



Market Opportunity Assessment Pearland Entrepreneurship Hub

February 12, 2021

Pearland Economic Development Corporation



(This page intentionally left blank.)

ACKNOWLEDGEMENTS

This publication was prepared by Business Cluster Development and Claggett Wolfe Associates in collaboration with the Pearland Economic Development Corporation and the City of Pearland. The statements, findings, conclusions, and recommendations are those of the authors and do not necessarily reflect those of Pearland Economic Development Corporation and the City of Pearland. Those involved in the project included:

Prepared For:

Pearland Economic Development Corporation

February 11, 2021

Submitted By:

Business Cluster Development
and
Claggett Wolfe Associates

Principal Authors:

Chuck Wolfe, Claggett Wolfe Associates
Carol Kraus Lauffer, Business Cluster Development

Contributors/Supporting Authors:

Jennifer Vincent, Claggett Wolfe Associates

The contributors and authors of the report owe a debt of gratitude to the many organizations and individuals that supported this effort with their time, information and insights.

(This page intentionally left blank.)

TABLE OF CONTENTS

Section	Title	Page
	Acknowledgments	i
1	Forward	1
2	Background and Approach	3
	2.1 Background	3
	2.2 Approach	3
3	Research Findings	7
	3.1 Overview	7
	3.2 Beneficiaries	7
	3.3 Minimal Viable Product (Value Propositions)	16
	3.4 Deployment	20
	3.5 Buy-in & Support	21
4	Mission Model Canvas	23
	4.1 Mission Achievement/Impact Factors	23
	4.2 Projected Project Utilization	26
5	Recommendations	27
Appendix A	Mission Model Canvas	30
	A.1 Mission Model Canvas	30
	A.2 Value Proposition Canvas	33
Appendix B	Three Horizons Model for Innovation	36
Appendix C	County Business Patterns Industry Activity	38
	C.1 Overview	38
	C.2 Findings	38
Appendix D	U.S. Utility Patent Activity	42
Appendix E	SBIR/STTR Activity	50
	E.1 SBIR Overview	50
	E.2 STTR Overview	50
	E.3 SBIR/STTR Award Activity	52
Appendix F	Interview Participants	54
Appendix G	Discussion Forum Findings	56

(This page intentionally left blank.)

LIST OF TABLES

Table No.	Title	Page
Table 3.1	Beneficiary Jobs	11
Table 3.2	Beneficiary Pains	12
Table 3.3	Beneficiary Gains	14
Table 3.4	Value of MVP Components by Primary Beneficiary	19
Table 4.1	Estimated Utilization/Participation Rates by Hub Offerings	26
Table 5.1	Assessment of Hub Impact Factors	27
Table C.1	Pearland Business Activity for All Businesses with Employees by 2-Digit NAICS Code Industry Sector (by # of Employees) - 2018	39
Table C.2	Pearland Business Activity for Businesses with Employees in Relevant Industry Sub-Sectors by 4-Digit NAICS Code (by # of Employees) - 2018	40
Table C.3	Pearland Business Activity for Businesses with Employees in Relevant Industry Sub-Sectors by 6-Digit NAICS Code (by # of Employees) - 2018	41
Table D.1	U.S. Utility Patent Activity for Patents with a Minimum of One Inventor Residing in Pearland, TX – January 1, 2015 to July 1, 2020	42
Table D.2	U.S. Utility Patent Awards for Patents with a Minimum of One Inventor Residing in Pearland, TX – January 1, 2019 to July 1, 2020	43
Table D.3	U.S. Utility Patent Applications for Patents with a Minimum of One Inventor Residing in Pearland, TX – January 1, 2019 to July 1, 2020	46
Table E.1	SBIR/STTR Awards to Pearland Businesses 2015 to 2020	52

(This page intentionally left blank.)

LIST OF FIGURES

Figure No.	Title	Page
Figure 3.1	Greater Houston Entrepreneurial Ecosystem	10
Figure 3.2	Pearland Entrepreneurship Hub MVP Framework	18
Figure 4.1	Pearland Entrepreneurship Hub Mission Model Canvas	25
Figure A.1	Mission Model Canvas	32
Figure A.2	Value Proposition Canvas	34

(This page intentionally left blank.)

SECTION 1: FOREWORD

The market opportunity assessment was developed using the Mission Model Canvas and its supporting Lean Startup: Value Proposition Canvas methodologies. An overview of each of the components of these methodologies is provided in Appendix A to assist the reader in understanding the content that appears in the feasibility study that follows.

The market opportunity assessment represents Phase I of the project and involves completing the first five sections of the Mission Model Canvas; Beneficiaries, Value Proposition (i.e., Minimal Viable Product), Deployment, Buy-in & Support, and Mission Achievement/Impact Factors. Once completed and accepted, the resulting information and findings will be used in Phase II of the project to complete the remaining four sections of the Mission Model Canvas: Key Resources, Key Activities, Key Partnerships, and Mission Budget/Cost. The combination of all the sections of the Business Model Canvas completed in Phases I and II of the project will constitute the Business Model and Plan for the project.

(This page intentionally left blank.)

SECTION 2: BACKGROUND AND APPROACH

2.1 BACKGROUND

The Pearland Prosperity Strategic Plan¹ established Business Formation & Early-Stage Growth as a key component of its strategic framework to:

“Establish a hub for entrepreneurship to concentrate local service and connect to the regional ecosystem.”

The Pearland Economic Development Corporation retained Business Cluster Development and Claggett Wolfe Associates to conduct a market opportunity assessment to fulfill this strategic initiative. The framework for the assessment focused on the needs of entrepreneurs, existing small businesses, and students (i.e., future innovators and entrepreneurs). However, the assessment also had an overarching objective of creating and/or expanding businesses and “primary” job opportunities for residents and students through economic diversification and growth. The approach used to perform this analysis is outlined in the following section.

2.2 APPROACH

The study began with a series of discussions between the project team (i.e., Carol Kraus Lauffer, Business Cluster Development and Chuck Wolfe, Claggett Wolfe Associates), the Pearland EDC and representatives from the project’s six-member steering committee² to formalize the project scope, establish a baseline for prioritizing the desired impacts, and discuss the range of users that could be served by the project (e.g., entrepreneurs, existing small businesses, and students). Based upon this early work, the project would:

- Complement or enhance the services and programs offered through the San Jacinto College Small Business Development Center (SBDC) – Pearland office, and other existing regional business support programs and services offered within the Greater Houston Ecosystem.
- Consider users seeking flexible workspace (i.e., coworking space and short-term occupancy offices), flexible prototyping and manufacturing space (i.e., maker space), and more robust and structured programs (i.e., incubation and acceleration programs).
- Evaluate opportunities for filling “gaps”, expanding service offerings, etc. with the ultimate objective of establishing a Minimal Viable Product (MVP) that would:
 - Help start and grow successful businesses and build a local business culture that embraces innovation and entrepreneurship.
 - Establish a learning environment that fosters innovation and encourages entrepreneurial pursuits while providing experiential learning opportunities for students (both K-12 and post-secondary programs).

¹ *Pearland Prosperity Strategic Plan*, Market Street Services, Inc., February 2020.

² Steering committee members included (in alphabetical order): Gary Bucek, San Jacinto College SBDC; Dwayne Busby, UHCL; Randy Ferguson, Pearland State Bank; Bill Jackson, Base Pair Biotechnologies, Inc.; Randeep Nambiar, Stellium, Inc.; and Scott Youngblood, CPA.

- Focus primarily on assisting entrepreneurs and small business in traded sectors³ that would result in the formation of “primary” jobs.
- Give priority to entrepreneurs and existing businesses with growth potential that are pursuing (or currently utilizing) Horizon 2 and/or Horizon 3 business models that result in the creation of “primary” jobs (see Appendix B for further details on Horizon 2 & 3 Innovations).
- Investigate collaborative opportunities through other Key Partnerships to help businesses in non-traded⁴ sectors to increase their opportunities for success through the adoption of Horizon 2 Innovations into their respective business models.
- Support other objectives and strategies of the Pearland Prosperity Strategic Plan that align with an Entrepreneurship Hub.

Following this guidance, the project team used the Mission Model Canvas and its associated Value Proposition Canvas (see Appendix A) to complete the Beneficiaries and Value Propositions segment of the Mission Model Canvas. The remainder of the market opportunity assessment involves completing the Deployment, Buy-in & Support and Mission Achievement/Impact Factors segments of the Mission Model Canvas. The goal of this process was the design of a Minimal Viable Product (MVP) that, when deployed effectively, would generate the Mission Achievement/Impact Factors. The resulting MVP would then set the stage for developing the business model and plan. The steps used to complete this process are listed below:

- Step 1: Identify potential Beneficiaries.
- Step 2: Review and identify industry sectors that could potentially obtain value from a project generated MVP and produce the desired Mission Achievement/Impact Factors.
- Step 3: Define a Minimal Viable Product (MVP) consisting of various value offerings (e.g., incubation program, acceleration program, incubation facility, and coworking space) to provide Beneficiaries with sufficient value to generate the Mission Achievement/Impact Factors established by the project’s supporters and partners.
- Step 4: Develop a deployment strategy for the MVP to maximize user engagement and generate the desired outcomes.
- Step 5: Outline the level of community support and buy-in for the proposed MVP.
- Step 6: Define the Mission Achievement/Impact Factors that will be generated by the MVP and measure them against those established by the project’s stakeholders.
- Step 7: Outline recommendations, as needed, to guide the business model and plan development process.

The project team reviewed published data from the following sources to complete the analysis and establish a baseline of activity as well as trends in the industry:

³ Businesses in traded sectors sell products or services to customers outside the region, state, or country (e.g., manufacturers and software developers selling state-wide).

⁴ Businesses in non-traded sectors sell products or services within the local/regional market (e.g., hair salons and restaurants selling locally).

- Innovation in Houston: A Study of the Bayou City's Startup Ecosystem.⁵
- U.S. Census Bureau County Business Pattern database.⁶ Data obtained from this source is outlined in Appendix C.
- U.S. Patent and Trademark Office.⁷ Data obtained from this source is outlined in Appendix D.
- <https://www.sbir.gov/>.⁸ Data obtained from this source is outlined in Appendix E.

Primary research was conducted using interviews (both Zoom video interviews and telephone), a Zoom group forum with a live polling exercise, and email exchanges with individuals representing each of the targeted Beneficiary segments (see Appendix F). Primary research also included LoopNet searches and Google Maps virtual tours to assess real estate conditions and potential sites that might house the project.

⁵ *Innovation in Houston: A Study of the Bayou City's Startup Ecosystem*, Accenture & The Greater Houston Partnership, March 2017.

⁶ Current activity was based on the most recent (i.e., 2018) County Business Pattern data.

⁷ Based on Inventor City searches using the advanced search features available on www.uspto.gov.

⁸ Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) grant activity.

(This page intentionally left blank.)

SECTION 3: RESEARCH FINDINGS

3.1 OVERVIEW

As the project team completed the primary and secondary research efforts outlined in Section 2, it concluded the following:

- The City of Pearland Entrepreneurial Ecosystem is part of the Greater Houston Entrepreneurial Ecosystem that includes the City of Houston as well as other surrounding communities including, but not limited to, Clear Lake, Galveston, League City, Pasadena, the Woodlands and Sugar Land as shown in Figure 3.1.
- Entrepreneurial activity in the Greater Houston Entrepreneurial Ecosystem is still emerging with assistance from:
 - Economic development organizations.
 - The region’s colleges and universities.
 - Recently established accelerators and entrepreneurial support programs.
 - Regional efforts such as HX Venture Fund’s fund of funds to expand the availability of investment capital beyond the historic focus of Private Equity heavily targeted towards the Energy sector.
- Entrepreneurial activity in the City of Pearland is currently concentrated in non-traded sectors with very limited activity in traded sectors as evidenced by the information provided in Appendix C.

Following the initial overview outlined above, research findings were aggregated into the following components of the Mission Model Canvas (see Appendix A).

- Beneficiaries.
- Minimal Viable Product (Value Propositions).
- Deployment.
- Buy-In & Support.

Summaries of the findings for each of these components are presented below.

3.2 BENEFICIARIES

As noted in Appendix A, Section A.1, Beneficiaries represent all of the people and entities whose Jobs (refer to Appendix A, Section A.2) could potentially be satisfied (or be fulfilled) through one or more of the value propositions incorporated into the MVP established by the project (e.g., flexible workspace, incubation and acceleration programs and services). The project team conducted both primary and secondary research to:

- Identify and prioritize the following potential Beneficiaries:
 - Direct Beneficiaries – Beneficiaries that will use the Entrepreneurship Hub’s programs, services, resources, and other offerings to get what they need to get done to reach their goals (i.e., Jobs). Emphasis was placed on Direct Beneficiaries that would be willing to embrace Horizon 2 and Horizon 3 business models (see Appendix B).

- Indirect Beneficiaries – Beneficiaries that will not directly use the Entrepreneurship Hub’s programs, services, resources and other offerings, but will accomplish what they want to get done through the success of the project’s direct Beneficiaries (i.e., their Jobs).
- Highlight the respective Jobs, Pains, and Gains of the project’s Direct and Indirect Beneficiaries.

An overview of the findings for each of the above is presented in sub-sections 3.2.1 through 3.2.4.

3.2.1 Direct Beneficiaries

Direct project Beneficiaries are described and prioritized below.

- Entrepreneurs – This Beneficiary includes both startups and early-stage businesses (i.e., 2 to 5 years in business) in traded sectors that will have a high probability of creating “primary” jobs. This group would be more likely to embrace Horizon 2 and Horizon 3 business models than established businesses and, thus, be more competitive and generate greater economic impacts. (Note: this group would include student entrepreneurs that have launched businesses).
- Existing Small Businesses – This Beneficiary includes established businesses (i.e., five plus years in business) that may benefit from a series of value propositions established for the Entrepreneurship Hub. In the City of Pearland, this Beneficiary includes two distinct groups as outlined below.
 - Businesses in traded sectors that will create or sustain “primary” jobs, and
 - Businesses in non-traded sectors that are seeking to implement innovative business practices (e.g., launching on-line shopping and home delivery, implementing augmented reality powered shopping experiences, engaging customers using chatbots and home delivery).

These two groups may benefit to varying degrees depending on their current business model (i.e., Horizon 1, 2 or 3), coachability and willingness to embrace change.

- Students – This Beneficiary includes primary, secondary and post-secondary students who, as a group, will likely outperform entrepreneurs in terms of embracing innovation and Horizon 2 and 3 business models. Nevertheless, their economic impact will probably not be realized for some time as they complete their education and formalize their career path. As a result, translating the benefits they receive from the project’s Value Proposition into its Mission Achievement/ Impact Factors will be delayed and not incorporated into near-term Mission Achievement/ Impact Factors. However, students represent the City of Pearland’s and the broader Houston region’s future so investing in this group will provide a pipeline that will generate significant returns in five, ten or more years.

3.2.2 Indirect Beneficiaries

Indirect Entrepreneurship Hub Beneficiaries are described below. This group will serve as stakeholders with each having an equal level of importance as Beneficiaries of the proposed Entrepreneurship Hub. As a result, they are not prioritized.

- The Pearland EDC and the City of Pearland.

- Academic Institutions (e.g., UHCL & UH, Rice University, Alvin and San Jacinto Community Colleges and the local K-12 schools within the Pearland and Alvin ISDs).⁹
- Existing Entrepreneurial and Business Support Programs (e.g., SBDC, TMCx, ION Smart Cities Accelerator, Houston Exponential, Junior Achievement, The Cannon Venture Studio, MassChallenge and Rice Alliance).
- Private Sector Partners & Other Stakeholders (e.g., Pearland State Bank and other banks, BioHouston, Pearland Chamber of Commerce, Brazoria County Hispanic Chamber of Commerce, Greater Businesses of Pearland, and accountants, attorneys and business consultants).

⁹ Academic institutions can be both Direct and Indirect Beneficiaries of the project. As a Direct Beneficiary, the institution's faculty may use the Entrepreneurship Hub's programs, services, resources, and other offerings to supplement/extend a course offering, establish a club or provide an after-school activity. As an Indirect Beneficiary, the institution itself may satisfy its Job of providing educational content to enrich students through fostering innovation and preparing students for entrepreneurial undertaking as well as providing experiential learning opportunities.

[illegible]

After reviewing entrepreneurial and entrepreneurial support activity and identifying project Beneficiaries, the project team proceeded to the next step in completing the Value Proposition Canvas by identifying:

- 10

The results in these tables represents summary findings from project interviews, polling exercises and observations derived from the project team’s experience in building entrepreneurial ecosystems. In addition, those highlighted in “bold” text represent Beneficiary Pains and Gains that were also identified in the Accenture and the Greater Houston Partnership 2017 study entitled, “Innovation in Houston: A Study of the Bayou City’s Startup Ecosystem”.

Based upon its research and industry experience, the project team also determined that only a small differential exists in the project’s ability to impact the three Direct Beneficiaries. Much of the impact experienced by each Direct Beneficiary will be associated with the nuances of each individual user and its choice of participating in (or using) the various MVP offerings. The impact on those choosing more structured support services will also vary based on a variety of factors including, but not limited to, stage of business development, industry sector, coachability and willingness to embrace a more advanced business model in an existing business operation.

Table 3.1: Beneficiary Jobs	
Beneficiary	Jobs (i.e., what each is trying to get done)
Entrepreneurs	<ul style="list-style-type: none"> Establish and grow successful business ventures to create wealth (individually and for employees) and/or attain social, environmental, or cultural goals.
Existing Small Businesses	<ul style="list-style-type: none"> Sustain and/or expand successful business ventures to create wealth (individually and for employees) and/or attain social, environmental, or cultural goals.
Students	<ul style="list-style-type: none"> Increase knowledge and skills needed to meet career and/or social, environmental, or cultural goals. Increase knowledge and skills to prepare for the pursuit of entrepreneurial endeavors. Increase knowledge and skills for personal enjoyment and enrichment.
Pearland EDC & The City of Pearland	<ul style="list-style-type: none"> Enhance the City’s innovation and entrepreneurial culture. Increase economic resiliency and diversity by supporting business formation, retention and growth. Foster business’ use of innovation and technology to improve local, regional and global competitiveness. Create “primary” jobs within traded sectors and create wealth for the City’s residents. Create an inclusive environment for supporting entrepreneurs and small business owners. Provide connectivity and awareness to maximize the impact of local, regional and state-wide programs, activities, etc. available to support entrepreneurs and small businesses within the City.
Academic Institutions	<ul style="list-style-type: none"> Provide students with real-world experiential learning opportunities to help them to more effectively tie their education to potential careers. Provide students with instructional content to help them build the knowledge and skills necessary to pursue their desired careers and/or achieve their social, environmental or cultural goals. Provide educational opportunities that increase student enrollment and participation in educational and other student focused activities (e.g., clubs and competitions).
Existing Entrepreneurial and Business Support Programs	<ul style="list-style-type: none"> Deliver solutions that provide value to each client and help them achieve their desired outcomes. Work collaboratively with other programs to maximize the value provided to each client and help them to achieve their desired outcomes. Generate outcomes that meet internal metrics and the needs of program partners and sponsors.
Private Sector Partners & Other Stakeholders	<ul style="list-style-type: none"> Increase the economic resiliency and diversity of the City by supporting business formation, retention and growth.

Table 3.2: Beneficiary Pains

Beneficiary	Pains (i.e., things that frustrate or prevent completion of Jobs)
Entrepreneurs	<ul style="list-style-type: none"> ▪ Limited or lack of access to debt and equity capital except for well-connected B2B startups in the Energy sector. ▪ Unaware of the various local and regional support programs or unclear as to which programs would help them to start and/or build a business (i.e., navigating the programs is confusing). ▪ Lack of access to a comprehensive support program to take a product or service from ideation to commercialization. ▪ Lack of opportunities to connect with other like-minded entrepreneurs and business owners in similar industry sectors or at similar stages of development from both within and outside of the City. ▪ Limited access to qualified professionals and industry experts/mentors for consultation/coaching. ▪ Limited culture of entrepreneurship or innovation. ▪ Lack of talent with technical and/or entrepreneurial experience needed to build a management team or staff a growing startup. ▪ Innovators with work visas tied to larger sponsoring corporations have limited ability to pursue starting a new venture. ▪ Outreach to entrepreneurs of different genders, ethnicities, and socio-economic groups is not regularly conducted.
Existing Small Businesses	<ul style="list-style-type: none"> ▪ Limited or lack of access to debt and equity capital except for well-connected B2B startups in the Energy sector. ▪ Unaware of the various local and regional support programs or unclear as to which programs would help them to build a business (i.e., navigating the programs is confusing). ▪ Lack of access to a comprehensive support program to take new products or services from ideation to commercialization. ▪ Lack of opportunities to connect with other like-minded entrepreneurs and business owners in similar industry sectors or at similar stages of development from both within and outside of the City. ▪ Limited access to qualified professionals and industry experts/mentors for consultation/coaching. ▪ Limited culture of innovation and/or willingness to embrace innovative business practices. ▪ Lack of talent with technical and/or managerial experience needed to grow businesses. ▪ Limited assistance with pivoting their businesses and/or identifying new market opportunities. ▪ Outreach to entrepreneurs of different genders, ethnicities, and socio-economic groups is not regularly conducted. ▪ Limited acknowledgement of non-retail or non-consumer service-related small business as valuable contributors to the local economy.
Students	<ul style="list-style-type: none"> ▪ Lack of internship opportunities with local companies. ▪ Limited or lack of community recognition and support at the K-12 level for non-college preparatory programs (e.g., skilled industry trade skills training programs). ▪ Lack of culture that embraces and encourages entrepreneurship as a career path. ▪ Limited or lack of opportunities to connect with entrepreneurs, business owners and other students around the topics of entrepreneurship and innovation. ▪ Lack of access to (or awareness of) integrated technical and entrepreneurship educational/training programs that extend from K-12 through college.
Pearland EDC & The City of Pearland	<ul style="list-style-type: none"> ▪ Limited culture of entrepreneurship or innovation. ▪ Lack of a clear and cohesive vision of how the City will participate in (and benefit from) supporting the City's entrepreneurs and small businesses in the traded sectors, and limited local and regional leadership. ▪ Limited or lack of coordination among existing public, private and nonprofit organizations supporting the formation and growth of new ventures and small businesses in traded sectors. ▪ Limited or lack of coordination amongst academic institutions with a presence in the City (or serving the City's residents) to establish a clear and cohesive vision for the role that each institution will play in supporting the City's economic future driven by innovation and entrepreneurship. ▪ Resident population, City and EDC focused predominantly on employment vs. entrepreneurship (including local innovators within the City of Pearland as evidenced by U.S. Utility Patent activity).

Table 3.2: Beneficiary Pains (Continued)

Beneficiary	Pains (i.e., things that frustrate or prevent completion of Jobs)
Academic Institutions	<ul style="list-style-type: none"> ▪ Limited culture of entrepreneurship or innovation. ▪ Mixed administrative and/or faculty support amongst the various academic institutions which inhibits the ability to establish a clear and cohesive vision of the role that each institution will play in providing a continuum of educational support for entrepreneurship and innovation at the primary, secondary and post-secondary levels of education. ▪ Resistance and a lengthy and time-consuming process for changing established curriculum that would support entrepreneurship and innovation. ▪ Limited pool of qualified (or interested) instructors to deliver the diverse instructional content needed to teach entrepreneurship and innovation. ▪ Budget or other financial constraints that could limit developing and implementing additional or enhanced entrepreneurship and innovation education and events. ▪ Very limited funded research at local universities that could lead to the commercialization of products or services¹⁰.
Existing Entrepreneurial and Business Support Programs	<ul style="list-style-type: none"> ▪ Limited culture of entrepreneurship or innovation. ▪ Limited awareness within the entrepreneurial and small business community of the solutions available to assist them in starting or growing their businesses. ▪ Limited resources for helping existing small businesses to pivot or identifying new market opportunities for growth. ▪ A competitive undercurrent within the region that inhibits full collaboration between programs driven, in some circumstances, by competition for clients, the need to establish their value to different sponsors and/or generate numbers-based metrics. ▪ Constraints established by funding sources that limit the program's ability to engage the skills/resources or dedicate the level of service needed to meet client needs. ▪ Lack of a sufficient pool of resources or professionals with the expertise necessary to meet the needs of clients in more specialized traded sectors that are new to the region (e.g., Industrial IoT, SaaS and Fintech) or those serving more complex domestic or international markets not commonly served by the region's existing traded sectors (e.g., Energy).
Private Sector Partners & Other Stakeholders	<ul style="list-style-type: none"> ▪ Limited culture of entrepreneurship or innovation. ▪ Limited local and regional leadership with a clear and cohesive vision of the future including how entrepreneurs and Subject Matter Experts (SMEs) in the traded sectors play a role in this future. ▪ Unaware of the various local and regional support programs or unclear as to which of these programs to support given the recent proliferations of programs. ▪ Limited integration or collaboration between public, private, nonprofit and academic efforts to support the formation and growth of new ventures and small businesses. ▪ Unclear roles and responsibilities of existing public, private and nonprofit organizations supporting the formation and growth of new ventures and small businesses in traded sectors. ▪ Limited engagement with entrepreneurs and small businesses due to a lack of awareness of the services that private sector partners offer (i.e., professional services offered by accountant, attorneys, marketing consultants, etc.). ▪ Limited or ineffective engagement with entrepreneurs and small businesses due to poor preparation (e.g., lack of information needed to complete a loan application or lack of market understanding prior to developing sales strategies and social media campaigns).

¹⁰ Based on a review of AUTM Statistics Access for Technology Transfer (STAT) data for the Rice University and the University of Houston from 2008 to 2018, university assigned U.S. Utility Patent activity presented in Appendix D and SBIR/STTR activity for Pearland based businesses as presented in Appendix E.

Table 3.3: Beneficiary Gains

Beneficiary	Gains (i.e., desired outcomes)
Entrepreneurs	<ul style="list-style-type: none"> Generate sufficient primary or supplemental income to provide a livelihood from a sustainable business in a traded sector and provide sufficient return for the time and resources invested. Establish a sustainable social enterprise that allows them to achieve the desired social, environmental or cultural goals associated with the enterprise.
Students	<ul style="list-style-type: none"> Secure a job and establish a sustainable career in a traded sector that utilizes their training and skills. Develop knowledge and/or skills to achieve personal goals including those that meet a social, environmental or cultural objective. Achieve an enjoyable, stimulating and engaging educational experience.
Existing Small Businesses	<ul style="list-style-type: none"> Generate sufficient primary or supplemental income to provide a livelihood from a sustainable business in a traded sector and provide sufficient return for the time and resources invested. Increase sales by expanding into new markets outside of the region and the state. Improve competitiveness and profitability by using technology, innovative business practices and more advanced business models.
Pearland EDC & The City of Pearland	<ul style="list-style-type: none"> Increase the creation of “primary” jobs within traded sectors. Transform the local community culture to embrace innovation and foster entrepreneurship and small business in traded sectors. Engage private, public, nonprofit and academic leaders to establish a clear and collective vision that outlines the role that entrepreneurs and small businesses in the traded sectors play in the City’s future economy. Foster innovation and provide commercialization support to improve the local, regional and global competitiveness of businesses within both traded and non-traded sectors. Establish public, private, nonprofit and academic partnerships to create and implement programs with clear roles and responsibilities that support “primary” job growth, wealth generation and community sustainability generated by business creation/growth within traded and non-traded sectors. Maximize the overall impact and return on investment from programs created to support “primary” job growth and business creation/growth within traded sectors. Support the formation and growth of enterprises that reflect the diversity of the City and the broader Houston region.
Academic Institutions	<ul style="list-style-type: none"> Continue to the transform the culture of administrators, faculty and students to embrace innovation and entrepreneurship. Engage a diverse cross section of local and regional businesses to create internships and experiential learning opportunities for the City’s students to improve their transition from school to work. Increase the diversity and number of credit/non-credit courses, clubs, etc. in entrepreneurship and innovation and secure qualified faculty, advisors and mentors to support these efforts. Increase enrollment in entrepreneurship and innovation courses, participation in clubs, etc. to sustain each effort and generate student outcomes. Provide students with a seamless transition in their educational pursuits from K-12 through college that will result in the creation and/or growth of businesses in the traded sectors. Support the creation of student enterprises.
Existing Entrepreneurial and Business Support Programs	<ul style="list-style-type: none"> Generate additional and ongoing demand for the programs and services offered. Have measurable outcomes that reflect the program’s impact(s) on helping entrepreneurs and small businesses build successful businesses. Establish non-competitive partnerships with other business assistance programs to leverage limited resources and maximize the value provided to client companies. Provide value and generate sufficient measurable outcomes to attract additional public and private capital to support existing or proposed programs.
Private Sector Partners & Other Stakeholders	<ul style="list-style-type: none"> Increase customer or member base by supporting business formation, retention and growth. Establish public, private, nonprofit and academic partnerships to create and implement programs that support job growth, wealth generation and community sustainability generated by business creation/growth within traded and non-traded sectors.

3.2.4 Additional Observations and Findings

The following is an overview of additional observations and findings generated from the primary and secondary research while conducting the market opportunity assessment for the Entrepreneurship Hub. This overview also includes the project team's observations relative to its experience in working to expand and strengthen entrepreneurial ecosystems in the U.S. and around the world.

- The region's residents have shown a propensity towards innovation as evidenced by the patent awards and applications presented in Appendix D. However, these innovations have remained the property of major multi-national corporations and other business located outside of the City of Pearland. A cursory review of patent activity aggregated by "inventor city" for the period from January 1, 2019 to July 1, 2020 showed that over 95% of the awarded patents and patent application were associated with inventors whose patent was assigned to businesses located outside of the City.
- The project team found a significant level of suppressed data for the City of Pearland from the U.S. Census Bureau County Business Patterns database. Based on this finding and the level of reported data, the project team would anticipate a potential pool of approximately 200 existing businesses in the Manufacturing and Professional, Scientific, and Technical Services sectors that may be potential clients of the Entrepreneurship Hub's programs and services. This pool of businesses, along with a small cross section of high growth businesses in other industry sectors, would likely generate 28 to 48 clients over a five-year period.
- The City is served by a strong post-secondary educational infrastructure in the surrounding area (i.e., UH, UHCL, Rice University, San Jacinto Community College, Alvin Community College and Brazosport Community College) as well as a UHCL campus in Pearland. These institutions have relationships with the major oil companies, TMC, NASA, Google, etc. that can serve as a foundation for stimulating innovation and new venture formation in Pearland and provide the workforce necessary to grow successful businesses. Students at these institutions tend to seek employment with the major firms mentioned here, versus choosing an entrepreneurial endeavor.
- Several post-secondary educational institutions (e.g., San Jacinto Community College, UH, UHCL) currently have programs (e.g., the Small Business Institute at UHCL) or offer courses that support entrepreneurs and small business owners (e.g., both SJCC and Alvin Community College offer small business management courses), and some institutions are in the process of expanding their programs. The Pearland Campus of UHCL has space that can accommodate business plan competitions and other events to support innovation and entrepreneurship, in addition to an interest in offering the space for these purposes. UHCL, for example, has a Startup Business Luncheon speaker series.
- The region also has a cross-section of primary and secondary educational infrastructure at the Pearland and Alvin ISDs (e.g., Robert Turner College & Career High School, J.B. Hensler College & Career Academy) that are receptive to the concept of increasing their focus on entrepreneurship and innovation.
- Traditionally, Houston is a corporate city, dominated by the presence of larger firms (especially in the energy industry), and smaller and younger firms tend to bootstrap versus raise outside capital. Several organizations, including Houston Exponential and the Greater Houston Partnership, are working to shift the culture and mindset in Houston, but it will take time.

- As described earlier, the Greater Houston entrepreneurial ecosystem has greatly expanded over the past few years. However, Pearland’s entrepreneurial assistance efforts are in their infancy and the City has yet to determine its role in the larger regional ecosystem.
- During the Discussion Forum, the individuals that participated in the live polling exercise provided the following additional perceptions and insights (see Appendix F):
 - The levels of collaboration amongst the various participants in the Greater Houston entrepreneurial ecosystem are described as “siloed with bridges” or “siloed.” Additional work can be done to foster linkages and relationships among the various entrepreneurial support programs and stakeholders in order to provide a more supportive environment for entrepreneurs and small businesses and increase the numbers of startups.
 - A majority of participants rated the entrepreneurial infrastructure for stimulating innovation, encouraging commercialization of ideas and scaling business operations in other traded and non-traded sectors—with the exception of the Energy sector—as needing additional work.
 - A majority of participants indicated that they did not think the level of regional entrepreneurial activity over the next 3 to 5 years would be sufficient to support the region’s existing or planned entrepreneurial support programs unless these programs attract entrepreneurs from outside of the greater Houston region.
- Although the greater Houston entrepreneurial ecosystem has expanded its offerings (e.g., business accelerators, coworking/maker spaces and equity funding), the project team did not identify any Ideation efforts to stimulate entrepreneurial activity.
- Pearland is perceived as a great place to live and recognized for its good schools and the number of retail/restaurant businesses in the community. It lacks a strong brand identity and visibility as a place to start and grow your traded sector, “primary” job generating business and needs to differentiate itself within the growing Greater Houston ecosystem.
- Philanthropy in Houston and Pearland has generally been directed at social programs and cultural institutions. Yet, increased philanthropy will be required to support the entrepreneurship and innovation-focused efforts.
- The Galveston Economic Development Partnership has been discussing and engaging different organizations in Greater Houston, including the Pearland EDC, to help to connect the two regions for economic development purposes. Some of these efforts may yield opportunities for increased seed stage capital, in addition to collaboration on shared goals.

3.3 MINIMAL VIABLE PRODUCT (VALUE PROPOSITIONS)

The Minimal Viable Product (MVP) was developed from the project team’s research and observations of the City’s and greater Houston region’s current entrepreneurial ecosystem, and the Value Propositions derived from an assessment of the Jobs, Pains, and Gains identified in Section 3.2.

The following Value Propositions represent the components of the Entrepreneurship Hub’s MVP which would be an integral part of building the City’s entrepreneurial ecosystem as it establishes itself as an active participant in the broader Houston entrepreneurial ecosystem. Each value offering is described below and further highlighted in the Mission Model Canvas presented in Section 4. Additional details

will be provided in Phase II of the project as the project team develops the Key Resources and Key Activities components of the Mission Model Canvas.

The offerings that follow are prioritized in the order in which Direct Beneficiaries have identified their value in helping them overcome their Pains, achieve their Gains, and generate their desired outcomes. As a result, Direct Beneficiary participation in the Entrepreneurship Hub will be impacted by its ability to deliver value when implementing each of these components. An overview of the Entrepreneurship Hub's operational framework and linkages is provided in Figure 3.2.

- Ideation & Innovation Competitions – There are a number of variations to this MVP value offering but an overview that the project team considers relevant to the Entrepreneurship Hub is presented in the definition below taken from www.digital.gov¹¹ as they describe how ideation competitions are used by federal agencies such as the U.S. Patent & Trademark Office¹² to foster innovation and solve problems:

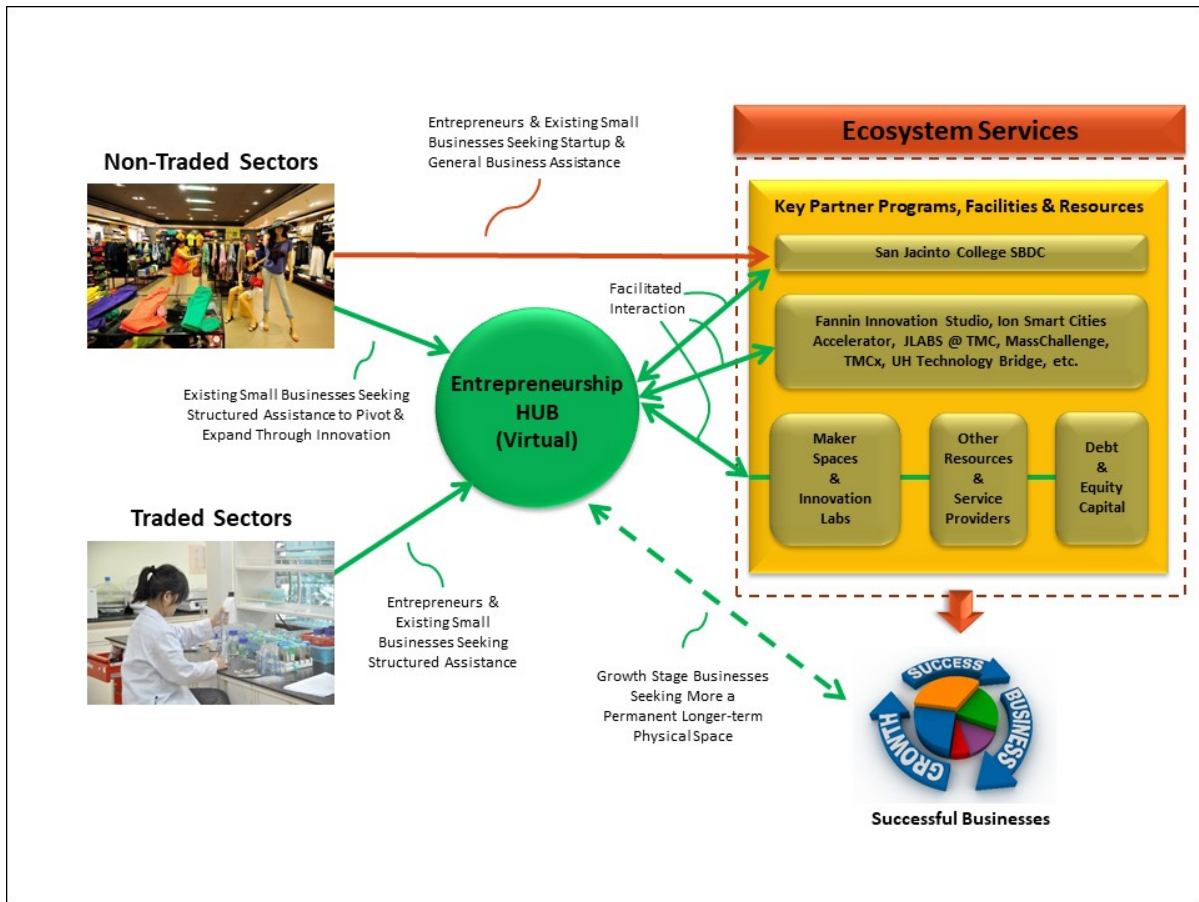
“Ideation is the process of generating and developing new ideas to solve a problem or improve a product, process, or service. Public and private sector organizations commonly engage in ideation with the public or their customers. Challenge and prize competitions can gather ideas from the public, including experts, academics, students, and the private sector, on how to solve a problem. Sometimes the ideation phase is the first of several stages, where ideas are implemented in later phases” through other follow-on efforts such as business plan competitions and incubation and acceleration programs.

- Business Plan Competitions – This MVP value offering is a City focused competition for City residents and those seeking to open a business in Pearland. The competition would build on the competition currently under development by the Pearland Leadership Foundation and will emulate the nationally ranked, student-focused Rice Business Plan Competition. The competitions can be used to directly launch or enhance a local business operation as well as serve as a feeder to regional and national incubation and acceleration programs and other regional and national competitions. Competition segments may include different cross sections of the community (e.g., students, new startups, existing businesses, etc.) which should be determined following further research focused specifically on this offering.
- Student Programs to Foster Innovative Thinking and Encourage Entrepreneurship – This is an essential component of the MVP as it provides value to students as Direct Beneficiaries and value to multiple In-Direct Beneficiaries (e.g., academic institutions and economic development organizations). The importance of this component of the MVP cannot be understated as it also lays the foundation for effecting transformational change within the City as innovative thinking and entrepreneurship gain traction over time. A clear Beneficiary Job that would benefit from this offering would be the City's desire to enhance City's innovation and entrepreneurial culture.

¹¹ Digital.gov's mission is to transform how government learns, builds, delivers, and measure digital services in the 21st century. The Digital.gov team is comprised of a cross-functional team of writers, editors, strategists, technologists and designers who all work at the Technology Transformation Services at the General Services Administration.

¹² USPTO Patents for Humanity <https://patentsforhumanity.devpost.com/>.

Figure 3.2: Pearland Entrepreneurship Hub MVP Framework



- **Pro-Active Coaching** – This MVP value offering differs from existing offerings by engaging entrepreneurs and existing small business owners in a pro-active incubation process that extends beyond the current engagements with the SBDC. This value offering takes them through all the stages and aspects of developing or expanding the business rather than periodic engagements based upon client identified needs. The proposed pro-active vs. passive approach¹³ involves more intensive oversight and concentrated engagements to a limited number of clients that could translate into 50 to 100 or more hours of support per year. Clients will be supported using a “case management” approach which provides guidance from start to finish using mutually established milestones and performance metrics (e.g., product launch and financial sustainability). The “case management” process will include:
 - A client selection process (e.g., “coachable” entrepreneurs with sound business models).
 - A client graduation process (e.g., milestones are attained).

¹³ Passive programs rely on the client to identify their needs and then seek out the appropriate solution or providers to help them to fill these needs. Pro-active programs take an active role in helping the business to establish milestones and performance metrics, identify services and resources, facilitate the interaction with service and resource providers, monitor progress against established milestones and performance metrics, and assist in “pivoting” the business model based on changing operational or market conditions.

- A case manager, who would be either a staff person or contractor, that works with his/her client to establish milestones, connects the client to appropriate internal (i.e., Entrepreneurship Hub) and external service providers and resources (e.g., Ion Smart Cities Accelerator and Greentown Labs), facilitates the interaction with internal and external service providers and resources to monitor outcomes and identify additional needs, and tracks client performance relative to milestones to establish when the client will graduate from this component of the Entrepreneurship Hub.

It is important to note that this component of the Entrepreneurship Hub is designed to provide an increased level of service to a limited number of clients (see Section 4.2 for Entrepreneurship Hub utilization projections). As a result, additional efforts will be necessary to ensure that this approach is acceptable to program funders and supporters.

The specific operational aspects of this value offering will be more fully developed in the Key Activities component of the Mission Model Canvas. It is also important to note that business counseling and mentoring will be undervalued until a clear correlation is established between these offerings and the success of Entrepreneurship Hub clients. Although this component of the Entrepreneurship Hub MVP will have the greatest impact on client success, program funders and supporters will have to understand that the impacts from pro-active business counseling and mentoring will take longer to evolve as clients move from startup and early-stage operations to sustainable business models.

- Location Assistance and Incentives – This MVP value offering is an extension of the current efforts of the Pearland EDC but focuses on early-stage companies that are emerging from the various Houston incubation and acceleration programs (e.g., TMCx, The Ion and Fruition Technology Labs). As these companies reach a size in which they are ready to move beyond the local sphere of these programs, the Entrepreneurship Hub staff would identify the opportunity and facilitate the interaction with the Pearland EDC to identify potential locations within the City and develop an incentive package to entice the business to location within the City.

As a next step in the market assessment process, the project team rated the value each of the MVP value offerings relative to each direct Beneficiary as shown in Table 3.4.

Table 3.4: Value of MVP Components by Primary Beneficiary			
	Entrepreneurs	Existing Small Businesses	Students
Events & Activities	High	Moderate	Moderate
Ideation & Innovation Competitions	Low/Moderate	Low	Moderate/High
Business Plan Competitions	Moderate/High	Low/Moderate	Moderate/High
Student Programs – Innovation & Entrepreneurship	NA	NA	Moderate
Pro-Active Coaching - Entrepreneurs	Moderate/High	NA	Low
Pro-Active Coaching – Existing Small Businesses	NA	Moderate/High	NA

3.4 DEPLOYMENT

The project team identified multiple channels available for deploying the MVP defined in Section 3.3. These channels were identified and prioritized based on market conditions, and the region's entrepreneurial and existing small business culture. The following deployment channels are listed from highest to lowest in terms of their ability to attract and engage users to the project. Additional details of these deployment channels will be more fully developed in the Key Resources and Key Activities component of the Mission Model Canvas.

- **Events & Activities** – The most effective deployment channel will be events and activities to spur innovation, ideation and entrepreneurship. They will include business plan competitions, hackathons, featured speakers and other events. Offering prize money or other awards will help to enhance the attractiveness of the events and activities. Events and activities will be directed primarily at Pearland residents or those who may wish to start a business in Pearland; existing traded sector, small businesses located in Pearland; and students at the college and high school level as a means for spurring innovative thinking and entrepreneurial ideas. Events and activities will be knowledge building events designed to provide information and teach skills, as well as social and networking events. They will be conducted on a virtual basis during the pandemic and then would transition to in-person events when it becomes appropriate to do so. Each event will be designed as a platform for guiding the Primary Beneficiaries to the various solutions (including Key Partner solution providers) needed for developing innovative business and product ideas, in addition to serving as a platform for engaging Indirect Beneficiaries as Key Partners in the creation, hosting and deployment of the events and activities. In addition, events and activities will play an important role in deployment as visible actions that help to build awareness of Pearland as a hub for innovation and the offerings that Pearland provides to entrepreneurs and small businesses.
- **Social Media & Website** – The next most effective deployment channel for reaching the intended demographic and especially for effective outreach to students will be social media and a well-designed website. Also, lessons learned from the pandemic demonstrate the power of social media in promoting virtual events. Particular attention should be paid to inclusive outreach among the diverse community organizations in Pearland and use of social media channels that will effectively engage all of Pearland in the events, activities and programs at the Entrepreneurship Hub.
- **Academic Partner Promotion** – Academic institutions, including SJCC, Alvin CC, UHCL and the two ISDs will be critical for deployment, as their students are a key audience for the Entrepreneurship Hub. Each Academic Partner must promote the Hub and its events and activities to its students, as well as periodically host events and activities on its campuses.
- **Key Partner Referrals** – The successful deployment of the Hub is predicated on referrals from Key Partners both in and around Pearland and the Greater Houston ecosystem. The Greater Houston ecosystem's growing and evolving landscape requires fostering strong relationships with Key Partners and supporting and encouraging cross-referrals, from the partners to Pearland and from Pearland to the variety of resources offered in the ecosystem. Relationships within Pearland, including the Pearland Chamber of Commerce, the Brazoria County Hispanic Chamber of Commerce, Greater Businesses of Pearland, the SBDC, the Pearland Leadership Foundation, the ISDs and other organizations with a presence in Pearland are equally important for successful deployment.

3.5 BUY-IN & SUPPORT

To proceed, the project's MVP will have to secure and maintain a sufficient level of support (i.e., agreement with the MVP and a potential for engagement with the MVP) from representatives of each of the following groups.

- Pearland EDC and the City of Pearland.
- Academic Institutions and the Independent School Districts.
- San Jacinto Small Business Development Center.
- Pearland Chamber of Commerce, Brazoria County Hispanic Chamber of Commerce, and Greater Businesses of Pearland.
- Pearland Prosperity Implementation Committee.

Through its research efforts, the project team found strong Buy-In and Support (e.g., funding, political/community support and/or a willingness other organizations to participate as a Key Partner) from key individuals at the Pearland EDC and City of Pearland, academic institutions including the San Jacinto Community College, the University of Houston-Clearlake and the Independent School Districts that serve Pearland, as well as a number of other private, academic and nonprofit organizations located within and outside of the City of Pearland. Based upon these findings, the project team determined that sufficient Buy-in and Support is present to move the effort forward to the business model and plan phase of the project. However, the project team also found the following issues that will require consideration and must be addressed as the project moves forward:


- The greater Houston ecosystem hosts a growing number of entrepreneurial support organizations, from accelerators to coworking/maker spaces to business plan competitions and other events. A number of the leaders of the organizations and programs in the ecosystem were interviewed for this project and expressed interest in participating and collaborating with an Entrepreneurship Hub in Pearland; efforts will be required by Pearland to ensure the continued support and future participation of these organizations.
- The time horizon for anticipated results of the Entrepreneurship Hub and its activities will be long-term. Anecdotal information gathered during the interviews found varied time horizons for generating tangible results with some seeking results in 18 to 24 months while others did not have a defined timeline. However, interviewees did not clearly define "tangible results" during the interviews. As a result, additional work will be required to both define tangible results and acceptable timelines for generating these results.
- A change in personnel will occur at the Small Business Development Center in about six months with the anticipated retirement of the long-time Business Advisor located in Pearland. Nevertheless, leadership at the SBDC at SJCC remains and changes at the Business Advisor level will create opportunities for entrepreneurs in Pearland and the Hub. Collaboration and cooperation between the Hub and the SBDC, as well as the Chamber which hosts the SBDC's Pearland office, are critical.
- Strong support for an Entrepreneurship Hub was found among administrators and faculty at UHCL, SJCC and Alvin Community College, which all serve Pearland and the region. Each organization indicated that securing additional Buy-In and Support within their respective institutions should go smoothly for non-credit courses at the college and university level and extra-curricular activities (e.g., clubs and activities) at all levels. However, securing Buy-in and

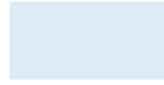
Support for Hub initiatives that would involve the creation of new credit courses, changes in K-12 curriculum or other activities involving higher level approvals (e.g., Texas Education Agency or national accreditation) would be much more difficult and therefore take much longer to achieve.


- Inclusive outreach within Pearland and inclusive engagement in entrepreneurial programming, events, etc. are equally critical for the success of the Hub. During the interviews, numerous regional stakeholders described Houston as a very diverse community, and those that live or work in Pearland applied the same description to Pearland. At the same time, some stakeholders characterized different segments of the Pearland community as being somewhat insular with established networks and connections which can, at times, serve as barriers for individuals and businesses outside of those networks. The success of the Hub can only be achieved by effectively recognizing the importance of engaging the entire community, including diverse groups, and actively conducting outreach to ensure their participation in the Hub and its programs. Collaborating with groups such as Greater Businesses of Pearland, the Brazoria Hispanic Chamber of Commerce and other groups that bring together the City's diverse population will be important for achieving Buy-In and Support.

SECTION 4: MISSION MODEL CANVAS

As noted in Section 1, the Mission Model Canvas utilizes a LEAN startup methodology to present a single page tool that presents a comprehensive business model for the Entrepreneurship Hub. During the market opportunity assessment process, the project team used the information presented in Section 3 as well as its experience in building business support ecosystems around the world to complete the Beneficiaries, Value Propositions, Deployment and Buy-in & Support components of the canvas associated with the Entrepreneurship Hub's MVP. In this section, the project team extended this work to develop the Mission Achievement/Impact Factors component of the canvas. The project team also estimated utilization of various Entrepreneurship Hub value offerings. The Mission Model Canvas is presented in Figure 4.1. Additional detail will be developed when the remainder of the Mission Model Canvas is completed during the business model and plan development phase of the Entrepreneurship Hub. A color key for the Mission Model Canvas is provided below.

 Activities, resources and physical assets highlighted in “yellow” represent primary study findings or actions for their respective portion of the Mission Model Canvas. For example, “yellow” is used to represent groups that will be engaged as clients or users and thus will be the primary (or direct) Beneficiaries of the MVP. At the same time, Social Media and Events are primary actions that will be implemented to deploy the MVP.

 Findings and actions highlighted in “blue” represent secondary Beneficiaries that serve as stakeholders, supporters, and partners. Although this group will benefit from the Entrepreneurship Hub, it is important that they follow the basic premise of success identified Brad Feld's book entitled “Startup Communities: Building an Entrepreneurial Ecosystem in Your City” where it was stated “In Boulder, people are willing to work harder and devote a greater amount of time to help startups succeed with no expectations for reward.”¹⁴

 Activities, resources and physical assets highlighted in “orange” represent the core Value Proposition of the Entrepreneurship Hub's business model. Building the business model around the Value Proposition keeps the Entrepreneurship Hub focused on its Beneficiaries and their needs. By implementing and maintaining its Value Proposition, the Entrepreneurship Hub will attract the broadest range of users and have the greatest impact on achieving the Entrepreneurship Hub's Mission Achievement and Impact Factors.

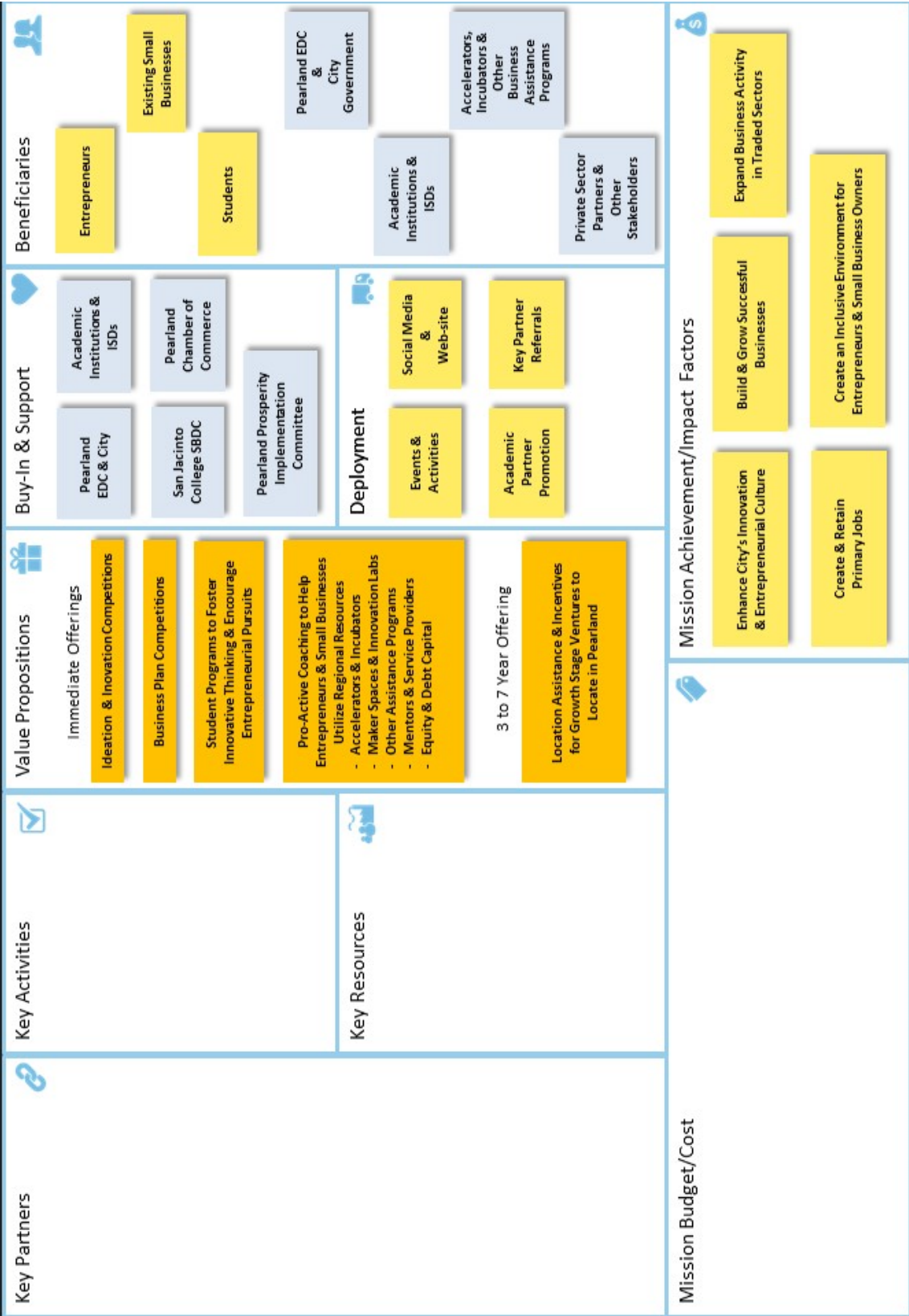
4.1 MISSION ACHIEVEMENT/IMPACT FACTORS

Mission achievements/impact factors are divided into six categories that align with the aggregated mission of the Beneficiaries and key Entrepreneurship Hub goals (see Section 2). Additional detail will be developed for this section of the Mission Model Canvas during the business model and plan development phase of the Entrepreneurship Hub to establish a baseline of anticipated qualitative and quantitative impacts for each factor. These, in turn, will serve as metrics for monitoring the Entrepreneurship Hub's performance over time following its launch.

¹⁴ Feld, Brad, *Startup Communities: Building an Entrepreneurial Ecosystem in Your City*, John Wiley & Sons, Inc., 2012, p. 16.

- Enhance City’s Innovation & Entrepreneurial Culture – This Mission Achievement/Impact Factor is foundational as it addresses a shift in the mindset of public officials, City and Pearland EDC staff, residents, program operators, local faculty, and students. The MVP includes various activities, programs, and services to bring these groups together in social, business, and educational settings to understand and embrace innovation and entrepreneurship.
- Build & Grow Successful Businesses – This Mission Achievement/Impact Factor is directly tied to the “Expand Business Activity in Traded Sectors” and “Create & Retain Primary Jobs” discussions below. However, it is listed separately due to its importance in maximizing the Entrepreneurship Hub’s impact, and its ultimate success. Specific emphasis is placed on the term “successful businesses” as it transcends local interpretations of success and focuses on establishing practices that will build nationally and globally competitive businesses. As a result, the Entrepreneurship Hub MVP includes an overarching emphasis on building and growing successful businesses. As this factor is directly tied to the “Expand Business Activity in Traded Sectors” and “Create & Retain Primary Jobs” factors below, the additional work to develop qualitative and quantitative measures during the business model and plan development phase of the Entrepreneurship Hub will be coordinated with these additional impact factors.
- Expand Business Activity in Traded Sectors – Appendix C showed that the City has a very limited base of business activity in traded sectors. As a result, the City’s economy is heavily reliant on non-traded (or less-traded) sectors such as retail and health care services. Consequently, entrepreneurial and small business activity in both existing and new traded sectors must be expanded to increase economic opportunities for the City and its residents. The Entrepreneurship Hub MVP is designed to stimulate activity in existing and new traded sectors by supporting the formation and growth of new businesses with an emphasis on those embracing Horizon 2 or 3 Innovation. The MVP is also designed to assist those non-traded sectors businesses looking to adjust their business model to adopt Horizon 2 Innovation.
- Create & Retain Primary Jobs – This Mission Achievement/Impact Factor is a direct outcome of the first three impact factors outlined above. Assistance with ideation and innovation, and then guidance with business startup and growth, will ultimately contribute to the creation and retention of “primary” jobs in Pearland. It will benefit not only startups but also existing small businesses in the community who need assistance with developing new product or service ideas to expand their businesses, or to pursue new markets for their products and services. Longer term, Pearland would prepare to capture the growing companies with appropriate sites and space to accommodate their growth as outlined in the MVP.
- Create an Inclusive Environment for Entrepreneurs and Small Business Owners – This Mission Achievement/Impact Factor focuses on making a concerted effort to engage across all residents and business owners in Pearland and paying particular attention to people and groups across a wide spectrum of gender, race, ethnicity and cultures. Many of the stakeholders that were interviewed commented on the tremendous diversity in Houston, as well as in Pearland. Yet, a number of those interviewed indicated that they may not conduct intentional outreach to engage diverse members of the community to the extent that they should (as described under Buy-in and Support). The mission and ultimate outcome are the implementation of an approach that produces tangible results in terms of inclusivity in event participation, new business formation and existing business growth.

Figure 4.1: Pearland Entrepreneurship HUB Mission Model Canvas



4.2 PROJECTED ENTREPRENEURSHIP HUB UTILIZATION

The project team used the research conducted for this study, and the information outlined in Section 3, to develop utilization projections by targeted program or activity for the first five (5) years of operation. A breakdown of the Entrepreneurship Hub's projected utilization is provided in Table 4.1.

Table 4.1: Estimated Utilization/Participation Rates by Hub Offerings

	Year 1	Year 2	Year 3	Year 4	Year 5
Events & Activities (Estimate 1 per quarter)	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40
Ideation & Innovation Competitions (Estimate 1 per year)	25 to 30	25 to 30	25 to 30	30 to 40	30 to 40
Business Plan Competitions (Estimate 1 per year)	25 to 30	25 to 30	25 to 30	30 to 40	30 to 40
Student Programs – Innovation & Entrepreneurship	TBD	TBD	TBD	TBD	TBD
Pro-Active Coaching - Entrepreneurs	2 to 6	2 to 6	4 to 8	6 to 10	8 to 12
Pro-Active Coaching – Existing Small Businesses	4 to 8	4 to 8	6 to 10	6 to 10	8 to 12

The project team anticipates the participation in the events & activities, competitions and pro-active coaching services will continue to increase in years six (6) to 10 as:

- Efforts to enhance the City's innovation and entrepreneurial evolves take hold.
- Awareness of the Entrepreneurship Hub and its value offerings increases throughout the City.
- Testimonials are obtained from entrepreneurs and existing small business whose success and/or growth can be attributed to Entrepreneurship Hub.

The level of these increases cannot be determined at this point and will not be well understood until the Entrepreneurship Hub's business model has been in operation for three (3) to four (4) years, and full integration of all programs is achieved (both internally and with Key Partners). As a result, any future program enhancement efforts should not be considered until at least the third year of operation.

The level of participation in student programs cannot be determined at this time and must be determined following a market assessment and business model development effort focused specifically on this effort (which is not part of the scope of work).

SECTION 5: RECOMMENDATIONS

The following recommendations address the project's market opportunity in terms of the MVP's ability to attain or create the Mission Achievement/Impact Factors outlined in Section 4.1. In addition, key factors to success include the project's ability to have:

- Strong Buy-in & Support, as well as engagement, from stakeholders including the growing number of entrepreneurial support organization and programs (e.g., accelerators, incubators, coworking, etc.) in the greater Houston region.
- Commitment to a longer-term horizon for results, including new business startups, existing small businesses, and creation and retention of Primary Jobs.

A summary of the project team's findings relative to the Entrepreneurship Hub's defined impact factors is presented in Table 5.1.

Table 5.1: Assessment of Hub Impact Factors	
Alignment/Attainment Objectives	Potential Level of Alignment/ Attainment
Enhance City's Innovation & Entrepreneurial Culture	Moderate/High
Build & Grow Successful Businesses	Moderate
Expand Business Activity in Traded Sectors	Low/Moderate
Create & Retain Primary Jobs	Low/Moderate
Create an Inclusive Environment for Entrepreneurs & Small Business Owners	Moderate

Based upon the findings outlined in Table 5.1, the project team concluded that there is a market for an Entrepreneurship Hub comprised of the MVP defined in Section 3.3 with an emphasis on:

- Participating as an active partner in the growing Houston ecosystem.
- Providing enhanced assistance to entrepreneurs and small business owners in the traded sectors in Pearland.
- Actively engaging the diverse community of entrepreneurs and small business owners.

In addition to the above, the project team also recommends a particular emphasis on the Ideation & Innovation Competitions component of the MVP as a clear "gap" exists in both Pearland and the greater Houston ecosystems. While the results will not be immediate, the competitions work toward achieving the Mission Achievement/Impact Factor of Enhancing the City's Innovation & Entrepreneurial Culture, which will ultimately yield more successful businesses in Pearland in the longer term. The strong interest of the community colleges (e.g., San Jacinto Community College and Alvin Community College), UHCL and the ISDs (e.g., Pearland and Alvin) in partnering in this Value Offering will assist in helping the City achieve its associated Mission Achievement/Impact Factors.

At the same time, the project team recommends that the Entrepreneurship Hub focus on enhancing the services offered by existing organizations such as the SBDC versus replacing the current services available to support entrepreneurs and small business owners in Pearland, especially in traded sectors.

The Hub would be virtual in nature, as the market assessment determined that demand for a physical space in Pearland does not exist currently nor is it anticipated within the next few years. Whenever space is required for events and other activities, the Hub would utilize the facilities at its Key Partners, which include many of the educational institutions and incubators, accelerators, etc. named in this report. The virtual Hub should operate with a dedicated staff person to serve as a “navigator” to:

- Guide entrepreneurs and small business owners to resources within the greater Houston ecosystem.
- Provide structured assistance including Pro-Active Coaching (MVP – Value Proposition).
- Engage diverse communities and create an inclusive environment for entrepreneurship and business development in Pearland.
- Establish and maintain partnerships with educational institutions and entrepreneurial support providers in the region in order to create and participate in Ideation & Innovation Competitions that would benefit Pearland residents and those who may wish to start a business in Pearland.

Based upon these findings, the project team recommends that the project proceed to the business model planning stage of the process to complete the remaining components of the Mission Model Canvas. As the Entrepreneurship Hub moves forward, the project team also recommends that the Pearland EDC and City of Pearland take steps to address the following items:

- Continue to engage with entrepreneurial support providers (e.g., accelerators, incubators, coworking, etc.), educational institutions and others in the greater Houston ecosystem in order to, at a minimum, create bridges between siloed organizations and forge more permanent, openly collaborative connections that will, ultimately, impact the success of the Hub.
- Work closely with the SBDC and other service providers to enhance the assistance available to entrepreneurs and small business owners in Pearland.
- Manage the expectations of the community regarding the long-term timeframe for creating results such as increased traded sector business activity in Pearland, new Primary Jobs, and retention of businesses in office and manufacturing space within the city.
- Embrace the fact that providing more, in-depth value-driven programs and services to a smaller number of clients (e.g., entrepreneurs and existing small business owners) will have a greater impact on generating tangible outcomes than those that focus on serving a larger number of clients.
- Conduct a more focused study of the types of student programs, resources and activities that will be necessary to implement the Student Programs to Foster Innovative Thinking and Encourage Entrepreneurship component of the MVP value

offering. This assessment should include a market assessment followed by the creation of a program specific MVP and business model.

APPENDIX A: MISSION MODEL CANVAS

The market assessment and subsequent business model and plan were developed using the Mission Model Canvas (see Figure A.1) and its supporting Lean Startup: Value Proposition Canvas (see Figure A.2) methodologies developed by Strategyzer AG¹⁵ and Steve Blank.¹⁶ A brief overview of each of the components of these methodologies is provided below to assist the reader in understanding the content that appears in the plan that follows.¹⁷

A.1 Mission Model Canvas

- **Beneficiaries** – All the people or organizations for which you are creating value. The Canvas engages Beneficiaries by identifying three key factors that define their respective involvement in the project and ultimately defines the project’s Value Proposition (see Value Proposition Canvas discussion below).

For the purposes of this project, Beneficiaries include the ultimate customer (e.g., entrepreneurs, existing small businesses and students). However, others need to be involved before the customer can benefit from the project. Thus, in addition to the direct customer segment, Beneficiaries include the following additional segments that will derive both direct and indirect benefit from the project.

- Stakeholders and Project Partners (e.g., economic development organizations, elected officials, government agencies, academic institutions, school districts, other accelerators/incubators/business assistance organizations, business associations, and innovation spaces such maker spaces, coworking spaces and innovation labs).
- Resource Network Providers (e.g., accountant, attorneys, bankers, investors, and business consultants)
- **Value Proposition** – Defines the project’s Minimal Viable Product (MVP). The MVP defines the programs and services that create value to each of the Beneficiaries. In turn, the MVP should assist each Beneficiary to overcome the challenges they face and generate the measurable outcomes they desire. Ultimately, the MVP should enable them to realize what they wanted to achieve through the project (e.g., stimulating innovation, creating jobs, generating wealth, and creating educational and future employment opportunities for students).
- **Deployment** – Details:¹⁸
 - How the project will deploy its MVP (i.e., programs and services) to obtain the broadest utilization and engagement amongst its Beneficiaries.
 - What constitutes a successful deployment as outlined in the Mission Achievement/Impact Factors (e.g., number of customers, frequency of partner engagements, and economic benefits generated).

¹⁵ Osterwalder, Alexander and Pigneur, Yves, “Business Model Generation: Handbook For Visionaries, Game Changers, and Challengers”, John Wiley & Sons, Inc., 2010.

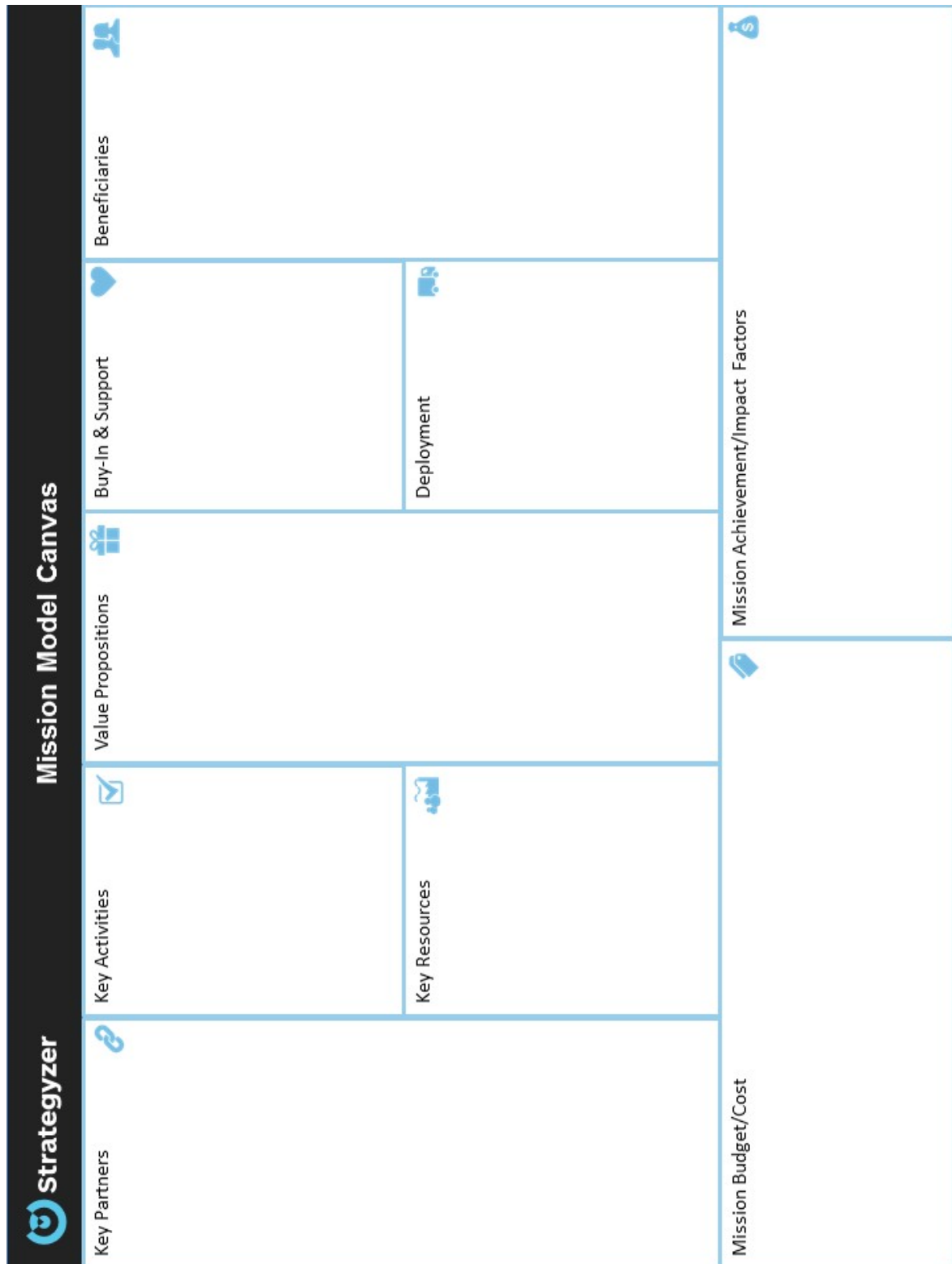
¹⁶ <https://steveblank.com/2016/02/23/the-mission-model-canvas-an-adapted-business-model-canvas-for-mission-driven-organizations/>

¹⁷ The descriptions provided were adapted from information published on www.strategyzer.com.

¹⁸ <https://steveblank.com/2016/02/23/the-mission-model-canvas-an-adapted-business-model-canvas-for-mission-driven-organizations/>

- How the MVP will turn a potential Horizon 2 or 3 innovation into something that gets adopted by an entrepreneur or business currently using a Horizon 1 business model (see Appendix B for a description of Horizon 1, 2 and 3 innovations)?
- **Buy In & Support** – Defines who amongst the Beneficiaries must be engaged at different stages of the project’s life span to:
 - Deploy the MVP.
 - Provide long-term support and maintenance of the MVP.
 - Sustain the iterative development of future MVPs in response to changing market conditions.
- **Mission Achievement/Impact Factors** – Establishes the value that the project is creating for the sum total of all Beneficiaries (i.e., the common good). Individual value is evaluated for each segment (on the Value Proposition Canvas), but this may be different from the project’s overall Mission Achievement. Mission Achievement addresses the desired outcomes of the overall project rather than individual desires of each individual Beneficiary. Mission Achievement can be both quantitative (e.g., 10 new technology ventures formed within five years) and qualitative (e.g., establish the region as a center of innovation both in terms of new intellectual property as well as the effective use of technology in business).
- **Key Resources** –The infrastructure needed to create, deliver and create value. This may include:
 - Physical assets in the form of building and equipment.
 - Financial resources both for supporting clients and maintaining operations.
 - Intellectual resources in the form of proprietary knowledge, customer databases, resource databases, brand, and partnerships.
 - Human resources representing internal and external staff that are key to the execution of the business model.
- **Key Activities** – The most important actions that an organization must take to operate successfully. This would include activities necessary to deliver the Value Proposition, reach/engage clients, maintain relationships with key stakeholders and resource providers, and generate revenue or secure grants.
- **Key Partnerships** – The organizations and/or individuals who can help leverage the business model since it is unlikely that a single organization will have all of the key resources or perform all of the key activities itself.
- **Mission Budget/Cost** – The financial component of the business model involving:
 - Revenue generated from fees, grants, sponsorships, etc.
 - Program and general operating expenses.

Figure A.1: Mission Model Canvas



Source: Strategyzer® and Steve Blank, <https://steveblank.com/2016/02/23/the-mission-model-canvas-an-adapted-business-model-canvas-for-mission-driven-organizations/>

A.2 Value Proposition Canvas

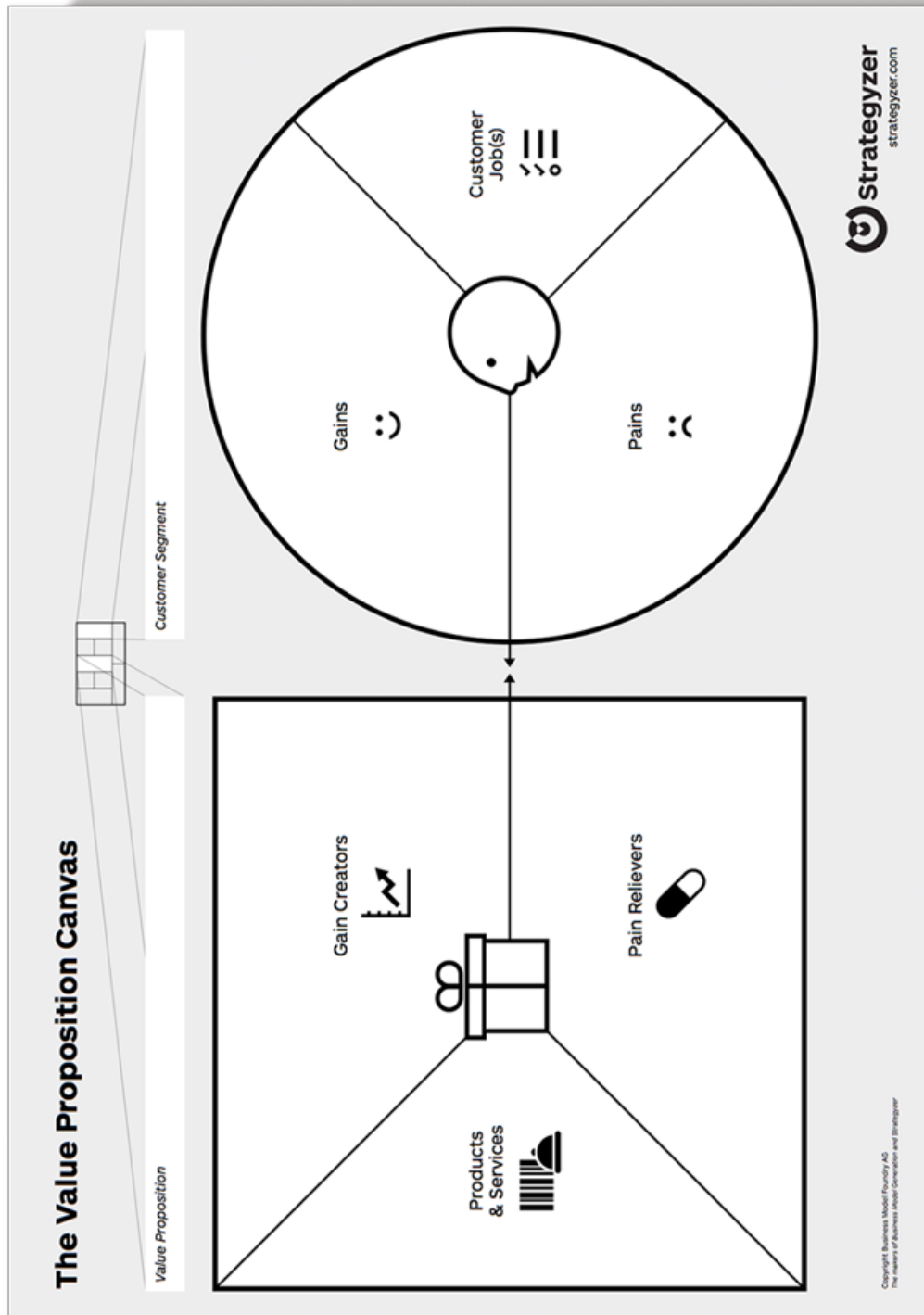
The Value Proposition Canvas (see Figure A.2) serves as the cornerstone for identifying Beneficiary (Customer) needs and designing products and services they want (i.e., products and services they perceive valuable or will gain value from).

- **Beneficiary (Customer) Jobs** – Beneficiaries are those individuals and/or organizations that will benefit from the Mission-driven project as it delivers an MVP that attains or generates the desired Mission Achievement/Impact Factors. Beneficiaries may include:
 - Program customers/users (e.g., clients served by the project).
 - Members of a resources network (e.g., a law firm that may eventually benefit from the project as it builds and graduates successful ventures).
 - Program partners (e.g., an educational institution that increases the benefits to its students using the programs, services, and facilities offered by the project).
 - Government and stakeholders (e.g., an economic development organization that supports business formation and growth to provide employment opportunities to residents and tax revenue for a municipality using the programs and services offered by the project).

Beneficiary jobs describe what each Beneficiary is trying to get done through the project. This might include tasks they are trying to perform or complete (e.g., create jobs), problems they are trying to solve (e.g., an educational institution preparing students with the skills needed to realize their career goals in a fast-paced technology-focused economy), or needs they are trying to satisfy (e.g., a mechanism to bring together complimentary initiatives focused on supporting the formation and growth of businesses in traded sectors).

- **Beneficiary Pains** – Pains describe anything that frustrates or prevents Beneficiaries from getting their respective jobs done. Pains can also describe potential risks or bad outcomes that could materialize if the job is done badly.
- **Beneficiary Gains** – Gains describe the outcomes and benefits each Beneficiary wants. Gains may be required or expected outcomes and benefits. Gains may also include unexpected positive outcomes and benefits.

Figure A.2: Value Proposition Canvas



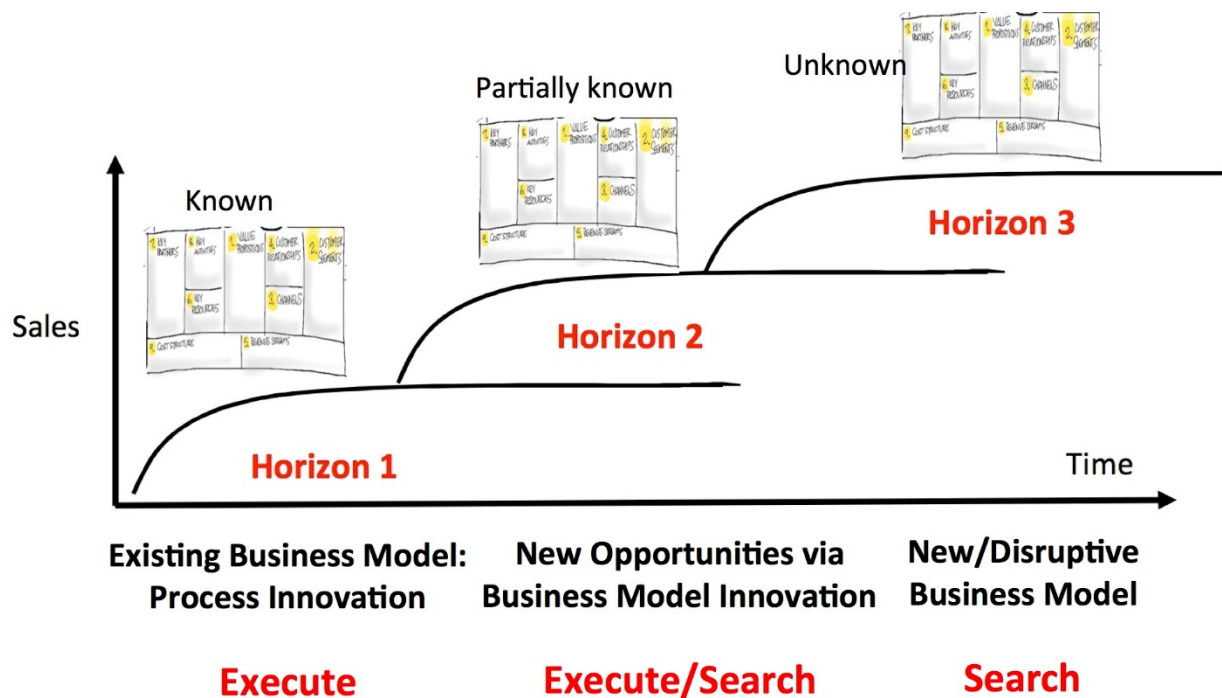
Source: Strategyzer®, www.strategyzer.com

(This page intentionally left blank.)

APPENDIX B: THREE HORIZONS MODEL FOR INNOVATION

Current thinking aggregates companies (and future entrepreneurs) as being in one of three horizons of innovation as outlined below. To “Open Up Transformative Innovation” and truly be disruptive in their respective domains, these participants need to strive to move to a higher level of innovation. Such change is also needed to sustain business operations and remain relevant in a changing and competitive marketplace.¹⁹

- Horizon 1 Innovation – “Business as usual.”
- Horizon 2 Innovation – “Innovations become more effective than the original system (i.e., business as usual) through the use of technology and innovative business practices.”
- Horizon 3 Innovation – “Radical innovation that introduces a completely new way of doing things.”



(Source: Baghai, Coley, White adapted by Steve Blank)

¹⁹ Adapted by Claggett Wolfe from an International Futures Forum articles entitled “Three Horizons” (Source: <http://www.internationalfuturesforum.com/three-horizons>) and a post by Steve Blank entitled “Lean Innovation Management – Making Corporate Innovation Work” (Source: <https://steveblank.com/2015/06/26/lean-innovation-management-making-corporate-innovation-work/>)

(This page intentionally left blank.)

APPENDIX C: COUNTY BUSINESS PATTERNS INDUSTRY ACTIVITY

C.1 Overview

Data reflecting the level of current business activity in industry sectors can highlight the diversity and number of businesses that could benefit from programs and services defined in the project MVP. This is especially relevant as existing small businesses are potential clients for these programs and services.

Current business activity was determined using data collected from the U.S. Census Bureau County Business Patterns Employers database for the two primary Zip Codes associated with the City of Pearland, 77581 and 77584.²⁰ Data for Employer Businesses (i.e., businesses with employees) was gathered at the 2-, 4- and 6-digit North American Industry Classification System (NAICS) code level.²¹ It is important to note that when a small number of businesses within a specific NAICS code exist in a given geographic area, information is suppressed by the U.S. Census Bureau to preserve confidentiality.

U.S. Census Bureau County Business Patterns Nonemployer data (i.e., businesses operating without employees) for the City of Pearland was not available at the Zip Code level. As a result, the project team was unable to assess the level of industry activity for nonemployer businesses.

A general summary of business activity across all industry sectors at the 2-digit NAICS code level is presented in Table C.1. However, for the purposes of this study, businesses within the following industry sectors were determined to be the most likely to both create or retain “Primary Jobs” and benefit from the enhanced programs and services²² offered through an accelerator, incubator and/or maker space that might emerge as a component of the MVP developed for this project.

- NAICS 31—33: Manufacturing
- NAICS 51: Information
- NAICS 54: Professional, Scientific, and Technical Services

Additional sub-sector data for these three industry sectors was obtained at the 4-digit and 6-digit NAICS code levels as shown in Tables C.2 and C.3, respectively.

C.2 Findings

The project team’s current business activity findings are highlighted below.

- Approximately 92% of existing businesses within the City of Pearland fall into industry sectors and sub-sectors that have existing support programs and services offered through the San Jacinto

²⁰ The assessment of current business activity was limited to 2018, the most recent data available from the U.S. Census Bureau County Business Patterns database.

²¹ A more detailed description of industry sectors and sub-sectors included in each NAICS code is available at https://www.census.gov/eos/www/naics/2017NAICS/2017_NAICS_Manual.pdf.

²² Enhanced programs and services would be defined as those that compliment and expand the programs and services currently offered by the San Jacinto College Small Business Development Center with an office in the City of Pearland.

College Small Business Development Center which has an office at the Pearland Chamber of Commerce offices.

- Taking into consideration the level of suppressed data, the project team would anticipate a potential pool of approximately 200 existing businesses in the Manufacturing and Professional, Scientific, and Technical Services sectors that may be potential clients of the programs and services that might emerge as a component of the MVP developed for this project. Based on the project team's experience with similar industry sectors in other areas of the U.S., this pool along with a small cross section of high growth businesses in other industry sectors would likely generate 28 to 48 clients over a five-year period.

Table C.1: Pearland Business Activity for All Businesses with Employees by 2-Digit NAICS Code Industry Sector (by # of Employees) – 2018

NAICS Code	Industry Description	Total	1 to 4	5 to 9	10 to 19	20 to 49	50 +
11	Agriculture, Forestry, Fishing and Hunting	NA	NA	NA	NA	NA	NA
21	Mining, Quarrying, and Oil and Gas Extraction	10	3	NA	NA	NA	NA
22	Utilities	NA	NA	NA	NA	NA	NA
23	Construction*	173	108	28	19	9	4
31 -- 33	Manufacturing*	80	31	13	14	11	6
42	Wholesale Trade*	76	35	14	15	4	3
44 -- 45	Retail Trade*	343	132	81	55	44	29
48 -- 49	Transportation and Warehousing*	46	31	NA	9	NA	NA
51	Information*	29	18	3	NA	3	NA
52	Finance and Insurance	154	87	46	18	3	NA
53	Real Estate and Rental and Leasing*	113	88	18	NA	NA	NA
54	Professional, Scientific, and Technical Services*	302	249	23	17	8	3
55	Management of Companies and Enterprises*	9	3	NA	NA	NA	NA
56	Administrative and Support and Waste Management and Remediation Services*	99	63	12	9	9	NA
61	Educational Services*	60	20	15	15	9	NA
62	Health Care and Social Assistance*	437	239	80	58	45	10
71	Arts, Entertainment, and Recreation*	26	11	3	0	3	NA
72	Accommodation and Food Services*	268	54	39	49	91	NA
81	Other Services (except Public Administration) *	221	114	49	31	23	NA
	Totals	2,455	1,299	425	303	266	92

NA – Not Available

* Total for industry includes establishments not categorized by “# of Employees”. The number of uncategorized establishments ranges from one (1) to seven (7) establishments.

Table C.2: Pearland Business Activity for Businesses with Employees in Relevant Industry Sub-Sectors by 4-Digit NAICS Code (by # of Employees) – 2018

NAICS Code	Industry Description	Total	1 to 4	5 to 9	10 to 19	20 to 49	50 +
31 -- 33	Manufacturing*	80	31	13	14	11	6
3231	Printing and Related Support Activities	3	NA	NA	NA	NA	NA
3323	Architectural and Structural Metals Manufacturing	9	NA	NA	NA	NA	NA
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	11	NA	NA	3	NA	NA
3331	Agriculture, Construction, and Mining Machinery Manufacturing	4	NA	NA	NA	NA	NA
3339	Other General Purpose Machinery Manufacturing	7	NA	NA	NA	NA	NA
3399	Other Miscellaneous Manufacturing ²³	7	NA	NA	NA	NA	NA
	Not Classified	46	31	13	11	11	6
51	Information*	29	18	3	NA	3	NA
5121	Motion Picture and Video Industries	3	NA	NA	NA	NA	NA
5173	Wired and Wireless Telecommunications Carriers	17	6	3	NA	3	NA
	Not Classified	9	12	0	NA	0	NA
54	Professional, Scientific, and Technical Services*	302	249	23	17	8	3
5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	36	29	NA	NA	NA	NA
5413	Architectural, Engineering, and Related Services	44	31	4	5	NA	NA
5414	Specialized Design Services	3	3	NA	NA	NA	NA
5415	Computer Systems Design and Related Services	67	62	NA	NA	NA	NA
5416	Management, Scientific, and Technical Consulting Services	74	70	NA	NA	NA	NA
5417	Scientific Research and Development Services	4	4	NA	NA	NA	NA
5418	Advertising, Public Relations, and Related Services	7	NA	NA	NA	NA	NA
5419	Other Professional, Scientific, and Technical Services ²⁴	30	19	NA	5	3	NA
	Not Classified	37	31	19	7	5	3

NA – Not Available

* Total for industry includes establishments not categorized by “# of Employees”. The number of uncategorized establishments ranges from one (1) to seven (7) establishments.

²³ This industry group comprises establishments primarily engaged in miscellaneous manufacturing, such as jewelry and silverware manufacturing, sporting and athletic goods manufacturing, doll, toy, and game manufacturing, office supplies (except paper) manufacturing, sign manufacturing, and all other miscellaneous manufacturing

²⁴ This industry group comprises establishments engaged in professional, scientific, and technical services (except legal services; accounting, tax preparation, bookkeeping, and related services; architectural, engineering, and related services; specialized design services; computer systems design and related services; management, scientific, and technical consulting services; scientific research and development services; and advertising, public relations, and related services)

Table C.3: Pearland Business Activity for Businesses with Employees in Relevant Industry Sub-Sectors by 6-Digit NAICS Code (by # of Employees) – 2018

NAICS Code	Industry Description	Total	1 to 4	5 to 9	10 to 19	20 to 49	50 +
31 -- 33	Manufacturing*	80	31	13	14	11	6
333132	Oil and Gas Field Machinery and Equipment Mfg,	4	NA	NA	NA	NA	NA
	Not Classified or In Non-Relevant Sub-Sectors	74	31	13	14	11	6
51	Information*	29	18	3	NA	3	NA
	Not Classified or In Non-Relevant Sub-Sectors	29	18	3	NA	3	NA
54	Professional, Scientific, and Technical Services*	302	249	23	17	8	3
541380	Testing Laboratories	3	NA	NA	NA	NA	NA
541430	Graphic Design Services	3	3	0	0	0	0
541511	Custom Computer Programming Services	27	24	NA	NA	NA	NA
541512	Computer Systems Design Services	35	33	NA	NA	NA	NA
541613	Marketing Consulting Services	10	9	NA	NA	NA	NA
541620	Environmental Consulting Services	7	7	0	0	0	0
541690	Other Scientific and Technical Consulting Services	7	4	NA	NA	NA	NA
	Not Classified or In Non-Relevant Sub-Sectors	210	169	23	17	8	3

NA – Not Available

* Total for industry includes establishments not categorized by “# of Employees”. The number of uncategorized establishments ranges from one (1) to seven (7) establishments.

APPENDIX D: U.S. UTILITY PATENT ACTIVITY

The U.S. Patent and Trademark Office's online database was searched for the period January 1, 2015 to July 1, 2020²⁵ to identify U.S. Utility Patent awards and applications in which at least one inventor resided in Pearland, TX. The results are summarized below with details provided in the tables that follow.

- As shown in Table D.1, from January 1, 2015 to July 1, 2020 Pearland residents have participated as inventors on a significant number of U.S. Utility Patents applied for or awarded during the five- and one-half-year period.

Table D.1: U.S. Utility Patent Activity for Patents with a Minimum of One Inventor Residing in Pearland, TX – January 1, 2015 to July 1, 2020

Activity Period	Number of Patent Awards	Number of Patent Applications
January 1, 2015 to December 31, 2015	202	233
January 1, 2016 to December 31, 2016	195	286
January 1, 2017 to December 31, 2017	221	270
January 1, 2018 to December 31, 2018	228	234
January 1, 2019 to December 31, 2019	278	202
January 1, 2020 to July 1, 2020	128	186
Total – All Activity Periods	1,252	1,411

- A more in-depth look at patent activity from January 2, 2019 to July 1, 2020 showed the following:
 - Approximately 270 different Pearland residents reflecting the diversity of the region were listed as inventors for U.S. Utility Patent awards or applications during this 18-month period.
 - 389 of the 406 patent awards (approximately 96%) were assigned to established businesses with only 10 (approximately 2.5%) assigned to Pearland based businesses as listed below and presented in Table D.2.
 - Adient Medical Inc.: 3 patents awarded
 - Base Pair Biotechnologies Inc.: 3 patents awarded
 - Packaging Service Company Inc.: 2 patents awarded
 - Aquamarine Subsea Houston Inc.: 1 patent awarded (no longer located in the City of Pearland)
 - Hexa Containment: 1 patent awarded
 - A significant number of patent awards and applications were assigned to businesses in the energy and life sciences sectors.
 - None of the patent awards or applications were assigned to businesses that would be considered startups.

²⁵ The search period was ended on July 1, 2020 to allow for lags in data reporting in the USPTO database.

Table D.2: Assignees of U.S. Utility Patent Awards with a Minimum of One Inventor Residing in Pearland, TX – January 1, 2019 to July 1, 2020

Name of Patent Assignee	Number of Patent Awards
Dow Global Technologies LLC, Midland, MI	67
Saudi Arabian Oil Company, Dhahran, SA	40
Schlumberger Technology Corporation, Sugar Land, TX	18
Board of Regents, The University of Texas System, Austin, TX	17
Baker Hughes, A GE Company LLC, Houston, TX	15
Cameron International Corporation, Houston, TX	15
University of Houston, Houston, TX	14
AT&T Intellectual Property I L.P., Atlanta, GA	12
ExxonMobil Upstream Research Company, Spring, TX	11
Technologies Holdings Corp., Houston, TX	10
Weatherford Technology Holdings LLC, Houston, TX	8
Halliburton Energy Services Inc., Houston, TX	7
Omni AI Inc., Houston, TX	7
Techemet LP, Pasadena, TX	6
Univation Technologies LLC, Houston, TX	6
Baylor College of Medicine, Houston, TX	5
Immatics Biotechnologies GMBH, Tuebingen, DE	5
Chart Energy & Chemicals Inc., Ball Ground, GA	4
Ecolab USA Inc., St. Paul, MN	4
Gagemaker LP, Pasadena, TX	4
General Electric Technology GMBH, Baden, CH	4
Adient Medical Inc., Pearland, TX	3**
Air Liquide Large Industries U.S. LP, Houston, TX	3
Avigilon Patent Holding 1 Corporation, Vancouver, CA	3
Base Pair Biotechnologies Inc., Pearland, TX	3**
Cisco Technology Inc., San Jose, CA	3
M-I LLC, Houston, TX	3
Rebellion Photonics Inc., Houston, TX	3
Texas Instruments Inc., Dallas, TX	3
Veristic Technologies Inc., Houston, TX	3
Visualase Inc., Minneapolis, MN	3
Aviara Pharmaceuticals Inc., Houston, TX	2
Corner Star Limited, Hong Kong, HK	2
Covestro LLC, Pittsburg, PA	2

Table D.2: Assignees of U.S. Utility Patent Awards with a Minimum of One Inventor Residing in Pearland, TX – January 1, 2019 to July 1, 2020 (Continued)

Name of Patent Assignee	Number of Patent Awards
NASA, Washington, DC	2
Packaging Service Co. Inc., Pearland, TX	2**
Sabic Global Technologies, B.V., Bergen Op Zoom, NL	2
Shell Oil Company, Houston, TX	2
Spoked Solutions LLC, Houston, TX	2
Stratata Systems Limited, Floriana, Malta	2
The WellBoss Company LLC, Houston, TX	2
UOP LLC, Des Plaines, IL	2
Activator Methods International, LTD, Phoenix, AZ	1
Agile Data Decisions LLC, Houston, TX	1
American Heart Technologies LLC, Houston, TX	1
AppDynamics LLC SF, CA - Cisco Technology Inc., San Jose, CA	1
Aquamarine Subsea Houston Inc., Pearland, TX	1**
Ashley Diana Black International Holdings LLC, Friendswood, TX	1
Aurora Innovative Technology LLC, Missouri City, TX	1
Blue Cube IP LLC, St. Louis, MO	1
BMC Software Inc., Houston, TX	1
BP Corporation North America Inc., Houston, TX	1
CGG Services SAS, Massy, FR	1
Chicago Mercantile Exchange Inc., Chicago, IL	1
Concepts NREC LLC, White River Junction, VT	1
Draper Inc., Spiceland, IN	1
Ensco International Inc., Wilmington, DE	1
Envision Energy Co. Ltd., Jiangyin, CN	1
Equistar Chemicals LP, Houston, TX	1
FINA Technology Inc., Houston, TX	1
FMC Technologies Inc., Houston, TX	1
Hamilton Sundstrand Corp., Charlotte, NC	1
Hanwha Power Systems Co., Ltd, Changwon-si, KR	1
Harsco Technologies LLC, Fairmont, MN	1
Hexa Containment, Pearland, TX	1**
Hexion Inc., Columbus, OH	1
InDyne Inc., Reston, VA	1
Ineos Americas LLC, Mobile, AL	1

Table D.2: Assignees of U.S. Utility Patent Awards with a Minimum of One Inventor Residing in Pearland, TX – January 1, 2019 to July 1, 2020 (Continued)

Name of Patent Assignee	Number of Patent Awards
Intellective Ai Inc., Dallas, TX	1
International Business Machines Corporation, Armonk, NY	1
Ionwerks Inc., Houston, TX	1
Johnson & Johnson Vision Care Inc., Jacksonville, FL	1
KPTools Inc., Houston, TX	1
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude Paris FR	1
Life Technologies Corporation, Carlsbad, CA	1
LyondellBasell Acetyls LLC, Houston, TX	1
Merichem Company, Houston, TX	1
National Oilwell DHT L.P., Conroe, TX	1
Phillips 66 Company, Houston, TX	1
Process Mercury Group LLC, Houston, TX	1
Rapiscan Systems Inc., Torrance, CA	1
Rectorseal LLC, Houston, TX	1
Reme Technologies LLC, Conroe, TX	1
Repeat Precision LLC, Houston, TX	1
RiceTec Inc., Alvin, TX	1
Rohm and Haas Electronic Materials CMP Holdings Inc., Newark, DE	1
Sasol Technology (PTY) Limited (Sandton, Gauteng Province, ZA)	1
Seaboard International, Inc., Houston, TX	1
Sekassai Specialty Chemicals America LLC, Dallas, TX	1
SnIP Holdings Inc., The Woodlands, TX	1
TapcoEnpro LLC, Channelview, TX	1
Texas Children's Hospital, Houston, TX	1
The Boeing Company, Chicago, IL	1
The Goodyear Tire & Rubber Company, Akron, OH	1
The Penn State Research Foundation, University Park, PA	1
The Texas A&M University System, College Station, TX	1
University of Electronic Science and Technology of China	1
W.R. Grace & Co.-Conn., Columbia, MD	1
Wellbore Integrity Solutions LLC, Houston, TX	1
Winter Creek Designs, Needville, TX	1
Total Awards Assigned	389
Total Awards	406

** Pearland Business

- 379 of the 388 patent applications (approximately 98%) were assigned to established businesses with only 11 (approximately 3.0%) assigned to Pearland based businesses as listed below and presented in Table D.3.
 - Base Pair Biotechnologies Inc.: 8 patent applications
 - Lonza Walkersville Inc. (purchased Pearland based business): 2 patent applications
 - Adient Medical Inc.: 1 patent application

Table D.3: Assignees of U.S. Utility Patent Applications with a Minimum of One Inventor Residing in Pearland, TX – January 1, 2019 to July 1, 2020

Name of Patent Assignee	Number of Patent Applications
Dow Technology Investments LLC, Midland, MI	43
Saudi Arabian Oil Company, Dhahran, SA	35
Immatics Biotechnologies GmbH, Tuebingen, DE	26
Board of Regents, The University of Texas System, Austin, TX	25
ExxonMobil Chemical Patents Inc., Baytown, TX	17
AT&T Intellectual Property I, L.P., Atlanta, GA	15
Baylor College of Medicine, Houston, TX	10
Strataca Systems Limited, Floriana, MT	10
Baker Hughes, a GE Company LLC, Houston, TX	9
Base Pair Biotechnologies Inc., Pearland, TX	8**
Schlumberger Technology Corporation, Sugarland, TX	8
Omni AI Inc., Houston, TX	7
University of Houston System, Houston, TX	7
Chat Energy & Chemicals Inc., The Woodlands, TX	6
Ecolab USA Inc., St. Paul, MN	6
Techemet LP, Pasadena, TX	6
Repeat Precision LLC, Houston, TX	5
Ascend Performance Materials Operations LLC, Houston, TX	4
Halliburton Energy Services Inc., Houston, TX	4
JPMorgan Chase Bank, N.A., New York, NY	4
Multi-Chem Group LLC, Houston, TX	4
Phillips 66 Company, Houston, TX	4
Rebellion Photonics Inc., Houston, TX	4
Univation Technologies LLC, Houston, TX	4
Weatherford Technology Holdings LLC, Houston, TX	4
7 Hills Pharma LLC, Houston, TX	3
Cisco Technology Inc., San Jose, CA	3
FMC Technologies Inc., Houston, TX	3

Table D.3: Assignees of U.S. Utility Patent Applications with a Minimum of One Inventor Residing in Pearland, TX – January 1, 2019 to July 1, 2020 (Continued)

Name of Patent Assignee	Number of Patent Applications
Gagemaker LP, Pasadena, TX	3
Rapiscan Systems Inc., Torrance, CA	3
Avigilon Patent Holding 1 Corporation, Vancouver, CA	2
Covestro LLC, Pittsburgh, PA	2
Downhole Technology LLC, Houston, TX	2
E I Du Pont De Nemours and Company, Wilmington, DE	2
Foro Energy Inc., Houston, TX	2
Genomics A Inc., Round Rock, TX	2
Georgia Tech Research Corporation, Atlanta, GA	2
Harsco Technologies LLC, Fairmont, MN	2
Hexion Inc., Columbus, OH	2
Lonza Walkersville Inc., Walkersville, MD	2**
Merichem Company, Houston, TX	2
National Oilwell DHT LP, Conroe, TX	2
Rectorseal LLC, Houston, TX	2
Smith International Inc., Houston, TX	2
Texas Children's Hospital, Houston, TX	2
Texas Instruments Incorporated, Dallas, TX	2
The Methodist Hospital System, Houston, TX	2
TPC Group LLC, Houston, TX	2
Veristic Technologies Inc., Houston, TX	2
William Marsh Rice University, Houston, TX	2
Winter Creek Designs, Needville, TX	2
Xcath Inc., Houston, TX	2
Actuated Medical Inc., Bellefonte, PA	1
Adient Medical Inc., Pearland, TX	1**
Aurora Innovative Technology LLC, Missouri City, TX	1
Aviara Pharmaceuticals Inc., Houston, TX	1
Black Diamond Oilfield Rentals LLC, Houston, TX	1
Board of Trustees of Southern Illinois University, Edwardsville, IL	1
Cameron International Corporation, Houston, TX	1
Carnegie Mellon University, Pittsburgh, PA	1
Certified Safety Inc., League City, TX	1
Chicago Mercantile Exchange Inc., Chicago, IL	1

Table D.3: Assignees of U.S. Utility Patent Applications with a Minimum of One Inventor Residing in Pearland, TX – January 1, 2019 to July 1, 2020 (Continued)

Name of Patent Assignee	Number of Patent Applications
Compressor Engineering Corporation, Houston, TX	1
Ensco International Incorporated, Wilmington, DE	1
Everheart Systems Inc., Webster, TX	1
Expro Americas LLC, Houston, TX	1
Hypertherm Inc., Hanover, NH	1
Ionwerks Inc., Houston, TX	1
Janssen Pharmaceutica NV, Beerse, BE	1
Lamons Gasket Company, Houston, TX	1
Life Technologies Corporation, Carlsbad, CA	1
Lummus Technology LLC, Bloomfield, NJ	1
Lyondell Chemical Technology LP, Houston, TX	1
LyondellBasell Acetyls LLC, Houston, TX	1
Medivators Inc., Minneapolis, MN	1
M-I LLC, Houston, TX	1
Oceaneering International Inc., Houston, TX	1
Oil States Industries Inc., Arlington, TX	1
Process Mercury Group LLC, Houston, TX	1
Ram Ramakrishnan, Sugar Land, TX	1
Reme Technologies LLC, Conroe, TX	1
Sabir Global Technologies, B.V., Bergen OP Zoom, NL	1
Seaboard International Inc., Houston, TX	1
Technologies Holding Corp., Houston, TX	1
The Proctor & Gamble Company, Cincinnati, OH	1
The Texas A&M University System, College Station, TX	1
TIV Inc., Charlotte, NC	1
Transocean Sedco Forex Ventures Limited, Grand Cayman, KY	1
University of Louisville Research Foundation Inc., Louisville, KY	1
Visualase Inc., Minneapolis, MN	1
W.R. Grace & Co.-Conn., Columbia, MD	1
Total Applications Assigned	371
Total Applications	388

** Pearland Business

(This page intentionally left blank.)

APPENDIX E: SBIR/STTR ACTIVITY

E.1 SBIR OVERVIEW²⁶

The federal Small Business Innovation Research (SBIR) program is designed to encourage small business product commercialization by providing financial support to explore the market viability of technological enhancements. In particular, the SBIR program targets small businesses with serious research and development needs that they are unable to fund on their own and reserves a specific percentage of federal R&D funds for these businesses. The program enables small businesses to compete on the same level as larger businesses by awarding grants to fund the critical startup and development stages. It also encourages the commercialization of technology products/services that will stimulate the economy.

SBIR grants are awarded to small businesses that meet the following qualifications:

- American-owned and independently operated
- For-profit
- Company size limited to 500 employees
- Principal researcher employed by business

The SBIR grant program is structured in three phases.

- Phase I. The objective of Phase I is to establish the technical merit, feasibility, and commercial potential of the proposed R/R&D efforts and to determine the quality of performance of the small business awardee organization prior to providing further Federal support in Phase II. SBIR Phase I awards normally do not exceed \$150,000 total costs for 6 months.
- Phase II. The objective of Phase II is to continue the R/R&D efforts initiated in Phase I. Funding is based on the results achieved in Phase I and the scientific and technical merit and commercial potential of the project proposed in Phase II. Only Phase I awardees are eligible for a Phase II award. SBIR Phase II awards normally do not exceed \$1,000,000 total costs for 2 years.
- Phase III. The objective of Phase III, where appropriate, is for the small business to pursue commercialization objectives resulting from the Phase I/II R/R&D activities. The SBIR program does not fund Phase III. In some Federal agencies, Phase III may involve follow-on, non-SBIR funded R&D or production contracts for products, processes or services intended for use by the U.S. Government.

E.2 STTR OVERVIEW²⁷

Small Business Technology Transfer (STTR) is another program that expands funding opportunities in the federal innovation research and development (R&D) arena. Central to the program is expansion of the public/private sector partnership to include the joint venture opportunities for small businesses and nonprofit research institutions. The unique feature of the STTR program is the requirement for the small business to formally collaborate with a research institution in Phase I and Phase II. STTR's most

²⁶ Source: U.S. Small Business Administration (<http://www.sbir.gov/about/about-sbir>)

²⁷ U.S. Small Business Administration (<http://www.sbir.gov/about/about-sttr>)

important role is to bridge the gap between performance of basic science and commercialization of resulting innovations.

Only United States small businesses are eligible to participate in the STTR program. The small business must meet *all* of the following criteria at the time of award:

- Organized for profit, with a place of business located in the United States;
- At least 51 percent owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the United States; and
- No more than 500 employees, including affiliates.

The nonprofit research institution must also meet certain eligibility criteria:

- Located in the U.S.
- Meet one of three definitions:
 - Nonprofit college or university
 - Domestic nonprofit research organization
 - Federally funded R&D center (FFRDC)

The STTR program differs from the SBIR program in three important aspects:

1. The SBC and its partnering institution are required to establish an intellectual property agreement detailing the allocation of intellectual property rights and the rights to carry out follow-on research, development or commercialization activities.
2. The STTR program requires that the SBC perform at least 40% of the R&D and the single partnering research institution to perform at least 30% of the R&D.
3. Unlike the SBIR program, the STTR program does not require the Principal Investigator to be primarily employed by the SBC.

The STTR Program is structured in three phases

- *Phase I.* The objective of Phase I is to establish the technical merit, feasibility, and commercial potential of the proposed R/R&D efforts and to determine the quality of performance of the small businesses prior to providing further Federal support in Phase II. STTR Phase I awards normally do not exceed \$100,000 total costs for 1 year.
- *Phase II.* The objective of Phase II is to continue the R/R&D efforts initiated in Phase I. Funding is based on the results achieved in Phase I and the scientific and technical merit and commercial potential of the Phase II project proposed. Only Phase I awardees are eligible for a Phase II award. STTR Phase II awards normally do not exceed \$750,000 total costs for 2 years.
- *Phase III.* The objective of Phase III, where appropriate, is for the small business to pursue commercialization objectives resulting from the Phase I/II R/R&D activities. The STTR program does not fund Phase III. In some Federal agencies, Phase III may involve follow-on, non-STTR funded R&D or production contracts for products, processes or services intended for use by the U.S. Government.

E.3 SBIR/STTR AWARD ACTIVITY

SBIR/STTR grant award activity was obtained from the U.S. Small Business Administration's <https://www.sbir.gov/> database. The search was conducted using the following filters:

- All agencies.
- Both Phase I and Phase II awards.
- Both SBIR and STTR programs.
- Years 2015 to 2020.
- State of Texas.

The findings were then filtered to represent awards made to businesses with a contact city listed as Pearland. The results are summarized in Table E.1 below.

Table E.1: SBIR/STTR Awards to Pearland Businesses – 2015 to 2020				
Company	Phase	Program	Award Yr.	Award Amount
AltiSora LLC	Phase I	SBIR	2020	\$199,940
Adient Medical Inc.	Phase II	SBIR	2017	\$2,997,152
Adient Medical Inc.	Phase II	SBIR	2017	\$1,754,160
Base Pair Biotechnologies Inc.	Phase I	STTR	2016	\$218,783
Base Pair Biotechnologies Inc.	Phase I	SBIR	2017	\$150,000
Base Pair Biotechnologies Inc.	Phase I	SBIR	2018	\$300,000
Base Pair Biotechnologies Inc.	Phase I	SBIR	2019	\$600,000
Base Pair Biotechnologies Inc.	Phase I	SBIR	2019	\$215,306
Base Pair Biotechnologies Inc.	Phase I	SBIR	2019	\$100,000
Pharmareview Corporation*	Phase II	STTR	2016	\$1,604,091
Pharmareview Corporation*	Phase II	STTR	2017	\$1,696,381
Saguaro Innovation LLC	Phase I	SBIR	2017	\$139,817

- * Since receiving its STTR awards Pharmareview has moved its operations to a City of Houston location just south of the Texas Medical Center.

(This page intentionally left blank.)

APPENDIX F: INTERVIEW PARTICIPANTS

Name	Affiliation
Gina Aguirre Adams	<i>Brazoria Hispanic Chamber</i>
Carol Artz-Bucek	<i>Pearland Chamber of Commerce</i>
Kai Bouchard	<i>Pearland Independent School District – Turner School</i>
Meg Boulware	<i>Boulware Valoir PLLC</i>
Gary Bucek	<i>San Jacinto Small Business Development Center</i>
Matt Buchanan	<i>Pearland Economic Development Corporation (PEDC)</i>
Brad Burke	<i>Rice Alliance</i>
Joe Burke	<i>Junior Achievement</i>
Dwayne Busby	<i>University of Houston Clear Lake</i>
Stephanie Campbell	<i>Houston Angel Network</i>
Tony Carbone	<i>Pearland City Council</i>
Mona Chavarria	<i>PEDC Board of Directors</i>
Eleanor Chuzel	<i>Gener8tor</i>
Mark Collins	<i>1-800 Plumber + Air</i>
Daniel Combs	<i>Alvin Independent School District</i>
Kim Effenberger	<i>Junior Achievement</i>
Mitch Eggers	<i>Adient Medical Devices</i>
Randy Ferguson	<i>Pearland State Bank</i>
Omar Fortune	<i>Houston Galveston Area Council</i>
Wendy Ghormly	<i>Texas First Bank</i>
Richard Gianni	<i>LiftFund</i>
Christine Galib	<i>Smart Cities Accelerator</i>
Larson Gow	<i>The Cannon Venture Studio</i>
David Graham	<i>Code Ninja's</i>
Sandy Guitar	<i>HX Venture Fund</i>
Dena Hanks	<i>Pearland Leadership Foundation</i>
Bob Harvey	<i>Greater Houston Partnership</i>
David Headley	<i>Sparx Engineering</i>
Adrian Hernandez	<i>Pearland City Council</i>
Herb Hildebrand	<i>San Jacinto SBDC</i>
Paul Hoopingarner	<i>Sparx Engineering</i>
Chris Hymel	<i>Signal Advance</i>
Prentice Keller	<i>Gener8tor</i>
John Kelly	<i>Pearland Independent School District</i>
Kyle Kettler	<i>Alvin Independent School District – JB Hensler School</i>
Dorothy Kirkman	<i>University of Houston Clear Lake</i>
Bill Jackson	<i>Base Pair Biotechnologies</i>
Ricardo Jimenez	<i>Neurogene</i>
Antonio Johnson	<i>PEDC Board of Directors</i>
Mary Jove	<i>Alvin Community College</i>
Beth Lewis	<i>University of Houston Clear Lake – Pearland Campus</i>

Tom Luby	<i>TMCx</i>
Brian Malone	<i>Pearland Economic Development Corporation</i>
Kelly McCormick	<i>University of Houston Red Labs</i>
Edgartt Melton	<i>7th Echelon</i>
Harvin Moore	<i>HX Houston Exponential</i>
Randeep Nambiar	<i>Stellium, Inc.</i>
Jan Odegard	<i>The ION</i>
Alex Okwonna	<i>San Jacinto Community College</i>
Hugh Patton	<i>PEDC Board of Directors</i>
Clay Pearson	<i>City of Pearland</i>
Richard Pettys	<i>Sparx Engineering</i>
Chaime Powell	<i>UH Technology Bridge</i>
Gregory Phillips	<i>Phillips Kaiser PLLC</i>
Copeland Rhea	<i>Clay Development & Construction</i>
Brian Richards	<i>Accenture</i>
Rick Short	<i>UHCL</i>
Jeff Sjostrom	<i>Galveston Economic Development Partnership</i>
Mark Smith	<i>Attorney PLLC & Pearland Chamber of Commerce</i>
Ann Strouhall	<i>Strouhall & Associates</i>
Ann Tanabe	<i>BioHouston</i>
Chris Taylor	<i>University of Houston Technology Bridge</i>
Seth Thompson	<i>AG/CM</i>
Remington Tonar	<i>The Cannon Venture Studio</i>
Rob Tucci	<i>Texas HALO Fund</i>
Walter Ulrich	<i>Texas Turnaround</i>
Roger Watkins	<i>San Jacinto Community College</i>
Kevin Wooten	<i>University of Houston Clear Lake</i>
Atul Varadhachary	<i>Fannin Innovation Studio</i>
Chandrakanth Vemula	<i>Greater Businesses of Pearland</i>
Troy Voelker	<i>University of Houston Clear Lake – Pearland Campus</i>
Roland von Kurnatowski	<i>TX/RX</i>
Sheila Wall	<i>San Jacinto Community College</i>
Scott Youngblood	<i>CPA</i>

APPENDIX G: DISCUSSION FORUM FINDINGS

The project team conducted a one and one-half hour Zoom Discussion Forum with live polling on October 28, 2020. The purpose of the Forum was to validate research findings obtained from the primary and secondary research conducted for the market assessment. An invitation was extended to all 71+ interview participants including representatives from the Pearland EDC and the City of Pearland who attended as observers. The questions used in the live polling exercise are presented below along with a summary of the responses.

Question #1: Which of the following best describes the level of collaboration amongst the region's various participants in the entrepreneurial ecosystem?

Responses Question #1 (n= 27):

	Total Responses	% of Total
a. Siloed	11	41%
b. Siloed with bridges	13	48%
c. Highly collaborative	1	4%
d. Unsure as to the level of collaboration	2	7%

Question #2: Which of the following best reflects how you view the Pearland Entrepreneurial Ecosystem?

Responses Question #2 (n= 30):

	Total Responses	% of Total
a. Pearland is part of the Greater Houston Ecosystem	9	30%
b. Pearland is part of the Greater Houston Ecosystem but its entrepreneurs have unique needs that require customized solutions not found in the Houston Ecosystem	14	47%
c. Pearland has a distinct Ecosystem that operates independently from the Greater Houston Ecosystem	4	13%
d. Unsure of how Pearland and the Greater Houston Ecosystems align	3	10%

Question #3: Rate the maturity of the entrepreneurial support infrastructure in the Energy sector in terms of stimulating innovative thinking, encouraging the commercialization of new ideas and providing the resources needed for businesses to scale.

Responses Question #3 (n= 28):

	Total Responses	% of Total
a. The region's infrastructure is very mature	11	38%
b. The region infrastructure is somewhat mature but needs to continue to progress in various areas (e.g., equity financing, post-accelerator support, talent) to reach maturity	10	34%
c. The region is more at an adolescent stage and still testing what might work	3	10%
d. The region is in its infancy and has a long way to go before it reaches maturity	1	3%
e. Not sure of the maturity of the infrastructure for this sector	3	10%

Question #4: Rate the maturity of the entrepreneurial support infrastructure in the Aerospace sector in terms of stimulating innovative thinking, encouraging the commercialization of new ideas and providing the resources needed for businesses to scale.

Responses Question #4 (n= 28):

	Total Responses	% of Total
a. The region's infrastructure is very mature	5	17%
b. The region infrastructure is somewhat mature but needs to continue to progress in various areas (e.g., equity financing, post-accelerator support, talent) to reach maturity	9	31%
c. The region is more at an adolescent stage and still testing what might work	3	10%
d. The region is in its infancy and has a long way to go before it reaches maturity	3	10%
e. Not sure of the maturity of the infrastructure for this sector	8	28%

Question #5: Rate the maturity of the entrepreneurial support infrastructure in the Industrial Tech sector in terms of stimulating innovative thinking, encouraging the commercialization of new ideas and providing the resources needed for businesses to scale.

Responses Question #5 (n= 28):

	Total Responses	% of Total
a. The region's infrastructure is very mature	3	10%
b. The region infrastructure is somewhat mature but needs to continue to progress in various areas (e.g., equity financing, post-accelerator support, talent) to reach maturity	10	34%
c. The region is more at an adolescent stage and still testing what might work	7	24%
d. The region is in its infancy and has a long way to go before it reaches maturity	3	10%
e. Not sure of the maturity of the infrastructure for this sector	5	17%

Question #6: Rate the maturity of the entrepreneurial support infrastructure in the IoT, SaaS, etc. sectors in terms of stimulating innovative thinking, encouraging the commercialization of new ideas and providing the resources needed for businesses to scale.

Responses Question #6 (n= 28):

	Total Responses	% of Total
a. The region's infrastructure is very mature	0	0%
b. The region infrastructure is somewhat mature but needs to continue to progress in various areas (e.g., equity financing, post-accelerator support, talent) to reach maturity	3	10%
c. The region is more at an adolescent stage and still testing what might work	9	31%
d. The region is in its infancy and has a long way to go before it reaches maturity	6	21%
e. Not sure of the maturity of the infrastructure for this sector	7	24%

Question #7: Rate the maturity of the entrepreneurial support infrastructure in the in the non-tech sectors in terms of stimulating innovative thinking, encouraging the commercialization of new ideas and providing the resources needed for businesses to scale.

Responses Question #7 (n= 28):

	Total Responses	% of Total
a. The region's infrastructure is very mature	0	0%
b. The region infrastructure is somewhat mature but needs to continue to progress in various areas (e.g., equity financing, post-accelerator support, talent) to reach maturity	10	34%
c. The region is more at an adolescent stage and still testing what might work	7	24%
d. The region is in its infancy and has a long way to go before it reaches maturity	4	14%
e. Not sure of the maturity of the infrastructure for this sector	5	17%

Question #8: Rate the maturity of the entrepreneurial support infrastructure in the Life Sciences/Med Tech sectors in terms of stimulating innovative thinking, encouraging the commercialization of new ideas and providing the resources needed for businesses to scale.

Responses Question #8 (n= 28):

	Total Responses	% of Total
a. The region's infrastructure is very mature	4	14%
b. The region infrastructure is somewhat mature but needs to continue to progress in various areas (e.g., equity financing, post-accelerator support, talent) to reach maturity	10	34%
c. The region is more at an adolescent stage and still testing what might work	9	31%
d. The region is in its infancy and has a long way to go before it reaches maturity	3	10%
e. Not sure of the maturity of the infrastructure for this sector	2	7%

Question #9: In which of the following areas do you believe there are "gaps" in the region's entrepreneurial infrastructure in supporting each of the following stages of a venture's development? (Please choose all that apply)

Responses Question #9:

	Total Responses	% of Total
a. Ideation	14	48%
b. Proof of Concept	11	38%
c. Commercialization	16	55%
d. Business Startup	10	34%
e. Scaling	17	59%
f. Not Sure	4	14%

Question #10: Which of the following best describes the inclusiveness of the region's entrepreneurial ecosystem for its diverse population (e.g., race, ethnicity, nationality, gender, socio-economic status, educational background, etc.)?

Responses Question #10 (n=30):

	Total Responses	% of Total
a. The region's entrepreneurial support programs are inclusive for any individual or team	6	20%
b. The region's entrepreneurial support programs are somewhat inclusive, but efforts are underway to be more inclusive for the underserved	8	27%
c. The region's entrepreneurial support programs are somewhat inclusive, but no efforts are currently underway to include the underserved	5	17%
d. The region's entrepreneurial support programs are not inclusive, but efforts are underway to change this situation	4	13%
e. The region's entrepreneurial support programs are not inclusive and no efforts are currently underway to change this situation	1	3%
f. Unsure of the inclusiveness of the region's entrepreneurial support programs	6	20%

Question #11: Considering the current entrepreneurial culture and level of regional entrepreneurial activity, which of the following best describes the projected deal flow for the region's entrepreneurial support programs?

Responses Question #11 (n=30):

	Total Responses	% of Total
a. The region is generating sufficient deal flow to sustain all of the established or planned entrepreneurial support programs	1	3%
b. Regional entrepreneurial activity is growing at a rate that should sustain all of the existing or planned entrepreneurial support programs within the next 3 to 5 years	2	7%
c. The level of regional entrepreneurial activity over the next 3 to 5 years is likely to be insufficient to support some of the existing or planned entrepreneurial support programs	12	40%
d. The level of regional entrepreneurial activity combined with the attraction of entrepreneurs from outside the area will be sufficient to sustain the existing or planned entrepreneurial support programs for an indefinite period of time	6	20%
e. Unsure of the level of entrepreneurial activity that would support these programs	9	30%

Question #12: Which of the following would best describe the region's entrepreneurial culture for establishing innovative high growth ventures?

Responses Question #12 (n=30):

	Total Responses	% of Total
a. The region's residents are more focused on employment with established businesses than taking the risk of starting a new venture or joining an early-stage venture	3	10%
b. The region's residents are moderate risk takers and gradually beginning to view entrepreneurship as an alternate career path.	11	37%
c. The region's residents are willing to take risks in starting new ventures but are more likely to bootstrap than to seek outside assistance and capital to accelerate their launch and growth trajectory	4	13%
d. The region's residents are willing to take risks in starting new ventures and are likely to seek outside assistance and capital to accelerate their launch and growth trajectory	8	27%
e. Unsure of the region's entrepreneurial culture	4	13%