

SCHOOL CONSTRUCTION

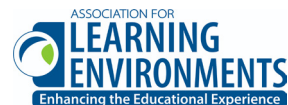
A LOCAL SNAPSHOT

GREATER HOUSTON BULLETIN

SUMMER 2018

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AGC Houston
THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA
Quality People. Quality Projects.



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This school construction cost report is the result of a collaboration between members of the Associated General Contractors of America, Houston Chapter (AGC) and members of the Association for Learning Environments, Gulf Coast Chapter (A4LE).

The goal of this report is to provide information to assist local school districts in planning for their construction projects.

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2018-2019 COST TRENDS SURVEY

BY: BOB RICHARDSON, DUROTECH, INC.

As part of the AGC/A4LE Joint Committee, Durotech conducts an annual survey of over 3,000 subcontractors from all major design firms in the K-12 construction market within the Houston region. Respondents are asked to provide cost projections from their point of view based on how costs affect their specific trades. They are grouped into three categories: Labor Intensive (shell; concrete, masonry, earthwork, underground, etc.), Finish/Specialty (non-MEP interiors), and MEP (mechanical, electrical, plumbing).

MAJOR SUBCONTRACTOR CONCERNS

According to the 2018 survey, 57 percent of respondents are concerned about how the economy will affect their businesses. Current data from the U.S. Department of Labor's producer price indexes does not include hikes due to tariffs, which could seriously affect construction costs. Although the 25 percent tariff on steel and the 10 percent tariff on aluminum have only been in effect for a short time, they are already affecting U.S. businesses that source material from abroad. As a result, American-made steel mills are seeing an increase in demand.

Subcontractors are also concerned with labor in relation to both availability and productivity. Nearly 80 percent of those surveyed feel that labor will be hard to come by for the foreseeable future, up 50 percent from last year. In addition, 36 percent predict that productivity will decrease as salaries increase due to availability.

Another major concern is competition. Many are lowering their margins to stay in business. Depending on the trade and their perception of the overall market and economic trends that affect their business, not all cost increases felt by subcontractors are passed through to the owner. Nearly 40 percent of survey respondents indicate a major concern for competition, up from only 16 percent last year.

The chart below details the subcontractor survey results and trends for the past three years. ■

Contact Bob Richardson at bobr@durotechgc.com for more information regarding this survey.

Specialty Contractor Surveys & Trends* (%)												
	Labor Intensive Trades			Finish/Specialty Trades			MEP Trades			Average All Trades		
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
Materials Cost Increases	7.1	5.3	4.7	4.2	4.8	7.5	0.9	4.5	8.29	3.6	4.8	6.5
Labor Cost Increase	9.9	6.3	3.7	5.4	4.9	5.9	5.8	3.5	5.14	6	4.5	4.6
Labor Production Rate Increase	6.4	9.3	0.5	6.6	2.6	2.8	0.8	5	1.0	4	1.3	1.4
Revenue Increase	4.1	7.1	0**	26	12	11.9	15	9.5	5.71	18.5	10.1	7.0
Margin Increases	2	1.6	1.3	3.7	2.2	1.3	-0.5	-0.1	2.29	1.3	1.5	0.6

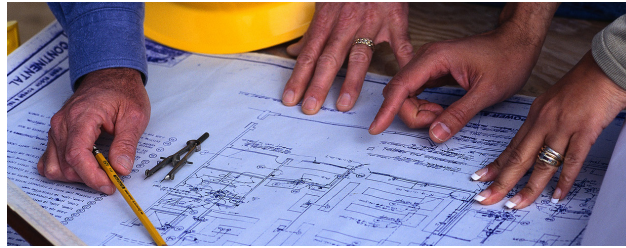
*Percentages indicated are an average of all respondents in each category and overall.
 **Survey responses included both increases and decreases resulting in a zero net increase.
 Source: Annual Subcontractor Survey by Durotech, Inc.

DESIGN FIRM SURVEY RESULTS

Design Professional Average Future Cost Projections*

	2018	2019
Elementary	\$197-210/sf (Avg. \$203/sf)	\$200-210/sf (Avg. \$206/sf)
Middle/JHS	\$220-269/sf (Avg. \$241/sf)	\$225-253/sf (Avg. \$241/sf)
High School	\$242-298/sf (Avg. \$270/sf)	\$247-297/sf (Avg. \$268/sf)

*Costs vary in school types based on location, programs, scope, technology and finish requirements.
Source: Annual Subcontractor Survey by Durotech, Inc.

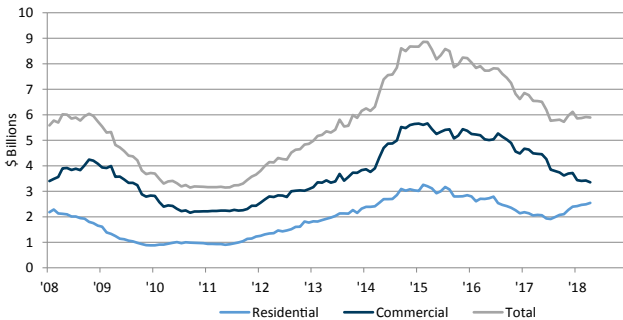


Design Firm Survey: Growing Concerns

- Not enough time to complete drawings
- Permit time increasing
- Concerns starting to appear about professional staff availability

Source: Annual Subcontractor Survey by Durotech, Inc.

City of Houston Building Permit Value 12-Month Total



Source: City of Houston & Greater Houston Partnership

According to the City of Houston's Department of Public Works & Engineering Planning & Development Services, building permits for the 12 months ending April 2018 totaled \$5.9 billion, down 9.8 percent from \$6.5 billion in the 12 months ending April 2017. Residential permit values rose 22.9 percent to \$2.5 billion while commercial permit values fell 25 percent to \$3.3 billion.

K-12 School Bonds Passed from 2014 to 2016 in Millions

District	2014	2015	2016
Aldine ISD	-	\$798	-
Alief ISD	-	\$341	-
Alvin ISD	-	\$245	-
Anahuac ISD	-	-	\$15
Brazosport ISD	\$175	-	-
Cleveland ISD	-	\$35	-
Conroe ISD	-	\$487	-
Cypress-Fairbanks ISD	\$1,209.2	-	-
Dayton ISD	\$87.8	-	-
Dickinson ISD	\$56	-	\$70
Fort Bend ISD	\$484.1	-	-
Galena Park ISD	-	-	\$290
Hardin ISD	\$16.8	-	-
Huffman ISD	-	-	\$44.1
Katy ISD	\$748.1	-	-
Klein ISD	-	\$498.1	-
La Porte ISD	\$260	-	-
Lamar CISD	\$240.6	-	-
Pasadena ISD	\$175.5	-	-
Pearland ISD	-	-	\$220
Santa Fe ISD	-	-	\$34.5
Sheldon ISD	-	-	\$285
Spring ISD	-	-	\$330
Sweeny ISD	\$26	-	-
Waller ISD	-	\$71.3	-

Source: Texas Bond Review Board

CYPRESS-FAIRBANKS ISD SAFETY

BY: STEVEN BRYAN, CYPRESS-FAIRBANKS ISD

CFISD has recently implemented several new measures of safety throughout the District to insure the safety of students and staff members. The safety of our students is the number 1 priority. CFISD has recently implemented increased security measures to help secure our buildings and the people inside. This program does not replace our existing safety plans, it only helps to enhance what is already in place.

One of the first things that has been added to our existing safety plans is the Raptor Emergency Buttons. In an emergency situation at your campus, clicking this button will dispatch a text message or email to staff members at that school silently notifying that there is an emergency situation that requires action.

In addition to the Raptor Buttons we have also implemented the Standard Response Protocol (SRP). This protocol basically states “In an emergency when you hear it, do it”. In a LOCKOUT situation the directive is the “secure the perimeter” and is used to safeguard students and staff within the building. Students are to move out of sight and maintain silence. Teachers are to lock interior doors, turn off lights and take attendance to make sure all students are secure. In a LOCKDOWN the directive is “Locks, Lights, Out of Sight”. This secures individual rooms and keeps students in a quiet place. EVACUATE is followed by a location and is used to move students and staff from one location to a different location in or out of the building. The last portion of SRP is SHELTER. This is for situation of a natural disaster or hazard and is a safety strategy for group or self protection.

The main addition to our security improvements throughout the district are security vestibules and lockdown buttons that are being added to every campus and most support facilities. The lockdown buttons will send a very distinct alarm throughout the building that lets staff and students know the building has an emergency situation and they need to go in to lockdown procedures. The security vestibule is an additional layer of security that gives administration an opportunity to vet and clear individuals upon entry. Students and staff get the additional time to follow the standard response protocol in an effort to ensure safety. This controlled access for the administrative staff adds precious moments for police response to take over in case of an emergency situation.

In conclusion, these additional measures being taken by the District do not replace existing safety plans already practiced by our students and staff but enhance our security protocol and allow our campuses and support facilities the time needed to take all measures of safety. ■

Contact Steven Bryan at steven.bryan@cfisd.net for more information.



FASTEST GROWING SCHOOL DISTRICTS IN HOUSTON METRO, AGING IN SUBURBIA

BY: JUSTIN SILHAVY, POPULATION AND SURVEY ANALYSTS (PASA)

2017-2018 SCHOOL YEAR, POST-HARVEY

The start of the 2017-2018 school year was marred by the historic flooding caused by outer bands of Hurricane Harvey in late August. Of the 24 counties in the AGC Gulf Coast Region, all but eight were declared disaster areas. Population and Survey Analysts assessed shifts in student enrollment and surveyed housing to determine the path forward for school districts in a post-Harvey era. Most high-growth school districts continued increasing in enrollment post-Harvey.

The more rental properties incurring flood damage in a school district, the greater the magnitude of student displacement. Many apartments in Greenspoint near Bush intercontinental Airport were still under renovation from the Tax Day Flood in April 2016 when Harvey's rains fell. This continual cycle of flooding has disrupted enrollment in Aldine ISD for two consecutive years as families are uprooted. Aldine ISD enrollment has declined by 4.5% since Fall 2015.

In the southeast suburbs, Dickinson ISD, particularly in the City of Dickinson where approximately 80% of all structures flooded, saw some of the worst flooding in the region. Student displacement was minimal in flooded single-family housing, however older apartment properties were mostly vacated. In fast-growing Katy ISD, swaths of neighborhoods flooded inside the Barker and Addicks Reservoirs, but districtwide enrollment was not affected. In fact, Katy ISD enrollment was up, increasing by 2,101 students in Fall 2017. Most flooded residential structures in Katy ISD are owner-occupied, single-family homes. Families in these homes must make repairs and remain in place whereas apartment dwellers must find new homes and are often displaced from their original neighborhood.

PROJECTIONS OF NEW HOUSING IN SUBURBAN SCHOOL DISTRICTS - 10 YEARS FORWARD

With Hurricane Harvey behind us, and housing demand maintaining strong levels, we continue to focus our attention toward high growth areas on high ground. To avoid stricter flood plain regulations, residential developers may seek out land outside of flood plains along new highway thoroughfares near job growth epicenters. Suburban growth is anticipated to mostly continue with some slowdowns in certain flood plains of Harris County. High-growth areas are moving outward in

all directions of Houston, particularly north and west. Housing demand is increasing in the east and south suburbs as well.

In its second year ranking #1 in regional housing projections developed by PASA, Lamar CISD is projected to have 50,996 new homes occupied by October 2027. Katy ISD and Cypress-Fairbanks ISD round out the top three with 43,763 and 36,259 housing occupancies projected. Northern Baytown and the future East Grand Parkway Corridor are situated north of major industrial employment clusters that are growing in part due to a booming petrochemical sector and the market shift toward e-commerce and distribution. Texas City is also newly becoming a growth hotspot. Portions of this bayside community extend west of Interstate 45 and have seen impressive growth. Industrial growth at the Port of Freeport and in the petrochemical sector in Brazoria County also contributes to housing demand in western Galveston County and Brazoria County. PASA recently completed a Demographic Update for Dickinson ISD showing annual growth of 3-4% due to the population growth projected in western Texas City.

Elsewhere, Waller ISD and Willis ISD are emerging as future high-growth areas as developers plan new residential communities along major freeways. Johnson Development and Howard Hughes Corporation are both investing in these communities and will be developing over the course of the next decade. Farther from Houston, Brazos County has seen a surge of growth as Texas A&M University continues expanding its flagship campus. New housing communities could add thousands of new homes in eastern Bryan ISD, a 20-minute drive from the sole station planned along Central Texas Railway's future bullet train from Houston to Dallas.

Rank of Projected New Housing Occupancies, 2017-2027

Lamar CISD	50,996
Katy ISD	43,763
Cy-Fair ISD	36,259
Fort Bend ISD	35,126
Conroe ISD*	32,657
Klein ISD*	22,465
Waller ISD	20,497
Humble ISD*	17,048
Dickinson ISD	11,263

Source: Population and Survey Analysts

*Analysis performed 2-3 years ago



IMPACTS OF AGING POPULATIONS ON SCHOOL DISTRICTS

In the Houston-Gulf Coast region, the percentage of the population 60 years of age or older increased in all 27 of the most populated school districts tracked by the US Census from 2011 to 2016. Fort Bend ISD and Klein ISD have seen the largest increase in the percentage of older residents in this timeframe. This aging population has new options when buying a new home in the Metro Area. Inside Loop 610, many empty-nesters have been purchasing townhomes or condos offering elevators. In the suburban fringe, sections of master-planned communities offer a lifestyle restricted to residents 55 or older.

While Lamar CISD faces growing pains, 3.2% of the growth will occur in age-restricted communities. Many retirees are seeking to live near their adult children yet surrounded by peers in their own neighborhood. In Fulshear, Bonterra at Cross Creek Ranch is now under construction, offering homes in an age-restricted setting. In nearby Richmond, Sweetgrass, a Del Webb community, is nearing completion as several other new active-adult communities are planned in nearby Rosenberg.

In terms of age, Montgomery ISD, with a median age of 46.3, ranks oldest of all large districts in the region. Interestingly, the school district is highly regarded, and enrollment grew by just over 19% from 2011 to 2016. Brenham ISD and Galveston ISD round out the top three oldest districts with median ages of 41.1 and 38.2, respectively. These three districts are typically areas retirees migrate. The next oldest districts are more surprising: Magnolia ISD (37.4), Clear Creek ISD (36.9), and Fort Bend ISD (36) all are suburban districts aging despite being popular places to raise a family. Many residents choose to remain in their homes into retirement in these communities. These demographic shifts often cause school enrollment to decline in specific areas, so Districts must often make difficult decisions regarding school building use and boundary shifts. PASA must carefully determine how concentrations of older residents will affect the future enrollment and placement of new schools. ■

Contact Justin Silhavy at jsilhavy@pasatx.com for more information.



SCHOOL FINANCE UPDATE

BY: DAN CASEY, MOAK, CASEY & ASSOCIATES

While there have been modest formula changes to school funding for the 2018-19 school year, the bigger picture focuses on the impact of Hurricane Harvey and a relatively bleak outlook for the state budget in the 2020-21 biennium. A recently-established Texas Commission on Public School Finance presents an opportunity for the most significant review of the school funding system in the last decade. Given that the Texas Supreme Court determined in May 2016 that the current school finance system is minimally constitutional but in need of work, the Commission is viewed as a potential vehicle for updating the current finance system and addressing future needs.

Under a traditional state biennial funding calendar, the second year—in this case, the 2018-19 school year—generally reflects few school funding changes from the first year of the biennium. The 2018-19 school year does reflect some differences from changes made in last summer's special session that resulted from the passage of House Bill 21.

For the 2017-18 school year, school districts that suffered M&O revenue decreases from the prior year due to state formula changes and other conditions received transition hardship aid capped at \$100 million because of special-session action, which will be decreased to \$50 million for the 2018-19 school year. In addition, charter schools will receive \$60 million in 2018-19 for school facilities funding, the details of which will be released by the Texas Education Agency (TEA) in September, with a charter schools state aid template available by July 1.

Traditional public schools receiving state facilities funding through the Existing Debt Allotment (EDA) program will also see \$60 million in additional funding for 2018-19, through an increased yield in the EDA program. The current \$35 yield per ADA per penny of I&S tax effort is expected to be increased to approximately \$37 per ADA for the 2018-19 school year. This increase should provide modest help in meeting the debt service needs of EDA districts.

While these changes are of interest, it should be noted that the special session wrapped up shortly before Hurricane Harvey hit the Texas coastline. A recent Legislative Budget Board presentation put the cost of Hurricane Harvey at more than \$5 billion for state agencies, with much of this amount expected to be paid for from additional federal funds. The TEA has identified \$426 million in additional state costs associated with 2017 reappraisals, hold-harmless payments for districts with declining enrollments and decreased recapture payments from wealthy districts with facilities damage.

The other challenge ahead for school funding and other state services is the difficult state budget outlook for the 2020-21 biennium. In addition to Hurricane Harvey, a \$2.5 billion shortfall is currently anticipated for the Medicaid program. Various other shortfalls and deferrals contribute to what is expected to be a potential \$7 billion shortfall at the start of the legislative session next January.

One hopeful step is the creation of the Texas Commission on Public School Finance by House Bill 21 in last summer's special session. The 13-member Commission began its discussions in January in examining a school finance system which has many of its basic components dating back to House Bill 72 in 1984.

One area where the state has fallen substantially behind is in its efforts to support school facilities funding. The Instructional Facilities Allotment was established in 1997 to assist property-poor districts prospectively in meeting their facilities needs. The Existing Debt Allotment (EDA) program referenced earlier was created in 1999 to provide equalized support for districts with currently high debt-service tax rates. When these programs were initiated, state support covered nearly half of school district payments for voter-approved bonds. Based on recent testimony provided by the Fast Growth School Coalition, this percentage has dropped to as low as seven percent, which clearly leaves the burden for funding facilities on local taxpayers in fast-growing communities.

There has been open discussion among Commission members as to the potential scope of their recommendations, which will be due later this year. One view is that the Commission should be restricted to changes that can be accomplished at current funding levels for public schools, given the uncertain state funding outlook. Another view is an interest in promoting major reforms that fit the new state standards for college, career and military readiness, as well as addressing current deficiencies in funding, such as teacher pay, facilities and transportation. The role of the property tax in funding schools is also expected to be addressed by the Commission. Based on my observation of the Commission meetings and their Working Group subcommittees, the members are fully engaged in understanding the current school finance system and considering what direction is needed to move the education system forward in the future. It is probably the most comprehensive effort undertaken in the last decade. ■

Contact Dan Casey at dcasey@moakcasey.com for more information.

2018 K-12 School Bonds Election Results Greater Houston Area School Districts			
District	Purpose	Bond Total	Status
Galveston ISD	School Renovations and Technology	\$31,000,000	Approved
Goose Creek ISD	School Renovations, Technology, Athletics and Multi-Purpose Center	\$437,405,000	Defeated
Humble ISD	New Schools, Renovations, Athletics and Technology	\$575,000,000	Approved
Texas City ISD	New Schools, Renovations, Security and Technology	\$136,100,000	Approved

Source: Texas Comptroller



2017 K-12 School Bonds Election Results Greater Houston Area School Districts			
District	Purpose	Bond Total	Status
Barbers Hill ISD	School Additions, Childhood Center	\$120,000,000	Approved
Clear Creek ISD	New Schools, Safety Improvements and Campus Expansions	\$487,000,000	Approved
Cleveland ISD	New School and Additions	\$80,000,000	Approved
Crosby ISD	New Schools and Additions	\$109,500,000	Approved
Danbury ISD	New Elementary School	\$18,700,000	Approved
Deer Park ISD	New School, Renovations, Technology and Transportation	\$156,000,000	Approved
Katy ISD	New Schools, Renovations, Expansions, Technology and Security	\$609,204,553	Approved
Lamar CISD	New Facilities, Technology, Infrastructure, Athletics, Transportation	\$445,451,000	Approved
Pasadena ISD	New School, Renovations, Band Equipment, Technology and Transportation	\$135,000,000	Approved
Spring Branch ISD	Facilities, Career and Technology, Transportation and Administration	\$898,400,000	Approved
Stafford MSD	New Schools	\$62,000,000	Approved
Tomball ISD	New Schools, Expansions and Athletic Facilities	\$275,000,000	Approved

Source: Texas Comptroller

Unemployment Rate

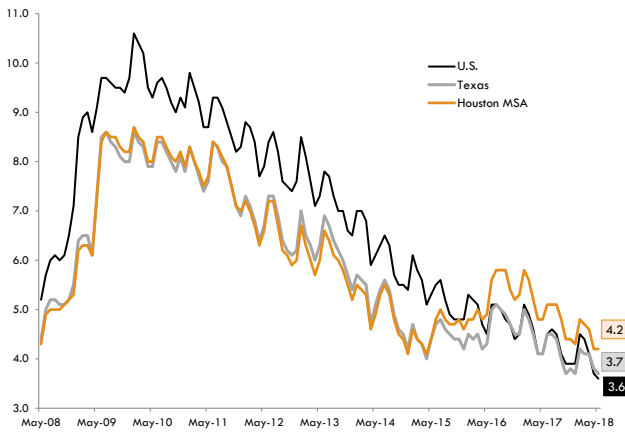
May 2018

Monthly

Houston - Sugar Land - Baytown	4.2
Texas	3.7
U.S.	3.6

Source: Texas Workforce Commission (Not seasonally adjusted)

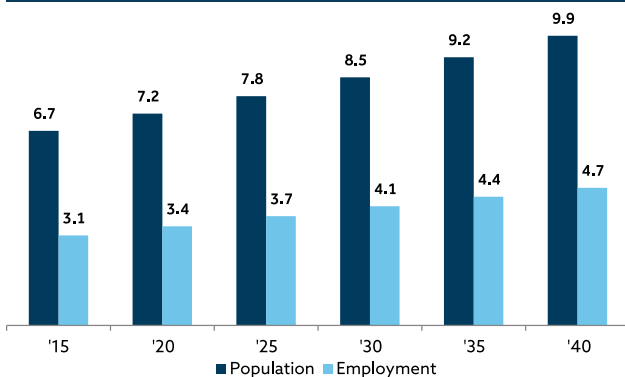
Unemployment Rates (NSA) - U.S., Texas, and Houston MSA, May 2008 to May 2018



Source: Texas Workforce Commission (Not seasonally adjusted)



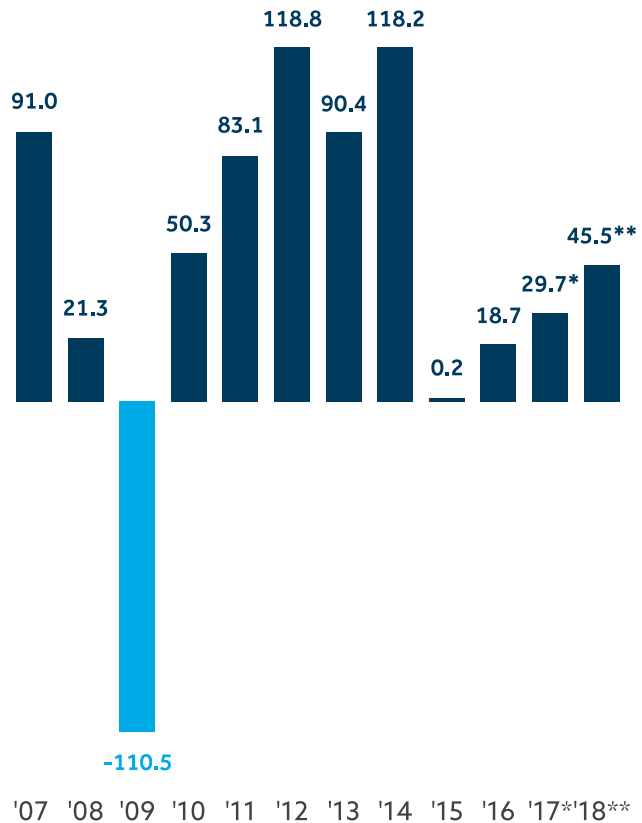
Population and Employment Houston-The Woodlands-Sugar Land MSA in Millions



Source: 2018 Perryman Economic Forecast, released February 2018

Metro Houston Job Growth

December to December, (000s)

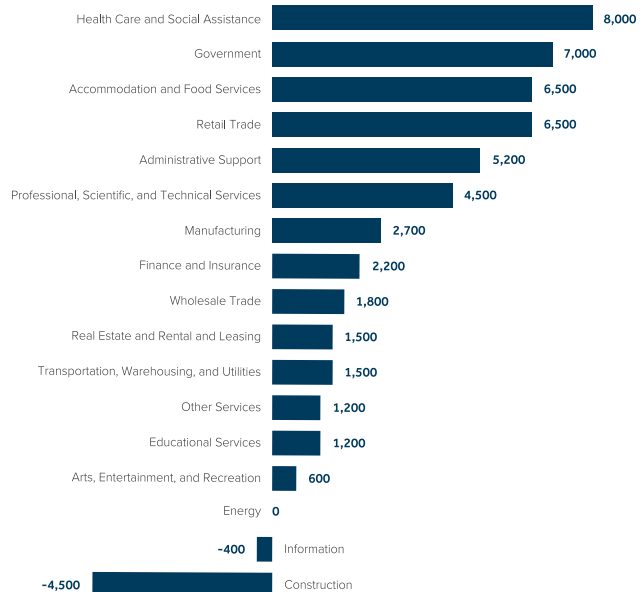


Source: Texas Workforce Commission & Greater Houston Partnership forecasts

*Partnership's '17 forecast **Partnership's '18 forecast

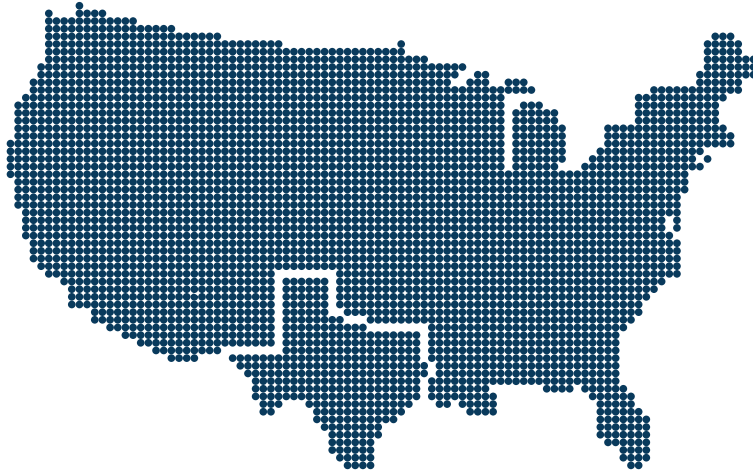
Metro Houston, Forecast Job Gains/Losses

December '17 - December '18



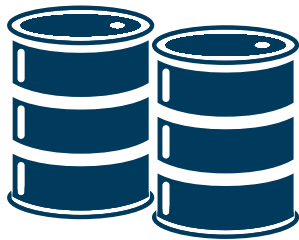
Source: Greater Houston Partnership

**Current Oil Rig Count
(as of 6/15/2018)**



**UNITED STATES
1,059
TEXAS
534**

Source: Baker Hughes



West Texas Intermediate Spot Market Price

	April 2017	April 2018	% Increase
Monthly Price	\$51.06	\$66.25	29.7%
YTD Average Price	\$51.48	\$63.76	23.9%

EIA expects West Texas Intermediate (WTI) crude oil prices will average almost \$7/b lower than Brent prices in 2018 and \$6/b lower than Brent prices in 2019. NYMEX WTI contract values for September 2018 delivery traded during the five-day period ending June 7, 2018, suggest a range of \$52/b to \$81/b encompasses the market expectation for September 2018 WTI prices at the 95% confidence level.

Source: US Energy Information Administration
Forecast as of 6/12/2018

Henry Hub Natural Gas Price

	April 2017	April 2018	% Increase
Monthly Price	\$2.88	\$2.69	-6.6%
YTD Average Price	\$3.04	\$3.00	-1.3%

EIA expects Henry Hub natural gas spot prices to average \$2.99/MMBtu in 2018 and \$3.08/MMBtu in 2019. NYMEX contract values for September 2018 delivery that traded during the five-day period ending June 7, 2018, suggest that a range of \$2.38/MMBtu to \$3.57/MMBtu encompasses the market expectation for September Henry Hub natural gas prices at the 95% confidence level.

Source: US Energy Information Administration
Forecast as of 6/12/2018





Houston Housing Indicators

Categories	May 2017	May 2018	Change
Total Property Sales	9,660	9,721	0.6%
Total Dollar Volume	\$2,759,672,948	\$2,814,431,443	2.0%
Total Active Listings	40,058	39,478	-1.4%
Single-Family Home Sales	8,078	8,157	1.0%
Single-Family Average Sales Price	\$301,678	\$305,511	1.3%
Single-Family Median Sales Price	\$235,000	\$243,000	3.4%
Single-Family Months Inventory*	4.0	4.0	unch
Single-Family Pending Sales	8,018	8,991	12.1%

*Months inventory estimates the number of months it will take to deplete current active inventory based on the prior 12 months sales activity. This figure is representative of the single-family homes market.

Source: Houston Association of Realtors

Houston Real Estate Highlights in May

- Single-family home sales rose 1.0 percent year-over-year, with 8,157 units sold, the second largest one-month sales volume of all time;
- Days on Market (DOM) for single-family homes increased slightly from 51 to 52 days;
- Total property sales edged up 0.6 percent with 9,721 units sold;
- Total dollar volume increased 2.0 percent to \$2.8 billion;
- The single-family home median price rose 3.4 percent to \$243,000, which represents an all-time high;
- The single-family home average price increased 1.3 percent to a record high of \$305,511;
- Single-family homes months of inventory was flat at a 4.0-months supply, the highest level since last August and equal to the national inventory level;
- Townhome/condominium sales fell 6.4 percent, with the average price up 2.5 percent to \$213,912 and the median price up 3.0 percent to \$170,000;
- Leases of single-family homes declined 1.8 percent with the average rent up 3.7 percent to \$1,845;
- Volume of townhome/condominium leases dropped 22.6 percent with average rent up 1.0 percent to \$1,580.

Source: Houston Association of Realtors



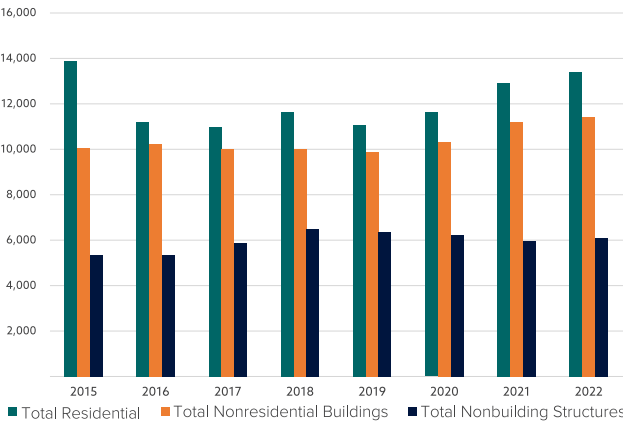
PMI - Houston Indicators

	May 2017	May 2018	Percent Change
Monthly	56.6	58.8	3.9%
YTD Average	53.6	56.5	5.4%

Source: Purchasing Managers Index (ISM)

The PMI is a leading indicator of economic conditions for Houston. An index number below 50 represents a contracting economy; readings above 50 indicate an expanding economy. After three months of forecasted contraction post-Harvey, the PMI is now showing Houston poised for near term expansion.

Houston Construction Put in Place, 2015-2022, (000s)



Source: FMI Forecast - CIP Houston

THE NEW STATE ENERGY CODE AND ITS IMPACT ON SCHOOL CONSTRUCTION - A FOLLOW UP

BY: MICAH HAWKINS, CYPRESS-FAIRBANKS ISD AND SEAN HOLDER, SALAS O'BRIEN

Since the time of last reporting, the State Attorney General has advised that school buildings should be categorized as commercial construction within the context of the 2015 International Energy Conservation Code (IECC). Therefore, in those municipalities that either adopted the 2015 IECC or where 2015 IECC governs by default, K-12 construction projects begun after November 1, 2016 must adhere to the new code.

Undoubtedly this presents the greatest problem for those bond programs planned, budgeted, and approved under the 2009 IECC which now must design and build projects under the vastly different 2015 IECC. Over the last year, the greatest unforeseen cost associated with the updated code is the mandated third-party commissioning of buildings where the total mechanical equipment cooling capacity is equal to or greater than 480,000 btu/h, or 40 tons and 600,000 btu/h combined service water-heating and space-heating capacity. The building systems that are required to be commissioned include HVAC, lighting, and building service water heating. This commissioning scope far exceeds standard testing and balancing and as such, is a new direct project cost ranging from 1.25% to 2.25% of the total construction value according to the National Association of State Facility Administrators.

Another cost impact has come in the form of more stringent mechanical system requirements, which has led to approximately a 15% cost increase in mechanical equipment when compared to the previous state adopted version of the IECC. This added cost stems from a combination of greater equipment efficiencies and the utilization of additional energy efficient options. Current code complainant chillers are now 17% more efficient. In addition, waterside economizers and chiller condenser heat recovery are two examples of energy efficient options that are becoming more prevalent as design engineers are challenged to comply with the code.

Cost impacts of other new requirements have been more difficult to ascertain. New reduced lighting power densities mandates make the use of LED lighting almost a certainty.

Further, new lighting control requirements include continuous dimming, daylight zoning, and occupancy sensors. While the necessity of LED lights and lighting control features are new to the code, the added cost of those features vary based on individual owners' building programs. Districts previously specifying LED lighting and networked lighting controls may actually see better pricing stemming from these changes as LED lighting becomes more prevalent in the market and the network component of lighting controls can be scaled back due to greater local automation. LED lighting also produces approximately 75% less heat than fluorescent leading to a reduced heat load on the building mechanical system. Additionally, many districts have been using low-E glass, rigid insulation, and thicker roof insulation for years prior to the new code addressing the building envelope. Therefore, in the instance of these examples—LED lighting, lighting controls, and various building envelope components—the 2015 IECC code is simply formalizing previously established best practices and there should be minimal cost impact to those districts that had proactively enacted those standards.

Ultimately, the focus of the 2015 IECC is to reduce energy consumption and emissions throughout the life of a building and the results seen in the first year of implementation are promising. Energy models performed on K-12 buildings have shown a 10-18% reduction in energy usage resulting from 2015 IECC changes. Further, despite the added cost to the construction budget, commissioning has been shown to save 8-20% on operation and 15-35% on Maintenance costs according to the U.S. General Services Administration. As both stewards of the finances, and more importantly the planet, the initial indications illustrate the outcome we all have hoped to achieve. While there are cost impacts that must be budgeted for accordingly, the result is reduced operating and maintenance expenses in an age of tightening budgets and a reduced impact on the environment. ■

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