



APRIL 2020

FISCAL NOTES

BRINGING SPACE DOWN TO EARTH

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STATE REVENUE WATCH

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Helping Foster Youths in Higher Education By Spencer Grubbs

TEXAS PROGRAMS
ASSIST VULNERABLE KIDS



According to the Texas Department of Family and Protective Services (DFPS), more than 33,000 Texas children and youths were placed in foster care in fiscal 2019, and during that year more than 51,000 were under DFPS care at some point. These kids represent a vulnerable subset of Texas' large and growing adolescent population. Those who experience abuse and neglect in childhood often are left with lifelong scars, physical and emotional, and many face difficulties in making a successful transition to adulthood.

Foster care is intended to protect children who can't safely live at home with their parents, generally because of abuse or neglect. In Texas, such youths are placed in the state's foster care system when a relative or family friend can't provide care. Texas courts grant DFPS temporary legal custody, called *conservatorship*, of these youths.

The social and economic consequences of children in turmoil are dramatic. Students who have been

in foster care complete high school, college and vocational training at *much* lower rates than their counterparts. Texas' economic progress will depend on how well the state can ensure educational success for all its young people — including the most vulnerable.

LEAVING FOSTER CARE

In Texas, DFPS conservatorship of a youth ends when "permanency" is achieved through family reunification, adoption or custody by relatives, or when the youth turns 18 — "aging out" — whichever comes first. More than 20,300 youths left DFPS conservatorship in fiscal 2019; of those, 93 percent achieved permanency of some kind and 6 percent aged out.

Nearly 19,000 youths who achieved permanency in fiscal 2019 spent an average of about 1.5 years in care with two placements each. Those who aged out in that year, however, spent an average of nearly four

CONTINUED ON PAGE 3

A Message from the Comptroller

Just like you, we're watching the ongoing story of COVID-19 unfold in real time. As I write this, it's early days yet. Comptroller staff who can work from home are doing so, and whether at home or in the office, we continue to assist taxpayers and help them with their responsibilities throughout this crisis. We're monitoring conditions in Texas daily, and studying the effects we can expect on the state economy and state revenues. Our next issue will open the discussion.



In the meantime, I urge everyone who does business with the Comptroller's office, or who has questions about how our tax functions are continuing during the outbreak, to visit our emergency page at comptroller.texas.gov/about/emergency/, or our Virtual Field Office at comptroller.texas.gov/taxes/file-pay/virtual-field-office.php. Taxpayers are strongly encouraged to use our online tools, tutorials and other resources for tax services, and to establish 24/7 account access on Webfile.

COVID-19 is the biggest story right now, but Texas has other stories.

In this issue of *Fiscal Notes*, we look at how the state attempts to help Texas foster children, tens of thousands of kids who face steep odds, enter adulthood successfully. Texas students in foster care are much more likely than their peers to face problems in school — and much less likely to pursue or earn a postsecondary degree after they leave the program. In Texas, those leaving foster care can pursue college tuition waivers, training vouchers, scholarship programs and other services.

We also spotlight ways in which the National Aeronautics and Space Administration (NASA) supports private enterprise while pursuing advanced technologies. Since 1962, NASA has transferred its technologies to benefit American companies and the national economy. Hundreds of companies have taken advantage of NASA's patents, mentoring and support to bring new technologies and products to market; we've spoken with some of the players.

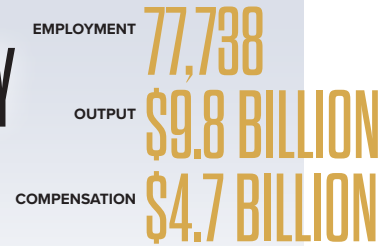
These are difficult times, but I know Texans are tough in good times and bad. This agency will do everything in its power to help.

GLENN HEGAR

Texas Comptroller of Public Accounts

TEXAS COMMUNITY COLLEGES

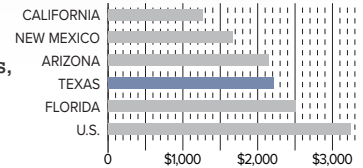
STATEWIDE IMPACT OF COMMUNITY COLLEGES' SPENDING, FISCAL 2019



Note: Figures include direct, indirect and induced economic impacts. Sources: JobsEQ, Texas Comptroller of Public Accounts, Texas Higher Education Coordinating Board and Texas community colleges.

AFFORDABILITY AVERAGE ANNUAL TUITION & FEES: MOST AFFORDABLE PUBLIC TWO-YEAR INSTITUTIONS BY STATE, 2017-18 SCHOOL YEAR

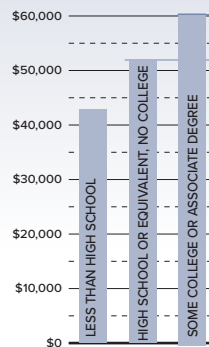
Community colleges are much more affordable than other higher education options. In the 2017-18 school year, Texas' community colleges had the nation's fourth-lowest tuition and fees.



Source: National Center for Education Statistics

WAGES BY EDUCATIONAL ATTAINMENT

AVERAGE ANNUAL EARNINGS BY EDUCATIONAL ATTAINMENT, TEXAS, FISCAL 2019



Sources: U.S. Census Bureau and JobsEQ

Community colleges provide their students with a good return on investment.

AVERAGE EARNINGS INCREASE OVER HIGH SCHOOL OR EQUIVALENT

\$8,393

EMPLOYED, SOME COLLEGE OR ASSOCIATE DEGREE

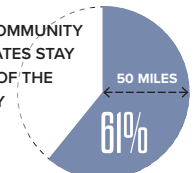
3,245,675

TOTAL STATEWIDE EARNINGS INCREASE

\$27.2 BILLION

Sources: U.S. Census Bureau, JobsEQ and Texas Comptroller of Public Accounts

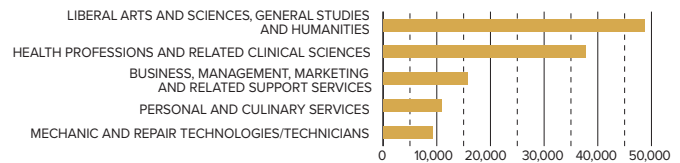
61 PERCENT OF COMMUNITY COLLEGE GRADUATES STAY WITHIN 50 MILES OF THE INSTITUTION THEY ATTENDED.



DEGREES AWARDED

TOP CERTIFICATES AND DEGREES IN TEXAS COMMUNITY COLLEGES, 2017-18 SCHOOL YEAR

Sources: Emsi and Wall Street Journal



Source: JobsEQ

SUMMARY

Texas' 50 community college districts contribute nearly \$10 billion to the state's economy and support nearly 78,000 jobs. They also provide Texas students with a low-cost option to build skills or prepare for further education, leading to better jobs and adding more than \$27 billion to total statewide income.

TO SEE INFORMATION ON COMMUNITY COLLEGES AND THE TEXAS ECONOMY: <https://comptroller.texas.gov/economy/economic-data/colleges/>

If you would like to receive paper copies of *Fiscal Notes*, contact us at fiscal.notes@cpa.texas.gov

years in care and experienced more than six placements (**Exhibit 1**).

Regardless of how these youths leave care, the abuse and neglect that initiated their placement in foster care puts them at a high risk of emotional and behavioral problems that can adversely affect educational attainment.

AN EDUCATIONAL CHALLENGE

Compared to their peers, students in foster care are 3.4 times more likely to be suspended from school and 3.6 times more likely to drop out of high school, according to data presented at the 2017 P-16 Statewide Professional Development Conference. Although DFPS always seeks to place youths in foster care in a safe and permanent living arrangement as quickly as possible, many are moved from home to home multiple times until an appropriate living arrangement can be established.

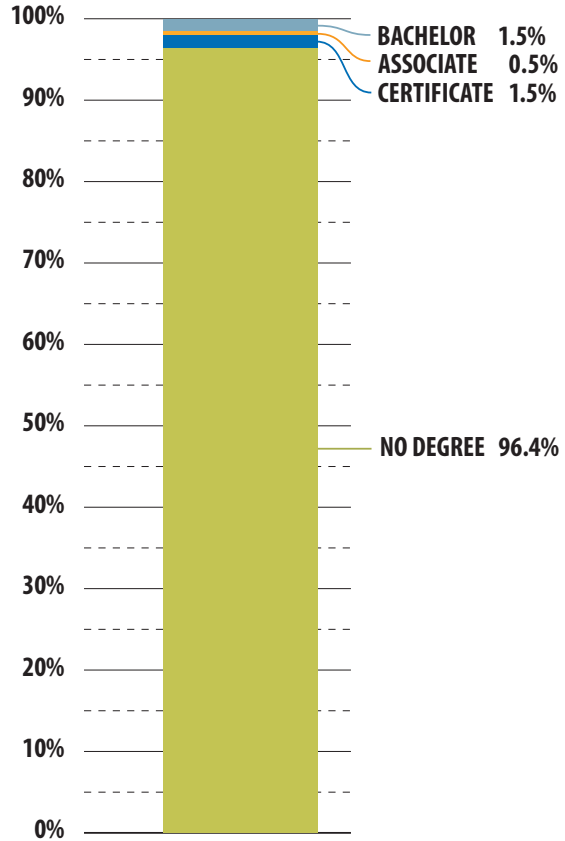
Multiple moves often involve changing schools, another factor that can affect student performance; foster students can lose valuable social supports and even course credits. According to data presented at the 2017 conference, 47 percent of Texas students in foster care have attended at least two different schools in the same school year, versus just 7 percent of students not in care.

For those who have *left* foster care, postsecondary education can be challenging simply because they haven't had the same level of familial and financial support as their peers. In a 2017 study of nearly 4,000 former Texas foster-care children, *two-thirds* (67 percent) hadn't pursued postsecondary education. Of those who *did* enroll, fewer than 4 percent had earned a certificate, an associate degree or bachelor's degree (**Exhibit 2**).

In the 2017 study, 38 percent of nearly 4,000 youths aged out of foster care after turning 18, while 62 percent

EXHIBIT 2

ATTAINMENT OF TEXAS FOSTER-CARE ALUMNI PURSUING HIGHER EDUCATION, AGES 18 TO 24

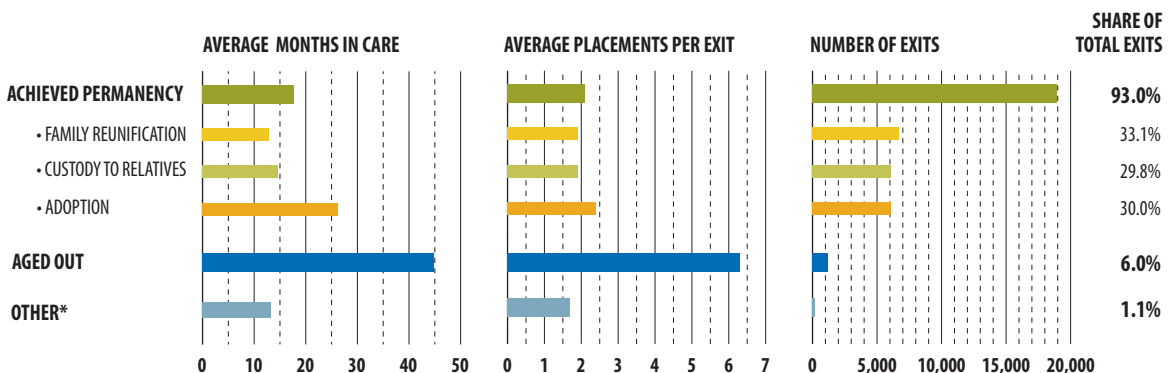


Note: Study cohort consisted of 3,855 persons formerly in foster care who turned 18 between Sept. 1, 2008, and Aug. 31, 2009; the length of time in foster care and each individual's tuition waiver eligibility are unknown. Totals may not add due to rounding.

Source: Education Reach for Texans

EXHIBIT 1

YOUTHS EXITING DFPS CONSERVATORSHIP IN TEXAS, FISCAL 2019



*Missing or incomplete data.

Source: Texas Department of Family and Protective Services

Helping Foster Youths in Higher Education

left foster care after achieving some sort of permanency. The results suggest that foster care alumni struggle educationally regardless of exit reason, age or time spent in DFPS conservatorship.

LIAISONS FOR HIGHER EDUCATION

Texas lawmakers have established programs to help address low college enrollment and retention rates among foster care alumni. In 2015, the Legislature amended the Education Code to require each Texas public institution of higher education (IHE) to appoint at least one employee to serve as a foster-care liaison.

These liaisons help identify those who have been in foster care and provide them with a direct point of contact with the school from enrollment to graduation. They're also responsible for disseminating information about available support services and financial resources. According to the Texas Higher Education Coordinating Board (THECB), about 117 liaisons serve foster-care



JAVIER FLORES
FOSTER-CARE LIAISON,
ANGELO STATE
UNIVERSITY

alumni at Texas universities, state colleges, community colleges, technical colleges and health-related institutions.

Dr. Javier Flores, foster-care liaison at Angelo State University, says that “navigating through the higher education admissions and enrollment processes can be daunting, especially for individuals formerly placed in foster care.” In his role as vice president for student affairs and enrollment management, Flores works with “departments across the

university to develop processes, practices and programs leading to an increase in enrollment, retention and ultimately graduation rates” for former foster kids.

TUITION AND FEE WAIVERS FOR FOSTER KIDS

Texas is one of 22 states that provides a college tuition waiver program for youths and young adults currently or formerly in foster care. Texas’ program, established by the Legislature in 1993, waives tuition and required fees (excluding optional fees such as parking costs) at state IHEs for young people currently or formerly in DFPS’ foster care program. To qualify, participants must enroll in an IHE as an undergraduate student or in a dual-credit course by age 25, among other requirements. The tuition waiver is an unfunded mandate, meaning that state-supported IHEs must cover the associated loss of

tuition and fees without reimbursement from the state.

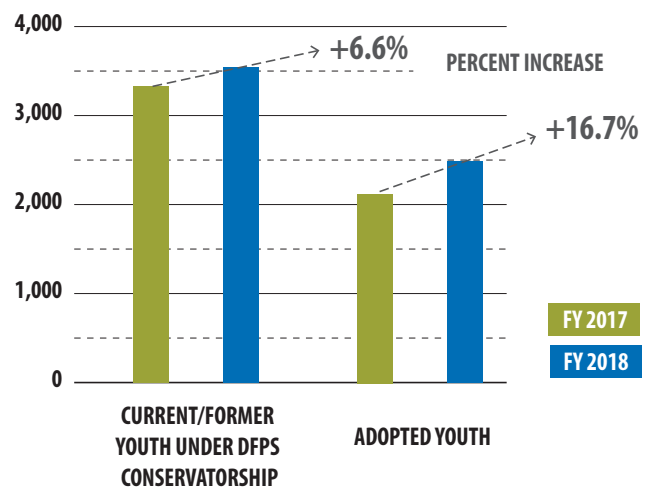
A 2018 study conducted by faculty from several state IHEs, including Texas State University in San Marcos, suggests that those who have been in foster care and use the state college tuition waiver have higher rates of first- and second-year retention, higher grade-point averages and higher graduation rates than those who don’t. The study also found that youths who use the waiver are about three times more likely to earn a bachelor’s degree than those who don’t. Data compiled by THECB, however, show that waiver use among eligible foster youths is limited. Of the 1,666 eligible foster children born in 1992 who were tracked through the 2015-16 academic year, only about 25 percent used the waiver.

Some signs point toward greater use of the waiver, however. In fiscal 2018, a total of 6,037 Texans received tuition and fee exemptions under the tuition waiver program. Of these, nearly 59 percent (3,547) were currently or formerly under DFPS conservatorship, while about 31 percent (2,490) had been adopted. Use of the exemption rose from the previous year for both groups — by 6.6 percent and 16.7 percent, respectively (**Exhibit 3**).

Fiscal 2018 exemptions for those currently or formerly in foster care or who were adopted from DFPS foster care amounted to \$22.2 million in foregone tuition and fee revenue. Community colleges served the highest number of young adults receiving tuition waivers in fiscal 2018; about two-thirds of those

EXHIBIT 3

FOSTER AND ADOPTED YOUTHS RECEIVING STATE COLLEGE TUITION WAIVERS IN TEXAS, FISCAL 2017 AND 2018



Note: Data self-reported by institutions of higher education.
Source: Texas Department of Family and Protective Services



receiving tuition waivers (4,015) attended community colleges. Nearly 70 percent (\$15.4 million) of the cost, however, was assumed by universities, which have considerably higher tuition rates (**Exhibit 4**).

TRANSITIONAL LIVING SERVICES

DFPS promotes self-sufficiency and success among foster-care alumni through its Transitional Living Services (TLS) programs, provided by DFPS staff, contracted service providers and 18 transition centers across the state. The state college tuition and fee waiver is one of these programs, but it’s not the only one. Other TLS programs include:

Circles of Support — voluntary support group meetings that include foster youths, family members, foster care providers and teachers to help develop and review transition plans for entering adulthood;

Preparation for Adult Living — a program preparing older foster youths for a successful transition to adulthood with resources such as life skills training, transitional living allowances, case management, aftercare room and board assistance, GED classes and

driver education; and

Education and Training Vouchers — a federally funded program that provides eligible youths with up to \$5,000 per year to attend college or vocational training.

SUPERVISED INDEPENDENT LIVING

DFPS also administers Supervised Independent Living (SIL), a type of extended foster-care placement that allows young adults aged 18 or older to reside in a less restrictive living arrangement while continuing to receive casework and support services to help them become self-sufficient. It also connects participants to higher education. Extending foster care beyond age 18 is very beneficial for those aging out of the system. According to the

National Conference of State Legislatures, extended foster care doubles the likelihood they will complete at least one year of college by age 21.

“As with any youth turning 18,” says Debra Emerson, DFPS’ CPS Director of Youth Transitional Living Services, “many are not prepared to be fully independent. Extended foster care provides the same support parents provide their own children for successful transition to adulthood.”

SIL provides those currently or formerly in foster care with an extra layer of support to reduce the stress of living independently for the first time. Young adults in SIL programs live independently in college dorms, where they are



DEBRA EMERSON

CPS DIRECTOR OF YOUTH TRANSITIONAL LIVING SERVICES, TEXAS DEPARTMENT OF FAMILY AND PROTECTIVE SERVICES

EXHIBIT 4

NUMBER OF STUDENTS RECEIVING STATE COLLEGE TUITION WAIVER AND VALUE OF WAIVERS BY TYPE OF INSTITUTION, FISCAL 2018

TYPE OF INSTITUTION	IN OR FORMERLY IN FOSTER CARE		ADOPTED	
	NUMBER OF STUDENTS	VALUE OF WAIVERS	NUMBER OF STUDENTS	VALUE OF WAIVERS
PUBLIC UNIVERSITIES	834	\$6,238,596	1,041	\$9,153,645
COMMUNITY COLLEGES	2,601	4,135,459	1,414	2,212,710
PUBLIC HEALTH-RELATED	6	40,844	9	67,310
STATE COLLEGES	33	101,848	26	60,873
TECHNICAL COLLEGES	73	180,091	0	0
TOTAL	3,547	\$10,696,838	2,490	\$11,494,538

Source: Texas Department of Family and Protective Services

Helping Foster Youths in Higher Education

immersed in academic and social life on or near campus and receive financial help for necessary purchases. According to Education Reach for Texans, transitioning directly from foster care to student housing can increase the likelihood of attending and committing to higher education. Currently, 13 SIL sites operate at IHEs across Texas, including two community colleges (**Exhibit 5**); the newest site is Texas A&M at College Station.

UNIVERSITY PROGRAMS

In addition to state-level support, programs at some universities around the state provide helpful resources for foster-care alumni seeking postsecondary degrees.

Texas State University, for instance, established its Foster Care Alumni Creating Educational Success (FACES) program in 2011. With a network of more than 50 mentors and access to university and community resources, FACES aims to increase the retention and graduation rates among foster-care alumni attending the university. FACES students can access mentoring services from Texas State faculty and staff, a lending library providing free textbooks and emergency funding for necessary expenditures such as rent or medical services.

Similarly, in 2019 the University of Houston (UH) launched the Diamond Family Scholars Program with a \$17 million endowment from local philanthropists. With a wide range of support services, notably an \$8,500 annual scholarship, the program intends to increase the current four-year graduation rate of foster-care alumni at UH from 37 percent to 60 percent within four years, with a long-term goal of 80 percent.

Texas' current and former foster youths are at a high risk of poor educational outcomes



that can damage their prospects for economic success and a better life. Texas has taken meaningful steps to help them succeed — and build a strong future workforce that includes all Texans. **FN**

For more information on Texas higher education, see our article on student loan debt in our March issue.

EXHIBIT 5

SUPERVISED INDEPENDENT LIVING CONTRACTED PROVIDERS		
NAME OF INSTITUTION	TYPE OF INSTITUTION	COMPTROLLER REGION
TEXAS WOMAN'S UNIVERSITY	UNIVERSITY	METROPLEX
UNIVERSITY OF NORTH TEXAS	UNIVERSITY	METROPLEX
TARLETON STATE UNIVERSITY	UNIVERSITY	METROPLEX
WEATHERFORD COLLEGE	COMMUNITY COLLEGE	METROPLEX
NAVARRO COLLEGE	COMMUNITY COLLEGE	METROPLEX
WEST TEXAS A&M UNIVERSITY	UNIVERSITY	HIGH PLAINS
TEXAS SOUTHERN UNIVERSITY	UNIVERSITY	GULF COAST
TEXAS A&M SAN ANTONIO	UNIVERSITY	ALAMO
UNIVERSITY OF TEXAS AT SAN ANTONIO	UNIVERSITY	ALAMO
TEXAS A&M CORPUS CHRISTI	UNIVERSITY	SOUTH TEXAS
TEXAS A&M KINGSVILLE	UNIVERSITY	SOUTH TEXAS
TEXAS A&M INTERNATIONAL UNIVERSITY	UNIVERSITY	SOUTH TEXAS
TEXAS A&M COLLEGE STATION	UNIVERSITY	CENTRAL TEXAS

Source: Texas Department of Family and Protective Services

NASA, PRIVATE BUSINESS COLLABORATE ON NEW PRODUCTS

The vision statement of the National Aeronautics and Space Administration (NASA) is “To reach for new heights and reveal the unknown for the benefit of humankind.” Space is its ultimate goal, but the space program also benefits those of us on Earth — and not least by aiding private companies.

While some popular tales of NASA “spinoffs” are urban legends — Velcro, Teflon and Tang breakfast drink all predate the space program — many space-related technologies and processes developed or fostered by NASA have made their way into the marketplace. For example:

- Digital image sensors use complementary metal oxide semiconductors (CMOSs) to enhance screen displays; they’re found in virtually all cellular telephones as well as most digital cameras. CMOS technology matured in the 1990s at NASA’s Jet Propulsion Laboratory.
- New refrigerators that draw power from solar and wind energy can provide reliable storage in remote areas and energy-challenged countries. Founded by an ex-NASA scientist, Tucson-based SunDanzer makes refrigerators for household, commercial, medical and other uses.
- Planet, an Earth-imaging company founded in 2010 by three former NASA scientists, aims to photograph the entire planet daily, producing data for varied purposes including agriculture, emergency response, natural resource protection and security. Begun in a garage, the company now boasts a 27,000-square-foot lab and Google as a partner.

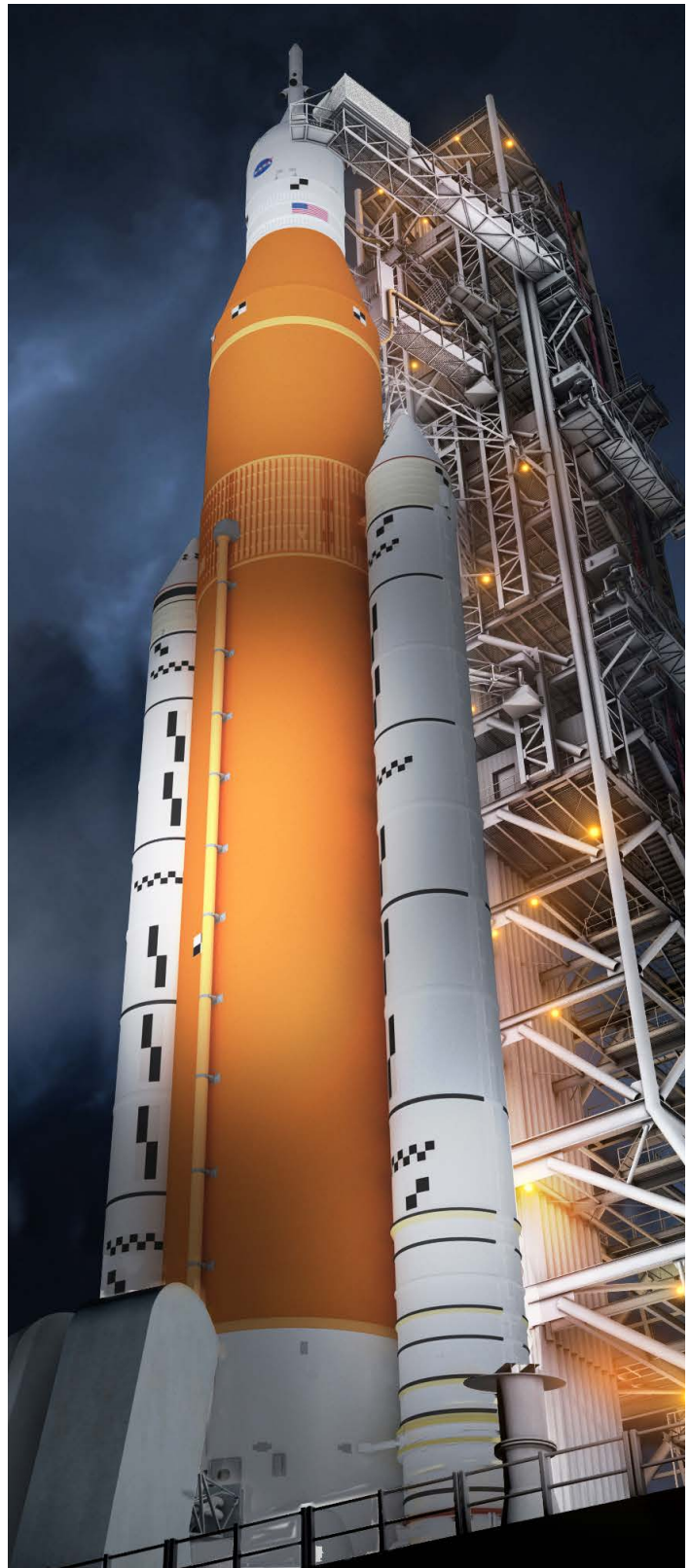
“The agility and creativity of the companies we work with is incredible,” says Technology Transfer Officer Kris Romig, head of Commercialization Services at the Johnson Space Center (JSC) in Houston.

FROM SPACE TO THE MARKET

Making space flight pay off for the public has always been a NASA goal. Congress included commercialization requirements in the 1958 legislation creating the agency. NASA established a program to transfer space-related technologies to the private sector in 1962.

Each of NASA’s 10 field centers (**Exhibit 1**) has a technology transfer office employing a combined total of about 50 as well as contractors and support personnel. The agency currently maintains more than 1,400 active patents across 15 categories and

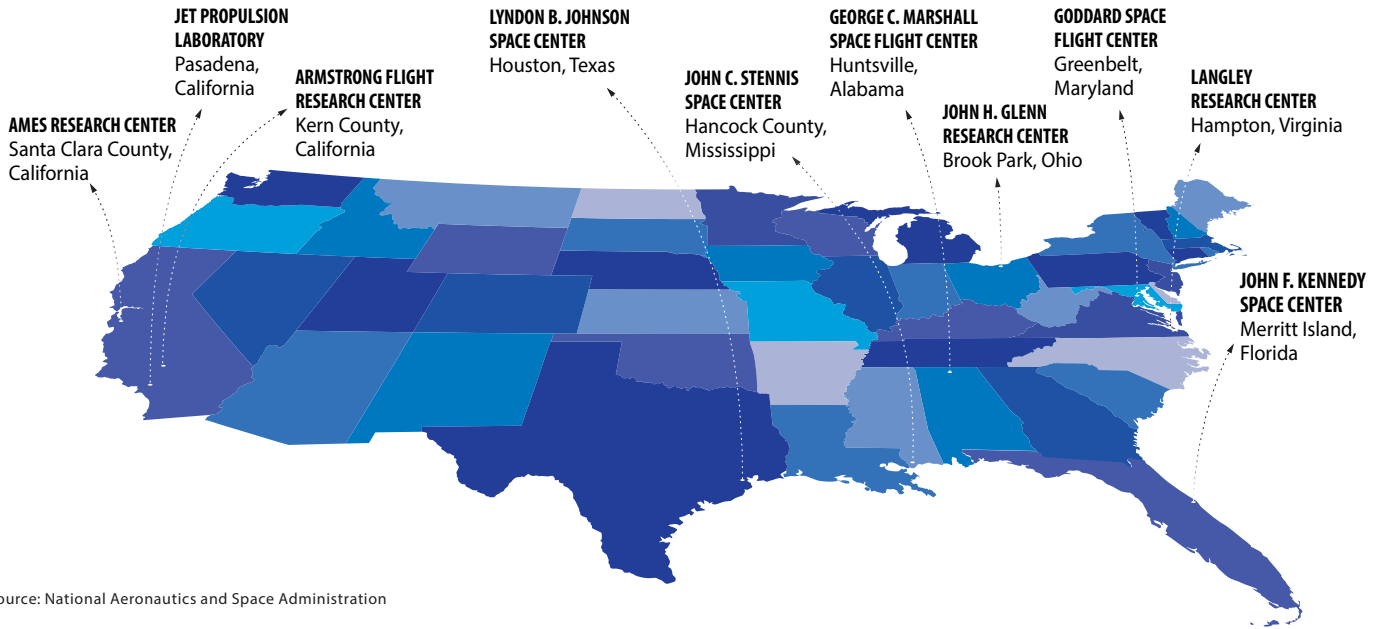
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Artist conception of the Space Launch System, the new NASA rocket series intended to return man to the moon. Photo courtesy of NASA.

EXHIBIT 1

NASA FIELD CENTERS



Source: National Aeronautics and Space Administration

has licensed more than 300 of them (**Exhibit 2**) but, according to Romig, patents only 5 to 10 percent of what it invents. Most of the software the agency employs is open source, and some of its technologies and processes are available for private use free of charge.

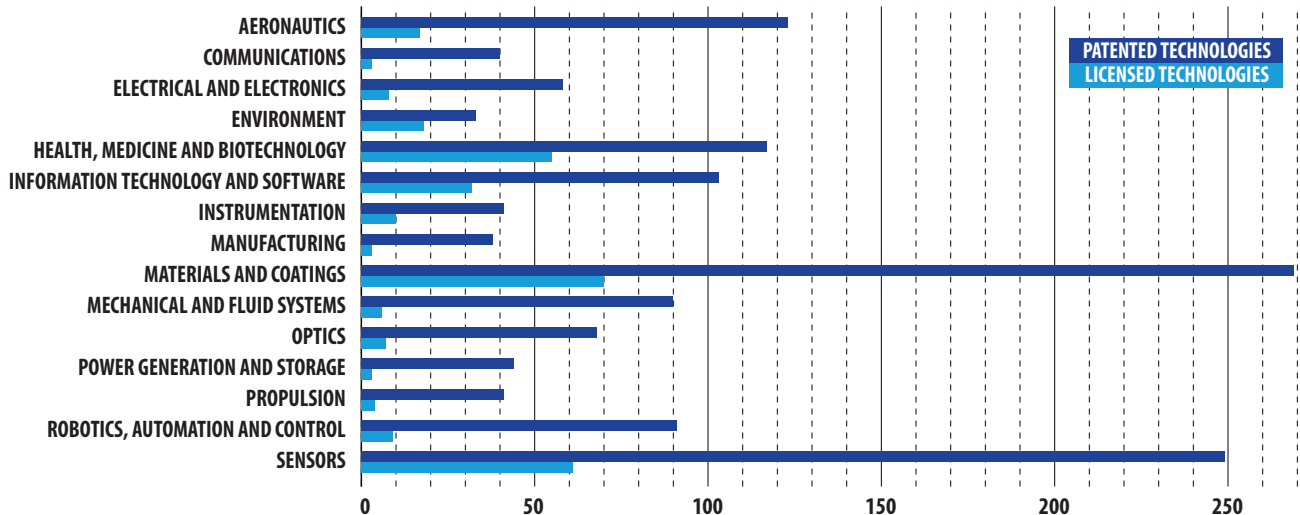
In the past 10 years, NASA's emphasis has been on licensing, which often (but not always) grants the holder exclusive rights to the use of agency-developed

technology. Romig says that NASA has issued about 650 patent licenses since 2010 and currently licenses about 100 to 150 more annually. They vary in duration and type, from research and evaluative licenses to long-term licenses, usually for 20 years.

American businesses take precedence, but international firms are allowed to participate as well, Romig said, noting that stipulations may be made on

EXHIBIT 2

NASA'S PATENT PORTFOLIO



Source: National Aeronautics and Space Administration



KRIS ROMIG

COMMERCIALIZATION
SERVICES LEAD,
JOHNSON SPACE CENTER

manufacturing locations. “We’re trying to improve the U.S. economy,” he says.

NASA also forms strategic partnerships with companies performing space-related research and development (R&D) and participates in two federal grant programs run by the Small Business Administration, Small Business Innovation Research and Small Business Technology Transfer. Through them, NASA solicits and selects R&D proposals for innovative technologies with potential applications for both aerospace initiatives and consumer products.

Gauging the economic impact of space commercialization efforts is problematic at best. Private licensees must submit annual financial reports with sales and revenue figures, but publicly held and other corporate entities do not, a data gap NASA hopes to close. A 2013 study conducted for NASA by the Tauri Group (now part of the nonprofit consultancy LMI) estimated the median annual revenue of each spinoff enterprise at \$1 million, based on 2011 data.

A CURE FOR BAD VIBES

A chance encounter with NASA personnel several years ago led to a potential innovation in the way engineers counteract swaying in skyscrapers, bridges and other tall structures.

During testing of the Ares rocket prototype, slated as a manned launch vehicle until it was cancelled in 2010, dangerous levels of vibration emerged. This prompted NASA scientists to develop a fluid harmonic disruptor to “dampen” (reduce) vibrations during launch. On board the rocket, it was a spherical liquid

oxygen tank. The adaptation for structures was essentially a 2-by-60-foot water-filled pipe fitted with a bellows.

NASA’s solution was a more elegant answer to a problem plaguing building construction for decades. Tall buildings often employ “tuned mass dampers” to absorb motion due to high winds and earthquakes. Typically, these are heavy spheres suspended by lines hung inside upper floors, where they function much like pendulums; some buildings use liquid-filled vats for the same purpose.

At a social event in 2015, the subject came up during casual conversation between a NASA scientist and a colleague of Elisabeth Malsch, a senior principal at Thornton Tomasetti, a multinational structural engineering firm with three Texas offices. Within days, she and some colleagues were watching a demonstration of a fluid harmonic disruptor at Marshall Space Flight Center in Huntsville, Ala.

Using weighted carts, NASA personnel moved a 300-foot rocket testing building back and forth while Malsch and company stood inside it on a stairwell. When they shut off the dampening device, Malsch said the movement became so pronounced they had to hold on to handrails to steady themselves.

Convinced there was an application for construction, Thornton Tomasetti obtained a research license to work on adapting NASA’s technology. A million dollars later, in collaboration with Canadian engineering consultancy RWDI, they’d produced the first fluid harmonic damper for buildings.

Dubbed “Hummingbird,” it’s a modular system of water-filled pipes or tubes that can be configured for virtually any space within a structure: walls, floors, ceilings or rooftops. “It’s easy to hide a pipe in a building,” Malsch says, “but not a ball or a vat.”

In 2016, the first commercial Hummingbird system was placed in a 35-story residential building in Brooklyn that was unusually susceptible to wind motion due to its slender shape and modular steel internal framework. It’s Hummingbird’s only perch so far, but that hasn’t stopped the partner firms from creating a company to market it.

Malsch says the architecture, engineering and construction industry is slow to adapt to change, making the innovation something of a hard sell. But



ELISABETH MALSCH

SENIOR PRINCIPAL,
THORNTON TOMASETTI



Elisabeth Malsch examines the first installation of Hummingbird, a fluid harmonic damper derived from NASA technology. Photo courtesy of Thornton Tomasetti.

Bringing Space Down to Earth

NASA believes it also could be useful in automobiles, aircraft and ocean vessels, and even in moderating the effects of tides.

KEEPING COOL

Austin businessman Chris Bilec has licensed the rights to an epoxy-based coating NASA designed to insulate rocket exteriors from extreme heat. He's trying to find uses for this "phase-change reaction material" for aircraft, pipe heat traps, residential rooftops and food and beverage containers, among other things.



CHRIS BILEC
PRIMEBILEC
INVESTMENTS LLC

Bilec has developed an iceless cooler, but hasn't sold any yet. "Maybe I'm not charging enough," he says half-jokingly, adding that he'd like to emulate the success of Yeti, an Austin-based thermal container company.

Two other promising applications are gypsum board for fire-retardant construction and firefighting equipment and vehicles. Bilec says an Australian firm may distribute his product to firefighters who've been battling wildfires there, noting that it's especially useful outdoors.

Bilec said the NASA license was affordable enough to purchase by himself, adding that it's a good deal for smaller companies.

BETTER BATTERIES

NASA also supports the private sector with mentoring and connections to private investors. Its iTech program conducts periodic forums to identify innovative technologies with potential applications in both the commercial and spaceflight realms. NASA reports that iTech participant companies have raised \$500 million in private financing in just three years.

Jay Fraser's firm, New Dominion Enterprises (NDE) of San Antonio, is developing additives to enhance the safety and durability of lithium-ion (LI) batteries, used in portable electronics, electric vehicles and a variety of aerospace applications. At NASA's 2018 iTech Cycle III Forum, NDE bested almost 400 other competitors, finishing just outside the top three finalists. NASA declined to assist NDE at the time, but the company is moving ahead with testing and manufacturing its patented, three-phase technology.

"We'll go back [to iTech] when we're ready," Fraser said, "when the product has been sold and is mature enough for NASA." He remains in contact with key agency officials as well as his advisors at UT's Austin Technology Incubator.

Assuming their efforts succeed, the veteran entrepreneur believes he and his business partner, research scientist Mason Harrup, are on the verge of a major breakthrough: a substantial improvement in the LI battery invented by UT-Austin Professor John Goodenough. The standard variety is subject to a limited lifespan and safety hazards due to its reliance on organic, flammable electrolytes, the substance that supports electric conduction within the battery.

Harrup thinks he has solved the problem. While working at the U.S. Department of Energy's Idaho National Laboratory, he developed an inorganic, nonflammable electrolyte that extends a battery's useful life. NDE has licensed the patent for the materials he invented while on staff. Along with this additive, NDE eventually plans to develop two other substances that, once perfected, should fully replace today's conventional electrolytes in LI batteries.

"From everything we know in the published literature, we have the only inorganic liquid for lithium-ion batteries anywhere in the world," Fraser says. "It could be the most important innovation since the LI battery was invented."

If he's right, it would have a significant impact not just on battery technology but virtually all electrified machines, especially electric vehicles, as well as on renewable energy — think wind turbines and solar power farms. As for NASA, NDE offers power-supply applications for the space station, Mars rovers and future moon bases.

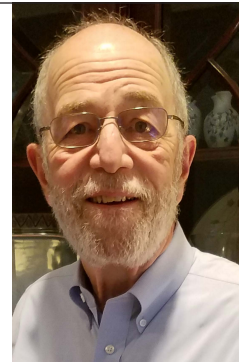
"We're poised to be a five-year overnight success," he says.

As space exploration becomes increasingly privatized, the latest trend Romig observes is investors funding startups to commercialize NASA technologies for both earthbound and space-based applications. As the conventional paradigm shifts, he sees NASA working toward more partnerships.

"New programs take time to develop," Romig allowed, adding, "We're constantly looking to get new things out." **FN**

For a fun, interactive look at space innovations that have become part of our daily lives, visit NASA's Home and City webpage at nasa.gov/homeandcity.

For more information on NASA's impact in Texas, see comptroller.texas.gov/economy/economic-data/nasa/.



JAY FRASER
NEW DOMINION
ENTERPRISES



MASON HARRUP
NEW DOMINION
ENTERPRISES

This table presents data on net state revenue collections by source. It includes most recent monthly collections, year-to-date (YTD) totals for the current fiscal year and a comparison of current YTD totals with those in the equivalent period of the previous fiscal year.

These numbers were current at press time. For the most current data as well as downloadable files, visit comptroller.texas.gov/transparency.

Note: Texas' fiscal year begins on Sept. 1 and ends on Aug. 31.

NET STATE REVENUE — All Funds Excluding Trust

(AMOUNTS IN THOUSANDS)

Monthly and Year-to-Date Collections: Percent Change From Previous Year

Tax Collections by Major Tax	MARCH 2020	YEAR TO DATE: TOTAL	YEAR TO DATE: CHANGE FROM PREVIOUS YEAR
SALES TAX	\$2,690,408	\$20,425,344	4.97%
PERCENT CHANGE FROM MARCH 2019	2.86%		
MOTOR VEHICLE SALES AND RENTAL TAXES	388,503	3,057,833	5.97%
PERCENT CHANGE FROM MARCH 2019	-2.59%		
MOTOR FUEL TAXES	293,000	2,178,414	1.85%
PERCENT CHANGE FROM MARCH 2019	2.59%		
FRANCHISE TAX	160,252	25,830	-621.02%
PERCENT CHANGE FROM MARCH 2019	-11.13%		
OIL PRODUCTION TAX	305,524	2,460,467	14.76%
PERCENT CHANGE FROM MARCH 2019	10.52%		
INSURANCE TAXES	368,678	1,597,912	4.85%
PERCENT CHANGE FROM MARCH 2019	-36.37%		
CIGARETTE AND TOBACCO TAXES	124,071	716,633	-5.68%
PERCENT CHANGE FROM MARCH 2019	18.72%		
NATURAL GAS PRODUCTION TAX	101,633	785,583	-26.77%
PERCENT CHANGE FROM MARCH 2019	-30.09%		
ALCOHOLIC BEVERAGES TAXES	86,595	796,558	3.19%
PERCENT CHANGE FROM MARCH 2019	-18.77%		
HOTEL OCCUPANCY TAX	45,554	351,769	4.02%
PERCENT CHANGE FROM MARCH 2019	-7.10%		
UTILITY TAXES¹	3,250	236,797	6.49%
PERCENT CHANGE FROM MARCH 2019	414.59%		
OTHER TAXES²	13,211	130,143	-15.32%
PERCENT CHANGE FROM MARCH 2019	-21.63%		
TOTAL TAX COLLECTIONS	\$4,580,678	\$32,763,283	4.13%
PERCENT CHANGE FROM MARCH 2019	-3.75%		
Revenue By Source	MARCH 2020	YEAR TO DATE: TOTAL	YEAR TO DATE: CHANGE FROM PREVIOUS YEAR
TOTAL TAX COLLECTIONS	\$4,580,678	\$32,763,283	4.13%
PERCENT CHANGE FROM MARCH 2019	-3.75%		
FEDERAL INCOME	3,639,618	26,439,319	7.14%
PERCENT CHANGE FROM MARCH 2019	10.34%		
LICENSES, FEES, FINES AND PENALTIES	445,205	3,820,504	-1.01%
PERCENT CHANGE FROM MARCH 2019	8.33%		
STATE HEALTH SERVICE FEES AND REBATES³	324,093	3,786,795	-9.76%
PERCENT CHANGE FROM MARCH 2019	3.84%		
NET LOTTERY PROCEEDS⁴	182,774	1,323,941	-12.99%
PERCENT CHANGE FROM MARCH 2019	-15.97%		
LAND INCOME	197,055	1,336,225	-3.08%
PERCENT CHANGE FROM MARCH 2019	18.73%		
INTEREST AND INVESTMENT INCOME	324,789	1,851,346	25.04%
PERCENT CHANGE FROM MARCH 2019	-22.08%		
SETTLEMENTS OF CLAIMS	5,790	572,218	16.50%
PERCENT CHANGE FROM MARCH 2019	9.38%		
ESCHEATED ESTATES	9,666	120,208	4.38%
PERCENT CHANGE FROM MARCH 2019	63.97%		
SALES OF GOODS AND SERVICES	19,733	152,934	-2.93%
PERCENT CHANGE FROM MARCH 2019	-23.54%		
OTHER REVENUE	81,793	843,151	-41.43%
PERCENT CHANGE FROM MARCH 2019	-84.43%		
TOTAL NET REVENUE	\$9,811,194	\$73,009,922	3.15%
PERCENT CHANGE FROM MARCH 2019	-3.27%		

¹ Includes public utility gross receipts assessment, gas, electric and water utility tax and gas utility pipeline tax.

² Includes taxes not separately listed, such as taxes on oil well services, coin-operated amusement machines, cement and combative sports admissions as well as refunds to employers of certain welfare recipients.

³ Includes various health-related service fees and rebates that were previously in "license, fees, fines and penalties" or in other non-tax revenue categories.

⁴ Gross sales less retailer commission and the smaller prizes paid by retailers.

Notes: Totals may not add due to rounding. Excludes local funds and deposits by certain semi-independent agencies.

Includes certain state revenues that are deposited in the State Treasury but not appropriated.



FISCAL NOTES

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