

HOUSTON

COMMERCE



Change, Meet Opportunity

Between COVID, tech disruption, and a slow economy, almost every area of Houston business is having to take a new road. This is how they plan to make a better tomorrow.

At the 2020 YTexas State of Business Summit, one thing became clear: The coronavirus will have Houston industries doing things differently in 2021.



“Sure, the vaccine will come,” said **Mario Diaz**, Director of Aviation at the Houston Airport System. “But we think we will have

to deal with this virus for another 12 to 18 months. And the best way to deal with it is to change behaviors.”

Both on Summit panels and in interviews, leaders said they planned to grow their companies in 2021 by taking advantage of the many attributes that Houston and Texas have to offer.



One of those is a continuing supply of workforce talent. “We had more than 30 interns at our Johnson Space

Center office and another 15 at the location where I am,” said **Steve Clarke**, Vice President of People & Places Solutions at construction giant Jacobs. “The talent we’re seeing coming out of college is amazing.”



The Houston economy is also getting a boost from a push to build

Relocations here have been spread across a diverse group of industries, including energy, biotech and life sciences, technology and machinery, and industrial manufacturing.

—Susan Davenport

up a variety of commercial industries operating in the metro area, according to **Susan Davenport**, Senior Vice President and Chief Economic Development Officer at the Greater Houston Partnership. Some 60-plus companies have moved headquarter operations to the region from out of state since 2010, she says. Companies have relocated from more than 20 different US states, such as California, Pennsylvania, and Louisiana, and at least 10 foreign countries.

“Relocations here have been spread across a diverse group of industries, including energy, biotech and life sciences, technology and machinery, and industrial manufacturing,” she says. “In recent years, Houston has seen a push toward the innovation sector. Just recently, Hewlett Packard Enterprise announced plans to move its headquarters from Silicon Valley to the Bayou City.” The most common types of jobs they brought involve office, engineering, technology, and headquarters work, Davenport says.

Beyond the immediate health crisis, many industries in Houston are poised to see strong annual growth between 2019 and 2045 in their real gross product, or the financial worth of the products and services they produce.

The Perryman Group, a Waco-based consulting firm, expects steady growth across several industries in Houston. It forecasts manufacturing

to expand 4.03 percent per year, professional services at 3.45 percent, and finance and insurance at 3.28 percent.¹

THE NEW ENERGY

For some of the 4,650 energy-related firms in the Houston metro area, the path out of the 2020 slump may include everything from consolidation to renewable forms of energy.



“We’re on the road to recovery, but it’s going to be a long road,” said

Todd Staples,

President of the Texas Oil & Gas Association, at the Summit. “The bright spot is we have seen a little uptick in demand.”

In 2019, before COVID hit hard, the oil and gas industry paid over \$16 billion in state and local taxes and state royalties, according to Staples.

“And even an Aggie like me can tell you that equates to about \$44 million a day going to pay for our schools, our roads, our universities—a phenomenal impact for Texas,” he said.



Though capacity of solar and wind power doubled over the last five years, renewable

sources supplied only about a quarter of demand growth in power generation, according to **Sean Strawbridge**, CEO of the Port of Corpus Christi. Hydrocarbons accounted for the other 75 percent, he said.

“That means renewables couldn’t even keep pace with the incremental energy demand that we saw, let alone drive any fuel displacement,” he said. Should a vaccine help return demand growth to what was forecasted before COVID, he said, “you’re still looking at a combined nuclear, hydro, and renewables of only about 17 percent by 2050.”

Still, he added, the industry has committed to developing a range of power sources, known as the “all of the above” strategy. “The big majors are already recognizing that they’re going to be relegated to niche players if they don’t diversify their energy production portfolios.”

Improvements in refining technologies have made fuels 99 percent cleaner, and methane emissions from natural gas systems have declined 23 percent since 1990, even as production skyrocketed.



Yet while Texas is known for its oil and gas production, it has also produced over 29,000

megawatts of wind power in the last 20 years, according to **Mike Howard**, Chairman and CEO of Howard Energy Partners. The company, which has a Houston office, helps turn raw fuels into forms that can power equipment and then moves them from point A to B.

“Due to innovation and a lack of regulation in Texas, we’ve given ourselves

probably the lowest drilling cost for exploration and production,” he says.

LOW-COST MONEY

Few organizations went untouched by the COVID-related downturn, but it has come with upsides for some. For one, the slowdown has lowered the price of debt for Texas Central, the for-profit company planning to build a 236-mile high-speed rail line connecting the Houston area with Dallas-Fort Worth, with a stop in the Brazos Valley near College Station.



Faced with low returns on many financial assets, pension funds have purchased interests in similar

projects in Europe, according to Dr. **Carlos Aguilar**, Texas Central’s President and CEO. Long-term debt in this arena often comes from government agencies like the US Department of Transportation, he said at the Summit.

With COVID creating delays in infrastructure works such as liquified natural gas, Texas Central was looking in the fall to land lower-cost construction financing. Slated to create 17,000 construction jobs, the project’s civil infrastructure costs—such as building tracks—will be around \$20 billion.

“There is a lot of unused capital out there,” Aguilar said. “We have to go through a bit of convincing some skittish money that is now wondering what to do with their funds during COVID.”

The pandemic is also forcing the Houston Airport System, the enterprise fund that runs the George Bush, Hobby, and Ellington airports, to build non-airline revenue in areas like parking, concessions, and ground transportation, according to the System’s Mario Diaz.

Companies may avoid nonessential business travel for one to three years, Diaz said at the Summit.

In addition to familiar tactics like wearing masks, the Houston Airport System is working on using ultraviolet lights to sterilize ducts and improving

air circulation to limit the spread of airborne antigens, Diaz said. “We need to make the customer as comfortable and safe as possible.”

SPACE CITY: THE NEXT FRONTIER

Already home to 500-plus aerospace companies, Houston’s commercial spaceport at Ellington Airport recently finished phase one of its development by installing infrastructure on 150 acres of land. The facility has landed companies like Intuitive Machines, which has a NASA contract to become the first private US company to land spacecraft on the moon. The Houston Spaceport continues to seek more partners to operate from its headquarters, designed not only as a facility for launching spacecraft but also as a hub for innovation and collaboration.

“We are talking to a number of other companies—I’m not at liberty to discuss them—in manufacturing of space components and even aviation products of aircraft,” Diaz said. “A number of universities are working with us on building an aerospace technical training center,” including Texas A&M, the University of Houston, and Texas Southern University.

And Johnson Space Center (JSC) is seeking commercial partners to help it pursue missions where astronauts live and operate on other celestial bodies—including Mars, eventually.



Known as mission control for the first moon landing, JSC is now working on the Artemis program, which

aims to land the first woman and next man on the Moon by 2024. That mission will include seeking water, building a sustainable base, and investigating the Moon’s mysteries, according to **Nicholas Skytland**, Deputy Chief of JSC’s Exploration Technology Office.

“Technology really drives exploration,” Skytland said at the Summit. “We have commercial partnerships and a lot of activity in areas like advanced propulsion systems and precision landing. How do we excavate material we find on the moon and construct

habitats? How do we live in these extreme environments?”

NASA is thus looking at the design of everything from spacesuits to habitats, Skytland said. “We need these small startups that are thinking innovatively, challenging the status quo, and advancing the technology.”

NASA’s largest service provider, Jacobs, moved its headquarters to Texas about four years ago. “If you’ve never been to a rocket launch, it’s a life-changing experience,” says Jacobs’ Steve Clarke. “It will get you excited about the industry like nothing else.”

PILOT TESTS GROW STARTUPS

The Ion, an innovation and startup hub launched by Rice University, recently received \$1.4 million in federal funding to help form its Aerospace Innovation Hub to develop minority-led companies addressing challenges in that industry.

The Ion, which anchors a new 16-acre Innovation District in Midtown Houston, will work on the project with JSC and DivInc, the latter an Austin-based accelerator for underrepresented entrepreneurs like women and people of color.

To give its startups a better chance of success, The Ion helps line up pilot tests with the City of Houston and other communities for the fledgling companies’ products.



“This is a way for entrepreneurs to check and tweak their solutions with that key stakeholder

[pilots] so they can iron out any evaluations they may need to make before they scale up,” says **Christine Galib**, Senior Director of Programs at The Ion.

That in turn helps fundraising because entrepreneurs can show they have validated their technologies in a real-world setting, she notes. It can also prompt the corporate venture arms that The Ion works with to take a look at the invention. Its program partners and sponsors include Chevron Technology Ventures, Microsoft, and Intel. 



¹The Perryman Group, “Perryman Texas Top Ten,” <https://data.perryman.com/texas-top-ten>.

HOUSTON

COMMUNITY



Creating More for a Community

As new residents pour in, Houston-area students are learning more marketable skills while the public transit system is helping test more efficient ways to move people from point A to point B.

With the Houston metro's population of over 7 million projected to nearly double by 2040, business and government leaders are building a stronger society now by improving building blocks like education and public transit.

The Houston school system is focusing on teaching job skills employers will need today and tomorrow as the region's largest industries face disruption from technology and COVID-19. Texas A&M, for instance, is working with Houston Methodist on an engineering medical program that will be part of a planned complex the school system is building in the city's Texas Medical Center.



"Things like telemedicine and robotics are going to be at the forefront of medicine in five or 10 years, perhaps even next year [2021]," **Ross Guieb**, Executive Director of the George H. W. Bush Combat Development Center at A&M's Bryan campus, said at the YTexas Summit. "When you have companies coming back for more of the same types of students, that's how you build that connection."

The City of Houston, meanwhile, has built a 345-mile network of bike-friendly

lanes and trails across 500 miles. Voters in November 2019 approved a \$3.5 billion bond that, among other things, will allow its transit agency, METRO, to add three light-rail lines through downtown.¹

The agency reportedly hopes to land matching federal and state money for its proposed \$7.5 billion METRONext Moving Forward Plan, which would span 500 miles of transit improvements and additions. "METRORapid in August debuted with the Silver Line in the Uptown area," says **Tom Lambert**, President and CEO of Houston METRO. "It utilizes technology known as 'bus rapid transit' and resembles rail, operating from platforms with a 10-minute frequency for most of the service day."

While public transit like light rail eases vehicle emissions and traffic alike, it also spurs construction and business relocations near passenger stations. "Since its inception in 2004, there has been more than \$8 billion in development along the METRORail Red Line," Lambert says.

NO DEGREE? NO PROBLEM

Higher-ed institutions like San Jacinto College have created industry-focused training programs through an employer-led coalition called UpSkill Houston.

Launched by the Greater Houston Partnership in 2014, the group focuses on the city's nearly 1 million middle-skill jobs, which require more education and skills beyond a high school diploma but less than a four-year degree.

For instance, UpSkill Houston supported San Jacinto College on the school's new LyondellBasell Center for Petrochemical, Energy & Technology. Industry leaders and employer partners provided input on the design of laboratory space and curriculum.

"It is important that UpSkill Houston is employer-led, because employers best understand the skills they need in their workers," says **Peter Beard**, Senior Vice President of Regional Workforce Development at the Greater Houston Partnership. In need of soft skills (such as time management and problem solving) as well as digital and job-related expertise, employers are focusing on growing the talent pool from which they recruit.

One result is Women In Construction, which initially trained women in the earn-and-learn program to be pipefitters in industrial construction and since has expanded to other contractors and specialty crafts like HVAC/mechanical. The program is

the result of S&B Engineers and Constructors working with Workforce Solutions, an operating affiliate of Gulf Coast Workforce Board, and the THRIVE program at the United Way of Greater Houston.

Last fall, Beard said that UpSkill Houston was in the early stages of helping people who lost jobs in energy to move to new fields. Some may find opportunities in the tech sector, guiding development of automation systems and artificial intelligence for the cleantech and renewable energy industry, he said. "When you think about the technicians that worked on the oil well pad, there are probably similar skills and competencies needed to support solar and wind," said Beard.

People with maintenance and construction skills will likely be able to perform work needed to install solar panels, Beard said. "In the coming months, we will have more to report as we engage with the renewable and cleantech employers."

HELPING PAY COLLEGE COSTS

In a similar vein, PK-12 organizations joined forces with higher-ed organizations to create Harris County Promise, which helps provide funding so more high school seniors can earn college credentials and degrees. Launched in January 2020,

Harris County Promise is a last-dollar scholarship, meaning that it covers the gap between the cost of tuition and fees and the amount paid by grant aid (including federal and state aid and additional scholarships).



"We've got more than 50 school districts here serving nearly a million students," said **Paris**

Woods, the organization's Managing Director, at the YTexas Summit. "A huge goal for us is moving college enrollment rates up from 52 percent, where they've been for several years."

The three community colleges the Promise program works with—Houston Community College, San Jacinto College, and Lone Star College—"are helping ensure that any credential or degree that Promise dollars earn translates directly into a workforce opportunity the graduate would not have had access to otherwise," she added.

Once youngsters reach higher education, schools are increasingly offering more targeted degree programs to help develop skills for markets that students may want to eventually work in. Texas A&M's engineering studies, for instance, may look different from what previous generations remember.

"We created a multidisciplinary approach that allows you to take classes on the needs of industry," says Ross Guieb of A&M's Bryan campus.

"We tailor it to fit the niche capabilities or niche field the student is interested in."

A&M also created the ENGR[x] program, which requires internships in areas like entrepreneurship or travel abroad. Guieb says he has seen two of his sons grow as leaders through participating in the famed Corps of Cadets, a military-style student organization.

A fundraising program at A&M also helped facilities like the SuSu and Mark A. Fischer '72 Engineering Design Center, an academic "makerspace" for building things. "We can fail, learn from it, and then do it again," Guieb says. "Collaboration is important because you start to get leadership skills."

FOSTERING ENTREPRENEURSHIP

Houston is also developing programs to build opportunities and entrepreneurial skills among those currently in the workforce. For example, the Rice Alliance for Technology and Entrepreneurship offers training and a career fair for those seeking internships or full-time jobs with fledgling businesses.



"Almost every student we see says, 'I work for Amazon or Microsoft or Exxon today,

but in three to 10 years I want to start my own company or be involved with smaller, more nimble businesses,'"

says **Brad Burke**, Managing Director of the Rice Alliance.

In late 2020, Rice University was turning the former Sears store in Midtown into The Ion, a 270,000-square-foot innovation and startup hub that will anchor the four-mile long Innovation Corridor.

"Whether they work at big companies or want to be an entrepreneur, students need skills to succeed like creative problem solving, planning when they don't have anything at all, or creating a vision and getting people to support it," Burke says. "We're going to give them the capabilities they need."

Over the 20 years the Rice Alliance has been around, it has seen more than 2,500 companies go through its program and raise \$21 billion-plus in funding, according to Burke.

But while the Alliance may be aimed at the private sector, even government arms like Houston METRO have adopted a spirit of entrepreneurship and experimentation.

SELF-DRIVING PUBLIC TRANSIT

In 2019, Houston METRO joined with Texas Southern University to launch a pilot test of the region's first autonomous shuttle, part of a study by the school's Center for Transportation, Training, and Research. Operating along a one-mile stretch of campus called Tiger

Walk, the six-seat electric vehicle (with standing room for six more) provided real-world data on how autonomous vehicles, or AV, can help transit agencies better serve smaller neighborhoods and hard-to-reach areas by connecting them to public transport.

"METRO was instrumental in helping Texas receive federal designation as an AV proving ground," said Tom Lambert, the agency's President and CEO. "This helped make this project possible."

To help further the effort, METRO recently received a \$1.5 million grant from the US Department of Transportation to help develop "the first autonomous, midsize, full-speed, fully compliant vehicle for the public transit market."

Plans are for the vehicle to operate as part of the University District Project, connecting the Third Ward, the University of Houston, and TSU to the METRO system, by way of the 54 Scott bus corridor, the METRORail Purple Line, and eventually to the Eastwood Transit Center, Lambert said. The Eastwood facility has park-and-ride commuter bus service.

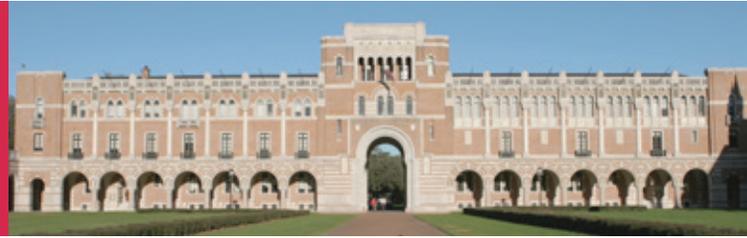
METRO is working on the project with Phoenix Motorcars, AECOM, EasyMile, and the Federal Transit Administration. "We believe automation and electrification are important contributors to the sustainability of public transportation," Lambert said. [▼](#)

¹American Planning Association, "Toward Modern Mobility," <https://www.planning.org/planning/2020/jan/toward-modern-mobility>.



HOUSTON

CULTURE



Thinking Creatively, Working Together

The Houston area is combatting COVID-19 and a difficult economy with the same culture of cooperation and innovation that helped it recover quickly from Hurricane Harvey.

When Hurricane Harvey flooded the greater Houston area in 2017, the world saw the region's spirit through videos of residents using boats and other means to help neighbors.

2021 sees the Houston metro facing new challenges from COVID-19 and a slow national economy. Its population is meeting them through the same culture of cooperation and creativity that spurred the rapid rebound from the storm.

the Texans, to do things differently to serve their staffers and improve their business relationships.



"We have pushed hard to experiment with all kinds of technologies to keep our

business moving forward," says **Jamey Rootes**, the franchise's President. "These will enhance our operations and offerings as we emerge from a mainly virtual world. We have deployed six years of innovation in six months because necessity is the mother of invention."

COVID has impacted society. A series of reports looked at how the pandemic has affected low-income and underserved populations. Those came from Baker experts working with colleagues like Dr. Quianta Moore, a fellow in child health policy, and Zeinab Bakhiet, a research project manager.¹

Other work has examined balancing protection of human life with safeguarding economic well-being.

"The Institute also analyzes issues beyond just energy and health, such as presidential elections, public finance, entrepreneurship and economic growth, US–Mexico relations, the Middle East, and China," Ambassador Djerejian said. "Houston's rich demographic and cultural diversity underscores the Institute's mission of producing research with local, national, and global relevance."



"If you don't look for opportunity now, you won't be in the ballgame," says **Chris Shepherd**,

owner and Executive Chef at Underbelly Hospitality, a Houston restaurant group. "We're here to help each other out. We have to do it together."

Having lost 70 to 80 percent of his business since COVID forced shutdowns of many public places, Shepherd found new revenue streams such as using Zoom videoconferencing to teach cooking classes out of his own kitchen.

"Everybody gets a box that we've shipped and cooks their dinner with us," he says. The classes will "absolutely" continue after COVID passes, he adds.

The pandemic also prompted Houston's NFL team,

WEBINARS' SIDE BENEFITS

Since March, Rice University's Baker Institute for Public Policy has substituted webinars for in-person gatherings.

"These virtual events have actually allowed us to grow our audience base and more widely publicize our programs," said Ambassador **Edward Djerejian**, Director of the Institute, which was ranked the second best university-affiliated think tank globally in 2019.

Its Center for Energy Studies ranked first in its class.

Fellows and scholars at the Institute's Center for Health and Biosciences have produced research into various ways

LEARNING FROM THE BEST

The Baker Institute's health and life science researchers benefit from working across the street from the Texas Medical Center, or TMC, one of the world's largest districts of university research, hospitals, and related healthcare.

The Greater Houston Partnership similarly leaned on TMC in setting up its Work Safe Program, a

Photo by Julie Soefer

set of principles its nearly 1,100 member companies could follow for reducing risk when Texas reopened in the spring of 2020. The Partnership, which encompasses 12 counties, was working last September with 55 to 60 chambers of commerce and related organizations on various strategies for initiatives at the statewide level, according to **Susan Davenport**, Senior Vice President and Chief Economic Development Officer.

"It's everything we're undertaking," Davenport said at the YTexas Summit. "We're bringing that broad piece together, working on it in unison and making it create a stronger outcome on all fronts when we pull all these pieces together."

One of the Partnership's initiatives—moving the region's energy industry from fossil fuels like oil to renewable sources—took a step forward in June 2020, when the climate-technology incubator Greentown Labs announced plans to open a Houston location this spring.



"Houston alone has 130 solar and wind companies," says Dr. **Emily Reichert**,

Greentown's CEO. "It has an ambitious climate action

plan to be carbon neutral by 2050, actually the same as Boston's [near the incubator's headquarters]. By opening Greentown Houston, we aim to build a bridge between Boston and Houston by having the brightest minds in engineering and business working together on our shared global climate challenge."

MEETING THOSE WHO DISAGREE

Though partisanship has been sharp nationally in recent years, Houston area residents are part of efforts to open lines of communication between people with different viewpoints statewide.

One avenue for that is the Texas Lyceum, a nonprofit leadership forum where people from across the Lone Star State gather to discuss issues like housing, immigration, and the environment. The group's conferences lead to widely cited nonpartisan polls and, in conjunction with state universities, policy whitepapers.



"You can come from completely opposite viewpoints on a topic, have a heated discussion

and disagree without being disagreeable," says **Sanjay Ramabhadran**, Chairman and 2019 President of the Texas Lyceum. "You can argue about it all evening, all night, and all

early morning long. That's where those relationships are formed." One story circulated among Texas Lyceum alumni is of US Senator Ted Cruz playing dominoes or poker until the wee hours of the morning while discussing the conference's topic, according to Ramabhadran, who is also a Founding Principal at Houston's VERSA Infrastructure.



The Lyceum's 2021 President, **Castlen Kennedy**, remembers chatting at one

conference with an African American woman about their respective experiences as parents of little boys. "She shared with me some of her fears, concerns, and challenges," said Kennedy, Vice President of Corporate Communications and Public Affairs at Apache Corporation. "And it was a moment where I connected with somebody, where I understood a perspective that I didn't understand before."

AHEAD: MORE RESTAURANTS, MARKETING TO THE LATINX COMMUNITY

As difficult as 2020 was, Houston residents are meeting the future with their trademark optimism.

Chris Shepherd of Underbelly Hospitality said in an October

interview that he was making progress toward getting his company's meals available through grocery stores. He has also installed a catering kitchen.

And in keeping with Underbelly's tradition of running completely different types of restaurants, he believes he will have 10 locations by 2030, with each concept pushing the others to be better.

Jamey Rootes, President of the Houston Texans, was also optimistic about his organization's future—and looking forward to reaching out to Houston's diverse consumer base. While the Texans have sold out every home game since their 2002 inception, Rootes and company will be seeking ways to expand their reach to the Latinx market, which in 2018 made up 37.6 percent of the metro's population.

"We have always had a robust platform, including television, radio, digital, social media, and in-person outreach, to engage the Latinx community and their love of sports," he said. "We hope additional exposure to US football will allow them to express that passion for the local team." 

¹ Quianta Moore, "The Impact of COVID-19 on Vulnerable Families," Rice University's Baker Institute for Public Policy—Research Library, <https://www.bakerinstitute.org/research/impact-covid-19-vulnerable-families>.



