Harris County

Appraisal District

2019

Market Trends Report

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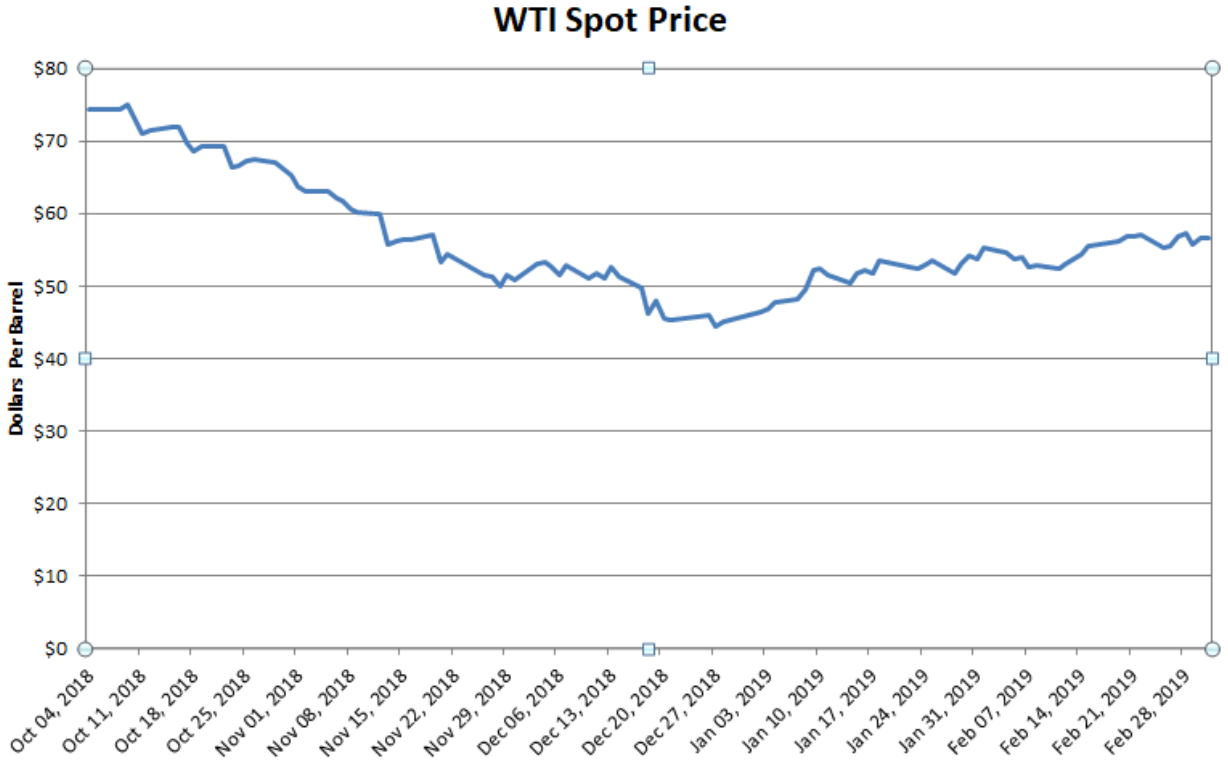
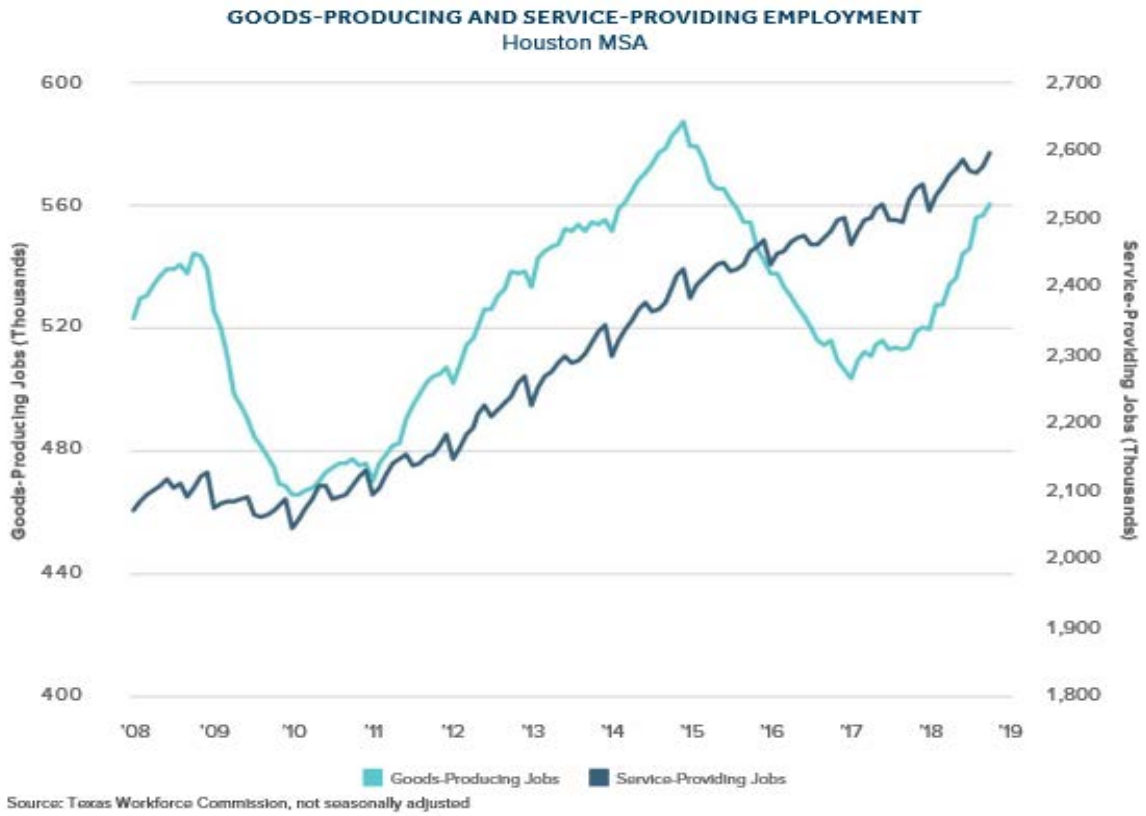
Despite the numerous issues and challenges presented by Hurricane Harvey which included the flooding of almost 70,000 homes, Houston's economy and residential markets are doing well. The stability in Houston's economy and housing market can be best identified by several key metrics that are indicative of a healthy Houston: Oil prices, Job Growth, and Home Inventory.

OIL PRICES - The spot price for West Texas Intermediate oil (WTI) which showed considerable weakness in the last two months of 2018 appears to have stabilized with its price ranging in the mid$50s for the last 8+ weeks. Many consider $60 the threshold at which the oil industry returns to profitability.



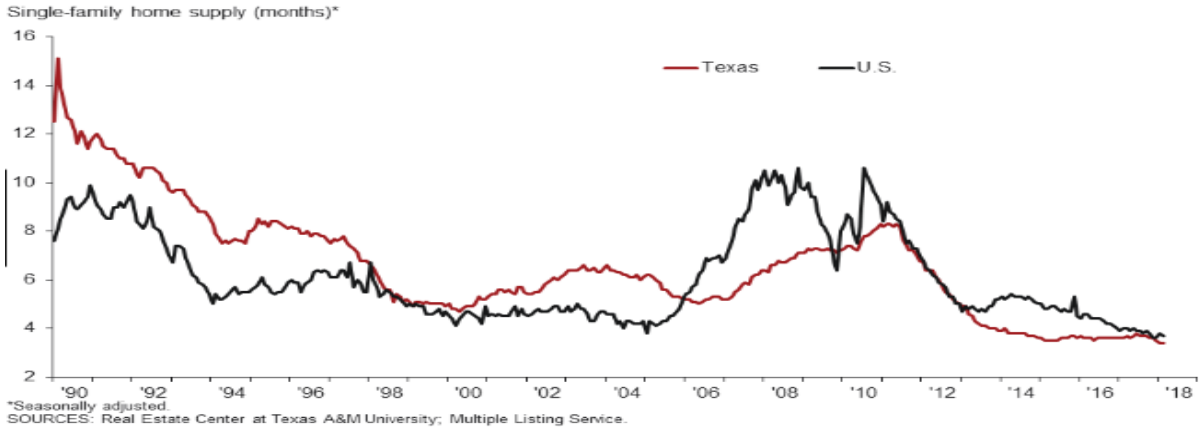
JOB GROWTH - According to the Texas Workforce Commision, Metro Houston added 117,800 jobs in 2018. Unemployment in the metro area fell to 3.8 in 2018 compared to 4.1 percent in 2017. The Greater Houston Partnership is forecasting that the Greater Houston Metropolitan area will create more than 71,000 jobs in 2019 with the biggest gains in construction, mining, and healthcare.

In 2015 thru 2016 there were concerns over the types of jobs that are being lost versus those being gained. Specifically, goods-producing jobs like; mining, construction, manufacturing, and professional services, which are typically higher paying jobs were falling while service jobs were being added. However this trend has changed as the Metro Houston area is now adding jobs in both sectors as depicted in the chart below.



HOME INVENTORY - According to the Houston Association of Realtors (HAR), the inventory of available homes which was at 3.2 months in January 2018 rose to 3.7 as of January 2019. This mark is the same as the national average inventory which also stands at 3.7 months of supply. Typically, 6 months of inventory is considered equilibrium. Accordingly, inventory levels below 6 months indicate a seller's market which is generally accompanied by an increase in prices and in turn appraisal values. Until the supply of homes moves closer to equilibrium we are likely to continue experiencing a seller's market and the corresponding increases in sales prices. The number of days it took a home to sell (a.k.a. Days on Market) narrowed from 68 to 65 days.

Houston's housing market has been a sellers' market since 2012-2013 which is depicted in the Houston Association of Realtor's chart below:



Sales Volume Update

According to HAR, sales volume for single family residential properties in 2018 totaled 82,177 units which is a 3.8 percent increase versus the 79,143 units sold in 2017.

CATEGORIES	FULL-YEAR 2017	FULL-YEAR 2018	CHANGE
SINGLE-FAMILY HOME SALES	79,143	82,177	3.8%
TOTAL PROPERTY SALES	94,818	98,323	3.7%
TOTAL DOLLAR VOLUME	$23,049,934,248	$28,016,207,841	21.5%
SINGLE-FAMILY AVERAGE SALES PRICE	$291,340	$298,982	2.6%
SINGLE-FAMILY MEDIAN SALES PRICE	$229,900	$237,500	3.3%

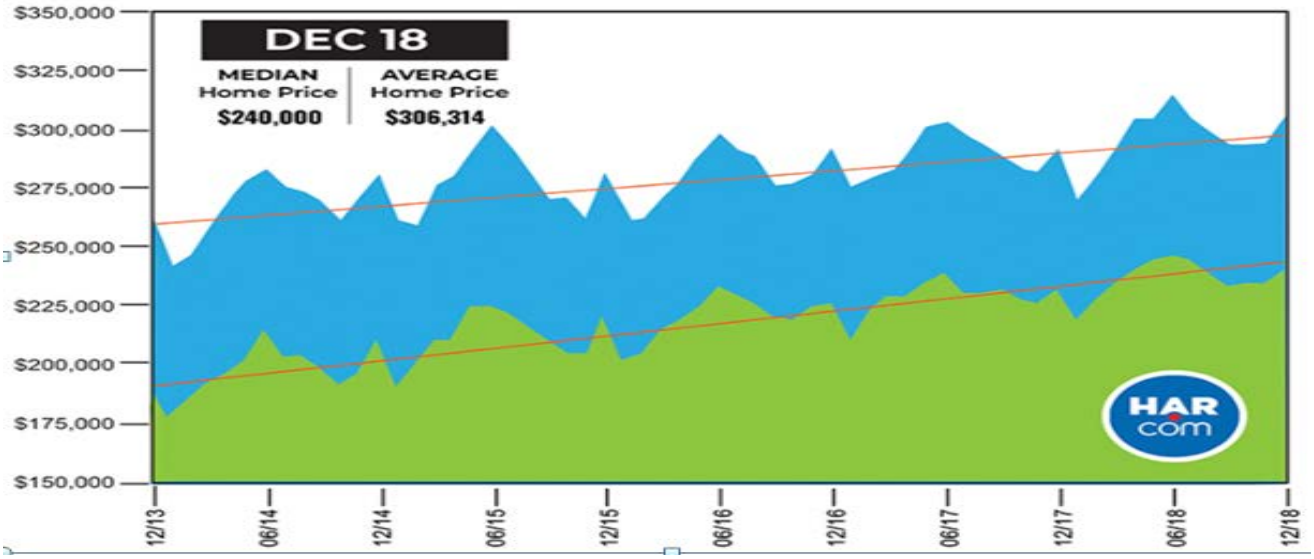
Courtesy HAR January 10, 2018

Sales Price Update

The chart below shows a five year trend line for both the average home sale price and the median home sale price of single family homes. In a fulls year's comparison the median price for a home increased to its highest level ever rising 3.3% to $237,500. This represents an approximately 25 percent increase over the 5-year period (Median price Dec. 2013 - $190,000).

In a full year's comparison the average price increased 2.6% to $298,982. This represents an almost 15 percent increase over the 5-year period (Average price Dec. 2013 - $260,000).

Single Family Average Home Price & Single Family Median Home Price



Courtesy HAR January 13, 2016

Townhomes and Condominiums

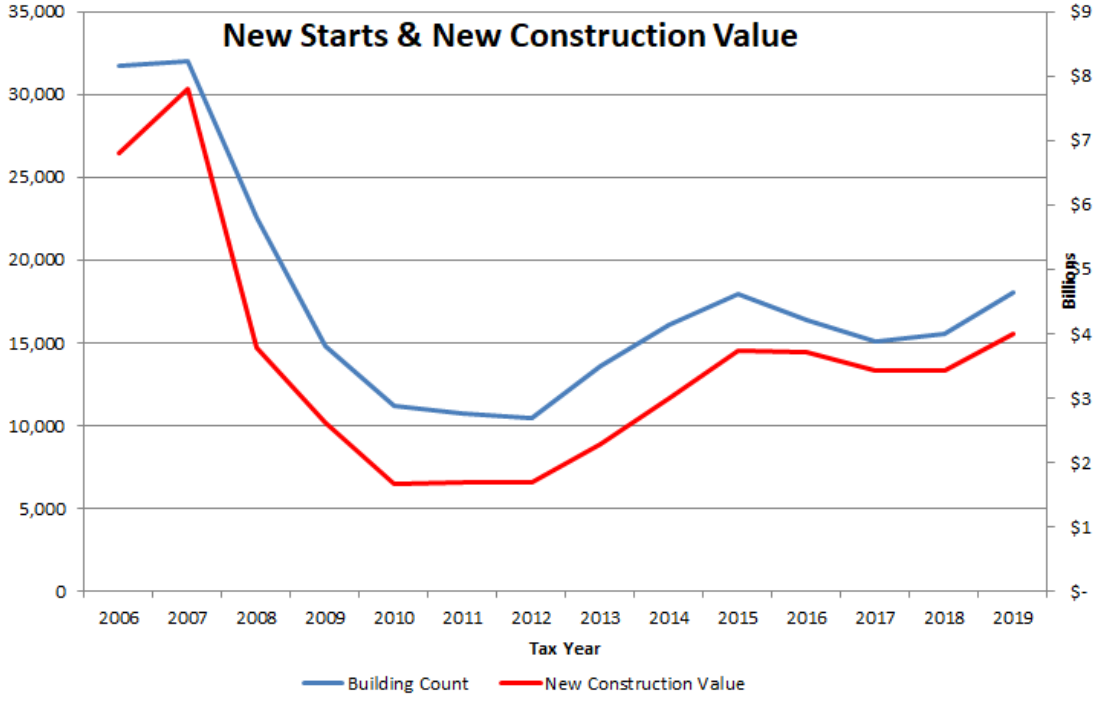
Sales volume of townhouses and condominiums have now fallen for five consecutive months. January sales fell to 324 units versus 362 units in January of 2018 representing a 10.5 percent reduction. During the last year inventory increased to 4.1 months' supply from the 3.4 months of supply in January 2018. Over the last year both the median and average sale price has fall 2.8 and 2.3 percent respectively.

Lease Property Update

Generally as the supply of properties for sale remains below equilibrium the demand for lease property naturally increases. The number of single-family home, townhome, and condo leases increased more than 16 percent compared to December 2017. The average rent for single-family homes was mostly flat increasing 0.4% to $1,755, while the average rental rate for townhomes and condos decreased 0.8% to $1,504.

New Construction

The number of new starts for 2019 will likely surpass 18,000 homes which will be the most in eleven years. The new construction value associated with the new starts should exceed $4 billion which will also be the most in eleven years.



2019 Outlook and Insights

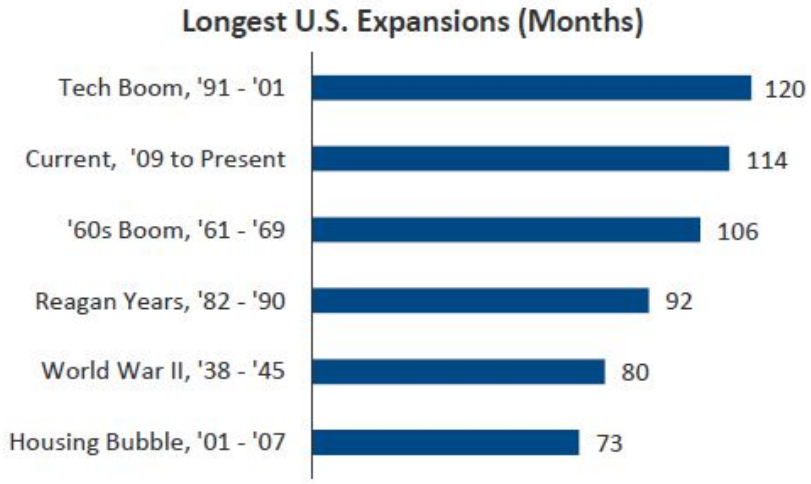
It is difficult to say what will happen with the housing market in 2019. Below is a list of factors that will be important indicators as to how the economy and housing market fair in 2019.

- Oil price – In late 2018 oil prices have shown signs of weakness which were due in no small part to; oversupply, political strife, trade concerns, and economy concerns.
- Interest rates – After years of a near zero "Feds Fund Rate" the Federal Reserve has increased the rate 25 basis points or 1/4 point 7 times in the last two years. (next meeting is March 20, 2019). The fed funds rate currently stands at 2.5% with the prime lending rate at 5.5%.
- Tax Reform - What impact will Federal Tax reform have on the economy and the housing market? Of specific concerns are the "SALT" tax provisions which would either limit or eliminate deductions for state and local income taxes and state property taxes.
- Job Growth – The Greater Houston Partnership has projected growth of 71,000 jobs in 2019. Leading the way is healthcare, construction, and mining with a combined forecast of more than 24,000.
- Natural Disasters – Will Harris County have another Natural disaster? Major events like hurricanes have a major impact on the local economy and a shock to the housing market. With three major disasters in a 27 month period between 2015 & 2017 this is becoming more a routine for Houstonians. We are currently enjoying an 18 month streak without a natural disaster in Harris County.

2019 Houston Commercial Real Estate Market Overview

United States: Long Expansion Leads to Economic Uncertainty

The U.S. economy is currently in one of the longest expansion periods in history. The current period has lasted 114 months, second only to the Tech Boom of the 1990's. And if prognosticators are correct we will be surpassing the prior record before the expansion ends.



Source: National Bureau for Economic Research

The unusually long expansion period is making some economists and investors nervous as they wonder when it will end, what will cause it to end, and how bad the end might be. The Dow Jones Industrial Average declined steadily throughout 2018 but rebounded by January 2019. The rebound occurred as the Fed announced it would "hold steady" after raising the Federal Funds Rate four times in 2018. The announcement by the Fed was welcome news as many feared additional rate hikes would stifle investment and lead to a recession. The outlook has shifted from thinking a recession will occur any day now, to expecting continued slow and steady growth.

The United States GDP grew at 2.9% in 2018 and the expectation is the growth will continue, but at a slightly slower rate of 2.6% to 2.7% for 2019.

Houston: Slow Growth is Better than No Growth

While Houston has traditionally been relatively immune to national recessions, that may not be the case today. The economy in the Greater Houston area continued to improve in 2018 but important sectors, such as the office market, are just beginning to recover from the last oil downturn and a national recession would surely slow that recovery.

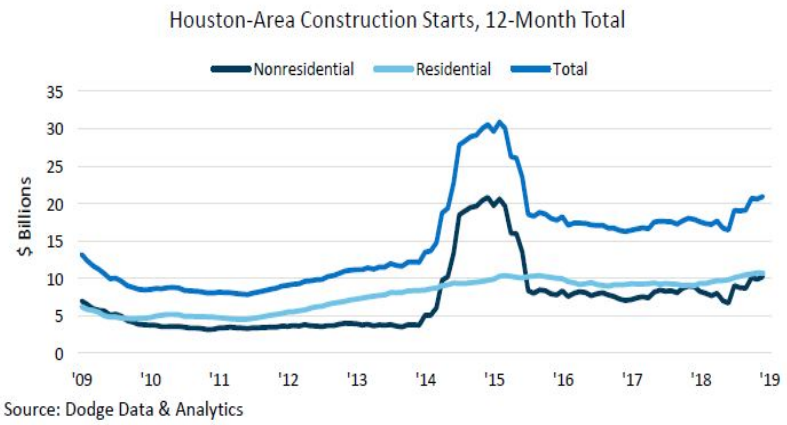
The U.S. unemployment rate hit a low of 3.7% in 2018, the lowest rate recorded since 1969. Houston fared well also, with an unemployment rate of 3.8% by year end, down from 3.9% at the beginning of 2018. The Texas Workforce Commission reported 108,300 jobs were added to the local economy in 2018. According to Greater Houston Partnership, Houston had the largest job

growth of any Metro in the U.S. over the past year. The professional and business services sector gained the most jobs at 28,500 which increased demand for office space and helped to stabilize the office market. Blue collar jobs made the most significant impact in terms of growth, with construction jobs increasing by 8.8% and manufacturing jobs by 7.1%. That equates to an addition of 35,000 blue collar jobs to the local economy. And wage growth is expected to be strongest among blue collar workers. The strength of the blue-collar sector coupled with trending demographics has resulted in a shift of investment activity toward Class C and D properties. The impact is most evident in the C-class apartment properties in the southeast quadrant of the City.

The energy sector enjoyed the highest annual job growth since 2013 with the creation of 4,500 jobs, a 5.8% increase, further signaling a potential recovery in the office market. However, the Metro still has 10,000 fewer oil and gas jobs than it did in the beginning of 2010. The sector also faced some instability in 2018 as crude oil fluctuated from a high of $75 per barrel in October to a low of $45 per barrel in the fourth quarter.

In step with the national economy, the Houston economy is expected to continue to expand in 2019, although at a slower pace, with between 70,000 and 85,000 job growth according to several sources.

Commercial building activity slipped 6.7% to $9.2 billion in 2018 per Dodge Data & Analytics. City of Houston permits paint a similar picture with permits values falling 17.7% to $2.8 billion. The slowdown in the new construction pipeline should lead to further stabilization in some of the markets, such as office and high-rise apartments, that were suffering from an oversupply in prior years.



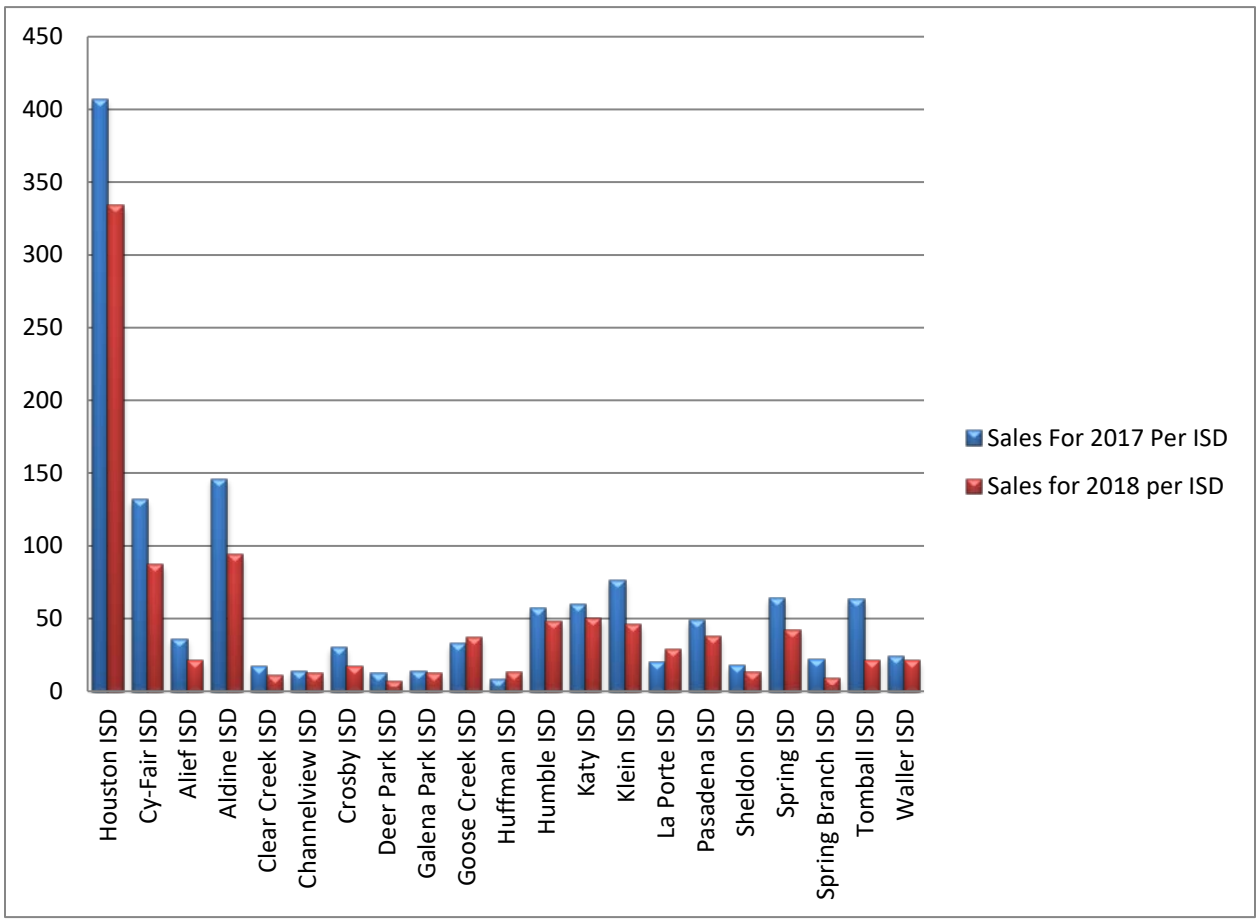
The Port of Houston expansion projects led to an increase in activity throughout the year, totaling a 10% increase in TEUs. The Port had another record-breaking year with 2.7 million TEUs and remained in position as the largest port for foreign water-borne tonnage in the United States. The Port faces challenges into the future as it currently can only accommodate one-way traffic for the larger container ships coming into the port resulting from the expansion of the Panama Canal. Shipping companies have formed the Coalition for a Fair and Open Port to address the traffic issues.

The Houston Airport System also saw a near-record breaking year with approximately 470,000 metric tons of air freight for 2018, up from 425,000 metric tons in 2017.

While local economic metrics look strong, Houston does have reasons to be concerned. Oil prices are still uncertain and the trade war with China remains unresolved. The impact on the local economy of a downturn in oil prices is obvious to anyone familiar with Houston. But many Houstonians are unaware that China is the City's second largest trading partner after Mexico. Further sanctions could have a significant impact on the Port of Houston and slow the growth of the warehouse sector.

Commercial Land: Sales slow as quality tracts become scarce

Sales volume for commercial land slowed almost county-wide in 2018, continuing the trend from 2017. However, there was still some significant activity as investors are focusing on developing the tracts they acquired in prior years, particularly within the inner loop. Available quality vacant land tracts are becoming more scarce. The northwest quadrant continued to lead all outlying market areas in terms of sales activity, followed by the southeast quadrant, and the northeast quadrant.



CBD: New Construction Continues Despite Slow Office Recovery

The Downtown Living Initiative Program has continued to spark development. The program encouraged developers to build 5,000 multifamily residential units in downtown Houston using tax abatements as incentive. Two new high-rise apartments were constructed and another high-rise apartment saw a total rehab. Several mid-rise apartments were constructed as well. Currently there is one high-rise under construction, with a second one to be built when the first is completed. Land has also been cleared for a new mid-rise apartment called Regalia at the Park. Located at Commerce Street and Crawford, this is the first big project in the former warehouse district near Minute Maid Park.

There was also major movement in office development as the former Houston Chronicle site was cleared and excavated for a 47-story, one million square foot office building with parking garage. Hines, the developer, will be occupying part of the building and another 212,000 square feet is pre-leased.

We may also finally see the expansion of Chevron's downtown campus. The project, a 50-story, 1.7 million square foot tower had been placed on the back burner in the past due to the downturn in the market. Demolition crews have recently cleared a block purchased by Chevron. The block is the former home to the Houston Press and the intended use of the block is a construction staging area for Chevron's new office tower. No start date has been set yet, but the clearing of that block might be an indicator construction is near.

Chevron's proposed new downtown office tower

Galleria/Uptown District sees More Mixed-Use Development

Westcreek Lane in The Galleria/Uptown district has become the hot spot for high-rise and mid-rise apartments, residential condominiums and multi-use retail space. More land has been cleared and site prep has begun on a14-story high-rise apartment by Atlanta-based Gables Residential. The northwest corner of Westcreek Lane and Westheimer Road has been cleared as well. This corner was home to Sullivan's Steakhouse, Le Peep and Westcreek Market & Deli. No plans have been announced yet for this two-acre corner. Infrastructure expansion continues in the area as the dedicated bus lane under on Post Oak Road is nearing completion. The lane will run from Richmond Avenue to the 610 Loop. Not all signs are positive in the district, as Marathon Oil announced plans to move out of the Galleria area and head west to City Centre near the Energy Corridor.

Inner Loop Continues Transformation

The 16.8-acre tract, formerly home to the ExxonMobil Upstream Research facility has been cleared and is in site prep mode for a new mixed-use master planned property. Located on Buffalo Speedway, the redevelopment will consist of an ultimate buildout of over 1,000 residential units, 500,000 square feet of Class A office space, 100,000 square feet of retail space, and 200 hotel rooms. Construction will start in 2019.

Shell Oil has sold a former information center that occupies 21 acres at Old Spanish Trail and Greenbriar Drive. No plans have been verified yet, but it is rumored the property is to be cleared with the exception of the parking garage and redeveloped as mixed-use multi-family residential. Shell vacated the property 2-3 years ago.

Houston-based companies Radom Capitol and Triten Real Estate Partners are teaming up to redevelop 200,000 square feet of industrial buildings into a mixed-use project that will contain 100,000 square feet of creative office space, 100,000 square feet of retail, an abundance of green

space and a boardwalk-inspired gathering space around the Heights bike trails at North Shepherd Street and 6th and 7th Streets. Construction is expected to start in the second quarter of 2019.

Caydon Property Group has topped out their first U.S. high rise on Fannin Street in Midtown Houston. The 27-story tower will include 357 studio, one- and two-bedroom apartments with European-style interiors and resort-style amenities including a pool with swim-up bar, fitness center and separate yoga studio. “2850 Fannin St” is along the MetroRail and opposite the new Midtown Park, with more than 12,000 square feet of green space and a retail plaza.

Another high rise is under construction on Main Street in Midtown. “3300 Main” is a luxury mixed-use development by AECOM and Houston-based PMRG. The 29-story tower will feature 328 units with 15K SF of ground-level retail on a 1.16-acre site. The property was formerly owned by the City. Construction is expected to be completed in 2020.

Rice Management Company is moving ahead with the transformation of the former Midtown Sears building into an innovation hub. Work will begin in May and is expected to be completed by late 2020. The project, named “The Ion”, will integrate entrepreneurial, corporate and academic communities by supporting businesses throughout the innovation lifecycle. It will host educational events, demonstrations, hack-a-thons and programming. There will also be a mix of restaurant and entertainment amenities. Hines will be managing the development. The Ion is expected to be the first phase of Midtown’s 16-acre “Innovation District” that will incorporate public spaces and infrastructure with housing and commercial development.

Northwest Quadrant's Exponential Growth Continues

The largest area of construction in the Northwest Quadrant is Springwoods Village. CDC is the master developer of the 2,000-acre mixed use community at the northwest corner of I-45 and the Grand Parkway. It opened in 2014 and is anchored by the ExxonMobil campus. Other major anchors are Southwestern Energy and CHI St Luke's Hospital. The American Bureau of Shipping recently opened their new headquarters in January 2019, joining several hotels and retail shopping centers that opened in 2018. The most recent deal was inked in the fall of 2018 as Hewlett Packard Enterprise announced plans to build a 568,000 square foot campus, beginning construction in late 2019. The campus will be in the CityPlace development, the 60-acre urban center of Springwoods Village.

CityPlace will be the mixed-use city center of Springwoods Village

The Grand Parkway is a catalyst for growth in the area. The major intersections along the Grand Parkway are being developed with power centers and grocery-anchored shopping centers. Infill along the Grand Parkway is following with new strip centers, restaurants and entertainment venues.

Aldine ISD is still seeing growth in Pinto Park Business Park. Pinto Park is home to giants like Amazon, Sysco, Grocers Supply, and soon a $250 million manufacturing and distribution plant for Coca-Cola. The facility will occupy one million square feet of warehouse space located on a 140-acre site within the business park.

The other notable project in Aldine is the East Aldine Town Center. The Town Center will be roughly 300,000 square feet of commercial and institutional space. This project will provide many community focused goods and services. About 80,000 square feet will be for Lone Star/Early College High School, and additional 50,000 square feet for Baker Ripley, which provided a space to assist in skill and business support for the community. Plus 25,000 square feet for a new 911 call center. A new amphitheater/ community center with the capacity to serve 1,500 people is also planned.

A rendering of Redemption Square, the mixed-use city center of Generation Park

Northeast Quadrant Growth Spurred by Generation Park

The activity of the northeast quadrant is concentrated at the intersection of North Sam Houston Parkway and West Lake Houston Parkway at Generation Park. The 4,000-acre project is filling out, with the latest announcement of a new San Jacinto College campus slated for opening in 2020.

The heart of Generation Park is Redemption Square, a 52-acre urban mixed-use district designed to provide amenities to the businesses that call Generation Park home. Redemption Square will feature multiple hotels, including a Courtyard Marriott, luxury apartments, Class A offices, an early child development center, fitness center, restaurants, shops and daily services.

Southeast Quadrant to see Redevelopment of Baytown's San Jacinto Mall

The repurposing of San Jacinto Mall is finally set to begin in early 2019. The original mall will be demolished and redeveloped as a lifestyle-center outdoor mall dubbed "San Jacinto Marketplace." Fidelis acquired the site in 2015 and redevelopment was stalled by negotiations with the major anchors. Most of the anchors, other than the Sears store which recently sold, will remain open during renovation. The construction of San Jacinto Blvd and Hunt Road has created more access to additional land for commercial development behind the San Jacinto Mall. Hearings are still being held to change the zoning use of that area.

ExxonMobil is purchasing more land around their Baytown plant with the intent of creating a buffer zone between the plant and the surrounding community.

In Pasadena, most activity is taking place along the East Sam Houston Parkway with retail and medical infill, and new warehouse space between the Pasadena Freeway and Red Bluff Road.

Growth along the Gulf Freeway corridor continues with ongoing expansion around Baybrook Mall and the 177-acre mixed-use Webster Destination Development.

In Channelview, the Environmental Protection Agency has decided to remove the toxic sludge from the San Jacinto waste pits. The pits were severely damaged during Hurricane Harvey. There has been recent sales activity along that waterway for waterfront properties that will create access to the river channel.

Southwest Quadrant: Marathon Oil to Move to CityCentre

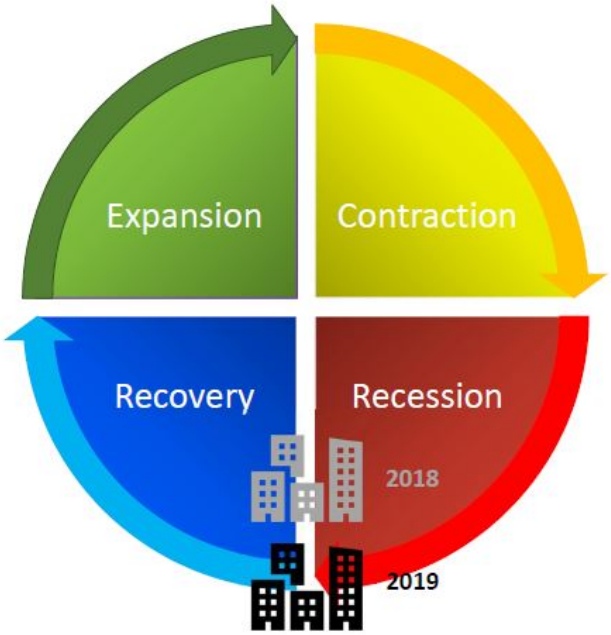
In an effort to get closer to where their employees live, Marathon Oil wants to build a tower on a tract with Katy Freeway frontage in the Town & Country outskirts north of City Centre. CEO Lee Tillman set a tentative move-in date of 2021. Specs on the office space have not yet been made available to the public. The proposed office at 10575 Katy Freeway would sit on about two acres of land and possibly share space with a residential high-rise and another office tower on four more acres adjoining this location.

The proposed new Marathon Oil tower near CityCentre

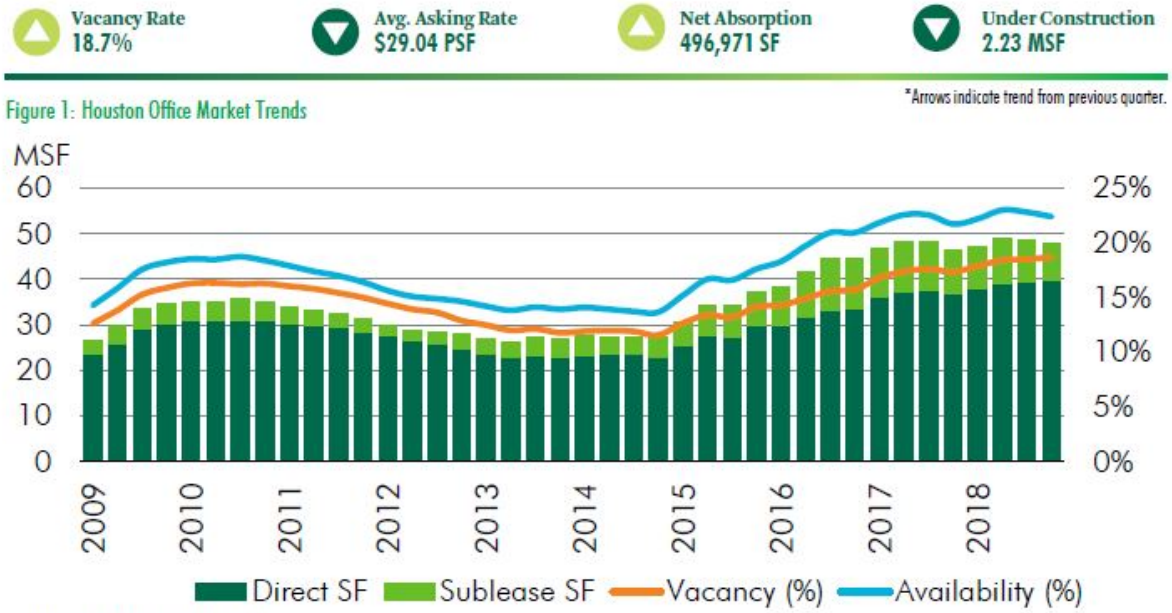
Houston-based Moody National appears to be gearing up to build a mixed-use project just east of Memorial City in west Houston. A construction fence surrounds the site of a former Toys R Us store near the southeast corner of Interstate 10 and Bunker Hill Road. Signs on the fence show renderings of a six-story mixed-use project slated to open in 2019. It would offer 275,000 square feet of office space and over 45,000 square feet of retail space. Moody National acquired two adjacent parcels totaling nearly 5.2 acres at the site in August 2017. The construction fence only surrounds the vacant Toys R Us site, but Moody National also owns an adjacent apartment community.

Office: On the Brink of Recovery

The Houston office market saw positive net absorption for the fourth quarter of 2018, despite over one million square feet of deliveries. The newest deliveries were in the North submarket at Springwoods Village, with American Bureau of Shipping and Hewlett-Packard, both build to suit. The high volume of new construction absorption was offset by more than one million square feet of expiring sublease space coming online. By year end vacancy had inched to 18.7% on average for the office sector. Overall vacancy rates are still elevated compared to the five-year average of 16.4%, however the amount of sublease space is shrinking which is a good sign the office market is on the brink of recovery.



Newer and renovated Class A properties are continuing to outperform the rest of the market as tenants are paying premium rents for the higher quality, more efficient buildings that are well located. The new deliveries and flight to quality were resulting in ongoing negative absorption for Class A properties. However, for 2018 Class A office had 74,443 square feet of net positive absorption, further signaling the market was beginning to recover. And the vacancy rate at 16.7% among Class A office buildings is lower than the metro average.



Source: CBRE Research, Q4 2018.

The flight to quality is still affecting Class B properties. They ended the year with net negative absorption of 1,295,636 square feet despite no new deliveries. The Energy Corridor continues to struggle the most to obtain stability, ending the year with 360,929 square feet of negative net

absorption, 20.2% total vacancy and 26.2% including sublease space. Most of the vacancy is in the Class B buildings with 28.3% and almost all sublease space remains in the Class A buildings.

The Greenspoint submarket continues to struggle also with 766,795 square feet of negative absorption in 2018, mostly among Class A properties, and has the highest vacancy rate in the metro at 49.5%.

The CBD had negative absorption of 226,439 square feet in 2018. There is 1.9 million square feet currently under construction in the CBD and about 2.5 million in the metro. Approximately 46.7% of the new construction is build-to-suit or preleased. The two largest projects are Texas Tower with a little over 1.1 million square feet developed by Hines, and Capitol Tower with almost 800,000 square feet developed by SCD Acquisitions. The Hines project is 32.8% pre-leased and is set to deliver in October 2021. SCD's project is 81% pre-leased and will deliver in June 2019.

Leasing activity was steady throughout the year, totaling 14 million square feet. Per Colliers, asking rents ended the year at $44.30 for CBD Class A, $34.43 for Overall Class A, and $31.64 for Suburban Class A. Rental rates remained at around $52 per square foot in the best performing buildings in the CBD.

Asking rents were down slightly year over year and but remained relatively flat over the previous five-year period. Average rental rates for all classes ended the year at $29.04.

Notable recent activity includes ConocoPhillips leasing 597,600 square feet in Energy Center IV and McDermott International leasing 524,300 square feet in Energy Center V in the Katy Freeway submarket; Waste Management leasing 284,300 square feet in Capitol Tower and Midcoast Energy Partners leasing 61,700 square feet in Hess Tower in the CBD; and PROS, Inc leasing 97,700 square feet in Kirby Collection in Greenway Plaza.

Colliers Houston Office Report Q4 2018

The highest sale in the Houston office market in 2018 was the Memorial Hermann Medical Plaza at 6400 Fannin Street in the Texas Medical Center. The 510,355 square foot building designed by Kirksey Architecture was constructed in 2007 and sold in July for $793 per square foot according to the Houston Chronicle.

Helios Plaza sold in December 2017. The building is located in the Katy Freeway West submarket and is occupied in full by BP America. According to the Chronicle, BP will continue to lease the building.

Sales Analysis by Building Size

Based on Office Building Sales From Oct. 2017 - Sept. 2018

Bldg Size	#	RBA	$ Volume	Price/SF	Cap Rate
< 50,000 SF	48	510,595	$81,339,396	$ 159.30	7.03%
50K-249K SF	13	2,080,489	$318,200,285	$ 152.94	7.58%
250K-499K SF	5	1,584,088	$425,900,000	$ 268.86	5.53%
>500K SF	7	6,045,759	$1,533,500,000	$ 253.65	7.55%

Source: CoStar COMPS®

The Marathon Oil Tower at 5555 San Felipe Street sold in January 2018. Marathon Oil had a lease in place that expires in 2021 for 62% of the building. The remaining space was being subleased at well-below market rents at the time of sale. The building was built in 1983 and had sold previously in 2013. The buyer, a private REIT, plans to renovate the property with hopes of renewing the existing leases and re-tenanting the building at higher market rents. According to the Chronicle they are planning on spending $25 million upgrading the building.

Several office buildings sold in the Bellaire submarket in 2018 including a portfolio of five 1970's buildings, a portfolio of three 1980's buildings, and a an extensively renovated 1970's building. The sales ranged from $127 to $252 per square foot. Some of the buildings had sold previously and an internal analysis indicates an appreciation rate of up to 6% per year in the Bellaire market for these vintage office buildings.

Brookhollow Central, a three-building portfolio on the North Loop built in 1980, sold in February 2018 for $70.5 million ($87 per square foot) according to the Chronicle. The buildings were 38% leased at the time of sale. The investor is planning to improve the occupancy now that the road construction in the area has been completed. The property previously sold in 2012 for a similar price and was 70% occupied at that time. The buyer was California-based Hertz Investment Group. Earlier in the year Hertz purchased Westchase Park Plaza for $24 million ($103 per square foot) according to the Chronicle. It was recently renovated and was 60% leased at the time of sale. The buyer plans to stabilize the property at 85 to 90 percent leased within two to three years and plans to hold the investment for approximately 10 years, according to an interview in the Chronicle with Hertz's chief investment officer Jim Ingram. Ingram added "We just think this is a good time to be getting into the Houston market from a long-term perspective."

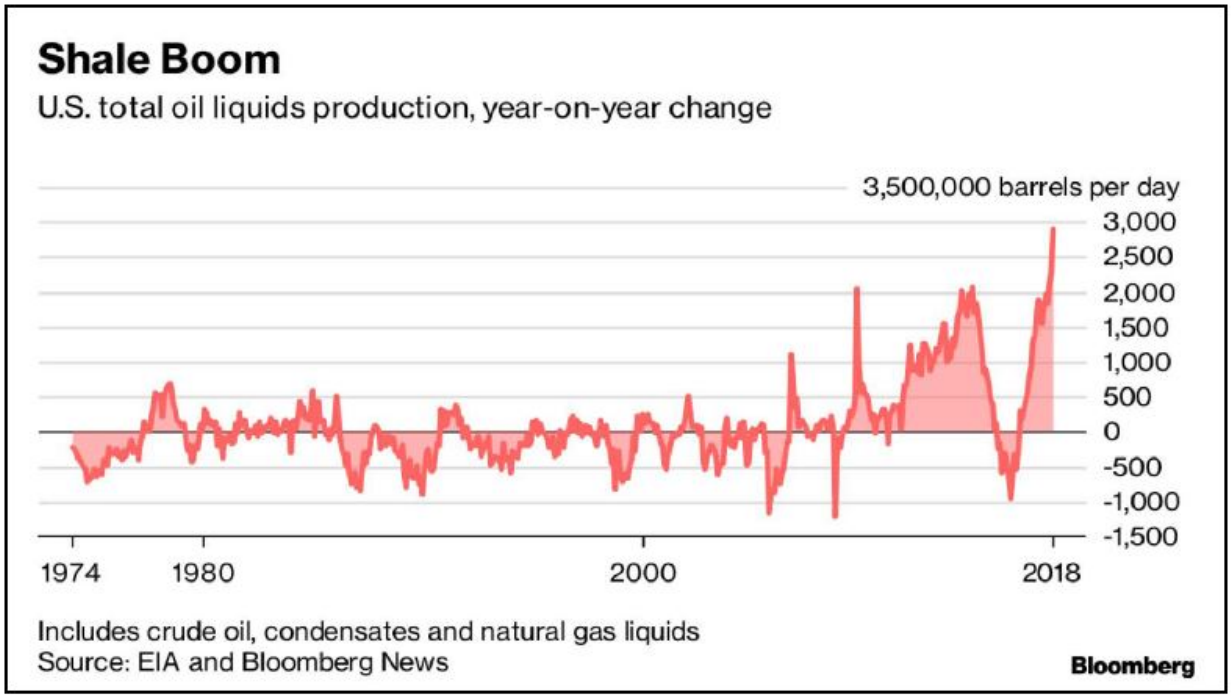
Coworking continues to trend and has a positive impact on the Houston office market. During the fourth quarter providers such as WeWork, Spaces, LifeTime Work, CommonGrounds Workplace and Bond Collective all inked new leases. This trend is expected to continue as the emerging providers break into more submarkets and compete for market share. The coworking concept is popular because it offers people who would traditionally work from home or in inferior locations the opportunity to have big-office amenities at an affordable price point by sharing office space

with others. Providers offer flexibility in work space from an area as small as a phone booth, to a desk in a common area, to private offices in multiple sizes. Amenities can include answering service, front-desk service, WiFi, IT support, security, office equipment, exercise rooms, food service, mail service and even craft coffee and beer. Many workers appreciate having a diverse group to collaborate with and the spaces are often rented on a month-to-month or even hourly basis.

Images from WeWork in Galleria Office Tower I

The Houston office market is extremely large and diverse. There is about 183 million square feet of existing office inventory. Approximately 28.9 million square feet is concentrated in the CBD and 61.6 million square feet in the Energy Corridor / Katy Freeway / Westchase submarkets that are heavily dependent on oil and gas. While many submarkets are already healthy, the energy submarkets are just beginning to recover and will need additional time. All submarkets are expected to show positive absorption in 2019 according to Greater Houston Partnership.

Market rents remain flat, but concessions are still common as landlords move to retain tenants whose leases are expiring and attract new tenants to fill the existing vacant space. In the previous several years, the situation was made worse by ongoing deliveries of new construction buildings that were started before the previous oil downturn. The last of the new construction pipeline, Energy Centers IV and V, have now delivered and are becoming occupied. If current demand continues, the energy markets should start to stabilize since there are no other new buildings set to deliver.



The biggest uncertainty facing the Houston office market is still oil prices. With the United States production capabilities increasing and moving toward energy independence, there is a degree of uncertainty as to where the price per barrel will stabilize. By the third quarter 2018 most oil companies were reporting profits again. And Houston had recouped 24,400 of the 86,400 high paying energy jobs it had lost. Furthermore, the oil companies that survived were leaner and more cost-conscious. The U.S. Energy Information Administration forecasts production of 1.2 million more barrels per day in 2019 than in 2018. They are also predicting $65 a barrel for 2019, which leaves plenty of room for profit if the Feds are correct in saying drilling costs are covered at $52. Some sources are reporting the break-even point to be even lower as technology increases and costs to drill decline. Even if we do have another period of low oil, it is unlikely to result in layoffs since the companies are already operating so lean. Greater Houston Partnership's forecast calls for the energy industry to add 1,900 jobs in 2019.

Oil only affects a part of the Houston office market (albeit a large part). Market fundamentals such as population growth and an otherwise strong and diverse local economy should bode well for the office market heading into 2019.

ENERGY OVERVIEW

	Peak	Trough	Most Recent
U.S. Rig Count	1,931	404	1,081
Oil Prices (WTI, $/bbl)	$107.95	$26.19	$59.93
U.S. Exploration Budgets (Billions)	$231.80	$88.20	$132.50
Houston Energy Employment	300,100	213,700	237,700

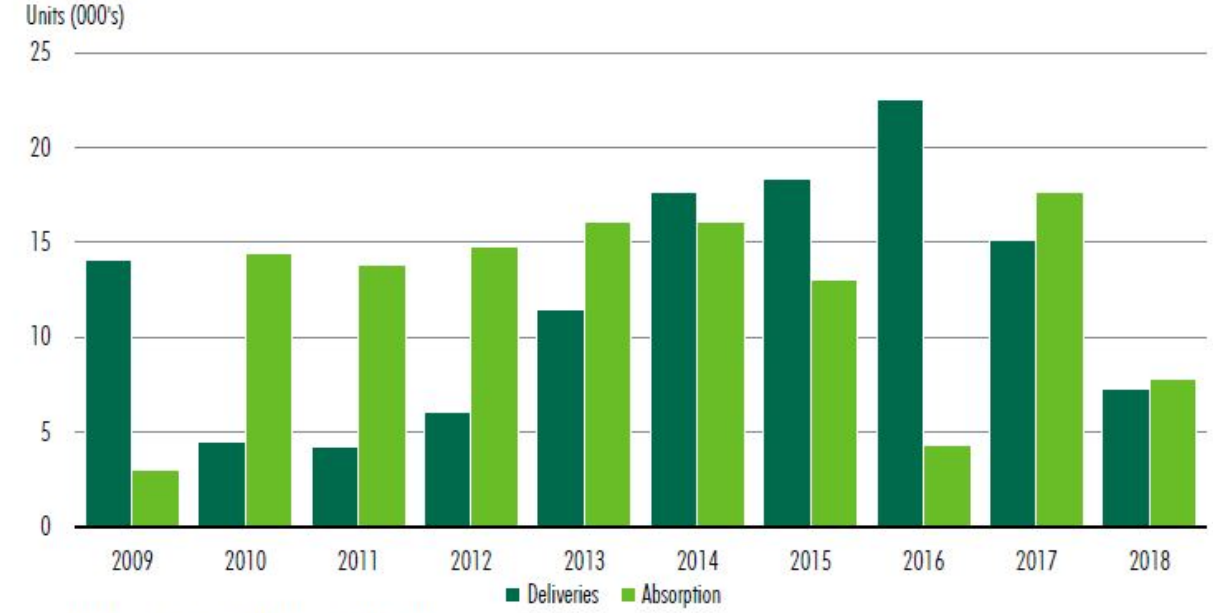
Sources: Baker Hughes, U.S. Energy Information Administration, Oil & Gas Journal, Texas Workforce Commission

Apartments: Back in Expansion

Apartment developers continued to restrain the new construction pipeline in 2018 and absorption outpaced deliveries for the second year in a row, resulting in strong market fundamentals for apartments heading into 2019. However not all submarkets are out of the woods yet.

Developer Martin Fein was quoted by Realty News Report as saying "Some submarkets are strong – the Katy sector absorbed all its units very well as did North Houston. The Galleria area is still somewhat on the weak side – downtown as well. In the CBD, there are a lot of units coming on line, and it's going to take a while for those units to be absorbed."

Figure 4: Absorption Continues To Outpace Deliveries



Source: CBRE Research, Apartment Data Services, Q4 2018.

Fein went on to say "There is no question Houston multifamily development is getting denser . . . we've seen a lot of maturation of the Inner Loop multifamily market in such a way that what recently has been a lot of mid-rise apartment development has morphed into high-rise developments due in part to strong demand and fewer sites. I see continued saturation and densification in the Inner Loop market, with more and more vertical development because the cost of land is increasing. That, in turn, is causing many developers to go up in height with their products."

New development is being constrained not only by the lack of appropriate sites and the rising cost of available land, but also by increasing construction costs, which should further stabilize the market. Situs RERC survey respondents ranked apartments as the best sector nationally among main property types (return outweighs risk) due to healthy market fundamentals and immunity to a potential economic downturn. Demand for apartments is expected to remain strong due to population growth, the rising cost of single-family housing, real wage growth and rising mortgage rates.

The overall Houston vacancy rate is estimated at 9-10%. Historical vacancy rates are 7-8%. Vacancy is predicted to remain at the higher rates for another year or two. Class A and B apartments are enjoying lower vacancy rates than average for Houston. Urban Class A apartment vacancy rates are 8.3% just above the national average of 7.9%. Suburban Class A are faring better at 6.5%, and Class B Urban and Suburban apartment vacancies are estimated at only 4.8%.

Average rental rates ended the year at $1.16 per square foot and have shown an increase almost every year since 2009. They are well above the ten-year annual average of $0.99 per square foot. Rental rates per unit for Class A average $1,174 for Suburban locations and $1,460 for Urban locations. Class B averages are $774 for Suburban and $817 for Urban. Submarkets that ended the year with the highest rental rate growth were Beltway 8/I-45 South, Braeswood/Fondren SW, and Greenspoint. Submarkets that ended with the largest declines were Med Center/Braes Bayou, Hwy 288 South and Westchase. Rental rates are expected to continue to grow, though at only 1-2% annually. Concessions were reported in 45% of the market with an average concession of 6.8% of total rent. Internal analysis indicated a wide variation of concessions and secondary income, particularly among Class A mid- and high-rise properties.

The Houston apartment market saw $7.4 billion in sales during 2018, totaling 277 apartment complexes and 67,639 units. This was the strongest year in terms of sales volume since before the subprime mortgage meltdown. One of the most notable sales was of Lakeview Apartments in the Willowbrook submarket. The 278-unit complex sold for an allocated $33.4 million or $120,141 per unit.

The newest high-rise development planned for Houston is the Hines tower at 710 Preston Street in the Central Business District. The 46-story luxury residential tower will be the tallest apartment tower in Houston. Construction is slated to begin in March and is expected to be completed in 2021. It will have 6,800 square feet of retail space on the first floor. The project, named "The Preston," will be adjacent to the 40-story apartment building, "Market Square Tower," and the new office tower at 801 Texas Avenue, "Texas Tower." The building will have good views of Market Square Park. This location is also home to many restaurants, bars and entertainment venues such as Jones Hall and Toyota Center. Developers are seeing the area as a new focal point for the CBD as market demand shifts toward more walkable and mixed-use spaces. The design of the building emphasizes downtown views and natural lighting.

Perhaps the biggest trend in the Houston apartment market is the increasing investor interest in Class C and D properties. As blue-collar jobs and wages increase, there is growing demand for well-placed Class C and D apartment complexes. Investors are paying a premium for these projects, compressing cap rates close to the typical cap rates even for Class A and B properties. Some investors are looking to redevelop and raise the rents in some of the historically under-performing complexes, but many will keep the apartments relatively affordable, opting for the consistent steady income projects at the lower end of the spectrum tend to produce. Due to the recent oversupply of Class A projects, many investors see Class C properties as a safer risk.

While developers will continue to build Class A and B apartment communities in Houston, the lower-class projects will not have to compete directly with new construction because the market rental rates these properties can command will not support rising new construction costs. Therefore, it is unlikely Houston will suffer from the lack of affordable housing that is sweeping many parts of the nation.

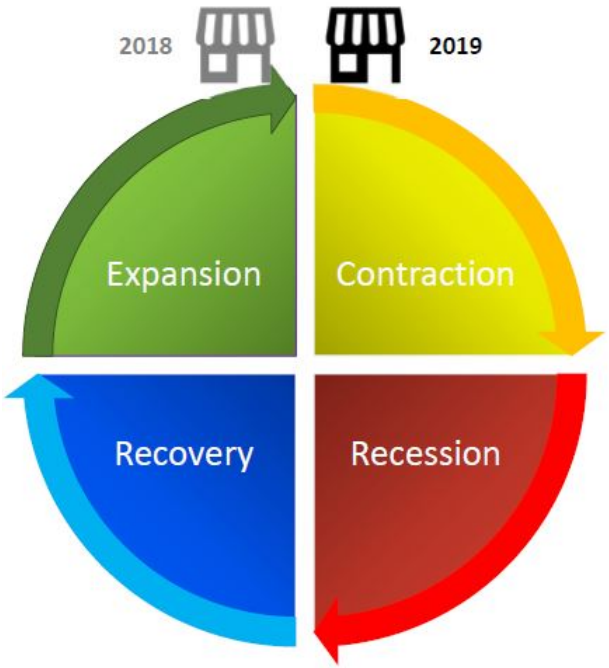
PRIVATE INVESTORS ARE SEEKING OPPORTUNITIES IN THE EASTERN AND SOUTHEASTERN PORTIONS OF THE METRO, NEAR PETROCHEMICAL PLANTS. PROPERTIES CONSTRUCTED DURING THE 1970'S AND '80'S ARE TRADING IN THE LOW 5'S TO MID-6 PERCENT AREA

Marcus & Millichap

There are 570,669 apartment units in Houston and about 15,795 units under construction (4,500 new units broke ground in the fourth quarter alone). There were 7,966 units absorbed in 2018. If historic trends continue, the new constructions units will take more than 18 months to be absorbed. Although the multifamily market shows strong underlying market fundamentals and favorable demographics, restraint is needed in new construction Class A and B properties to prevent an over-supply from suppressing rental rates and occupancy rates.

Retail: Expansion Peaks

After several years of expansion, Houston retail development is finally starting to show signs that it has peaked. But that doesn't mean Class A & B occupancy or rental rates are declining. In fact, the market remains extremely healthy, but for how long?



Core retail property types are expected to continue to perform well, with vacancy rates below 6% going on five years in a row and rental rates continuing to inch upward. The move toward the suburbs is being fueled by infrastructure projects like the Grand Parkway and demand for newer HEB and Kroger neighborhood centers continues to rise. Empty-nesters and Millennials are driving the demand for well-located mixed-use lifestyle centers.

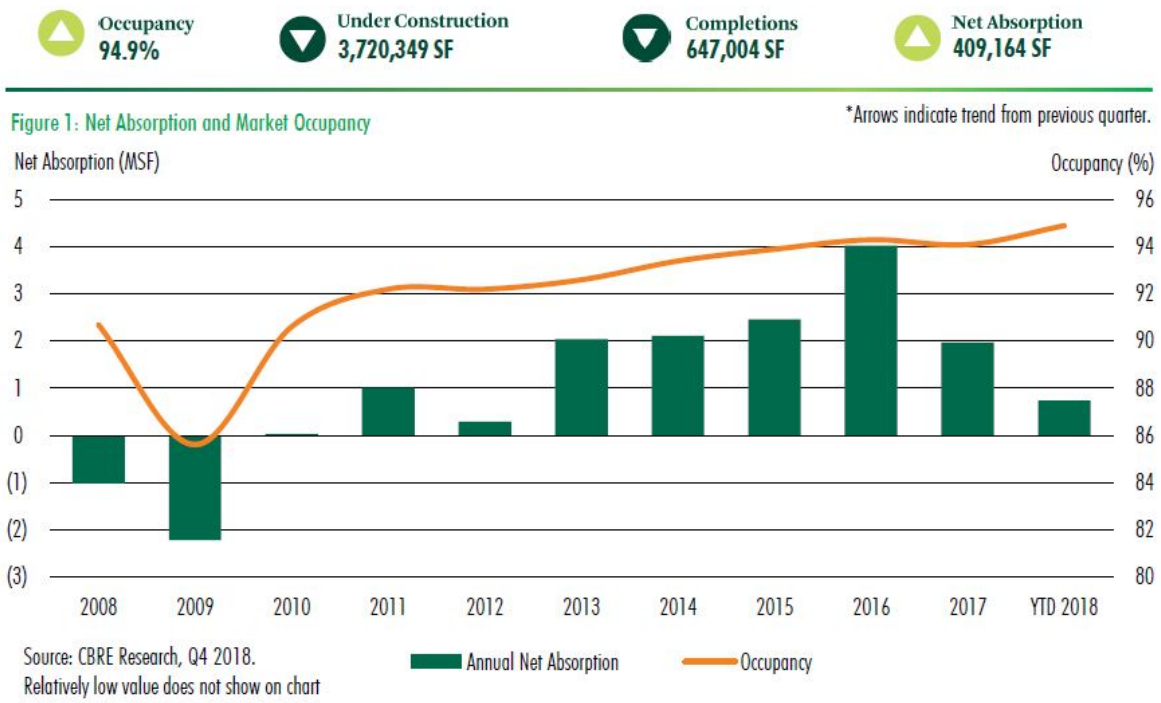
There are several major retail projects underway. Along with the mixed-use projects already mentioned, grocers continue to fight over market share. After opening several new locations in 2018, Kroger does not have any new locations slated for this year, however HEB plans seven new stores, Aldi has six new stores underway, Sprouts and Whole Foods each have an additional store being built, and Costco is building another location in Cypress.

Grocer	Number of Local Stores as of Jan 2019
Kroger	97
HEB	96
La Michoacana	72
Walmart	71
Aldi	42

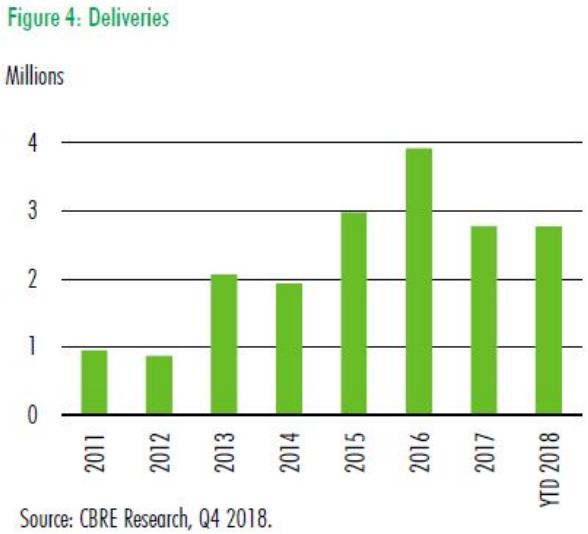
Overall occupancy is expected to remain strong at around 95 percent and rental rates will increase slightly to keep up with higher land cost, building costs and increasing interest rates. The rental rate increases are strongest in the Community shopping centers.

The time of retail speculation has ended, at least for now. There is currently 1.2 million square feet of retail space under construction and 66% is pre-leased. With the flight to the newer, higher quality projects that has occurred recently, investors are now turning their attention to redevelopment of the Class C and D retail centers while also continuing to look for development opportunities for well-located mixed-use projects.

The newest trend in restaurants has been the emergence of food halls, and downtown Houston is home to two of the newest food halls in the nation, with a third scheduled for completion in 2019. Grabbing the most headlines is Finn Hall, located in the Art Deco JPMorgan Chase building downtown. The 20,000 square foot food hall features ten scaled-down kitchens from local restauranteurs such as Low Tide, Amaya Coffee, Goode Co Taqueria, and Dish Society as well as two full-service bars. Some of the vendors got their start in food trucks and some have well-established full-service restaurants in the metro. The food hall concept delivers more high-quality food choices at a cost that makes it easier for vendors to break into the downtown market.



The retail developers have shown restraint in new construction deliveries again this year and that has resulted in a balanced market. After peaking in 2016 with almost four million square feet, net absorption for 2018 was less than one million square feet. However, occupancy ended the year at a high of about 95%, thanks to the slow-down in deliveries. Although the lowest it's been since 2012, the absorption rate for the year is just below the ten-year average of 1.1 million square feet.



Sales of retail buildings in 2018 were down compared to 2017. In the first three quarters there were 31 retail sales transactions with a total volume of $289,482,287. The average price per square foot was $187. The same period in 2017 saw $371,755,698 in sales activity but the average price per square foot was lower at $174. Fourth quarter reports indicate sales for the year at 2.5 M square feet with average sale price of $205 per square foot. Cap rates have compressed in 2018 averaging 7.00% compared to 8.00% in 2017. That puts Houston retail well above the national average for the previous 18 months.

The largest lease signings occurring in 2018 included 120,000 square feet by Life Time Fitness at Baybrook Mall and 108,632 square feet by At Home on Kirby Drive.

A total of 4,302,996 square feet of retail space was built in the Houston metro area (including surrounding counties) in 2018. At the end of the year there was 4,120,696 square feet under construction. The most notable delivery in Harris County was 9922 Fry Road, a 150,000 square foot building that is already fully occupied.

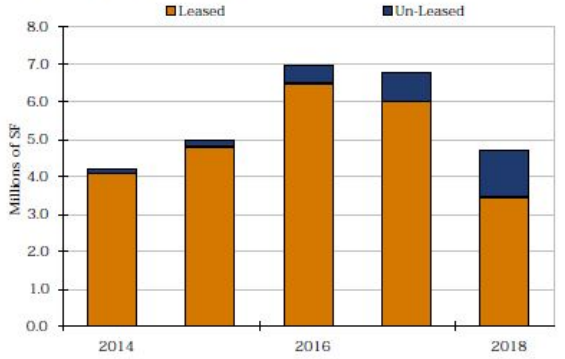
Construction Activity Markets Ranked by Under Construction Square Footage

	Under Construction Inventory				Average Bldg Size	
Market	# Bldgs	Total GLA	Preleased SF	Preleased %	All Existing	U/C
Southwest Ret	36	1,181,125	961,993	81.4%	17,939	32,809
North Ret	28	802,282	464,745	57.9%	15,238	28,653
Northwest Ret	36	738,885	374,154	50.6%	15,504	20,525
West Ret	23	531,242	308,226	58.0%	21,700	23,097
Southeast Ret	12	309,138	243,515	78.8%	13,853	25,761
Inner Loop Ret	16	274,622	175,733	64.0%	9,496	17,164
South Ret	9	122,694	58,538	47.7%	12,168	13,633
Northeast Ret	6	112,708	55,164	48.9%	13,139	18,785
CBD Ret	1	31,000	9,610	31.0%	15,010	31,000
East Ret	2	17,000	17,000	100.0%	13,129	8,500
All Other	0	0	0	0.0%	9,135	0
Totals	**169**	**4,120,696**	**2,668,678**	**64.8%**	**14,785**	**24,383**

Source: CoStar Property®

Recent Deliveries

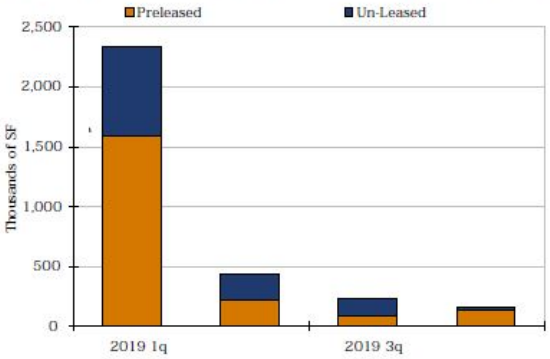
Leased & Un-Leased SF in Deliveries Since 2014



Source: CoStar Property®

Future Deliveries

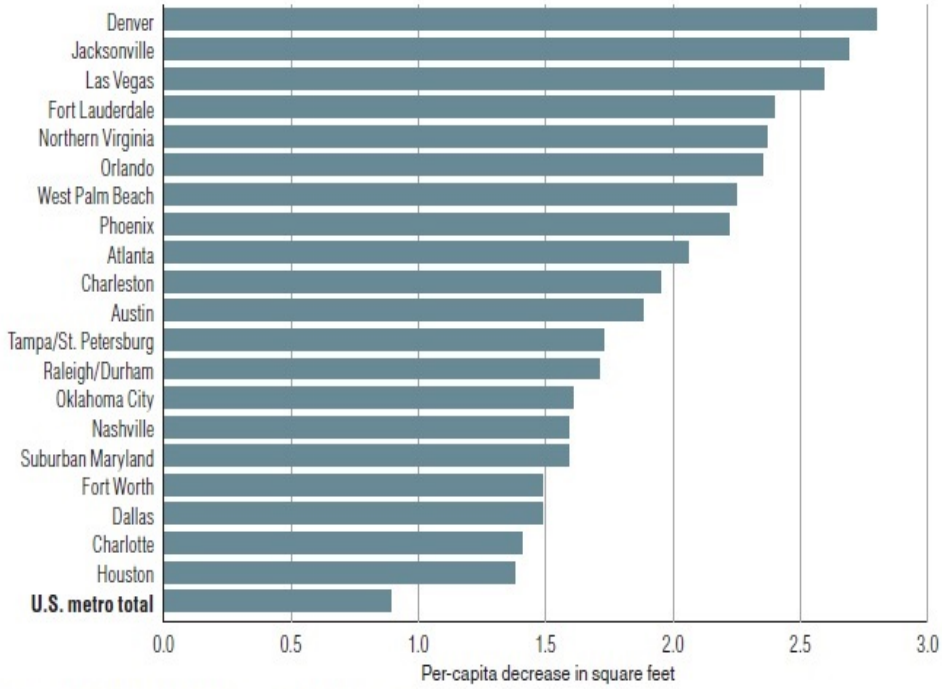
Preleased & Un-Leased SF in Properties Scheduled to Deliver



Source: CoStar Property®

The effect of e-commerce on bricks-and-sticks retail has been making national headlines for about a decade. In the beginning the potential effects were purely speculative and many were crying "apocalypse." Now that we have a decade of data to analyze, it seems the doom and gloom hasn't quite played out the way some were predicting. Houston has lost about 1.3 square feet of retail space per capita. While Houston has experienced retail loss above the national average, our loss has been minor compared with other cities, such as Denver, Jacksonville and Las Vegas who have lost more than 2.5 square feet per capita.

Exhibit 1-14 **Largest Decreases in Retail Square Footage by Market, 2007–2018**



Source: REIS Inc., Neighborhood & Community Center Inventory.

Effect of E-Commerce on Retail Space

Store closures have outpaced store openings. And retail bankruptcies are continuing to make headlines. The latest being Sears which joins almost 40 other retail bankruptcies in the previous 2.5 years in North America. As retailers reposition themselves to compete in the age of e-commerce, we are seeing some good news. Mergers and acquisitions are occurring at a faster pace as funds become more available, and retail sales increased 3.9 percent from 2016 to 2017 nationally. Retailers are discovering that physical locations are a highly important part of their success and the flight to quality and emergence of mixed-use lifestyle centers reflect this. One of the biggest challenges the retail sector faces is how to redevelop and repurpose properties that no longer function in the new retail era. The conversion of the Midtown Sears building to an innovation hub, mentioned earlier, is a great example of solving the problems that retail properties face in this age of disruption.

Rental rates ended 2018 at $17.24 per square foot NNN overall, an increase of 7.1% over end of year 2017. That equates to a 14.5% increase since the oil downturn in 2014. The highest rental rates continue to be commanded by mixed-use lifestyle centers, ending the year at $31.85 per square foot NNN, up from $30.47 year-over-year. Grocery-anchored centers were at $15.66 per square foot NNN, a slight 1.6% decline from 2017. Power Centers ended the year at $15.55 per square foot NNN.

Q4 2018 Retail Market Statistical Summary									
PROPERTY TYPE	RENTABLE AREA	DIRECT VACANT SF	DIRECT VACANCY RATE	SUBLET VACANT SF	SUBLET VACANCY RATE	TOTAL VACANT SF	TOTAL VACANCY RATE	4Q18 NET ABSORPTION	CLASS A RENTAL RATES (IN-LINE*)
Strip Centers (unanchored)	36,101,860	2,777,547	7.7%	16,191	0.0%	2,793,738	7.7%	245,535	$27.00-$45.00
Neighborhood Centers (one anchor)	71,188,498	5,824,447	8.2%	58,638	0.1%	5,883,085	8.3%	112,571	$28.00-$46.00
Community Centers (two anchors)	47,235,125	2,483,208	5.3%	61,339	0.1%	2,544,547	5.4%	101,635	$28.00-$45.00
Power Centers (three or > anchors)	29,298,373	1,588,537	5.4%	200	0.0%	1,588,737	5.4%	(70,689)	$28.00-$45.00
Lifestyle Centers	6,106,573	115,056	1.9%	-	0.0%	115,056	1.9%	110,139	$40.00-$85.00
Outlet Centers	1,397,035	144,058	10.3%	-	0.0%	144,058	10.3%	21,320	$20.00-$40.00
Theme/Entertainment	499,468	12,238	2.5%	-	0.0%	12,238	2.5%	-	$25.00-$35.00
Single-Tenant	73,041,262	1,069,625	1.5%	72,373	0.1%	1,141,998	1.6%	6,689	N/A
Malls	22,294,815	1,026,452	4.6%	12,397	0.1%	1,038,849	4.7%	(38,746)	N/A
GREATER HOUSTON	287,163,009	15,041,168	5.2%	221,138	0.1%	15,262,306	5.3%	488,454	

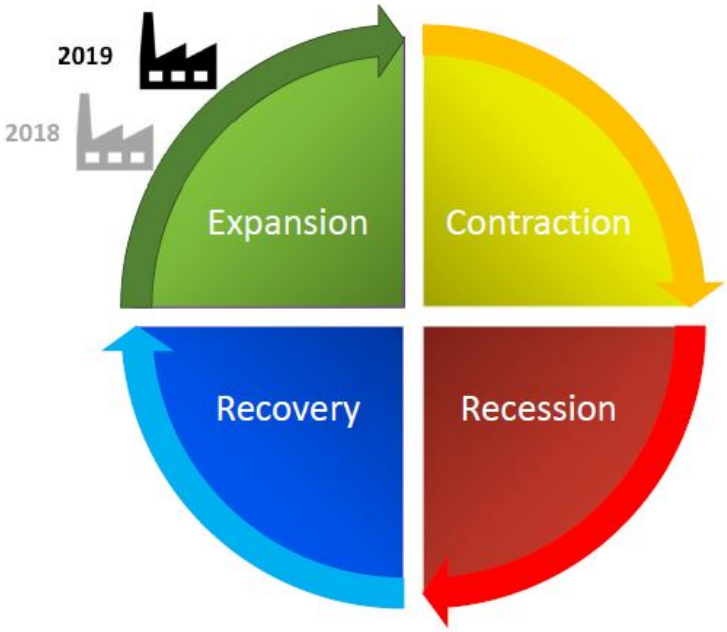
Colliers Q4 2018 Houston Retail Summary

The Houston retail market should remain favorable, supported by population growth, as long as oil prices continue to rebound and developers continue to exercise restraint. Developers are changing their focus in 2019 to redevelopment opportunities and additional locations for mixed-use projects. Big box retailers that are not well-located and lower-class regional malls will continue to struggle to remain profitable as market demands evolve and the e-commerce sector continues to grow.

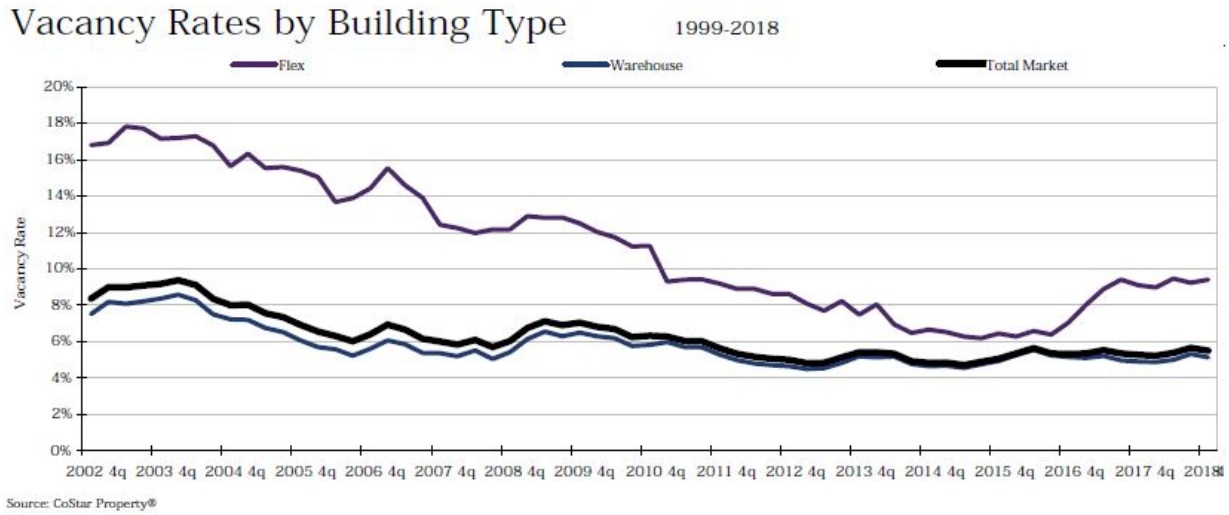
Warehouse: Expansion Continues - No End in Sight

All indicators continue to be positive for Houston's industrial/warehouse sector. Vacancy rates remain stable, ending the year at an average of only 5%. The expansionary period is going on ten years and construction activity continues to increase while vacancy remains low.

There were 16.3 million square feet of construction starts in 2018, with 5.9 million square feet in the fourth quarter alone. Last year saw 10.6 million square feet of net absorption. Over 12 million square feet is currently under construction, of which 35.5% is preleased.



The strongest submarket in terms of growth is the North submarket which is anchored by Houston's IAH airport and has plenty of freeway access via I-45, I-69, Beltway 8 and the Grand Parkway. The average building size under construction in the metro is 233,000 square feet.



However, the North submarket is home to five of the seven properties under construction that are larger than 500,000 square feet.

The largest project currently under construction is a 727,600 square foot distribution warehouse for Grocers Supply Company. It is located on Woodham Drive in the Liberty Pines Business Park off the North Hardy Toll Road and is expected to be completed by April 2019. A similar distribution warehouse being constructed on North Rankin for Conn's HomePlus is expected to deliver in June 2019. Liberty Property Trust is the developer for both projects.

Because of the significant amount of new construction activity there, the North submarket is experiencing the highest vacancy rate at 7.1%. The lowest vacancy rate is in the Northeast sector at 3.5% followed by the South corridor at 3.9%. Not surprisingly, the Flex buildings had the highest vacancy rates by building type at over 9% again this year.

Asking rents averaged about $7.50 per square foot (gross) annually with the strongest submarkets being the North, Northwest and Southwest which were closer to $7.80 on average. The current rates have increased year over year but are still lower than the previous high of $8.00-$8.50 from 2014 and 2015. Newer bulk industrial space is averaging $4.68 to $5.16 per square foot (NNN) and flex rates range from $7.20 to $10.80 per square foot (NNN) depending on amenities, age, TI allowance and location.

According to CoStar, average asking rents by type are $7.09 per square foot for Warehouse Distribution, $9.21 per square foot for Flex/Service space, and $10.23 per square foot for Tech/R&D space. The quoted asking rents per CoStar were NNN rates.

Houston's manufacturing sector gained the most jobs annually since 2011, adding 15,600 jobs last year. The Houston Purchasing Mangers Index (PMI) remained over 50 for the year, indicating an expansionary climate. In fact, the PMI average 56.6 for 2018 which is the highest annual average since 2013. Covestro AG, one of the world's largest polymer companies, will be expanding their existing site in Baytown to allow capacity for 500 kilotons of MDI, an insulation material used in building and refrigerators. The expansion project is expected to cost $1.72 billion and is expected to be coming online in 2024.

As mentioned earlier, activity through the Port of Houston is at an all-time high. And demand for warehouse and distribution centers continues to increase. The growing population with its shift toward e-commerce and accompanying increase in consumer spending and demand for warehouse storage and distribution centers can be credited with driving most of the growth in the industrial sector.

Core Industries
Houston Metro Area | 2017 Gross Domestic Product

CORE INDUSTRIES	$ (BIL)	% GDP
Trade/Transportation/Utilities	$103	21%
Manufacturing	$83	17%
Financial Activities	$67	14%
Professional/Business Services	$65	13%
Energy	$44	9%
Government	$38	8%
Construction	$30	6%
Education/Health Services	$27	5%
Total Core Industries:	$457	93%
Other	$33	7%
Total GDP:	$490	100%

SOURCE Bureau of Economic Analysis, Transwestern

While Houston's economy is becoming more diverse, manufacturing, along with trade, transportation and utilities remain the largest sector of the local economy. They make up over 38% of Houston's GDP, equating to over $186 Billion in economic activity.

The City still also remains highly dependent on Energy and the combined industries make up almost half of Houston's GDP. The oil industry has yet to fully stabilize, leading to concerns over the long-term impact on Houston's industrial sector.

Like retail, the warehouse sector is experiencing a "flight to quality" and buildings constructed before 2000 saw negative absorption in 2018 compared to 2.1 million square feet of absorption for newer buildings. Of the industrial space under construction, 42% is pre-leased.

Total sales volume was down in 2018 compared to 2017, with 41 transactions totaling $338 M and an average price per square foot of $78. Although sales volume is down year over year, the average sale price increased from $76 in 2017. Significant transactions in the previous year included the sale of a 226,596 square foot cold storage facility built in 1990 and renovated in 2014. It sold in a bulk portfolio sale for an estimated $97 per square foot in October. A four-building portfolio totaling 1,047,797 square feet of distribution warehouse built in 2001 sold for $95 per square foot in September.

Cap rates inched up only slightly in 2018 from 7.23% to 7.26%.

Refineries

The price of crude oil rose on supply-demand fundamentals throughout most of 2018 on the back of OPEC supply cuts and then tanked in the last two months of the year similar to the stock market on fears of U.S./China trade disputes possibly weakening global economic growth. On the first trading day of 2018, the price of West Texas Intermediate (WTI) was about $60.37 per barrel. It now stands around $46.31 (NYMEX; first trading day 2019). Other benchmark crudes experienced similar price declines. Over-production and limited transport options forced the price of Western Canadian crudes down even more until curtailments were announced in Alberta to free up export pipeline space.

Year-over-year crude runs at Gulf Coast refineries increased. The Texas Gulf Coast refinery average annual capacity utilization, as defined by the Department of Energy, for 2018 (data through November) was 94.8 percent compared to 87.8 percent for the same period in 2017. Hurricane Harvey can be blamed for most of the production dip in '17.

The Muse, Stancil U.S. Gulf Coast composite refining margin (*Oil & Gas Journal*) for 2018 is down about 20% from where it was for 2017. For 2018, Baker & O'Brien Inc.'s PRISM® cash margins for refining on the Gulf Coast (PADD 3) averaged $1.54 per barrel higher than the same period for the prior year. Another third-party subscription service reflects an 8.5% decrease in U.S. composite refinery earnings from '17 to '18 and then forecasts an increase in refinery earnings from 2018 and 2019 of about 5%. Houston Refining reported a year-over-year increase of about $10 million in EBITDA on lower crude runs. Clearly, refinery margins will be site specific depending on configuration, crude diet, and utilization.

The price of RINs (Renewable Identification Numbers; the renewable fuels trading/compliance mechanism) fell over the course of 2018 and their average cost was about half of the 2017 average. President Trump has made comments about the possible year-round sale of E15 gasoline in addition to reforms that could block Wall Street banks from trading RINs. While there has been no new reform, the public focus and scrutiny appear to have taken the trading volatility out of the price of RINs.

Valero owns the only new construction in the Harris County refining space for 2018 as they continue work on a new $300 million alkylation project. Completion is projected to be sometime during the second quarter of 2019.

In October of 2018 Marathon Petroleum completed its stock and debt acquisition of Andeavor for $23 billion which included all 10 of Andeavor's refineries along with its associated pipelines and terminals. At the end of January 2019, Chevron announced its intention to buy Petrobras' Pasadena refinery for $350 million. One could assume that Chevron is looking for another location to process its West Texas crude.

Chemicals

The chemicals industry is heavily dependent on auto manufacturing and home building and, as the economy goes, so goes the chemical industry. With the government shutdown, some of the retail sales information is missing for the end of the year to get accurate figures, but 2018 was a generally a good year for the automotive industry. Current housing figures are also hard to come by with the Census Bureau, but from November to November new housing units show a 3.6% drop from last year nationwide.

Texas has been blessed with oil and natural gas fields that continue to be discovered, or through newer technologies, have been newly developed. West Texas is the hot area currently with new growth in the oil industry, drilling and processing are very strong in this area. The glut of natural gas that has hit the market since 2005 has caused a tremendous amount of new construction to process the gas. Cheap natural gas means lower raw material costs for many chemicals and possibly greater profit margins for their products, but gas may not stay cheap for long.

Newly developed plans for exporting natural gas through LNG liquefaction terminals may impact the price of gas soon. Expansions of existing facilities and construction of new projects are on the horizon and with natural gas going out to the world market, natural gas prices may not be as cheap or as stable as they have been for the past 10 years. Only time will tell, but natural gas feedstocks have already caused a squeeze in margins for producers who depend on natural gas or natural gas components like ethane & propane.

Crude oil prices increased throughout the year 2018 until October when the price per barrel of WTI peaked near $75 and then began to fall quickly. Since bottoming out at nearly $45/bbl in January, prices seem to be somewhat stable in the $55/bbl range. While oil has dropped significantly from being over $100 per barrel, natural gas is likely to continue as the preferred feed product for chemical manufacturing soon due to the abundance of supply.

In Harris County, there have been several very large building projects that have taken advantage of the abundant natural gas available. These projects have been completed, but the ethylene margins are currently distressed and are likely to continue to be poor for the foreseeable future. It is expected that the economics of these units may become very ugly, especially if foreign countries decide that they don’t want our plastics, or that they can get them cheaper from the Middle East or Asia.

Operation rates specifically for olefins units have been steady and hovered at over 90 percent on average through November of 2018 which is up from last year, which is to be expected not having a Harvey like event like 2017. Oil prices appear to not have any effect on olefin unit run rates at this point, but oil is impacting the overall economy of Texas and the US which does affect profitability. It appears that 2018 may have increased production, but down in overall economics. All together this industry appears to have peaked in 2015 for the current 5-15-year cycle we are on and values will likely decline over the next few years especially with the impact of the massive new plants coming online in the next few years.

Chemical-related inventory volumes should be near the levels they were on January 1, 2018, and prices are up or down depending on the chemical. Value changes for most chemical facilities look

to be down for commodity chemicals going into 2019 but may be up or down more for specialty chemicals.

Utilities

Electric

The electric power generation sector has been through a great deal of turbulence over the past few years and it doesn't look like it's going to get any better soon. Historically, the price of electricity has followed the dominant fuel used to generate the power for peaking plants. In Texas, natural gas is our primary fuel. Very mild weather for the past few years and impacts from wind generation have caused power prices to be historically low.

The Competitive Renewable Energy Zones (CREZ) initiative was adopted by the Public Utility Commission of Texas (PUCT) in April 2008, with a $5 billion plan to add transmission infrastructure to move electricity from wind farms in West Texas to markets in the North, South, and Houston zones. Wind energy has zero fuel cost and is a clean alternative to burning hydrocarbons. Wind generation can receive federal tax incentives allowing them to sell power at negative prices (loss of ~20 dollars per Megawatt) and the federal government makes up that difference. When the government incentives go away, wind power producers will have to bid in at positive pricing increasing the average price for electricity. Phase-out of the incentives began in 2017 for projects that started construction after 1/1/2017. Under the current law, no incentives will be available for projects that start construction in 2020 or later. There were a few spikes in power pricing in 2018 due to weather and reduced reserve capacity in ERCOT. Reserve capacity has dropped primarily due to the shutting down of multiple coal-fired power plants in 2017 and 2018. Additional coal-fired plants are scheduled for closure soon.

In addition to new wind farm construction that began almost entirely before 1/1/2017, there has been a new trend of taking existing wind farms that have lost their incentives and replacing the turbines which allow the wind farm to qualify for the incentives all over again. These "re-power" windfarms are getting another 10 years of production tax credits in addition to local abatements on property taxes. This results in electric prices being depressed for the foreseeable future.

Peaker plants were proposed all over Texas to help offset the load loss when the wind stops and wind generation dies out, but very few projects have broken ground. Recent changes by ERCOT to incentivize industry to build additional capacity should increase the cost of power in the future until new capacity is built.

Natural Gas

Natural Gas Distribution utility companies typically request that regulators allow them higher returns (through the rates they can charge their customers) to pay for the cost of expansions when needed, repairs from natural disasters, and general maintenance. However, the main goal of regulators is to make sure gas distribution companies remain operational while keeping service costs as low as possible, in return for the monopoly power given to these companies over designated service areas.

Because both revenues and expenses tend to be held in line with this process, the values of property owned by these natural gas distribution businesses tend to be rather stable. Other factors that augur well for continued healthy future demand for utility services are:

- the nation's population appears to be on a steady upward growth course
- limited practical alternatives exist for consumers seeking a steady supply of natural gas
- natural gas supplies in this country are abundant thanks to proficient drilling and extraction technologies

Unseasonably warm or cold weather can cause substantial volatility in quarterly operating results; however, companies strive to counteract this exposure through long-term oriented temperature-adjusted rate mechanisms. For 2019, the market values of the companies in this sector should remain steady if not trend upwards because of improved earnings, relative to previous year's totals. Supporting factors include new rates, an expanded customer base, plus higher consumption levels. It should also be mentioned that although this group of companies has not been completely sheltered from the heightened volatility that's recently re-entered financial markets, these equities have held up better than those in several other sectors in recognition of their inherently and necessarily conservative operational strategy.

Merger and acquisition (M&A) activity remain robust within the Telecommunications Services Industry. A plethora of deals have been penned over the past year, including the potential marriage of T-Mobile and Sprint Corp. Most Telephone companies in addition to the traditional landlines have a thriving cell phone business which currently is the most profitable portion of the communications sector. For the traditional portion of Telephone Utilities, the number of phone lines in the United States continues to decrease. Many people are dropping traditional phone lines for internet phone services or have chosen to carry just cellular phones. Margins remain under pressure across the Telecommunications Services Industry.

Data usage has grown exponentially over the past few years as technological innovation has led to faster networks and more powerful handsets, giving consumers new uses for their phones. Thus, price competition has become more intense. We could be near the nadir for pricing, however. The advent of 5G technology has the potential to increase network speeds markedly and allow a plethora of new uses and services. The infrastructure for 5G will be expensive, and it's likely that as new services are introduced, they will come with added costs to help cover some of the expense of the network upgrades. Traditional telephone property across the state is expected to continue declining over the next few years. It should be noted that all telephone calls, including cell calls, are currently still directed through the traditional telephone switching system.

The cable companies and telephone companies are in competition for the same market. The ability for these industries to provide phone, television and the internet has reduced the ability for both industries to earn a profit. Looking ahead, we expect spending for infrastructure buildout to remain elevated through 2021. We think the companies that get 5G to market quickly will have an advantage. The network carriers should benefit as consumers buy new equipment to take advantage of the networks and buy new services. Traditional telecommunications will continue to decline as 5G advances.

Underground Storage

Natural gas–a colorless, odorless, gaseous hydrocarbon–may be stored in several different ways. It is most commonly held as inventory underground under pressure in three types of facilities.

These underground facilities are a) depleted reservoirs in oil and/or natural gas fields; b) salt cavern formations; and c) aquifers. Natural gas is also stored in a liquid or gaseous form in above–ground tanks, such as at liquid natural gas (LNG) export facilities. Each storage type has its own physical characteristics (porosity, permeability, retention capability) and economics (site preparation and maintenance costs, deliverability rates, and cycling capability) which govern its suitability for particular applications. Two important characteristics of an underground storage facility are its capacity to hold natural gas for future use and the rate at which gas inventory can be withdrawn–called its deliverability rate.

Conversion of a gas field from production to storage duty takes advantage of existing wells, gathering systems, and pipeline connections; thus, most existing natural gas storage in the United States is in depleted natural gas or oil fields that are close to consumption centers. Salt dome cavern construction is more costly than depleted field conversions when measured based on dollars per thousand cubic feet of working gas capacity. However, caverns provide very high withdrawal and injection rates relative to their working gas capacity (the gas owned by others, being stored), with relatively low base gas requirements (the "permanent" gas in the facility owned by the facility owner, needed to keep operational working pressures at a required minimum). Profitable economics of salt dome cavern operations are predicated on their ability to perform several withdrawal and injection cycles ("turns") each year made possible by their high-deliverability characteristic.

The principal owners/operators of underground storage facilities are interstate pipeline companies, intrastate pipeline companies, local distribution companies (LDCs), and independent storage service providers. If a storage facility serves interstate commerce, it is subject to the jurisdiction of the Federal Energy Regulatory Commission (FERC); otherwise, it is state-regulated. Most working gas held in storage facilities is held under lease with shippers, LDCs, or end users who own the gas.

Underground gas storage serves a variety of purposes. Pipeline companies, both interstate and intrastate, rely heavily on underground storage to facilitate load balancing and system supply management on their long-haul transmission lines. Local gas distribution companies generally use underground storage exclusively to serve various customer needs directly. Independent storage service providers build and own underground storage facilities to almost exclusively serve third-party customers like marketers and electricity generators on an "open access" basis. All of these storage purposes exist because of the underlying principle that injection happens during summer months when demand is relatively low (and which keeps upstream producers in business), and conversely, withdrawal happens in the winter months when there isn't enough upstream gas being produced to satisfy total demand. This underlying principle has been somewhat eroding over the last ten years as available supply from upstream producers has ramped up to be more or less adequate year-round now, thus negatively affecting (diminishing) the value of underground storage facilities.

Underground gas storage facilities are being used for all the purposes described above, and market values must be determined every tax year per the item's legally prescribed lien date (January 1 for most items). Proper identification of the subject property is key to understanding how to go about the appraisal. The subject property to be appraised includes obvious items such as all gas inventories, major items of machinery and equipment such as compressors that facilitate the injection and withdrawal of gas volumes, and ancillary business personal property. These are all examples of taxable tangible personal property. Less obvious are the real property items associated

with these facilities in accordance with Property Tax Code, Sec. 1.04(2)(B) (improvements) and 1.04(2)(E) (estates or interests in any of the other five items of defined real property).

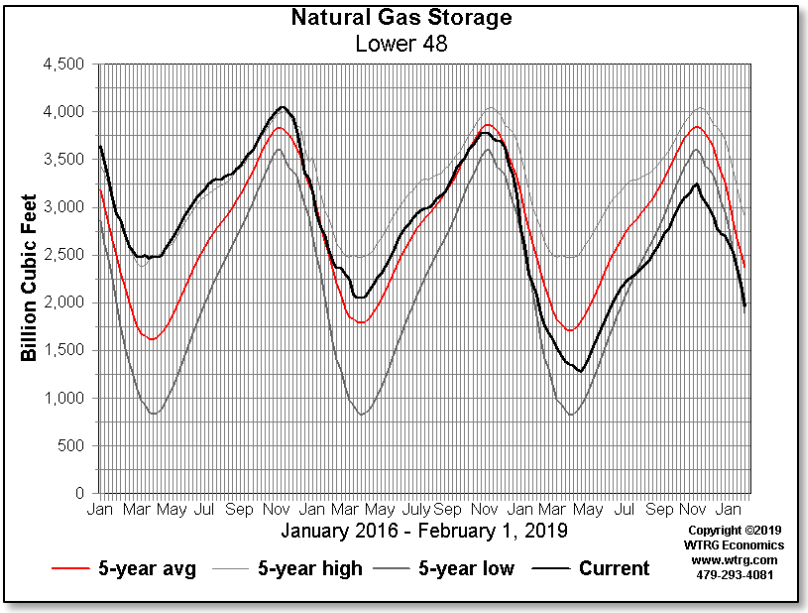
Salt dome caverns and injection wells have been categorized by the courts as improvements to land. The right to inject substances into the subsurface of land, whether that subsurface consists of a cavern or a depleted reservoir, constitutes a taxable real property estate or interest subject to taxation. These types of interest are typically leasehold (lessee) interests obtained by the owner/operator of the facility through an agreement (lease) with landowners whereas the landowners have retained a lessor interest which is also a taxable real property.

The appraisal of these types of real property (the rights associated with ownership of land) should not be confused with an appraisal of the land (or real estate) itself. Each stick of the "bundle of rights" that are embedded within fee simple ownership of land requires a separate appraisal when being put to a separate use and monetized to the extent that additional value is evident. Appraisal districts are not legally required to describe properties on the roll with an exact correspondence or categorization to the definitions of Real or Personal property in the Property Tax Code. Instead, they are only bound to describe the property to the extent the taxpayers can be assured that only taxable property is being appraised and there is no double taxation taking place.

Further, courts have repeatedly recognized the constitutional problem that could arise if the property should escape taxation entirely because it was unclear which of the Code's appellations should apply. If otherwise taxable property could escape taxation merely because the label assigned to it by the appraisal district overlapped with the label assigned to another aspect of the property, the result would seldom be equal and uniform taxation of property in proportion to its value. The courts have made it clear they do not *presume* double taxation merely because it is semantically possible to include one valuable aspect of the property in two different appraisal accounts. Instead, evidence about what property was or was not included in each appraisal account should be consulted to determine whether double taxation has in fact occurred.

According to WTRG Economics in review of EIA data, for the week ending February 1, 2019, total gas in storage is 1,960 Bcf, 135 Bcf (6.4%) lower than the same time last year and 415 Bcf (17.5%) lower than the 5-year average. A year ago, storage was 393 Bcf lower than the 5-year average compared to the current 415 Bcf deficit. In fact, storage levels in the U.S. regions remain below the 5-year average, and all regions are lower than last year. The greatest deficit is in the South-Central region (includes Harris County) with a 166 Bcf deficit (19.3%) to the norm. Even with these current deficits though, overall storage levels are predicted to be higher than last year by the end of March absent unusually extended periods of cold weather for the remainder of this winter, due to tremendous volumes being produced.

Injection and withdrawal amounts can fluctuate widely over short periods of time, particularly in winter when significant cold weather events can trigger large sudden withdrawals. However, over time, storage levels have a predictable swing pattern of increasing during the summer months and depleting during the winter months:



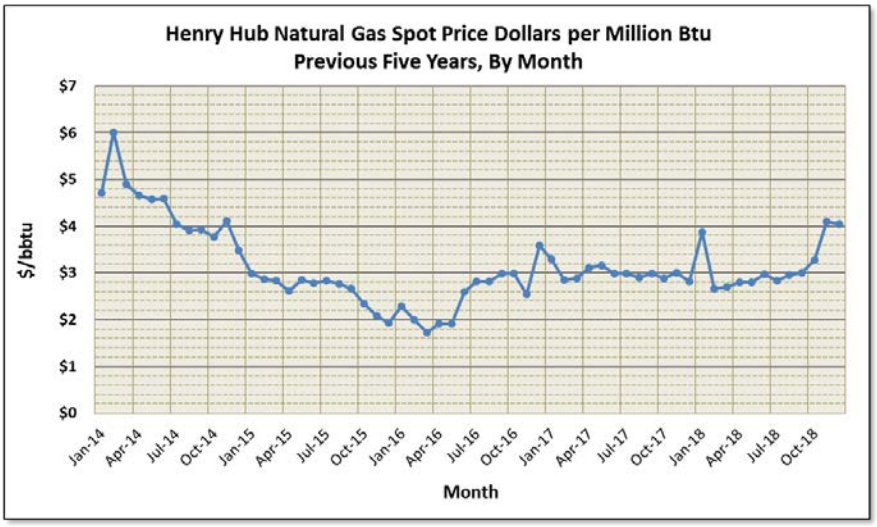
The storage volumes at individual storage facilities such as Kinder Morgan Clear West Lake facility or Energy Transfer's Bammel facility do not necessarily follow overall U.S. trends. In any event, gas inventories present on the inventory owner's chosen lien date (either January 1 or September 1) will be appraised with the prevailing price at that time.

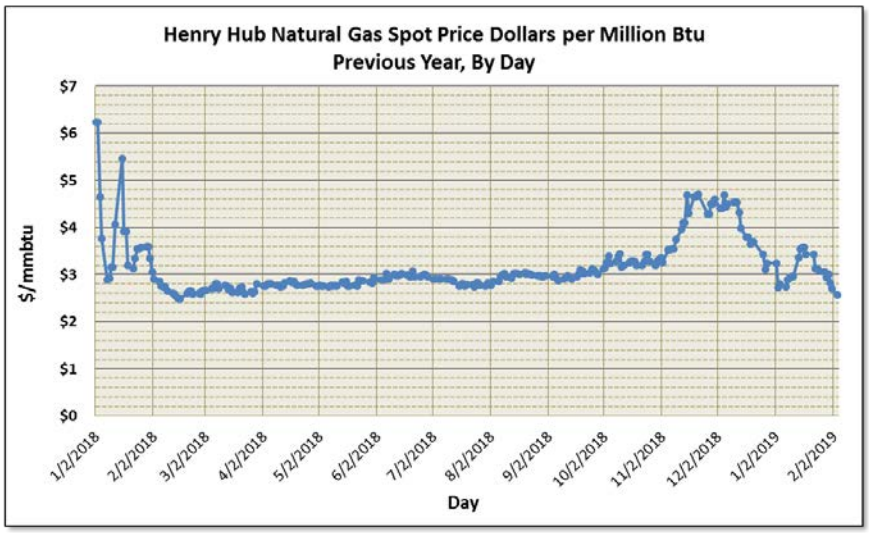
Natural gas production is expected to continue growing in 2019, per the EIA's January 2019 Short-Term Energy Outlook (STEO). EIA forecasts dry natural gas production will average 90.2 Bcf per day in 2019, more than 8% higher than the U.S. production record high of 83.3 BCF/d in 2018. EIA forecasts that Henry Hub natural gas spot prices will average $2.89 per million British thermal units in 2019, down from $3.15/MMBtu in 2018.

Of course, all this production must be consumed somewhere, either domestically or abroad. Total U.S. natural gas consumption averaged an estimated 81.6 billion cubic feet per day (Bcf/d) in 2018, and EIA expects it to increase by 1.1 Bcf/d (1.3%) in 2019 and then increase by a further 0.9 Bcf/d (1.1%) in 2020. The largest natural gas consuming sector in the United States is the electric power sector. EIA estimates that electric generation consumed an average of 29.0 Bcf/d in 2018, up 14.4% from 2017 because of warm summer temperatures in 2018 and the addition of natural gas-fired electric generation capacity. EIA forecasts power sector consumption of natural gas to remain largely unchanged in 2019 and then rise by 3.3% in 2020 because of continuing increases in natural gas-fired electric generation capacity.

As with any other commodity, the price of natural gas is naturally regulated by supply and demand. In the last decade since shale production started to truly disrupt the energy market, both supply and demand of domestically produced natural gas have steadfastly increased. The bulk of the increase in natural gas supply has actually come about because of the increase in production of oil wells which results in vast amounts of associated (casinghead) gas. Even with the tremendous gains in the export business related to LNG facilities recently built (with several more currently in construction), the price of natural gas is currently forecasted to remain constrained at the $3.00/mmbtu range for the foreseeable future due to supply being more than adequate to meet demand from all anticipated sources. Short-term spikes and troughs will periodically occur. This

volatility can be seen in the previous five years of Henry Hub spot price data in the two charts below:





As these charts demonstrate, the prevailing natural gas price on both September 1, 2018, and January 1, 2019, was about $3/mmbtu, which translates into a somewhat higher price per mcf basis depending on how rich (or "wet") the gas is. Coincidentally (or perhaps not), this was about the same price level seen on the same two dates a year previously.

Telecommunications

The latest in 2019 is 5G technology, which provides low latency. Compared to the current 4G LTE technology, 5G is targeting to reach both high speed, low power and low latency for massive IoT (Internet of things) tactile internets and robotics. One of the examples of 5g with Low latency will be in autonomous cars.

Many wireless communication carriers have yet to deploy their 5G technology platform, which shows no signs of significant growth until 2020. Although, there was a very slow rollout of the fixed wireless 5G technology by Verizon in 5 markets, including Houston in late 2018. With

expectations for only a few devices to be launched in 2019 utilizing this technology. 5G products include RA backup and customer premise equipment which allows for faster communication. Currently, Verizon is the only telecommunication company that has started the installation of the 5g in some major cities.

Theoretically, 5G can be 20 times faster than 4G! It should also increase data rates, improve connection density, reduce latency and strengthen connection security all-around. However, the most important innovation of 5G is the ability to make networks ubiquitous. This will allow users to transfer between networks without experiencing service disruptions.

Because 5G is revolutionary, disruptive and expensive, an opportunity exists for a new participant in the delivery of these services. Large, well-capitalized tech companies (Google, Facebook, and Amazon) have often been mentioned as new disruptive participants. Established companies in three sectors will likely dominate the first stage of the build out followed by the carriers: Data Centers (hardware and network upgrades), Modem and Intellectual Property Suppliers, and Mobile Telecoms. Some trends, like the proliferation of cloud services and SD-WAN, will be the continuation of the ongoing shift towards the cloud model, while others, like autonomous things and 5G, promise new developments soon.

The 5G has a penetration rate of 70% and 50% of the cost is based on linear road density. When the linear density is below 15 the cost will be higher. Many experts say it will cost $300 Billion in total to gradually rollout, develop and update 5G. Companies need to pass these costs onto consumers in a fully saturated market, many of whom will not willingly absorb the additional cost without a killer app driving their decision. For the installation of 5G, the telecommunication companies will be using existing fiber and towers. They need to install small cells to power the 5G. which in turn will result in the increase in the cost associated with the equipment. It is anticipated that for the efficient functioning it requires at least 5000 small cells per site.

Even though 4G will continue to coexist with 5G for some more time, we can see additional obsolescence in 2g and 3G equipment. Some companies did not report any 2G equipment in 2018. Even though they will continue to support existing 2G equipment, they will not add any additional 2G equipment and will limit their 3G equipment purchases.

In addition to the new projects, maintenance of existing communication infrastructure has its own challenges. Early long-haul fiber projects are nearing useful life of the infrastructure and will require maintenance or replacement. The primary limiters to substantial growth are the speed to market of 5G and the engineering requirements that are associated with an increasingly complex network. Major service providers are also struggling to increase capacity to meet customer expectations without increasing cost at a similar rate.

Fiber Optic long distance transmission carriers will see only continued depreciation for 2019. Although, this hinges on the speed at which 5G is completely rolled out since the major telecommunication companies will be utilizing the existing fiber optic cable for the installation of 5G. Instead of providing their own cables, the expectation is for them to lease fiber cables from companies with existing lines.

As noted in 2018, there has been an increase of Data Centers built in the Houston area within the last year, and many of which are not being utilized to capacity. Only about 35-40% of the available

space is being utilized within the newer facilities. Many of the existing centers have also begun disposing of their switching equipment.

Broadcast television capital expenditures should be minimal in 2019. The improvement in technology has resulted in a decrease in equipment cost and investment. Other communication and internet company's asset values will decrease due to further depreciation of their assets and lower investment cost associated with newer technologies. With Netflix, Hulu, SlingTV and other streaming services becoming increasingly popular, cable companies will be switching to similar services and moving away from traditional cable methods such as satellite dish, an antenna, etc. Especially with the big marketing push by the companies for users to 'cut the cord!'

Manufacturing

Texas manufacturing had a dismal finish to 2018 after posting a 12-year record high production index of 35.2 in May 2018. The production index is a key measure of state manufacturing conditions. The index had fallen to 7.3 by December 2018 according to business executives responding to the Texas Manufacturing Outlook Survey, which polls businesses on whether key indicators of activity have increased, remained the same, or decreased from the previous month. The survey is conducted monthly by the Federal Reserve Bank of Dallas and the survey responses are used to calculate an index for each indicator. The production index, a key measure of state manufacturing conditions, ended 2018 at 7.35. The indexes of future general business activity and future company outlook fell 23 points to 3.2 and 8.8, respectively. Most other indexes for future manufacturing activity also posted double-digit declines in December but remained solidly in positive territory.

According to the International Monetary Fund publication, global expansion has weakened. The October 2018 World Economic Outlook (WEO) forecast estimated growth at 3.7 percent for 2018. The global economy is projected to grow at 3.5 percent in 2019 and 3.6 percent in 2020.

In The Balance publication, the U.S. economic outlook is healthy according to the key economic indicators. The most critical indicator is the gross domestic product, which measures the nation's production output. The GDP growth rate is expected to remain between the 2 percent to 3 percent ideal range. Unemployment is forecast to continue at a natural rate and inflation or deflation should be minimal.

The Texas economy experienced another downshift in growth over the last two months, although the level of activity remains strong. Job growth decelerated slightly in the fourth quarter, and the Dallas Fed's Texas Business Outlook Surveys (TBOS) suggest a slowing in output growth in December 2018 and January 2019. Expectations have also slumped; the 2019 job growth forecast for Texas is now between 1 and 2 percent, and survey contacts' outlooks have notably deteriorated since November. Headwinds include lower oil prices, a strong dollar, tariffs, higher interest rates, labor constraints, and increased uncertainty. Wage and price inflation may also be moderating; survey data point to softer growth in the second half of 2018 and expectations for slower growth in 2019.

The Greater Houston Partnership forecasts the nine-county metro Houston area will create 71,000 jobs in '19.1 Employment will grow in all sectors, with health care, construction and administrative services turning in the strongest performances. Energy should continue to recover, construction activity should pick up and retail should benefit from population growth. Professional services should find new clients throughout the region and health care should recapture its crown as the region's leading job generator. The year should end with 3.2 million payroll jobs, a net increase of more than 600,000 over the past 10 years. Only New York, Los Angeles, and Dallas created more jobs over the same period.

The Houston retail market did not experience much change in market conditions in the fourth quarter of 2018. The vacancy rate remained at 5.2% from the previous quarter. Net absorption was positive 800,882 square feet, and vacant sublease space increased by 3,341 square feet. A total of 52 retail buildings with 851,641 square feet of retail space were delivered to the market in the quarter, with 4,120,696 square feet still under construction at the end of the quarter.

The Houston Office market ended the fourth quarter of 2018 with a vacancy rate of 16.5%. The vacancy rate was down over the previous quarter, with net absorption totaling positive 2,004,576 square feet in the fourth quarter. Vacant sublease space decreased in the quarter, ending the quarter at 4,974,697 square feet. A total of 17 buildings delivered to the market in the quarter totaling 814,151 square feet, with 3,141,781 square feet still under construction at the end of the quarter.

The commercial personal property tax base decreased by approximately 1 percent for the tax year 2018. Harris County saw a 4 percent increase in the general personal property value base for 2018. It is anticipated that this sector will increase for 2019 as the economy continues slight growth in the Houston area. The total value of the leased asset component of commercial personal property

decreased 21 percent in the 2018 tax year. The value for this sector may see a slight increase for the 2019 tax year as office market vacancy rates are expected to decline over the next few years and most leased assets are generally business office machinery and equipment.

With the improvement of Houston's economy, business and leisure travel has picked up. Trade through the region's four ports continues to grow. Wholesalers' fortunes tend to follow one of two paths—they track manufacturing, which tends to track the oil and gas industry, or they follow retail sales, which tend to track population, income and job growth. The outlook for energy and manufacturing is the brightest it's been in years. Strong employment and population growth should lift wholesale trade as well.

CBRE estimates there are 40 hotels under construction. For restaurants and bars, growth depends on several factors—increases in budgets for business entertaining, growing consumer confidence, healthy job growth, increasingly hectic lifestyles, consumers' willingness to try new concepts, and lack of will or skill to cook at home. All will support additional growth in '19.

Houston-area auto dealers sold 22,354 new vehicles in December '18, an increase of 7.4 percent from last December, according to TexAuto Facts, published by InfoNation, Inc. of Sugar Land. For the full year, 303,417 vehicles were sold, up 4.5 percent from 290,354 in '17. The average retail price per vehicle sold in Houston rose 3.2 percent from $38,320 in December '17 to $39,537 in December '18. That marks a record-high sales price for the region.

Since the dealer inventory component is tied to prior year vehicle sales, this indicates an increase in value for this sector in 2019. The tax base for Dealer Inventory in the tax year 2018 increased by 2 percent from 2017. Heavy equipment rentals saw a boost from post-Harvey cleanup, but that activity has wound down.

The tax base for business vehicles for the tax year 2018 decreased by 12 percent from 2017. Part of this decrease is a result of analyzing the data on record removing vehicles no long on the tape year and not rendered. We intensify adding vehicles during our discovery efforts from information on the Texas Department of Motor Vehicles records. The value for this sector, however, is expected to increase slightly for 2019.