

Savills Studley Report

National office sector

Q2 2017



SUMMARY

Market Highlights

AVAILABILITY RATES INCH LOWER

The national overall availability rate ticked down from 17.1% to 17.0%. Most markets posted minor changes, but the availability rate in Chicago's CBD jumped by 120 basis points to 16.1%. In contrast, Baltimore's overall availability rate dipped by 80 basis points to 17.2%.

ASKING RENTS STABLE

On a quarterly comparison, the national overall asking rent inched up by only 0.4% to \$33.13. Asking rent increased in the majority of markets, with sharper increases in Charlotte (+6.2% to \$24.37) and Phoenix (+4.7% to \$24.53). In contrast, asking rent

in Manhattan fell by 0.7% to \$74.73 - but its rent has increased by 3.0% year-on-year.

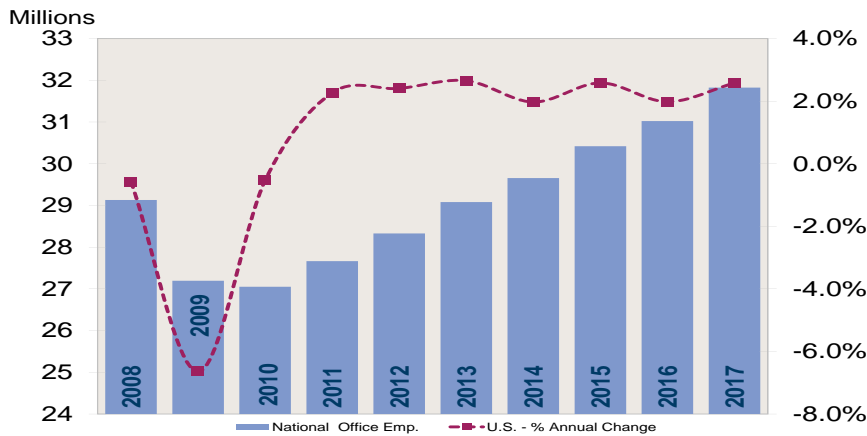
TRAILING LEASING SLIDES LOWER

National four-quarter trailing leasing (the sum of activity over the last four quarters) declined quarter-on-quarter by 4.2% to 218.4 msf. Trailing leasing has declined five consecutive quarters.

"Technological displacement of workers in the industrial and retail sectors is a well-traveled road. Algorithms and machine learning have been slowly thinning the ranks of business services employees for the last two cycles. Now, artificial intelligence is just starting to scratch the surface in terms of challenging the skills of human workers."

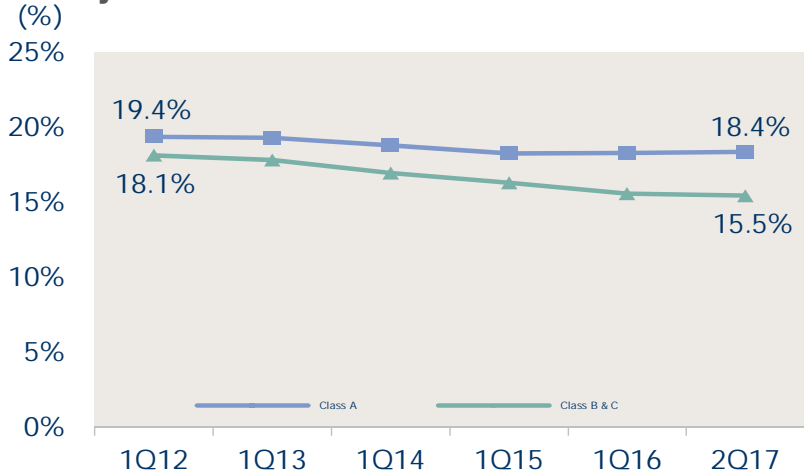
Keith DeCoster, Savills Studley Research

Office-Using Employment Trends

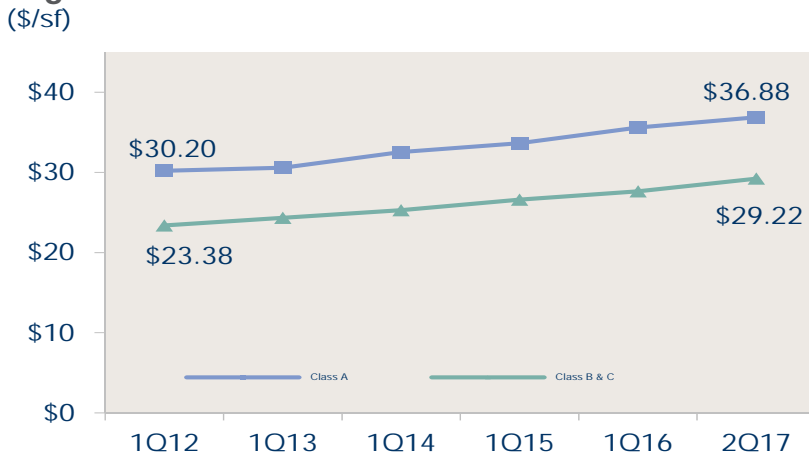


Source: Bureau of Labor Statistics

Availability Rate Trends



Asking Rent Trends



Rise of the Algorithms

The origins of robots can be found in the human search for amusement. Automaton, one of the first precursors to robots, were designed centuries ago. In 1562, clockmaker Juanelo Turriano was commissioned by Emperor Charles V of Spain to design a miracle – the result was a miniature “monkbot” that repeatedly offered penitence. In 17th century Japan, karakuri puppets performed amusing movements or served tea. Coined by Czechoslovakian writer and painter Josef Copek, the term robot is less than a century old. It has been embedded in our imagination much more recently thanks to writers such as Isaac Asimov and science fiction films. Today everyone is either a tither or agog about the rise of the machines – no longer just props in science fiction films, they are a key component in manufacturing, warehousing/ logistics and military operations.

Necessity is the mother of invention. The first wide-scale use of automated machinery came during war-time – not just at the battlefield, but on the homefront – often in response to a depleted workforce. During the American civil war, European demand for wheat and other grains was still strong. McCormick began manufacturing self-rakes in 1861. The machine could cut on average two acres per hour and yield 25 bushels. In contrast a person raking by hand typically had to stop every five to 10 minutes to rest.

Tech Enabled or Tech Displaced?

The distinction between technology that enhances the performance of a worker, and innovation that replaces them is critical. Industries with the most extreme labor shortages are among the top investors in innovations that alleviate labor shortages. The U.S. Bureau of Labor Statistics recently estimated a shortfall of 50,000 truck drivers. So far the trucking industry has been focused largely on using driver-enhancing technology such as telematics that monitors operators' driving performance and the condition of vehicles. Driverless vehicles could sharply reduce the need for a human operator. A joint report issued by four European transport firms in 2017 estimated that 50% to 70% of truck driving jobs will be eliminated in the U.S. and Europe due to self-driving technology by 2030.

Amazon has supplanted Walmart as the top employer in many secondary markets. They have about 230,000 people on their payroll, but the ratio of robots to humans is rising. As of year-end 2016 Amazon

reportedly employed 45,000 robots in its 20 fulfillment centers, up from 30,000 a year before. Amazon and other ecommerce firms are finetuning the science of reducing production and delivery costs. The U.S. retail workforce is vulnerable to extensive reduction as self check out, digital price tags and order ahead/curbside pickup - as well as others innovation yet to come - are implemented.

Everyone Has An Algorithm

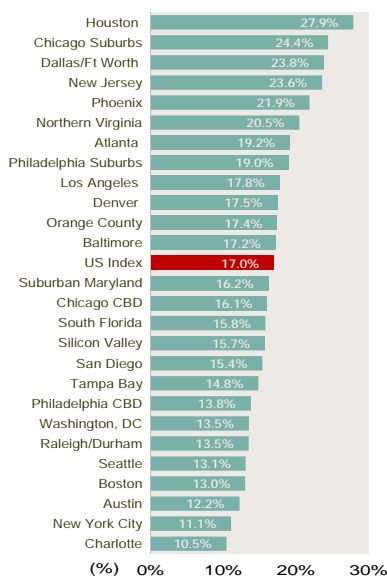
The path from driverless trucks to the elimination of 1.7 million trucking jobs is easy to see -- assuming legal and regulatory obstacles can be overcome. The impact of machine learning on the office workforce is not as transparent. An industrial robot on a car assembly line repeats the same steps with precision. Web crawlers (also known as internet bots) can sift through millions of pages looking for key terms and patterns, eliminating thousands of manpower hours. Everyone seems to have an algorithm, and if they don't they should be looking over their shoulder. Many media outlets such as Fox News and AP have been using software that automatically generate basic news reports for the last several years. Data analytics software and enterprise systems are reducing the number of people needed to assemble data. The days of making phone calls or site visits as well as logging data are dwindling thanks to crowdsourced data, IoT and telematics that stream updates.

The next frontier is artificial intelligence (A.I.) and deep learning – neural networks and droids that can filter and interpret data, and most importantly learn on their own. Consulting firm Forrester predicts that 6% percent of U.S. jobs will be displaced by artificial intelligence. Tel Aviv-based startup Workey is replacing headhunters with AI that anonymously matches candidates with companies. Users create an anonymous profile and Workey's A.I. finds positions that align with their skills and background

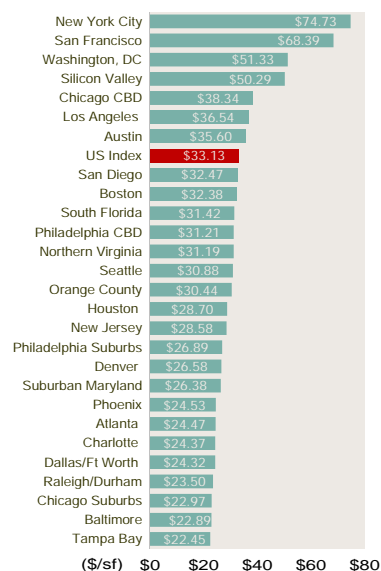
The rapid innovation in fintech has contributed to substantial workforce reduction at major banks. The proliferation of on-line equity trading platforms has thinned the rosters of brokers simply placing trades and diminished their hold on exclusive information. Alternative lenders such as Rocket Mortgage, SoFi and Avant have forced traditional banks to implement major efficiency campaigns that streamline and automate trading, currency exchanges and other basic transactions.

Obsolescence can come in a blink of an eye. Loyal3, one of the first on-line trading apps

Availability Rate Comparison



Rental Rate Comparison



Major Savills Studley Transactions

Tenant	Sq Feet	Address	Market Area
TPE Acquisition Inc	449,049	501 South Cheryl Lane	Los Angeles
CH Robinson Worldwide Inc	242,900	18260 Harmon Ave	Los Angeles
Cylance Inc	133,324	400 Spectrum Center Dr	Orange County
Liberty Mutual Insurance Company	115,654	24001 E Mission Ave	Spokane
ZNAT Insurance Company Inc	102,500	505 East Marine	Seattle
CareMore Health System Inc	80,821	12898 Towne Center Dr	Los Angeles
Panasonic Avionics Corporation	74,994	26110, 26140 & 26160 Enterprise Way	Orange County
City of Hope	74,925	4900 Rivergrade Rd	Los Angeles
Liberty Mutual Insurance Company	60,265	24041 E Mission Ave	Seattle
3M Company	60,000	9504 Rodney St	Charlotte

to give small investors access to a limited number of IPOs, shut down operations in May. They were yet another casualty of Robinhood – the trading app, which launched in 2013, allows investors to make commission-free stock trades on all equities.

There is a tendency to exaggerate both the potential gains and threats posed by artificial intelligence. Complex legal and banking transactions require the experience and expertise of seasoned professionals. The simplest transactions – wills, apartment leases and separations – are being absorbed by online sites.

Siri, Alexa and Erica - Chat Amongst Yourselves

Replacing a headhunter with A.I. or a bank teller with a voice-activated assistant has a lot of implications for the workforce. It also seems very impersonal, but for both the employer and the customer, part of the selling point of the automated option is that it lacks the complicating layer of

personality. Humans are costly, they make demands and mistakes. Language itself is a big hurdle – mistakes are often attributed to miscommunication. Listening is more than half the battle, people have a mind of their own, after all. Bank of America recently launched Erica, a chatbot that will use AI, predictive analytics and cognitive messaging to help customers make payments and offer helpful tips on how to save money.

A.I. seems to be recognizing inefficiencies of language. Facebook recently unplugged chatbots that had created their own language as a more efficient substitute for English. The so-called “dialogue agents” also learned negotiating techniques as they repeatedly bargained for various items. Voice recognition devices do not work perfectly – but SIRI and Alexa do not willfully mishear voice commands, at least not yet. To the extent that these innovations become widespread it will spawn a skills battle – workers will have to constantly refresh their abilities – the days of building a career on harvesting data may be numbered.

	Submarket	Total	Leasing Activity			Available SF			Availability Rate			Asking Rents Per SF		
			SF (1000's)	Last 12 Months	This Quarter	% Change from Last Qtr.	Year Ago	This Quarter	PP Change from Last Qtr. ⁽¹⁾	Year Ago	This Quarter	% Change from Last Qtr.	Year Ago	
	Atlanta	165,742	7,203	31,817	-0.4%	32,879	19.2%	-0.1%	19.8%	\$24.47	1.9%	\$21.95		
	Atlanta - Class A	98,555	4,386	18,388	2.4%	18,027	18.7%	0.4%	18.3%	\$27.47	1.0%	\$26.04		
	Austin	68,465	4,348	8,384	-2.8%	9,516	12.2%	-0.4%	14.0%	\$35.60	4.8%	\$31.42		
	Austin - Class A	30,549	2,646	4,444	-0.6%	5,072	14.5%	-0.2%	16.8%	\$40.62	4.3%	\$36.29		
	Baltimore	110,791	4,954	19,060	-4.8%	20,420	17.2%	-0.8%	17.8%	\$22.89	-1.6%	\$22.58		
	Baltimore - Class A	47,718	2,624	10,556	-5.1%	10,846	22.1%	-1.0%	21.2%	\$26.86	10.3%	\$24.25		
	Boston	287,852	12,546	37,510	-5.1%	41,204	13.0%	-0.8%	14.4%	\$32.38	-0.5%	\$29.54		
	Boston - Class A	136,254	6,833	20,004	-2.5%	21,288	14.7%	-0.4%	15.6%	\$40.87	2.7%	\$37.76		
	Charlotte	91,758	4,200	9,620	-5.8%	10,681	10.5%	-0.6%	11.6%	\$24.37	6.2%	\$20.48		
	Charlotte - Class A	48,882	1,892	6,265	-3.1%	6,638	12.8%	-0.4%	13.6%	\$27.50	5.3%	\$23.21		
	Chicago CBD	145,947	15,616	23,470	7.5%	22,291	16.1%	1.2%	15.2%	\$38.34	0.8%	\$37.45		
	Chicago - Class A	70,066	9,473	11,374	6.0%	11,118	16.2%	0.6%	16.2%	\$43.43	0.8%	\$41.87		
	Suburban Chicago	115,809	5,080	28,301	-0.7%	28,212	24.4%	0.6%	23.6%	\$22.97	0.4%	\$22.45		
	Suburban Chicago - Class A	63,095	3,255	16,525	-0.3%	16,660	26.2%	-0.1%	26.5%	\$25.79	0.5%	\$25.25		
	Dallas/Fort Worth	218,503	14,788	52,077	0.9%	46,168	23.8%	-0.6%	22.0%	\$24.32	-0.5%	\$24.04		
	Dallas/Fort Worth - Class A	123,951	9,131	30,223	0.7%	25,889	24.4%	-1.5%	22.4%	\$26.24	-0.5%	\$25.87		
	Denver	117,445	7,839	20,499	3.8%	20,328	17.5%	0.4%	17.6%	\$26.58	1.5%	\$26.32		
	Denver - Class A	51,144	4,101	10,367	6.5%	10,017	20.3%	0.6%	20.3%	\$29.66	0.4%	\$30.57		
	Houston	187,166	8,113	52,235	-0.1%	50,182	27.9%	0.8%	26.0%	\$28.70	0.2%	\$29.40		
	Houston - Class A	108,125	4,418	33,236	4.2%	30,465	30.7%	0.2%	29.2%	\$33.31	-1.5%	\$35.08		
	Los Angeles	206,685	16,543	36,695	-1.2%	36,085	17.8%	-0.2%	17.5%	\$36.54	-1.7%	\$36.10		
	Los Angeles - Class A	144,801	12,183	25,397	-1.5%	25,753	17.5%	-0.3%	17.8%	\$38.96	-1.9%	\$38.92		
	New Jersey	145,987	10,355	34,447	0.7%	35,916	23.6%	0.2%	24.4%	\$28.58	-1.8%	\$27.25		
	New Jersey - Class A	119,298	8,621	28,717	0.3%	29,062	24.1%	0.1%	24.3%	\$29.48	-2.4%	\$28.28		
	New York	453,088	28,334	50,338	-1.5%	46,727	11.1%	-0.2%	10.4%	\$74.73	-0.7%	\$72.53		
	New York - Class A	220,354	16,315	29,148	1.2%	25,033	13.2%	0.1%	11.6%	\$83.44	0.1%	\$79.90		
	Orange County	80,520	8,396	14,035	9.5%	14,065	17.4%	1.5%	17.5%	\$30.44	-2.0%	\$29.77		
	Orange County - Class A	42,470	4,557	8,262	4.6%	8,156	19.5%	0.9%	19.3%	\$33.99	0.2%	\$33.23		
	Philadelphia CBD	44,812	3,463	6,184	1.5%	6,228	13.8%	0.2%	13.9%	\$31.21	1.9%	\$29.58		
	Philadelphia - Class A	28,930	2,239	3,800	-0.9%	3,520	13.1%	-0.1%	12.2%	\$32.28	0.8%	\$32.38		
	Suburban Philadelphia	48,612	2,902	9,220	-2.8%	10,699	19.0%	-0.6%	21.1%	\$26.89	4.5%	\$25.86		
	Suburban Philadelphia - Class A	33,417	1,927	5,411	-4.8%	6,795	16.2%	-0.8%	19.3%	\$28.09	4.0%	\$26.93		
	Phoenix	102,497	7,887	22,444	-2.4%	22,964	21.9%	-0.5%	19.4%	\$24.53	4.7%	\$22.12		
	Phoenix - Class A	37,791	3,013	8,111	-3.9%	8,760	21.5%	-0.9%	21.4%	\$28.38	1.4%	\$26.63		
	Raleigh/Durham	53,581	3,635	7,231	-1.1%	7,441	13.5%	-0.6%	14.5%	\$23.50	2.6%	\$22.56		
	Raleigh/Durham - Class A	33,025	2,834	4,527	-0.1%	4,565	13.7%	-0.8%	14.8%	\$26.04	-0.1%	\$24.85		
	San Francisco	79,746	6,158	8,294	4.0%	7,342	10.4%	0.4%	9.2%	\$68.39	5.5%	\$64.01		
	San Francisco - Class A	48,468	3,418	5,453	0.1%	4,734	11.3%	0.0%	9.8%	\$68.92	4.2%	\$65.53		
	San Diego	65,981	5,570	10,146	-8.1%	11,828	15.4%	-1.4%	17.9%	\$32.47	-4.6%	\$32.14		
	San Diego - Class A	29,483	2,094	4,909	-10.9%	5,269	16.6%	-2.0%	17.9%	\$35.64	-5.2%	\$36.79		
	Seattle	119,174	9,033	15,590	-0.3%	16,494	13.1%	-0.1%	14.2%	\$30.88	0.3%	\$30.82		
	Seattle - Class A	57,263	5,336	6,271	1.9%	7,856	11.0%	0.1%	14.4%	\$39.23	1.9%	\$38.73		
	Silicon Valley	81,107	5,836	12,770	2.6%	11,059	15.7%	0.4%	13.7%	\$50.29	5.7%	\$44.14		
	Silicon Valley - Class A	26,237	2,810	5,145	4.4%	4,078	19.6%	0.9%	15.7%	\$50.95	-2.5%	\$46.62		
	South Florida	112,796	6,252	17,858	-2.9%	19,245	15.8%	-0.5%	17.1%	\$31.42	1.1%	\$29.32		
	South Florida - Class A	51,718	3,183	8,739	-2.5%	9,103	16.9%	-0.4%	17.6%	\$35.48	-0.1%	\$34.21		
	Tampa Bay	54,590	3,503	8,095	-1.5%	8,732	14.8%	-0.2%	16.0%	\$22.45	0.9%	\$21.72		
	Tampa Bay - Class A	23,825	1,793	2,933	-4.0%	3,026	12.3%	-0.5%	12.7%	\$26.85	1.2%	\$26.35		
	Suburban Maryland	83,828	4,226	13,620	0.7%	14,603	16.2%	0.1%	17.4%	\$26.38	1.4%	\$26.37		
	Suburban Maryland - Class A	43,104	3,074	7,979	-0.4%	8,779	18.5%	-0.1%	20.4%	\$27.47	1.1%	\$27.20		
	Northern Virginia	168,582	8,570	34,519	-1.4%	35,996	20.5%	-0.3%	21.4%	\$31.19	0.8%	\$30.90		
	Northern Virginia - Class A	97,094	5,940	21,237	-1.3%	22,219	21.9%	-0.3%	22.9%	\$33.24	1.2%	\$32.75		
	Washington, D.C.	130,636	7,768	17,683	5.4%	16,837	13.5%	0.7%	12.9%	\$51.33	Total	\$51.36		
	Washington, D.C. - Class A	73,646	5,196	9,314	4.4%	9,706	12.6%	0.5%	13.2%	\$55.62	0.2%	\$56.58		
	Savills Studley Major Markets Total	3,666,731	219,780	619,366	-0.5%	623,253	17.0%	-0.1%	17.0%	\$33.13	0.4%	\$31.47		
	Savills Studley Major Markets - Class A	1,929,680	132,035	352,663	0.0%	349,086	18.4%	0.0%	18.3%	\$36.39	0.7%	\$35.22		

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(1) Percentage point change for availability rates.

Unless otherwise noted, all rents quoted throughout this report are average asking gross (full service) rents psf.

Statistics are calculated using both direct and sublease information.

Short-term sublet spaces (terms under two years) were excluded.

The information in this report is obtained from sources deemed reliable, but no representation is made as to the accuracy thereof. Statistics compiled with the support of The CoStar Group.

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