US office real estate market - What happens next?

Real estate markets

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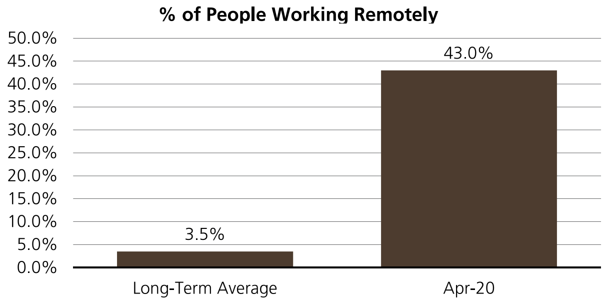
- We believe it is too early to write the epitaph for the entire office sector as there are a number of counterbalancing forces at work. However, the realities are that landlords, companies and tenants alike will all be forced to improvise, adapt and overcome a number of challenges in the post COVID-19 world.
- Companies will be faced with the realities of reconfiguring space to accommodate proper social distancing. Landlords will be faced with significant capital spending requirements to enhance building safety. Employees will be faced with the prospect of being in close physical proximity to a large group of people and, in some cases, utilize public transportation to get to work.
- Some markets will benefit from an inflow of jobs leaving more dense markets. Suburban office could see a revitalization. Newer, more environmentally sustainable buildings could see increased demand and pricing power while older, lower quality buildings could realize lower demand and significant capital and leasing costs.
- Some industries are more conducive to an office setting and owners of buildings housing those industries will likely fare better than their peers who focus on industries that can tolerate more flexibility. Landlords that heavily embraced co-working are likely to see significant changes.
- A number of tenants may seek shorter duration leases going forward. This could create challenges for landlords given the capital intensive nature of tenant improvements and leasing commissions. CAPEX cost sharing could become more commonplace in the future.

Guitar legend Joe Satriani's 2018 CD entitled *What Happens Next* was playing in the background as I was pondering the future of US office real estate — while working remotely! In retrospect, it was the perfect CD to be playing as we are all considering that question. The outbreak of the coronavirus (COVID-19) has led to a number of behavioral changes among both employers and employees. One of those key changes has been the number of employees that are working remotely as opposed to in their offices. In an April 2020 report real estate services firm Marcus & Millichap estimated that the number of employees working remotely across the US has grown from 3.5% to 43% (Fig 1). In light of this dramatic increase, a number of questions have been raised as to the future of demand for office space post COVID-19.

Fig 1: The percentage of US employees working remotely over the past five years and currently



Source: Marcus & Millichap, UBS

Summary

The future of office space demand is one of the most debated topics among investors, landlords, tenants and the press. To read some articles and research reports, one would believe that future of office demand is bleak as we will all be working remotely forever. To listen to some industry participants one would believe that as soon as shelter in place orders are lifted we will all run back to our offices at warp speed. As we discuss below, the range of outcomes is likely much more complex than these diametrically opposed views.

Companies will be faced with the realities of reconfiguring space to accommodate proper social distancing. Landlords will be faced with significant capital spending requirements to enhance building safety. Employees will be faced with the prospect of being in close physical proximity to a large group of people and, in some cases, utilize public transportation to get to work.

Some markets will benefit from an inflow of jobs leaving more dense markets. Suburban office could see a revitalization. Newer, more environmentally sustainable buildings could see increased demand and pricing power while older, lower quality buildings could realize lower demand and significant capital and leasing costs. Rents in some markets could go up for some asset classes and could be pressured (severely in some cases) for less desirable assets in less desirable markets.

Some industries are more conducive to an office setting and owners of buildings housing those industries will likely fare better than their peers who focus on industries that can tolerate more flexibility. Landlords that heavily embraced co-working are likely to see significant changes. We do believe that the flexible space model makes sense for some companies. However, it is highly likely that the current co-working business models are generally sub-optimal for the post COVID-19 world.

In short, we believe it is too early to write the epitaph for the entire office sector as a number of counterbalancing forces are at work. That said, the only constant in the office market going forward will be change. Landlords, companies and tenants alike will all be forced to improvise, adapt and overcome a number of challenges.

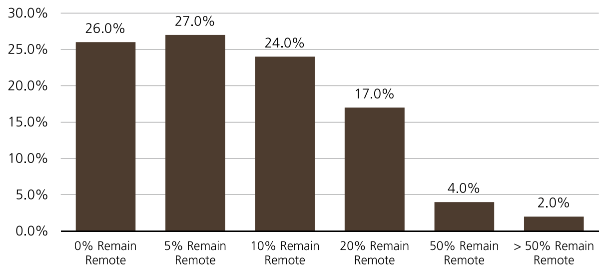
Not so long ago in a city not far away...

- In a 16 April 2020 interview with Bloomberg Television, Morgan Stanley CEO James Gorman said "we've proven we can operate with effectively no footprint. Can I see a future where part of every week, certainly part of every month, a lot of our employees will be at home? Absolutely." Gorman went on to say that Morgan Stanley may come out of the pandemic with "much less real estate."
- At the recent Berkshire Hathaway annual meeting chairman and CEO Warren Buffett said "a lot of people have learned they can work at home, or that there's other methods of conducting their business than they might have thought from what they were doing a couple of years ago. When change happens in the world you adjust to it."
- Nationwide Insurance recently announced that the company will exit most of their buildings outside of four main campuses by 1 November 2020 and move associates in these locations to permanent remote working status. Effectively Nationwide is transitioning to a hybrid operating model that comprises primarily

working-from-office in four main corporate campuses and working-from-home in most other locations. – Source: Insurance Journal, 30 April 2020.

With headlines such as these it is little wonder the future of the traditional office is under significant scrutiny. A recent survey by Gartner, Inc. of 317 CFOs and finance leaders yielded results that further heightened the scrutiny. According the survey 74% of the respondents indicated that some percentage of their employees would remain working remotely post COVID-19 with 24% predicting at least 10% of employees would remain remote and 23% predicted 20% or more would remain remote (Fig 2).

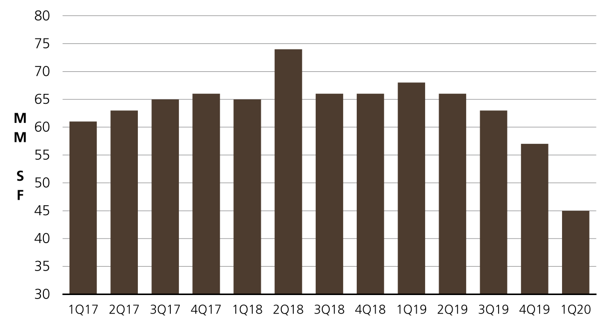
Fig 2: Survey results of 317 CFOs and finance leaders on future remote working plans



Source: Gartner Inc, UBS

Separating emotion from practicality
During a crisis it is very common for people to make declarative statements regarding future behaviors. It is likely that there will be a number of behavioral changes in the post COVID-19 world including how office space is utilized. That said there may be some counterbalancing forces that could challenge "the office is dead" narrative. No one can argue with the COVID-19 impact on office leasing (Fig 3) although we note the pace of leasing had already begun to slow in 4Q 2019.

Fig 3: US office leasing trends by quarter 2017-19 (MM square feet)



Source: JLL, UBS

One of the counterbalancing forces we believe could help offset a potential decline in the percentage of people going to the office is de-densification. Over the past 20 years the average allocated square footage per employee has steadily declined from over 250 square feet to less than 150 square feet. This densification has become even more extreme in the co-working space (to be discussed in more detail below) resulting in allocated per employee as low as 60-75 square feet. The social distancing requirements that have developed as a result of COVID-19 are likely to reverse the densification trend as companies grapple with the realities of reconfiguring office space to accommodate appropriate distance levels between employees, between walkways and employees, evaluating the use of barriers vs. wider spacing and how to handle common spaces. As a result, it is possible that a reduced number of employees could still require a significant amount of square footage.

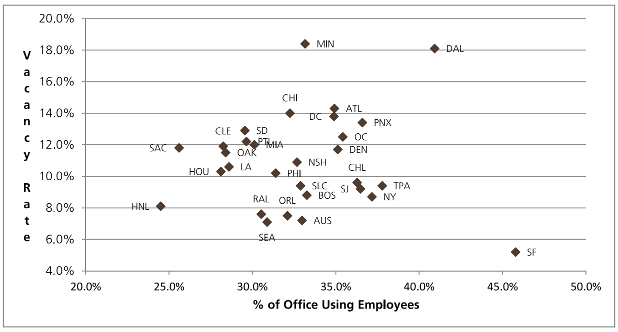
Another change that could occur is the elimination of hot desking (sometimes referred to as hotel desking). This is where employees do not have assigned desks/ workstations, and they utilize any open seating area and plug in the laptops. In a post COVID-19 world there may be a reluctance on the part of employees to utilize a space when they are unsure of the hygiene of the previous user and how thoroughly it has been cleaned. What is currently unknown is whether this would lead to more remote working or a move back to assigned workstations.

One point that should not be underestimated is the difficulty in actually executing a footprint alteration to conform office space with evolving social distancing requirements. Removing desks/workstations and staggering the number of employees is likely relatively straightforward. However, when it comes to retrofitting offices for automatic fixtures and doors, increasing the width of corridor space between work spaces, reconfiguring conference and common are space, adding barriers between desks, etc could be very time-consuming and expensive. Should this prove to be the case, remote work policies could be in place significantly longer than when certain cities begin to "normalize."

Are certain cities potentially more at risk for a remote working?
In Fig 4, we plot 30 cities in the US that have a significant portion of their employment in office-using jobs against their current vacancy rates. Cities with elevated percentages of office using jobs and vacancy rates include Dallas, Minneapolis, Atlanta, Phoenix, Chicago and Washington DC. Although San Francisco has the highest

percentage office-using employees, it is an exceptionally tight market with a vacancy rate around 5%. (For detailed data on the top 63 office markets in the US please see Fig 12 on page 8.)

Fig 4: 30 US cities with a significant portion of office using activities vs. their vacancy rates



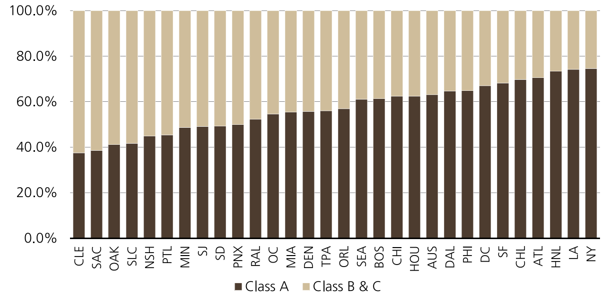
Source: CBRE, UBS

Are certain industries potentially more (or less) likely insulated from remote working?
In our view certain industries are more likely to continue utilizing office space including technology, life sciences, securities trading and government-oriented functions. Alternatively, those industries that have a high percentage of "dynamic" workers (those that spend significant amount of time out of the office) including consulting, accounting, real estate brokerage and sales-based organizations could realize substantial value by shrinking their office footprints.

Age and building quality could be a significant differentiating factor
Newly constructed and newly renovated building are likely to be more in demand by tenants as many already contain some features tenants will require in the post COVID-19 world, particularly as it pertains to automation, air filtration and other environmental/sustainable features. Although these building will still require additional capital spending to address certain COVID-specific issues, the overall level of incremental capital spending could be lower.

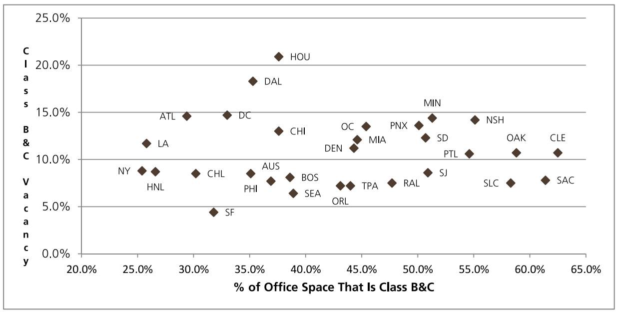
To that end we examined the mix of office stock for 30 of the largest office using cities in the US by class A and class B/C (Fig 5) and the vacancy rate for class B/C buildings for those cities (Fig 6). In our view, a higher concentration of lower quality properties combined with a higher vacancy could be an incremental negative for office demand in those cities post COVID-19.

Fig 5: Mix of class A vs. class B/C office space for 30 US cities with a significant portion of office using activities



Source: CBRE, UBS

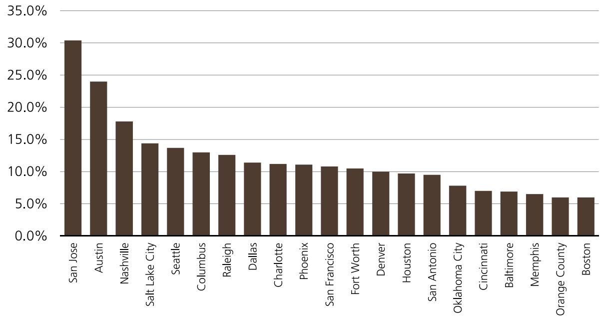
Fig 6: Percent of office space that is class B/C vs the class B/C vacancy rate for 30 US cities with a significant portion of office using activities



Source: CBRE, UBS

Taking the analysis one step further we examined the markets that had the higher proportion of cumulative new office construction as a % of existing inventory over the past five years (Fig 7). The theory being that the more modern the space the more desirable it might be to tenants. Not surprisingly several cities on the list are hotbeds of strong technology job growth (San Jose, San Francisco, Boston, Seattle, Denver). However, what we found particularly interesting was the number of cities that were located in secondary markets. One of the key trends in the US over the past several years has been the migration of population and jobs from higher cost states (particularly in the East and Midwest) to lower cost states in the sunbelt and southwest. The draw of more favorable business climates and living costs in many of these cities is likely to be amplified by the higher level of newer, sustainable and more cost effective office space.

Fig 7: US cities with the highest percentage of new capacity built over the past five years



Source: CBRE, UBS

Can companies build an effective culture in a world dominated by remote working?

There are a number of benefits to having employees gather in an office setting including culture building, efficiency optimization, socialization, creative collaboration, talent mentoring and building camaraderie across disparate functions. Although many companies employed technology to effectively collaborate and communicate with co-workers and customers, there is real value to social proximity. This is going to be a navigational challenge for companies as they balance the needs of the organization against the realities of social distancing.

On a related topic, is office space necessary to attract and retain talent? There is likely no one right answer to this question. Certain industries rely more heavily on in-person collaboration and could face recruiting and retention challenges if they lack the properly amenitized space. In addition, many employees are focused on creativity and sustainability and are drawn to companies that have office space that comport with their objectives. That said certain industries have been able to attract talent specifically as a result of flexible, remote working policies. Going forward offering more flexible work policies could be a key retention and recruiting tool.

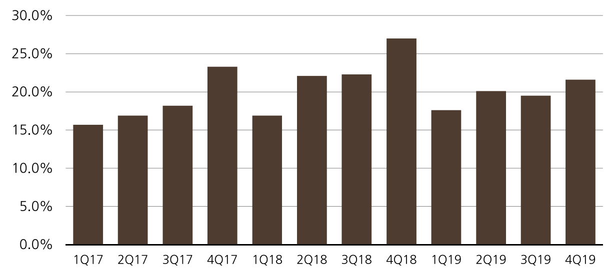
Reconfiguration is expensive — who is going to pay for it?

Real estate already represented a significant operational cost to companies prior to COVID-19. There are a number of physical and structural changes that are going to be required in building including, but not limited to:

- Thermal scanners
- Upgraded air filtration systems
- More frequent and more professional cleaning
- Wider personal and aisle spacing
- Voice-activated technology for many devices
- Antimicrobial furniture
- Potential elevator reconfiguration
- Touchless appliances and bathroom fixtures
- Potential reconfiguration of conference room and communal spaces

All of these changes will involve significant capital spending. The ultimate question is who will pay for it? Will it be split between landlord and tenant? The office business is a capital intensive business to begin with. Fig 8 highlights the quarterly trend of CAPEX as a % of net operating income (NOI) for a group of 17 publicly traded CBD and suburban office REITs. As the data indicate, the office REITs are already spending a significant portion of their NOI on CAPEX. If the landlords are forced to absorb all the costs associated with realities of the post COVID-19 world, free cash flow could be negatively impacted, particularly if they are unable to pass those costs along in the form of higher rent.

Fig 8: CAPEX as a percentage of net operating income for a select group of publicly traded office REITs 2017-2019



Source: Company data, UBS

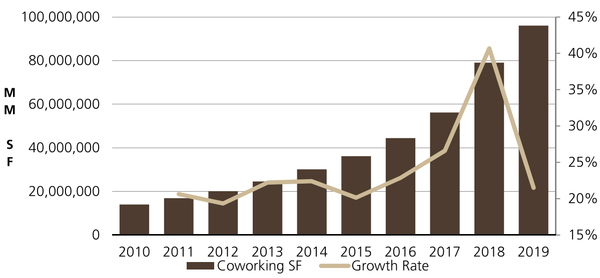
Will there be a revitalization of the suburban office market?

This is a trend that is certainly possible, particularly for more dense cities with a high percentage of daily commuters that utilize public transportation. Companies that elect to have a portion of their employees work remotely could utilize overflow space in suburban locations and outlying submarkets. Suburban office space tends to be significantly less expensive than urban space. In addition, employees wary of commuting on public transportation may value the driveability/walkability of a suburban location.

Will tenants seek shorter lease durations?
This is a difficult question to answer. Historically, office leases have run 10+ years with some running significantly longer. In the pre-COVID world the certainty of cash flows from the landlord's (and lender's) perspective and visibility of expenses from the tenant's perspective were valuable planning tools. Although landlords and lenders are still going to prefer longer duration leases, it is unclear how tenants will respond as their current leases approach their end of term. On one hand, moving is extremely costly and disruptive. On the other, tenants may value the added level of flexibility that shorter duration leases provide, particularly if they elect to flex their square footage needs around the country.

Co-working — the 800 pound gorilla in the office
Although not a new concept, the use of co-working or flex space skyrocketed in the US over the past decade (Fig 9) as companies including WeWork, Knotel, Convene, Impact Hub, Regus/IWG and Industrious (among others) invested heavily in office-as-a-service concept.

Fig 9: Co-working share of US office occupancy 2010-2019



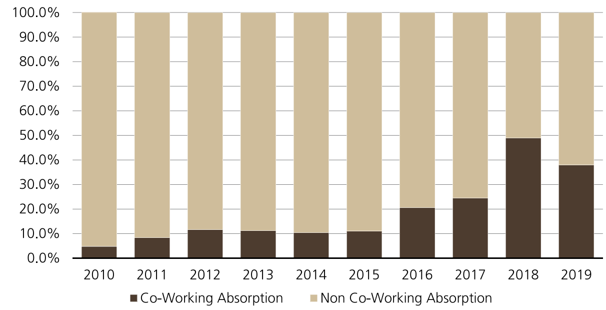
Source: JLL, UBS

We believe there is still a place for the co-working model — larger enterprises value the flexibility co-working offers and smaller/startup businesses benefit from lower capital costs and access to services and technology. However, it is highly likely that the co-working model will see significant changes going forward including:

- a reversal of the densification trend;
- a re-design (and even potential elimination) of the common space that featured beer taps, baristas, arcade games and communal meeting spaces (can anyone say 1999!). The realities of the environmental challenges post COVID-19 are likely to make this communal space more challenging to operate;
- more frequent, more professional cleaning services are going to be required to attract tenants;
- business models will need to evolve to give landlords more comfort in the co-working operator's ability to meet its obligations. More scrutiny of balance sheets, cash flow and tenant quality will likely ensue. It is also possible that there could be a shift from leasing space to revenue sharing or management agreements with landlords;
- landlords, particularly public REITs may re-think their desire to partner with co-working companies.

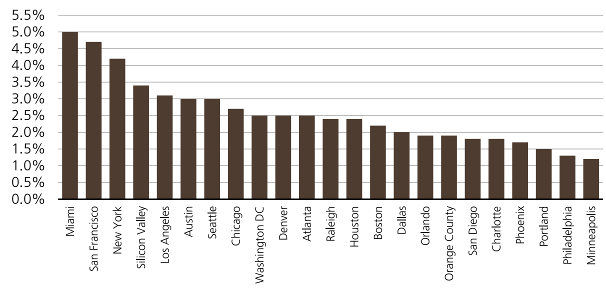
Despite its rapid growth, co-working still represents a relatively small portion of the overall office leasing across the US, well below 5% nationally. However, as the data in Fig 10 indicate co-working accounts for a very significant portion of US office leasing in the past several years. Should there be a significant disruption in the co-working market, office market absorption could be pressured. In addition, the percentage of co-leasing varies widely by market (Fig 11). It will be interesting to see how these figures evolve in the new world order of office usage.

Fig 10: Net square footage absorption by co-working operators 2010-2019



Source: JLL, UBS

Fig 11: Co-working penetration by market - percentage of office space occupied by co-working



Source: JLL, UBS

What is the outlook for rent growth and new development?

If there is a bright spot in the current turmoil it is that the risk of overbuilding office space is reduced substantially. We have heard from a number of office REITs who have indicated that unless a development project is well underway new developments will put on hold for the foreseeable future.

The outlook for future rents is likely to be very market and quality specific. As we discussed previously there is likely to be a greater focus on newer, more modern buildings and the potential for increased demand for suburban office. If this proves to be the case, then certain markets could see increasing rents in these asset classes. Conversely, markets that have a greater concentration of older, lower quality assets and/or focus on those industries that are more conducive to remote working could see rent pressures. In addition, the trend of moving portions of employees/ operations to lower cost geographies could accelerate given the growing concerns of being located in densely populated cities. This is particularly true for those cities that are located in states that are considered business, tax and regulatory unfriendly.

What about the outlook for ancillary revenues?

Many office building receive a portion of their revenues from ancillary services such as retail and parking. Given the current shelter in place restrictions many office building owners have cited significantly reduced parking and retail revenues. Parking costs and retail rents in many larger cities can be quite high. Although they generally represent a small percentage of overall revenue, expanded remote working policies or outmigration from larger cities could represent an additional headwind to office landlords.

Fig 12: Select operating statistics for the top 63 US office markets - Sorted by of office using employment as a percentage of total employment. Data as of 4Q 2019

	Office Using Employment				Vacancy		% of Total Office SF		Vacancy		5 Year New
Market	in 000	As a % of Employment	Total Office SF (000)	Total	Downtown	Suburban	Class A	Class B/C	Class A	Class B/C	Capacity
San Francisco	604	45.8%	100,303	5.2%	3.6%	6.8%	68.2%	31.8%	8.7%	4.4%	10.8%
Dallas	1,129	40.9%	176,180	18.1%	23.3%	17.2%	64.7%	35.3%	18.8%	18.3%	11.4%
Wilmington, DE	148	40.0%	13,227	11.4%	15.0%	8.3%	71.8%	28.2%	10.4%	12.6%	3.1%
Stamford	171	39.0%	34,191	13.3%	#N/A	13.3%	73.0%	27.0%	10.0%	16.1%	1.9%
Tampa	526	37.8%	40,634	9.4%	7.1%	9.9%	56.0%	44.0%	11.8%	7.2%	2.3%
New York	2,698	37.2%	504,446	8.7%	7.4%	14.1%	74.6%	25.4%	8.6%	8.8%	2.6%
Phoenix	802	36.6%	87,926	13.4%	18.4%	12.3%	49.9%	50.1%	13.9%	13.6%	11.1%
San Jose	427	36.5%	57,435	9.2%	13.3%	8.6%	49.1%	50.9%	9.5%	8.6%	30.4%
Charlotte	454	36.3%	51,269	9.6%	6.2%	11.7%	69.8%	30.2%	11.5%	8.5%	11.2%
Jacksonville	261	35.8%	22,865	14.4%	14.1%	14.6%	50.7%	49.3%	15.1%	13.0%	5.2%
Orange County	597	35.4%	77,132	12.5%	#N/A	12.5%	54.6%	45.4%	10.7%	13.5%	6.0%
Fort Lauderdale	310	35.4%	28,842	10.2%	12.5%	9.6%	52.7%	47.3%	11.0%	11.0%	3.5%
Hartford	230	35.3%	25,564	18.3%	18.3%	18.2%	54.8%	45.2%	18.7%	17.9%	0.0%
Denver	653	35.1%	104,722	11.7%	12.4%	11.5%	55.7%	44.3%	12.8%	11.2%	10.0%
Atlanta	1,002	34.9%	146,566	14.3%	10.7%	15.4%	70.6%	29.4%	14.0%	14.6%	4.5%
Washington, DC	1,173	34.9%	319,942	13.8%	11.3%	15.3%	67.0%	33.0%	14.3%	14.7%	4.4%
Richmond	233	33.8%	27,624	7.8%	#N/A	#N/A	47.1%	52.9%	7.3%	8.1%	3.2%
West Palm Beach	219	33.7%	24,799	11.6%	#N/A	11.6%	49.0%	51.0%	10.3%	12.4%	2.0%
Kansas City	378	33.7%	48,343	10.3%	11.1%	10.1%	37.6%	62.4%	10.5%	10.6%	4.5%
Columbus	377	33.6%	34,031	11.6%	9.7%	12.5%	53.0%	47.0%	13.9%	11.7%	13.0%
Trenton	94	33.3%	11,858	11.6%	#N/A	11.6%	68.8%	31.2%	9.3%	11.9%	2.4%
Boston	1,148	33.3%	196,046	8.8%	4.4%	11.2%	61.4%	38.6%	10.5%	8.1%	6.0%
Minneapolis	671	33.2%	70,346	18.4%	22.3%	15.1%	48.7%	51.3%	22.0%	14.4%	2.8%
Newark	412	33.0%	60,858	16.8%	#N/A	16.8%	71.7%	28.3%	14.7%	16.6%	1.6%
Austin	365	33.0%	49,759	7.2%	6.3%	7.4%	63.1%	36.9%	8.1%	7.7%	24.0%
San Antonio	360	32.9%	28,583	14.0%	11.1%	14.6%	43.0%	57.0%	15.5%	13.3%	9.5%
Salt Lake City	340	32.9%	36,191	9.4%	10.2%	9.1%	41.7%	58.3%	10.4%	7.5%	14.4%
Nashville	341	32.7%	40,414	10.9%	7.1%	12.0%	44.9%	55.1%	10.3%	14.2%	17.8%
Chicago	1,584	32.3%	242,974	14.0%	10.5%	18.6%	62.4%	37.6%	15.7%	13.0%	4.9%
Orlando	437	32.1%	38,382	7.5%	7.8%	7.4%	56.9%	43.1%	9.4%	7.2%	4.0%
Philadelphia	823	31.4%	115,064	10.2%	7.3%	11.5%	64.9%	35.1%	11.3%	8.5%	4.4%
Detroit	722	31.2%	72,040	13.3%	9.8%	14.0%	43.2%	56.8%	13.3%	12.1%	1.7%
Seattle	658	30.9%	99,655	7.1%	6.1%	8.3%	61.1%	38.9%	8.2%	6.4%	13.7%
Cincinnati	351	30.8%	37,185	12.4%	7.1%	15.4%	56.7%	43.3%	9.7%	14.1%	7.0%
St. Louis	435	30.6%	44,371	13.0%	21.8%	9.2%	63.3%	36.7%	10.1%	14.6%	2.8%
Raleigh	297	30.5%	60,680	7.6%	5.3%	7.8%	52.3%	47.7%	7.3%	7.5%	12.6%
Miami	373	30.1%	46,967	12.0%	16.7%	9.7%	55.4%	44.6%	11.6%	12.1%	5.5%
Pittsburgh	359	30.1%	82,127	10.9%	12.4%	9.5%	40.0%	60.0%	8.2%	15.1%	3.0%
Indianapolis	324	29.8%	34,158	13.9%	12.4%	14.7%	56.3%	43.7%	13.3%	13.4%	5.6%
Portland	365	29.6%	48,623	12.2%	13.3%	11.5%	45.4%	54.6%	12.4%	10.6%	4.7%
Baltimore	425	29.5%	63,393	12.9%	16.9%	12.1%	59.1%	40.9%	13.3%	12.8%	6.9%
San Diego	436	28.6%	58,794	10.6%	13.2%	10.2%	49.3%	50.7%	11.4%	12.3%	3.8%
Los Angeles	1,307	28.4%	188,499	11.5%	14.9%	10.7%	74.2%	25.8%	12.2%	11.7%	3.5%
Oakland	342	28.3%	54,710	11.9%	13.0%	11.6%	41.2%	58.8%	11.8%	10.7%	4.5%
Cleveland	401	28.1%	52,251	10.3%	12.5%	9.3%	37.5%	62.5%	9.3%	10.7%	2.4%
Houston	896	28.0%	174,391	21.0%	22.4%	20.7%	62.4%	37.6%	23.6%	20.9%	9.7%
Milwaukee	242	27.3%	37,813	15.1%	#N/A	#N/A	32.7%	67.3%	14.2%	16.8%	2.5%
Louisville	201	27.1%	33,302	6.9%	#N/A	#N/A	30.3%	69.7%	5.0%	10.7%	3.0%
Albuquerque	108	27.1%	13,083	18.0%	23.7%	16.5%	10.3%	89.7%	19.4%	8.1%	0.5%
Las Vegas	279	26.8%	34,012	13.0%	17.9%	12.6%	17.0%	83.0%	12.6%	13.0%	3.8%
Norfolk	209	26.1%	29,876	9.3%	11.7%	8.9%	37.7%	62.3%	8.3%	8.4%	2.0%
Ventura	82	26.1%	6,297	14.9%	#N/A	14.9%	32.7%	67.3%	12.0%	19.0%	2.2%
Sacramento	263	25.6%	43,982	11.8%	10.9%	12.0%	38.6%	61.4%	13.4%	7.8%	1.5%
Memphis	168	25.4%	28,712	12.2%	13.6%	11.7%	34.0%	66.0%	13.4%	9.4%	6.5%
Albany	120	25.2%	32,876	5.4%	#N/A	#N/A	13.7%	86.3%	5.5%	3.3%	1.0%
Tulsa	114	24.9%	29,183	14.5%	10.2%	17.6%	26.7%	73.3%	16.9%	14.0%	3.1%
Oklahoma City	163	24.6%	28,004	14.0%	#N/A	#N/A	21.5%	78.5%	11.3%	23.3%	7.8%
Honolulu	119	24.5%	11,173	8.1%	7.6%	8.7%	73.4%	26.6%	10.9%	8.7%	0.0%
Tucson	96	24.4%	9,500	12.0%	15.4%	11.7%	47.3%	52.7%	13.4%	9.2%	3.7%
Fort Worth	259	23.8%	28,618	17.8%	17.8%	17.8%	42.6%	57.4%	15.7%	20.0%	10.5%
Long Island	320	23.8%	31,463	7.4%	#N/A	7.4%	59.2%	40.8%	9.0%	7.0%	0.0%
Toledo	61	19.6%	10,137	5.7%	7.4%	4.3%	22.4%	77.6%	4.0%	11.0%	2.1%
Riverside	261	16.8%	23,846	9.1%	#N/A	9.1%	36.6%	63.4%	7.8%	9.8%	0.3%

Source: CBRE, UBS

Appendix

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