

An aerial photograph of a busy port area. In the foreground, several large white gantry cranes are positioned over a ship's deck, which is filled with stacks of colorful shipping containers. The ship is docked at a pier. In the background, a dense city skyline with various skyscrapers is visible under a clear blue sky. The water of the harbor is a deep blue. A semi-transparent blue box is overlaid on the center of the image, containing white text.

INDUSTRIAL REPORT
Spring 2018

Hitting Its Stride

Yardi® Matrix

INDUSTRIAL SPACES



Industrial Sector Hits New Highs in 2017

Momentum to Continue in the Coming Quarters

After being largely bypassed by institutional investors for decades, the industrial sector has attracted new interest in recent years. The sector just posted its second year of record performance across key indicators and is heading for an even stronger 2018.

Behind the newfound attention is tremendous demand for space due to the skyrocketing growth in e-commerce, which relies heavily on fulfillment and distribution facilities near population centers. Institutional investors—both domestic and foreign—have embraced the story and are eager to get into the game in the early stages. According to the most recent MSCI IPD U.S. Quarterly Property Index, the industrial sector's 2017 total return was 12.1%, a figure that has benefited from strong demand for last-mile logistics assets.

Fundamentals back the optimistic outlook. Industrial vacancy rates fell to a record low 5% at year-end 2017, according to Cushman & Wakefield, even as new deliveries accounted for more than 232 million square feet during the year, including both speculative and build-to-suit properties. Meanwhile, rents reached an all-time high of \$5.50 per square foot in fourth quarter 2017, up 5.4% year-over-year from the fourth quarter of 2016.

Atlanta, Chicago and Dallas—three major logistics submarkets—exemplify soaring demand. The three markets combined closed the fourth quarter of 2017 with nearly one-quarter of the total U.S. absorption of 82 million square feet, according to JLL. With more than 22 million square feet of space absorbed, Atlanta achieved a historic low vacancy rate of 7.1% in the fourth quarter of 2017, down from 7.9% a year earlier. Atlanta currently has more than 7 million square feet of industrial space under construction and nearly 25 million square feet in planning, permitting and pre-development stages, according to Yardi Matrix data.

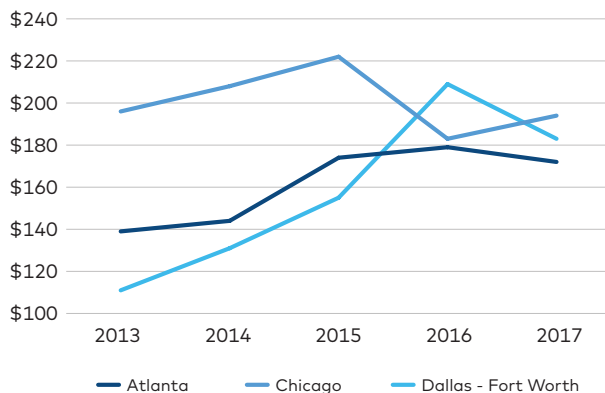
In Chicago, nearly 20 million square feet of industrial space was absorbed during the year, pushing the market's overall vacancy rate to 7.3%, down 20 basis points year-over-year. Infill development remains strong—especially in the O'Hare and Joliet submarkets, where industrial space is in high demand as growing manufacturing businesses expand their facilities. In the two submarkets alone, there are 10 projects under construction, totaling nearly 3.5 million square feet, according

to Yardi Matrix. Net average asking rents were \$4.79 per square foot at the end of 2017.

Dallas absorbed more than 21 million square feet of industrial space in 2017, although vacancy rates rose by 90 basis points to 7.0% at the end of 2017, due to the number of large warehouses delivered during the year that have yet to find a tenant. Though scarce, industrial buildings under 100,000 square feet were in great demand in 2017. Asking rates reached \$5.75 per square foot. Sales values have also grown considerably in Dallas, as the average price per square foot has increased from \$57 to \$72 from 2013-2017.

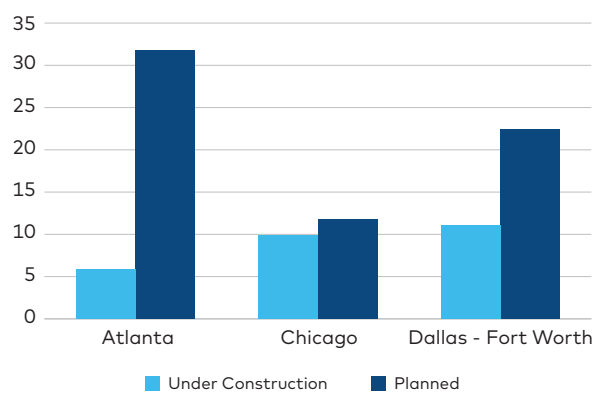
Developers are confident enough in demand for modern warehouse and distribution space that speculative development is being delivered at a record pace. Of the total industrial space that hit the market in the fourth quarter of 2017, 75.5% was built speculatively, according to JLL, an increase over the same quarter the previous year. Meanwhile, build-to-suit projects accounted for 19.3% of the new product, while owner-user occupied space held a 5.1% share.

Sales Price Per Square Foot



Source: Yardi Matrix

New Development (square feet in millions)



Source: Yardi Matrix

Driving Forces

E-commerce sales continued to be the horsepower driving the industrial sector forward in 2017. And while online transactions only accounted for about 9.0% of total U.S. sales activity throughout the year, according to JLL, growth is expected to continue rising, with ever-changing consumer habits and lifestyle trends pushing that share to 14.0% in the coming years. Already, e-commerce demand for industrial space accounted for almost 29.0% of total U.S. leasing demand last year, a 3.0% increase over the previous year.

Warehouse space, especially in densely urban clusters, remained a hot commodity for both investors and tenants in 2017, and the competition for quality warehouses at affordable prices is expected to be even more fierce in the coming quarters. Online retailers such as Amazon, eBay and Walmart are looking to move closer to the customer, focusing on proximity and expanding beyond big-box warehouse centers to smaller spaces—usually infill locations in urban cores.

This need to locate in city centers—where there is already a lack of options as developers reinvent the space for residential use and the small amount of available land is very expensive—has forced developers and architects to take a different tack to meet fulfillment center needs. With e-commerce requiring three times the space of traditional warehouses, vertical design is gaining in popularity. Prologis is nearing completion of the first multistory industrial warehouse constructed in the U.S., while a joint venture of Innovo Property Group and Square Mile Capital Management plans to build another such property in the Bronx, N.Y.

And just as online retailers are willing to pay higher rents to be closer to consumers, so too are many biopharmaceutical companies—which



continue to cluster around major research institutions to gain better access to top talent. However, some companies are looking elsewhere for more affordable space, including suburban markets and second-tier clusters, in their quest for more affordable rents and modern facilities that can foster innovation.

Major seaport areas are also attracting increased development, as the ports themselves are updated to accommodate larger ships and compete more strongly in the global import-export marketplace.

Increased demand from such growth sectors is drawing more real estate investors to industrial space with the allure of improved returns and longer-term tenancy. As investors develop a keener eye for the new opportunities available in today's industrial market, they can benefit from the shifts in location, design and use of these facilities that are among the sector's top trends.

PORTS

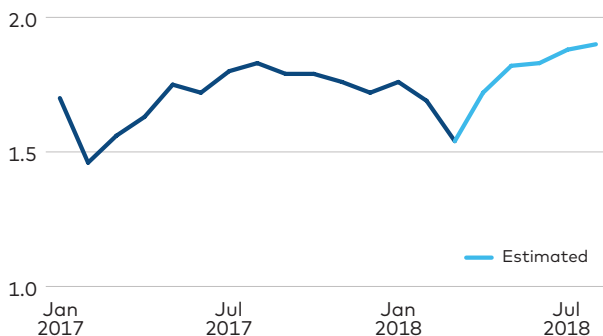
Growing Cargo Deliveries Drive Demand for Space

After a flat 2016, imports at major ports on both coasts increased in 2017, due to both an improving retail market fueled by the growing e-commerce sector and the expansion of the Panama Canal.

Retail imports hit 1.6 million twenty-foot equivalent units (TEUs) in December, with all of 2017 pegged at 20.5 million TEUs, according to the most recent Global Port Tracker report, issued in January by the National Retail Federation. That marked a 7.6% increase over the previous year's record 19.1 million TEUs and a new all-time record in the 17 years since the NRF began tracking imports. The Global Port Tracker covers the West Coast ports of Los Angeles and Long Beach, Oakland, Seattle and Tacoma; the East Coast ports of New York and New Jersey, Hampton Roads, Charleston, Savannah, Port Everglades and Miami; and Houston on the Gulf Coast.

Expect a further increase in the first half of this year, with a total of 10.4 million TEUs, a 5.6% increase over the first half of 2017, according to the NRF. Its monthly estimates are likewise mostly for increases, including 1.76 million TEUs in January (up 4.1% year-over-year); 1.69 million in February (down 4.1%); 1.54 million in March (down 1.2%);

Monthly Retail Imports (2017-2018; TEUs in millions)



Sources: National Retail Federation and Hackett Associates

Panamax vs. New Panamax

	Panamax	New Panamax
Length	294.13 m (965 ft)	366 m (1,200 ft)
Width	32.31 m (106 ft)	49 m (160.7 ft)
Draught	12.04 m (41.2 ft)	15.2 m (49.9 ft)
TEUs	5,000	13,000

Containership capacity: maximum dimensions based on expanded Panama Canal locks.
Source: Maritime Connector

1.72 million in April (up 5.8%); 1.82 million in May (up 4.1%); and 1.83 million in June (up 6.5%).

For the East Coast ports, consumer demand wasn't the only business driver. The decade-long, \$5.3 billion effort to expand the Panama Canal opened up new lanes for traffic, with increased depth and width that allowed bigger ships with more cargo traveling from Asia to the East Coast ports to reduce their travel time by following a more direct route.

The expanded canal opened on June 26, 2016. On August 22, 2017, the CMA CGM *Theodore Roosevelt*, with a capacity of 14,414 TEUs and a length of some 1,200 feet, became the largest ship to cross the newly opened Panama Canal, en route to the Port of New York and New Jersey. Just one month later, the Panama Canal Authority welcomed the 2,000th of the so-called Neopanamax vessels transiting its expanded locks: the 9,504 TEU COSCO *Yantian* contain-



The expanded Panama Canal marks its 2,000th Neopanamax vessel. *Photo courtesy of ACP*

ership traveling northbound from the Pacific to the Atlantic Ocean.

The number of larger ships entering East Coast ports is on the rise now that the height restriction has been removed for ships smaller than 9,800 TEUs passing under the Bayonne Bridge to the Port of New York and New Jersey. Since the Panama Canal expansion was completed, the bridge can handle ships as long as 1,200 feet and with cargo capacity as great as 13,000 TEUs, more than double the cargo capacity prior to the opening.

West Coast ports can accommodate even larger ships. At mid-year 2017, the West Coast ports of Los Angeles, Long Beach, Oakland and Seattle-Tacoma were receiving vessels in the 18,000 TEU range, with the largest having a capacity of nearly 22,000 TEUs, according to JLL. Almost half of the 14 ports tracked in JLL's Port, Airport & Global Infrastructure report (PAGI) reported record-high annual TEU volumes, although only Seattle-Tacoma, Long Beach and Montreal had reached pre-recession peaks.

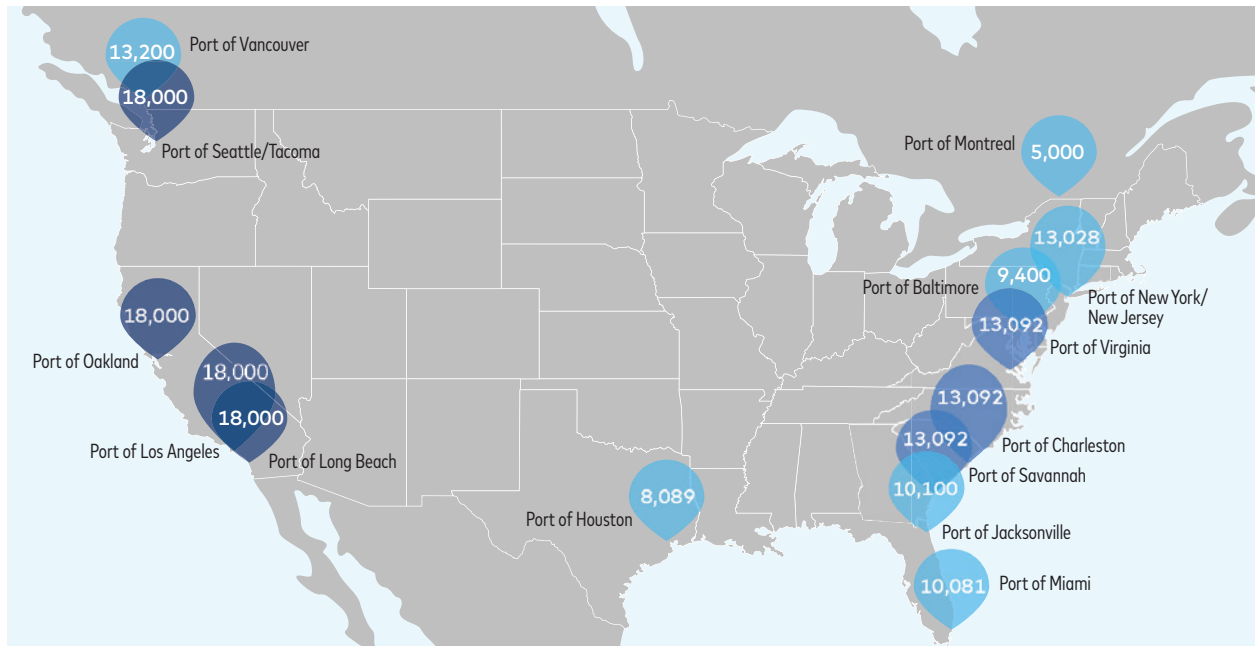
Space Needed

As the ship sizes increase, demand for industrial space is ramping up across all U.S. seaports but especially the major ones. Among those seeking space are importers shifting their logistics operations closer to the ports in order to increase the amount of transloading or cross-docking they can conduct.

Most container-related U.S. trade is concentrated in a few key ports: Los Angeles and Long Beach, Savannah, Seattle-Tacoma, New York-New Jersey, Houston and Miami. These are tight warehouse and distribution markets, with rents hovering around \$10 per square foot triple-net.

To meet demand, developers—such as Prologis, Duke Realty, Trammell Crow Co. and The Opus Group—are constructing more than 25 million square feet across the 14 port-centric markets analyzed in JLL's PAGI report, with an overwhelming 65.0% of the share concentrated on the country's East and Gulf coasts. That represents a doubling in construction activity since 2015.

Growing Accommodation at North Atlantic Ports (largest vessel handled, in TEUs)



As of June 2017. Source: JLL

But port-centric markets are land constrained—especially along the West Coast, where vacancy rates for warehouses and distribution centers were below 3% in the fourth quarter of 2017. As demand for industrial space close in to the ports continues to outpace supply and new deliveries, industrial developers are getting creative, transforming existing properties into desirable space. They are also developing new space further inland—where larger sites that can accommodate big-box projects are cheaper and easier to find—and the new structures are being marketed to logistics and other port-centric companies.

Take the Los Angeles area, which houses the two busiest ports in the country: Los Angeles and Long Beach. Los Angeles, the largest U.S. port, had the busiest year in its century-long history, according to a recent report issued by Cushman & Wakefield. More than 9.3 million TEUs transited the port in 2017—a 5.5% increase over 2016—

thanks to its 86 cranes (72 of which are Neopanamax cranes) and eight container terminals. China, Japan, South Korea, Taiwan, Vietnam, Hong Kong and Thailand are among the major trading partners, and the port's planned \$2.6 billion investment in capital improvements over the next 10 years will result in up-to-date cargo terminals and improved rail and warehouse infrastructure that will attract more e-commerce tenants from around the world.

The neighboring Port of Long Beach was the second-busiest U.S. port last year, moving a record 7.5 million TEUs of cargo, 11.4% more than the previous year. More than \$1.3 billion is being invested to build the Gerald Desmond Bridge, which will accommodate larger cargo ships, as well as improving traffic flow thanks to its greater width. An additional \$4 billion will be spent over the next decade to create a more sustainable and efficient gateway capable of handling even larger ships.

With so much activity between the two ports, the Los Angeles Basin area surrounding them ended the year very tight, although the vacancy rate rose slightly to 2.2% as 8 million square feet was delivered, according to Cushman & Wakefield. In all, the submarket absorbed 25.6 million square feet last year but received 25.7 million square feet in new supply.

The giant Inland Empire, to the east, had more available space but not by much: It turned in a 4.1% vacancy rate last year, following 42.6 million square feet of leasing—only the second time the submarket has ever leased more than 40 million square feet.

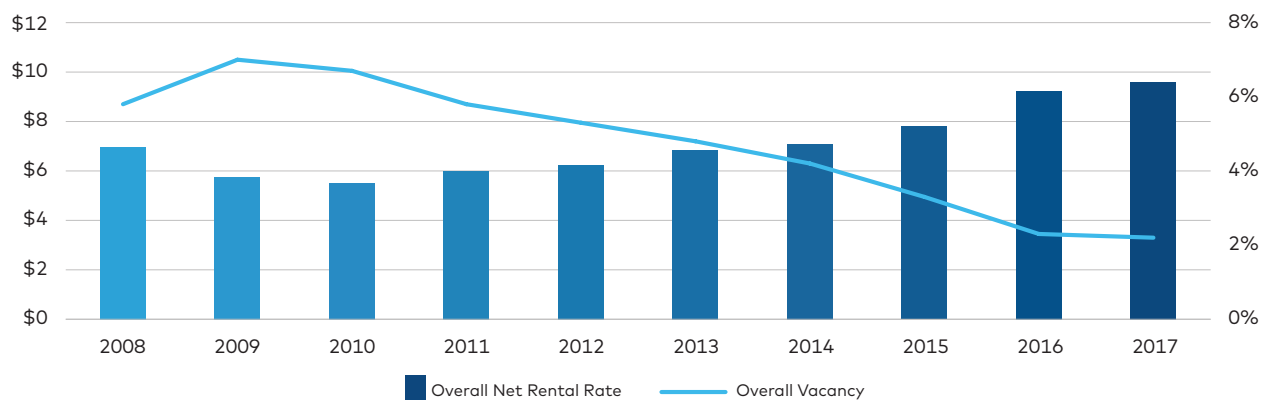
In all, the Greater Los Angeles industrial market tightened to a 1.3% vacancy rate by the end of 2017, leaving e-commerce tenants with few leasing options. To meet the increased demand, 54 projects are currently under construction totalling 18 million square feet, according to Yardi Matrix. Including projects in planning and

pre-development the number grows to more than 100 million square feet. While Los Angeles Basin rent growth was significantly lower than 2016's double-digit increase, overall rents are still up 56% from the historic lows reached during the financial crisis.

Sales values and transaction activity have also increased recently in Greater Los Angeles. After remaining relatively flat near \$300 per square foot between 2013 and 2015, prices accelerated over the past two years to roughly \$375 per square foot in Los Angeles. Nearby in the Inland Empire, prices were also flat, around \$135 per square foot, before increasing to more than \$200 per square foot in 2017.

Transaction volume has followed a similar trajectory. Between 20 million and 24 million square feet per year changed hands in the 2013-2016 time period, before accelerating to nearly 30 million square feet in 2017, according to Yardi Matrix.

Overall Vacancy and Annual Rents (for combined Los Angeles, Orange County and Inland Empire, as of fourth quarter 2017)



Source: Cushman & Wakefield

E-COMMERCE

Online Sales Fuel Fulfillment Furor

Consumers' hunger for online purchases has increased steadily over the past decade, and commercial real estate forecasters expect further growth in e-commerce sales in the coming years, impacting the need for fulfillment space. While e-commerce still constitutes under 10% of total retail sales, according to estimates by the U.S. Census Bureau, e-commerce sales reached \$119.0 billion in the fourth quarter of 2017, a 3.2% increase over the third quarter. Warehouse and distribution share likewise remains small—at a mere 4% of the total, or about 600 million square feet out of an overall inventory of 2.2 billion square feet. But this growing sector's special needs have been primary drivers of increases in industrial property values and lease rates across the U.S.

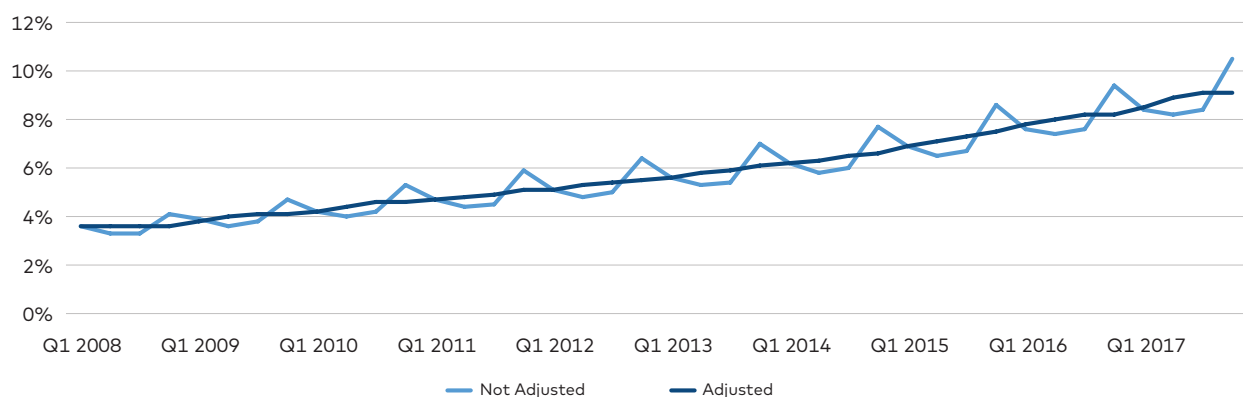
The expanding online retail market has necessitated changes in both retail and industrial space, along with supply-chain configuration to make it compatible with online delivery, as retailers have switched their focus from competing on price to competing on convenience. A heightened need for improved sorting, packing and tracking technology demands new industrial facilities that offer more up-to-date technological capabilities—and that requires more space. In fact, online retailers need three times the distribution center space required for traditional brick-and-mortar retailers, according to estimates from Prologis, which manages some 400 e-commerce tenants occupying more than 50 million square feet of

logistics space. Furthermore, expectations for faster delivery are increasing demand for facilities located closer to major population centers.

A small number of retailers are driving these shifts: A short list of 10 retail giants dominate overall U.S. e-commerce sales, according to an eMarketer study supplied to RetailDive, including Amazon, eBay, Walmart, Apple, The Home Depot, Best Buy, Macy's, Wayfair, Costco and QVC—which together account for almost two-thirds of the market.

With a logistics footprint of more than 100 fulfillment centers across the U.S., Amazon is by far the biggest player in the e-commerce sec-

Estimated E-Commerce Sales as a Percent of Total Quarterly Sales (first quarter 2008 to fourth quarter 2017)



Source: U.S. Census Bureau

tor, especially after the \$13.7 billion acquisition of Whole Foods Market Inc. last year. The retail giant, which lays claim to more than 40% of the online retail sales in the U.S., will continue to drive much of the e-commerce growth in the coming years. According to the eMarketer study, online sales in the U.S. are projected to grow by 15.8% to more than \$450 billion by the end of 2017, and Amazon is estimated to hold a share of nearly \$197 billion, or almost 4% of all retail sales in the country.

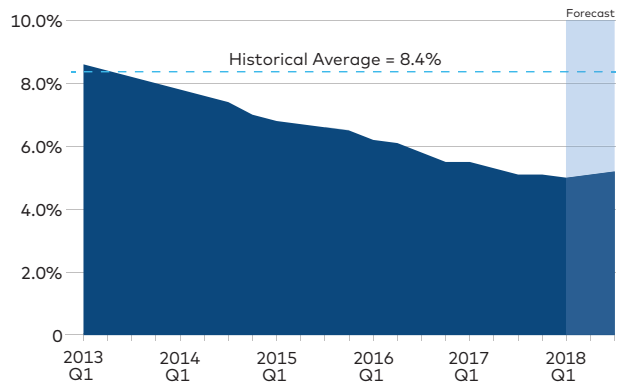
Amazon's main competitor, eBay, lags far behind. The retailer's e-commerce sales are projected to reach \$30.6 billion by the end of the year, but its share of total e-commerce sales will drop to 6.8%. And Walmart's e-commerce sales are estimated to gain 46.8% to reach \$16.2 billion by year's end, but they will comprise just 3.6% of total U.S. online sales and only 0.3% of overall retail sales, despite the retailer's continued efforts to boost its online operations.

Nonetheless, demand for industrial space continues to rise. The U.S. industrial market absorbed 63.3 million square feet in the fourth quarter of 2017, according to Cushman & Wakefield, boosting net occupancy gains for the year to more than 243.3 million square feet. Demand for industrial space has exceeded supply for 31 consecutive quarters, holding the record-low average national vacancy rate at 5.1% in the fourth quarter, a 0.4% decrease since the fourth quarter of 2016.

Locational Pressures

As Amazon pushes for faster and cheaper shipping, needs are further evolving. The pressure to fulfill orders within days or even hours through last-mile delivery comes with increased logistics challenges. The online retailer has big logistics footprints in Indianapolis, Cincinnati and Columbus, Ohio, which are hubs for DHL and FedEx,

Industrial Market—Overall Vacancy (second quarter 2017)

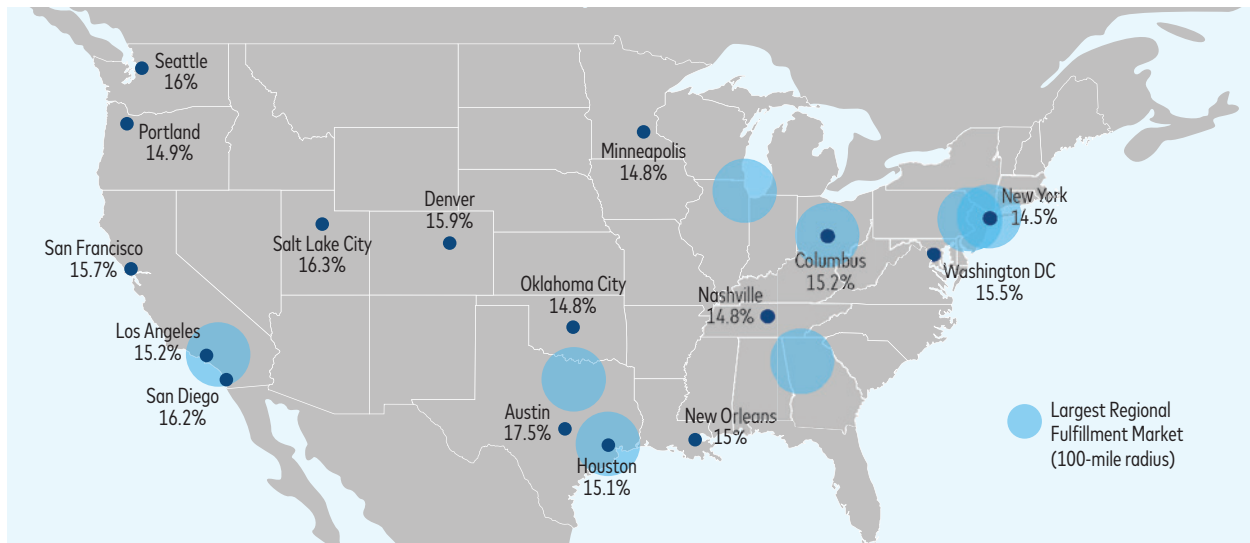


Source: Cushman & Wakefield

allowing Amazon to reach a large number of customers within less than 24 hours.

In an effort to please consumers, fast delivery times and free shipping are on track to become the new norm in e-commerce, but this comes at a huge cost, due to the need for convenient real estate in densely populated areas, high-speed shipping and hiring of additional employees. And storing products in close proximity to population clusters means tweaking logistics. In 2016, Amazon lost a record \$7.2 billion on shipping costs, according to an analysis by GeekWire. The amount, which reflects the difference between what the retail giant charges customers for shipping and what the company actually spends to deliver the items to their doors, has had a negligible impact on Amazon's overall profit: In 2016, the company posted a corporate profit of \$2.4 billion, up from \$596 million in 2015. However, its net profit was mainly due to the performance of its Web Services division, which posted sales of more than \$12 billion in 2016, largely compensating for those billions Amazon's online sales operation spent on shipping.

Proximity to Demand (locations of fulfillment centers vs. Millennial concentrations)



The current largest regional fulfillment markets in the U.S. (depicted by the blue circles indicating a 100-mile radius around each one) and the cities that have the highest percentage of Millennials don't always align.

Sources: Headlight Data, Colliers International via NAIOP

Among the biggest expenses is the need to locate adjacent to or within close proximity to dense markets with high income demographics—usually Millennials who value convenience and the “one-click” lifestyle. More often than not, industrial properties are scarce near or within urban cores and come at a high cost. Increasing competition for available industrial space has caused rental rates to skyrocket over the past few quarters, breaking the \$5 per square foot record for the first time in mid-2017.

While mega-structures continue to play an important role in industrial real estate, online retailers have also started opting for leasing or building smaller storage spaces outside the traditional industrial corridors but within shorter truck routes. Infill properties have also become desirable, as they allow the retailers to fulfill the last mile of the supply chain more rapidly.

In fact, according to a study on logistics facilities by New York Life Insurance Co., the revival of demand for obsolete space situated in deindustrialized

Northeastern locations is on the rise, but supply is limited. Over the past decade, for instance, around 10 million square feet of industrial space in New York City has been converted to other uses, such as hotels and offices. And as demand is growing and supply is getting scarcer, vacancy rates have reached historic lows.

From 2010 to 2014, the bulk of e-commerce leasing activity was registered in inland markets like Greater Los Angeles, Dallas, Chicago, Memphis and Atlanta, which are still popular today. But there is a growing interest in coastal industrial gateway areas such as Houston, New York/New Jersey, Long Beach/Los Angeles and Seattle, where industrial tenants have been facing a labor shortage caused by a low unemployment rate combined with the more labor-intensive environment of e-commerce fulfillment centers. As a result, e-commerce-focused leasing is driving up local demand for labor at a rate two to three times that of traditional warehousing operations.

BIOPHARMACEUTICAL INDUSTRIES

Research Expansion Reaps Returns

Though long viewed as a small commercial real estate sector, life sciences has become one of the hottest investment alternatives, offering growth combined with long-term, stable returns. That's due to an extensive demand for space to meet the needs of fast-paced expansion, driven by a formula of aging population, resistance to e-commerce, a surge in healthcare costs and an ongoing need for more efficient and effective medical treatments.

As competition heats up for the next breakthrough in medicine and technology, many companies face an acute lack of space and rising rents. With shrinking availability of laboratory space in established life science clusters such as Boston, San Francisco and Seattle, life science companies are seeking new locations for innovation, operations and investment divisions. Traditional clusters in the Northeast and California continue to be the pillars of the life science sector in the U.S., and many companies are still willing to pay a premium to ensure the immediate access to top talent these afford. However, some businesses have started opting for lower-priced,

more amenitized suburban space, while others are relocating to regional markets such as Houston, Denver and Chicago, which are gaining critical mass as a result.

Given the competition to serve these tenants, which are signing long-term leases despite growth, investors need to be both quick and determined, according to CBRE's 2018 national life sciences outlook, as the country's economic growth has entered its late stages and technology is advancing with increasingly greater speed.

Talent Search

The need for talent is a driving force in determining location as biopharmaceutical companies seek additions to their teams while striving to retain existing expertise. Wages have increased by 19.2% on average over the past five years, but the total number of life science employees has gone up by just 4.3% since 2012, not because companies aren't hiring but due to an acute shortage of available workers, JLL noted in its 2017 Life Sciences Outlook. In order to make up for the lack of qualified talent, several states including Minnesota and Pennsylvania have created grant programs that enable companies to engage colleges in training students in a specific skill area.

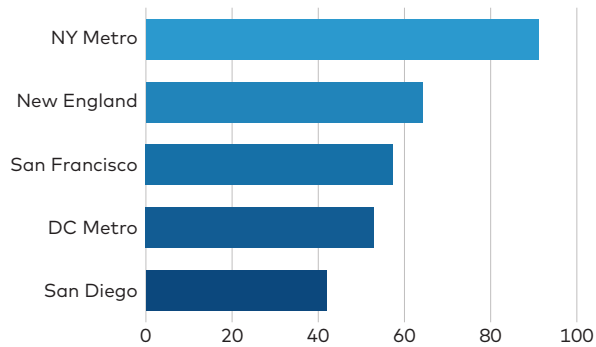
Major life science clusters offer immediate access to a rich pool of research institutions, uni-

Top U.S. Life Science Clusters

Top U.S. Submarkets	Asking Rent (\$ NNN; price per square foot)	Vacancy
East Cambridge (Boston)	\$75.05	6.8%
North County (Bay Area)	\$58.68	1.2%
I-287 West (Westchester)	\$52.00	6.0%
Torrey Pines (San Diego)	\$50.40	5.9%
Lake Union (Seattle)	\$39.37	1.3%
CBD (Philadelphia)	\$38.00	1.9%

Source: JLL Research

U.S. Life Science Employment (in thousands)



Source: Moody's via Transwestern

versities, hospitals and the scientists associated with them. Thus, biopharma companies remain in top-tier clusters, despite rising operating costs and skyrocketing rents driven by a lack of available R&D lab space. Nine of the top 10 U.S. life science clusters have single-digit direct vacancy rates, according to JLL, which in its Life Sciences Workplace Insights ranked them as Boston (topping the list for the second consecutive year); the San Francisco Bay area; Raleigh-Durham; San Diego; Seattle-Bellevue; the Maryland suburbs and D.C. metro area; Philadelphia; Los Angeles/Orange County; Westchester County, N.Y.; and one-time leader New Jersey, now ranked 10th.

While Boston—home to elite academic research institutions like Harvard University and the Massachusetts Institute of Technology, as well as the top three National Institutes of Health-funded hospitals in the U.S.—is the top biotech cluster in the U.S., the Big Apple has emerged as the largest bioscience employer in the country, according to Transwestern's mid-year life science outlook. The city counts more than 91,000 bioscience jobs, accounting for 20% of the total employment within the top 10 science markets. New York has the world's largest

concentration of academic institutions, with 11 major academic medical centers. It also houses three of the country's leading 15 hospitals and five of the top 50 medical schools. And in 2016, New York ranked second in the nation with \$1.4 billion in NIH awards. All these factors make up for the lack of funding force that's behind Boston's and San Francisco's dynamics, according to Transwestern.

While existing science clusters are constantly adapting to meet biopharma needs, new urban lab developments are also a growing trend, as life science companies—both well-established and startup businesses—are willing to pay a premium for amenity-rich spaces located near the major research institutions that drive innovation.

For example, in Houston—which has a rising life science reputation—the Texas Medical Center Corp. is fundraising to build a \$2 billion collaborative translational research campus on 30 acres. Referred to as TMC3, the proposed innovation campus in the Texas Medical Center would be anchored by the University of Texas, Texas A&M, Baylor College of Medicine and the University of Texas M.D. Anderson Cancer Center.

However, second-tier clusters such as Seattle and Philadelphia are attracting interest among life science companies seeking more affordable space, such as office-to-lab conversions or up-graded second-generation buildings. As capital continues to be reinvested back into the industry and the related infrastructure, new clusters are starting to take shape in these markets. At the same time, significant institutional capital—coming from both real estate investors and biopharma supporters, including philanthropic organizations backing new medical breakthroughs—is flooding top markets, prompting more established companies to entertain the cost-saving benefits of rising markets.



The Cove at Oyster Point, San Francisco. *Rendering courtesy of Project Management Advisors Inc.*

Yet even in highly competitive clusters such as Seattle-Bellevue, affordable development locations are hard to find, limiting the number of construction projects underway.

Suburban Search

The search for more available space, lower rents, innovation and employee well-being are taking still other companies to the suburbs.

For instance, in suburban Boston, four spec developments totaling 1.2 million square feet of space are expected to attract a number of life science businesses, according to JLL's research study. For example, The Davis Cos. is building The Alewife Research Center (The ARC), a Class A, transit-oriented lab building in Cambridge. The 223,000-square-foot property is scheduled for completion in fall 2018 and will be available for occupancy by life science and pharmaceutical companies that require flexible lab space and broad access to both urban and suburban talent pools.

Another noteworthy example is The Cove at Oyster Point, a multi-tenant life science development

currently under construction in the epicenter of South San Francisco's life science cluster. The seven-building, 1 million-square-foot campus being developed by HCP is the largest life science project underway in the U.S., with a long list of amenities, including fitness and exercise rooms, a bowling alley, bocce ball courts, a café, an amphitheater and hotel space. With South San Francisco boasting a 2% vacancy rate for life science space, The Cove at Oyster Point is almost fully pre-leased to tenants that are competing for Bay Area top talent with advanced degrees in chemistry, biology and genomics.

In Rochester, Minn., the world-renowned Mayo Clinic became the first anchor for Discover Square, a 16-block subdistrict on which developer Mortenson, Destination Medical Center, the state of Minnesota and local lenders broke ground in late 2017. Set for completion in 20 years, the 2 million-square-foot Discover Square is one of six sub-districts created within Destination Medical Center's Development Plan, a \$5.6 billion initiative catalyzing mixed-use neighborhoods made up of life science businesses, new startups and residential options anchored by signature spaces.

INDUSTRIAL PROPERTY DESIGN

Evolving Needs Demand New Designs

Over the past few years, the growth of e-commerce, increased delivery of imports via larger vessels and other trends are driving a need for new types of space. Adaptive reuse is creating new value in obsolete layouts, providing solutions that are sometimes cheaper than building new and sometimes the only way to locate where necessary. Among the biggest new designs:

Fulfillment centers. The growth of e-commerce as a means to deliver retail goods is generating increased need for warehouses focused on delivery to the consumer—and in many cases located close to the consumer. E-commerce players are more interested in smaller warehouses, usually 50,000 square feet or less, that are proximate to residential areas. In fact, in most cases, these small facilities are also meant to fill in the gap between two larger distribution centers. While these smaller storage centers mimic larger warehouses in design and equipment, they often feature ceiling heights as low as 28 feet or even less so that workers can easily reach the product; they also include fewer loading docks.

Vertical warehouses. Shrinking land availability and resultant soaring land prices—combined with

growing competition from residential investors in dense urban markets—have prompted a number of developers and architects to design upward instead of outward. Multistory facilities' greatest advantage is greater usable space within a smaller physical footprint. One required design feature is truck parking away from the structure in order to maximize the number of building docks.

Among the best examples of vertical industrial design is Prologis' build-to-suit warehouse in Seattle, the first of its kind in the U.S.—although the company has already built a number of similar structures in Japan and the U.K. In April 2017, it started construction on the 590,000-square-foot Georgetown Crossroads, which will feature fulfillment space on the first two floors and offices, light manufacturing, laboratories and production on the



Prologis' Georgetown Crossroads, Seattle. Image courtesy of Prologis



Method Southside
Soapbox factory, Chicago.
Rendering courtesy of Method

third floor. Upon completion in late 2018, the facility will have truck ramps leading to loading docks on the second and third floors, served via forklift-accessible freight elevators designed for lighter-scale warehouse operations. Common-area facilities will include lobbies; passenger elevators; an amenity center with conference rooms, restrooms and showers; as well as wide traffic corridors.

Refrigerated warehouses have become popular mainly in major cities, where e-commerce is booming and one-hour delivery is critical, fed by increased demand from food delivery tenants such as Fresh Direct, Hello Fresh and the grocery divisions of Amazon and Walmart. This growth is expected to continue over the next five years as the sector—which until recently was overlooked by both investors and developers—continues to benefit from strong consumer demand for food products and cold beverages. IBISWorld projects that the storage of goods will generate 69.4% of industry revenue in 2017.

While demand for refrigerated warehouses is on the rise, this is a highly specialized type of asset that is more expensive to build and thus never developed speculatively. As a result, while the refrigerated storage industry is likely to grow 3.4% annually between 2014 and 2019, the number of facilities will likely increase by just 1%, according to JLL. However, tenant fluctuation is extremely low, with a tenant tending to remain for 15 to 30 years. These cold storage facilities typically

feature larger floorplates, 32- to 36-foot clear heights and state-of-the-art cooling/freezer systems that offer variable climate control for foods and beverages stored in different parts of the warehouse. They also feature thicker, vented floors under the freezer area and cold docks.

Sustainable design. Industrial facilities have a huge environmental impact. According to the U.S. Green Building Council, the manufacturing sector alone accounts for 30% of the nation's total energy consumption, using an estimated 15,900 million gallons of water per day, or 4% of total domestic daily water use. Their energy costs account for hundreds of millions of dollars per year.

Though many industrial tenants and developers remain reluctant to invest capital into LEED certifications, the industrial sector is beginning to reap the benefits of sustainable design. The ability to improve energy efficiency is attracting interest; although designing and building green facilities is expensive, LEED-certified industrial assets are more likely to have higher renewal rates, lower turnover and less absorption time on the market.

In 2012, the USGBC developed LEED programs designed specifically for industrial facilities, and invited corporate sustainability and building professionals from construction, design, architecture and engineering divisions across the sector to participate in the verification and, ultimately, the certification process.



Glisan Corporate Park, Gresham, Ore.

In Spring 2015, eco-friendly cleaning product maker Method Products completed the first LEED Platinum manufacturing facility for consumer-packaged goods in the U.S. Located on a former brown-field site in Chicago's historic Pullman Factory District, Method's 150,000-square-foot Southside Soapbox was designed to use less energy while operating with the highest levels of efficiency. Approximately 30% of the factory's energy is supplied by a refurbished 230-foot, 600-kilowatt on-site turbine, and the facility features a 75,000-square-foot green rooftop that conserves energy.

This March, Trammell Crow Co. and Principal Real Estate Investors finished construction of Glisan Corporate Park, a three-building, 504,528-square-foot speculative development in Gresham, Ore. The first LEED-certified speculative industrial project since 2012, it contains spaces ranging from 139,727 to 200,701 square feet and boasts 30- to 32-foot clear heights. There's also plentiful parking and trailer storage, and each building sits on its own parcel, with its own water and sewer utilities.

Meanwhile, a partnership between an affiliate of North Signal Capital and a fund managed by Westport Capital Partners has broken ground on a 340,000-square-foot build-to-suit warehouse and production facility for Science Applications International Corp. (SAIC). The building will be part of North Pointe Commerce Park in Hanahan, about 15 miles northwest of Charleston. De-

LEED-Certified Projects in the U.S. (by sector)

Space Type*	No. of LEED Projects
Office	23,290
Retail	9,572
Higher Ed	5,738
Public Assembly	3,528
Multifamily Residential	3,517
K-12	3,288
Health Care	2,542
Lodging	1,699
Laboratory	1,690
Military Base	1,597
Public Order & Safety	1,561
Industrial Manufacturing	1,513
Warehouse & Distribution	1,432
Other	1,415
Service	1,239
Office: Mixed Use	1,116
Educational Facilities	455
Data Center	292
Religious Worship	146
Single-Family Home	41

Data as of February 2018.
Source: U.S. Green Building Council

signed to meet LEED certification requirements, the facility will be built with insulated tilt-up concrete, light-emitting diode illumination and early-suppression, fast-response sprinkler systems.

According to February updates issued by the USGBC, there are now 1,513 LEED-certified industrial facilities across the country, while the number of LEED-certified warehouse and distribution centers amounts to 1,432. And with LEED certification for new industrial assets more financially viable, both small and large industrial landlords are likelier to pursue greater sustainability in the coming years.

EXECUTIVE INSIGHT

Q&A with Jim Connor, Chairman & CEO, Duke Realty

Commercial real estate veteran Jim Connor has stayed on top of his game throughout his two-decade-long tenure with Duke Realty Corp., and has been responsible for tremendous growth in the REIT's office and industrial portfolios across the country. Since joining Duke in 1998 as a senior vice president for industrial operations, Connor has held a variety of senior management positions, replacing retiring CEO Denny Oklak at the end of 2015. He also heads the company's executive and investment committees. Connor talked with Yardi Matrix about the current state of the U.S. industrial real estate market, tackling the biggest concerns and challenges in the manufacturing and warehouse/distribution sectors.

Q. *What's your view of the current state of the U.S. industrial real estate market?*

A. It's pretty good right now, and 2018 looks like it will perform similarly to 2016 and 2017, which were very good years for Duke Realty. Vacancy is about 4.5% nationally, and rents are growing at 5.0 to 10.0% a year. Supply is in check, and demand continues to be very robust.

Q. *What factors are currently driving investment, and how are they impacting the investment arena?*

A. Investor demand for industrial product is still very strong. The industrial sector has consistently been one of the top-performing sectors over the last five years.

Q. *Are you seeing increased institutional investment?*

A. As the sector continues to perform well, more investors are allocating dollars toward industrial real estate, yet most are underweight in industrial because they can't find enough product to buy.



Q. *How are financiers viewing the sector?*

A. Financing remains very controlled, and that is one of the factors that has kept the sector from becoming overbuilt. Both construction lending and permanent financing remain at conservative levels compared to previous cycles.

Q. *What would you consider a value-add industrial acquisition in today's economic climate?*

A. For Duke Realty, buying older, functionally obsolete buildings in infill markets and razing them to create new state-of-the-art logistics properties would be value-add acquisitions.

Q. *What are the biggest user concerns today?*

A. Increasing rents or costs for real estate are not the greatest concerns. Rather, the cost and availability of labor and the time and cost of last-mile transportation are top of mind.

Q. *What do owners need to do to address these concerns, and in particular, are there needs not being met?*

A. At Duke Realty, we've started doing labor analytics studies before we make major investments in land and buildings. Knowing the cost and availability of labor for our clients before we start projects is critical.

Q. *What kind of design changes have you implemented in recent construction projects?*

A. Bigger is better! With material-handling equipment and inventory-management systems, companies can operate much larger facilities more cost effectively. One million-square-foot buildings are now commonplace, and we have two 1.5 million-square-foot buildings under development right now. The other (issue) is clear height. Most of our major new projects are being built with 36-foot to 40-foot clear, and we're being asked by our clients if we can build 50-foot to 60-foot clear.

Q. *What are today's site location challenges?*

A. The biggest challenges today are the cost of land and the amount of time and cost it takes to entitle land for industrial development.

Q. *Where are you seeing the greatest opportunities?*

A. Infill redevelopment is extremely challenging but very profitable. We will continue to focus a great deal of our resources on infill redevelopment in the top 10 (U.S.) metros.

Q. *How are port expansions impacting your business?*

A. We are a nation of consumers. Consumer spending is up and consumer confidence is at an all-time high, driving increased import traffic. The widening of the Panama Canal is driving increased volumes at the East Coast ports. In turn, demand for logistics facilities in and around ports in the United States is on the upswing.

Q. *How will e-commerce further impact the industrial sector in the coming years?*

A. E-commerce is still in its infancy in the United States. U.S. consumers have come to expect that they can get any item delivered anywhere within 48 hours. This trend will only continue, and all retailers will need to embrace e-commerce and make significant investments in their logistics and supply-chain systems to meet consumer demands. Those that don't are destined to fail.

Q. *Do you foresee any other disruptors impacting the sector in the near future?*

A. Outside of some global macro event, I think the chances of a major negative disruption are very minimal. I do think there are some potentially positive disruptors on the horizon. The changes in the grocery business will be substantial and will create opportunities in the industrial sector, as retailers rebuild their logistics and supply chains to meet the demands of more online customers for fresher and more ready-to-eat products.

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