

Introduction: The Houston Independent School District (Houston ISD) is the largest public school system in Texas and the seventh-largest in the nation, covering 333 square miles within the Greater Houston area. With 283 schools, Houston ISD serves a highly ethnically-, culturally-, linguistically-, and economically-diverse population of 214,891 students, as shown in Table 1. Houston ISD has been identified as a high-need local educational agency (LEA) based on the U.S. Census Bureau’s 2015 Small Area Income and Poverty Estimates (SAIPE) for school districts. Residing within the District’s geographic boundaries are 78,939 children, ages 5 to 17 that live below the federal poverty level. The federal poverty level percentage for Houston ISD, at 32.1%, exceeds the average for the state of Texas at 22%. Houston ISD’s proposed project, *Partnerships that Fuel Opportunities in STEM Education*, has identified a total of six high-need, high-poverty, and low-academic performing schools (i.e., two high schools, two middle schools, and two elementary schools.) that serve high-need students. Through the project, the District seeks to establish three significantly revised and add three new STEM magnet schools within Houston ISD boundaries to serve the needs of students and business demand in the Greater Houston area.

All six campuses will be new or significantly revised, whole-school STEM (Science, Technology, Engineering, and Math) magnet programs, meaning every student in those schools will benefit from an instructional approach that emphasizes a rich STEM curriculum. The current magnet programs at three of the existing Houston ISD schools included in the grant proposal have struggled to draw students and will be revised as up-to-date STEM-based magnets. The proposed six magnet schools are intended to provide students and families with a wide variety of academically-rigorous, STEM-focused school choice options, while also promoting racial, economic, cultural, and geographic diversity in the Greater Houston area. The schools, along

with campus demographics, and proposed STEM-based magnet themes are identified in Table 1.

Table 1. Selected Demographics for Proposed High-Need Schools (2015-2016)						
Area	Enrolled (#)	ED (%)	LEP (%)	At-Risk (%)	SWD (%)	Proposed Magnet Theme
Milby HS	1,452	85	19	77	12	Energy, Medicine, and
Deady MS*	701	89	34	78	13	Energy, Medicine, and
Davila ES*	443	93	51	71	7	Energy, Medicine, and
Washington HS	738	77	12	83	17	Aerospace and
Wesley ES*	395	97	7	60	9	Aerospace and
Rusk MS	530	91	17	60	5	Health Science Academy
Cohort Total/Avg.	4,259	88.6	23.3	71.5	10.5	3 New / 3 Revised
Houston ISD	214,891	76.5	30.3	72	7.2	N/A
Texas	5,284,252	59	18.5	64.2	8.6	N/A

Source: Houston ISD, District and School Profiles, 2014-2015; Texas Education Agency, TAPR Report, 2015-2016. ED – Economically Disadvantaged, LEP – Limited English Proficient, and SWD – Students with Disabilities. Color designates feeder pattern. * New programs.

All of the selected six schools have significant isolated minority populations (i.e., Deady MS: 98% Hispanic; Davila ES: 98% Hispanic; Milby HS: 91% Hispanic; Washington HS: 56%

African American; Wesley ES: 83% African American; and Rusk: 74% Hispanic). Through the project, Houston ISD seeks to be proactive in enhancing students’ opportunities, to provide an impetus for all students, regardless of racial background and economic status, to want to attend the proposed magnet schools.

Competitive Preference Priority 1—*Need for Assistance*

(a) The costs of fully implementing the magnet schools project as proposed

If the current demographic trends of socioeconomic segregation and decreasing educational attainment continue unabated, by 2040, Houston, Texas, will be significantly less educated, less economically competitive in the global market place, will have higher poverty rates, and will have a need for greater levels of government assistance (Murdock et al., 2008). Between the years 2000 and 2050, educational attainment in Texas is projected to significantly decrease and is still on a trajectory to be poorer and less competitive in the global economy (Isensee, 2015). A 2011 study by Rothwell and Berube of the Brookings Institution found that Houston lacks “enough educated workers to fill all the jobs that local industry creates,” and ranked Houston 94 out of 100, among the nation’s largest metropolitan regions, for its education gap among workers (Sixel, 2011). In a 2011 Georgetown University study, the researchers state that the vast majority of new jobs require higher skills and post-secondary degrees. It concludes that “a dramatic increase in educational attainment must become a top national priority if we intend to build our labor pool and beat out other countries for the jobs of the future” (Carnevale, Rose, & Cheah, 2011).

In the 2015-2016 academic year, Houston ISD recorded a dropout rate of 10.9%. The District graduation rate increased from 81.8% in 2014 to 82% in 2015, however, the District must do more to ensure that all students receive a high-quality education and graduate on-time,

prepared for their career and/or college of their choice. In Houston ISD, African American students have the lowest graduation rates at 79.3% and have the highest dropout rates at 14.4% than any other student ethnic group in the District. In Houston ISD, 76.5% of students are economically disadvantaged, 30.3% of students are Limited English Proficient (LEP), and 72% are at-risk of not graduating on time with their peers. On the most recent administration of the state assessment test (State of Texas Academic Assessment Rating - STAAR), a full 39% of Houston ISD students did not meet standard in math and 40% of Houston ISD students did not meet standard in reading, with more African American and Hispanic students not meeting standard in both math and reading than all other groups.

Without grant funding, Houston ISD will be unable to significantly revise and restructure the six STEM-based magnet programs to ensure that all students are not only college and career ready entering a college or career of their choice, but are also inspired to seize local, national, and global industry opportunities. In an urban district as large and diverse as Houston ISD, with so many economically disadvantaged students, there is a strong need for the continual effort to reduce minority group isolation in elementary, middle, and high schools (Performance Measure A) and to provide participating students equal opportunity to resources that will provide them with the ability to meet or exceed student achievement standards in reading and math (Performance Measures B and C). The development and expansion of the six magnet programs proposed in this project will advance innovative methods and practices promoting diversity and increasing choices in public education in Houston ISD and the City of Houston at a cost per student that is reasonable for the impact it will make. It will also allow the district to continue operating these magnet school programs years after Federal funding ends (Performance Measure D). The proposed magnet programs will: (a) substantially strengthen students' knowledge of

academic subjects and their attainment of tangible and marketable vocational, technological, and professional skills; (b) provide capacity-building by providing extensive professional development for staff that will sustain school operations at a high performance level; and (c) implement and improve courses of instruction to strengthen students' knowledge of academic subjects in order to meet or exceed the state's college and career readiness standards, including high school graduation and attainment of postsecondary education or productive employment at least three years after the grant funding ends (Performance Measure E).

Meeting the needs of the diverse Houston ISD student population will result in ever increasing pressures on the budget for the foreseeable future. While in 2007 and 2012, the Houston community demonstrated support of bond issues, the resources available in these fiscally-tight years are increasingly limited, based on "adjusted per-pupil expenditures (PPE)"—an analysis that accounts for regional cost differences. For the 2017-2018 school year, Houston ISD is currently experiencing an unprecedented budget shortfall of \$77.5-million due to current State of Texas public school (K-12) funding structure. Under Chapter 41 of the Texas Education Code, the state school finance system requires districts designated as "property-wealthy" to send tax dollars back to the state—a process known as “recapture” and commonly referred to as “Robin Hood” in Texas. The money is then re-distributed to districts deemed to be “property-poor”, as well as to the state’s general fund for use in non-education purposes. Houston ISD is subject to the \$77.5 million recapture obligation or the removal of about \$8 billion dollars’ worth of non-residential, commercial properties from the District’s tax roll. Although 76.5% of Houston ISD students come from low-income families, the District under the public school (K-12) funding structure is considered to be "property-wealthy" through the state’s current funding formula because of rising property values throughout the city of Houston.

The estimate for the total cost of implementing the proposed project includes funds provided by Houston ISD and startup funds sought through the Magnet Schools Assistance Program (MSAP) grant to support the six schools for a combined total District and MSAP request of \$20,342,191. From Table 2, it is evident that the costs of this proposal are considerable, averaging approximately \$4 million per year. While Houston ISD will invest financial resources in the project, they are insufficient to implement the project and unilaterally carry out the MSAP purposes at the six selected high-need schools.

Cost Category	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Personnel and Fringe	\$1,203,104	\$1,414,950	\$1,425,967	\$1,387,598	\$1,420,634	\$6,852,253
Travel	\$648,292	\$621,532	\$617,532	\$581,103	\$581,107	\$3,049,566
Equipment	\$1,155,472	\$1,416,899	\$1,059,859	\$209,196	\$6,000	\$3,847,426
Supplies	\$488,752	\$516,170	\$454,560	\$319,050	\$290,500	\$2,069,032
Contractual	\$903,810	\$605,040	\$503,290	\$470,790	\$353,850	\$2,836,780
Construction	\$0	\$0	\$0	\$0	\$0	\$0
Other	\$189,314	\$302,314	\$273,814	\$238,348	\$83,598	\$1,087,388
Indirect Costs	\$147,127	\$182,859	\$131,935	\$78,268	\$59,558	\$599,747
TOTALS	\$4,735,871	\$5,059,764	\$4,466,957	\$3,284,353	\$2,795,247	\$20,342,191

(b) The resources available to the applicant to carry out the project if funds under the program were not provided

Houston ISD has operated magnet programs for over 40 years beginning as a tool for desegregation. Houston ISD still dedicates significant fiscal resources to magnet schools. However, these resources are insufficient to implement this project without MSAP funding. Existing resources include a magnet programs office staff, a magnet program instructional coordinator in each of the 110 magnet schools, representing 119 magnet programs in the district, and direct support to magnet programs in the schools. Furthermore, the Houston ISD budget supports unique curricula and facility demands that many of the magnet programs require, along with the costs of transporting students to and from programs across the city. Since Houston ISD students may apply to any of the District's magnet programs across 333 square miles of Greater Houston, this policy creates significant transportation costs.

While the Houston ISD budget is adequate to maintain magnet school operations at current funding levels, the significant revision of three magnet schools and the addition of three new magnet schools, including major expansion and upgrading, as envisioned in this proposal, is beyond its scope. Table 3 presents figures for the budgetary expenditures that the District anticipates contributing to the operation of the magnet programs at the six schools in this project—fiscal resources that are above and beyond those devoted to sustaining regular schools. The travel expenses, as indicated in Table 3, are those estimated to provide transportation for students enrolling as magnet students at the six schools in the proposal. The District is conservatively projecting an annual 3% cost increase for staff and transportation to keep pace with the average inflation rate, as reported by the February 2017 Consumer Price Index data provided by the U.S. Department of Labor, Bureau of Labor Statistics.

Table 3. Estimated Expenses for Magnet Program by Cost Category: DISTRICT ONLY*						
Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Personnel	\$466,092	\$480,078	\$494,478	\$509,316	\$524,598	\$2,474,562
Supplies	\$90,000	\$90,000	\$90,000	\$90,000	\$90,000	\$450,000
Student Transport	\$483,870	\$483,870	\$483,870	\$483,870	\$483,870	\$2,419,350
TOTALS	\$1,039,962	\$1,053,948	\$1,068,348	\$1,083,186	\$1,098,468	\$5,343,912

**Magnet funding is allocated to the six targeted schools at which time school based magnet advisory committees determine how to best distribute funds to meet program needs.*

From the budgetary figures presented in Table 3 above, it is apparent that Houston ISD is committed to the continuing success and development of the six magnet programs in the proposal. However, fiscal resources available to the District are already stressed, as a result of severe budget cuts during the last several years. The 2014-15 State budget did not fully restore funding to public schools in Texas. The State's 2014-15 budget provided \$3.2 billion more in General Revenue to the Texas Education Agency than the budget for the 2012-2013 biennium, but it failed to raise per-student funding to pre-recession levels. As previously stated, under Texas' current funding structure, for the 2017-2018 school year, Houston ISD will send millions of dollars back to the state, resulting in a projected amount of \$77 million dollars that Houston ISD will have to return to the state.

Compounding these fiscal difficulties, Houston ISD's student population presents increasing challenges with growing numbers of low-income students, LEP students, and students presenting complex needs for exceptional children services (Austin American Statesman, 2015). If current trends in public school spending, educational achievement, and family income

continue to decline statewide, it is forecasted that the mean annual income will drop, poverty will rise, and the percentage of educated workers will decrease (Murdock, 2015). According to Fred Heldenfels, former chairman of the Texas Higher Education Coordinating Board, "Texas lags behind the national average in workers between the ages of 25 and 34 with a post-secondary education. There are not enough young workers obtaining a degree to replace the highly-educated workers approaching retirement" in Texas. (Houston Chronicle, January 27, 2013). In order to successfully implement the programs described in this proposal, it will require greater fiscal resources well in excess of those currently available to Houston ISD.

1(c) The extent to which the costs of the project exceed the applicant's resources

The cost of the proposed project greatly exceeds Houston ISD's current resources. At present, any additional resources available to Houston ISD are absorbed by day-to-day operational expenses. Specifically, between 2012 and 2016, Houston ISD had to absorb an additional \$71 million to cover the increasing costs for electricity, rising insurance rates, and other costs associated with running the school district. These costs continue to increase. In fact, the District is expected to face a \$10 million rise in healthcare costs and almost a \$1 million increase in water costs during the next school year due to the recent rate increase passed by Houston's City Council.

Houston ISD has bond funds that will support renovations at two Houston ISD schools within the proposed project; however, these funds have already been committed to specific renovation projects and will not directly support the magnet themes. To succeed, this project requires significant additional staffing, extensive professional development, thematic enhancements to the facilities, technology upgrades, instructional materials, and revised curricula. Carrying out the revisions planned in this proposal well exceeds Houston ISD's

available resources. Table 4 below, shows the MSAP funds requested in the proposal.

Table 4: Estimated Expenses by Cost Category: MSAP ONLY						
Cost Category	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Personnel	\$650,915	\$818,017	\$813,576	\$763,107	\$778,090	\$3,823,705
Fringes	\$86,097	\$116,855	\$117,913	\$115,175	\$117,946	\$553,986
Travel	\$164,422	\$137,662	\$133,662	\$97,233	\$97,237	\$630,216
Equipment	\$1,155,472	\$1,416,899	\$1,059,859	\$209,196	\$6,000	\$3,847,426
Supplies	\$398,752	\$426,170	\$364,560	\$229,050	\$200,500	\$1,619,032
Contractual	\$903,810	\$605,040	\$503,290	\$470,790	\$353,850	\$2,836,780
Construction	\$0	\$0	\$0	\$0	\$0	\$0
Other	\$189,314	\$302,314	\$273,814	\$238,348	\$83,598	\$1,087,388
Indirect Costs	\$147,127	\$182,859	\$131,935	\$78,268	\$59,558	\$599,747
TOTALS	\$3,695,909	\$4,005,816	\$3,398,609	\$2,201,167	\$1,696,779	\$14,998,279

The estimated cost of fully implementing magnet programs at the six schools is approximately \$20,342,191 over the five-year period of the grant program—considering both Houston ISD’s contribution to the project schools and this request for MSAP funding. Of the total amount, the school district is able to support approximately \$5,343,912 (26%). To successfully implement the proposed project, Houston ISD is seeking \$14,998,279 (74%) in MSAP funding.

1 (d) The difficulty of effectively carrying out the approved plan and the project for which

assistance is sought, including consideration of how the design of the magnet schools project— e.g., the type of program proposed, the location of the magnet school within the LEA—impacts the applicant’s ability to successfully carry out the approved plan.

If funded, the Partnerships that Fuel Opportunities in STEM Education Project will significantly revise two high-need high school magnet programs, and one high-need middle school magnet program, and open two new high-need elementary school magnet programs and one high-need middle school magnet program by implementing school wide STEM-based programs. The project will have a direct impact on an estimated 257 staff members (instructional and non-instructional)—and a projected 4,259 students, from the targeted campuses, by the fifth year of the grant. Although Houston ISD faces significant challenges in carrying out the proposed plans, if the District is to provide higher-quality options for all students, it must meet these challenges. For instance, changing the reputations of these campuses as low-performing schools (e.g., three of the Houston ISD schools were identified as “Improvement Required” campuses by the Texas Education Agency Accountability ratings for 2016) will require a long-term commitment from the District, well beyond the MSAP grant. Revising and or initiating STEM-based program offerings will require significant modifications to the operations at these schools. Also, conducting the professional development and providing the staffing needed to meet new, rigorous STEM-based academic standards is a costly endeavor—both fiscally and in terms of staff time for professional development. With the six schools introducing updated, revised, or new magnet themes, numerous activities must be carried out to ensure success, including marketing and promoting the programs; providing six schools with theme-focused curricula, equipment, materials and supplies; and providing focused, high-quality professional development for teachers and staff.

Houston ISD has a long, successful history of providing students and parents with academic choices through its magnet school programs. Building upon that history, this MSAP proposal is designed to look ahead where the future of public education lies. To adequately prepare students for that future, Houston ISD is seeking MSAP funding for the proposed project Partnerships that Fuel Opportunities in STEM Education.

Competitive Preference Priority 2—New or Revised Magnet Schools Projects

For the proposed project, Houston ISD has identified the following campuses and Magnet themes:

- Milby HS: Energy, Medicine, and Aerospace Institute (Revised)
- Deady MS: Energy, Medicine, and Aerospace Academy (New)
- Davila ES: Energy, Medicine, and Aerospace Academy (New)
- Washington HS: Aerospace and Engineering Professions (Revised)
- Wesley ES: Aerospace and Engineering Professions (New)
- Rusk MS: Health Science Academy (Revised)

Please see attachment **Table 6: New or Revised Magnet School Projects-Competitive Preference 2** for more information about the proposed new and revised Magnet schools.

For the proposed project, Houston ISD has identified at least two research-based sources of evidence of promise that include strategies and practices that will be implemented in the selected Magnet schools. These include the following:

Meyrick, K. M. (2011). How STEM education improves student learning. *Meridian K-12 School Computer Technologies Journal*. (14) 1, 1 – 6. Retrieved from: <https://ncsu.edu/meridian/summer2011/meyrick/print.html>

Citation Outcomes: This study found that students that had been exposed to STEM

activities made significant gains in the classroom and that student learning improved, not just with academically gifted populations, but with all students. Another reason why STEM education is beneficial to the students is because in much of the instruction, especially the engineering component and problem solving involved in the mathematics and science courses connects curriculum to the real world, therefore providing “authentic purposes for learning and solving problems” (p. 2). Discovery, problem solving, and inquiry-based learning are all critical to STEM integration and is closely aligned to and is a form of project-based learning. Project-based learning (PBL) is a method that allows students to gain knowledge and skills usually in collaborative teams for an extended period of time, to research and report on engaging and complex questions, problems, or challenges. Project-based learning allows for personalization of the learning environment and engagement for students from diverse cultures. Effective PBL focuses on rigor and is aligned to college- and career-ready standards. Studies have shown that rigor improves student achievement (Gray, 2008). There are several critical components of PBL that should be incorporated into the strategy in order to ensure effectiveness (Larmer et al, 2015) that are directly tied to cultural values of the majority of students in the district but works effectively with all students. This article also explains how important professional development is for teachers so that they are prepared to effectively reach the students involved in the project.

Relevance to Proposed Project: Houston ISD’s STEM project will provide learners with purpose, context, potential motivation, and is also able to tap into the real- world connectivity realm for many learners through our partnerships with Baylor College of Medicine, NASA, Pumps and Pipes, Independent Petroleum Association of America (IPAA), and others. The use of STEM allows for student’s active learning, including cross-curricular integration, project-based learning, authentic and alternative assessments, writing literacy via research and

reflection, creating partnerships with the business community, and solving or attempting to solve authentic, real-world problems, all of which are the focus of the Houston project, entitled

Partnerships that Fuel Opportunities in STEM Education.

Wells, A. S., Fox, L., & Cordova-Cobo, D. (2016). How Racially Diverse Schools and

Classrooms Can Benefit All Students. *The Century Foundation*. Retrieved from:

<https://tcf.org/content/facts/the-benefits-of-socioeconomically-and-racially-integrated-schools-and-classrooms/>.

Citation Outcomes: This article demonstrated the importance and benefits of racial and socioeconomic integration in schools. The article documents how students who are exposed to students different from themselves leads to improved cognitive skills, critical thinking, and problem-solving skills. This article highlights the cognitive, social, and emotional benefits to all students, of every race and ethnicity for students who interact with people of all races, social status, and creed. Since America is such a diverse country, it is beneficial that students are exposed to other children who are different from themselves so that they can effectively and comfortably fit into the workforce. The article also discussed how groups from different social statuses and races who interact with one another tends to reduce prejudice and improve interracial attitudes. Additionally, the article discussed how students who attend racially diverse schools have a smaller achievement gap on tests, with all students improving. White student achievement did not go down; however, African American and Hispanic achievement improved. Finally, the article highlighted how socially-, racially-, and ethnically-diverse schools have lower dropout rates, higher graduation rate, and overall improved student climate.

Relevance to Proposed Project: This article is extremely relevant to the proposed project because the **Partnerships that Fuel Opportunities in STEM Education** project is

focused on ensuring that students who are socio-economically, racially, and ethnically different have the same opportunity to receive a high-quality education. This project, aligned to the clarion call that "we do well when we all do well" (Eleanor Roosevelt), is critical for Americans to change the paradigm regarding changing attitudes about race and resources. It is important to equip all students with the skills they need for success in the future and provide strategies for how to achieve success in teaching students in a culturally responsive and caring manner.

Competitive Preference Priority 3— *Selection of Students*

Houston ISD has implemented an online application and lottery system which is a valuable asset in managing the process by which students and their families may apply to and are accepted into MSAP STEM magnet programs. This central application system allows Houston ISD to maintain and increase equity in access to programs and to process all applications more efficiently. To accommodate the needs of families without access to technology or the internet, Houston ISD will ensure that convenient computer access and technical assistance is provided at schools and other locations.

Although the 2016–2017 Houston ISD magnet application is available online, there is also a paper application that is available each October, following extensive advertisement and recruitment to parents and students within the Houston ISD community. An application takes about five to 10 minutes to complete. When there are more qualified applicants than space available, a school-specific lottery shall be used to select students. All lottery sessions will be held at Houston ISD’s administrative building by the Office of School Choice. Lottery results are not final until approved by the Office of School Choice. Providing parents with clarity and transparency of the magnet application process through websites, letters, parental software portal and information sessions at school choice fairs has allowed our parents to gain a better

understanding and make informative choices concerning magnet schools for their students. Please see attachment **Table 5: Selection of Students-Competitive Preference 3** for additional information.

Competitive Priority 4— <i>Increasing Racial Integration and Socioeconomic Diversity</i>

The mission of the Houston ISD Magnet Department is to provide a broad system of specialized choices designed to meet the needs, interests, and/or talents of the district's diverse, multicultural student population in a rigorous educational setting. Ensuring equitable access to these quality educational programs for all students in all communities in Houston ISD is the over-reaching goal of the department.

The following areas and activities are the primary focus of the day-to-day work in achieving the goal of increasing racial integration and socioeconomic diversity within the District:

- Ensure Diversity of the Student Population – Create and implement a recruitment plan which targets underrepresented populations in magnet programs; implement policies and procedures in the selection process that ensure equitable access for all students.
- Ensure Unique and Innovative Curriculum – Assist magnet schools with developing and implementing a rigorous, innovative, theme-based curriculum.
- Support for Specialized Teaching Staff – Assist magnet schools with developing professional development that aligns to their magnet theme and school improvement plans.
- Acquisition of Dynamic Community Partnerships – Secure partnerships for magnet schools aligned to the region's industry and community resources and magnet schools' themes.

- Develop and Implement Technology-Infused Learning – Ensure learner-centered schools through a variety of technology-facilitated learning methods that promote active knowledge creation by students.

The six schools in *Partnerships that Fuel Opportunities in STEM Education* are all traditional Magnet Schools as defined in *What Happens When Schools Become Magnet Schools? A Longitudinal Study of Diversity and Achievement* (Betts, et al., 2015). Houston ISD chose to place these magnet programs in underrepresented schools in neighborhoods that serve higher proportions of students from low-income households or minority racial/ethnic groups than their districts. Traditional magnet schools have shown success in recruiting students who are higher achieving and more economically advantaged than the neighborhood students, or more likely to help the school achieve racial/ethnic diversity. (Betts, et al., 2015). We chose traditional magnets based on two factors; the schools create feeder patterns in communities that have high minority group isolation, these areas have low magnet participation, and there are few high-quality choice options within the surrounding neighborhoods.

With the implementation of the proposed project, Houston ISD is creating feeder patterns in areas of limited quality choice options to expand district efforts to promote racial and socioeconomic integration. The Aerospace and Engineering Academies at Milby High School, Deady Middle School, and Davila Elementary will create a STEM feeder pattern in neighborhoods that are geographically close. Washington High School, Williams Middle School, and Wesley Elementary will create an additional aerospace engineering and applied science feeder pattern. In-zone and out-of-zone students will have the opportunity to attend high quality academically rigorous programs that directly support the Houston community by leading to STEM-related careers.

The Office of School Choice (OSC) for Houston ISD has put in place multiple ways to communicate and recruit students to apply for magnet schools. OSC has also used multiple modalities to communicate to families about the different magnet programs available in Houston ISD. OSC does a mail out to the approximately 215,000 students currently enrolled in Houston ISD to provide a brochure about the different magnet programs in multiple languages. This brochure, sent to every student in the District, also provides parents a calendar of events and locations so parents can plan the best available time for them to learn more about the magnet programs that their family might be interested in. OSC also did multiple call outs to every student in the district in multiple languages to inform parents the week before magnet open houses were scheduled allowing parents to schedule time to visit the programs they were interested in. The Superintendent of Houston ISD Richard Carranza also did a **36-stop** tour of Houston ISD schools for a “Listen & Learn” tour that targeted all areas of the District. The OSC Department attended each Listen and Learn tour to speak about magnet programs and the application process.

Magnet Recruitment Fairs are held throughout the city during the recruitment period. They are strategically placed in areas where minority group isolation occurs and are open to the entire Houston community. These Open Houses are held on Saturday mornings to ensure that parents have access to information and the ability to visit with schools on the weekends when most parents are available. More than 5,000 parents, students, and community members attend these events to learn about the choices available through magnet programs. These events are a well-established tradition in the Houston area and regularly receive extensive local media coverage. Each magnet program is represented by school personnel including the magnet coordinator, administrators, teachers, and sometimes students. While parents are visiting with

schools the district provides numerous translators on site so parents can communicate with schools in their native language if needed. Appropriate visuals, displays, and handouts are available for parents and students from each magnet program, as well as an overview of all programs provided by the district in multiple languages. On-site computer labs are set up to assist parents in filling out the application. Parents also have the option of filling out paper based applications that are provided in multiple languages, for any parent or family that does not have computer access. Grant program schools will be given a prime location and additional recruiting space at these events to encourage parent interest and attract targeted students. In addition to individual school displays, there will also be a display promoting the grant program schools.

Parent Magnet Tours – “Magnet Thursdays,” are scheduled each Thursday, October through December. Tours are available at every magnet campus each Thursday as publicized by the school. Grant program schools will publicize additional parent orientation meetings with a focus on the groups currently underrepresented at the school.

Magnet School Career Days are scheduled every year from September through December. During this time, magnet high school coordinators make program presentations for 8th grade students at every Houston ISD middle school. Every middle school in Houston ISD is given a date at the beginning of the school year so they can advertise to their students and parents when all magnet high school will be on campus. Parents are encouraged and welcome to attend so they can also gather information with their student. Houston ISD provides an overview of the magnet programs and how to apply for all 8th graders, followed by time to circulate among the schools represented in order to ask questions and gather information. This event is a culmination of information that has been provided to 6th, 7th, and 8th grade students on vertical theme alignment with high school programs and other magnet options. High school magnet

coordinators will provide guidance concerning which high schools will best fulfill the career preparation goals of these students and pathways they provide for high school graduation.

Spring Recruitment Fair is held at the Houston ISD Administration building in April. The fair is designed to assist in the placement of students who are on waiting lists and/or who did not submit first round applications within the magnet timeline. Schools and programs will have booths to display information and distribute literature about their educational programs. Grant program schools will be given a prime location and additional recruiting space at this event in order to encourage parent interest and attract targeted students. In addition to individual school displays, there will also be a display promoting the grant program schools.

Elementary Magnet Outreach Program is designed to meet the needs of each community the Magnet school serves as well as reach out to others outside of the base community. Elementary magnet coordinators visit daycares, churches, Pre-K programs, community centers, and other appropriate organizations to provide information for parents. Parents receive information about secondary schools at this time to plan for continuity for their child's education.

Campus-Based Recruitment - Each Magnet program has an individually designed recruitment plan outlining strategies to recruit students from throughout the district. Campus based-recruitment plans for the grant program schools will be written in collaboration with staff and community, the Office of School Choice, the Family and Community Engagement Department, and Houston ISD Print Services communications designers. Recruitment materials and their distribution will be designed to target underrepresented groups and to reduce minority isolation. Business partners will provide printed information for distribution on opportunities in their fields.

Strategic Marketing - In an effort to help increase enrollment, retention, and stakeholder communication, Rice University Executive Education collaborated with Houston ISD to develop the Strategic Marketing Management Program for School Leaders. The course is designed to enable participants to conduct a marketing strategy audit of their organization and then develop a strategic marketing plan (*Rice News*, February 23, 2012). Principals from all ***Partnerships that Fuel Opportunities in STEM Education*** schools will participate in this program to better enable them to formulate recruitment plans for their individual campuses.

Equal access and treatment for project participants from traditionally underrepresented groups - The ***Partnerships that Fuel Opportunities in STEM Education*** project has been designed to promote inclusiveness and equal access. From the outset, planning has focused on providing a welcoming environment for all members of the school communities. Representatives from the Houston ISD's Multilingual, Special Education, Advanced Academics, the Family and Community Engagement Department, Curriculum, and Professional Development departments have worked together to create a plan that integrates individualized instruction and cultural awareness into the STEM curriculum in order to provide a rigorous yet highly accessible experience for all students. The district has also formed a partnership with the Women in Engineering Program (WEP) Texas Girls Collaborative Project (TxGCP) through the University of Texas and will be working with them to ensure that our female students are supported and encouraged to pursue STEM studies and careers.

Addressing the linguistic and socio-affective needs of English Language Learners (ELL's) has long been at the forefront of the district's focus. Two of the district's core initiatives include an effective teacher in every classroom and rigorous instructional standards and supports. These initiatives are supported by several district wide projects. One example is the development

of a four-day institute Everyday ExcELLEnce to assist teachers in understanding the cognitive, affective, and linguistic needs of ELL students. This training weaves second language acquisition theory with J. Seidnitz' work *Navigating the ELPS* and includes eight easily implemented routines to develop language in all four skill areas of listening, speaking, reading, and writing. Teachers use scaffolding to model specific school learning with the "I do", "We do", and then "You do" framework (Mooney, 1996). Informal progress monitoring allows teachers to monitor comprehension and make informed instructional decisions (Airasian, 2005). To ensure high levels of training implementation, follow-up training will include walk-through feedback and follow up coaching by the project STEM Specialists and supplemental online support. This training will be offered to all content area teachers at the six proposed magnet schools.

The project will also offer support to campuses to understand cultural competencies. Emphasis will be placed on the pedagogical model of "diversity as a resource." Nieto's (2002) work informs teachers that they need to teach students the "cultural capital" to negotiate society but also make a commitment to become students of their students. The most important component for resources for students is that they be rigorous, culturally inclusive, and able to be used at home and at school (Cole, 2008). In order to build on the strengths of the diverse student population, teachers must view their students and communities as "funds of knowledge" (Moll and Greenberg, 1990). Through improved cultural competencies, teachers will be better able to communicate with students and their families, resulting in increased student achievement and parent involvement. Research by Katie Denslow (2000), shows that through multicultural teacher training, teachers can learn to have an understanding of different races and ethnicities in order to incorporate differences in their curriculum. Research (Edmonds, 1979; and Murphy, J. & P. Hallinger, 1985) on effective schools has shown that when teaching and learning are positive

experiences, high levels of academic success for all students can be achieved. The district will work with social advocacy organizations in the project schools to implement their No Place for Hate or similar program. This organization will provide programs for students, teachers, and parents to help them thrive in an environment of diversity. Personnel at the project schools will receive training in cultural diversity as well as ongoing training in the subject area.

Personnel in the Office of Special Education Services will serve as advocates for students with disabilities, promoting the individualized education program (IEP) best suited for each student. Parents, as part of a student's IEP Committee, will be able to identify STEM programs and pursue equitable access to these programs that successfully prepare students for a variety of post-secondary school options. The FUTURES Academy, Energy, Medical, Aerospace, and Engineering programs are all rigorous, high quality, and practical programs that prepare students for well-paying jobs and a bright future. Especially important is that Special Education representatives will participate in recruiting efforts for the STEM grant campuses. The district special education leadership will ensure all students with disabilities who would benefit from the opportunities available and their parents are aware of the processes for access and admission to the STEM grant schools. Once enrolled in the magnet program, these students will be supported with the resources required by their IEPs, such as resource teachers, accessible facilities, and assistive technology.

Through its universal testing program, Houston ISD Advanced Academics ensures the appropriate identification and placement of all students who require an advanced, differentiated curriculum. They support STEM instruction and curriculum through a recent alliance with Houston ISD's Curriculum Department, offering input and suggestions in the areas of differentiation and rigor at each grade level and core subject area. This alliance supports the

needs of gifted and talented (G/T) students and helps maintain student engagement at all levels. Advanced Academics assists Professional Support and Development (PSD) with new teacher training offerings in the area of research and the research process, utilizing the Texas Performance Standards Project (TPSP) as a basis for training. The multitude of approaches currently in use by Houston ISD Advanced Academics serves to ensure that traditionally underrepresented groups are both identified and supported according to individual needs for G/T instruction.

The Family and Community Engagement (FACE) Department has worked to ensure that parents have meaningful engagement in the process. A Core Initiative is *Building a Culture of Trust Through Action* -Fostering effective, timely, two-way external communication to engage community members and parents. The FACE Department strengthens the relationship between parents and schools through mutual trust, collaboration, training, and effective communication to ensure the academic and personal success of all Houston ISD students. This department will provide direct services to the six identified schools and will facilitate and coordinate Houston ISD parent involvement activities consistent with the district's core value: "Parents Are Partners."

Traditionally underrepresented groups will be encouraged to enter and remain in the *Partnerships that Fuel Opportunities in STEM Education* program through the absence of entrance requirements and the presence of proactive, individualized remediation combined with rigorous, high-interest curriculum. The combined efforts of various Houston ISD departments will serve to meet the needs of all students enrolled in the program.

A. Desegregation

Overview

Since 1970, when a historic court order led to the creation of Houston Independent School District's (Houston ISD's) magnet programs, Houston ISD has promoted the value of diversity and has declared that there can be no achievement gap among children based on ethnicity, race, or socioeconomic status. With 119 magnet programs throughout Houston ISD with a total of 283 schools located in 333 square mile area, Houston Independent School District provides families with a wide variety of choice and options for all students to be able to find the perfect program. Leading the way in community partnerships in a city that is economically driven by the health and medical industry, aerospace industries, and considered a world capital for the oil, gas, and engineering industries, Houston ISD is on the forefront of connecting students to the areas of learning and industries, bridging the classroom and real world divide seamlessly.

School choice remains an integral part of the Houston ISD system. School choice ignites the spirit of competition, motivates excellence, promotes innovation, and empowers parents to match their children with schools that best meet their children's needs, interests, and talents. It is important for Houston ISD to focus on developing, improving, and using innovative educational tools so that every child at every school has access to instructional programs that appeal to students' passion and interest.

Enhancing choice programs to reduce minority-group isolation will combat schools that are racially and socio- economically isolated. To resolve this situation, Houston ISD seeks approval of a plan and resolution to eliminate, reduce, or prevent minority group isolation while increasing economic diversity. The three-tiered approach, enhancing programs, facilitating and supporting open admission policies, and ensuring transportation will serve to decrease the isolated communities in Houston ISD.

(a) Desegregation - The Secretary reviews each application to determine the quality of the desegregation-related activities and determines the extent to which the applicant demonstrates -

(1) The effectiveness of its plan to recruit students from different social, economic, ethnic, and racial backgrounds into the magnet schools.

(1) Recruitment of students – The Houston Independent School District’s Beliefs and Vision and the Strategic Direction calls for the district to ensure that every student has an equal opportunity to quality education programs. Houston ISD’s Office of School Choice is dedicated to providing equity in access to quality educational programs for all students, and to this end, has developed a comprehensive Magnet Recruitment Plan for the District. Houston ISD’s recruitment plan was designed with the intent to sufficiently create a diverse environment, by increasing opportunities through a variety of programs that will attract students and maintain an interest level that will improve academic success. Recruitment for each campus will focus on increasing the range of students, so each campus student demographics closely resembles the District’s student profile. Houston ISD’s recruitment plan includes strategic and focused marketing that is key to successfully informing families outside of the zoned school areas about the programs offered on their campus. Children that attend diverse schools also learn how to be more comfortable as adults when working with people from various cultural backgrounds (The Century Foundation, 2016). The project schools will strategically conduct extensive targeted recruiting and marketing in an effort to ensure that students from different social, economic, ethnic, and racial backgrounds have equal access to information about the programs in addition to the activities listed below. All recruitment efforts will be coordinated by the Office of School Choice and individual campuses.

(2) Dissemination of Magnet Information - The Office of School Choice (OSC) for Houston ISD has put in place multiple ways to communicate and recruit students to apply for magnet schools. OSC has also used multiple modalities to communicate to families about the different magnet programs available in Houston ISD. OSC does a mail out to the approximately 215,000 students currently enrolled in Houston ISD to provide a brochure about the different magnet programs in multiple languages. This brochure also provides parents a calendar of events and locations so parents can plan the best available time for them to learn more about the magnet programs that their family might be interested in. OSC also did multiple call outs to every student in the district in multiple languages to inform parents the week before magnet open houses were scheduled, allowing parents to schedule time to visit the programs they were interested in. The Superintendent of Houston ISD, Richard Carranza, also did a 36 stop tour of Houston ISD schools for a “Listen & Learn” tour that targeted areas of the District under-represented in magnet programs and low socio-economical areas to get feedback about what the communities needs are. Houston ISD also provides a centralized magnet website where parents and families have the ability to search the 119 magnet programs available.

(3) Magnet Training - The Office of School Choice provides each of the 119 magnet programs with a coordinator that oversees the magnet program located on the designated campuses. These coordinators are provided training before the school year begins to align curriculum, coordinate recruitment plans, training on the online application system, and information on how to target families from areas outside their zone to make sure that each school is recruiting a diverse group to their school.

(4) Magnet Open Houses – are held throughout the city throughout the entire school year. They are strategically placed in areas where minority group isolation occurs and are open to the

entire Houston community. These Open Houses are held on Saturday mornings to insure that parents have access to information and the ability to visit with schools on the weekends when most parents are available. Hundreds of parents, students, and community members attend these events to learn about the choices available through magnet programs. These events are well established traditions in the Houston area, and regularly receive extensive local media coverage. Each Magnet program is represented by school personnel including the magnet coordinator, administrators, teachers, and sometimes students. While parents are visiting with schools the district provide numerous translators on site so parents are able to communicate with schools in their native language if needed. Appropriate visuals, displays, and handouts are available for parents and students from each magnet program, as well as an overview of all programs provided by the District in multiple languages. On-site computer labs are set up to assist parents in filling out the application. Parents also have the option of filling out paper based applications that are provided in multiple languages, for any parent or family that does not have computer access. Grant program schools will be given a prime location and additional recruiting space at these events in order to encourage parent interest and attract targeted students. In addition to individual school displays, there will also be a display promoting the grant program schools as a whole.

(5) ***Parent Magnet Tours*** – “*Magnet Thursdays*”, are scheduled each Thursday, October through December. Tours are available at every magnet campus each Thursday as publicized by the school. Grant program schools will be publicized and additional parent orientation meetings will take place with a focus on the groups currently underrepresented at the school.

Magnet School Career Days - are scheduled every year from September through December. During this time, magnet high school coordinators make program presentations for 8th grade students at every Houston ISD middle school. Every middle school in Houston ISD is

given a date at the beginning of the school year so they can advertise to their students and parents when all magnet high school will be on campus. Parents are encouraged and welcome to attend so they can also gather information with their student. Houston ISD provides an overview of the Magnet programs and how to apply for all 8th graders it is followed by time to circulate among the schools represented in order to ask questions and gather information. This event is a culmination of information that has been provided to 6th, 7th, and 8th grade students on vertical theme alignment with high school programs and other magnet options. High school magnet coordinators will provide guidance concerning which high schools will best fulfill the career preparation goals of these students and pathways they provide for high school graduation.

(6) ***Spring School Choice Fair*** –is held in the community in under-represented areas in April. The fair is designed to assist in the placement of students who are on waiting lists and/or who did not submit first round applications within the magnet timeline. Schools and programs will have booths to display information and distribute literature about their educational programs. Grant program schools will be given a prime location and additional recruiting space at this event in order to encourage parent interest and attract targeted students. In addition to individual school displays, there will also be a display promoting the grant program schools as a whole.

(7) ***Elementary Magnet Outreach Program*** –is designed to meet the needs of each community the Magnet school serves as well as reach out to others outside of the base community. Elementary magnet coordinators visit daycares, churches, pre-K programs, community centers, and other appropriate organizations to provide information for parents. Parents receive information about secondary schools at this time to plan for continuity for their child’s education.

(8) *Campus-Based Recruitment* – Each Magnet program has an individually designed recruitment plan outlining strategies to recruit students from throughout the district. Campus based-recruitment plans for the grant program schools will be written in collaboration with staff and community, the Office of School Choice, Family and Community Engagement, and Houston ISD Print Services communications designers. Recruitment materials and their distribution will be designed to target under-represented groups and to reduce minority isolation. Business partners will provide printed information for distribution on opportunities in their fields. In an effort to help increase enrollment, retention, and stakeholder communication, Rice University Executive Education collaborated with Houston ISD to develop the Strategic Marketing Management Program for School Leaders. The course is designed to enable participants to conduct a marketing strategy audit of their organization and then develop a strategic marketing plan (McCaig, 2012). Principals from all *Partnerships that Fuel Opportunities in STEM Education* schools will participate in this program to better enable them to formulate recruitment plans for their individual campuses.

(9) *Community Outreach* - To make sure that all minority groups are informed of all 119 magnet programs that Houston ISD has to offer, the Office of School Choice has partnered with specialized agencies to make sure that these groups are informed about applying and their school options. Grant schools specifically are brought to these events to display and disseminate information about their programs. OSC will continuously reach out to entities to support the work of the District, especially as it pertains to increasing student achievement and socioeconomic diversity.

Monitoring and Compliance

The District will annually monitor and assess the effectiveness of its efforts to attain diversity and efforts to avoid minority group isolation at the magnet schools under the Magnet Schools Assistance Program project. This will include an analysis of:

- The percentage of students at each school from each racial/ethnic group.
- The percentage of socio-economically disadvantaged students at each school (as determined by the free and reduced lunch applications).
- The effectiveness of the District's magnet schools.

Importance of Diversity

In accordance with the 2010 Board of Education Declaration of Beliefs and Visions, a diverse, vibrant student population, reflecting Houston's international standing, is an asset. Every student, regardless of culture, ethnicity, language, or economic status, has both equal opportunity and equal access to high-quality education evidenced through results of growth and accountability ratings. There can be no achievement gap among students based on race, ethnicity, or socioeconomic status.

(2) How it will foster interaction among students of different social, economic, ethnic, and racial backgrounds in classroom activities, extracurricular activities, or other activities in the magnet schools (or, if appropriate, in the schools in which the magnet school programs operate).

Partnerships that Fuel Opportunities in STEM Education, is designed to enhance interaction among students of different social, economic, ethnic, and racial backgrounds in classroom, and extracurricular activities. Houston ISD's proposed project will redesign, and/or restructure the programs offered, increase racial and socioeconomic diversity, and reduce minority-group isolation of students throughout the system. Instruction that takes place in a

diverse classroom setting has a positive impact on all students, enhancing critical thinking and problem solving skills (The Century Foundation, 2016). The project schools all offer Summer Bridge programs, which give students opportunities to meet new friends and build relationships before the school year starts. Programs under this project will provide rigorous, enriching learning experiences to students zoned to the six project schools, as well as students from all parts of Houston.

The Houston Independent School District proposes to redesign, restructure, and significantly revise three magnet schools and add three new magnet schools that would be whole-school STEM magnet programs, meaning every student in these schools would benefit from an instructional approach that emphasizes a rich, innovative STEM curriculum. This proposal ensures that all elementary and middle school students are prepared for challenging STEM-related coursework in high school. The inclusion of high school and college level coursework in the outlined plan will not only prepare students for college and career, but will also inspire them to seize the global industry opportunities found in the city of Houston. Houston ISD will provide whole-school STEM magnet programs at the following schools:

Milby High School Academy for Aerospace, Engineering, and Medicine Professions is located on the east side of Houston and will offer a significantly revised whole school energy, health science, and aerospace magnet program. Milby will offer the following pathways: an Aerospace Academy, an Applied Science and Health Professions Academy, and a Petroleum Exploration and Engineering Academy. In collaboration with NASA Johnson Space Center, the aerospace community, the Independent Petroleum Association of America, and Pumps and Pipes, students and teachers will be exposed to cutting edge technologies and cross cutting concepts that have led to amazing breakthroughs in science, technology, engineering, and

medicine. Currently, Milby High School is a Science, Technology, Engineering, and Math magnet school. Milby school administration and faculty have helped to improve student achievement at the school, but not significantly, partially because the magnet program has been a school-within-a-school model instead of the more effective whole-school model. Currently, only 279 students have elected to be in the magnet program including students living in the attendance zone. The program will be phased in over a three-year period beginning in the fall of 2018.

Deady Middle School Academy of Aerospace and Engineering, once housed a communications arts magnet program that was closed after the 2013-2014 school year due to low enrollment. The number of students at Deady Middle School has continued to dwindle in recent years. The creation of a new Energy, Medicine, and Aerospace Academy at Deady Middle School will lay a foundation of success and sustainability that will strengthen the vertical STEM alignment to Milby's proposed Energy, Medicine, and Aerospace Institute magnet program. Deady will become a school-wide magnet STEM program with an energy, medicine, and aerospace STEM curriculum infused across all grade levels and content areas. The program will be phased in over a three-year period beginning in the fall of 2018.

Davila Elementary School Academy of Aerospace and Engineering Professions – The new Energy, Medicine, and Aerospace Academy at Davila Elementary School will complete the vertical STEM alignment to Milby High School. This whole-school STEM program will incorporate all four STEM components with a distinctive energy, medicine, and aerospace curriculum per grade level that will integrate cross cutting STEM concepts. The unique collaboration with NASA Johnson Space Center, the aerospace community, the Independent Petroleum Association of America, and Pumps and Pipes, will help students to develop line of

sight into the STEM educational opportunities that await them in their feeder schools and across the district. The program will be phased in over a three-year period beginning in the fall of 2018.

Washington High School Academy of Aerospace and Engineering Professions is currently an Houston ISD magnet school for Engineering Professions. The current engineering professions magnet theme has not served to attract the students necessary to reduce minority isolation nor the interest to sustain a robust program. A new, whole-school STEM magnet would provide the students of Washington High School, the Independence Heights community, and of all areas of Houston ISD, an opportunity to prepare for a college degree and careers in a STEM-related fields. In collaboration with NASA Johnson Space Center, the aerospace community, and Pumps and Pipes, Washington High School will transition from a school within a school program to a whole-school STEM program that includes all four areas of STEM. Three pathways would be offered: Engineering Professions, the FUTURES Academy of Engineering Sciences, and an Aerospace STEM Academy. Program implementation will begin in the fall of 2018.

Wesley Elementary School Academy of Aerospace and Engineering Professions will offer new magnet program that is designed to better meet the needs of students in the north central area of Houston. The school currently has an enrollment of 372 students, well below the school's building capacity of 740. In collaboration with NASA Johnson Space Center, the aerospace community, and Pumps and Pipes, an enhanced high-interest STEM program would fulfill the potential of this campus to attract and maintain students. The addition of an Aerospace and Engineering Professions Academy at Wesley will complete the STEM feeder pattern to Washington High School. Williams Middle School, the feeder middle school for Wesley Elementary and Washington High School, is currently a STEM magnet school. The school wide aerospace and engineering curriculum at Wesley will allow all students to become engaged in

innovative STEM program that will better prepare students for academic success and will strengthen the vertical STEM alignment to Washington High School. Program implementation will begin in the fall 2018.

Baylor College of Medicine Biotech Academy at Rusk– is currently a 3 - 8 STEM magnet school that is transitioning into a middle school. Rusk will provide a significantly revised whole school program focused on careers in health and medicine. The Biotech Academy at Rusk will serve students in grades 6 - 8. This program will be modeled after the successful Baylor College of Medicine Academy at Ryan Middle School. BCMA at Ryan has an extensive wait list each year for its magnet program and Baylor College of Medicine Biotech Academy at Rusk will provide additional access to the exceptional Baylor College of Medicine curriculum. Students that wish to continue their medical studies may apply to the nationally acclaimed Michael E. DeBakey High School for Health Professions and will be well prepared for the rigors of the program.

All of these programs will use race-neutral selection methods and will offer attractive, viable, and popular choices to students in order to reduce minority group isolation and ensure high quality, innovative educational offerings for students regardless of where they live in Houston. The significantly revised and new magnet proposals complement the menu of choices Houston ISD provides to ensure students in Houston have the option of attending a school that is racially and socio- economically diverse. Admissions to all of the magnet schools under the Magnet Schools Assistance Program project will be made available to all students annually; no academic criteria, entrance examination, or performance auditions will be used to select students.

Based on the previous success of Baylor College of Medicine at Ryan and DeBakey High School, Houston ISD has found that these partnership schools are a strong “magnet” to attract

students from every socioeconomic group. Having effective programs available to all students, in partnership with these well-known medical, scientific, and engineering leaders, will attract a racially, ethnically, and economically diverse group of students.

(3) How it will ensure equal access and treatment for eligible project participants who have been traditionally underrepresented in courses or activities offered as part of the magnet school, e.g., women and girls in mathematics, science, or technology courses, and disabled students.

Houston ISD's *Partnerships that Fuel Opportunities in STEM Education* has been designed to promote inclusiveness, equal access, and raise the expectations for student performance through creating a diverse educational environment. While low SES may present challenges to students' educational experiences, "when low-income students have the rare opportunity to attend well-integrated school districts, they can benefit from positive peer effects that come from attending schools with their better-off peers" (EdBuild, 2016, p. 8). The belief is that if students are offered programs that demand a higher level of performance, students will rise to the occasion. From the outset, planning has focused on providing a welcoming environment for all members of the school communities. The new and revised programs will enable the project schools to build strong foundations for the programs and for recruiting and engaging groups traditionally underrepresented in specialized professions. Representatives from the Houston ISD's Multilingual, Special Education, Advanced Academics, Family and Community Engagement, Curriculum, and Professional Development Departments have worked together to create a plan that integrates individualized instruction and cultural awareness into the STEM curriculum in order to provide a rigorous yet highly accessible experience for all students. The district has also formed a partnership with the Women in Engineering Program (WEP)

Texas Girls Collaborative Project (TxGCP) through the University of Texas and will be working with them to ensure that our female students are supported and encouraged to pursue STEM studies and careers. Promoting higher levels of academic achievement, these enhanced or new programs will help reduce, prevent, or eliminate the isolated minority at each project school by attracting students from ethnicities underrepresented at those campuses (The Century Foundation, 2016).

Addressing the linguistic and socio-affective needs of English Language Learners (ELL's) has long been at the forefront of the district's focus. Two of the district's core initiatives include an effective teacher in every classroom and rigorous instructional standards and supports. These initiatives are supported by several district wide projects. One example is the development of a four-day institute Everyday ExcELLEnce to assist teachers in understanding the cognitive, affective, and linguistic needs of ELL students. This training weaves second language acquisition theory with J. Seidnitz' work *Navigating the ELPS* and includes eight easily implemented routines to develop language in all four skill areas of listening, speaking, reading, and writing. Teachers use scaffolding to model specific school learning with the "I do", "We do", and then "You do" framework (Mooney, 1996). Informal progress monitoring allows teachers to monitor comprehension and make informed instructional decisions (Airasian, 2005). To ensure high levels of training implementation, follow-up training will include walk-through feedback and follow up coaching by the project STEM Specialists and supplemental online support. This training will be offered to all content area teachers at the six proposed magnet schools.

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but also make a commitment to become students of their students. The most important component for resources for students is that they be rigorous, culturally inclusive, and able to be used at home and at school (Cole, 2008). In order to be culturally responsive when teaching a diverse student population, teachers must use their students' strengths as starting points and build on their "funds of knowledge" (Krasnoff, 2016). Through improved cultural competencies, teachers will be better able to communicate with students and their families, resulting in increased student achievement and parent involvement. Research by Katie Denslow (2000), shows that through multicultural teacher training, teachers can learn to have an understanding of different races and ethnicities in order to incorporate differences in their curriculum. Research on effective schools has shown that when teachers are supportive, and have a positive attitude, students achieve a higher level of academic success (Gallagher, 2013). Personnel at the project schools will receive training in cultural diversity as well as ongoing training in the subject area.

Personnel in the Office of Special Education Services will serve as advocates for students with disabilities, promoting the individualized education program (IEP) best suited for each student. Parents, as part of a student's IEP Committee, will be able to identify STEM programs and pursue equitable access to these programs that successfully prepare students for a variety of post-secondary school options. The FUTURES Academy, Energy, Medical, Aerospace, and Engineering programs are all rigorous, high quality, and practical programs that prepare students for well-paying jobs and a bright future. Especially important is that Special Education representatives will participate in recruiting efforts for the STEM grant campuses. The district special education leadership will ensure all students with disabilities who would benefit from the opportunities available and their parents are aware of the processes for access and admission to the STEM grant schools. Once enrolled in the magnet program, these students will be supported

with the resources required by their IEPs, such as resource teachers, accessible facilities, and assistive technology.

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The Family and Community Engagement (FACE) Department has worked to ensure that parents have meaningful engagement in the process. Houston ISD values parents as partners in preparing students to succeed in college, career, and beyond, FACE is dedicated to advancing student achievement by building parent engagement. The FACE Department strengthens the relationship between parents and schools through mutual trust, collaboration, training, and effective communication to ensure the academic and personal success of all Houston ISD students. This department will provide direct services to the six identified schools and will facilitate and coordinate Houston ISD parent involvement activities consistent with the district's core value: "Parents Are Partners."

Traditionally underrepresented groups will be encouraged to enter and remain in the *Partnerships that Fuel Opportunities in STEM Education* program through the absence of entrance requirements and the presence of proactive, individualized remediation combined with rigorous, high-interest curriculum. The combined efforts of various Houston ISD departments will serve to meet the needs of all students enrolled in the program.

(4) The effectiveness of all other desegregation strategies proposed by the applicant for the elimination, reduction, or prevention of minority group isolation in elementary schools and secondary schools with substantial proportions of minority students. (Section 4401(b)(1) of the ESEA, as amended by the ESSA)

Houston ISD strives to maintain a program that is racially, ethnically, and socio-economically diverse student body. Through the *Partnerships that Fuel Opportunities in STEM Education* program, a variety of planned strategies for the elimination, reduction, and prevention of minority group isolation in the project schools include; open admission magnet programs, nondiscrimination policy, and magnet transportation. **Open Admission Magnet Programs**, admissions to all of the magnet schools under the Magnet Schools Assistance Program project will be made available to all students annually; no academic criteria, entrance examination, or performance auditions will be used to select students. Furthermore, Houston ISD will support and promote an open access lottery and magnet application system that is fully accessible to all Houston ISD residents. Open labs and magnet open houses will be held in strategic sections of the city where historically underrepresented magnet application populations exist. Each magnet program accepts, within its enrollment goal, students who have a strong interest in its magnet theme. The following students will be given priority for enrollment in the following order if they indicate their intent to attend the magnet school:

- Students who currently attend or live in the attendance area of the school zone;
- Applicants who live outside the attendance area, but have one or more siblings that are currently enrolled there and will be in attendance in the entrance grade (K, 6, and 9) for the upcoming school year;
- Students that reside within the Houston ISD District boundary.

Any eligible student who meets the requirements for the program to which they are applying (complete an application) will be entered in a lottery if there are more applicants than available seats. Research shows there are positive effect on academics for students who win admission to racially and socioeconomically diverse magnet schools through a lottery process (The Century Foundation, 2016). The date of the application does not influence their chances as long as it is within the first application window (Phase 1). When magnet program enrollment goals have been met, a waitlist of applicants will be established. As space becomes available, wait listed students may be offered a seat in the program in their order on the waitlist. For schools with space, after all applications in Phase 1 have been processed, eligible students who meet the qualifications for the program to which they are applying, will be considered in the order in which their application was submitted. Beginning the first day after the end of the calendar school year, when no further eligible Houston ISD-resident student applications remain, out of district eligible students will be considered in the order in which they submitted their applications. **Nondiscrimination Policy**, in line with Board Policy FFH (Local) Student Welfare: Freedom from Discrimination, Harassment, and Retaliation: “The District prohibits discrimination, including harassment, against any student on the basis of age, race, color, ancestry, national origin, gender, handicap or disability, marital status, religion, veteran status, political affiliation, sexual orientation, gender identity, and/or gender expression, or on any other

basis prohibited by law. Retaliation against anyone involved in the complaint process is a violation of District policy and is prohibited.”

Magnet Transportation, in accordance with Board Policy CNA3 (REGULATION)-X, transportation will be provided to students enrolled in the magnet program. Students eligible for transportation to magnet programs are residents of Houston ISD within the 333-square mile attendance boundary. Students who are attending such magnet programs on approved transfers or who reside two or more miles from their assigned campuses will be guaranteed transportation. Students eligible for magnet program transportation will be provided round trip transportation between District-designated stops that are less than two miles from their home and their assigned campuses. Funding is needed to support these additional schools and programs.

B. Quality of Project Design

(b) Quality of Project Design

(1) The manner and extent to which the magnet school program will improve student academic achievement for all students attending the magnet school programs, including the manner and extent to which each magnet school program will increase student academic achievement in the instructional area or areas offered by the school, including any evidence, or if such evidence is not available, a rationale based on current research findings, to support such description.

Houston ISD’s proposed project seeks to build local capacity to support and fulfill the District’s Beliefs and Vision and the Strategic Direction that calls for the District to ensure that every student has an equal opportunity to quality education programs. The *Partnerships that Fuel Opportunities in STEM Education* project will enable the District to create and implement more rigorous and relevant courses of instruction to strengthen students' knowledge of academic

subjects and attainment of post-secondary education or productive employment, especially in STEM fields. There are six principles that drive this magnet school framework: (a) Leadership Excellence; (b) Teaching Excellence; (c) Instructional Excellence; (d) School Design; (e) Social and Emotional Learning Support; and (f) Family and Community Empowerment (Daggett, 2014). Schools in the twenty-first century and beyond require substantially more resources than schools required in years past. In Houston ISD’s project, the focus will be on ensuring equity to the high-needs schools by providing high quality teachers, leaders, and active engagement into rigorous STEM education to increase their academic achievement and close achievement gaps.

The purposes of the proposed *Partnerships that Fuel Opportunities in STEM Education* project are to accomplish the following:

- Reduce minority group isolation in feeder pattern elementary, middle, and high schools
- Provide all students an equal opportunity to meet state academic content and student achievement standards
- Advance innovative methods and practices promoting diversity and increasing choices in public education
- Substantially strengthen students' knowledge of academic subjects and their attainment of tangible and marketable vocational, technological, and professional skills
- Fulfill a capacity-building role by providing extensive professional development for staff that will sustain school operations at a high-performance level after funding ends
- Implement and improve courses of instruction to strengthen students' knowledge of academic subjects and attainment of post-secondary education or productive employment, especially in STEM fields.

The proposed project’s goals, measurable objectives, and MSAP performance measures

for the *Partnerships that Fuel Opportunities in STEM Education* program are:

Goal 1: Increase racial integration and socioeconomic diversity in the MSAP STEM schools.

Objective 1.1: By the end of the project period, the number of students outside of the isolated minority group will increase by 15% in the participating schools, as measured by the baseline year. **(Performance Measure A)**

Objective 1.2: By the end of the project period, the students' socioeconomic diversity will increase 15% in the MSAP STEM schools, as measured by the baseline year. **(Performance Measure A)**

Goal 2: Increase the academic achievement rates of all participating students in Reading/English Language Arts, Math, and Science in the MSAP STEM schools.

Objective 2.1: By the end of the project period, the number of participating students from outside of the isolated minority group scoring proficient or above on the State Reading/English Language Arts assessments will increase by 25%, as measured by the baseline year. **(Performance Measure B)**

Objective 2.2: By the end of the project period, the number of participating students from outside of the isolated minority group scoring proficient or above on State Math assessments will increase by 25%, as measured by the baseline year. **(Performance Measure C)**

Objective 2.3: By the end of the project period, the number of participating students from outside of the isolated minority group scoring proficient or above on State **Science** assessments **will increase by 25%**, as measured by the baseline year.

Objective 2.4: By the end of the project period, the number of participating students from low socioeconomic backgrounds scoring proficient or above on the State Reading/English Language Arts assessments will increase by 25%, as measured by the baseline year.

Objective 2.5: By the end of the project period, the number of participating students from low socioeconomic backgrounds scoring proficient or above on the State Math assessments will increase by 25%, as measured by the baseline year.

Objective 2.6: By the end of the project period, the number of participating students from low socioeconomic backgrounds scoring proficient or above on the State Science assessments will increase by 25%, as measured by the baseline year.

Objective 2.7: By the end of the project period, the participating students' achievement rates for all demographic groups will increase by at least 5% each year by scoring proficient or above on State Reading/English Language Arts assessments, as measured by the baseline year.

(Performance Measure B)

Objective 2.8: By the end of the project period, the participating students' achievement for all demographic groups will increase by at least 5% each year by scoring proficient or above on State **Math** assessments, as measured by the baseline year. **(Performance Measure C)**

Objective 2.9: By the end of the project period, the participating students' achievement for all demographic groups will increase by at least 5% each year by scoring proficient or above on State **Science** assessments, as measured by the baseline year.

Objective 2.10: By the end of the project period, the number of participating students from outside of the isolated minority group will increase their high school graduation rates by at least 5% each year, as measured by the baseline year.

Objective 2.11: By the end of the project period, the number of participating students from low socioeconomic backgrounds will increase their high school graduation rates by at least 5% each year, as measured by the baseline year.

Goal 3: Increase industry, university, and community partnerships that will support and enhance

the innovative themes at the MSAP STEM schools.

Objective 3.1: By the end of each project year, increase the number of STEM-related industry partnerships by at least one that will support and enhance the innovative themes at the MSAP STEM schools, as measured by the previous year.

Objective 3.2: By the end of each project year, increase the number of STEM-related university partnerships by at least one that will support and enhance the innovative themes at the MSAP STEM schools, as measured by the previous year.

Objective 3.3: By the end of each project year, increase the number of STEM-related community partnerships by at least one that will support and enhance the innovative themes at the MSAP STEM schools, as measured by the previous year.

Goal 4: Reduce minority group isolation in the six MSAP STEM schools.

Objective 4.1: By the end of the project period, the number and percentage of magnet schools receiving assistance will reduce minority group isolation by 25%, as measured by the baseline year.

Objective 4.2: By the end of the project period, the percentage of magnet schools that received assistance that are still operating magnet school programs three years after Federal funding ends will be 100%, as measured by the baseline year. **(Performance Measure D)**

Objective 4.3: By the end of the project period, the percentage of magnet schools that received assistance that meet the State’s annual measurable objectives and, for high schools, graduation rate targets at least three years after Federal funding ends will be 100%, as measured by the baseline year. **(Performance Measure E)**

Goal 5: Increase the instructional capacity of specialized and core-area teachers to deliver unique, innovative curriculum at the MSAP STEM schools.

Objective 5.1: By the end of each project year, Houston ISD will provide at least six STEM-focused opportunities for development and training to strengthen job-related skills and competencies aligned with the teachers' identified areas of focus.

Objective 5.2: By the end of each project year, Houston ISD will provide at least two STEM-focused externship opportunities for development and training to strengthen job-related skills and competencies aligned with the teachers' identified areas of focus.

Improve Student Academic Achievement for All Students Attending Each Magnet School Program: Houston ISD is the nation's first two-time winner of the prestigious Broad Prize, which recognizes each year the public-school system that has demonstrated the greatest overall performance and improvement in student achievement, while reducing achievement gaps among poor and minority students. Houston ISD won the Broad Prize in 2002 and 2013. The District is seeking to leverage the proposed reform efforts to maximize its impact on student achievement by reaching the following student outcomes: (1) Becoming the first district to eradicate the racial achievement gap; (2) Having 100% of students reading and performing on math and other STEM related courses on grade level, as measured by a national test in grades tested; and (3) Leading the nation in the National Assessment of Educational Progress (NAEP) reading and math scores in grades 4 and 8. Additionally, the District must do more to ensure that all students receive a high-quality education and graduate on-time, prepared for their career and/or college of their choice.

The Houston ISD Curriculum, Instruction, and Assessment (CIA) Department has developed curriculum standards and assessments that prepare students to succeed in college and the workplace and compete in the global economy. Houston ISD also uses the Texas College and Career Readiness Standards (CCRS) across the curriculum, with a focus on integrating

STEM, toward college and career readiness. The District, through a continuous improvement model, has developed and is currently implementing a comprehensive K-12 curriculum fully-aligned to the state standards in science, technology, engineering, and mathematics, literacy, and all other core courses. This curriculum provides opportunities for students at all levels to have access to rigorous learning, including access to college-readiness courses and college-level coursework at the high school level through dual credit, Advanced Placement (AP), International Baccalaureate (IB) or other accelerated coursework. The District’s curriculum provides the following tools for teachers to provide rigorous, standards-based instruction to students:

- The **Vertical Alignment Matrix (VAM)** provides a map of the Houston ISD PK-12 curriculum by illustrating the vertical relationship among the Texas Essential Knowledge and Skills (TEKS)—the state academic standards for Texas public schools—to student expectations from grade to grade and/or course to course. The VAM delineates the responsibility of instruction and supports the Houston ISD’s college-bound/career-ready culture by outlining accountability for student learning.
- The **Scope and Sequence** document serves as a course/grade-level outline, syllabus, or overview. The Scope and Sequence provides sequencing and pacing of content so that the STAAR-tested curriculum is taught prior to the test administration.
- The **HUB Master Courses** include the relevant TEKS, Texas College and Career Readiness Standards, English Language Proficiency Standards, Key Concepts, Academic Vocabulary, Assessment Connections, Essential Understandings/Guiding Questions, Instructional Considerations and Strategies, and Resources. To ensure that these learning resources are adaptable and fully accessible to all students, specialists in the Special Education, Multilingual, and Advanced Academics Departments continually work with CIA curriculum

writers to build instructional support for students with identified needs. Houston ISD also offers English as a Second Language (ESL) instructional programming for all secondary English Language Learners (ELL) who require intensive English language and literacy development. In addition, the District provides students with electronic access to a wealth of materials in the classroom, school library and at home.

- The **HUB/Power UP** is a districtwide initiative aimed at digitally transforming 21st century teaching and learning across Houston ISD. The HUB is a K-12 online platform that is becoming the center of collaboration, personalization, curriculum, instruction, and communication for all Houston ISD staff and students. The HUB is being used by educators and students to give everyone involved in a child’s education the information, digital tools, and resources they need to learn together—both inside and outside the classroom. Through the Power UP initiative, teaching and learning is being transformed by providing laptops for high school students’ use in the classroom and at home.
- **Digital Resources** are provided by the District for all students to support their learning. Through the Library Services Department, digital resources and online databases are available to all students, teachers, parents, and administrators in Houston ISD. Campus access is available through any District computer; access to these resources outside of Houston ISD campuses requires a user name and password that gets issued to each student.
- **Literacy and Numeracy Blueprints** serve as a guide to teachers, parents, and students to identify key skills and concepts students should have mastered each year. These documents (also available in Spanish) provide suggestions to parents and teachers to support students’ academic success.

- **Pacing Calendars** assist teachers to plan and pace instruction using the Houston ISD Curriculum; the CIA Department develops valuable yearly Pacing Calendars. These calendars mirror the Scope and Sequence timelines in a visual format to support effective instructional planning by teachers.
- **Unit Planning Guides and Exemplar Units** facilitate the planning and effective delivery of rigorous instruction. Teachers are provided with units of instruction aligned to College and Career Readiness Standards, TEKS, and English Language Proficiency Standards. Instructional units provide teachers with research-based lessons, instructional practices, formative assessments, and blended learning tools to provide inquiry-based differentiated instruction for all students.
- **Houston ISD Video Exemplar Project** features exemplary practices where teachers learn to use multiple approaches in the context of their own classrooms. Teachers can view and practice reflective discussion and collaborative work using debates, role playing, problem-solving, simulations, Socratic seminars, case studies, concept mapping, concept attainment, STEM pedagogy flipped classroom models, and best practices for curriculum delivery. Virtual teacher-to-teacher conversations will be facilitated across the STEM schools through the newly acquired Houston ISD e-Learn Management System designed to facilitate online, personalized learning and collaboration among teachers and school leaders.

To ensure the success of the proposed project, Houston ISD will provide the participating schools with administrators and staff who have the skills to implement the program successfully. Two core initiatives in the Houston ISD Strategic Plan are “an effective teacher in every classroom” and “an effective principal in every school.” The four key strategies for the Effective Teacher Initiative are the following: (1) Smart recruitment and staffing to attract the nation’s

strongest teachers to meet the District needs; (2) Useful appraisals to guide instruction; (3) Individualized teacher support to ensure that teachers do their best work; and (4) New career pathways and differentiated compensation to recognize, retain, and reward effective teachers.

Under Houston ISD's teacher appraisal system, the most important criterion for evaluating teacher effectiveness is student performance, which counts for approximately 50% of teachers' summative ratings. Student performance refers to multiple measures, including results of the **State of Texas Assessments of Academic Readiness (STAAR)**—the state-mandated assessment tests used to assess student achievement and knowledge in core subjects—and district-level formative assessments. Each academic year, teachers' skills and knowledge that promote student learning are measured by multiple classroom observations following a rubric.

Houston ISD will capitalize on a variety of delivery systems to provide professional growth activities for teachers and administrators to enable these professionals to maximize their effectiveness through quality support and interaction and skills refinement that will result in improved student achievement. These systems will include school-based professional learning communities, multi-day summer institutes, school-based-coaching and mentoring, on-line collaboration, and support from District staff. Staff development will be provided by a combination of Magnet Program Specialists with expertise in math and science, as well as by *Partnerships that Fuel Opportunities in STEM Education* partners involved in science, technology, engineering, and math, and contracted vendors with specialized STEM programs. The training opportunities will include the following:

- **Baylor College of Medicine (BCM)** will provide a STEM Specialist who will deliver science training to the STEM Specialists and science training to the teachers at Rusk School.

- **STEM Specialists** will be housed at all six participating campuses and will meet weekly with the District STEM Specialist and Program Manager to ensure fluid instruction. They will also monitor all scheduling, purchasing of necessary equipment, STEM implementation, and coaching to ensure equity and quality programming at each participating school.
- **The Rice University School Mathematics Project (RUSMP)** will provide math content training for teachers. RUSMP offers an intensive four-week professional development program in each June for teachers from pre-kindergarten through twelfth grade. Teachers gain content and pedagogical knowledge that have been shown to improve instruction and student achievement. The Rice University math and science content training programs will build upon the leadership development system for teachers who lack content expertise. In addition, Rice University will continue to work with Houston ISD to collaboratively design and deliver a leadership development support program for the cohort of Master STEM teachers.
- **STEM-focused Partners**, such as NASA's Lyndon B. Johnson Space Center (JSC) in Houston, Baylor College of Medicine, Pumps and Pipes, the University of Texas Girls Collaborative for STEM, and the Independent Petroleum Association of America, will meet with the STEM Specialists to coordinate their efforts in tutoring and mentoring with the needs of the proposed project.
- A contracted **STEM consultant** will provide a six-hour overview training for all staff at the STEM schools to help them understand the direction the school is taking and how their content area fits into the overall design for each respective campus. Additionally, STEM Instructors will receive an additional 15 hours of specialized STEM training according to each schools' theme.

- Teachers, from the participating schools, will participate in the **College Board's Springboard math training program**. The College Board's SpringBoard® curriculum is back-mapped from the knowledge and skills students need for success in rigorous coursework and Advanced Placement courses, which research (e.g., Mathews, 2007) has shown to be successful in preparing students for post-secondary math experiences.
- **Training in blended learning** will be provided by the STEM Specialists and outside vendors as innovative technology is acquired. This additional training will be research-based instructional best practices and will be provided as the needs are identified at each school.

Data-driven decision making is a critical element in ensuring academic achievement for all students in Houston ISD schools. Houston ISD's Accountability Office assists the schools with the review and disaggregation of campus-level data so that it can be compiled into actionable reports. The Accountability Office provides “just-in-time” data (up-to-the-minute attendance, discipline, grading, and formative assessment reports) and data coaching for campuses and school office members so that campus leaders can make the best instructional decisions. The summative assessment of student achievement in the proposed MSAP STEM project will be based on the results of the STAAR tests. Houston ISD makes use of assessment data, from many sources, as formative measures to guide instruction. The formative assessment tools include the following: (1) Norm-referenced tests used to establish national comparisons; (2) Advanced Placement (AP) testing funded by Houston ISD for all students in AP classes; (3) PSAT and SAT administered by the District and used to advise students with their Graduation Plans; (4) Teacher created assessments through EdPlan and iStation; and (5) Benchmark testing administered once each semester.

The formative assessments will allow students, teachers, and administrators to judge

progress toward meeting STEM objectives by the project, school, and individual student and their parents. Houston ISD has partnered with EdPlan to create a formative assessment system which contains rigorous aligned questions which teachers and campuses use to create "quick-check" assessments based on the curriculum being taught. This database is also used to create the District required Benchmark testing administered once each semester. Schools may use EdPlan for creating common assessments administered by departments or grade levels. The District has also developed a Principal and Teacher Dashboard system in partnership with IBM Cognos. These Dashboards allow campus staff to instantly see up-to-date information on student performance (as well as other campus-level needs) which is housed in Houston ISD's data warehouse. The information is updated nightly with the District's student information system to ensure teachers have the most current information possible on their students.

Through project based learning, STEM teachers will design and implement multi-dimensional assessments that provide students with varied opportunities to demonstrate learning and understanding. Students will have the opportunity to choose presentation modes that suit their interests and talents. Project based learning will enable the students from the participating schools to become actively engaged in their own learning, which research has documented that students from magnet schools tend to demonstrate "more positive academic attitudes and behaviors than students in non-magnet schools" (Siegel-Hawley & Frankenberg, 2011, p. 2).

In Houston ISD schools, computer-assisted instruction has become essential for diagnosing, addressing, and assessing individual student needs. Students are scheduled into their schools' computer labs to make use of programs such as iStation and Study Island to individualize instruction in reading and math. At the high school level, ninth grade students in the Secondary Reading Initiative classes, students with disabilities taking modified reading

assessments, and ELL students at the intermediate, advanced, and transitional ESL instructional levels utilize the iStation reading to provide prescribed instruction. Each high school has a Grad Lab where students can recover credit and take higher level classes. Grad Labs using the APEX system, and operated by Grad Lab Coaches, will be used to help students at risk of failing or those who wish to accelerate. The graduation coaches help students with their courses, which are designed to "catch them up" for graduation. Programs and licenses have been purchased centrally and at the individual schools. However, access is limited in the computer labs. The STEM project will allow the participating schools to purchase laptops to greatly enhance each school's capacity to provide academic interventions for all their students.

The *Partnerships that Fuel Opportunities in STEM Education* schools will provide exciting STEM-based learning for students who have chosen to attend, which will guide the students toward careers of interest to them. Industry, business, and university collaborations such as the LOFT (Latinos on Fast Track) STEM Leadership Symposium and the Southeastern Consortium for Minorities in Engineering (SECME) will provide mentoring and summer training programs which will introduce minority students to possibilities and opportunities in STEM postsecondary education. Mentoring opportunities provided to students by STEM mentors can provide positive long-term dividends and even close disparities in academic achievement between minority students and whites (Williams, 2014).

In Houston ISD, all schools have campus staff trained in identifying and serving students with special needs, including English Language Learners, students with disabilities, and students identified as gifted and talented (G/T). Since the proposed STEM program is a whole-school program, all students, from the participating schools will be included. All staff, from the participating schools, will participate in the STEM training opportunities and school-based

activities, including in the recruiting efforts to attract students to enroll and attend the proposed STEM programs. Personnel in the Multilingual, Office of Special Education Services, and Advanced Academics Departments will serve as advocates for these special needs students and will assist STEM personnel in ensuring that the program meets the needs of these students. The project-based, hands-on, individualized nature of the STEM programs is especially suited to the needs of these students (Crouch, 2016). The applied Math Labs at each school will give students the opportunity to experience their learning in a concrete format.

The greatest strength of the *Partnerships that Fuel Opportunities in STEM Education* project will be its innovative, engaging curriculum. Below is a description of each school’s respective STEM-focused program summarizing the curricular programs by grade level, content focus area, and STEM theme for each of the six participating schools in the proposed project.

Baylor College of Medicine Biotech Academy at Rusk
6th Grade Neuroscience
In partnership with Baylor College of Medicine (BCM), The Learning Brain, neuroscience teaching materials developed at BCM and curriculum will be implemented in the 6th grade magnet classes . The curriculum teaches neuroscience as it relates to the uniqueness of each person's brain; how the brain enables thinking; the sending of messages throughout the body; how people learn; the senses; how challenging the brain with physical and mental activities helps develop and maintain its structure and function; and how tobacco, alcohol, drugs, and other toxins can harm the nervous system.
7th Grade Scientific Approaches to Problem-Solving
Providing a wealth of support and teaching resources, Baylor's Scientific Decision-making (using evidence to make informed decisions through examples from cardiovascular

science) and Think Like an Astronaut (sports medicine, nutrition and fitness) curricula will be implemented in **7th grade magnet classes**. *Partnerships that Fuel Opportunities in STEM Education* schools have valuable partnerships with **Methodist DeBakey Heart Institute**, **ExxonMobil**, and local sports teams. Through these partnerships, students will have access to emerging medical technologies in cardiovascular and sports medicine technologies, along with presentations from experts in their respective fields.

8th Grade – Bioengineering and Health Technologies

Students in the 8th grade magnet elective class will have the opportunity to earn high school credit. Baylor College of Medicine's Think Like an Engineer, Science of Microbes, and Health Science Technologies curricula will be used to deliver hands-on standards-based lessons. Students will use problem solving and engineering design approaches to solve a variety of health science challenges. Students will be engaged in learner-centered applications of technology to understand microorganisms and mechanisms of diseases. Students will follow the engineering design process to design, construct, and test prosthetic devices, research Nano-medical technology as applied to surgical robots, and to explore cardiac medicine technologies. Medical software imaging will be used and students will design and construct a medical bracing prototype. Other projects will use the engineering design process to design, construct, and test assistive technology such as mobility devices (i.e., wheelchairs, scooters, and walkers). An introduction to common remote operation technologies for cardiac medicine, aerospace, and offshore energy industries will be reinforced by the Pumps and Pipes partnership which will allow students to mimic the real-world collaborations between Houston's largest industries (See Pumps and Pipes letter of support).

A Math computer lab will be used for intervention, acceleration, and enrichment. Math

programs may include but are not limited to Pitsco's Signature Math program—an example of a blended-learning program that combines one-to-one computing and teacher-led, small-group, hands-on learning.

Key Partnerships for Baylor College of Medicine Biotech Academy at Rusk:

- **Baylor College of Medicine (BCM):** The advantages to this partnership are exceptional and include the following: (1) Unique opportunities and exposure to medical institutions and professionals; (2) A full-time, on-site curriculum consultant from BCM for Rusk; (3) A unique Health Science middle school curriculum; (4) a BCM-sponsored Camp Med each summer; and (5) Educational field trips for students to the Texas Medical Center.
- **Pumps and Pipes:** The exceptional benefits of this partnership include the following: (1) Teachers' summer STEM-focused externships—under the auspices of the *“Building the Future Tool Kit Together”* program—the goal being to match Houston ISD Magnet teachers with industry mentors to expand outreach and opportunities for teachers and students to collaborate in technology industry projects which are held at the Houston Methodist Institute for Technology, Innovation & Education (MITIE) and mentors' place of work; (2) Talking to the STEM-focused experts, through the *“Cooking Science and Technology Together”* program, to bring the Pumps and Pipes experience directly to the classrooms; and (3) Students will attend the annual Pumps and Pipes Symposium to hear presentations from medical doctors, astrophysicists, research engineers and other STEM professionals (see letter of support).
- **Contributing Partnerships:** Methodist DeBakey Heart Institute, ExxonMobil, and the University of Houston

The Milby High School Academy for Aerospace, Engineering, and Medicine Professions

Pathways

The Energy, Medicine, and Aerospace program will be a significant revision and enhancement for Milby High School, located in the southeastern region of Houston. The Energy, Medicine, and Aerospace Institute at Milby High School will implement a STEM theme to promote higher achievement and rigor school-wide by revising and augmenting the following academies: (1) Petroleum Exploration and Engineering; (2) Applied Science and Health Professions; (3) Aerospace Science, and (4) Engineering.

Features

The Energy, Medicine, and Aerospace Institute will be a trailblazer in energy, technology, medical health science, and aerospace advancements. A STEM Specialist will lead the transformation of the school into the area’s premier high school for cutting edge STEM innovations. In close collaboration with NASA Johnson Space Center (JSC), Pumps and Pipes, and the Independent Petroleum Association of America (IPAA), students in each pathway will have access to experts in their respective fields, as well as theme-specific curriculum, resources, facilities, internships, teacher externships, and job shadowing. Students will follow a unique plan of study in each concentration enabling them to earn industry credentials, college credit, and professional licenses. Project Lead the Way students will engage in hands-on activities, projects, and problems that are reflective of real-world challenges. This compelling, real-world approach empowers students to learn essential, in-demand skills validated by the world’s leading companies, while also providing an invaluable connection between what students are learning in the classroom today and how it applies to the paths they’ll take in the future. As participants in global research and education, students in the Petroleum Exploration and Engineering pathway will participate in discussions about global industry challenges, the development of alternative

energy, offshore technologies, and geosciences; a special emphasis will be given to issues unique to the Gulf of Mexico region. The student educational experiences for Job Shadowing/Fieldtrips/Internships will include the following organizations, but are not limited to: International Petroleum Association of America (IPAA), Schlumberger Sugar Land, Halliburton Real Time Center, CGG Veritas, Western Geco, Ocean Star, Offshore Museum in Galveston, The Oil Sim Competition, The OTC Conference, Texas A&M Engineering Summer Camp, El Paso Corp, Marathon Oil, Shell, FMC, Oceaneering, Society for Petroleum Engineers, and CRANE AC.

In collaboration with NASA JSC, students in the Aerospace Science and Engineering pathway will explore advanced aerospace technology and engineering concepts, computer science principles that will connect real and virtual space, robotics soft software, and future flight technologies—all with special NASA mission applications. The student educational experiences for Job Shadowing/Fieldtrips/Internships will include the following organizations, but are not limited to: NASA Johnson Space Center, Mission Control, Neutral Buoyancy Laboratory, NASA's Cube Quest Challenge, First Robotics Competition, MATE ROV Competition, NASA's Future Engineers 'Think Outside the Box' Challenge, Space Center Houston Workshops, and the Greater Houston Area Aerospace Community Job Shadowing.

In the Applied Science and Health Professions pathway, students will earn certifications in First Aid and CPR, in addition to participating in onsite clinical observations at Lyndon B. Johnson (LBJ) General Hospital, Ben Taub General Hospital, and Strawberry Health Clinics. In close partnership with Pumps and Pipes, students will explore the latest medical technologies in cardiovascular medicine, biotechnology, and bioengineering. The student educational experiences for Job Shadowing/Fieldtrips/Internships will include the following organizations,

but are not limited to: Texas A & M, University of Texas, Texas Women’s University, Everest College, Memorial Hermann’s Trauma Unit, Memorial Hermann Life Flight Center, Fall & Spring Leadership Conferences, Pumps and Pipes Symposium, and the Methodist DeBakey Heart Institute. Of special note is the opportunity for students from each pathway to come together to exchange ideas and explore crossover technologies.

Facilities & Resources

The Energy, Medicine, and Aerospace Energy Institute will have a STEM Resource Center that, with the guidance of NASA JSC and Pumps and Pipes, will provide state of the art STEM resources, state of the art computer hardware and software, and additional digital resources. All classrooms will utilize state of the art electronic and digital technology, providing teachers with the instructional tools necessary to engage students in a technology rich, student-centered environment. Magnet classrooms and laboratories will be provided with theme-specific cutting edge industry standard equipment, resources, and technology. Grant funds will provide funding to assist with the integration of laptops into the classroom and provide an essential tool for internet access at home. Students will use an electronic management system to access assignments, collaborate on projects, and complete electronic submissions to their teachers. Students will also use electronic journals to track their progress toward academic goals.

Key Partnerships:

- **NASA Johnson Space Center:** NASA JSC will provide access to NASA educational STEM-related materials, NASA’s speaker’s bureau, NASA’s digital learning network, JSC’s volunteer base, and other special opportunities.
- **Independent Petroleum Association of America (IPAA):** The IPAA will provide (1) Membership of the IPAA/PESA Energy Education Center Alumni network; (2) Partnerships

with oil and natural gas businesses and associations; (3) Real-world career experiences through participation in a paid externship program; (4) Exploration of various careers in the industry through a guest speaker program; (5) Industry related and university field trips; (6) Industry related software scholarships for college; (7) Engineering and geosciences summer camp programs; (8) Mentoring to students by young and tenured industry professionals to enable a positive impact on first generation high school and college graduates; and (9) Access to the IPAA LinkedIn network, which allows companies to stay in touch with academy graduates for future opportunities as a college intern or later for full-time employment. (See letter of support).

- Pumps and Pipes:** The exceptional benefits of this partnership include the following: (1) Teachers’ summer STEM-focused externships—under the auspices of the *“Building the Future Tool Kit Together”* program—the goal being to match Houston ISD Magnet teachers with industry mentors to expand outreach and opportunities for teachers and students to collaborate in technology industry projects which are held at the Houston Methodist Institute for Technology, Innovation & Education (MITIE) and mentors’ place of work; (2) Talking to the STEM-focused experts, through the *“Cooking Science and Technology Together”* program, to bring the Pumps and Pipes experience directly to the classrooms; and (3) Students will attend the annual Pumps and Pipes Symposium to hear presentations from medical doctors, astrophysicists, research engineers and other STEM professionals (See letter of support).

Contributing Partnerships: Offshore Energy Center, Texas Girls Collaborative Project, Space Center Houston

The Deady Middle School Academy of Aerospace and Engineering Professions

6th Grade -Introduction to Energy, Medicine, and Aerospace Technologies

Middle school is a time of exploration; a time when students are figuring out what they are passionate about today and how that relates to who they will become tomorrow. During this transitional time, Project Lead the Way (PLTW) Gateway’s ten units empower students to lead their own discovery. The hands-on program boosts classroom engagement and excitement, drives collaboration, inspires “aha! moments”, and deep comprehension. As students engage in PLTW’s activities in computer science, engineering, and aerospace science, they will see a range of paths and possibilities they can look forward to in high school and beyond into STEM careers.

The **Sixth-grade** Energy, Medicine, and Aerospace Technologies classes will engage in explorations in energy, medicine, and aerospace supported by learning materials, such as Pitsco STEM Education Material Science modules, that focus on inquiry-based learning methods. In support of real-world applications, students will examine the material science applications in offshore technology. Through a valuable partnership with the **Offshore Energy Center (OEC)**, students will have an opportunity to conduct site visits to the OEC and gather first-hand information about equipment used in offshore energy exploration. Unique topics in geosciences will include an exploration of subsea geology of the Gulf of Mexico with foundational science content support using modules, such as Pitsco Education geology modules. **NASA** and **Space Center Houston**, both partners with *Partnerships that Fuel Opportunities in STEM Education* schools, will be of special relevance to students as they explore aerospace science through the practical application of fluid dynamics supported by materials such as Pitsco's Flight Technology module. Lego robotics platforms will be used so that students may participate in NASA Robotics Alliance projects, events, and competitions. Health Science topics will be cross disciplinary connecting to the effects of a space environment and deep water exploration on the human body.

7th Grade – Applied Sciences in Energy, Medicine, and Aerospace

The Seventh-grade magnet classes will focus on alternative or sustainable energy (i.e., solar, wind, geothermal, tidal/ocean, fuel cell, and bio-fuel technologies) to provide a broad foundation in associated mathematics that underlie engineering and the engineering design process. Materials such as Pitsco Education Sustainable Engineering modules will be used for calculating efficiencies and students will perform energy audits for solar, wind, fuel-cell, bio-fuel, and ocean/tidal renewable energies. In addition, students will conduct their own Leadership in Energy and Environmental Design (LEED) energy analysis of their school building. The complexity of robotics platforms will increase as students' technical skills become more enhanced. Students will participate in SeaPerch, an innovative underwater robotics program that equips teachers and students with the resources they need to build an underwater Remotely Operated Vehicle. These activities will allow students to make the real-world connection to offshore technologies in Houston's energy industries, as well as the challenges that astronauts face as they train in NASA's Neutral Buoyancy Lab (NBL). The partnerships with NASA JSC and the Independent Petroleum Association of America will help to facilitate site visits to NASA's NBL and offshore exploration facilities. Health science topics will be addressed through the study of the impacts on astronauts' health as a result of long-term space travel, in particular to the International Space Station. Pumps and Pipes will provide an avenue where students will engage in conversations about cross industry discussions to solve challenging problems. A Math computer lab will be used for intervention, acceleration, and enrichment. Math programs include but are not limited to Pitsco's Signature Math program which is an example of a blended-learning model that combines one-to-one computing and teacher-led, small-group, hands-on learning activities.

8th Grade –Applied Engineering and Technology in Energy, Medicine, and Aerospace

The Eighth-grade Magnet classes will use an advanced robotics engineering curriculum focused on the relevant applications of math and science concepts to space, energy, and medicine that will allow students to earn a high school elective credit. The WaterBotics curriculum is designed so that students engage in problem-based learning as they collaborate to design, build, test, and redesign underwater robots made of LEGO® components, motors, propellers, and other materials. The robots are developed through an iterative engineering design process. Student teams complete a series of design challenges or “missions” that increase in complexity and require more sophisticated solutions. Ultimately, students produce a fully functional underwater robot capable of maneuvering in a three-foot-deep pool. Students also learn computer programming as they design and program custom controllers for their robots using the NXT and LEGO® MINDSTORMS® software. Students will apply these engineering and technology principles to remotes operations such as heart surgery, remotely operated vehicles (ROVs) on Mars, and deep water exploration. VEX and Advanced Lego platforms will allow students to participate in competitions such as BEST and others that align to NASA’s Robotics Alliance Project.

Contributing Partnerships: NASA JSC, Space Center Houston, Urban Harvest, Pumps and Pipes, Independent Petroleum Association of America, Texas Girls Collaborative Project, Bay Area Economic Partnership

The Davila Elementary School Academy of Aerospace and Engineering Professions

Grade Level Themes

The Energy, Medicine, and Aerospace Academy at Davila Elementary School will implement a STEM theme to promote higher achievement and rigor school-wide by creating

grade level themes that align to energy, medicine, and aerospace. Engaging students at an early age builds confidence, grows interest, and puts them on course for strong accomplishments in middle school, high school, and beyond. Through the Project Lead the Way Launch, the program for kindergarten through fifth grade, students will learn to become problem solvers.

Features

The Energy, Medicine, and Aerospace Academy at Davila Elementary School will have a STEM specialist to lead the transformation of the school that will be centered around a 21st Century STEM theme critical to local, state, national, and international needs. The students will follow a spiraling curriculum in energy, medicine, and aerospace that is grade-level appropriate and is vertically aligned to the themes and pathways at Deady Middle School and Milby High School. Elementary students will develop enhanced process skills through a progressive STEM curriculum that aligns to energy, medicine, and aerospace topics. Through the valuable partnerships with NASA JSC, the Independent Petroleum Association of America, and Pumps and Pipes, the students will have unique opportunities to welcome industry leaders as collaborative partners in program design. In collaboration with NASA JSC and Space Center Houston, the students will make real-world connections to aerospace through explorations in space science, flight, rocketry, and robotics activities. The energy studies will be supported by wind, solar, tidal, and fuel cell activities. As Gulf of Mexico residents, the students will also examine the challenges faced by oil and gas exploration such as environmental impacts and deep water exploration. The Health science activities will include health and nutrition through a partnership with Urban Harvest. The establishment of working gardens will also tie into NASA's Plants in Space program for elementary students. A 3D portable education system will equip teachers with the ability to video conference with NASA and other schools across the globe.

Students will be engaged with 3D immersive interactive objects, such as how a rocket engine works and simulations of not only STEM topics, but of all of NASA’s 3D resources such as the International Space Station, a 3D view of Mars from the rover, as well as other NASA models, visualizations, and images. Student-created 3D projects will be possible with the use of 3D cameras.

Facilities & Resources

The classrooms will utilize state of the art electronic and digital technology to enable teachers to engage students in a technology-rich, student-centered environment. The Magnet classrooms and laboratories will be equipped with theme-specific cutting edge industry standard equipment, resources, and technology. The STEM Resource Center will provide energy, medicine, and aerospace-themed resources and state of the art computer hardware and software, and additional digital resources. In partnership with Urban Harvest, an outdoor classroom space will be created that will include a school garden, with vegetable, herb, fruit, or habitat gardens and ponds. A Makerspace location will be designated that builds on the national Maker movement. A Makerspace provides physical outlets for messy and creative thinking, innovating, and creating. The Davila Makerspace will host before and after school classes for students and will be open to grade level classes during the school day.

Contributing Partnerships: NASA JSC, Space Center Houston, Urban Harvest, Pumps and Pipes, Independent Petroleum Association of America, Texas Girls Collaborative Project, and the Bay Area Economic Partnership

The Washington High School Academy of Aerospace and Engineering Professions

Pathways

An Engineering Professions and Engineering Sciences Institute at Booker T. Washington

(BTWH) High School will be created in the northwestern region of Houston in collaboration with the NASA Johnson Space Center, the aerospace community, and Pumps and Pipes. The Aerospace and Engineering Professions Institute at Booker T. Washington will implement a STEM theme to promote higher achievement and rigor school-wide by significantly revising two and adding one additional pathway: Engineering Professions, Engineering Sciences, and Applied Aerospace Science and Engineering.

Features

The Aerospace and Engineering Professions Institute at Booker T. Washington High School will have a STEM specialist who will guide the transformation of the curriculum in close collaboration with the NASA Johnson Space Center, the aerospace community, and Pumps and Pipes. The Engineering Professions courses will focus on aerospace technology, high power rocketry, stable flight, transonic flight, high altitude flight, biofuels, underwater, terrestrial, and humanoid robotics technologies, drones, biofuels, and advanced air and space vehicle concept designs. The students will convert cafeteria scraps to biofuels, launch a rocket 19 miles into space, and power the engineering lab with a wind turbine. The FUTURES Engineering Sciences Academy will provide students an opportunity to earn a two-year Associates Degree, as well as industry credentials. The 2-year Associate in Science degree program prepares students to continue to complete a baccalaureate degree in electrical, mechanical, or civil engineering at an approved four-year university. The Applied Aerospace Science and Engineering Academy will provide students a broad spectrum of experiences in each of the four STEM disciplines. The students will be engaged with STEM-focused project-based learning experiences that will help to close achievement gaps in STEM coursework with special emphasis in aerospace challenges.

Facilities & Resources

The Aerospace and Engineering Professions Institute program will have a STEM Resource Center that will provide “Uniquely Houston” industry resources, such as artifacts from NASA JSC, Pumps and Pipes partners, and the aerospace community. State of the art computer hardware and software, and additional digital resources will provide students access to digital learning networks. All classrooms will utilize advanced electronic and digital technology that will provide teachers with the instructional tools necessary to engage students in a technology rich, student-centered environment. The Magnet classrooms and laboratories will be outfitted with theme specific cutting edge industry standard equipment, resources, and technology. The students will use an electronic management system to access assignments, collaborate on projects, and complete electronic submissions to their teachers. Students will use electronic journals to track their academic progress. When classes are scheduled at the college campus, the students have full access to all college resources. This allows students to choose from a wide array of courses and take classes with college students.

Key Partnerships:

- **NASA Johnson Space Center:** Booker T. Washington High School has entered into an agreement with NASA that documents the collaboration with BTWH and the JSC Exploration Integration and Science Directorate (EISD) under the HUNCH program agreement between NASA and the Houston Independent School District. The students have the opportunity to learn and study realistic problems related to NASA’s space flight and research programs and to create hardware prototypes, simulated space hardware (known as “mock-ups”), research results, or other solutions for NASA’s review and use.
- **Pumps and Pipes:** The exceptional benefits of this partnership include the following: (1) Teachers’ summer STEM-focused externships—under the auspices of the “*Building the*

Future Tool Kit Together” program—the goal being to match Houston ISD Magnet teachers with industry mentors to expand outreach and opportunities for teachers and students to collaborate in technology industry projects which are held at the Houston Methodist Institute for Technology, Innovation & Education (MITIE) and mentors’ place of work; (2) Talking to the STEM-focused experts, through the “*Cooking Science and Technology Together*” program, to bring the Pumps and Pipes experience directly to the classrooms; and (3) Students will attend the annual Pumps and Pipes Symposium to hear presentations from medical doctors, astrophysicists, research engineers and other STEM professionals (See letter of support).

- Other Partnerships to support Booker T. Washington High School’s STEM theme: Texas A and M University and KBR, Inc.

The Wesley Elementary School Academy of Aerospace and Engineering Professions

Grade Level Themes

In partnership with NASA JSC and the greater Houston Aerospace community, all students will be exposed to Aerospace studies through grade-level appropriate curriculum that is aligned to the six NASA Mission Directorates: Aeronautics, Aerospace Technology, Solar System and Beyond, Earth Science, the International Space Station, and Mission to Mars. Each grade level will explore each of the six Mission Directorate themes through sequenced activities that will lay a foundation for success in STEM subjects for middle school and increase academic achievement in math and science.

Features

The Aerospace and Engineering Professions Academy at Wesley will be a leader in innovative STEM disciplines with an enhanced focus on aerospace and engineering. A STEM

specialist will lead the transformation of the school into the area’s leading elementary school for STEM technologies. The students will follow a unique plan of study in a specific aerospace and engineering concentration enabling them to find academic success at the middle and high school levels. The elementary students will develop computer science and engineering skills through a progressive robotics curriculum with NASA themed challenges. Through the valuable partnership with NASA JSC and other aerospace community members, the students will conduct site visits that will make real-world connections to their space flight, rocketry, and robotics activities. Flight simulators will place students in life-like scenarios to better understand the principles of aerodynamics and flight. A 3D portable education system will equip teachers with the ability to videoconference with NASA and other schools across the globe. The students will be engaged with 3D immersive interactive objects, such as how a rocket engine works and simulations of not only STEM topics, but of all of NASA’s 3D resources such as the International Space Station, a 3D view of Mars from the rover, as well as other NASA models, visualizations, and images. The student-created 3D projects will be possible with the use of 3D cameras.

Facilities & Resources

The classrooms will utilize state of the art electronic and digital technology to enable teachers to engage students in a technology-rich, student-centered environment. The Magnet classrooms and laboratories will be equipped with theme specific cutting edge industry standard equipment, resources, and technology. The Media Center will provide NASA- themed engineering resources and state of the art computer hardware and software, and additional digital resources. In partnership with Urban Harvest, an outdoor classroom will be created that will include a school garden, with vegetable, herb, fruit, or habitat gardens and ponds. A Makerspace

location will be designated that builds on the national Maker movement. The Wesley Makerspace will host before and after school classes for students and will be open to classes during the school day.

Contributing Partnerships: NASA JSC, Urban Harvest, Pumps and Pipes, and the Texas Girls Collaborative Project

(2) The extent to which the applicant demonstrates that it has the resources to operate the project beyond the length of the grant, including a multi-year financial and operating model and accompanying plan; the demonstrated commitment of any partners; evidence of broad support from stakeholders (e.g., State educational agencies, teachers' unions) critical to the project's long-term success; or more than one of these types of evidence.

Houston ISD expects the *Partnerships that Fuel Opportunities in STEM Education* programs to join the District's long Magnet tradition and be an example for others to follow. Houston ISD is committed to continue operating the six schools in this project beyond the period of MSAP funding. The sustainability of the plan is based on the following premises: (1) MSAP funds are "start-up" costs for transforming six low-performing, racially-segregated schools; (2) The current budget appropriations will continue to be used for normal operating expenses; (3) Houston ISD expects the participating schools to bolster average daily attendance (ADA) revenue by significantly increasing their enrollment; (4) Houston ISD has infrastructure and policies in place that will sustain the Magnet programs beyond when grant funding ends; and (5) Houston ISD has identified supplemental funding sources to provide ongoing support of the programs including grants and higher education and business partners.

The start-up costs of transforming six low-performing and minority-isolated schools into

innovative thematic programs that attract students districtwide are too great for Houston ISD to accomplish on its own. MSAP will fund initial costs including professional development for teaching staff, new equipment for labs, learning centers and classrooms, new books and other materials, field trips, etc. The specialized professional development is critical to ensure magnet teachers are well-trained in their respective school's STEM theme industry. Significant funding is allocated to professional development over the five-year grant period to build internal capacity. In addition to training staff in their content areas, campuses will also be focused on training staff to use student data to adjust instruction and interventions as needed. When possible, staff will attend train the trainer professional development. Although certifying current staff in the specialized course work, the project will also ensure that it continues the staff development and that it will also take place beyond the grant period. Houston ISD is contracting an external evaluator who will monitor the schools' progress, assess the fidelity of program implementation and the schools' preparedness to operate independent of MSAP funds. As a key strategy for attracting a diverse student body, MSAP funds will also be utilized to market the schools, inform the Houston community about the programs, and recruit students from other areas of the city, particularly those of different socioeconomic, racial, and ethnic groups than the current majority at each campus, to apply and attend the STEM-focused schools. The early marketing will set a precedent for the programs' reputations and build enrollment. With increasing enrollments, the participating schools will be able to bolster their revenue streams and to further sustain the programs when MSAP support ends.

A second aspect lending strength to program sustainability is that the six schools have current operating budgets which will sustain normal school operations once the grant ends. Houston ISD will leverage MSAP funds for the initial start-up, but once new programs are up

and running, Houston ISD has the ability to sustain them. After five years of support, each *Partnerships that Fuel Opportunities in STEM Education* program will rely on its operating budget for personnel, regular professional development, supplies and equipment. The specialized professional development will build the capacity of the existing staff to adapt curriculum to each school's theme, as well as to support new hires; however, the schools will also be expected to recruit staff based on the required experience to teach the specialized curriculum.

The third pillar of capacity is significantly increased enrollment. The six schools have capacity (classroom seats, unfilled spaced) that far exceeds current enrollment. This sets them up to recruit and admit students from other areas of the District. During the span of the grant, Houston ISD projects a 9.5% increase in enrollment at Washington High School (The Aerospace and Engineering Institute), 21.5% increase at Milby High School (Energy, Medicine, and Aerospace Institute), 11.25% higher enrollment at Deady Middle School (Energy, Medicine, and Aerospace Academy), a 28.2% rise at Rusk Middle School (Medical and Health Professions), a 11.25% increase at Davila Elementary School (Energy, Medicine, and Aerospace Academy), and a 9.5% increase at Wesley Elementary School (Aerospace and Engineering Academy). The District expects that attractive themes, rigorous curriculum, increased diversity, and improved student performance will drive enrollment up which will make the programs more sustainable programmatically and fiscally. The higher enrollment will generate more revenue for the schools and the District. Houston ISD predicts these programs will attract students to transfer from other Houston ISD schools, which will shift allocations to these schools. The District also aims to bring back students who left Houston ISD, thereby increasing overall revenues for the District through the partnerships with Houston area industry leaders, high quality staff, and additional resources. Based on the predicted increase in enrollment and revenue, the campus principals at

the six schools will commit to funding the STEM Specialist using their general fund budget once the grant expires. The enrollment revenue will also allow schools to continue professional development for teachers, provide additional opportunities for interactive learning experiences, better technology, increase exposure to their fields of study, and continue blended learning and extracurricular opportunities.

The fourth area of capacity is the infrastructure and policies that Houston ISD has in place to support Magnet schools. Two of the existing schools' full or partial remodel will be completed or close to completion by the beginning of the project period. The modern facilities will attract students, high quality teachers, and will be equipped to support new technology. As part of its commitment to providing school choice, Houston ISD pays for transportation for students to attend school outside of their attendance zones. Transportation is often a barrier to true school choice in many other Districts. However, in Houston ISD, providing transportation is an assurance to families that the District is a partner in providing great and meaningful educational options to students. Furthermore, Houston ISD staffs a Magnet Programs Department dedicated to supporting the 110 magnet schools across the District. The Magnet Programs Department supports the specialized curricula of Magnet Schools, provides leadership support via the Assistant Superintendent of School Choice, staffs magnet school coordinators at many campuses, and provides supplies and materials to support the themes of these schools.

The policies and infrastructure within the participating schools also prepare the programs for sustainability. The STEM Specialists will spend 40% of their time on classroom instruction, while spending 60% of their time on implementation and sustainability, including recruiting students, conducting professional development for cross-curricular integration of STEM themes, conducting professional learning communities with teachers, and working with administration

and the Magnet Office on parent and community engagement. Houston ISD will have an agreement with teachers at participating schools with programs that require the most specialized training, to commit to a minimum of three to five years at the school to ensure the investment in training to build school-level and teacher-level capacity is not lost due to turnover.

The fifth element of capacity building comes from additional funding sources. Additional financial support is critical to the ongoing success of Houston ISD magnet programs and the District has identified several funding sources that will be utilized. This includes obtaining additional state funding, and leveraging partnerships with higher education and the Houston business community. The state of Texas provides additional financial support to high schools that implement a whole-school STEM program and course sequence. The two participating high schools will receive weighted state funding because of the whole-school magnet format of the proposed project. Houston ISD's capacity to sustain high-performing STEM magnets is also bolstered by the local industries of the Houston region. Houston has the largest number of Fortune 500 companies (25) in Texas—mostly in the energy sector (Halkias, 2015)—and Houston ISD is diligent about forming strong relationships with business partners in the energy, aerospace, engineering and medical sectors, as demonstrated by the numerous letters of support for the proposed project. These corporate partners are a source of knowledge and expertise but also offer financial assistance to Houston ISD. The District will utilize corporate partners for field trips, guest lessons from experts in the field, opportunities for teacher development, donations of supplies, equipment, technology, and monetary donations—all to reduce the added expenses of the specialized costs that come with quality K-12 STEM-theme programming.

Other funding opportunities for program sustainability includes grant sources to provide additional support to Houston ISD schools in the form of entitlement and competitive awards.

Federal Title I funds will be leveraged at all participating schools to ensure they are staffed with high-quality teachers who have the best training and instructional resources on hand to advance the achievement of all students. The District has chosen to fulfill the need for better STEM education and plans to vigorously pursue grant funding for STEM programs offered by the National Science Foundation and others. A unique feature of Houston ISD is its full-time staff of successful and experienced grant developers. Over the years, the Houston ISD Grant Department has secured hundreds of millions of dollars in federal, state, local, foundation, and corporate funding for the District. Recent examples include the following: (1) The Texas Title I Priority Schools (TTIPS) grant amounting to \$62,504,261 to support comprehensive school turn-around reforms at chronically low-achieving schools; (2) The 21st Century Community Learning Centers Program grant amounting to \$32,350,242 to provide out-of-school enrichment opportunities; and (3) The Healthy Tomorrows Partnership for Children Program grant amounting to \$49,970 to support innovative, community-based projects to improve access to health care and promote preventive health services in schools and their communities. The Houston ISD Grants Department will provide their expertise to the *Partnerships that Fuel Opportunities in STEM Education* program to generate additional revenue streams during the MSAP funding period and beyond.

The *Partnerships that Fuel Opportunities in STEM Education* is one way Houston ISD is acting on its commitment to provide Houston students and their families with the best choice in urban education. The cost of transforming six high-needs schools, however, will be prohibitive without the support of MSAP funding. The needs of a large, diverse, and expanding, urban school district, such as Houston ISD, are numerous and these six schools represent some with the greatest need. With the infusion of MSAP funds, Houston ISD will provide higher quality,

engaging, academically rigorous and economically relevant educational offerings across the District.

(3) The extent to which the training or professional development services to be provided by the proposed project are of sufficient quality, intensity, and duration to lead to improvements in practice among the recipients of those services.

The President’s Council of Advisors on Science and Technology concludes, “The most important factor in ensuring excellence is great STEM teachers, with both deep content knowledge in STEM subjects and mastery of the pedagogical skills required to teach these subjects well” (PCAST, 2010, p. 11). Classroom teachers require sufficient knowledge and professional development to effectively integrate STEM content into their instructional practices (Rockland et al., 2010). Carefully crafted professional development will meet the instructional needs of teachers and administrators and the requirements of each STEM theme. Houston ISD also commits to assist and support the administration of each school in developing transformed learning communities at each magnet school with a full, successful theme implementation.

STEM instructors will engage in intensive professional development from multiple university and industry partners for engineering instruction including, but not limited to Rice University, NASA JSC, the University of Houston (U of H), Texas Southern University (TSU), Houston Community College (HCC), Pre-AP and AP course training from the College Board, and inquiry-based science training from Baylor College of Medicine. Professional development and coaching in math instruction will be provided for math teachers throughout the project. Over one hundred hours of additional math training that includes the appropriate use of technology and manipulatives is included for teachers at the project schools through Rice University’s School Mathematics Project (RUSMP). Houston ISD is currently seeking bids for training

teachers in technology integration to facilitate blending learning practices. Professional Development is outlined in the management plan to systematically implement the magnet theme programs and ensure success for all students.

Houston ISD will organize professional development through university partnerships, specifically for STEM leaders and administrative teams at each of the six STEM schools. To support the adoption and sustainability of school-wide STEM themes, professional development will be tailored to meet the needs of non-science educators to integrate the themes effectively across the curriculum at each participating school. Specific theme-based training will be continuously provided to STEM instructors to ensure effective implementation of an engaging inquiry-based curriculum. The STEM instructors will have the opportunity to collaborate with industry leaders at conferences, workshops, competitions, and meetings to gain cutting edge information that will be integrated into classroom instruction.

Teachers will learn to embed, differentiate, and deliver instruction of the STEM-specific curriculum, STEM-related activities and field experiences through project-based learning; staff development is a necessary requisite for teachers to effectively integrate project-based learning with STEM concepts (Meyrick, 2011). A carefully designed professional development plan will be developed for teachers that will increase student achievement in math, reading and science. Core teachers of math, reading, and science will receive a minimum of 60 hours of professional development per year. A STEM specialist at each campus will receive a minimum of 80 hours of professional development during each year of the grant. The proposed project also includes extensive professional development on blended learning facilitation to ensure success from the onset of the project's implementation.

(4) The extent to which the proposed project is supported by strong theory (as defined

in this notice).

Although Houston is the home of the Texas Medical Center, major oil and gas companies, and NASA, all of which need employees with strong STEM knowledge and skills, the Houston region has a significant education gap among workers and all the STEM-related jobs created by local industry (Rothwell, 2014). The number of STEM-related jobs are increasing quickly nationally—approximately one million additional STEM-related jobs nationally by 2022—but many persons with minority backgrounds continue to be underrepresented among recipients of STEM-related degrees and among those employed in STEM jobs (Hinojosa et al., 2016). Additionally, the United States is ranked 27th internationally in the number of STEM college graduates it is producing, while many students perform poorly academically in STEM subjects (Morrell & Parker, 2013).

According to the U. S. Department of Commerce (2011), the majority of jobs in the future will require at least some STEM content knowledge; a STEM education creates critical thinkers, increases science literacy, and enables the next generation of innovators (Landon et al., 2011). Science and math proficiency is also positively associated with student success in college (Breiner et al, 2011). Additionally, persons with STEM degrees have higher incomes and are less likely to be unemployed than their non-STEM degreed peers. (U. S. Department of Commerce, 2011). Houston ISD’s proposed project is focused on increasing the number of high quality STEM programs that increase racial integration and socioeconomic diversity among students and to prepare them so that they will graduate from high school college and career ready and to meet the demand for STEM-educated workers that the greater Houston region needs.

Magnet schools by design are meant to create "distinctive and appealing" high quality education programs—that are not currently offered in more traditional schools—and that attract

and enroll students from diverse backgrounds and communities (U.S. Department of Education, 2004, p. 1). While magnet schools strive to enroll racially and socioeconomically diverse student populations, research documents that traditional "high minority segregated school environments" are associated with negative educational outcomes for their students, but there are substantial, positive educational outcomes for students that attend racially and socioeconomically diverse magnet schools, such as "increased student achievement, higher levels of student motivation and satisfaction with school, higher levels of teacher motivation and morale, and higher levels of parent satisfaction with the school" (Siegel-Hawley & Frankenberg, 2011, p. 1). Additionally, the long-term outcomes of high quality magnet schools enable students, regardless of racial, ethnic, and socioeconomic backgrounds to truly develop and achievement their full potential as contributing members of society, such as the following: (1) Develop higher order thinking skills; (2) Cultivate an empathic outlook or the ability to understand multiple perspectives; (3) Less likely to accept stereotypes; (4) Attain higher levels of academic achievement; (5) Develop more cross-racial/ethnic/socioeconomic friendships; (6) Develop a higher willingness to attend diverse colleges and live in diverse neighborhoods; (7) Develop a higher sense of civic and communal responsibility; (8) Attain higher levels of college-going and graduation rates; and (9) Attain more meaningful employment in their chosen career paths (Siegel-Hawley & Frankenberg, 2011). These are the types of traits that the District is striving to develop in every student that attends a Houston ISD school. Houston ISD is placing an emphasis on ensuring that all students graduate ready for the world and possessing the characteristics they will need to be successful in college and to compete in today's global workforce. With the help of many partners, as well as leaders from Houston's largest industries and institutes of higher education, Houston ISD has developed the Global Graduate profile; these are the attributes or skill sets that

Texas and local industry need to address the skills gap and to be globally competitive (U.S. Chamber of Commerce, 2014). The profile contains six characteristics or qualities that Houston ISD wants all students to acquire and develop during their time in elementary, middle, and high school; these include the following: (1) A **Leader** - Works collaboratively and leads by example and embraces new ideas and technologies and motivates others to be open to change; (2) **Adaptable and Productive** – An industrious member of a global society that demonstrates flexibility and cross-cultural skills when fulfilling personal, professional and community experiences; (3) **Responsible Decision Maker** – Sets goals, develops action plans, and works hard when faced with challenges and obstacles while persisting to achieve a goal.; (4) **Skilled Communicator** – Reads, writes, speaks, listens effectively, and adapts to diverse audiences and settings; (5) **Critical Thinker** – Identifies and dissects issues, seeks multiple opinions, critically evaluates various solutions, understands when additional information is needed, and effectively uses technology (21st century literacies) to research; and (6) **College-Ready Learner** – Proficient in the core disciplines, as evidenced by successful performance on state and national assessments and works hard and persists to achieve academic and career goals. The *Partnerships that Fuel Opportunities in STEM Education* project will be fully-informed by this body of research on effective magnet schools. (Please see the Appendices for a copy of the research studies that Houston ISD seeks to implement in support of the proposed project).

Although the District seeks to do more to ensure that all students receive a high-quality education and graduate on-time, prepared for their career and/or college of their choice, there is also the recognition that barriers such as low socioeconomic status (SES), the students' home language and parents' backgrounds may contribute to achievement gaps in learning (Ford, 2013). Since Houston ISD is committed to providing a high-quality education for every child, regardless

of where they live, the District's efforts will be concentrated and focused on the participating schools in the proposed project in order for the students to be meaningfully engaged in their learning, as well as to be nurtured in rigorous and relevant STEM programs to excel academically. The proposed project will incorporate several strategies to meaningfully engage all students, regardless of background and academic achievement to ensure their overall success in STEM fields. The integration of STEM across the curriculum beginning with the early grades through high school will augment their overall academic ability, increase higher order thinking skills, and sets the foundation for their interest in STEM learning and career opportunities (Howard-Brown & Martinez, 2012). Multiple PD and mentoring opportunities will allow teachers to grow in their STEM content knowledge and learn how to educate diverse learners with engaging, relevant, real-world lessons, especially students that belong to groups that have been traditionally underrepresented in STEM fields of study and jobs. By providing students with engaging, relevant, real-world lessons, the students are presented with opportunities to “solve real-world problems in context so that they are able to grasp a deeper understanding of the content and how to apply their knowledge in a meaningful way” (Howard-Brown & Martinez, 2012; p. 2).

Teachers have a significant impact on school culture, equity, and how they affect students (Sammons and Bakkum, 2011) and are directly linked to student learning (Odden, 2011). The quality of effective campus leadership also has a significant impact on school culture and equity (Habegger, 2008; Villarreal, 2001), teacher turnover and effectiveness (Beteille, Kalogrides, and Loeb, 2011), and student success (Leithwood et al., 2004), especially at high-need schools (Seashore-Louis et al., 2010). Ingersoll and Smith (2004) have also concluded that mentoring does indeed matter, and that when coupled with other professional development, teachers are less

likely to leave the teaching profession. Several key factors of a successful STEM mentoring program include: (1) A mentor of the same teaching content area; (2) Common planning time; (3) Regularly scheduled collaboration; and (4) An external teacher network—all of which are included in this project. By providing meaningful PD, mentoring, and other opportunities to collaborate with other teachers, teacher effectiveness and staff cohesion will enhance equity and improve student achievement (Almy & Tooley, 2012).

School leaders must be prepared to handle issues that are more characteristic of high-need schools, such as student behavior, motivation and engagement; teaching and learning for high-need and/or low performing students; improvement of the physical environment of the school; and cultures of care and achievement (Day & Sammons, 2013). Effective instructional supervision allows teachers to analyze their own practices and set goals for personal growth (Mielke & Frontier, 2012). As the leader of the campus, the principal must facilitate innovative, instructional programs, which are implemented and evaluated for student success, and provide resources and materials to support all staff in accomplishing campus goals. With the right supports and standards, principals are best positioned to improve the quality of instruction within schools and strengthen parent and community engagement (The Wallace Foundation, 2013). Effective classroom learning practices are shaped by strategic instructional leadership, positive school climate, high teacher effectiveness, and supportive family and community engagement. Effective staff development is a necessary requisite for teachers to effectively integrate project-based learning and STEM concepts into instruction (Meyrick, 2011).

The strategies included in the proposed project are supported by strong theory and are designed to increase student achievement, improve the academic standing of the participating schools, and positively impact their equity, while also increasing the racial integration and

socioeconomic diversity of their student populations and the educational outcomes. The recruiting of teachers who are culturally-responsive and/or providing cultural responsiveness training to teachers—especially culturally responsive STEM training—can help to increase student success, as well as to diminish the underrepresentation of minority and female students (Farinde & Lewis, 2012). Teachers trained in culturally responsive STEM instruction, along with identifying the pedagogical best practices of teachers (regardless of race)—who are successful with students of color, students who live in poverty, or other student characteristics—can ensure these students will receive the type of education that will help them be successful academically (Cotton, 1991; Delpit, 1995, 2006; Ladson-Billings, 1995, 2006, 2009; Li, Nan & Hasan, 2010).

As previously stated, the proposed project demonstrates the strong support from multiple partners with a solid foundation in STEM, such as the following, but not limited to Baylor College of Medicine, NASA JSC, Rice University, the University of Houston, Texas Southern University, Houston Community College, and Pumps and Pipes. It is also essential that the university, industry, and community partners that collaborate with the school district be committed to working with the students and teachers to help them be successful (Rutgers University, 2009). The District's vision of robust partnerships with industry, universities, and community organizations to sustain the efficacy of the proposed STEM-focused programs are grounded in the shared missions of Houston ISD and all the identified partnerships, as well as their strong unity of shared desired outcomes for the proposed project—a best practice of such collaborations is the “focus on shared outcomes of STEM” and that the stakeholders hold the belief that “STEM is about creating better teachers, students, and workforce in order for the United States to better compete globally” (Breiner et al., 2011, p. 10). The partnerships will be instrumental in guiding the practices of the proposed project.

C. Quality of Management Plan

(1) The adequacy of the management plan to achieve the objectives of the proposed project on time and within budget, including clearly defined responsibilities, timelines, and milestones for accomplishing project tasks.

In developing the management plan for this project, Houston ISD has taken a comprehensive approach to ensure that minority isolation is eliminated, reduced, or prevented; academic achievement rates increase; partnership involvement increases; distinctive STEM curricula is implemented; and teacher capacity in STEM areas is increased. The responsibility for implementation of the plan is multi-tiered to guarantee support from all levels of district management including but not limited to the Family and Community Engagement, Multilingual, Advanced Academics, and College- and Career-Readiness, and Curriculum departments, and is integrated into well-established processes and procedures currently practiced. This integration will enable the District to leverage grant funds to be used specifically to build a solid foundation for STEM programs, and for recruiting and engaging groups traditionally underrepresented in the STEM professions. When grant funding has ended, it will also enable Houston ISD to sustain the programs that have been created.

There will be frequent references to the Career and Technology Education (CTE) Department throughout the grant implementation in the management plan. The specialists in the CTE department under the Career and Technology department director will support the grant implementation in conjunction with the MSAP Grant manager. Grant implementation will also be supported by the project STEM Specialists. The timeline below identifies when the activities will be completed and by whom.

Goal 1: Increase racial integration and socioeconomic diversity in the MSAP STEM

schools.			
Activity	Person(s)/Departments Responsible	Time Frame	Milestones
Submit awarded grant for District Board of Education acceptance	Grants Department Manager	Planning Period: November 2017	Approved project available to plan for execution
Hire qualified Program Manager and other project staff	Project Director, Human Resources	Planning Period: December 2017	Position vacancies filled
Complete contracts for external evaluator and service providers	Project Director, Program Manager	Planning Period: January 2018 – Sept. 2022	Contracts executed; project activities are completed on time and within budget
Meet with participating departments, campus, and District administrators	Project Director, Program Manager	Planning Period: January 2018 – Sept. 2022 (Quarterly)	Department and campus responsibilities acknowledged by agenda and sign in sheet
Weekly meetings with STEM Specialists	Program Manager Instructional Specialist	January 2018 – Sept. 2022	Project activities are completed on

			time and within budget
Schools meet with local industry, university, and community representatives regarding innovative and emerging STEM career fields.	School Choice Magnet Specialist Assistant Superintendent Career and Technology Department	Planning Period: November 2017 – February 2018	Partnerships established
Research of diversity in local/global industry staffing, including projected long term workforce needs.	Career and Technology	Planning Period: November 2017 – February 2018 and on-going	Documented research available
Parent/Student surveys on factors weighed to determine school choice.	Office of School Choice- Magnet Specialist	Planning Period: February 2018 – April 2018	Surveys/Survey Results
Create targeted recruitment plans to promote diversity in the STEM schools	All STEM project schools Office of School Choice- Assistant Superintendent Magnet Specialist	Planning Period: February 2018 – May 2018	Recruitment Plans
Select research based STEM curriculum for the STEM schools and	Office of School Choice Career and Technology Department	Planning Period: February 2018 – May 2018	Documentation of review and selection of

initiate requests for proposals of vendors for professional development and external evaluation.	Procurement		curriculum, RFP's from vendors
Design and print new marketing materials. Update websites; create new marketing and promotional videos. Annual School Choice Fair. Continue citywide information campaign. Recruitment at Back to School events/fairs.	All STEM project schools Office of School Choice Assistant Superintendent Magnet Specialist	Planning Period: February 2018 – June 2018	Completed Website /marketing products, fliers, recruitment plans
Begin targeted recruitment for new and revised magnet programs.	All STEM project schools Magnet Specialist	Planning Period: February 2018 – June 2018	Recruitment plans, district and school calendars completed
Meet with Human Resources Department to launch multimedia recruitment (teacher and administrator)	Office of School Choice- Assistant Superintendent Human Resources	Planning Period: February 2018 – June 2018	Highly effective teachers recruited to teach at STEM schools.

Develop Advisory Council	Project Director School Support Officers	Planning Period: February 2018 – June 2018	Biannual meetings, sign in sheets & minutes
Themed Summer Bridge STEM camp	All STEM project schools CTE Specialists MSAP Program manager	Summer 2018, 2019, 2020, 2021	Engaged students Student Evaluations
Offer parent meetings/classes to increase parental involvement in academic achievement	All STEM project schools Family and Community Engagement (FACE) Department	January 2018 – May 2022	Parent Calendar of Events, Agendas, Sign- In sheets created
Purchase or revise marquees to exemplify new or revised STEM magnet themes	All STEM project schools Assistant Superintendent	May 2018	Revised marquees
Hire a muralist to emphasize magnet themes at each STEM school	Davila ES, Deady MS, Rusk MS, and Wesley ES STEM schools Assistant Superintendent	March 2018	Schools reflect magnet themes
Magnet Awareness Activities	All STEM project schools Office of School Choice	October 2017, 2018, 2019, 2020, 2021	District and School Calendars reflect magnet activities

District-wide Magnet Open Houses	Office of School Choice District Magnet Schools MSAP Project Director MSAP Program Manager	October 2017, 2018, 2019, 2020, 2021	District and School Calendars, websites reflect magnet activities
Open Houses at all Magnet Programs	All STEM project schools MSAP Program Manager	October 2017, 2018, 2019, 2020, 2021	Increased number of participants at magnet activities
Start accepting applications for upcoming school year	District Magnet Schools	October 2017, 2018, 2019, 2020, 2021	Increased number of magnet school applications
Marketing for STEM magnet programs	District Magnet Schools- MSAP Program Manager	Ongoing	Marketing plan created; Increased number of magnet applications received from diverse groups
Parent Notification- application status mailed	District Magnet Schools	March 2018, 2019, 2020, 2021, 2022	Increased number of magnet school applications
Magnet Thursdays – Parents may tour schools	District Magnet Schools- MSAP Project Director	October 2017, 2018,	Increased number of magnet school

of interest each Thursday, October - November		2019, 2020, 2021	applications
Transfers are granted and processed	Transfer Department MSAP Project Director	Summer 2018, 2019, 2020, 2021	Incoming Magnet Rosters
Create transportation bus routes	Transportation Department MSAP Project Director	September Summer 2018, 2019, 2020, 2021	Bus routes created
Initiate diversity training	All STEM project schools MSAP Program Manager	Spring 2018, 2019, 2020, 2021	Agenda, Sign In- Sheets, Instructional evaluations
Goal 2: Increase the academic achievement rates of all participating students in Reading/English Language Arts, Math, and Science in the MSAP STEM schools.			
Activity	Person(s)/Departments Responsible	Time Frame	Milestones
Purchase materials, software, and technology/equipment for applied Math labs, STEM Labs, computer labs, classrooms and resource	Office of School Choice All STEM project schools Career and Technology MSAP Program Manager IT Department	November 2017, 2018, 2019, 2020, 2021	Purchase orders completed

centers			
Training for Integrated Technology	All STEM project schools STEM/IT Specialists IT Department Core subject area teachers	Summer 2018, 2019, 2020, 2021	Agendas and sign in Sheets
Cultural/linguistic (ELL) and data-driven decision making professional development training	All STEM project schools MSAP Program Manager	August 2018, 2019, 2020, 2021	Agendas and sign in sheets
Theme Specific Engineering Training	All STEM project schools STEM/IT Specialists MSAP Program Manager	Fall 2018, 2019, 2020, 2021	Agendas and sign in sheets
Rice/ Baylor/College Board, Math/Science, Pre-AP and AP Trainings	All STEM project schools STEM/IT Specialists Math/Science Teachers MSAP Program Manager	Summer 2018, 2019, 2020, 2021	Agendas and sign in sheets
District offices, campus based administrators, and instructional staff review student achievement data to drive instruction in reading, math, and	All STEM project schools Research and Accountability and Curriculum departments MSAP Program Manager CTE Specialists	January 2018, 2019, 2020, 2021	Outline of PD, PLC agendas/minutes, interventions, and instructional plans/

science.			considerations based on data review
College Field Trips	All STEM project schools Office of School Choice	September 2018, 2019, 2020, 2021	Attendance Rosters
STEM students participate in engineering, robotics, rocketry, and SECME competitions	All STEM project schools Magnet and CTE Specialists	September – May 2018, 2019, 2020, 2021	Attendance Rosters
Goal 3: Increase industry, university, and community partnerships that will support and enhance the innovative themes at the MSAP STEM schools.			
Activity	Person(s)/Departments Responsible	Time Frame	Milestones
University of Texas Girls Collaborative for STEM - Coordinator Cohort Meetings	Magnet Specialist MSAP Program Manager All STEM project schools CTE Specialists Magnet Specialist	Semi-annually 2018, 2019, 2020, 2021	Agendas and sign in sheets
Pumps & Pipes- Coordinator Cohort Meetings	Magnet Specialist CTE Specialists	Semi-annually 2018, 2019, 2020, 2021	Agendas and sign in sheets
NASA Johnson Space	Office of School Choice	Semi-annually	Agendas and sign

Center- Coordinator Cohort Meetings	CTE Specialists	2018, 2019, 2020, 2021	in sheets
STEM Symposiums- Community event hosted	All STEM project schools Showcase STEM projects	Spring 2018, 2019, 2020, 2021	Agendas and sign in sheets
Partnership/community appreciation events	All STEM project schools	Spring 2018, 2019, 2020, 2021	Agendas and sign in sheets
Partnership outreach	All STEM project schools MSAP Program Manager Magnet Specialist Strategic Partnerships	Ongoing 2018, 2019, 2020, 2021	Conference fliers Notes from meetings Follow up-emails
Attendance at STEM specific industry/ community/university conferences	STEM instructors CTE Specialists STEM/IT Specialists	Ongoing 2018, 2019, 2020, 2021	Agendas and sign in sheets
Goal 4: Reduce minority group isolation in the six MSAP STEM schools.			
Activity	Person(s)/Departments Responsible	Time Frame	Milestones
Underwater Robotics- Purchase materials, train STEM instructors	All STEM project schools MSAP Program Manager CTE Specialists	Summer 2018, 2019, 2020, 2021	Purchase orders completed, STEM projects

	STEM/IT Specialists and Instructors		completed on time.
Robotics Purchase materials, train STEM instructors	MSAP Program Manager CTE Specialists STEM/IT Specialists and Instructors	Ongoing 2018, 2019, 2020, 2021	Purchase orders Agendas and Sign in Sheets
Purchase STEM specific curriculum, resources, and equipment for each unique theme	All STEM project schools MSAP Program Manager CTE Specialists STEM/IT Specialists	October and Summer Ongoing 2018, 2019, 2020, 2021	Purchase Orders
Implementation of STEM magnet specialty course	All STEM project schools	Spring 2018	Course Offerings list and rosters from each STEM school
Implementation of STEM magnet resource center	All STEM project Middle Schools	Beginning Fall 2018	Purchase Orders Schedule/ attendance
Baylor Health Science and Medical Health Science Curriculum Development and Support	STEM/IT Specialist and Instructors CTE Specialists	October and Summer Ongoing 2018, 2019, 2020, 2021	Agendas and Sign in sheets

Pumps and Pipes Energy, Medicine, Aerospace Curriculum Development and Support	STEM/IT Specialist and Instructors CTE Specialists	November and Summer Ongoing 2018, 2019, 2020, 2021	Agendas and Sign in sheets
NASA JSC STEM/Aerospace Curriculum Development and Support	STEM/IT Specialist and Instructors CTE Specialists	November and Summer 2018, 2019, 2020, 2021	Agendas and Sign in sheets
Goal 5: Increase the instructional capacity of specialized and core-area teachers to deliver unique, innovative curriculum at the MSAP STEM schools.			
Activity	Person(s)/Departments Responsible	Time Frame	Milestones
Theme-based Curriculum Training- Instructional staff- campus wide	All STEM project schools MSAP Program Manager CTE Specialists	January 2018 through May 2018	Agendas and Sign in Sheets
Theme-based Curriculum training core teachers	All STEM project schools MSAP Program Manager CTE Specialists	Grades K and 1 st 6 th and 9 th October 2018 2 nd and 3 rd 7 th and 10 th	Agendas and Sign in Sheets

		<p>Summer 2019</p> <p>8th, 11th and 12th</p> <p>4th and 5th</p> <p>Summer 2020</p>	
<p>Technology Integration Training- Instructional staff- campus wide</p>	<p>All STEM project schools</p> <p>CTE Specialists</p> <p>MSAP Program Manager</p> <p>IT Department</p>	<p>Beginning Fall of 2018 and continuing</p>	<p>Agendas and Sign in Sheets</p>
<p>Theme-based curriculum training- STEM instructors- training for STEM curriculum including NASA JSC, AVRover (3D Technology), Texas Girls Collaborative Project, Urban Harvest, Baylor College of Medicine, Rice University, U of H, Independent Petroleum Association of America, Pumps and Pipes.</p>	<p>All STEM project schools</p> <p>CTE Specialists</p> <p>MSAP Program Manager</p>	<p>Grades K and 1st</p> <p>6th and 9th</p> <p>October 2018</p> <p>2nd and 3rd</p> <p>7th and 10th</p> <p>Summer 2019</p> <p>8th, 11th and 12th</p> <p>4th and 5th</p> <p>Summer 2020</p>	<p>Agendas and Sign in Sheets</p>

STEM /IT Specialists Collaborative meetings Led by CTE Specialists	All STEM project schools CTE Specialists	Monthly beginning January 2018	Agendas and Sign in Sheets
Attendance at STEM specific educational conferences	STEM Instructors STEM/IT Specialists CTE Specialists	Ongoing	Conference Agendas

(2) How the applicant will ensure that a diversity of perspectives are brought to bear in the operation of the proposed project, including those of parents, teachers, the business community, a variety of disciplinary and professional fields, recipients or beneficiaries of services, or others, as appropriate.

The Houston ISD STEM management plan will benefit program students and communities in numerous interdependent areas. Each component of the plan will support and enrich the other components. The following outcomes will be attained through this plan:

- Reduce minority group isolation in selected STEM programs. (Performance Measure A)
- Increase academic achievement rates of all students within each major demographic student group in **Reading, Math**, and Science in selected STEM programs. (Performance Measures B & C)
- Increase industry, university, and community partnerships that will support and enhance the innovative theme at STEM programs.
- Implement distinctive curriculum specific to the theme at each STEM school.
- Increase instructional capacity of specialized and core area teachers to deliver unique, innovative curriculum at each STEM school.

The *Partnerships that Fuel Opportunities in STEM Education* project management plan makes optimal use of resources and personnel through integration of STEM management into district management processes and procedures currently in place. Houston ISD's Multilingual Department will ensure that the language acquisition needs of English Language Learners are appropriately addressed and Special Education specialists will ensure that Individualized Education Programs (IEPs) are in place and followed for all students needing Special Education Services. The Advanced Academics Department will support the *Partnerships that Fuel Opportunities in STEM Education* project through student identification and teacher training for gifted and talented students. The Houston ISD Curriculum and the Career and Technology Education Departments will support the project by developing innovative STEM curriculum and technical applications for the schools in the program. The Family and Community Engagement (FACE) Department will work with parents, families and community groups to assist in student recruitment. The Professional Development Department will create teacher and administrator training plans that integrate instructional best practices and cultural awareness. The Houston ISD Budgeting Department has helped to develop the budget for the *Partnerships that Fuel Opportunities in STEM Education* project and will work with the Project Director and Program manager to ensure that funds are dispersed in a manner most beneficial to students. The MSAP Grant Advisory Committee will work together with key district personnel from these departments and from the proposed campuses to plan the STEM program. Just as individuals from a broad cross-section of the district have been involved in planning the project, they will also be involved in supporting the STEM schools as they implement the plan. The proposal allows independence and flexibility for principals, teachers, and school decision-making groups, while ensuring that support and oversight will be provided

by the Office of School Choice. The MSAP Advisory Committee, made up of parents, students, school administrators, partners, the project director, project manager, central office designee, and at least one board of education member will bring a diversity of perspectives based on the needs of the project communities. The Program Manager, along with the Project Director, will oversee the project’s MSAP Grant Advisory Committee to ensure a variety of diverse perspectives toward the implementation of the program for the racial, ethnic, and socioeconomic integration of the schools. These key stakeholders will meet a minimum of semi-annually per year—during the grant period—to address any strengths and weaknesses in the implementation and create action items to address the project’s needs that will be shared with the external evaluator. Each school will also have the opportunity to have an advisory committee to hold the school accountable for success.

D. Quality of Personnel

(d) Quality of Personnel

The Houston Independent School District (Houston ISD) and all providers participating in the proposed project are equal opportunity employers. All candidates for employment are evaluated solely on qualifications for the job, areas of expertise, and interest in developing the academic skills of students. Job vacancies will be widely advertised to ensure a diverse applicant pool. Houston ISD also guarantees that project services such as professional development for teachers and administrators are equally accessible to all appropriate staff. Hiring for project positions will be in accordance with federal and Texas laws and Houston ISD’s Equal Employment Opportunity policies.

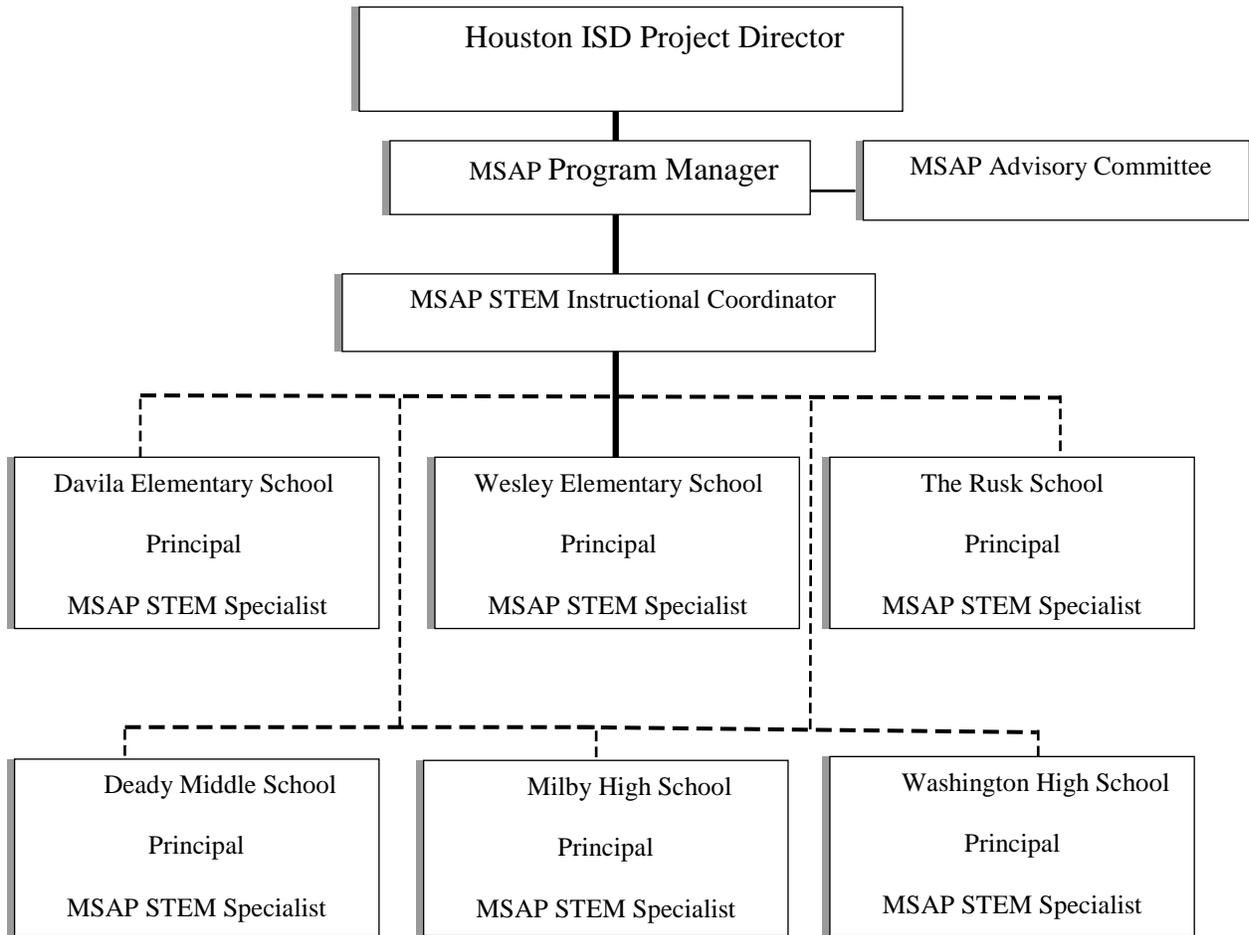
(1) The Secretary reviews ... qualifications of the personnel...

(d)(1)(a) ***The project director ... is qualified to manage the project***

Noelia Longoria, Assistant Superintendent of the Houston ISD Office of School Choice, will serve as the project director for the ***Partnerships that Fuel Opportunities in STEM Education*** project. Ms. Longoria will devote approximately 25% of her time and effort overseeing the administration and implementation of the project. In her capacity, as Assistant Superintendent for the Office of School Choice, Ms. Longoria oversees administration of the district's 110 magnet programs with nine magnet central office staff members. Noelia Longoria has an M.E. in Guidance and Counseling and Mid-Management. She has over 10 years of leadership experience in Houston ISD and has served as Dean of Instruction, Principal, School Support Officer, and Assistant Superintendent.

Ms. Longoria is well versed in magnet school operations; she served as the School Support Officer for several of the district's premier magnet schools, including Lamar High School (Business Professions), Bellaire High School (World Languages), Westside High School (Integrated Technology), Davis High School (Media for Culinary Arts and Hotel Management), Chavez (Applied Science and Engineering), and Austin High School (Teaching Professions and Maritime). Ms. Longoria will manage the work activities of the MSAP Program Manager. She will consult with the MSAP staff of the six participating schools. She will also oversee the implementation of the MSAP evaluation and MSAP advisory council. In collaboration with the project manager, she will coordinate magnet school strategies, services, and activities with the principals of the six schools.

Organizational Chart for Partnerships that Fuel Opportunities in STEM Education



(d)(1)(b) ***Other key personnel are qualified to manage the project***

A Program Manager, funded by the grant, will coordinate the day-to-day operations of the proposed project. The position will be a 12-month full-time position; 100% of the individual's time and effort will be dedicated to coordinating the ***Partnerships that Fuel Opportunities in STEM Education*** project. Houston ISD has identified the Program Manager; whose qualifications and professional background experience include instructional curriculum, desegregation and magnet school programs, and a strong background in cultural and linguistic competencies. This position also requires experience in successful parent and student outreach activities in diverse communities. The MSAP Program Manager position necessitates someone with successful management skills to assist with the development of activities that support program goals and objectives and ensures their successful implementation, including strong partnership engagement. At least three years of exemplary teaching experience are required along with strong organizational skills.

The MSAP Program Manager will work closely with the school-based staff to devise a consistent, targeted recruitment plan with brochures, public services announcements (PSAs) and advertisements tailored for each school and its magnet theme. The targeted recruitment plan will support efforts to reduce minority group isolation in each school. Houston ISD will focus special recruitment efforts on families who have left the traditional public schools (e.g., private schools, home schools, charter schools). Houston ISD boundaries are not the same as the City of Houston, which includes several other public school districts. By extending recruitment efforts to the whole city, the district expects to reduce minority and socioeconomic group isolation at the six project schools through appealing to racial population groups with larger representation in the city than in Houston ISD (Please see the Appendices for a job description).

The six project schools will be led by experienced educational leaders; each campus principal will collectively bring a variety of talents and resources to the project. Of the six project schools, 100% of the principals have master's degrees and one has a doctorate; In addition, 100% have a variety of certifications, including certifications for the following areas: Texas Superintendent, Instructional Leadership, Standard Principal, Professional Development and Appraisal System, Composite Science for grades 6-12, ELL (EC-12), and Gifted and Talented Education.

Baylor College of Medicine Biotech Academy at Rusk Principal Jesus Herrera, has 20+ years of experience in public education as a teacher and administrator. In his current position, Mr. Herrera provides leadership and instructional support for over 530 students and 37 staff members. He has a Master of Education Degree in Administration and Supervision. As a Bilingual educator with non-profit and community organizing experience, Mr. Herrera has effective communication skills enabling him to successfully engage students, parents and the community.

Wesley Elementary School Academy of Aerospace and Engineering Professions Principal Rhonda Leduff, has 17 years of educational experience, and 8 of those years have been in leadership roles. Currently Ms. Leduff provides leadership and instructional support for over 300 students and 25 staff members. Principal Rhonda Le Duff has a Master's Degree in Educational Leadership and has certifications in Science Composite (6 – 12), Principal (EC – 12), Gifted and Talented, ILD-Instructional Leadership Development, and PDAS-Professional Development Appraisal System.

Davila Elementary School Academy of Aerospace and Engineering Professions Principal Berzayda Ochoa, leads a staff of 27 and provides instructional support for over 400

students. Ms. Ochoa has over 10 years of experience in Houston ISD as a Bilingual teacher, Dean of Instruction and Principal. She has a Master's Degree in Educational Leadership and Texas certifications in Bilingual – Spanish (EC-4) and Principal (EC-12).

Milby High School Academy for Aerospace, Engineering, and Medicine Professions

Principal, Roy De La Garza has 19 years of experience in education, he currently provides leadership and instructional support for over 1500 students and 48 staff members. Mr. De La Garza has a Master's degree Educational Leadership and certifications in Administration-Mid Management, Elementary (1-8), and ESL (EC-12).

Washington High School Academy of Aerospace and Engineering Professions,

Principal Carlos Phillips has 16 years of educational experience in Houston ISD, and 11 years in a leadership role. He currently provides leadership and instructional support for over 700 students and 49 staff members. Dr. Phillips has a Master's Degree in Educational Administration and a Doctoral Degree in Education Leadership and Cultural Studies. Dr. Phillips credentials also include Administration Mid-Management, Elementary (1-8), and ESL (EC-12).

Deady Middle School Academy of Aerospace and Engineering Professions, Principal

Richard Smith, has 7 years of experience in education, three of those years have been in a leadership role. In his current position, he provides leadership and instructional support for over 700 students and 49 staff members Mr. Smith has a Master's of Education Degree, along with Science Composite (6 – 12) Principal (EC – 12) Gifted and Talented, ILD-Instructional Leadership Development, and PDAS-Professional Development Appraisal System.

Collectively, the six Houston ISD principals represent major racial categories in Houston ISD. Principal resumes and job descriptions are provided in the Appendices. The principals will be assisted at their respective schools by a campus-based STEM Specialist to assist and

implement all project activities. The STEM Specialist, yet to be named, will be someone whose qualifications and professional experience include teaching, knowledge of school choice programs, and have a strong background in STEM content knowledge and in cultural and linguistic competencies. This position will also require experience in successful parent and student outreach activities in diverse communities. Each STEM Specialist will work closely with the participating principals to ensure that the project activities are implemented with fidelity. (See Appendices for the resumes or job descriptions).

Two board members will be invited to serve on the project's advisory council. They will devote time to this project to ensure its success and serve as key members. Several District-level key personnel and departments are supporting the proposed project; the project will also have two co-sponsors to provide districtwide leadership to ensure its success on time and within budget, including the following: **Dr. Grenita Lathan**, Chief Academic Officer, provides leadership and oversees a number of critical areas in the District, including elementary and secondary curriculum and development, advanced academics, multilingual programs, college and career readiness, special education, grants, student assessment, and research and accountability. She will devote 10% of time, in-kind, to this project and serve as a District Co-Sponsor and as a key member of the proposed project's advisory committee. **Mr. Mark Smith**, Chief of Student Support Services, provides leadership and oversees the delivery of social, emotional, physical, and academic support and wrap-around services that students need to succeed. He will devote 10% of time, in-kind, to this project and serve as a District Co-Sponsor and as a key member of the proposed project's advisory committee. **Mrs. Annie Wolfe**, Officer of Secondary Curriculum and Development, and **Mr. Lance Menster**, Officer of Elementary Curriculum and Development, support curricular enhancements and assistance with the District's online

curricular alignment resource. **Mr. Adam Stephens**, Officer of Advanced Academics, provides leadership and oversees advanced academic programs in the District, including Advanced Placement Programs, International Baccalaureate Programs, and STEM Integration and Sustainability. **Mr. Glenn Reed**, General Manager of Budgeting and Financial Planning, provides leadership and oversees school-based budgeting, special revenue budgeting, and budget operations and review in the District. **Dr. Annetra Piper**, Manager of the **Grants Department**, will provide assistance in generating additional funding resources and general grants management. **Dr. Venita Holmes**, Manager of Research and Accountability, provides leadership and oversees the District’s research efforts. Unless indicated, these key personnel will devote 10% of time, in-kind, to this project (see resumes for background and qualifications).

(d)(1)(c) Teachers ... are qualified to implement the special curriculum of the magnet schools

In 2010, Houston ISD launched the Effective Teachers Initiative (ETI), a multi-year program devoted to the goal of having an effective teacher in every Houston ISD classroom so that every Houston ISD student is set up for success. Since 2010—when the Board of Education selected the Effective Teachers Initiative as the first of five core priorities within Houston ISD’s Strategic Direction—the district has been transforming the way it recruits and selects new teachers, provides teachers with the professional support and development they need, and recognizes the most effective teachers through expanded career and compensation opportunities.

The teachers at the six Houston ISD schools are experienced and many hold advanced degrees. In 2015-2016, the number of average years of teacher experience was 13 years at Milby HS, 12 years at Washington HS, 9 years at Deady MS, 4 years at Rusk MS, 10 years at Davila ES, and 8 years at Wesley ES. In 2015-2016, the percentage of teachers with advanced degrees was 40% at Milby HS, 43% at Washington HS, 33% at Deady MS, 12% at Rusk ES, 22% at

Davila ES, and 31% at Wesley ES.

The *Partnerships that Fuel Opportunities in STEM Education* project Houston ISD schools are all Title I schools and 100% of teachers providing instruction in these schools are expected to meet the NCLB definition of “highly qualified.” New teachers hired to work in these magnet schools, including the magnet school instructional coordinators, and other staff hired with grant funds, will be hired in part based on the talents and interests that they bring associated with the magnet theme at the six schools. Additionally, for new and returning teachers, the professional development offerings will be provided to all school staff to develop the skills necessary to implement the specialized curriculum of the magnet schools.

(2) Experience and training in fields related to the objectives of the project...

The key personnel identified in this section and many others who will support the project have varied and complementary experiences and competencies. Resumes and job descriptions found in the Appendices describe individual experience in curriculum development and desegregation, as well as the job description for each specific position. Along with the individuals named above, many others at both the central office and school level will support implementation of the *Partnerships that Fuel Opportunities in STEM Education* project, including: Mr. Richard Carranza, Superintendent of Schools; Dr. Grenita Lathan, Chief Academic Officer; Mr. Mark Smith, Chief School Services Support Officer; Gloria Cavazos, Chief Human Resources Officer; Michael Love, Assistant Superintendent, Career and Technical Education (CTE) and College and Career Readiness; Gracie Guerrero, Assistant Superintendent, Multilingual Programs; Lance Menster, Officer, Curriculum and Instruction; Dr. Josephine Rice, Assistant Superintendent; Leadership Development; Beatriz Arnillas, Senior Manager, IT Solutions, Dr. Elizabeth Cocina, Director, Family and Community Engagement; Caleen Allen,

General Manager, Strategic Partnerships; Dr. Venita Holmes, Manager, Research and Accountability; and Dr. Annetra Piper, Manager, Grants.

E. Quality of Project Evaluation

An External Evaluator will be hired to coordinate and implement an evaluation plan that effectively measures the success of the program to reach the stated goals and objectives. The independent evaluator will be funded by the grant and contracted to carry out the formative, summative and impact evaluations of the project. The evaluator’s qualifications, relevant training, and experience, as an independent evaluator, will ensure that the project’s evaluation is prudently conducted. This person will also provide leadership in the collection, analysis, and reporting of all pertinent data to facilitate on-going refinements of the project.

The contract for an independent evaluator will be competitively awarded and will follow Houston ISD’s policies and procedures for competitive bidding. Houston ISD has contracted with many qualified education evaluators on federal and state projects in the past. Qualifications of the successful bidder will include the following: (1) Experience with TEA’s testing and accountability practices and data structures; (2) A proficient understanding of magnet school principles and practices; (3) A proficient understanding of diverse student populations and varied theories of learning and pedagogy, and (4) Experience with federal program evaluations.

The evaluator will possess at least a master’s degree and technical expertise in program evaluation. The evaluator will work with the project director and project manager to collect data, complete reports, and provide feedback to help guide continuing program improvement. The evaluator, in partnership with the Houston ISD Research and Accountability Department, the project director, and the leadership of the six participating schools, will develop and implement an evaluation plan that effectively measures, by applying qualitative and quantitative methods,

the success of the project to reach the stated goals and objectives. The evaluation plan will be comprehensive and consist of both formative and summative components.

The Houston ISD Department of Research and Accountability will serve as the contact for the evaluation process. This department will provide support as needed as it relates to student, teacher, and campus performance results. The department has access to and experience in reporting student performance data on both state and national standardized assessments and District formative assessments, as well as other outcome measures as needed for grant reporting purposes. The primary role of the Department of Research and Accountability will to address the technical needs of the Evaluator (e.g., the timely access to data and other program artifacts relevant to the evaluation for assessment purposes), as he/she coordinates and implements the evaluation design.

The evaluation plan for the proposed project will focus on specific, measurable, high-yield objectives. The MSAP Project Director and Project manager will meet at least quarterly each year with the outside evaluator to ensure that all activities related to the grant are monitored, documented, evaluated, and adjusted on a regular basis to achieve the goals and objectives of the project. The robust details of the project's evaluation plan will also enable Houston ISD to develop a viable program design to replicate the successes of the project at other District campuses in the future.

The project evaluation for all the schools includes the regular measurement of parent involvement through surveys for parents and maintaining accurate documentation of parent participation in a variety of activities. Across the project, the advisory council at the District level, the Superintendents' Parent Advisory Committee (SPAC), and the Shared Decision-Making Committees (SDMC's) at each school site, will guide the schools on increasing parent

engagement and involvement opportunities. Parents may become involved with the school and their children's education in a many ways (e.g., attending school meetings, volunteering to assist with school fundraisers and events, assisting with mentoring and tutoring programs, participating in parent classes designed to help parents assist children with homework, and assist with STEM project based learning events).

Once Houston ISD has received notification of award acceptance, the Procurement Department will issue a Request for Application (RFA) for an Independent Evaluator. The RFA will reflect the job description outlined previously in this proposal. Through this competitive process, an Evaluator will be selected who meets these criteria. The Evaluator will work with the Project Director and District staff to obtain the data necessary to determine whether objectives have been met. The Grant Manager and District staff will serve as a liaison with the various Houston ISD departments (i.e., Research, Attendance, School Choice, Demographics, Curriculum, Staff Development, Parent Involvement, Grants Development) to assist the Evaluator in obtaining the needed data and background information. The Grant Manager will also liaise with the Principals and STEM/IT Specialists and/or Magnet Coordinators at each of the project schools to facilitate site visits, hold focus groups, and administer and collect surveys.

To provide a complete and accurate evaluation, the Evaluator will visit each school at least once per semester to monitor implementation of the MSAP STEM project. The Evaluator will observe classroom lessons, collaborative planning, and magnet recruiting activities. During the site visits, the Evaluator will meet with the school STEM Specialist and/or Magnet Coordinator to review documentation of the status of project activities and to hear plans for the successful completion of these activities. The Evaluator will design a checklist for the Project Manager to record and document the management plan at each campus. The Evaluator will

gather and analyze test data, design staff development evaluations to be completed by participants, and develop surveys which will be administered to staff and partner participants as well as students. The Evaluator will meet with the Program Manager at least once a month, maintaining ongoing communication via e-mail and telephone. The Evaluator will prepare written quarterly reports to the Project Director detailing the formative data obtained to that point to aid the Advisory Committee in refining the project. The U.S. Department of Education (USDOE) Annual Progress and Complete Data Reports will be completed by the Evaluator and Houston ISD will submit all reports to the USDOE as required. The Evaluator will also participate in the required USDOE conferences and meetings.

The products of the formative evaluation will be used to further refine and define program goals; and the summative evaluation will be used to determine the overall effectiveness of the project. The evaluator will meet quarterly with the project director to provide appropriate feedback on the program's implementation, parent/teacher/student/project staff concerns, project successes and deficiencies, as well as recommendations from parents, teachers, students, and project staff. An annual final report will be written to address the goals and objectives of the program for the five years that the program is funded. The final report will include the analysis of data to measure program impact. To enable program administrators to effectively plan (based on quality feedback and data), the evaluator will also meet with program administrators at the beginning and ending of each project year to discuss findings from the annual report.

As previously stated, both quantitative and qualitative data are included in the evaluation. The Evaluator will work with the Houston ISD Research and Accountability Department and the participating schools to obtain the following quantitative data for each campus: (1) Student demographic enrollment characteristics; (2) Parent activity sign-in sheets; (3) Documentation of

teacher certifications; (4) State academic and benchmark test data; (5) Identities of partners for each school; (6) Minutes of Advisory Committee meetings; (7) Staff development agendas and sign-in sheets; and (8) Magnet applications disaggregated by student race, ethnicity, and socioeconomic status. The STEM/IT Specialists will work with the Evaluator and staff to develop the following instruments for obtaining qualitative data: (1) Parent surveys; (2) Student surveys; (3) Project-based lesson matrices; (4) Lesson plans; (5) administrative/school leadership walk-throughs; and (6) student work protocols.

The following evaluation timeline will be followed for the proposed project:

Evaluation Timeline	Year 1	Year 2	Year 3	Year 4	Year 5
Selection of Evaluator	Jan 2018	N/A	N/A	N/A	N/A
Meeting with Key Personnel to explain procedures	March 2018	Aug 2018	Aug 2019	Aug 2020	Aug 2021
Meeting with Houston ISD Research and Accountability Department for academic data	N/A	Sept 2018	Sept 2019	Sept 2020	Sept 2021
Develop qualitative instruments	Mar 2018	Aug 2018	Aug 2019	Aug 2020	Aug 2021
Site visits - class visitation, school formative data review	N/A	Oct 2018, Apr 2019	Oct 2019, Apr 2020	Oct 2020, Apr 2021	Oct 2021, Apr 2022
Reports to Project Director	N/A	Oct 2018, Apr 2019	Oct 2019, Apr 2020	Oct 2020, Apr 2021	Oct 2021, Apr 2022
Preparation of Annual Progress Report	N/A	April 2019	April 2020	April 2021	April 2022

Preparation of Ad Hoc Report	N/A	Oct 2019	Oct 2020	Oct 2021	Oct 2022
Analysis of summative data	May 2018	June-Aug 2019	June-Aug 2020	June-Aug 2021	June-Aug 2022
Preparation of Complete Data Report	Oct 2018	Oct 2019	Sept 2020	Sept 2021	Sept 2022

(2) The extent to which the methods of evaluation include the use of objective performance measures that are clearly related to the intended outcomes of the project and will produce quantitative and qualitative data to the extent possible.

To ensure reliable qualitative and quantitative measures, the evaluation plan will document the history of the program, incorporating data on program development strategies, monitoring, and implementation activities. This strategy will capture valuable information on the perceptions of program participants regarding the extent that project activities meet the students' individual needs. The evaluation will also monitor the efficacy of program operations through classroom observations, site visits, meeting agendas, service provider logs, student parent surveys, and budgetary reports and documentation. This information will be utilized in both the formative and summative evaluations to modify practices and adjust expectations considering the data results. Additionally, the products of the formative and summative evaluations will be used to further refine and define program goals and determine the overall effectiveness of the project.

The evaluator will meet monthly with the Project Director to provide appropriate feedback on the program's implementation, parent/teacher/student/project staff concerns, project successes and deficiencies, as well as recommendations from parents, teachers, students, project staff, and other empirical evidence of published reports on other similar initiatives that have used

strategies and activities similar to those of the proposed project. Each year, an annual final report will be written to address the goals and objectives of the program for the five years that the program is funded. The final report will include the analysis of data to measure program impact. To enable program administrators to effectively plan (based on quality feedback/data), the evaluator will meet with program administrators at the beginning and ending of each project year to discuss findings from the annual report. The program evaluator will comply with all grant requirements from the funding agency. All project findings will be made accessible via the annual report to the USDE, as well as through other appropriate venues.

To ensure equity and high-quality STEM programming to the high-needs schools by providing high quality teachers, leaders, and active engagement into rigorous STEM education to increase their academic achievement and close the achievement gap, the project design and evaluation plan will require the use of objective performance measures that are clearly related to the intended outcomes of the *Partnerships that Fuel Opportunities in STEM Education* project. As previously stated, the purpose and desired outcomes that Houston ISD anticipates, as a result of the successful implementation of the project is to accomplish six outcomes: (1) The reduction of minority group isolation in the participating schools; (2) Provide all students an equal opportunity to meet state academic content and student achievement standards through engaging STEM educational programming; (3) Advance innovative methods and practices promoting diversity and increasing meaningful school choice options for students and their families across the District; (4) Substantially strengthen students' knowledge of academic STEM subjects and their attainment of tangible and marketable vocational, technological, and professional skills; (5) Fulfill the District's capacity-building role by providing extensive professional development for school staff that will sustain school operations at a high-performance level after funding ends;

and (6) Implement and improve courses of instruction to strengthen students' knowledge of academic subjects and attainment of post-secondary education or productive employment, especially in STEM fields.

All data, for the *Partnerships that Fuel Opportunities in STEM Education* project, will be collected, analyzed, and reported, including baseline data for the project's students, teachers, campuses, and parents. As previously stated, the proposed project's goals, measurable objectives, and MSAP performance measures for the proposed project includes the following:

Goal 1: Increase racial integration and socioeconomic diversity in the MSAP STEM schools.
Objective 1.1: By the end of the project period, the number of students outside of the isolated minority group will increase by 15% in the participating schools, as measured by the baseline year.
<ul style="list-style-type: none"> • Performance Measure A: The number and percentage of magnet schools receiving assistance whose student enrollment reduces, eliminates, or prevents minority group isolation.
Objective 1.2: By the end of the project period, the students' socioeconomic diversity will increase 15% in the MSAP STEM schools, as measured by the baseline year.
<ul style="list-style-type: none"> • Performance Measure A: The number and percentage of magnet schools receiving assistance whose student enrollment reduces, eliminates, or prevents minority group isolation.
Goal 2: Increase the academic achievement rates of all participating students in Reading/English Language Arts, Math, and Science in the MSAP STEM schools.
Objective 2.1: By the end of the project period, the number of participating students from outside

<p>of the isolated minority group scoring proficient or above on the State Reading/English Language Arts assessments will increase by 25%, as measured by the baseline year.</p>
<ul style="list-style-type: none"> Performance Measure B: The percentage increase of students from major racial and ethnic groups in magnet schools receiving assistance who score proficient or above on State assessments in reading/language arts as compared to previous year's data.
<p>Objective 2.2: By the end of the project period, the number of participating students from outside of the isolated minority group scoring proficient or above on State Math assessments will increase by 25%, as measured by the baseline year.</p>
<ul style="list-style-type: none"> Performance Measure C: The percentage increase of students from major racial and ethnic groups in magnet schools receiving assistance who score proficient or above on State assessments in mathematics as compared to previous year's data.
<p>Objective 2.3: By the end of the project period, the number of participating students from outside of the isolated minority group scoring proficient or above on State Science assessments will increase by 25%, as measured by the baseline year.</p>
<p>Objective 2.4: By the end of the project period, the number of participating students from low socioeconomic backgrounds scoring proficient or above on the State Reading/English Language Arts assessments will increase by 25%, as measured by the baseline year.</p>
<p>Objective 2.5: By the end of the project period, the number of participating students from low socioeconomic backgrounds scoring proficient or above on the State Math assessments will increase by 25%, as measured by the baseline year.</p>
<p>Objective 2.6: By the end of the project period, the number of participating students from low socioeconomic backgrounds scoring proficient or above on the State Science assessments will increase by 25%, as measured by the baseline year.</p>

Objective 2.7: By the end of the project period, the participating students' achievement rates for all demographic groups will increase by at least 5% each year by scoring proficient or above on State Reading/English Language Arts assessments, as measured by the baseline year.

- **Performance Measure B:** The percentage increase of students from major racial and ethnic groups in magnet schools receiving assistance who score proficient or above on State assessments in reading/language arts as compared to previous year's data.

Objective 2.8: By the end of the project period, the participating students' achievement for all demographic groups will increase by at least 5% each year by scoring proficient or above on State **Math** assessments, as measured by the baseline year.

- **Performance Measure C:** The percentage increase of students from major racial and ethnic groups in magnet schools receiving assistance who score proficient or above on State assessments in mathematics as compared to previous year's data.

Objective 2.9: By the end of the project period, the participating students' achievement for all demographic groups will increase by at least 5% each year by scoring proficient or above on State **Science** assessments, as measured by the baseline year.

Objective 2.10: By the end of the project period, the number of participating students from outside of the isolated minority group will increase their high school graduation rates by at least 5% each year, as measured by the baseline year.

Objective 2.11: By the end of the project period, the number of participating students from low socioeconomic backgrounds will increase their high school graduation rates by at least 5% each year, as measured by the baseline year.

<p>Goal 3: Increase industry, university, and community partnerships that will support and enhance the innovative themes at the MSAP STEM schools.</p>
<p>Objective 3.1: By the end of each project year, increase the number of STEM-related industry partnerships by at least one that will support and enhance the innovative themes at the MSAP STEM schools, as measured by the previous year.</p>
<p>Objective 3.2: By the end of each project year, increase the number of STEM-related university partnerships by at least one that will support and enhance the innovative themes at the MSAP STEM schools, as measured by the previous year.</p>
<p>Objective 3.3: By the end of each project year, increase the number of STEM-related community partnerships by at least one that will support and enhance the innovative themes at the MSAP STEM schools, as measured by the previous year.</p>
<p>Goal 4: Reduce minority group isolation in the six MSAP STEM schools.</p>
<p>Objective 4.1: By the end of the project period, the number and percentage of magnet schools receiving assistance will reduce minority group isolation by 25%, as measured by the baseline year.</p>
<p>Objective 4.2: By the end of the project period, the percentage of magnet schools that received assistance that are still operating magnet school programs three years after Federal funding ends will be 100%, as measured by the baseline year.</p>
<ul style="list-style-type: none"> • Performance Measure D: The percentage of magnet schools that received assistance that are still operating magnet school programs three years after Federal funding ends.
<p>Objective 4.3: By the end of the project period, the percentage of magnet schools that received assistance that meet the State’s annual measurable objectives and, for high schools, graduation</p>

rate targets at least three years after Federal funding ends will be 100%, as measured by the baseline year.
<ul style="list-style-type: none"> • Performance Measure E: The percentage of magnet schools that received assistance that meet the State’s annual measurable objectives and, for high schools, graduation rate targets at least three years after Federal funding ends.
Goal 5: Increase the instructional capacity of specialized and core-area teachers to deliver unique, innovative curriculum at the MSAP STEM schools.
Objective 5.1: By the end of each project year, Houston ISD will provide at least six STEM-focused opportunities for development and training to strengthen job-related skills and competencies aligned with the teachers’ identified areas of focus.
Objective 5.2: By the end of each project year, Houston ISD will provide at least two STEM-focused externship opportunities for development and training to strengthen job-related skills and competencies aligned with the teachers’ identified areas of focus.

Additionally, for the proposed project, each goal, objective, and MSAP performance measure will be evaluated as shown in the following chart:

Effectiveness Criteria	Instruments/Data Source	Formative/ Summative	Qualitative / Quantitative
Goal 1: Increase racial integration and socioeconomic diversity in the MSAP	a) Applications	a) Formative	a) Quantitative
	b) Application summary	b) Summative	b) Quantitative
	c) Enrollment data	c) Summative	c) Quantitative
	d) Recruitment plan	d) Formative	d) Quantitative

STEM schools.	e) Parent surveys	e) Summative	e) Qualitative
Objectives 1.1 – 1.2	f) Student surveys	f) Summative	f) Qualitative
Goal 2: Increase the academic achievement rates of all participating students in Reading/English Language Arts, Math, and Science in the MSAP STEM schools.	a) Benchmark testing	a) Formative	a) Quantitative
	b) STAAR/EOC tests	b) Summative	b) Quantitative
	c) Promotion rates	c) Formative	c) Quantitative
	d) Graduation rates	d) Formative	d) Quantitative
Objectives 2.1 –2.11			
Goal 3: Increase industry, university, and community partnerships that will support and enhance the innovative themes at the MSAP STEM schools.	a) MOUs	a) Summative	a) Quantitative
	b) SDMC minutes	b) Formative	b) Qualitative
	c) Other documentation of partnership activities, such as volunteer logs, sign-in sheets, etc.		
Objectives 3.1 – 3.3			

Goal 4: Reduce minority group isolation in the six MSAP STEM schools.	a) Applications b) Application summary c) Enrollment data d) Recruitment plan	a) Formative b) Summative c) Summative d) Formative	a) Quantitative b) Quantitative c) Quantitative d) Quantitative
Objectives 4.1 – 4.3	e) Parent surveys f) Student surveys g) Graduation rates	e) Summative f) Summative g) Summative	e) Qualitative f) Qualitative g) Quantitative
Goal 5: Increase the instructional capacity of specialized and core-area teachers to deliver unique, innovative curriculum at the MSAP STEM schools.	a) SD agendas b) Sign-in sheets c) Participant evaluations d) SD training records e) Lesson plans f) Walk-throughs g) Student projects	a) Formative b) Formative c) Formative d) Summative e) Formative f) Formative g) Formative	a) Quantitative b) Quantitative c) Qualitative d) Quantitative e) Qualitative f) Qualitative g) Qualitative
Objectives 5.1 – 5.2			

Description of how the evaluation methods and the use of objective performance measures will inform decision-making: Goal 1 (Objectives 1.1-1.2): Each project school will develop a yearly recruitment plan. During site visits, the Evaluator will view the documentation of the recruitment plan activities and modifications to the plan. The Magnet Coordinators will input data on each applicant into Houston ISD's data management system. Racially, ethnically, and socioeconomically disaggregated reports will be generated for the Program Manager and Evaluator at the end of each enrollment phase. These reports will generate discussions of the

need for further targeted recruiting efforts. Parent and student survey results will also help the staff to understand the factors driving student choice decisions at the six participating schools.

Goal 2 (Objectives 2.1-2.11): Each August, during the summer in-service, the school staff will meet to analyze the results from the previous year's State of Texas Assessments of Academic Readiness (STAAR) results. In grades 3-8, STAAR is administered to all students in reading and math. Science is tested in grades 5 and 8, writing in grades 4 and 7, and social studies in grade 8. The high school students take 12 End of Course (EOC) assessments. The results are disaggregated by race, ethnicity, socioeconomic, and linguistic needs. The plans for the coming year will be developed to ensure each student's mastery with students placed in tiers to determine the extent of intervention(s) needed. The benchmark testing will be administered two times a year to measure students' progress toward mastery of Reading, Math, and Science.

Goal 3 (Objectives 3.1-3.3): As noted previously in the proposal, extensive work has already been done in developing partnerships to enhance the STEM programs at the six schools. Each school will meet with their potential partners to develop plans to meet the needs of each respective partner to better support the STEM programming. Memorandums of Understanding (MOUs) will be created with each partner. Additionally, each school's Shared Decision Making Committee will review the progress of each partnership annually.

Goal 4 (Objectives 4.1-4.3) and Goal 5 (Objectives 5.1-5.2): Each school will purchase or develop curricula specific to their magnet theme to be implemented by the STEM Instructors. Additionally, core content teachers will work with the instructors to correlate their content area to the Texas Essential Knowledge and Skills (TEKS)—which are the state standards for what students should know and be able to do—with the STEM theme to support the magnet program. Staff development will be provided for administrators, STEM/IT Specialists, and core teachers.

Houston ISD maintains on-line data files of each employee's training record. The records for the project teachers will be printed and kept on file at the schools. The overall aims of the project to support and improve the instructional capacity of the specialized and core-area teachers will enable them to deliver a unique and an innovative STEM curriculum at the MSAP STEM schools, with the specific aim to increase the academic achievement of the participating students.

(3) The extent to which the costs are reasonable in relation to the objectives, design, and potential significance of the proposed project.

The proposed costs for the *Partnerships that Fuel Opportunities in STEM Education* Project are reasonable in relation to the objectives, design and significance of the proposed project. A project of this magnitude will need a substantial budget to keep it focused on the established goals and objectives of the project. Houston ISD has created a proposed budget for five years; the sustainability plan will encompass the specific areas that must continue in order to sustain the project when grant funding ends. The *Partnerships that Fuel Opportunities in STEM Education* project will serve approximately 4,259 students. The costs are very reasonable based on the number of services provided and the types of supports the students will receive during the life of the grant.

The purchase of equipment will be conducted following state guidelines for competitive bidding. The budgets for equipment proposed for the *Partnerships that Fuel Opportunities in STEM Education* project were developed using vendor-supplied information and represent the most current prices. If the District is awarded grant funds, Houston ISD will submit equipment specifications for all hardware items, installation, training, and all other information necessary for competitive bids as appropriate. The District will follow all state fiscal regulations in seeking and awarding bids for planned equipment purchases. Determination of equipment and supply

needs was made at the school level with assistance from central office staff and represents discussions of how best to implement the MSAP purposes and magnet themes at the six schools. All equipment, materials and supplies purchased with MSAP grant funds will supplement, and not supplant normal District purchases. The activities described in this proposal are supplemental to all existing programs in Houston ISD. The funds provided through this grant will supplement the existing services or activities required by state law, SBOE, or Houston ISD board policy. All activities of this grant are supplementary to existing structures and will not supplant current programs.

Houston ISD proposes to implement a project of significant complexity that will directly affect approximately 4,259 students by the fifth year of the performance period of the grant. In the project plan, through the support and commitment of Houston ISD resources, students are directly affected as early as opening day of the 2017-2018 school year. Furthermore, professional development (PD) for teachers will commence during the 2017-2018 school year—the PD possibly could begin before the announcement of the grant award is made, demonstrating Houston ISD’s commitment to the success of the project and the participating schools. The costs of the training are included in the MSAP budget proposal with the expectation that if grant funds are awarded, the District will recover these expenses as pre-award costs where permissible.

The programs at each school are costly to initiate and require significant levels of funding to implement them successfully. STEM programming in specific career pathways requires significant investments in teacher professional development and specialized equipment and materials. Additionally, the District has infused technology into each program to provide an engaging learning environment, attract middle class families back to the District, and create a level playing field of experiences for lower-SES neighborhood students. Houston ISD is firmly

committed to the success of all students and schools, the best use of its facilities, and the concept that magnet schools make the whole District stronger academically. Houston ISD is suffering budget cuts due to increasing operational costs with reduced revenue from state and local funds; yet its students' needs continue to grow. The MSAP funds are critical to the successful achievement of the project objectives and fulfillment of the District's commitment to provide quality school choices.

As previously stated, a portion of the funded award will pay for an external evaluator to facilitate the collection and assessment of data regarding the effectiveness of the program activities at the six participating schools. The projected cost of the evaluator for the program is extremely reasonable, and the evaluator will have extensive experience in evaluating grant-funded programs of this scope and complexity. All vendors, including the external evaluator, and outsourced activities will follow the standard laws of procurement. The project, implemented with fidelity, has the potential to make a significant difference in the lives of the participating schools' students, parents, and communities. This project will focus on services that are beneficial to high-need, low-income, special needs, minority, and/or ELL students.

The final school budgets, as they appear in the budget narrative attached in the appendices, are summarized in Table 5 below, and reflect an appropriate distribution of funds across school sites, years, and budget categories. The spending is aligned within the following parameters: (1) Whether a magnet program is being initiated or revised and the extent of the revision planned; (2) The phase-in plan of the program (per grade level each year); (3) The technology needs of the schools; (4) The number of students served; (5) The complexity of the proposed objectives; and (6) The requirements in terms of personnel, training, and equipment to ensure successful implementation of the theme and programmatic strands. At less than 7.5% of

the total, central operations expenses are reasonable and appropriate to ensure good management of grant funds while providing most of the funding to the school sites where it will have the most impact on students, and be most effective in achieving the MSAP purposes. The overall cost of this request—grant and match combined—per student impacted each year is approximately \$4,776. This is a reasonable investment in creating the new and three substantially revised magnet schools in an urban school district, and is more cost effective than many similar initiatives nationally.

Schools	Funding: Grant Request and Match					
	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	Total
Davila	\$598,339	\$577,807	\$575,687	\$284,661	\$208,827	\$2,245,321
Deady	\$596,031	\$753,372	\$488,132	\$412,313	\$201,203	\$2,451,052
Milby	\$443,260	\$399,774	\$372,430	\$256,057	\$224,205	\$1,695,725
Rusk	\$656,816	\$601,181	\$477,700	\$282,904	\$259,180	\$2,277,781
Washington	\$382,853	\$499,623	\$468,906	\$223,635	\$204,303	\$1,779,320
Wesley	\$600,299	\$643,490	\$600,041	\$353,098	\$220,159	\$2,417,088
Central Operations*	\$388,960	\$490,116	\$418,476	\$424,323	\$420,346	\$2,142,221
Match	\$1,039,962	\$1,053,948	\$1,068,348	\$1,083,186	\$1,088,239	\$5,333,683
Total Costs**	\$4,706,520	\$5,019,311	\$4,469,720	\$3,320,177	\$2,826,462	\$20,342,191

* *Central Operations with Indirect Costs* / ** *Total Costs with Direct + Indirect Costs*