

ANALYSIS

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Downturns, Construction Delays, and the COVID-19 Pandemic

The Economics of Supply Growth in the Age of Coronavirus

Abstract | Executive Summary

Economic downturns cause delays and cancellations for new construction in multifamily and commercial real estate, as uncertainty about the timing and magnitude of future cash flows prompts market players to reassess priorities. The COVID-19 crisis adds several layers of complexity as shelter-in-place policies are disrupting supply chains and (in some places) halting construction activity altogether. Supply growth forecasts are integral to evaluating the future of performance metrics for different property types, and a platform for tracking the status of construction projects is essential—particularly given the disruptions caused by the pandemic.

Introduction

Construction delays are not uncommon. 82% of multifamily projects that were begun during the years spanning 2002 to 2019 encountered some form of delay, defined as any month beyond the initial expected date of completion.¹ While industry expectations are that a 200+ unit multifamily building can be erected within 12 to 18 months, the actual average time to completion is 22.2 months. That translates to an approximately two-year wait relative to when a project was initially planned or proposed to when it finally receives its temporary certificate of occupancy (TCO) and begins leasing.

Why does this occur? How does this continue to happen in an age of sophisticated project management tools employing critical path analysis and collaborative software that allow teams to work together efficiently? There is an entire literature² in the construction industry exploring why delays occur, with reasons ranging from unanticipated weather to supply chain disruptions and labor shortages.

¹ It is uncertain how much of a role unrealistic completion dates play in resulting delays. Why not simply pad estimates for total completion times and perhaps finish early, particularly if a builder has extensive experience encountering delays? Sometimes the structure of winning contracts also rewards unrealistic projections of low costs and quick completion times; developers know that once time and cost have been sunk into a project, clients rarely switch contractor services.

² A useful reference is Branca, et.al. Federal Government Construction Contracts. American Bar Association, 3rd edition (July 2018). The US federal government is the largest purchaser of construction services in the US, and project delays are a big topic, not just for economists and policymakers but also for lawyers who need to deal with incentives and contracts that build in compensation for unanticipated delays. See in particular Chapter 19 by Andrew Ness: "The Law of Construction Delay, Acceleration, and Disruption," where the author goes into detail explaining reasons for delays—and associated costs.

This paper will focus on how the COVID-19 pandemic will affect construction delays across property types, and relevant geographic markets for those types. We combine Moody's Analytics REIS's proprietary building-level data on new construction lifecycles with real-time monitoring of which places have classified construction as either essential or non-essential. We make informed assessments of where delays will arise, in what magnitude, and how performance metrics like rent growth and vacancy trajectories will be affected.

The Economics of Construction Delays

Construction delays tend to vary across property types for very specific reasons. Table 1 shows how apartment buildings tend to encounter more delays—followed closely by retail and office. Only 45% of industrial projects from 2002 to 2019 encountered delays, a relatively small figure compared to the other sectors.

Table 1 Construction Delays Across Property Types

PROPERTY TYPE	ENCOUNTERED DELAYS	FINISHED EARLY	FINISHED ON TIME
Apartment	82%	15%	3%
Industrial	45%	15%	40%
Office	73%	16%	11%
Retail	79%	15%	6%

Source: Moody's Analytics REIS; time period covering years 2002 to 2019

What is driving these numbers? First, while this varies across jurisdictions, residential projects tend to be subject to stricter regulations and building codes. Furthermore, more complex projects tend to have longer construction cycles. Depending on the size of the building, "industry rules of thumb" specify a range between 9 and 18 months to erect a multi-floor multifamily, office, or retail project.³ At every step of the process, however, *any* kind of disagreement about design, specifications, materials, cost, or other details about the project will cause delays.

By contrast, industrial properties (particularly warehouse/distribution facilities) are relatively simpler projects: rarely exceeding one or two floors, with walls that require little ornamentation and few windows. Buildings like these are completed, on average, in as few as four to six months, assuming that permits are in order and financing is in place. Table 2 summarizes "industry rules of thumb" on how long it typically takes to build an average apartment or commercial building, and Moody's Analytics REIS figures on the *actual* time it took (on average) to complete projects. The difference between these two figures gives you average *completion delays*.

Table 2 Expected versus Actual Completion Times

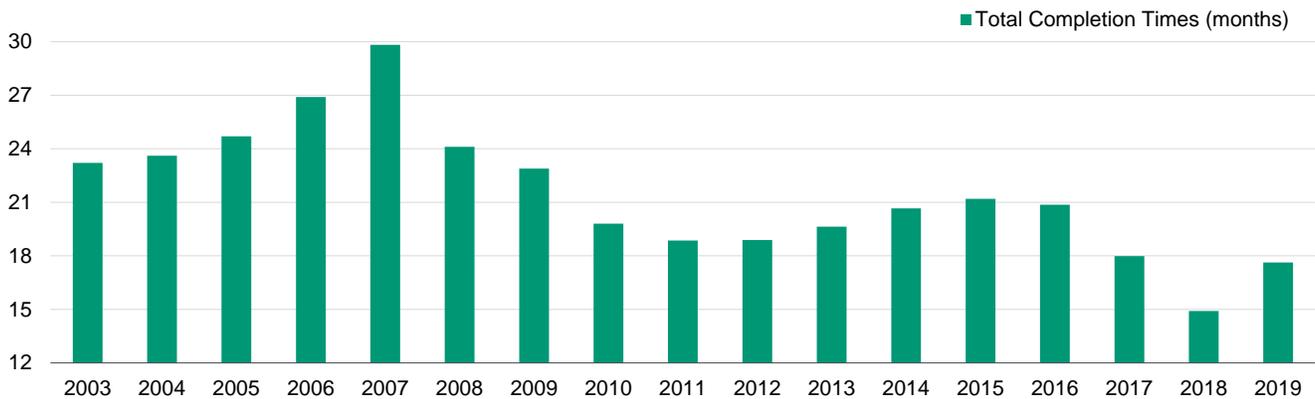
PROPERTY TYPE	EXPECTED CONSTRUCTION TIME	AVERAGE ACTUAL CONSTRUCTION TIME
Apartment	12 to 18 months	22.2 months
Industrial	3 to 6 months	9.9 months
Office	6 to 12 months	15.1 months
Retail	6 to 12 months	13.9 months

Source: Moody's Analytics REIS; time period covering years 2002 to 2019.

³ There are no definitive sources for construction times given the idiosyncratic nature of many real estate projects, particularly commercial construction. The Census Bureau's Survey of Construction shows that the average multifamily building required 15.4 months to construct (in 2019). No comparable time series exists for commercial buildings. <https://www.census.gov/construction/nrc/index.html>

The effect of economic cycles. Economic downturns tend to cause construction delays, and (in some cases) outright project cancellations. Figure 2 charts total completion times per year for the apartment sector from 2003 to 2019. Each column represents the average number of months that it required for a project that broke ground in any given year to receive its temporary certificate of occupancy. The most discernible spike occurs in 2007 because projects that broke ground that year ran into the Great Recession, which started in December 2007.

Figure 1 Total Completion Times (in Months) – Apartment Sector

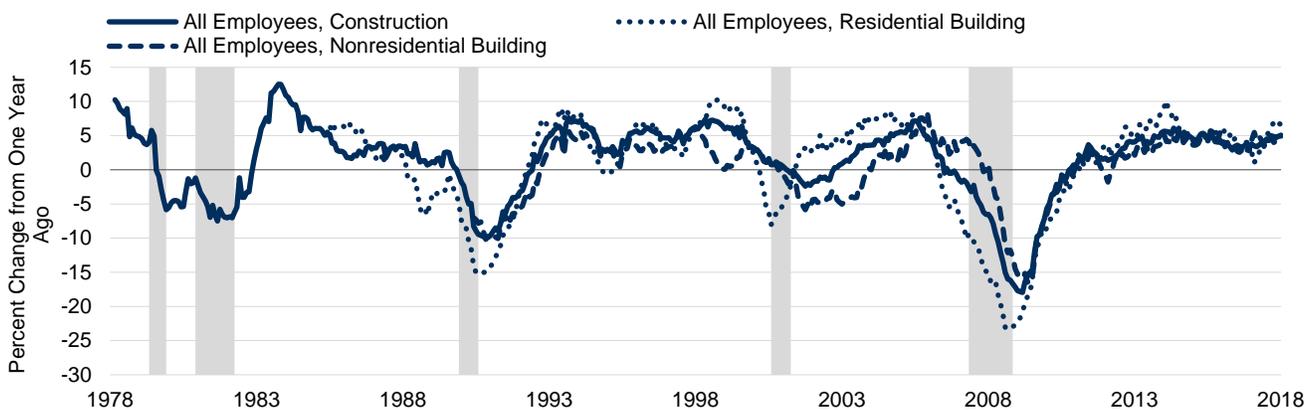


Source: Moody's Analytics REIS

Why would construction projects that have already broken ground encounter delays during recessions? Construction employment tends to be a leading indicator of economic activity, with the sector shedding jobs before the onset of a downturn. Labor shortages (among other reasons) therefore contribute to project delays.

Figure 2 Construction Employment and Recessions

1978 to 2018. Recessionary Periods Shaded in Grey.

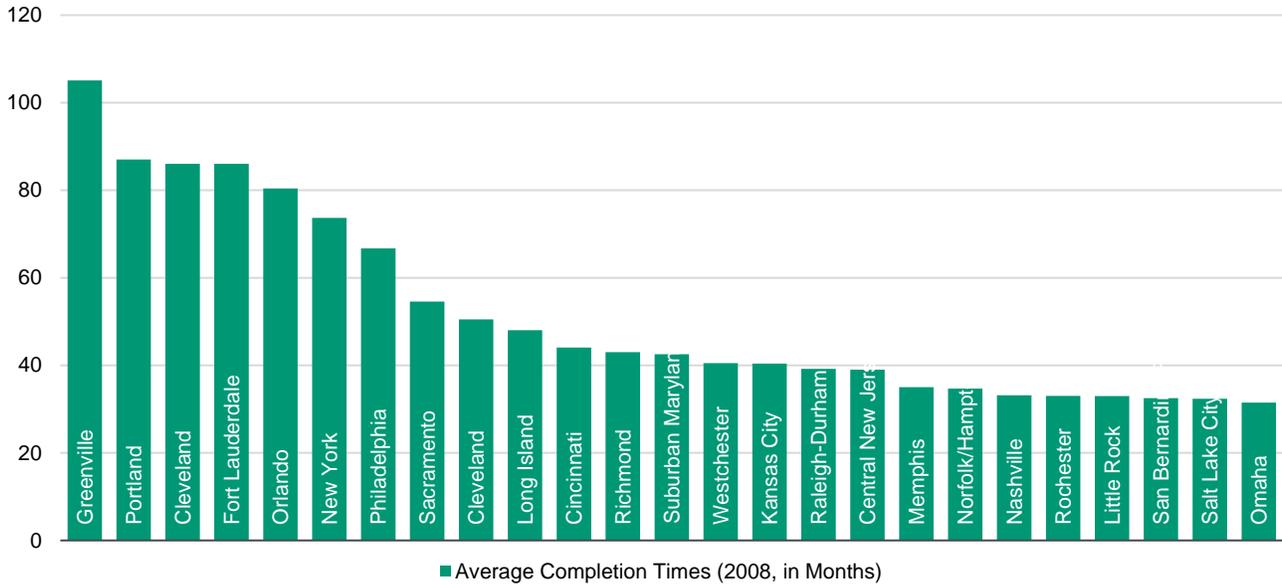


Source: FRED, St Louis Federal Reserve

Capital availability also tends to decline during such periods, as sources of financing reprioritize lending and investing activity. Completion times spiked by 21.2% during the 2008-09 downturn for the apartment sector. Patterns were similar for the retail sector (21.9% increase) but varied significantly for the office sector (7.3% increase) and the industrial sector (62.4% increase). There was far less building in the office sector post-9/11, and therefore fewer projects that encountered delays. Industrial tends to be more volatile, but given the low base, a 62.4% average increase in delays translates to projects being built in 7.3 months as opposed to the average of 4.5 months.

Construction delays vary across geographic markets. Despite the relatively minor increase in completion times as a whole during recessions, there is a wide disparity across geographic markets. Figure 3 below shows the top 25 office markets where completion times increased the most during 2008-09.

Figure 3 Top 25 Office Markets for 2008-09 Construction Delays



Source: Moody's Analytics REIS

At the MSA level, data tends to be driven by fewer, larger projects—particularly given the size of buildings in the office sector in some markets. For example, New York's figure of a 73.7 month completion time in 2008 is driven by three very large projects. Only three office projects broke ground that year: Two Gotham Center in Long Island City (which actually finished earlier than scheduled), 3 World Trade Center, and 4 World Trade Center, both of which incurred significant construction delays (114 months, and 24 months, respectively).

Once we start focusing on specific projects, then the causes of delays get tangled up in the minutiae of real estate deals. 3 World Trade Center, for example, which broke ground in 2008, did not formally hold a ribbon cutting ceremony until June 2018 (hence its 114-month total completion time).⁴ The delays were driven by ongoing disputes between the developer, government agencies, insurance companies, and 9/11 victims' family members who wanted the entire site to be preserved as a memorial.

Enter COVID-19

How will the COVID-19 pandemic affect construction delays and total completion times? The current downturn is different from typical recessions because of three factors. First, the slowdown in activity was prompted by a deliberate policy choice to shelter in place (previous recessions were driven either by an asset bubble bursting and/or credit conditions worsening). Shelter-in-place policies were implemented in various ways, impacting construction activity in different ways. Boston, for example, classified construction as a non-essential activity, while the state of Texas did not. As such, a system that actively monitors the impact of policy choices on construction activity is required.

Second, the scope of the shock is not simply national, but global. Global supply chains have been disrupted, delaying the arrival of imported construction material given how many countries have restricted business activities. In places like Austin, for example, construction delays are being attributed to supply chain disruptions:⁵ the state of Texas has declared construction to be an essential activity, so the delay isn't coming from direct policy mandates. Key real estate services like appraisal and underwriting,

⁴ <https://www.usatoday.com/story/news/nation/2018/06/10/3-world-trade-center-open-after-years-delays-twin-towers-site/689035002/>

⁵ <https://www.bizjournals.com/austin/news/2020/04/02/new-construction-projects-in-austin-being-delayed.html>

steps that are usually required before financing is released, are also being disrupted.⁶ An appraiser will usually need to visit a construction site physically to assess asset values; it is not at all clear whether this activity is considered essential or non-essential.⁷

The final reason why COVID-19 is different, and will likely continue affecting construction delays and inventory growth even after quarantine policies are lifted, is the uncertainty of reinfection. Without a credible and reliable treatment and vaccination protocol made widely available, economic activity will likely remain curtailed. Construction companies are trying to adapt to the "new normal." Some projects like infrastructure improvements, and certain buildings like hospitals and affordable housing units, are considered essential, but construction firms are being asked to enforce safety procedures to keep their workers safe and prevent the spread of COVID-19.⁸ If new safety protocols require social distancing measures that reduce capacity (fewer people on-site at any given time, more processes before and after actual construction work, stricter conditions, etc.) then these will also add to total delay.

The COVID-19 crisis requires close attention to detail as to how specific places are implementing, or relaxing, quarantine policies that might delay construction activity. Every project will also need to be evaluated to determine whether development has been delayed or canceled altogether.

Surveillance: Policies and Places

Moody's Analytics REIS's New Construction team closely tracks every multifamily and commercial real estate market in the country. Since the COVID-19 pandemic escalated significantly in mid- to late March, we have been tracking specific places that have implemented some form of policy that may result in construction delays. Table 3 below provides some of the data that we track for counties that have put construction on hold:

Table 3 Construction Stoppages, Select Places

GEOGRAPHY REIS MSA	STATE	CONSTRUCTION HALTED?	DATE OF WORK STOPPAGE	DATE OF CONSTRUCTION RESTART	NOTES
New York	NY	Yes	27-Mar	27-Apr	Projects with 30% affordable housing need not stop
Northern New Jersey	NJ	Depends	8-Apr	27-Apr	Schools, hospitals, affordable housing, emergency repairs exempt
Philadelphia	PA	No			
Detroit	MI	Yes	24-Mar	7-May	
San Francisco	CA	Case by case	20-Mar	4-May	

Source: Moody's Analytics REIS

Several inferences can be made from data that we observe and analyze: First, places that did not explicitly order construction activity to cease should be subject to less construction delays (for example, MSAs in Texas), unless supply chain disruptions were extreme (which some projects in Austin⁹ were reporting). Second, the longer the time elapsed between the date of work stopping and the date when construction restarts, the higher the likelihood of more delays (in the example in Table 3, New York and San Francisco are candidates). Third, we need to account for the possibility that *further* work stoppages will arise if reinfection spikes.

⁶ Guidelines issued by the Appraisal Institute can be found here and have been changing as the COVID-19 situation evolves: <https://www.appraisalinstitute.org/news/coronavirusupdate/>

⁷ <https://www.housingwire.com/articles/are-appraisals-an-essential-service/>

⁸ <https://www.latimes.com/california/story/2020-04-01/the-hammer-comes-down-on-construction-to-slow-coronavirus-spread-among-workers>

⁹ <https://www.bizjournals.com/austin/news/2020/04/02/new-construction-projects-in-austin-being-delayed.html>

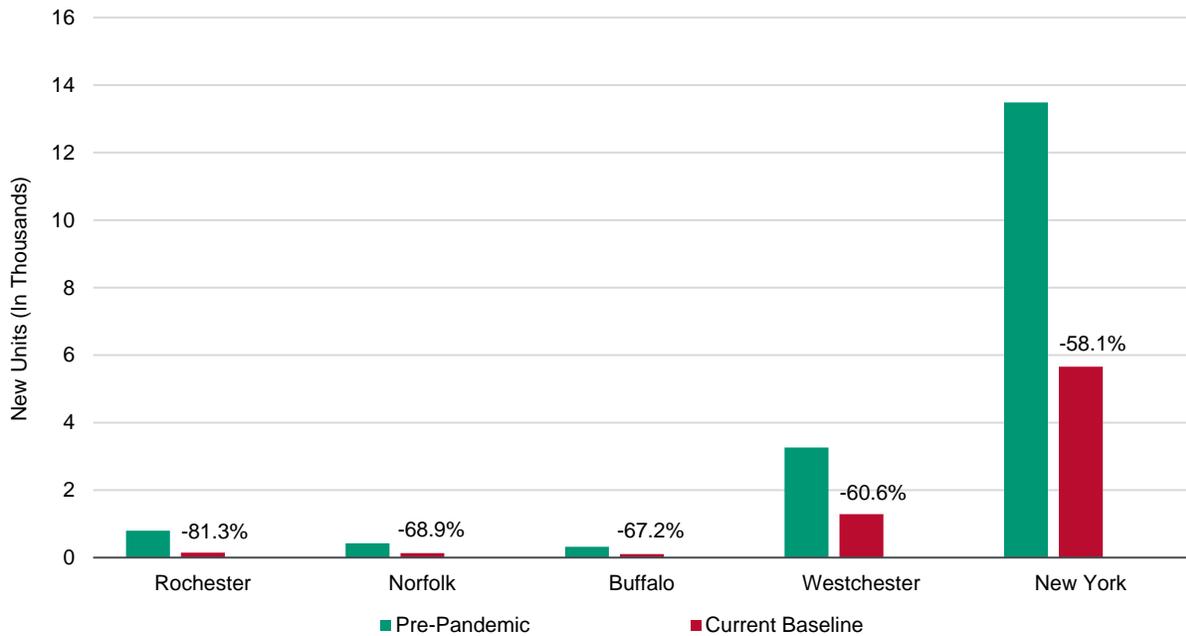
Using the Data to Inform Forecasts: Pre-Pandemic and the New Baseline

Moody's Analytics REIS regularly contacts developers about the status of specific construction projects. Multifamily and commercial properties are tracked all the way from the initial proposal and planning stages, through ground-breaking and until the project is complete. REIS also uses satellite imagery and other technology to confirm construction status. At the end of each calendar quarter, the latest information on construction projects feeds near-term inventory growth forecasts for submarkets and MSAs.

Changes Driven by COVID-19: The Apartment Sector. Prior to the outbreak of COVID-19, Moody's Analytics REIS expected over 300,000 units to come on line for the national multifamily market in 2020. If that had come to pass, the sector would have registered its highest figure for new construction in two decades.

Updated forecasts utilizing the latest information on building projects and construction delays have reduced the 2020 figure for supply growth by 21%, to just slightly under 246,000 units. The top five MSAs for reductions in forecasted new construction for 2020 are presented in Figure 4.

Figure 4 Change in Construction Estimates (2020), Pre- and Post-COVID



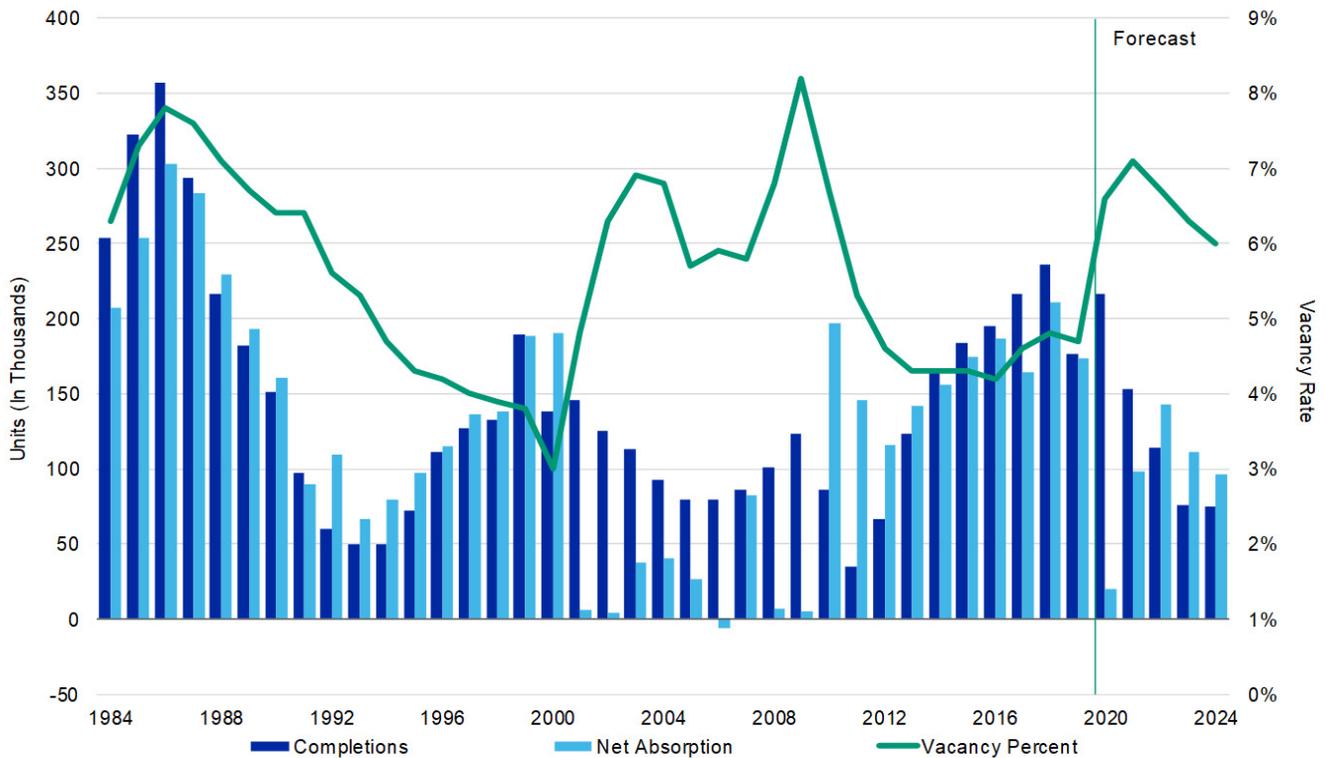
Source: Moody's Analytics REIS. Numbers above red columns indicate the percentage change from pre-pandemic to current baseline

While percentage change figures are indicative of how much forecasted construction has slowed down *within* a market pre- and post-COVID-19, analyzing the *absolute* change in the number of units conveys the magnitude of how many projects were “lost” to COVID-19 this year. Rochester, Norfolk/Hampton Roads, and Buffalo each expect less than 150 apartment units to come on line in 2020, post-COVID-19 adjustments. But that means their pre-pandemic base was not that large, ranging from 320 (Buffalo) to 798 (Rochester).

In contrast, Westchester County was forecasted to bring over 3,200 units on line in 2020 prior to COVID-19: now, the figure is less than 1,300. New York City was expecting close to 13,500 units to come on line this year. That figure has been reduced to just slightly over 5,600 units by COVID-19-driven delays.

Positive Countervailing Effects. In a sector like multifamily that has been contending with relatively strong supply growth in the last cycle, a 21% decline in expected inventory growth offers a positive effect that counteracts the potential pullback in demand from quarantine policies. Projected vacancies still rise, from 4.7% at the end of 2019 to 7.0% by the end of 2021, given the anticipated severity of this economic downturn. However, 7.0% is 110 basis points below the historic peak of 8.1% that was recorded in the apartment sector in 2009. Effective rents are projected to decline by 3.7% in 2020 alone—a far greater magnitude than the 2.5% decline the apartment sector experienced in 2009.

Figure 5 Apartment Completions, Absorptions, and Vacancies (1984 to 2024)



Source: Moody's Analytics REIS

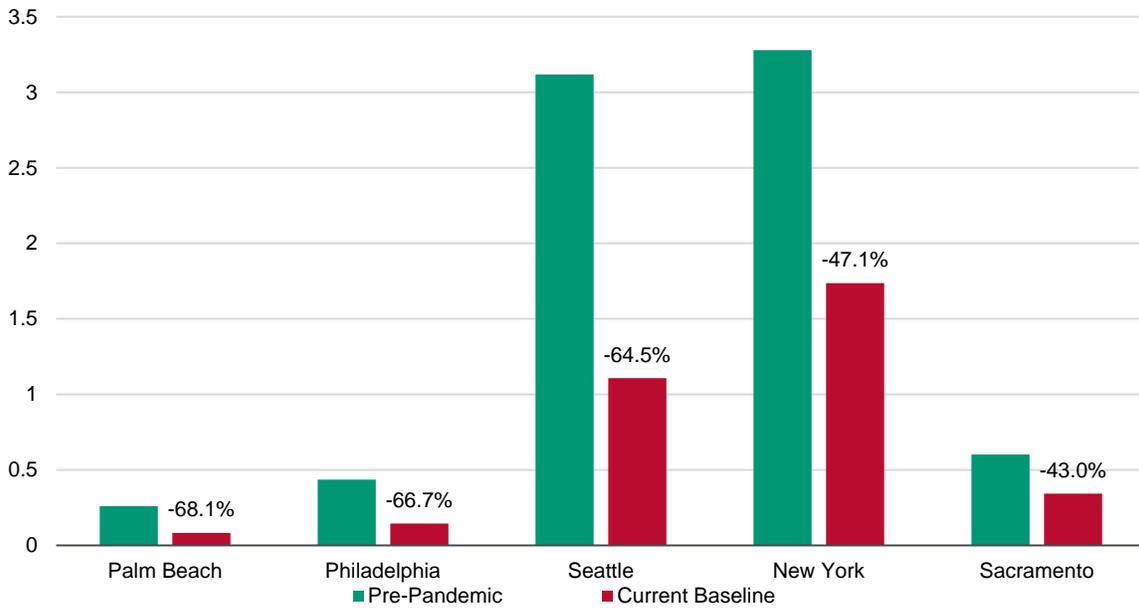
In other words, real estate performance metrics for multifamily would fare much worse if construction delays and cancellations did not arise. Having to deal with a supply glut in the midst of a demand pullback complicates and lengthens the distress and recovery process for real estate markets.

Changes Driven by COVID-19: The Office Sector. In contrast to the apartment sector, the office sector has not registered as many confirmed delays... yet. Projected construction figures at the national level for 2020 were reduced by 6.3% pre- and post-pandemic adjustments, from 50.8 million square feet to 47.8 million square feet. Why has there been a relative lack of construction delays in the office sector, compared to apartment properties? There was not as much construction activity in the first place over the last decade. Constrained by lackluster performance metrics—national office vacancies peaked at 17.6% in 2010 and dipped by only around 130 basis points over the next seven to eight years—developers did not bring as much product to market. Lenders supported only the most promising of projects that showed proof of significant pre-leasing: there is no evidence that there was any spec office project greenlit for bank financing in the last ten years.

As such, most office construction projects with which we spoke over the last quarter have confirmed that they are still on track to bring buildings on line this year. It is, of course, early in the process, and if economic reopening does not proceed smoothly further delays may be encountered. Of course, there was also significant variation across geographic markets. The top five markets that incurred construction delays are presented in Figure 6.

Figure 6 Pre- and Post-Pandemic Changes to 2020 Construction Forecasts

Office Sector, Largest Reductions to Construction Estimates

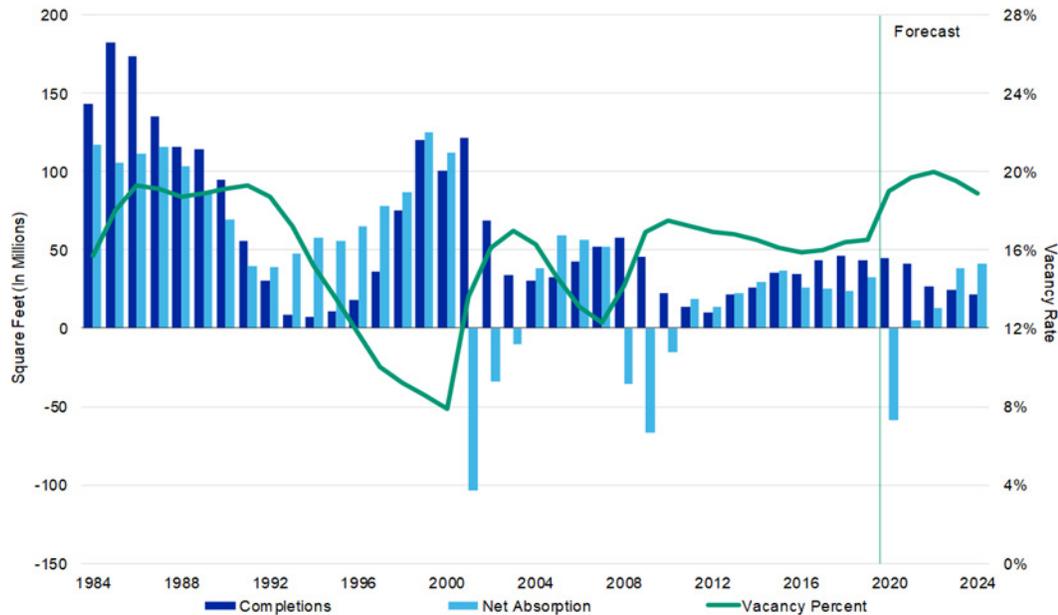


Source: Moody's Analytics REIS. Numbers above red columns indicate the percentage change from pre-pandemic to current baseline

Uncertainty about the medium and long-term. Unlike the apartment sector, office inventories did not grow as robustly in the last expansionary cycle. The COVID-19 crisis, however, has forced many employers to adopt remote working policies that are now casting doubt on future demand for office space.¹⁰ Moody's Analytics REIS expects office vacancies to rise to 20.2% by 2022, which would be a record high. Figure 7 below shows how vacancies in 2020 are expected to crest just slightly above the historic high of 19.7% from 1991.

¹⁰ We explore the future of the office sector in greater detail in this paper: "COVID-19 Will Force the Office Sector to Evolve (Further)" by Victor Calanog and Vivek Thadani, available upon request.

Figure 7 Office Completions, Absorptions, and Vacancies (1984 to 2024)



Source: Moody's Analytics REIS

Effective rents are projected to decline by 10.5% in 2020 alone—a larger drop than the 10.2% *total* decline that the sector went through from 2008 to 2010. New York City, the largest office market in the nation, has been hit severely by the COVID-19 crisis, and is forecasted to have effective rents decline by 20.3% in 2020 (a larger drop than the New York market experienced in 2008-09, when it was the epicenter of the financial services meltdown).

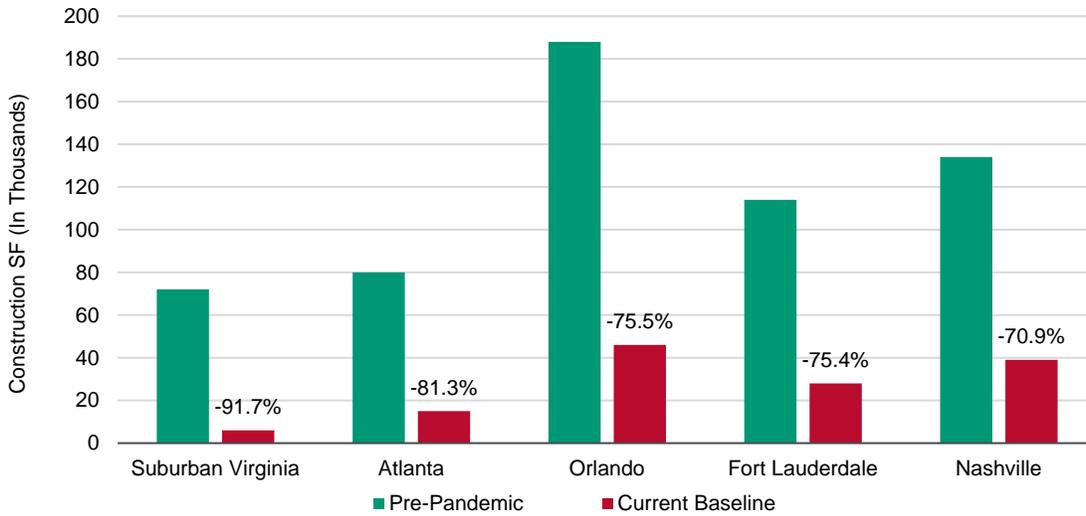
Changes Driven by COVID-19: The Retail Sector. Retail construction forecasts for 2020 have been reduced by 15.7% between pre-pandemic estimates and the current baseline. This is roughly similar to the 21% decline for multifamily, but it is important to note that the *scale* is completely different: Moody's Analytics REIS was projecting only 6.45 million square feet of new neighborhood and community center space to come on line before the COVID-19 crisis hit. That is about 0.3% of the inventory base. Updated baseline forecasts which consider the probability of construction delays are now even more modest at 5.44 million square feet.

The retail property sector has been under pressure for at least two decades because of the rise of online commerce. Developers did not bring much new supply to market in the last expansionary cycle: inventory grew by 1.7% per year from 2001 to 2008, but at less than *one-fourth* that pace (0.4% per annum) from 2010 to 2019. Much like the office sector, only projects that had relatively strong prospects tended to be greenlit for construction financing support in the retail sector. Given the modest amount of new supply that was projected to come on line, it is no surprise that projected supply growth was not revised downwards significantly.

Figure 8 lists the top five markets that had construction forecasts for 2020 revised significantly. Given the relatively modest bases, all it takes is for one or two projects to be delayed or canceled to reduce inventory growth figures between forecast periods significantly.

Figure 8 Pre- and Post-Pandemic Changes to 2020 Construction Forecasts

Retail Sector, Largest Reductions to Construction Estimates



Source: Moody's Analytics REIS. Numbers above red columns indicate the percentage change from pre-pandemic to current baseline

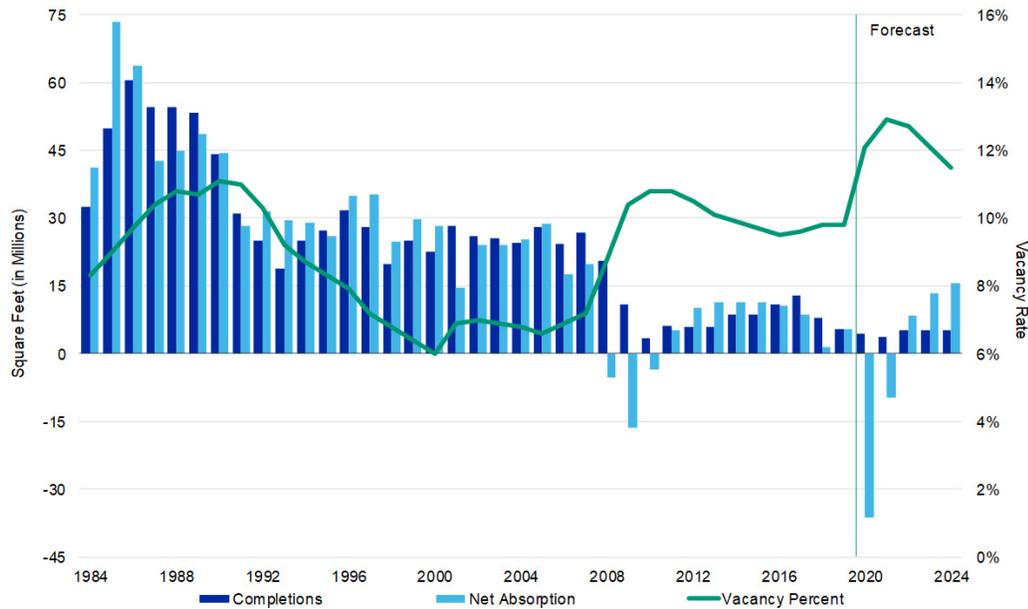
The Problem Isn't on the Supply Side. Given the restrained amount of development in the retail sector, the problem really is not to be found on the supply side. The issue that retail is grappling with, given the current crisis, is the significant distress that retail tenants are going through given shutdown policies. Major retailers like Neiman Marcus, JC Penney, and J Crew have already begun bankruptcy proceedings. Large operators like Simon Property Group have begun reopening stores in select areas but were blocked from doing so in New York and Indiana.¹¹ The long-term viability of brick and mortar retail is in question, given the accelerated shift to online commerce prompted by households sheltering in place.¹²

Moody's Analytics REIS expects retail vacancies to spike from 10.2% in 2019 to peak at 13.3% in 2021—a record high. Effective rents are expected to fall by 11.1% in 2020 alone, a historic decline.

¹¹ <https://therealdeal.com/2020/05/12/simon-says-malls-will-reopen-but-some-states-say-otherwise/>

¹² We speculate on the future of retail post-COVID-19 in this paper: "The COVID-19 Pandemic and the Retail Debacle" by Victor Calanog and Thomas LaSalvia, available upon request.

Figure 9 Retail Completions, Absorption, and Vacancies (1984 to 2024)



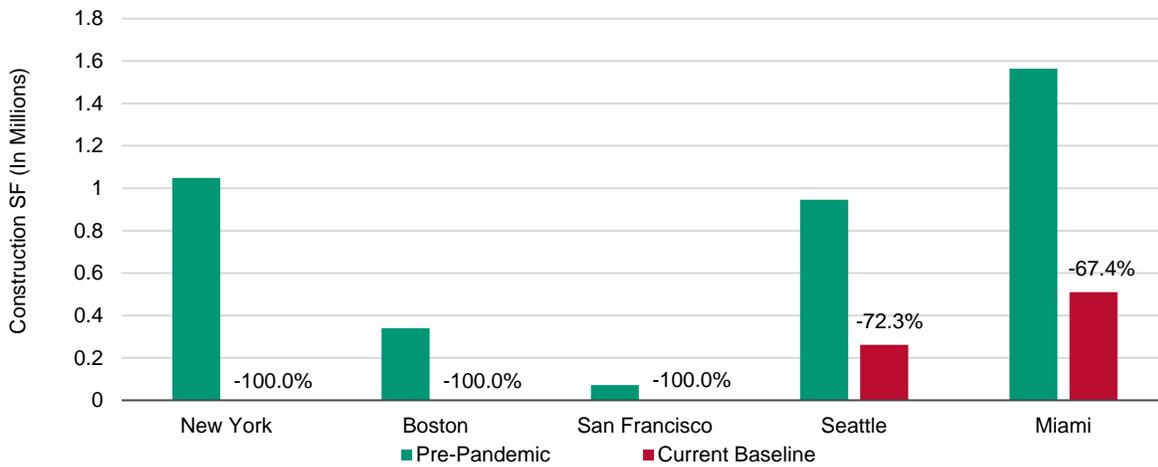
Source: Moody's Analytics REIS

Changes Driven by COVID-19: The Industrial Sector. In contrast to the distress in the retail sector, the shift to online commerce is expected to boost demand for industrial space, particularly warehouse/distribution properties. In the short run, however, it is likely that warehouse/distribution construction will pause as firms reassess how market demand will shift post-COVID-19. It is also much easier to delay or cancel—and subsequently restart—warehouse/distribution projects because of the simplicity of industrial design relative to other property types. At the national level, we expected close to 120 million square feet of new warehouse/distribution space to come on line in 2020, pre-pandemic. That figure is now down to 89.3 million square feet, a 24.4% decline.

Figure 10 lists specific markets where industrial construction is expected to be curbed significantly, based on project-level research and economic forecasts. It is no surprise that New York, Boston, and San Francisco expect to hit pause on construction, given policies in those cities that restrict building, and the severity of COVID-19 incidents in these places.

Figure 10 Pre- and Post-Pandemic Changes to 2020 Construction Forecasts

Industrial Sector, Reductions to Construction Estimates (Select Markets)



Source: Moody's Analytics REIS. Numbers above red columns indicate the percentage change from pre-pandemic to current baseline

A Relatively Brighter Future. Though we expect vacancies to rise for industrial properties, rents are expected to fall by a relatively modest 5.8% in 2020. That suggests that the warehouse/distribution sector will be second only to the multifamily sector in terms of the *least amount of rent declines* driven by the COVID-19 crisis. Construction is also expected to restart with relative ease once demand picks up and financing constraints loosen.

Conclusions

The COVID-19 crisis is a global shock, and quarantine policies have shut down large sections of the economy. It is no surprise that several measures of US economic activity have posted record declines during the month of April: 20.5 million jobs lost¹³ (more than ten times the previous record of 2 million, from September 1945); monthly retail sales tumbling by 16.4%¹⁴ (almost double the previous record of -8.3%, set just one month earlier). It is no surprise either that these massive levels of economic dislocation have already prompted builders to scale back on operations: housing starts fell by a record 30.2% in April—the biggest monthly drop since the US government started tracking the series in 1959.¹⁵

We expect multifamily and construction projects which have already broken ground to encounter significant delays: projected supply growth for 2020 has fallen by 21.0% for multifamily, 7.3% for office, 15.7% for retail, and 24.4% for industrial, relative to pre-pandemic levels.

Assessing whether or not commercial property construction projects will encounter delays requires an infrastructure that allows detailed, constant surveillance. Forecasts at the granular level are most useful for market participants if they present project-level assessments of where buildings are likely to come on line, or not, given the localized nature of real estate analysis.

Moody's Analytics REIS is in a position to be able to use two decades of detailed new construction research to inform its analysis. But more than that, given the fast-changing nature of unprecedented change driven by the COVID-19 crisis, we have created a platform, available for free to the public, which equips analysts to monitor the status of geographic markets and property types of interest.

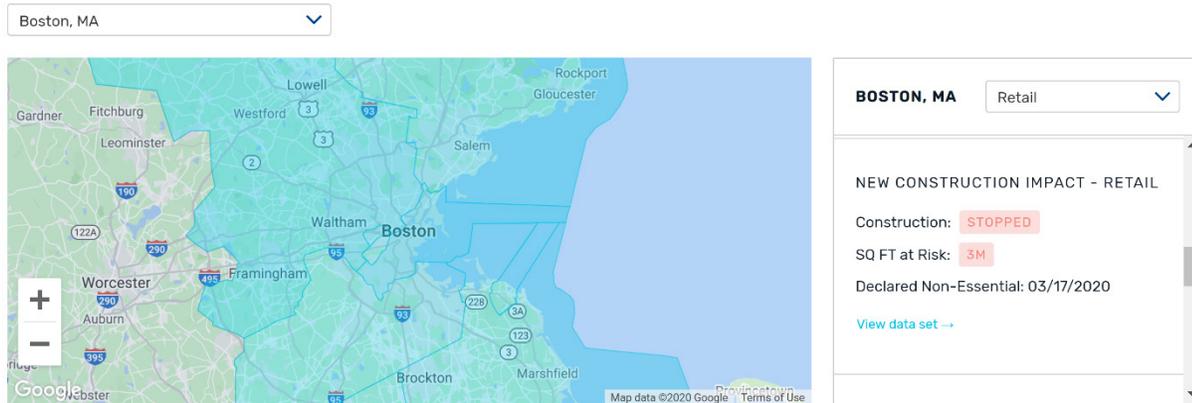
¹³ Employment report released by the Bureau of Labor Statistics on May 8, 2020.

¹⁴ Monthly retail report released by the US Commerce Department on May 15, 2020.

¹⁵ Report on housing starts released by the US Commerce Department on May 19, 2020.

The new [COVID-19 CRE Impact Dashboard](#) provides a visual representation of COVID-19 incidences (updated daily), an overview of the built environment (counts for specific property types), presented alongside our latest baseline and scenario forecasts for key performance variables and demographic trends. A panel focused on “New Construction Impact” also provides our updated assessments of the policy environment (indicating whether construction has stopped or resumed) and estimates of square footage of construction at risk of delays.

Figure 11 COVID-19 Impact Assessment Tool



COVID-19 Impact on New Construction - Retail

[Return to Map ↑](#)

Source: Moody's Analytics REIS

We are committed to providing the most current view of how multifamily and commercial property markets are evolving in response to the COVID-19 pandemic. A big part of that is monitoring how construction projects are either delayed, canceled, or restarted again, as the economy navigates its way through and out of this crisis.

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