention of the editors of D Magazine,

4 Coalition for a New Dallas. (2014). Retrieved April 27, 2022. <https://www.coalitionforanewdallas.org/>.

5 Macon, Alex. (2021, May 19). “Is This the Policy That Will Finally Bridge Dallas’ North-South Divide?” Retrieved April 27, 2022. <https://www.dmagazine.com/frontburner/2021/05/is-this-the-policy-that-will-finally-bridge-dallas-north-south-divide/>.

a monthly periodical covering a variety of topics in the Dallas Metroplex. Kennedy was offered his own regular guest column, placing him firmly on the radar of prominent municipal and business leaders. In 2014, Kennedy founded a Political Action Committee called Coalition for a New Dallas which laid out the economic and political case for the removal of IH-345.⁶

Around this time, Texas Department of Transportation (TxDOT) was also developing a plan called CityMAP in conjunction with the City of Dallas to determine the future for the ring of highways around the CBD. Cracks in the concrete supports of IH-345 had been repaired hundreds of times and the engineering for the elevated structure was considered deficient, with the state wishing to fund a replacement. It was at the urging of prominent business and political leaders that Coalition for a New Dallas was engaged by TxDOT to at least share some of the guiding principles for freeway removal. Published in 2016, the CityMAP plan contained nine different scenarios for IH-345, but only one of the scenarios was complete removal and reconstruction of the original street grid.⁷ The lifespan of IH-345 was extended for another decade when large cracks appeared and a \$24 million emergency repair was initiated, although this has also provided a longer window to advocate for the full removal option. Estimates for removal versus replacement vary widely and are still being determined, although the elevated viaduct will have to be demolished either way due to its structural obsolescence.

Beginning in about 2000, a flurry of development activity added over 25,000 new units of housing to the urban core of Dallas, and the subsequent increase in residential population has led to the creation of amenities to support a 24-hour neighborhood.⁸ However, while Downtown is far more vibrant now than it was even a decade ago, its growth has not kept pace with the surrounding neighborhoods and the metro area as a whole. Even while housing prices skyrocket in the inner city, the CBD itself still suffers from the perception of blight and the surrounding ring of highways serve as a prominent physical barrier to reaching its full potential. Kennedy says Dallas is a “Rust Belt inner city surrounded by Sun Belt suburbs,” aptly describing the failure of the CBD to capture a slice of regional prosperity.

According to projections from Coalition for a New Dallas,

6 Simek, Peter. (2015, February 2). “A Man Walks Into a City”. Retrieved April 30, 2022. <https://www.dmagazine.com/publications/d-magazine/2015/march/patrick-kennedy-urban-planner-dallas/>.

7 Texas Department of Transportation. (2022). Keep It Moving Dallas. Retrieved May 3, 2022. <http://www.keepitmovingdallas.com/content/citymap>.

8 ArcGIS Business Analyst: ESRI. Retrieved May 4, 2022. <https://bao.arcgis.com/>.

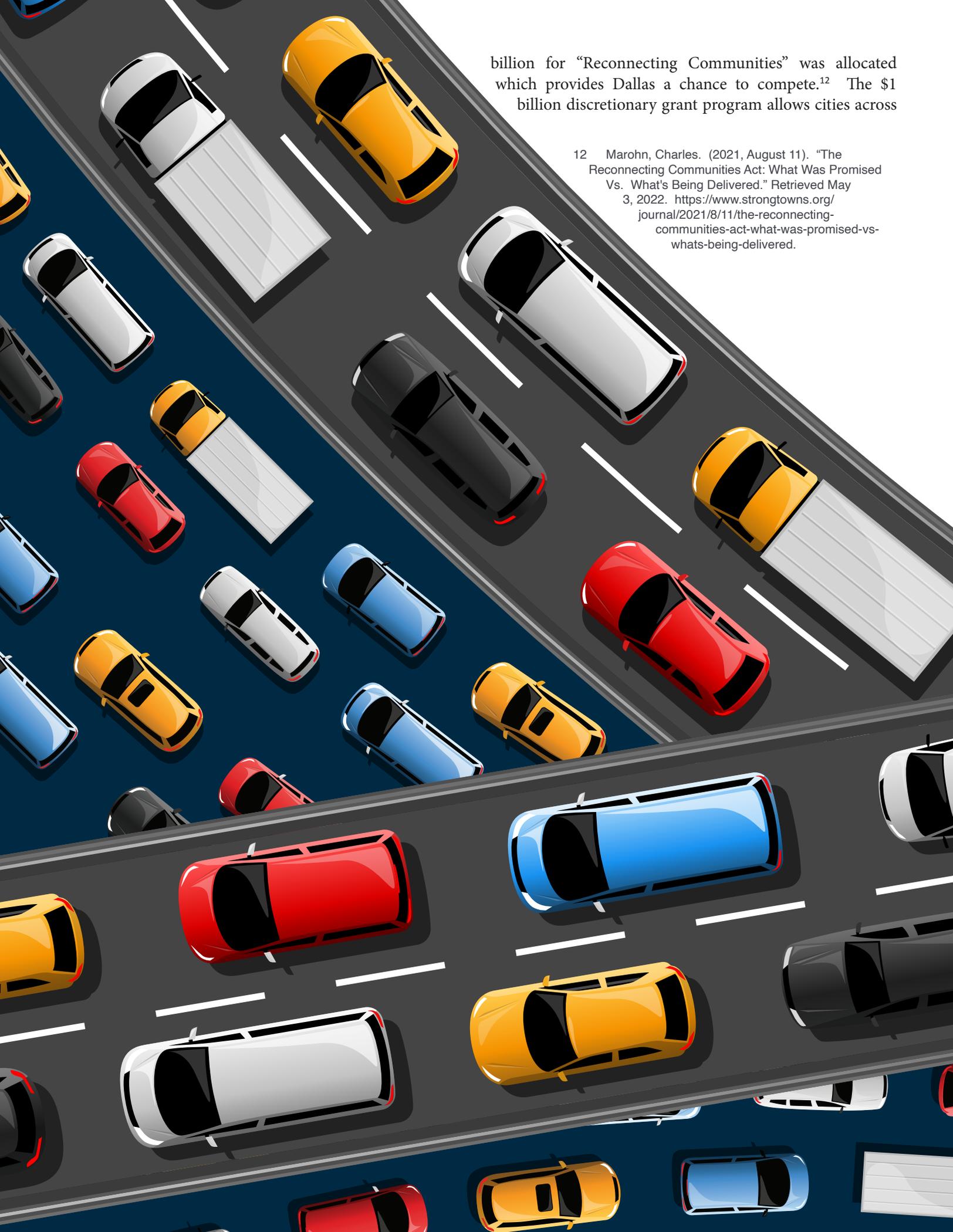
the full removal option could lead to the creation of 17,000 new residential units and a total of \$4 billion in new development, which translates to \$250 million in new tax revenues for the city.⁹ The removal option also fulfills the city’s goal of bridging the North-South divide by physically reconnecting neighborhoods and harnessing job growth in the vicinity of the most disadvantaged neighborhoods. Approximately 15% of Dallas residents, disproportionately concentrated in South Dallas, do not own a vehicle, which serves as an access barrier to high wage white-collar jobs in the prosperous Northern suburbs.¹⁰ While the issue of commute times has been raised, independently commissioned traffic studies have found that the removal option has negligible impacts on drive times, adding between 2 to 5 minutes per trip. The local street network is overbuilt for the amount of traffic that it currently handles and can easily absorb the trips that would have taken the freeway route.¹¹ Additionally, the current route largely functions as a bypass for parallel highways and studies have found that it disproportionately carries commercial traffic that originates outside of the City of Dallas. In effect, the elevated highway occupies what should be the most intensively used land in the city while contributing no tax revenues and blighting the surrounding neighborhoods.

As of now, the full removal option has significant momentum, but it could easily become the victim of partisan politics or get tossed aside due to the inertia of the status quo. To the south in Austin, the state is planning on moving forward with a 20-lane widening project for an urban freeway despite protests from community groups and local officials. Kennedy believes that the synchronization of economic development goals between public and private sector leaders offers the project a viable path forward not available to similar freeway removal projects in the US. In the recently passed \$1.5 trillion infrastructure appropriations bill, \$1

9 Coalition for a New Dallas. Retrieved April 27, 2022.

10 Young, Stephen. (2021, December 8). “Dallas Pedestrian Deaths Are Concentrated in High-Poverty Areas, New Data Says.” <https://www.dallasobserver.com/news/dallas-pedestrian-deaths-are-concentrated-in-high-poverty-areas-new-data-says-7137108>. Retrieved April 30, 2022.

11 Coalition for a New Dallas. Retrieved April 27, 2022.



billion for “Reconnecting Communities” was allocated which provides Dallas a chance to compete.¹² The \$1 billion discretionary grant program allows cities across

12 Marohn, Charles. (2021, August 11). “The Reconnecting Communities Act: What Was Promised Vs. What’s Being Delivered.” Retrieved May 3, 2022. <https://www.strongtowns.org/journal/2021/8/11/the-reconnecting-communities-act-what-was-promised-vs-whats-being-delivered>.

the country to seek funding for projects that mitigate the effects of freeways on communities, although funding was significantly reduced from the original legislation. Standards used by State DOT's generally favor efficiency, a metric known as vehicular service level, and these agencies still have a great deal of veto power over jurisdictions. Finally, the project has largely been well received by residents, but the public tends to react when they perceive that something is being taken away and an enterprising politician could easily turn IH-345 into the next campaign issue. Even with the political wind at its sails, the full removal option is by no means guaranteed.

Dallas has a once in a generation opportunity to shape a more equitable and sustainable future and the stars are aligned. Although there have been prominent freeway removal projects completed in the US in recent memory, they were mostly small segments of larger unrealized projects. The full removal option for IH-345, if it happens, will likely be the first through-running freeway removal project and could inspire other reluctant cities to dismantle portions of their own networks to serve economic development and sustainability goals.

AUTHOR BIO

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TREASURE ISLAND:

SAN FRANCISCO'S AMBITIOUS PUBLIC-PRIVATE DEVELOPMENT

INTRODUCTION

After decades of relative calm around the Yerba Buena exit, locals and visitors traveling over the Bay Bridge will notice a significant amount of new activity. Treasure Island, an artificial island located adjacent to Yerba Buena Island and the San Francisco-Oakland Bay Bridge, was completed in 1937 for the 1939 Golden Gate International Exposition. With the advent of World War II, the Island was taken over by the US Navy and remained in its control until September of 1997 when it was closed by the Federal Government. Years passed as local, state, and federal officials wrangled over the details of a conveyance plan. Finally, in 2010 House Speaker Nancy Pelosi and San Francisco Mayor Gavin Newsom signed a transfer agreement for the Island in exchange for a financial package worth up to \$105 million to the US Navy (*Mercury News*). Treasure Island was finally back in the hands of the people of San Francisco.





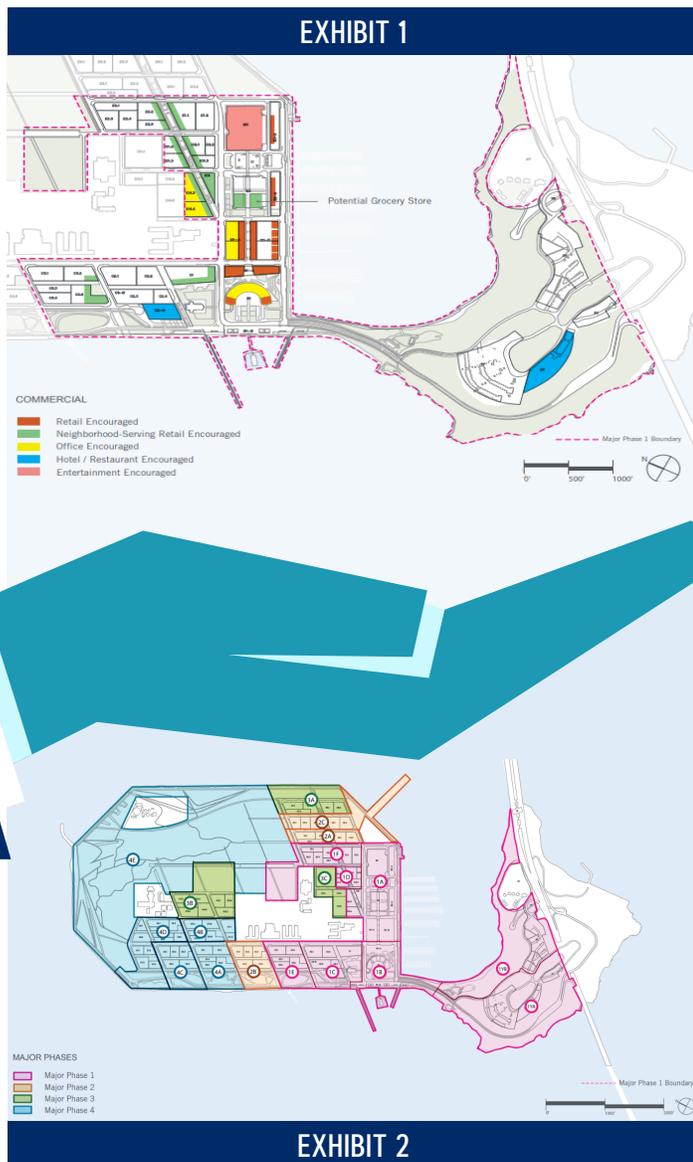
To tackle this massive public-private development, the California State Legislature created a special reuse authority for Treasure Island, transferring local redevelopment authority status from San Francisco to the Treasure Island Development Authority (TIDA). This state agency is staffed by the San Francisco mayor's office and is the entity responsible for planning the reuse and redevelopment of the former installation. TIDA has partnered with a group of private entities, in joint ventures, which have formed Treasure Island Community Development (TICD). As the megaproject commences, key questions remain. Can Treasure Island balance the interests of both public and private stakeholders? Can adaptive reuse be employed to preserve and financially stabilize historic structures? Is the former Navy base too risky of an investment due to seismic and remediation concerns? Will the Island become another wealthy enclave, or will it achieve its vision of equity and inclusion? Are the potential rewards worth the risk for all the stakeholders involved?

MILITARY CLOSURES AND SUBSEQUENT PUBLIC-PRIVATE DEVELOPMENT

BRAC or Base Realignment and Closure is a process where a US Federal commission evaluates and coordinates the closure of military installations. Since its creation in 1988, BRAC has been very impactful on the City and County of San Francisco. In the first round of recommended closures, the Presidio of San Francisco was selected. This decision would pave the way for the transformation of the Presidio from a gated military compound with restricted public access to one of the City's most popular attractions. With over 2.4 square miles of prime land, The Presidio Trust and National Park Service have successfully been able to partner with the private sector to help the government entities rehabilitate half of its approximately 800 structures and become financially self-sustaining.

Like the Presidio, Treasure Island was designated to close under BRAC. Unlike the Presidio, Treasure Island has a complex web of land use issues that have delayed a similar transformation. The Treasure Island Masterplan should be considered one of the most complex public-private developments in the history of the State of California. The Island's location, man-made construction, historical use, local/state/federal regulations, and ultimate development budget all have added to the complexity. Because of these factors and many others, the initial public-private partnership (PPP) formation got off to a rocky start with a \$1.7 billion deal between Lennar Corp. and a pair of Chinese government entities collapsing in 2013. The deal, involving the China Development Bank and Chinese Railway Construction Corp, fell apart largely over demands by the Chinese for more control over the developments than Lennar was willing to provide (*SFGate*).

This hiccup did not deter Lennar who would eventually partner with Stockbridge, a real estate investment management firm that is familiar with assets across the investment risk spectrum. Thus, Stockbridge Capital Group/Wilson Meany and Lennar Corp formed Treasure Island Community Development and became the master developer for Treasure Island. TICD coordinates with the Treasure Island Development Authority on its design and construction activities and receives permits from the City of San Francisco's public agencies (*TICD*). TICD, with TIDA's oversight, plans to bring residential, office, retail, restaurant, and entertainment space to the Island (Exhibit 1). Geotechnical improvements will be made to stabilize Treasure Island and the causeway that connects it to



Yerba Buena Island. The eventual build-out will be implemented in phases, anticipated to occur from approximately 2016 through 2034, depending on market conditions (*TIDA* Major Phase 1 & Exhibit 2).

ADAPTIVE REUSE

Adaptive reuse can present a tremendous opportunity to restore and reuse historic structures, but this opportunity comes with a myriad of challenges. The buildings on Treasure Island require significant seismic, accessibility, interior improvements, and code upgrades for future practical application. Additionally, Tidelands Trust restrictions limit the permissible uses of these structures. Nevertheless, the renovation of key historic buildings including Building One and the historic seaplane hangars are specified goals of the project as well as preserving several other structures that were placed on the National Register of Historic Places. These buildings include Buildings 1, 2, and 3, Building 111, the Senior Officers Quarters Historic District, and Quarters 10. Building One will serve as the “gateway” to Treasure Island and also as the primary community and operational center for this new neighborhood (*TIDA* Economic Development Conveyance). In total, the master development plan calls for 311,000 sq. ft. of space adapted for commercial use.

The Bay Area is home to many former commercial shipyards, military bases, and government installations that no longer serve their original purposes. The majority of San Francisco’s Embarcadero is a case study in adaptive reuse. *TIDA* and *TICD* have the benefit of analyzing these adaptive reuse projects that have deftly converted defunct space into a new appropriate use. One specific project that *TICD* should look to is a recently completed award-winning project at Pier 70. The Orton Development project consisting of six buildings on the former site of the Bethlehem Shipbuilding Yards won the 2021 AIA Award for Interior Architecture and has helped revitalize San

Francisco’s Dogpatch neighborhood. The cluster of buildings, all constructed between 1885 and 1941, is one of the best-preserved industrial complexes west of the Mississippi River (*AIA*). The newly imagined buildings attracted the development labs of Uber Advanced Technologies Group who felt the buildings could accommodate its needs for office space, communal areas, vehicle storage, and laboratories. Similar space opportunities exist on Treasure Island and could attract tech companies looking for flexible working areas.

SEISMIC HURDLES

Treasure Island was created with over 29 million cubic yards of mostly fine-to-medium-grained sand that was dredged from the San Francisco Bay and used as fill material over the Yerba Buena Shoals north of Yerba Buena Island. About 65 percent of the bottom sediments in this area were composed of sand and the remainder was soft clay. A low mound of rock was placed along the perimeter of the island to act as a retaining dike for the sand fill (Chief of Naval Research). Because the area is reclaimed land, there has been speculation and fear that the Island is more susceptible to liquefaction and damage in the event of a major earthquake. These fears might make it difficult to attract the general public to live, work, and socialize on the Island, especially in the proposed towers. Over the four major development phases of the Treasure Island project, 6,000 units will be constructed in towers slated to be over 40 stories tall (Exhibits 3 & 4).

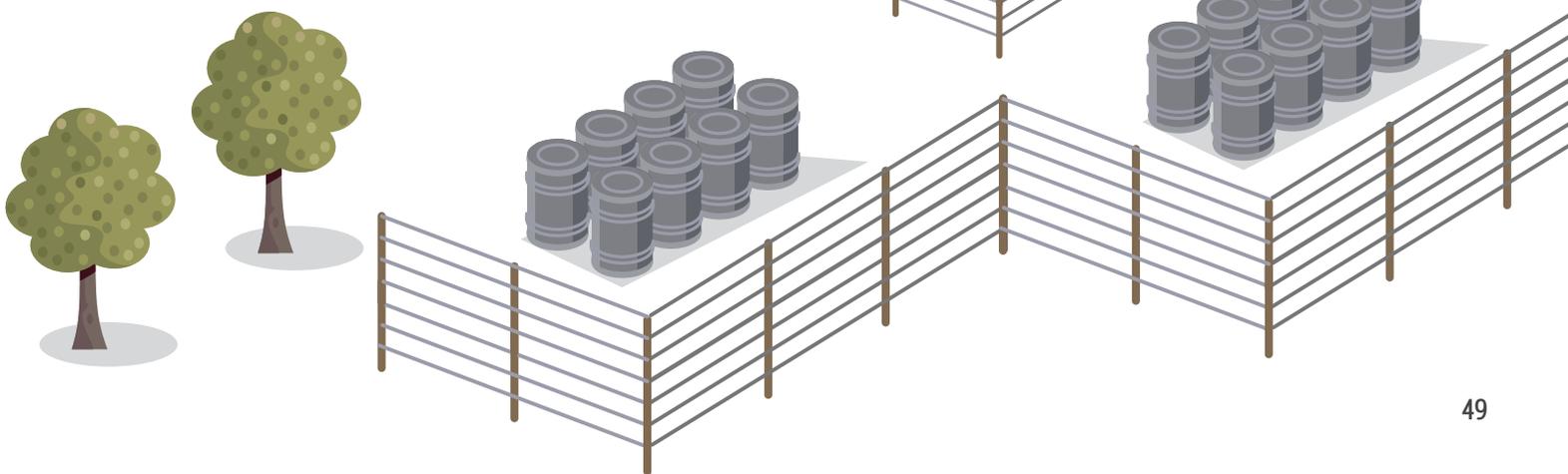


EXHIBIT 4

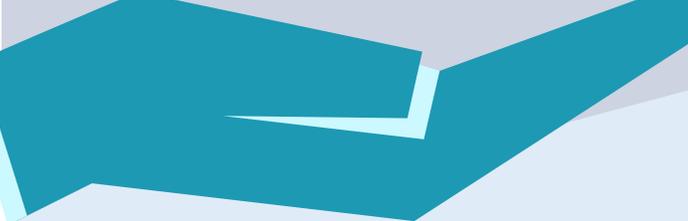


EXHIBIT 5

The concern over building on reclaimed land should be minimal as the building community of the Bay Area has been able to learn and assess critical findings from the 6.9 magnitude Loma Prieta Earthquake in 1989. The definitive Treasure Island seismic study conducted after the Loma Prieta Earthquake by the Naval Civil Engineering Laboratory entitled *Ground Motion Amplification and Seismic Liquefaction: A Study of Treasure Island* concluded that “Most buildings on Treasure Island suffered no or minor damage which was limited to minor cracking or differential settlement. Several buildings near the perimeter dike or areas of significant lateral spreading did experience greater damage. These areas experienced 6 to 10 inches of settlement. Buildings which were situated in areas which settled less than 6 inches generally experienced only minor damage” (US Department of Defense). California and the Bay Area have some of the most comprehensive building codes in the US, and any tower built on Treasure Island will be engineered to account for these seismic conditions.

REMEDIAION AND DEVELOPER RISK

The development at Treasure Island is not the first major development of a former US Navy site in San

Francisco. Lennar and FivePoint Holdings have already completed their first phase of development at the Hunters Point Shipyard. The master-planned community, of approximately 500 acres, is located along the southeastern waterfront of San Francisco. Lennar has already built 1,600 homes in the first phase of development (27% to 40% of which will be affordable, and 26 acres of open space), and is planning for an additional 10,500 new housing units to be located on the Shipyard and Candlestick Point, 32% of which will be affordable (City and County of San Francisco).

These types of projects can carry an immense amount of risk for the developer before, during, and after construction. In the case of Hunters Point, concerns that contamination was not properly remediated proved to be true. Consequently, Lennar and FivePoint Holdings have encountered legal issues over contaminated soil. A three-year legal battle has left Lennar and FivePoint on the hook for \$6.3 million after a U.S. District Court judge approved a settlement with homeowners who claimed they were sold property that was unsafe after soil mitigation efforts (*SFList*). Tetra Tech, who was hired to clear out radioactive soil at the former Navy shipyard was identified in the lawsuit as the overseeing party. In 2017, two Tetra Tech employees pleaded guilty to falsifying soil sample reports at some cleanup site locations (NBC). This situation highlights the risk for private developers who have to rely on their contractors and sub-contractors to finish a project as stipulated and can be on the hook when third-party employees are negligent. Cleanup of Treasure Island has already begun and will need comprehensive oversight to avoid costly mistakes.

AFFORDABLE HOUSING, EQUITY, AND INCLUSION

When discussing Treasure Island, the words “opportunity” and “potential” are used frequently. Many San Franciscans view Treasure Island as a relatively blank slate where a new neighborhood could emerge in the middle of the Bay. Yet, there is an undercurrent of fear that Treasure Island will become another wealthy San Francisco enclave that caters to the tech and business community. This ever-present affluence has impacted communities of color disproportionately in San Francisco, especially regarding housing. For many people, the cost of housing in San Francisco has become untenable. According to the latest “San Francisco Housing Needs and Trends Report” furnished by the San Francisco Planning Department, people of color are more likely to be housing cost-burdened with more than 40% of Black, Asian/ Pacific Islander, and

Latino renters cost-burdened and more than 20% of these renters severely affected (*SF Planning Housing*). Creating more affordable housing is a key component of the redevelopment of Treasure Island which will ultimately include 8,000 new homes of which 27% will be designated as affordable.

Addressing disparities in housing and community inclusion is crucial to truly bring to reality the potential of Treasure Island. San Francisco Mayor London Breed echoed these sentiments: “The vision for a revitalized Treasure Island is to create an equitable and thriving new community that serves the needs of people at all income levels... It’s crucial that we continue to build safe, affordable places to live for our most vulnerable residents” (Office of the Mayor). Tangible results can be seen. Most notable is the groundbreaking of the Maceo May Apartment complex on Treasure Island, which will provide 100% affordable housing for formerly homeless veterans. The 104-unit complex is being co-developed by Swords to Plowshares and the Chinatown Community Development Center, with 39 of the total units set aside for formerly homeless veterans currently living on Treasure Island and the remaining 65 units for currently homeless veterans. The Maceo May Apartment project is one of up to 20 buildings that will be 100 percent affordable on Treasure Island (Office of the Mayor).

In the future, oversight of the equity and inclusion objective has been tasked to the nonprofit One Treasure Island. Furthermore, the organization seeks to foster and steward an equitable, inclusive, and thriving community for all Treasure Island residents, employees, businesses, and visitors as well as championing integration and access to opportunities within the broader mixed-income neighborhood (One Treasure Island). These efforts are mainly directed at lower-income households and those who have experienced homelessness in hopes that they will achieve stability and new opportunity. To quantify and qualify these objectives One Treasure Island along with the Treasure Island Development Authority and the Treasure Island Community Development Group engaged the National Initiative on Mixed-Income Communities (NIMC) in July 2020. Based at Case Western Reserve University, NIMC is the only research center in the U.S. exclusively focused on the subject of mixed-income communities. NIMC’s initial scope of work is to develop community strategies to foster inclusion and belonging for community members of all backgrounds and income levels (One Treasure Island). To that end, NICM has published a strategic guide for the stakeholders of Treasure Island entitled *Towards*

an Equitable Future for Treasure Island: A Strategic Guide for Promoting Mixed-Income Inclusion.

With the implementation of this guide and additional NICM analysis, One Treasure Island along with Treasure Island Development Authority and Treasure Island Community Development are committed to tracking equity indicators into the future to evaluate the progress of efforts to develop Treasure Island as an equitable community over time. Throughout the multi-year redevelopment process, monitoring strategies will be in place to identify areas that require intervention. These areas include housing, transportation, services, programming, and community facility improvement as they have the greatest impact on the lives of lower-income members of the Treasure Island community.

CONCLUSION

Treasure Island is too valuable not to remediate both from the public and private perspectives. With its location centered in the San Francisco Bay, the planned community offers potential residents and workers the opportunity to be ten minutes away from Downtown San Francisco to the West and ten minutes from Oakland to the east. A new ferry service will aid commuters and tourists alike. Bicyclists are already enjoying unprecedented access to Treasure Island via new infrastructure on the Eastern Span of the Bay Bridge. In short, the Island has been underutilized for generations. The City and County of San Francisco have limited options to grow being surrounded by water on three sides. Treasure Island is the City and County’s best option for extensive new development. Furthermore, the development on Treasure Island represents a vision for a new equitable, and inclusive San Francisco neighborhood to rise out of abandoned barracks through new design and adaptive reuse. Yes, the development will present challenges for the Treasure Island stakeholders given all of the aforementioned reasons, but the immense opportunity outweighs these risks.

Acronyms

- (BRAC) Base Realignment and Closure
- (NIMC) National Initiative on Mixed-Income Communities
- (PPP) Public-Private Partnership
- (TICD) Treasure Island Community Development
- (TIDG) Treasure Island Development Group
- (TIDA) The Treasure Island Development Authority

Stakeholders

Government Agencies

- City of San Francisco
- County of San Francisco
- San Francisco Department of Public Works (DPW)
- San Francisco Public Utilities Commission (SFPUC)
- San Francisco Planning Department
- San Francisco Fire Department (SFFD)
- San Francisco Mayor's Office of Disability / Disability Council (MOD)
- San Francisco Municipal Transportation Agency (SFMTA)

State of California

- Treasure Island Development Authority (TIDA)
- Treasure Island/Yerba Buena Island Citizen Advisory Board (CAB)
- Treasure Island Mobility Management Agency (TIMMA)
- United States Congress
- United States Department of Defense
- United States Navy

Private Entities

- Kenwood Investments
- Lennar Corporation
- Stockbridge Capital Group, LLC
- Wilson Meany

WORKS CITED

- American Institute of Architects. 2021 AIA Awards. "An Historic Shipyard Reincarnation." <<https://www.aia.org/showcases/6378768-an-historic-shipyard-reincarnation>>
- CaseWestern Reserve University. National Initiative on Mixed-Income Communities. "Treasure Island Redevelopment: Promoting Mixed-Income Inclusion through the Retail Strategy." November 12, 2020. <<https://static1.squarespace.com/static/5ae8abfeb27e39303e95f65d/t/601c7ce670e7aa457c0461cd/1612479720670/Treasure+Island+Redevelopment.Retail+Strategy+and+Mixed-Income+Inclusion.11.12.2020.pdf>>
- City and County of San Francisco. Office of Community Investment and Infrastructure. "Hunters Point Shipyard and Candlestick Point." April 3, 2022. <<https://sfocii.org/hunters-point-shipyard-and-candlestick-point>>
- City and County of San Francisco. Office of the Mayor. "Mayor London Breed Announces Groundbreaking of First 100% Affordable Housing Complex on Treasure Island." Friday, September 18, 2020. <<https://sfmayor.org/article/mayor-london-breed-announces-groundbreaking-first-100-affordable-housing-complex-treasure>>
- City and County of San Francisco. San Francisco Planning Department. "San Francisco Housing Needs and Trends Report." July 2018. <https://default.sfplanning.org/publications_reports/Housing-Needs-and-Trends-Report-2018-ExecutiveSummary.pdf>
- City and County of San Francisco. Treasure Island Development Authority. "Amended and Restated Economic Development Conveyance Application for Naval Station Treasure Island." July 23, 2007. <<https://sftreasureisland.org/sites/default/files/AA%20Economic%20Development%20Conveyance%20Application.pdf>>
- City and County of San Francisco. Treasure Island Development Authority. "Treasure Island & Yerba Buena Island Major Phase 1 Application." May 8, 2015. <<https://sftreasureisland.org/majorphase1>>
- Environmental Protection Agency. "Base Realignment and Closure Act (BRAC) Sites." April 11, 2022. <<https://www.epa.gov/fedfacts/base-realignment-and-closure-act-brac-sites>>
- Mercury News. "San Francisco, Navy sign Treasure Island Deal." August 18, 2010. <<https://www.mercurynews.com/2010/08/18/san-francisco-navy-sign-treasure-island-deal/>>
- Naval Facilities Engineering Systems Command. "Former Naval Station Treasure Island." March 20, 2022. <https://www.bracpmo.navy.mil/brac_bases/california/former_ns_treasure_island.html>



NBC Bay Area. "Homeowners Celebrate Win in Hunters Point Radiation Settlement." March 31, 2022. <<https://www.nbcbayarea.com/news/local/san-francisco/homeowners-celebrate-win-in-hunters-point-radiation-settlement/2852100/>>

One Treasure Island. "Where Community Connects". April 25, 2022. <<https://www.onetreasureisland.org/mission/>>

San Francisco Gate. Phillip Matier And Andrew Ross. "S.F.-China Development Deal Falls Apart." April 11, 2013. <<https://www.sfgate.com/bayarea/matier-ross/article/S-F-China-development-deal-falls-apart-4427448.php>>

SF List. "\$6.3 Million Settlement Awarded to Hunters Point Homeowners Over Toxic Waste." April 1, 2022. <<https://sfist.com/2022/04/01/6-3-million-settlement-awarded-to-hunters-point-homeowners-over-toxic-waste/>>

Stockbridge. "Treasure Island". March 27, 2022. <<https://www.stockbridge.com/property/treasure-island/>>

Treasure Island Community Development. "San Francisco's Next Great Neighborhood". 2019. <<http://www.treasureislandsfbay.com/>>

United States Geological Survey. Thomas C. Hanks and A. Gerald Brady. "The Loma Prieta earthquake, ground motion, and damage in Oakland, Treasure Island, and San Francisco." <<https://pubs.er.usgs.gov/publication/70205993>>

United States Department of Defense. Defense Technical Information Center. Chief of Naval Research. "Ground Motion Amplification and Seismic Liquefaction: A Study of Treasure Island." June 1992. <<https://apps.dtic.mil/sti/pdfs/ADA253945.pdf>. >



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INNOVATION DISTRICT MODELS:

EXAMINING THE 21ST CENTURY INNOVATION LABS

INTRODUCTION

As the world shifts into a 21st-century knowledge-based economy, innovation and entrepreneurship have become the core of the new global economic growth model. The pursuit of maximizing innovation and productivity was disrupted when cities were faced with the unprecedented challenges of the Great Recession in 2008, causing millions prolonged unemployment, loss of life savings, and home mortgage foreclosures. As nations attempted to recover from this crisis, cities and regions were incentivized to address the need for growing jobs by revitalizing the urban fabric, attracting investments, and stimulating the innovative, productive, entrepreneurial, and trade economy. The revitalization goal encouraged cities and regions to experiment with different development approaches to create an economical and sustainable urban concept, which led the creation of a distinctly 21st-century spatial form known as the innovation district.

DEFINITION OF AN INNOVATION DISTRICT

An innovation district is best described as a “nexus of knowledge-based development in cities, where public and private actors work [toward] fostering, attracting, and retaining investment and talent.” This includes a creative class of knowledge workers, entrepreneurs, start-ups, and business incubators who work together to revitalize urban areas, boosting knowledge and innovative economic activities (Esmaeilpoorarabi et al., 2020). This new urban model takes advantage of the density and agglomeration of clustering institutions and companies, the benefits of which contribute to the sharing of knowledge and collaboration, and the acceleration of innovation, productivity, and creativity. Seamless public transit, road connectivity and overall ease of accessibility are the major contributors to a successful innovation district. Developers and planners typically accessorize innovation districts with copious social amenities, public open spaces, and innovation/maker spaces to attract millennial talents and encourage naturally occurring social interactions and collaboration. Some examples of successful innovation districts this journal will be analyzing are the Philadelphia University City, Seaport-South Boston Waterfront, and Raleigh-Durham’s Research Triangle Park.

INNOVATION DISTRICT CLASSIFICATIONS

This article examines three examples of successful innovation districts—Philadelphia’s University City, Seaport–South Boston Waterfront, and Raleigh–Durham’s Research Triangle Park—to gain a better understanding of this new spatial form and identify key characteristics of those districts. Although the three districts have many similarities, each is classified as a different innovation district model. A study by The Brookings Institution identified three (3) general innovation district models: anchor plus, re-imagined urban areas, and urbanized science parks. The anchor plus model is a type of innovation district that collaborates with or is located near anchor institutions, typically in a city’s downtown or midtown area, similar to Philadelphia’s University City. A re-imagined urban area is a type of urban renewal model that repurposes industrial and warehouses into new, revitalized economic and innovation centers, as exemplified by Boston’s South Waterfront. Lastly, an urbanized science park is an office park model that is commonly located in suburban and exurban areas and is developed with the intention of urbanization by concentrating mixed-used development and amenities in a compressed area, which can be seen in Raleigh–Durham’s Research Triangle Park

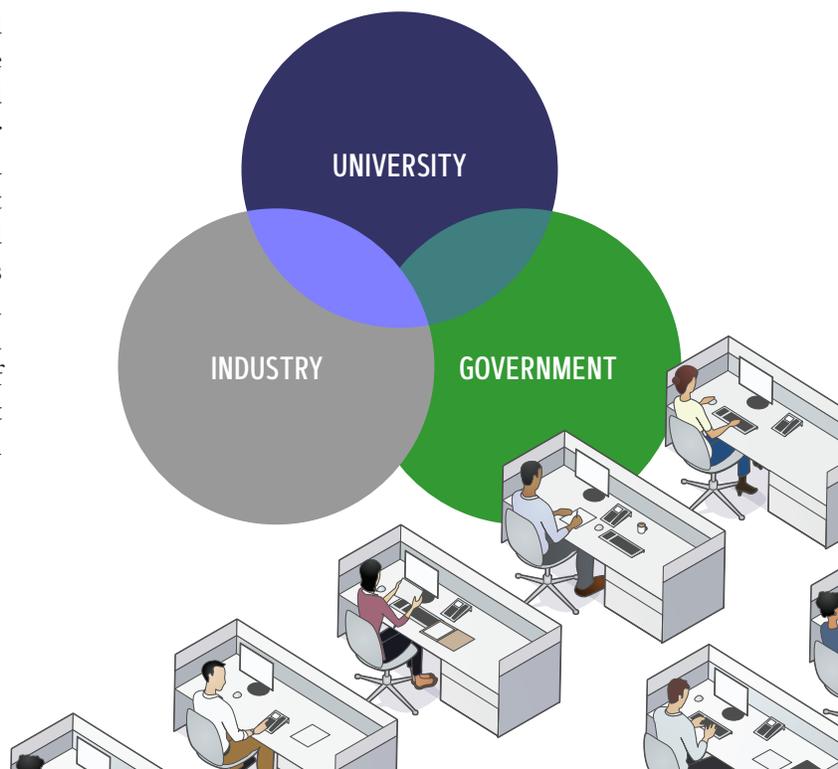
ROLE OF INSTITUTIONS IN THE CULMINATION OF INNOVATION DISTRICTS

Table 1: Characteristic Matrices below, compares each of the model’s defining characteristics to the innovation district’s typical commonalities. Table 1 indicates that co-locating with the universities or research & development (R&D) institutions plays a pivotal role in forming and achieving urban renewal and revitalization. No matter the geographical location, universities—especially research universities—have played a part in the establishment of innovation districts, or eventually become a catalyst for innovation activities in these districts. This, in part, is due to the numerous benefits of co-locating for both private firms and universities/institutions. Universities and R&D institutions offer skilled human capital and valuable researchers, while firms provide access to capital, and the opportunity to commercialize institutions’ innovative products. Research has also proven that there is a significant positive relationship between this collaboration of firms and institutions and the acceleration of innovation due to knowledge and idea spillovers. This strong symbiotic relationship contributes to the growing number of open innovation spaces all over the nation. Consequently, there is a strong movement toward open innovation labs, wherein firms, universities, and R&D institutions jointly generate new ideas, which will eventually be marketed by either firms or start-up companies.

THE TRIPLE HELIX MODEL OF INNOVATION

It is also important to highlight that the innovation processes in these district models are also made possible due to the involvement of local governments. The government plays

FIGURE 1 -
TRIPLE HELIX MODEL OF INNOVATION VENN DIAGRAM



an influential role in higher education policies by providing research funding and advancing economic growth. Due to this influence, the government has the power to act as a driving force for the concentration of innovation activities and interactions between universities and industries, similar to Philadelphia's University City and the Seaport-South Boston Waterfront districts, for example.

This relationship between universities, R&D institutions, private industries, and governments in the innovation processes is known as the triple helix model of innovation, a well-known concept by planners and practitioners described

models of a knowledge-based economy. This model was theorized as early as the 1990s and has been acknowledged as a contributor to institutions such as science parks. Since its inception, this model has been widely adopted as a public policy tool to help push the evolution and hybridization of the relationship between the model's stakeholders, which can be theorized as the source of culmination for innovation districts around the country. The triple helix model is foundational to the success of innovation districts, as it ensures that leaders from the three elements share a vision and understanding through structured partnerships and interactions.

TABLE 1 - CHARACTERISTIC MATRICES

Key Characteristics	Philadelphia's University City	Seaport-South Boston Waterfront	Raleigh-Durham's Research Triangle Park
Formation	Urban renewal, and community revitalization. University City District (UCD) launched in 1997 via Private-Public Partnership.	Urban revitalization and redevelopment. Private development began in 2010 via Mayor Menino's stewardship.	Exurban research park redevelopment. Redevelopment began in 2015 via Research Triangle Foundation, a private nonprofit organization.
Location	Urban. Collocated with the University of Pennsylvania, University of Pennsylvania Health System, Drexel University, and others.	Urban. Historic waterfront peninsula. Proximity to Harvard, Massachusetts Institute of Technology (MIT), and 80+ educational institutions.	Exurban. Collocated with North Carolina State University, Duke University, and the University of North Carolina at Chapel Hill.
Development Composition	Mixed-use. Educational, institutional, residential, commercial, labs, public parks, art, and cultural spaces.	Mixed-use. Residential, commercial, urban parks, and innovation labs. Co-working spaces, incubators, and innovation micro-units.	Mixed-use life science campus. Lab, biomanufacturing space, residential and commercial.
Industry Type	Advanced research & development. Tech and life sciences hub.	Integrative technology. Biotech and clean tech hub.	High-tech research and development park.
Infrastructure	<ul style="list-style-type: none"> High walkability. Transportation hub. Southeastern Pennsylvania Transportation Authority (SEPTA regional rail) Regional Rail New Jersey Transit. Amtrak trains. 	<ul style="list-style-type: none"> High walkability. Silver Line, Massachusetts Bay Transportation Authority (MBTA) Bridge. 	<ul style="list-style-type: none"> High walkability. Aspires to be a vehicle-free development.
Sociocultural Setting	<ul style="list-style-type: none"> High presence of social amenities. Provides entrepreneurship and workforce programs. 	<ul style="list-style-type: none"> Work-Live-Play social amenities. Provides entrepreneurship programs. 	<ul style="list-style-type: none"> Work-Live-Play neighborhood.
High-Level Skilled Employment	<ul style="list-style-type: none"> 85,000 job generation 	<ul style="list-style-type: none"> 5,000 job generation. 200 new companies. 	<ul style="list-style-type: none"> Job generation N/A 300 companies 1,800 startups
Demographics (CBRE Report)	<ul style="list-style-type: none"> Millennial population increase 1. 8% Increase in tech talent 9. 3% 	<ul style="list-style-type: none"> Millennial population increase 2. 0% Increase in tech talent 7. 2% 	<ul style="list-style-type: none"> Millennial population increases 11. 0% Increase in tech talent 20. 2%



DEMOGRAPHIC SHIFT

All three innovation districts above are listed as one of the top 50 largest markets by the tech professionals by a recent CBRE Tech Talent Report. Philadelphia, Boston, and Raleigh-Durham reported a 9.3%, 7.2%, and 20.2% increase, respectively, in tech talent from 2015 to 2020. There is also a high correlation between the tech talent market and the number of millennials in the tech workforce due to the generation's exposure growing up in the internet-connect world. Therefore, the increase in tech talent also contributes to these cities' large increase in the millennial population which ranges from 1.8% to 11% of the total labor pool. Millennials' preference for urban living and their presence in the labor pool has further fueled the growth of the innovation districts in recent years. These changes in living and working preferences motivate districts to shape the urban design and amenities to meet the needs of this demographic so that they may entice and retain these young talents.

PROVISION OF AMENITIES

The growth of the millennial workforce is fueling the demand for a balanced work-live-play neighborhood with an intermix of social amenities. The millennial demographic values the benefits of proximity and tends to reside in vibrant mixed-use neighborhoods accessorized by activated streetscapes and public spaces. Not only that, but office spaces also are shifting their design and features to incorporate amenities and physical spaces that create a unique user experience and encourage open collaboration. All the above innovation districts provide high-quality spaces such as research laboratories, maker spaces, open labs, in-office gyms, pocket gardens, and many other social amenities. While providing the open and collaborative social space is essential, innovation districts need to comprehensively program these spaces to promote social congregation and networking and reap the benefits of agglomeration.

INNOVATION DISTRICTS DEMOGRAPHIC IMPACTS

As mentioned previously, the main goal of an innovation district is to revitalize the urban fabric, attract investments, and stimulate the innovative, productive, entrepreneurial, and trade economy. There are many stakeholders involved in the formation of these districts, including local government, universities, institutions, industries, and surrounding communities. As a result, the measure of success of a district is not purely in the form of investment returns, but also includes many variables such as the growth of the community, job generation, provision of educational opportunities, university research funding, and more. The variation of each district's size, population, year of formation,

and geographical location makes it difficult to compare and quantify these characteristics, hence making it also difficult to measure the impact of a district.

Nevertheless, we will still attempt to determine the impacts of these districts by analyzing the index for total employment and other demographic data for Philadelphia University City, Seaport-South Boston Waterfront, and Raleigh-Durham's Research Triangle Park.

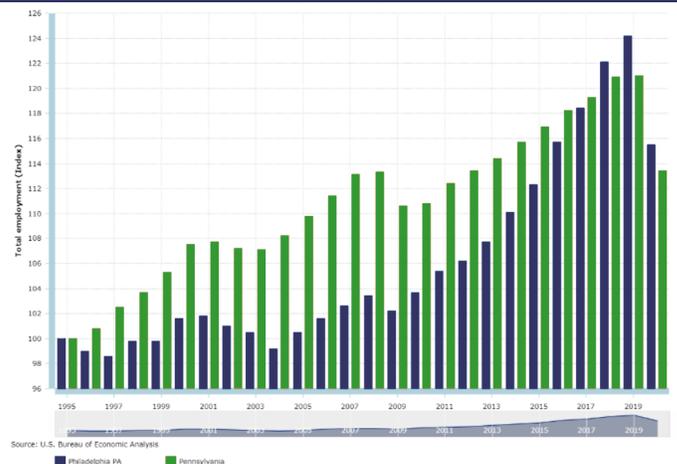
Philadelphia's University City

University City District (UCD) initiated the revitalization of Philadelphia's urban landscape in 1995. Since then, the district has undergone transformative changes in its infrastructure, public spaces, and overall neighborhood developments. UCD reported more than 14,000,000 square feet of development since 2002 in their 2017 Annual Report.

UCD's population and employment trend have seen a significant boost compared to UCD's 2002 demographic data. UCD offers 85,000 total jobs in 2022, a 57% increase from 2002. The city's population also elevated by approximately 11,000 (24%).

As seen in the total employment index chart below, since 1995, Pennsylvania county has consistently outperformed Philadelphia state in terms of total employment index until 2018. The county's employment peaked in both 2018 and 2019. The county's outperformance in growth can potentially be contributed to the district's transformation and ability to entice the influx of private firms. Although there was a drop in the employment index in 2020, most likely due to the impact of COVID-19, the county's drop was less significant than that of Philadelphia. Pennsylvania's employment index growth remains competitive through both the Great Recession and the COVID-19 pandemic.

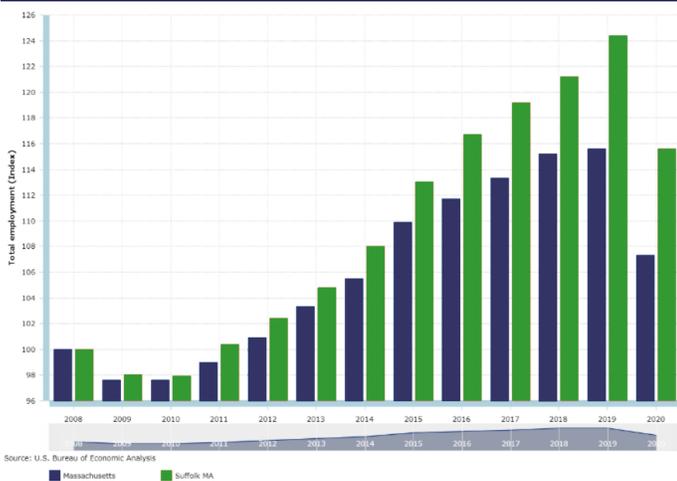
FIGURE 2 - CAINC4 PERSONAL INCOME AND EMPLOYMENT BY MAJOR COMPONENT



Seaport-South Boston Waterfront

The urban revitalization and redevelopment of Boston's waterfront district were initiated in 2010 by Mayor Menino's stewardship. In 2015, the district reportedly generated 37,900 new jobs since its inception. Substantiated by the U.S. Bureau of Economic Analysis chart below, Suffolk County has an exponentially steady growth in the employment index. In recent years, the county increased its total employment index gap compared to Massachusetts state, reflecting the county's employment resilience and sustainable growth.

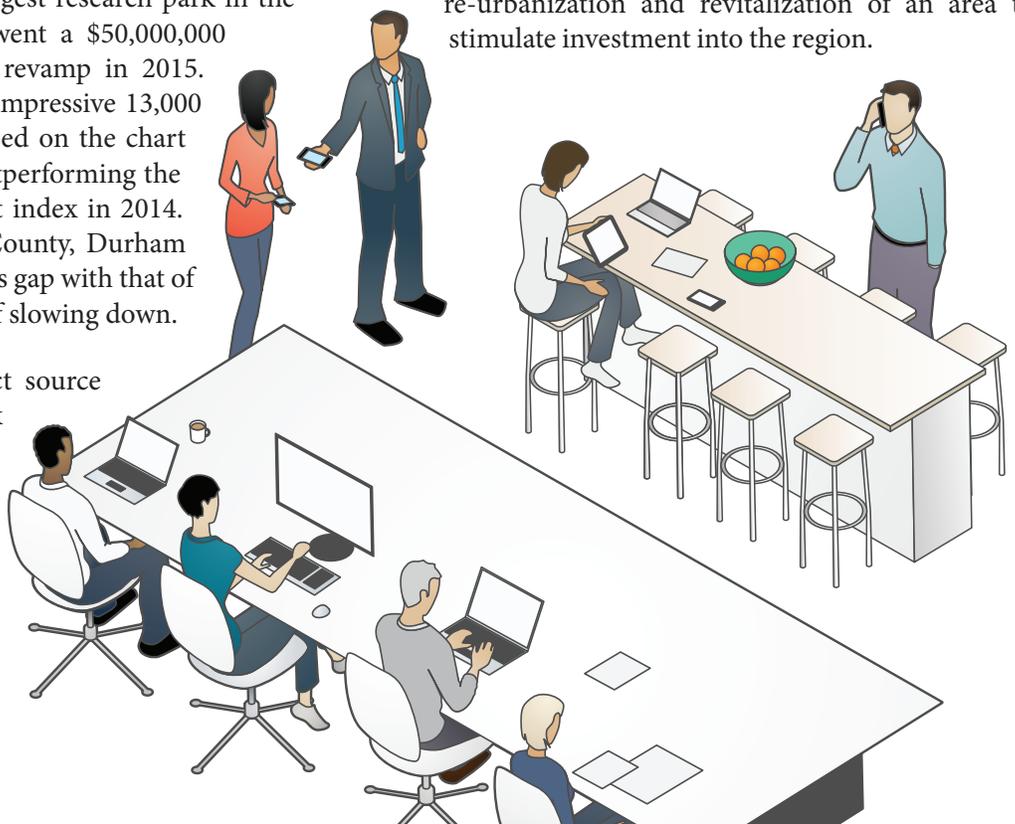
FIGURE 3 - CAINC4 PERSONAL INCOME AND EMPLOYMENT BY MAJOR COMPONENT



Raleigh-Durham's Research Triangle Park

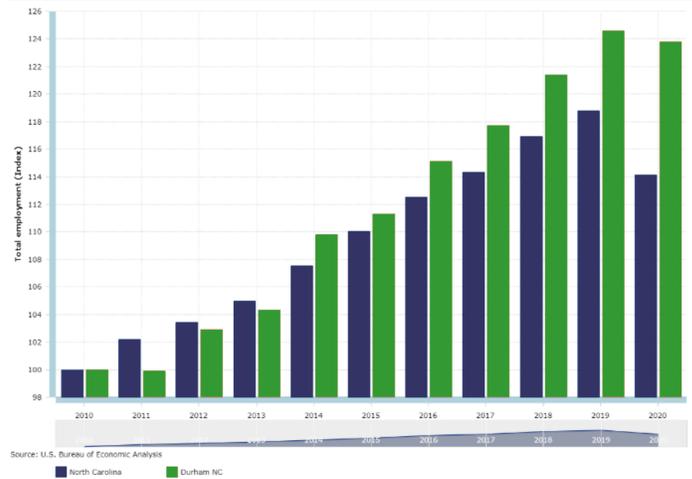
Raleigh-Durham's Research Triangle Park was created in 1959 and has grown to be the largest research park in the United States. The park underwent a \$50,000,000 redevelopment and master plan revamp in 2015. Since 2010, the park has had an impressive 13,000 employment increase (31%). Based on the chart below, Durham County began outperforming the North Carolina state employment index in 2014. Similar to the previous Suffolk County, Durham County has also been increasing its gap with that of the state, showing no indication of slowing down.

It is hard to determine the exact source of the total employment index growth for the counties listed above. However, the growth of the index is seen to grow substantially since the introduction of these districts. Not only that, but the growth of the counties' employment also seems to be both sustainable



and resilient throughout the different real estate market cycles, especially when compared to the overall states' performances. This stable employment growth is an important indicator of a healthy economy as it increases the region's consumer spending, company profits, increase in real estate investments, and more.

FIGURE 4 - CAINC4 PERSONAL INCOME AND EMPLOYMENT BY MAJOR COMPONENT



CRITICISM OF THE INNOVATION DISTRICT MODEL

The innovation district model, although gaining traction as a net positive economic growth contributor, also comes with its own set of potential negative externalities. Among the criticisms often raised are the issues of gentrification and displacement. Anchor plus and re-imagined urban areas innovation district models rely heavily on the role of local government and real estate developers to initiate re-urbanization and revitalization of an area to stimulate investment into the region.

The renewal and revitalization of urban areas have often been controversial due to their association with displacement via eminent domain. Additionally, the main concern on gentrification with respect to innovation districts, is that only the districts' residents can enjoy its benefits. Hence, they are presumed as exclusionary and provide limited socio-economic widespread impact, resulting in income, social, and racial polarization. Both local governments and developers are cognizant of these potential impacts and over the years have implemented strategies to mitigate these externalities, through inclusive entrepreneurship programs or entrepreneurship communities for underrepresented groups. Also, many innovation districts actively collaborate with local schools to provide training, internships, and after school-programs to stimulate science, technology, engineering, and mathematics (STEM) education. Public policies for these districts have also started including minimum requirements for public parks, while tax incentives encourage developers to provide more affordable housing units. In summary, the combination of strategies listed above can help minimize the impact of gentrification, hence alleviating potential issues such as rising poverty, and social inequality, and ensuring the inclusive socio-economic impact of the innovation districts throughout the region.

OPPORTUNITIES

This unique urban model can provide advantageous and sustainable growth to a region when strategically planned and developed. Based on the analysis of the three case studies provided above, we can see that although the innovation district case studies have their key feature similarities, many other development aspects of these models vary on case-by-case base such as city government support for innovation and accessibility. Hence, there is no one-size-fits-all solution.

Nevertheless, aspiring developers and city planners can still build a strong foundation for an innovation district primarily by ensuring sufficient local demand and drive for innovation. There needs to be a collective vision from the leaders of city governments, industries, and local universities to ensure collaborative design, planning, and governance, as described in the triple helix model of innovation. Unified support and contributions from the leaders of the triple helix model are the crucial ingredients for the catalytic formation of innovation districts. These leaders must be able to collectively identify and leverage their city and/or region's existing strengths and other differentiating factors. This could be in the form of natural resources, neighborhood identity or unique amenities.

We previously identified institutions such as universities to be a key ingredient of the innovation process. However, not all districts have a research university within their proximity.

In cases like this, developers and city planners can benefit greatly from establishing a strong relationship with a university during the early stages of innovation district planning to convince the university to build a satellite campus within their district. Expansion and satellite campuses have been proven to be equally beneficial to universities as they are to industries, due to their symbiotic relationship in acceleration and commercialization of research and innovation in innovation districts. Additionally, many research university students and researchers alike are equally attracted to innovation districts due to the mixed-use components and live-learn-work-play environment, while at the same time, industries benefit from this talent resource pool

Finally, to fully leverage the innovation district model, ongoing placemaking and programming must be administered. This may come in a form of a 24/7 neighborhood environment, public space activation via events and activities, or by having the right commercial and retail mix. Placemaking attracts, retains, and cultivates the network between industries and universities. Placemaking helps to create a culture of innovation by providing inclusive and flexible spaces that stimulate spontaneous social interactions through the provision of coffee shops, bars, and other similar public venues. However, public, and collaborative spaces provided can only be valuable with programming to encourage the congregation and to reap the benefits of agglomeration, whether in auditoriums or workshops. Programming can help to build and solidify inter-industry networks which further support idea generation and knowledge spillover.

CONCLUSION

Recent reports suggest that well over 100 innovation districts are estimated to emerge globally. The rise of innovation districts is due to their potential to be a disruptive urban model, providing strong economic and social benefits. This urban model, when successful, attracts investments, industries, and workers due to factors such as high-skilled job opportunities, attractive space design, and amenities, and provides innovative productivity benefits to the city. Urban models can come in various classifications, locations, forms, and functions. They do, however, bear similar key attributes, such as the synergistic relationship between industry, research universities, and government. Most of the innovation districts are also actively adapting and shifting their physical public and private space design and functions to meet the demand of their changing demographics. Although the conceptual framework of an innovation district may seem straightforward, innovation districts require ongoing programming and flexibility in space and function to meet the needs of their firms, institutions, and workforce. Innovation districts historically provided stable

economic growth and positive community benefits and have shown resilience through the pandemic. Hence, we can anticipate further growth and capital investment in this urban model.

RESOURCES

- Andrews, J. (2019, June 17). What makes a successful innovation district? *Cities Today*. Retrieved March 27, 2022, from <https://cities-today.com/what-makes-a-successful-innovation-district/>
- Boston Planning & Development Agency Research Division. (2019, March). South Boston Waterfront Economic Data. Boston Planning & Development Agency. <http://www.bostonplans.org/getattachment/178e7bd7-9770-4c89-98fb-7c3373d4c712>
- Bracken, D. (2010, September 4). RTP begins updating its master plan - Local/State - *NewsObserver.com*. *News Observer*. Retrieved April 12, 2022, from <https://web.archive.org/web/20101012050104/http://www.newsobserver.com/2010/09/04/663597/rtp-begins-updating-rules.html>
- Burke, C., & Zettler, Z. (2022, April 4). Retooling Innovation Districts for Midsized Cities. *Urban Land Magazine*. Retrieved May 3, 2022, from <https://urbanland.uli.org/economy-markets-trends/retooling-innovation-districts-for-mid-sized-cities/?msclkid=f054a719cf1911eca5972a180181a866>
- ECPA Urban Planning. (n.d.). Case Study: The Boston Waterfront Innovation District I Smart Cities Dive. *Smartcitiesdive*. Retrieved March 27, 2022, from <https://www.smartcitiesdive.com/ex/sustainablecitiescollective/case-study-boston-waterfront-innovation-district/27649/>
- Esmailpoorarabi, N., Yigitcanlar, T., Kamruzzaman, M., & Guaralda, M. (2020). Conceptual frameworks of innovation district place quality: An opinion paper. *Land Use Policy*, 90. <https://doi.org/10.1016/j.landusepol.2019.104166>
- Heaphy, L., & Wiig, A. (2020). The 21st century corporate town: The politics of planning innovation districts. *Telematics and Informatics*, 54. <https://doi.org/10.1016/j.tele.2020.101459>
- Katz, B., & Wagner, J. (2018, October 24). The Rise of Innovation Districts. *Brookings*. <https://www.brookings.edu/essay/rise-of-innovation-districts/>
- KPF. (n.d.). Seaport Square Innovation District by Kohn Pedersen Fox (KPF). Retrieved March 22, 2022, from <https://www.kpf.com/projects/seaport-square>
- Montini, L. (2014, June 16). 3 types of thriving 'Innovation Districts' in America. *Inc.com*. Retrieved March 23, 2022, from <https://www.inc.com/laura-montini/lessons-from-seattle-rtp-and-kendall-square-how-innovation-districts-are-born.html>
- Saunders, P. (2017, July 20). Innovation Districts -- Where Talent, Institutions, And Networks Come Together. *Forbes*. Retrieved February 14, 2022, from <https://www.forbes.com/sites/petesaunder1/2017/07/20/innovation-districts-where-talent-institutions-and-networks-come-together/?sh=76e69dfd4099>
- Seaport District. (2021, December 17). In *Wikipedia*. https://en.wikipedia.org/wiki/Seaport_District
- Spinoglio, M. (2015, May 26). The triple helix model role of different entities. *The Triple Helix Model – Role of different entities*. Retrieved March 21, 2022, from http://www.scienceportal.org.by/upload/2015/June/Inconet%20EaP%20-%20Presentation/4%20Spinoglio_Triple%20Helix.pdf
- The Brookings Institution. (2017, May). Connect to Compete: How the University City-Center City innovation district can help Philadelphia excel globally and serve locally. https://www.brookings.edu/wp-content/uploads/2017/05/csi_20170511_philadelphia_innovationdistrict_report1.pdf
- Research Triangle Park. (2022, March 21). In *Wikipedia*. https://en.wikipedia.org/wiki/Research_Triangle_Park

- Research Triangle Park. (n.d.). Research Triangle Park - Our Community. Retrieved March 27, 2022, from <https://www.rtp.org/our-community/>
- University City District 2017 Annual Review. (2018, January). *University City District*. <https://www.universitycity.org/sites/default/files/documents/UCD%20Annual%20Review%202017.pdf>
- University City District. (2022, January). The State of University City 2022. Retrieved March 25, 2022, <https://www.universitycity.org/sites/default/files/documents/The%20State%20of%20University%20City%202022.pdf>
- U.S. Bureau of Economic Analysis, "CAINC4 Personal Income and Employment by Major Component," Retrieved April 14, 2022, <https://apps.bea.gov/iTable/iTable.cfm?reqid=70&step=1&acrdn=6>.
- Vey, J. S. (2017, June 11). Does innovation equal gentrification? *Brookings*. Retrieved March 29, 2022, from <https://www.brookings.edu/blog/metropolitan-revolution/2017/07/11/does-innovation-equal-gentrification/>
- Wikipedia, the free encyclopedia. (2022, January 20). Innovation district. *Wikipedia*. Retrieved March 14, 2022, from https://en.wikipedia.org/wiki/Innovation_district#cite_note-32
- Wikipedia, the free encyclopedia. (2022, January 20). Triple helix model of innovation. *Wikipedia*. Retrieved March 21, 2022, from https://en.wikipedia.org/wiki/Triple_helix_model_of_innovation
- Wikipedia, the free encyclopedia. (2022, January 27). University City, Philadelphia. *Wikipedia*. Retrieved March 25, 2022, from https://en.wikipedia.org/wiki/University_City,_Philadelphia
- Yigitcanlar, T., Adu-McVie, R., & Erol, I. (2020). How can contemporary innovation districts be classified? A systematic review of the literature. *Land Use Policy*, 95. <https://doi.org/10.1016/j.landusepol.2020.104595>

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LOW HOTEL OCCUPANCY PAIN

BECOMES SHORT-TERM RENTAL GAIN



INTRODUCTION

Before the advent of vacation rental platforms, home-sharing was popular. Instead of being called “short-term vacation rentals” (STVRs), beginning in the 1950s, they were simply referred to as “vacation rentals.” Thousands of people still make destinations like the Hamptons their vacation home every summer. Before the advent of Airbnb and similar STVR platforms, vacation rental listings were circulated using advertisements and listings in newspapers.

Then came along VRBO (Vacation Rental by Owner) in 1995, which enabled people to take a vacation or make short-term rental bookings on a website while allowing homeowners to manage bookings ahead of time. This was a game-changer that marked the entrance of online platforms such as Booking.com, Craigslist, and HomeAway with accommodations spread across different locations. The industry grew rapidly when HomeAway acquired VRBO which was subsequently acquired by e-booking giant Expedia to compete with its top competitor, Booking.com.

It was not until 2008 that renting a private room in a larger residence was introduced when two hosts welcomed visitors to stay like locals in their San Francisco home. This concept evolved to become Airbnb. As the popularity of alternative vacation accommodations and global travel grew, more people took notice of the unique opportunity of listing their spare properties or rooms to contribute additional revenue to their primary earnings. More recently, people have increasingly adopted this trend to become full-time property managers building sustainable business platforms. According to the Skift Traveler, the estimated market valuation for STVRs was \$115 billion¹ as of 2019 and is estimated to grow at a rate of 64.6% between the years 2020-2024², making STVRs one of the fastest-growing emerging businesses. With two consecutive years of tremendous growth for companies such as Vacasa and Sonder making their IPO debuts, the industry has set a record for online travel companies going public. Given the favorable capital markets, investor optimism, and growth prospects, it is

now more than ever that a closer look must be taken at the current and future impact of STVRs on hotel performance and rental values of residential properties, especially in locations where STVRs have performed increasingly well.

HOTEL AND STVR PERFORMANCE PRE-PANDEMIC

Price is likely the main factor driving the popularity of STVRs higher with each passing year. The effect of STVRs price competitiveness is exaggerated, especially in markets with highly priced hotels.³ Historically, when searching for accommodation for travel or business, most people have chosen hotels. The year 2019 marked a decade since the US travel industry recovered from the financial crisis and the gross hotel bookings grew in revenue by 61.46% between 2009-2017.⁴

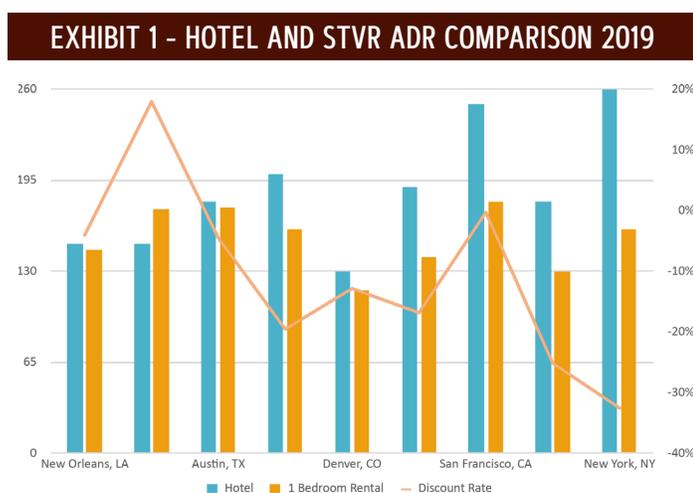
The year 2019 was one of the strongest for the US hotel market with favorable market conditions, including rapid business growth, stabilized occupancy of 68%, and a 12-month moving hotel average-daily-rate (ADR) at 1.9%, the first time it showed a sub-2% growth since 2011⁵. Approximately, a quarter of RevPAR was generated by business travel and a third by leisure travelers. Bleisure travel, which is the combination of business and travel, made a significant contribution towards making the annualized global hotel occupancy level reach a record level of 66%.⁶

Hotel growth was accompanied by a growth in other sectors like the airlines, cruises, restaurants, biking, and short-term rentals. His growth momentum was shared by short-term vacation rentals with the occupancy levels reaching a record high of 58.6% in 2019, the closest it has been to hotel occupancy levels. Following the series of social and economic events that have occurred since 2019, it has been of increasing interest to the travel industry to compare hotel performance and STVR performance.

When comparing hotel performance and STVR performance in 2019, it can be concluded that even though the ADR for short-term rentals was relatively discounted as compared to the hotel ADR, the hotel ADRs resulted in higher returns.

Exhibit 1 is a chart comparing the average ADR of hotels and short-term rentals strictly for single unit listings in gateway markets such as Chicago, New York, and San Francisco,

- <https://www.hospitalitynet.org/file/152008780.pdf>
- <https://www.prnewswire.com/news-releases/vacation-rental-market-size-to-grow-by-usd-62-97-billion--market-research-insights-highlight-the-growing-tourism-industry--the-increasing-popularity-of-short-term-rental-properties-as-key-drivers--17000-technavio-reports-301424248.html>



Source: AirDNA, CBRE Hotels Research, STR Q4 2019 Report

- <https://journals.sagepub.com/doi/full/10.1177/10963480211019110#>
- <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/consumer-business/us-consumer-2019-us-travel-and-hospitality-outlook.pdf>
- <https://str.com/es/press-release/str-us-hotel-performance-april-2019-0>
- <https://str.com/whitepaper/covid-19-impact-on-hotels-and-short-term-rentals-airdna>

and emerging markets such as New Orleans, Austin, and Nashville. Based on the various ADRs and the respective differences between STVRs and hotels, there is a margin of 5% across the emerging markets and this rate extends to as high as 20% for gateway markets. This margin indicating a lower rate for STVRs largely represents the difference in costs associated with operations, services, safety, and reputation. However, this gap has been shrinking with the exponential growth and acceptance of short-term rentals. It is not as straightforward to assess the impact of STVRs on hotel RevPAR (revenue per available room) as the data for STVR is largely fragmented and has biases attached. Many reports use data from Airbnb listings to draw conclusive impact assessments whereas, whereas the STVR market is much larger than Airbnb alone.

Even though it is challenging to assess the RevPAR impact, there exists a negative correlation between the satisfaction of STVR users on hotel performance.⁷ This is especially important when considering what followed post-pandemic, given that both hotels and STVRs experienced exceptional occupancy rates and returns in 2019.

PANDEMIC FUELED SURGE IN STVR OCCUPANCY

Among all the different industries, the travel industry was impacted most severely by the Covid-19 pandemic. The stay-at-home orders and social distancing measures delayed the recovery to the pre-pandemic levels of occupancy. While both hotels and STVR sectors experienced sharp declines in occupancy, the data below showcases how hotels experienced a more aggressive decline.

Before analyzing the performance metrics following the global pandemic, it is important to note that the hotel markets are categorized by market classes, a category curated especially by STR.

EXHIBIT 2		
Hotels	2020	2022
Occupancy Rate	44%	56.9%
ADR	-21.3%	6.8%
Rev/Room % change	-47.5%	-1.9%
% Increase in Supply	2%	1.5%
STVR's		
Occupancy Rate	58.2%	60.3%
ADR	5.1%	11.6%
Rev/Room % change	8.6%	26.4%
% Increase in Supply	-11.5%	20.5%

7 <https://www.sciencedirect.com/science/article/pii/S0278431917305844#bbib0150>

These classes include luxury, upper scale, upscale, upper midscale, midscale, and economy.⁸

The changes in occupancy rate, ADR, revenue per room growth rate, and supply are not indicative of all market classes or a single market class but the broader market.

The prominent observation from the data suggests that the occupancy rate fell more drastically for hotels than it did for STVRs. Overall, the hotels across market segments experienced a sharp decline in occupancy rate when compared to pre-pandemic levels. Hotels in city centers with conventional halls and large business presence were among the hardest hit as business travel paused and conferences went virtual. A report from the American Hotel and Lodging Association (AHLA) and Kalibri labs found that the luxury, upper scale, and upscale categories of hotel market classes experienced a higher vacancy than that experienced by midscale options. With leisure hotel spending on a speedy road to recovery, business travel revenue is far behind with a projected decline to be down 23% with \$20 billion lost in business travel revenue as compared to pre-pandemic levels.⁹ As per the same report, business travel including corporate, group, government, and commercial gatherings especially in the four hardest-hit markets--New York, Washington, San Francisco, and San Jose--are not expected to fully recover until 2024.

In addition to business travel trends being negatively impacted, there has been a shift in travel preferences where migration of travelers who were regular clients at the upscale hotels to midscale hotels also impacted the decline in hotel ADR. The Revenue per Room percentage for hotels dropped by 47.5 percent, making it the greatest downturn in hotel performance since the 2009 recession. For perspective, during the 2009 recession, around 10% of the hotel properties had experienced a 35.3 percent drop in total revenue.¹⁰

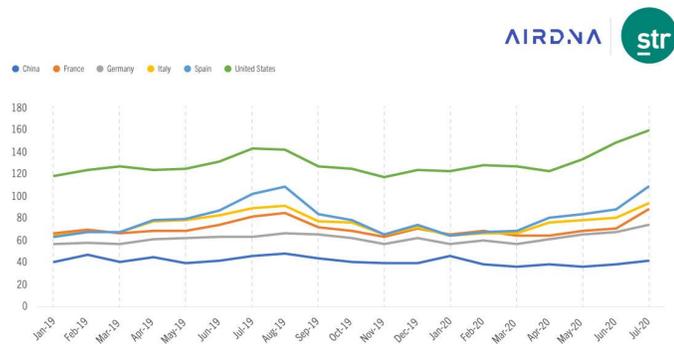
On the other hand, STVR performance picked up quickly after the first few weeks of the onset of the pandemic when the occupancy fell by more than 50%. The relatively quick recovery was due to the availability of full-service amenities and remote locations enabling people to maintain social distancing and make long-term bookings. Below is a graph suggesting how the average daily rates for Airbnbs around the globe in 2020 have returned to pre-pandemic levels, some even suggesting Airbnb rates higher than in 2019 due to the surge in demand.

8 <https://str.com/data-insights/resources/glossary/c>

9 <https://www.ahla.com/sites/default/files/Business%20Travel%20State%20by%20State%20Data%20One%20Pager%20April22.pdf>

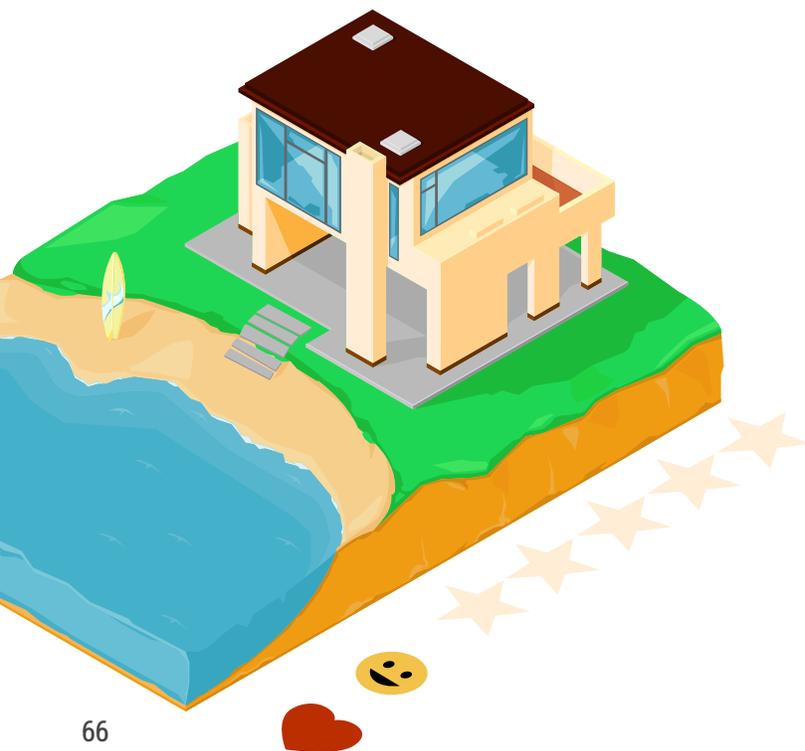
10 <https://www.cbrehotels.com/en/research/articles/us-hotels-changes-in-revpar-and-profits-during-historical-recessions>

EXHIBIT 3 - MONTHLY AVERAGE DAILY RATE BY COUNTRY



Source: AirDNA

When focusing on the performance within the US markets, the results showcase a similar and even wider gap for some markets between the occupancy levels and ADR. For an accurate assessment, short-term rentals can be thought to have two categories. The first category includes hotel-like units with studios and 1-bedroom units, most popular among business and solo travelers, especially those preferring specific amenities or city center locations. The second category is for 2+ Bedroom units typically ideal for family vacations and seasonal travelers, especially in tourist destinations. To better compare the STVR and hotel performance variances, it is useful to focus on five specific urban markets, namely New Orleans, Nashville, Austin, Chicago, and Denver. These cities are popular destinations amongst domestic and international travelers and have a high presence of hotels and STVRs.



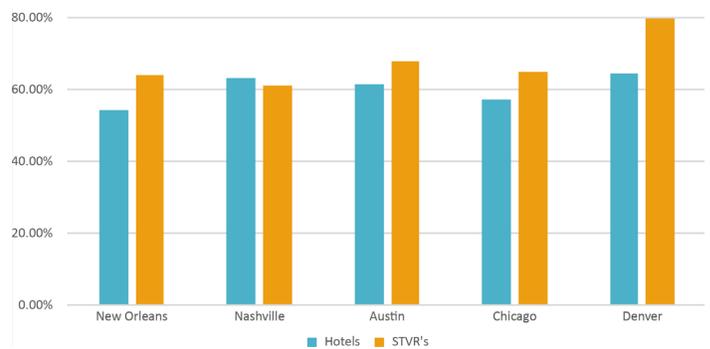
HOTEL AND STVR'S IN URBAN MARKETS

*Costar¹¹

EXHIBIT 4

Hotel	New Orleans	Nashville	Austin	Chicago	Denver
Occupancy %	54.3%	63.4%	61.65%	57.5%	64.4%
ADR	\$157.91	\$134.78	\$114	\$183	\$107.7
RevPAR	\$85.74	\$84.75	\$70	\$58.98	\$69.39
STVR's					
Occupancy %	64%	61%	68%	65%	80%
ADR	\$220	\$278	\$220	\$174	\$166
Revenue/month	\$3073	\$3941	\$2932	\$2343	\$2692

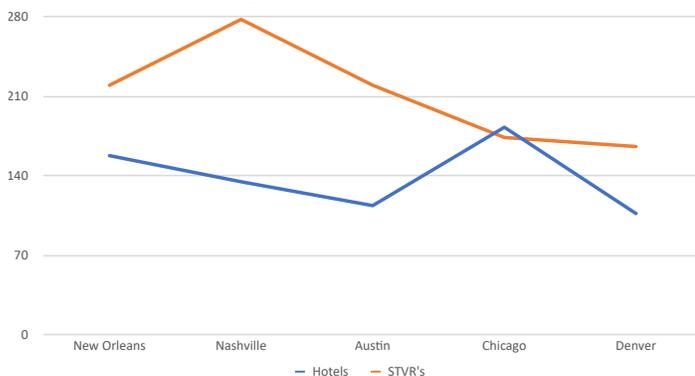
EXHIBIT 5 - OCCUPANCY LEVEL FOR HOTELS AND STVR'S 2022



Based on the recent listings and reports, STVRs have experienced a faster recovery than hotel counterparts in the five urban markets examined. Something worth noting during this period of recovery has been the dramatic change in travel behavior. Travelers are seeking experiential accommodation options for longer durations, especially to wipe out the stay-at-home and work-from-home fatigue. Airbnb for one has been tracking the emerging trends to add features like the search tab for “experiencing a new city” for individuals looking to relocate but wanting to live there before making it permanent. As per a recent survey conducted by the “Airbnb Report on Travel and Living”, it was found that a quarter of Airbnb stays in 2021 were longer than 28 days, especially in the first few months. As per the same survey of long-term stay bookers, more than 50% of the respondents reported working from home or

11 <https://www.costar.com/article/312010337/nashville-hotels-face-difficult-challenges-in-2021>

EXHIBIT 6 - AVERAGE ADR FOR HOTELS AND STVRs 2022



studying during their stays. The report highlighted that the percentage of long-term stays through Airbnb almost doubled from 14% of nights booked in 2019 to 24% of nights booked in Q1 of 2021.¹²

These leading trends have generated great interest from investors with favorable capital market conditions leading to strong new unit growth rates in high demand areas, but not as much as growth in demand. The rapidly increasing demand for short-term vacation rentals from both the travel and investor perspective is increasing the number of players in the market which is increasing the amount of supply. This will have foreseeable impacts on hotel performance as hotels do not retain as much of the gains made as the short-term vacation rentals get to. This is mainly because Airbnb makes the bulk of its revenue by charging a service fee for each booking made and has little stake in the operational expenses as compared to hotels that are operational heavy. Additionally, factors such as advance bookings, expansive spaces, and unique experiences are anticipated to continually boost occupancy levels for STVR across domestic and global markets.

IMPACT OF STVR ON RESIDENTIAL MARKETS

While the advent of STVRs has made travel more accessible and affordable, this has unfortunately reduced the supply of affordable housing. A recent study conducted by the *Harvard Law and Policy Review* in Los Angeles which has a significant amount of STVR listings showed how a 10% increase in short-term rental listings led to a 0.42% increase in home rental values and a 0.76% increase in home prices.¹³

¹² <https://news.airbnb.com/wp-content/uploads/sites/4/2021/05/Airbnb-Report-on-Travel-Living.pdf>

¹³ <https://mccmeetingspublic.blob.core.usgovcloudapi.net/salidacommeet-66476d94b19f4f68929dd9b05c9fa48b/ITEM-Attachment-001-ca0b4a2bb790441a93a1b0a496f3cddf.pdf>

In addition to increasing property taxes and eroding the character of historical neighborhoods, rental platforms like Airbnb reduce the affordable housing supply by distorting the housing market in two correlated mechanisms. The first mechanism is that of simple conversion where existing housing units previously occupied by long-term residents are instead rented out.

This conversion process takes away the converted housing unit from the rental market to the city's hotel stock, ultimately reducing the potential affordable housing stock. This is especially true for affluent or gentrifying neighborhoods with a relatively higher penetration of STVRs. The second mechanism is hotelization wherein, if homeowners and property managers can charge STVR rates less than hotel rates while earning a substantial premium in these neighborhoods, then there is a higher incentive for property owners and leaseholders to list each unit on a rental platform rather than to rent it to LA residents, thereby decreasing the housing supply and spurring inequality.

The New Orleans market is facing a similar issue where short-term rentals are exacerbating the affordable housing crisis. This issue has long existed before the concept of vacation rentals arrived on the market. However, with booming tourist activities and an increasing population growth rate in the last ten years of 11.7%, which is well above the national population growth rate of 7.4%, this problem has only become worse. The average STVR listing posted as "entire home" is estimated to be \$250 per night for two people. The current market rent for a one-bedroom apartment is \$767 per month, which roughly equals \$26 per night.¹⁴ This highlights the disparity that exists in pricing that prioritizes tourists over long-term residents. As the STVR industry expands, this is a serious threat to the long-term residents. The hosts are increasingly incentivized to make additional sources of income by renting their homes to transient occupiers.

The residents of NOLA, especially the low-income African American population is being increasingly pushed out of the historic core around the French Quarters into substandard levels of housing. Although governments recognize this and enact legal protection laws for renters, this is not executed as widely and strictly. Governments in a neighborhood with higher penetration of STVRs need to have strict renter rights in place that prevents the landlords from kicking out residents to have their units put up as STVRs. There has been a long battle between the city of New York and rental companies such as Airbnb. The *New York Times* recently reported that as STVRs became more popular, the city

¹⁴ <http://nolarentalreport.com/#/>

officials of New York responded by putting stricter short-term rental laws in place. City officials have long argued that landlords and tenants have exacerbated the equitable housing crisis by manipulating laws around short-term renting for lucrative benefits.¹⁵ As of today, any host willing to have a listing for less than 30-days on an STVR platform is required to officially register with the city. The narrative is changing for the good of the residents. However, this is one of the biggest challenges that the STVR sector faces as it expands and competes with hotels.

Just recently, the Mayor of Honolulu, Rick Blangiardi signed a bill to enforce significant zoning restrictions and duration requirements on short-term rentals in Oahu. This comes after a widespread community outcry about the loss of neighborhoods from illegal vacation rentals. The bill will limit the presence of vacation rentals in specific commercial districts with a required minimum stay of 90 days in some parts and required parking spots for each unit rented. Being a destination market, Honolulu experienced a high demand for short-term rentals as pandemic-related travel restrictions were lifted. The average ADR of STVR listings in Oahu averaged \$200 with occupancy reaching 88%. The Hawaii Tourism Authority Report by the Hawaii Tourism Authority (HTA) stated hotel performance with an average ADR of \$304 and an occupancy level of 55.2%.¹⁶ The wide gap between the occupancy levels of both STVRs and Hotels in Hawaii and the unconventional proximity between their ADRs led to higher listings on rental platforms that quickly escalated home rents across Honolulu. It comes as no surprise that the bill has been greatly supported by hotels as well as residents.

PREDICTED PERFORMANCE OF STVRs AND HOTELS

The new age travel preferences and disruptive effects generated post-pandemic by STVRs are showing trends for simpler, price-efficient, larger, and more convenient travel experiences. There are spillover effects from higher spending on ancillary services such as restaurants and outdoor activities that will continue to exaggerate this trend.

However, people will be people and the fundamentals of travel will not change. People are the main force of success in hospitality, whether it is the customer or the provider. The hotel industry is still recovering, and its performance cannot be fully materialized until business travel is back, international travel restrictions are fully lifted, COVID

variants and ill-effects have subsided, and inflation rates and labor costs have fully stabilized. Based on the consumer travel activity measured by STR and AirDNA, especially post-pandemic, it is likely that positive customer experience with STVRs effects the RevPAR of hotels in the same urban market. Major reasons for this include lower prices and higher demand for STVRs.

This doesn't guarantee that STVR performance will supersede that of hotels. As the economy bounces back with the return to office increasing business travel, and higher capital invested in hotels, it is favorable for hotel performance to return to pre-pandemic levels. As per the *Expedia Travel Trends Report 2022*, US travelers coming out of such a long period of constraints, are transforming the travel status quo where 68% of American travelers are planning to spend big on travel, adapting the "GOAT" (greatest of all trips) attitude, also commonly referred to as revenge travel in the hotel industry. Additionally, despite being among the hardest hit by the pandemic, the hotels are the only segment of the hospitality industry to receive significant COVID-related aid through the Save Hotels Jobs Act.¹⁷

However, it should be noted that the future performance of hotels will in some way, or another depend on their capability to offer simpler and more price-efficient accommodation to travelers. The method of underwriting hotels will also change to account for STVR impact in the list of comparables. As mentioned in the earlier section, it is hard to present bias-free and accurate STVR data for different markets to be able to fully assess the effect of STVRs on hotels. The different market classes for hotels have had different post-pandemic impacts which makes it equally harder to accurately determine the disruptive effect of existing and new STVR supply in the market. Keeping in mind the above-listed limitations, it can be concluded that STVRs will have varying impacts on the financial performance of all hotels across different market segments.



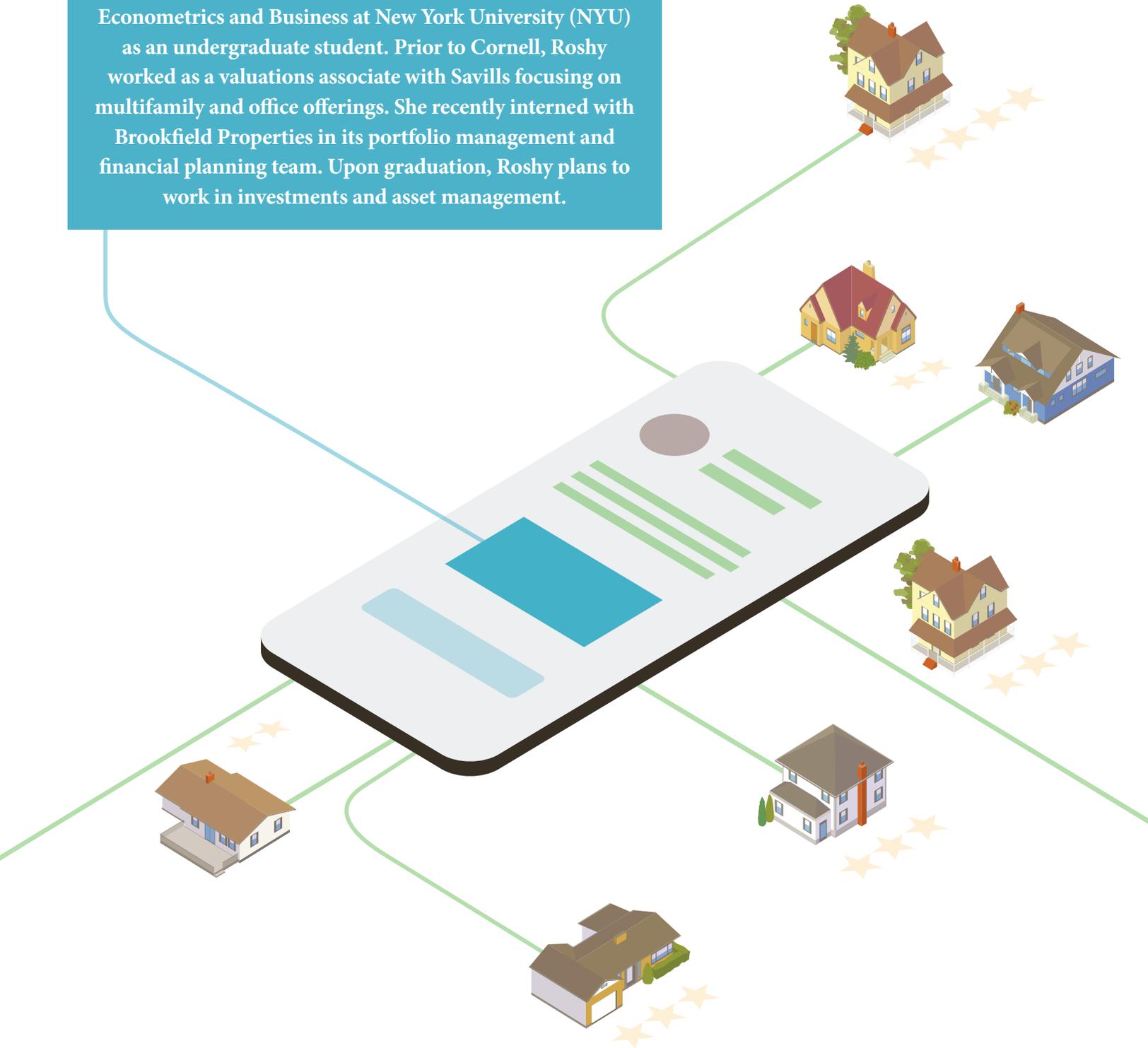
15 <https://www.nytimes.com/2021/12/09/nyregion/nyc-illegal-airbnb-regulation.html>

16 <https://governor.hawaii.gov/newsroom/hta-news-release-hawaii-hotel-revpar-down-13-5-in-september-2021-compared-to-september-2019-due-to-lower-occupancy-hawaii-still-leading-the-nation-in-revpar-and-adr/>

17 <https://www.hotelmanagement.net/operate/ahla-report-predicts-slow-recovery>

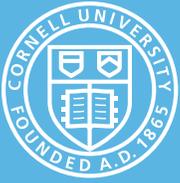
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Cornell Baker Program in Real Estate

