University of Houston College of Medicine

Business Plan

DRAFT REPORT
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EXECUTIVE SUMMARY

In Fall 2014, Chancellor Renu Khator announced that the University of Houston (UH) would explore pursuit of a medical school adding to established UH healthcare-related programs already serving the Houston region and the state of Texas. Dr. Khator stated in that address to the UH community her vision to establish "*…down the road, a primary care, community-based medical school."* In concurrence with a recommendation by the UH Health Workgroup, she further vowed to *"…not duplicate anything currently available in Houston, but to build upon it and focus entirely on community-based research and training."*

University leadership envisions a new community-based medical school that would feature an innovative curriculum focused on primary care, behavioral health, community and population health, and the care of communities with significant health and healthcare disparities. Administrators and advisors are in the final stages of developing a broad curriculum framework for the proposed UH College of Medicine (COM). This Business Plan represents a step in the planning process to develop a pro forma budget for the first 10 years of operation of the school as required by the Liaison Committee on Medical Education (LCME) for preliminary accreditation. The team of MGT of America Consulting, LLC (national higher education consultants) and NBBJ (architects and planners) was retained to assist the University in developing the Business Plan.

The shortage of physicians across the country is well documented. This problem is particularly acute in Texas, as it lags well behind all but a handful of states in terms of physicians per capita and most critically, primary care physicians. This latter need permeates both rural and urban areas of Texas, including the underserved areas of the Houston metro. The deficit is fueled by a growing and aging population, an aging physician workforce, as well as increased access to healthcare as a result of the Affordable Care Act. For a variety of reasons, the trend among medical students (both nationally and in Texas) is to pursue more lucrative specialties than a primary care practice, thus exacerbating this shortage. In part because of its long history of involvement with programs related to health professions and health sciences, UH officials recognize this critical unmet need, and wish to address it through the creation of the new College of Medicine employing a community-based model and a primary care focus.

COMMUNITY-BASED MODEL

The trend in medical education over the past several decades has been to train students in community settings rather than university teaching hospitals. This approach exposes students to the full spectrum of health issues, and is proving to be significantly more flexible and responsive than the traditional model focused entirely on a single, insular academic medical center. A central premise is that new physicians should be trained in the types of environments in which they will practice. In addition to a superior learning environment, this emerging model for medical education is much more efficient in terms of both capital and operating costs.

In response to the changes in healthcare delivery over the last few decades, innovative approaches to medical education have been developed that are:

- Community-based – where the medical school uses existing community hospitals and clinics for clinical training. The medical school's clinical faculty are typically located there, along with community faculty. The ownership of the hospital is not under the control of the school. Increasingly, community-based medical education programs are using community physicians as faculty.
- Ambulatory – where the medical students and their mentors work in an outpatient environment. This can include patients in the hospital who do not stay overnight, ambulatory clinics, and doctor's offices.

Today, new medical schools are successfully training students in diverse community settings, where most of the patients are. The students see patients all along the continuum of health to disease in doctors' offices, clinics, hospitals, and in all the settings where healthcare takes place. Research has shown that these students are much more likely to practice in settings outside of the academic health center than students trained in the high tech settings of tertiary and quaternary care.

This new model, like the traditional model for delivery of undergraduate medical education (UME), must pass through the rigorous five-step accreditation process established by the Liaison Committee on Medical Education (LCME). A more detailed description of that process and the proposed UH time lines to achieve accreditation designations as well as full College of Medicine buildout are depicted in the body and appendix of the Business Plan.

MISSION FOCUS

The University of Houston College of Medicine will be accountable to society for improving the overall health and healthcare of the population of Greater Houston, Texas and beyond by:

- Educating a diverse group of physicians who will provide compassionate, high value (high quality at reasonable cost) care to underserved patients, families and communities, with a focus on primary care and other needed physician specialties.
- Conducting interdisciplinary research to find innovative solutions to problems in health and healthcare.
- Providing integrated, evidence-based, high value care delivered to underserved patients by inter-professional teams.
- Engaging, collaborating with, and empowering underserved patient populations and community partners to improve their health and healthcare.

CURRICULUM DEVELOPMENT

A broad curriculum framework for the new College of Medicine continues to be developed. A set of differentiating features have been identified to guide that effort:

- Curriculum emphasis on community and population health, primary care, behavioral health, and preventive medicine.

- Highly integrated teaching of biomedical, clinical, behavioral and social, and health system and population health sciences throughout the four-year curriculum.
- Emphasis on inter-professional education and training.
- Adaptive education approach.
- Longitudinal primary care experience across the four-year curriculum.
- Longitudinal integrated core clinical clerkship.
- Emphasis on learning about social determinants of health and health disparities.
- Participation in an inter-professional student team providing care to a family living in an underserved community throughout the four years of the curriculum.
- Learning about engagement and partnership with communities to improve their health and healthcare through service learning.
- Emphasis on learning the health system and population health sciences.

The College of Medicine curriculum will focus on the areas of Biomedical Sciences, Clinical Sciences, Behavioral and Social Sciences, and Health System and Population Health Sciences.

COLLABORATIVE OPPORTUNITIES AND CLINICAL PARTNERS

It is anticipated that opportunities for interdisciplinary collaboration for existing UH faculty and staff and those of the new College of Medicine will be available and encouraged. As noted in other medical schools, such collaborations might include:

- Existing UH faculty participating in some teaching assignments within the College of Medicine, and College of Medicine faculty who might have courtesy appointments within other University departments.
- College of Medicine faculty serving on graduate committees in other disciplines.
- Attracting new high-performing research faculty.
- Landing interdisciplinary research contract and grant dollars, which may include sharing of specialized research facilities and equipment.
- Participation in interdisciplinary entrepreneurial activities which could benefit both the University community and the greater Houston region.

Clinical partners are an essential component of a community-based model. The Greater Houston Area enjoys the presence of several large and excellent health systems. Despite the current existence of two medical schools in Houston, there is ample clinical teaching capacity within the current healthcare systems to accommodate additional medical students and residents from a third medical school. A number of healthcare systems have capacity and have expressed an openness to developing clinical affiliation agreements, including teaching students at a new UH College of Medicine.

ANNUAL BUDGET PROJECTIONS

MGT developed pro forma budgets for each of 13 fiscal years, beginning with three years for planning and development and continuing with ten years of instruction with increasing numbers of students. The initial class of 30 students is projected to enter in 2019-20, and the size of the entering class will increase by 30 additional students each biennium. A full entering class of 120 students will start in Fall 2025, and the school will reach its full complement of 480 total students by Fall 2028.

The pro forma budget is tailored to the stated vision and mission for a community-based medical school with a focus on primary care. Recently accredited medical schools with similar missions, as well as other UH professional schools, were used as benchmarks in the development of the pro forma budget. Benchmark data informed planning assumptions about required numbers of faculty and staff, competitive salary rates, and typical costs for fringe benefits and operating expenses.

Once the new College of Medicine reaches it planned enrollment of 480 students, it is expected to have 247 FTE faculty and staff, and annual operating expenditures are projected to total approximately $54 million (expressed in current 2016 dollars). Total expenditures are projected to be much lower in early years, with $23.7 million for the three years of planning and $17.7 million for the first year of instruction.

The medical school is expected to depend on multiple sources of revenue to fund its operations. State appropriations are projected to cover about 46% of expected spending at full enrollment, and student tuition is projected to cover an additional 20%. Additional sources of revenue include sponsored research grants, medical practice patient income, and internal support. Similar to other new medical schools in Texas and elsewhere, internal support from gifts and other university sources will be needed, especially during early years of operations. Private giving is expected to provide much of the required internal support as the medical school matures.

Additionally, the new UH College of Medicine (COM) will require a significant amount space in which to operate on the campus as it grows to enrollment buildout. Given the length of time it takes for capital budget requests, approvals, design and construction of a new facility, temporary space must be identified for the new COM. Assuming enrollment buildout as outlined over a 10-year period beginning with the charter class of 30 students in Fall 2019, a permanent facility would need to be available by Fall 2021. The consultant team worked closely with university officials to identify facilities space needs of the College of Medicine, and develop preliminary estimates of capital costs required to meet those needs given certain parameters and assumptions, which are subject to change as plans solidify for the College's implementation.

1. INTRODUCTION

The University of Houston, in further exploration of the proposed new medical school, engaged MGT of America Consulting, LLC along with NBBJ architects and planners to create a business plan for the that effort. The plan identifies resources and assets required for the planning and implementation up to entry of the charter class through buildout to maximum target class size. The business plan development process included significant stakeholder input from university leaders and support personnel that would be impacted by the new school. Identification of various planning, instructional, clinical, facilities and operational benchmarks were included in the analysis leading up the formulation of the business plan goals, financial parameters and assumptions, and an incremental implementation schedule. A set of annual financial pro forma were developed through buildout. This report presents the business plan as developed for the University of Houston College of Medicine.

1.1 BACKGROUND AND NEED

On October 1, 2014 during her annual fall address, Chancellor Renu Khator announced that one of the key initiatives of the continued expansion and advancement of the University of Houston (UH) as a Tier One public research institution would be the pursuit of a stand-alone medical school adding to the cadre of established UH healthcare related programs already serving the region, the state of Texas, and beyond. Dr. Khator stated in that address to the UH community her vision to establish *"…down the road, a primary care, community-based medical school."* In concurrence with a recommendation by the UH Health Workgroup, she further vowed to *"…not duplicate anything currently available in Houston, but to build upon it and focus entirely on community-based research and training."*

The University serves over 42,000 students in one of the most ethnically diverse regions of the country. UH continues to make significant contributions in healthcare with more than 11,000 students annually enrolled in health-related degree programs, which account for nearly one-quarter of all degrees awarded by the University according to recent reports. Substantial UH research activities are focused on addressing health-related scientific, engineering, and policy issues. Clinical programs in optometry, pharmacy, nursing, clinical psychology, speech language pathology, and social work collectively treat upwards of 30,000 patients each year.

In the very early stages of exploring the addition of a new medical school to the UH academic landscape, University leadership undertook a series of activities and actions to carefully assess the possibilities and the steps that would be required to make the college a reality. Several key milestone events included:

- Commissioning the Tripp-Umbach study (June 2015) to initially describe local/regional/statewide need, pose a framework and focus for an instructional model, assess clinical instructional options in the greater Houston area and identify the next steps in the planning process.
- Identification of Critical Need:

- Texas needs more physicians per capita, as it ranked 41st of 50 states, well below the national average. To match the national per capita figure Texas would need roughly 13,000 more physicians today (according to AAMC 2015 State Physician Workforce Data Book).
- Critical shortages of physicians in primary care with a projected statewide need of 6,260 more by year 2030 to maintain current utilization levels (Robert Graham Center, 2013).
- Texas ranked 47th of 50 states for primary care physicians (PCP) per 100,000 population and today would need an additional 5,300 PCPs today to achieve the national rate (according to AAMC 2015 State Physician Workforce Data Book).
- Based on a review of recent match data available from seven Texas medical schools, it is estimated that only 2 of 10 graduates on average initially pursue residency programs that lead to a primary care practice. That figure is significantly lower for medical schools that are not located in a comprehensive university campus setting (2016 NRMP Match data analysis by UH staff).
- A 2015 Merritt Hawkins study of gaps in the Texas physician workforce, points out that there are 375 federally designated Health Care Professional Shortage Areas (HPSAs) in Texas with a deficit of primary care physicians across both rural and urban settings, including a number in the greater Houston area, indicative of underserved populations.
- A significant portion of the physician workforce is aging in Texas, as 26% are age 60 or older (according to AAMC 2015 State Physician Workforce Data Book).
- According to a 2013 projection report by the Robert Graham Center, additional primary care capacity will be needed to accommodate increased demand for healthcare due the implementation of the Affordable Care Act, and the aging of the state's population.

- Appointment of an experienced Planning Dean (September, 2015) to serve as point-person for this endeavor.
- Establishment of a 14-member Internal Advisory Committee (IAC) for the UH Medical School Planning (**Appendix A**) to offer a university-wide perspective in a collaborative setting.
- Site visits (Fall 2015/Spring 2016) to four existing medical schools around the country that have operational and instructional features supportive of the initial vision for the UH College of Medicine.
- The initiation of this Business Plan (April 2016) to illustrate a likely scenario for planning staffing, faculty capacities, enrollments, clinical instruction, and space needs, and the costs and sources of revenue needed from planning to full class buildout.
- The ongoing buildout of the new Health and Biosciences Building 2 (HBSB-2) facility scheduled to open in 2017.

The University of Houston envisions a new community-based medical school that would feature an innovative curriculum focused on primary care, behavioral health, community and population health, and the care of communities with significant health and healthcare disparities. Administrators and advisors are in the final stages of developing a broad curriculum framework for the school. The next step in the planning process is to develop a Business Plan, including a pro forma budget for the first 10 years of operation of the school as required by the Liaison Committee on Medical Education (LCME) for

preliminary accreditation. This pro forma budget will include the projected start-up operational costs that will be incurred in preparing and applying for LCME provisional accreditation and admitting the first entry class in the summer of 2019. In order to do so, an initial estimate of the space needs and capital costs for temporary space followed by a new stand-alone building to house the new school must be developed. University officials and planners anticipate that class size will gradually increase from an inaugural class of 30, expanding by 30 students every two years to an ultimate entering class size of 120 by year 2025.

1.2 PLANNING ASSIGNMENT

In accordance with the UH Request for Proposal (RFP) scope of work, the consultant team consisting of MGT of America (a national higher education planning and management consultant) and their partner NBBJ architects and planners, was charged with the following assignment:

- Develop a Business Plan, including a pro forma budget for the first 10 years of operation of the school as required by the LCME for preliminary accreditation of a new medical school.
- Determine projected start-up operational costs that will be incurred in preparing and applying for LCME preliminary accreditation and getting ready to admit the first incoming class by 2019.
- Estimate the space needs and capital costs for a new facility to house the new medical school.
- Present the resulting Business Plan to the Chancellor, and senior leadership of the University of Houston.

Resulting from this assignment is the UH College of Medicine Business Plan which follows. The plan documents the feasibility of the new college from planning years through target enrollment buildout. The Business Plan was developed based upon current information and thinking of the University as it considers the structure and components needed to develop an accredited College of Medicine. This initial business plan will provide the starting point for development of detailed curriculum and implementation plans once the new medical school begins to build its own faculty and staff. As the planning process continues, planning parameters and assumptions are expected to vary based on changing conditions and additional information.

1.3 OVERVIEW OF BUSINESS PLAN

The Business Plan that follows is presented in the following sequence of six additional chapters:

Chapter 2: **Guiding Principles for The New College of Medicine** – Provides the preliminary mission and vision statements along with guiding principles for the new College of Medicine.

Chapter 3: **Overall Design of the New College of Medicine** – Offers a description of the community-based model for the new College of Medicine along with the framework of the curriculum, and the planning timeline going forward.

Chapter 4: **Organizational Structure and Staffing** – Details the proposed academic, administrative and support units which will operate the College of Medicine, provides a timeline for administrator and faculty appointments, and notes the numerous opportunities for

clinical partnerships within Houston and the surrounding region. It concludes by identifying internal UH units that represent potential opportunities for research and service collaboration with the new College of Medicine.

Chapter 5: **Budget Needs** – Analyzes potential operating expenses and revenue streams available to offset those costs.

Chapter 6: **Phase-In Schedule of Enrollments and Budgets** – Outlines a proposed phase-in schedule for enrollment development, and describes the revenue and expenditure requirements on a year-by-year basis to implement these enrollment plans.

2. GUIDING PRINCIPLES - NEW COLLEGE OF MEDICINE

As it stands today, the Planning Dean and other members of the Internal Advisory Committee have developed the initial mission statement and vision for the new College of Medicine. While the language is subject to change, the essential message will remain. Additionally, the planning team has identified a set of guiding principles and a series of features or circumstances that will contribute to the value and distinctiveness of this proposed new medical school in Texas.

2.1 MISSION

The University of Houston College of Medicine is accountable to society for improving the overall health and healthcare of the population of Greater Houston, Texas and beyond by:

- Educating a diverse group of physicians who will provide compassionate, high value care to underserved patients, families and communities, with a focus on primary care and other needed physician specialties.
- Conducting interdisciplinary research to find innovative solutions to problems in health and healthcare.
- Providing integrated, evidence-based, high value care delivered to underserved patients by inter-professional teams.
- Engaging, collaborating with, and empowering underserved patient populations and community partners to improve their health and healthcare.

2.2 VISION

By 2030, the University of Houston College of Medicine will be recognized nationally for:

- Educating physicians who have a deep understanding of the social determinants of health, health disparities, and how to work with communities to improve their health and healthcare.
- Educating physicians who are experts in providing high value healthcare, managing the health of patient populations, and continuously improving healthcare delivery.
- Graduating physicians who choose to practice primary care and other needed physician specialties in underserved (urban or rural) communities.
- Educating physicians from underrepresented minorities in medicine, beginning with K-12 and college pre-medical ethnically and socioeconomically diverse “pipeline” programs.
- Conducting high impact, interdisciplinary research that contributes to improving health and healthcare, capitalizing on the breadth of talent and expertise present across our tier 1 research university.
- Providing inter-professional team-based care to patients in surrounding underserved communities and beyond that is integrated, evidence-based, safe, and of measurable high value.

- Engaging, collaborating with, and empowering patient populations and community partners to achieve measureable improvements in health and healthcare.
- Contributing to measurable improvements in the health of the underserved populations in surrounding geographic communities that are currently socioeconomically disadvantaged and have significant health disparities.

2.3 GUIDING PRINCIPLES

Through the work of the Planning Dean and the Internal Advisory Committee a value proposition for the new UH College of Medicine has emerged around three key guiding principles:

- The college will educate physicians who will deliver high value (high quality at reasonable cost) healthcare.
- The college will strive to educate physicians who will choose to practice primary care medicine.
- The college will educate physicians who will be experts in working with communities with significant health disparities to improve the health of their populations.

2.4 FEATURES OF A NEW UH COLLEGE OF MEDICINE

Evolving from planning discussions to date, the conceptual framework of a community-based model, and the combination of current circumstances and existing key educational assets of the University of Houston, the following features could contribute to the success and differentiation of the new UH College of Medicine.

- Given the documented shortage of primary care physicians in Texas, the new COM will establish "pipeline" programs in local middle schools and high schools located in underserved areas to encourage students to pursue a career in medicine. Holistic selection criteria for medical school applicants, including characteristics predictive of primary care practice and practice focused on underserved populations will be developed. Such programs and processes will mirror the success of several medical schools across the country that have a similar focus. UH representatives made a point early on to visit Florida State University (FSU) and Florida International University (FIU) which have successfully implemented such targeted efforts and have achieved results well surpassing the national norm for production of primary care physicians and those who serve underserved populations and geographies. FSU reports 50% of graduates choosing careers in primary care, compared to a national average of 20% of medical school graduates. Similarly, in a recent news article, FIU officials noted that "many of their graduates including 58% of the class of 2016 are choosing careers in primary care."

- UH plans to incorporate the 21st century model for offering the clinical experience in community based settings. This approach provides medical students far greater opportunities to see and engage in healthcare delivery at the point where 90% of the patient contact occurs, beyond a traditional teaching and research hospital paradigm.

- Given the extensive diversity of the University and the surrounding population of greater Houston, the new UH medical school can rely on the University's proven track record of developing programs and pathways to attract and enable underserved populations to access higher education and achieving degree completion. For example, the University plans to develop a post baccalaureate master's in biomedical sciences to prepare students for entry to medical school.

- The University already offers an extensive array of health science and health professions education programs, along with STEM and other related academics. Establishment of a new medical school integrated into this comprehensive university setting would provide numerous opportunities for cross-collaboration of instruction, research and service missions. This would range from courtesy faculty appoints and shared instructional engagements, joint research and grant opportunities, shared resources, and delivery of interdepartmental services to the local Houston community and beyond, just to name a few.

- Given the concerns over affordability and student debt upon graduation from college, the University will develop a seven year B.S. to M.D. program for academically strong high school students that guarantees them admission to the medical school following the first three successful years of undergraduate studies (as determined by a minimum GPA).

3. OVERALL DESIGN – NEW COLLEGE OF MEDICINE

The trend in medical education over the past several decades has been to train students in community settings rather than university teaching hospitals. This approach exposes students to the full spectrum of health issues, and is proving to be significantly more flexible and responsive than the traditional model focused entirely on a single, insular academic medical center. A central premise is that new physicians should be trained in the types of environments in which they will practice. In addition to a superior learning environment, this emerging model for medical education is much more efficient in terms of both capital and operating costs. Furthermore, this new model, like the traditional model for delivery of undergraduate medical education (UME), must pass through the rigorous five-step accreditation process established by the Liaison Committee on Medical Education (LCME). A more detailed description of that process and the proposed UH time lines to achieve accreditation designations as well as full College of Medicine buildout are depicted in this chapter.

3.1 COMMUNITY-BASED MODEL

In response to the changes in healthcare delivery over the last few decades, innovative approaches to medical education have been developed that are:

- Community-based – where the medical school uses existing community hospitals and clinics for clinical training. The medical school's clinical faculty are typically located there, along with community faculty. The ownership of the hospital is not under the control of the school. Increasingly, community-based medical education programs are using community physicians as faculty.
- Ambulatory – where the medical students and their mentors work in an outpatient environment. This can include patients in the hospital who do not stay overnight, ambulatory clinics, and doctor's offices.

Today, new medical schools are successfully training students in diverse community settings, where most of the patients are. The students see patients all along the continuum of health to disease in doctors' offices, clinics, hospitals, and in all the settings where healthcare takes place. Research has shown that these students are much more likely to practice in settings outside of the academic health center than students trained in the high tech settings of tertiary and quaternary care.

A side-by-side comparison of the traditional approach to training physicians and that taken in a community-based approach is shown in **Exhibit 3-1**.

EXHIBIT 3-1
COMPARISON OF TRADITIONAL AND COMMUNITY-BASED MEDICAL SCHOOLS

Topic	Traditional Medical School	Community-Based Medical School
Focus of curriculum	Focused on 20th century medical care	Focused on the evolving 21st century health care system
Hospital relationships	Owns and operates hospitals/clinics	Partners with existing community hospitals and other health care providers
Focus of leadership	Focused on the clinical enterprise	Focused on training physicians
Setting of training	Training primarily in tertiary/quaternary hospital settings	Training in all of the settings where patients are—doctors' offices, clinics, hospitals, etc.
Range of patients	Focused on the most serious and sickest patients	Focused on all levels of patient care across the life continuum for all kinds of patients
Location of training	Majority of clinical training occurs in academic medical center	Clinical training is distributed across multiple communities/geographic sites
Source of faculty	Academic physician clinical faculty	Community physician clinical faculty
Source of students	Recruits homogeneous medical student classes based primarily on academic credentials	Recruits diverse medical student classes by building academic pipeline programs from targeted populations in addition to traditional and nontraditional applicants
Student outcomes	Specialty-focused urban-based physician outcomes	Diverse practice outcomes for MD graduates

Source: MGT of America Consulting, LLC, 2016.

3.2 CURRICULUM FRAMEWORK

In October 2015, the Planning Dean for the new University of Houston College of Medicine convened an internal advisory committee consisting of senior faculty members and deans from the majority of the UH health professions colleges to provide advice and assistance in planning the new school. The committee developed a consensus document proposing a fundamental mission along with component missions for the school, and chose four existing medical schools around the country with similar missions as exemplars for members of the committee to visit. In December and January, one-day site visits were completed at those four institutions:

- Brown Alpert Medical School in Providence, Rhode Island.
- Florida State University College of Medicine in Tallahassee, Florida.
- Florida International University Wertheim College of Medicine in Miami, Florida.
- University of California-Riverside School of Medicine in Riverside, California.

At the completion of these visits, a two-day curriculum planning retreat was held by the committee with the participation of seven external advisors who are nationally recognized experts in the areas of:

- Primary care.
- Population health.
- Health informatics.
- Community engagement and partnership.
- Quality improvement and patient safety.

- Inter-professional education.
- Curriculum design, evaluation, and medical school accreditation by the LCME.

The goals of the retreat were to learn from these seven experts about current trends and best practices in medical education in their respective fields, and to develop a broad framework for the curriculum of the new medical school. The following sections summarize the committee's current thinking regarding the broad curriculum framework for the new College of Medicine at the University of Houston.

DIFFERENTIATING FEATURES OF THE PROPOSED CURRICULUM

- Curriculum emphasis on community and population health, primary care, behavioral health, and preventive medicine.
- Highly integrated teaching of biomedical, clinical, behavioral and social, and health system and population health sciences throughout the four-year curriculum.
- Emphasis on inter-professional education and training.
- Adaptive education approach.
- Longitudinal primary care experience across the four-year curriculum.
- Longitudinal integrated core clinical clerkship.
- Emphasis on learning about social determinants of health and health disparities.
- Participation in an inter-professional student team providing care to a family living in an underserved community throughout the four years of the curriculum.
- Learning about engagement and partnership with communities to improve their health and healthcare through service learning.
- Emphasis on learning the health system and population health sciences.

CURRICULUM LENGTH, TERMINAL DEGREE, AND EDUCATIONAL APPROACH

- A four-year, broad-based curriculum integrating the biomedical, clinical, behavioral and social, and health system and population health sciences, emphasizing community and population health, primary care and preventive medicine, leading to a Doctor of Medicine (M.D.) degree.
- Students will have opportunities to gain additional expertise through concentrated study in a number of areas such as primary care, community health, population health, global health, health informatics, healthcare administration, health policy, and biomedical ethics; or obtain an additional master's degree in business, health informatics, public health or public policy, during a fifth year of education in conjunction with other UH colleges or other institutions of higher learning in the Greater Houston area.
- Students will be encouraged to participate in research and scientific discovery, and opportunities will be available within the medical school and across the broader university community.
- "Pipeline" programs will be developed with area middle schools, high schools, and colleges in order to attract and admit minority students who are under-represented in medicine. A post-baccalaureate program leading to a master's degree in biomedical sciences will be developed on

the foundation of the UH honors pre-medical program to assist students who may need additional academic preparation in order to gain acceptance into medical school.

- The medical school's educational approach will be adaptive to learner needs and learning styles, and the curriculum will be adaptive to changes in the healthcare system and the medical profession.
- There will be a strong emphasis on inter-professional education and training, with the goal of educating healthcare professionals who will be adept at working together in inter-professional teams. This will include students from UH schools of medicine, nursing, pharmacy, optometry, social work, education, liberal arts and social sciences, and law. Joint educational activities will include didactic courses, simulations, patient care in clinical settings, and service learning opportunities involving community engagement and partnerships to improve the health of communities.
- Innovative and best practice teaching methods will be utilized, including problem-based, case-based, and team-based learning, "flipped classroom," clinical simulation including the use of standardized patients, virtual reality, telemedicine, and service learning.
- The teaching of the biomedical, clinical, behavioral/social, and health system and population health sciences will be highly integrated throughout the four-year curriculum.

BIOMEDICAL SCIENCES CURRICULUM

- The teaching of the biomedical sciences will be concentrated in the first 18 months of the curriculum, but biomedical sciences concepts will be reinforced and amplified during the remaining months of the curriculum that are more clinically focused.
- The biomedical sciences will be taught within the context of their relevance to clinical practice; utilizing clinical correlations and clinical problem solving through problem-, case-, and team-based learning exercises. Clinician faculty will join biomedical sciences faculty as co-teachers in this part of the curriculum.
- The biomedical sciences will be taught using an integrated body system approach, as opposed to a discipline-based approach. An initial Foundations of Biomedical Sciences course (molecular and cell biology, biochemistry, histology, principles of pathology, etc.) will be followed by system-specific blocks (respiratory, cardiovascular, gastrointestinal, etc.). The timing of clinical skills teaching will be coordinated with the body systems teaching in the biomedical sciences curriculum.

CLINICAL SCIENCES CURRICULUM

- The teaching of clinical sciences will begin on "day one" of the curriculum; students will be exposed to the care of patients in the community-based primary care setting as part of the clinical skills course and longitudinal primary care experience.
- The clinical sciences curriculum will utilize clinical simulation and standardized patients to teach fundamental principles of clinical care.
- The biomedical sciences will be taught within the context of their application to clinical medicine, with significant utilization of clinical correlations and clinical problem solving exercises, including a review of the scientific evidence in current biomedical literature.

- In lieu of a traditional block core clinical clerkship approach to teaching the clinical sciences, the curriculum will combine a longitudinal integrated core clinical clerkship with short hospital-based clinical rotations in internal medicine, surgery, obstetrics, and neonatology. The longitudinal integrated clinical clerkship will involve spending time each week with an internist, pediatrician, gynecologist, surgeon, psychiatrist, and family physician over a prolonged period of time (twelve months), mostly in an outpatient setting.
- Each student will be assigned to a primary care practice over the four-year curriculum in order to gain a longitudinal primary care experience one-half day per week with continuity of care of a panel of patients.
- The final year of the curriculum will include some required inpatient clinical rotations (ICU, acting internship) along with clinical electives across a broad range of specialties/subspecialties.

BEHAVIORAL AND SOCIAL SCIENCES CURRICULUM

- The teaching of the behavioral and social sciences will happen across all four years of the curriculum, and will be integrated with the teaching of the other sciences.
- Teaching methods will include didactic lectures; problem-, case-, and team-based learning exercises; simulation and use of standardized patients; and participation in the clinical care of patients and families in the outpatient, inpatient, community, and home settings.
- Students will learn about the social determinants of health and health disparities in multiple settings.
- Students will participate in an inter-professional student team providing care for a family in an underserved community throughout the four years of the curriculum.
- Students will learn about engaging and partnering with communities to improve their health and healthcare through inter-professional service learning experiences.
- Curricular content will include physician-patient communication, relationship-based care, the art of healing, cross-cultural care and cultural fluency, motivational interviewing, behavioral treatments for lifestyle modification, and healthcare management of patients with addictions.

HEALTH SYSTEM AND POPULATION HEALTH SCIENCES CURRICULUM

- The health system and population health sciences (epidemiology, biostatistics, research design including clinical trials, evidence-based medicine, clinical decision-making, health informatics, population health, quality improvement and patient-safety, health economics, health systems and policy, biomedical ethics, team-based care, and leadership) will be fundamental components of the curriculum and will be taught across the four years in an integrated fashion with the other sciences.
- Teaching methods will include didactic lectures; problem-, case-, and team-based learning exercises; case studies; team-based projects; and service learning opportunities. Some of the learning will occur in an inter-professional educational setting.

3.3 LCME STANDARDS FOR ACCREDITATION

LCME accreditation is essential for a new medical education program at the University of Houston. According to the LCME, accreditation signifies that national standards for structure, function, and performance are met by a medical school's education program leading to the M.D. degree. LCME accreditation establishes eligibility for selected federal grants and programs, including Title VII funding administered by the Public Health Service. Students and graduates of LCME-accredited medical schools are eligible to take the United States Medical Licensing Examination (USMLE). These graduates also have eligibility to enter residencies approved by the Accreditation Council for Graduate Medical Education (ACGME). Graduating from an LCME-accredited U.S. school and passing the national licensing examinations are accepted as prerequisites for medical licensure in most states (LCME.org).

Gaining LCME accreditation occurs over a five-step process as summarized in **Exhibit 3-2**. A set of flow-chart diagrams further illustrating the LCME process is presented in **Appendix B.** UH can become an "Applicant" at any time after being granted authorization by its Board of Regents and being able to demonstrate financial ability to develop the school over the next decade and beyond. While in applicant status, UH will undertake its initial self-study, develop plans, and complete a Data Collection Instrument (DCI) to seek "Candidate" status. Once candidate status is confirmed, the schedule for an on-site survey visit will be developed and, after the survey team confirms readiness, "Preliminary Accreditation" status will be granted by LCME. At that time, the University can initiate the process for student admissions and announce the starting date for its charter class.

EXHIBIT 3-2
FIVE-STEP PROCESS FOR GAINING LCME ACCREDITATION

Process for Obtaining LCME Accreditation

	Applicant	Candidate	Preliminary	Provisional	Full
Status	Not accredited	Not accredited	Accredited, *preliminary status*	Accredited, *provisional status*	Accredited
Process	1 • Program submits $25,000 application fee and application affirming it will be offered in the U.S. or Canada and that the institution will be chartered and located in the U.S. or Canada • Applicant submits Preliminary DCI and self-study within 18 months of initial application • LCME reviews materials; determines that sufficient progress has been made to warrant an on-site survey visit for preliminary accreditation • "Candidate" status granted	2 • Onsite survey visit conducted • LCME reviews survey report; determines sufficient progress has been made toward compliance with *those standards deemed to be essential prerequisites to the admission of a charter class* • Preliminary accreditation granted	3 • Charter class begins first year • Program submits Provisional DCI and self-study • Survey visit conducted before charter class reaches midpoint of second year • LCME reviews survey report; determines that sufficient progress has been made toward program implementation and compliance with *relevant* standards • Provisional accreditation granted	4 • Charter class progresses to third year • Program submits Full DCI and self-study • Survey visit conducted early in fourth year of charter class • LCME reviews survey report; determines program is in sufficient compliance with accreditation standards • Full accreditation granted for the balance of an eight-year term	• Onsite survey visits conducted once every eight years for continued accreditation • Eight-year accreditation cycle begins year of initial accreditation (e.g. year preliminary accreditation granted)
Restrictions	Prior to receiving preliminary accreditation, programs **MAY NOT**: • recruit or advertise for students; • solicit or collect application fees or applicant information; • initiate a process for reviewing admissions applications; • schedule interviews for potential matriculants • issue letters of admission			Program is now subject to full set of LCME accreditation standards	

*Based on a four-year curriculum. An alternative timetable will be developed for programs of a different duration.
Source: LCME.org.

The LCME self-study and on-site survey will address twelve "standards" or areas of concern. As a group, the twelve standards are used to assess the readiness and capacity of the host university to offer a medical education program that will produce graduates who are prepared to succeed in residency programs and medical practice. The twelve standards that went into effect in July 2015 are listed in **Exhibit 3-3**. A number of specific concerns are contained within each of the twelve standards.

EXHIBIT 3-3
LCME STANDARDS EFFECTIVE 2015

Standard Number	Topics of Concern
Standard 1	Mission, Planning, Organization, and Integrity
Standard 2	Leadership and Administration
Standard 3	Academic and Learning Environments
Standard 4	Faculty Preparation, Productivity, Participation, and Policies
Standard 5	Educational Resources and Infrastructure
Standard 6	Competencies, Curricular Objectives, and Curricular Design
Standard 7	Curricular Content
Standard 8	Curricular Management, Evaluation, and Enhancement
Standard 9	Teaching, Supervision, Assessment, and Student and Patient Safety
Standard 10	Medical Student Selection, Assignment, and Progress
Standard 11	Medical Student Academic Support, Career Advising, and Educational Records
Standard 12	Medical Student Health Services, Personal Counseling, and Financial Aid Services

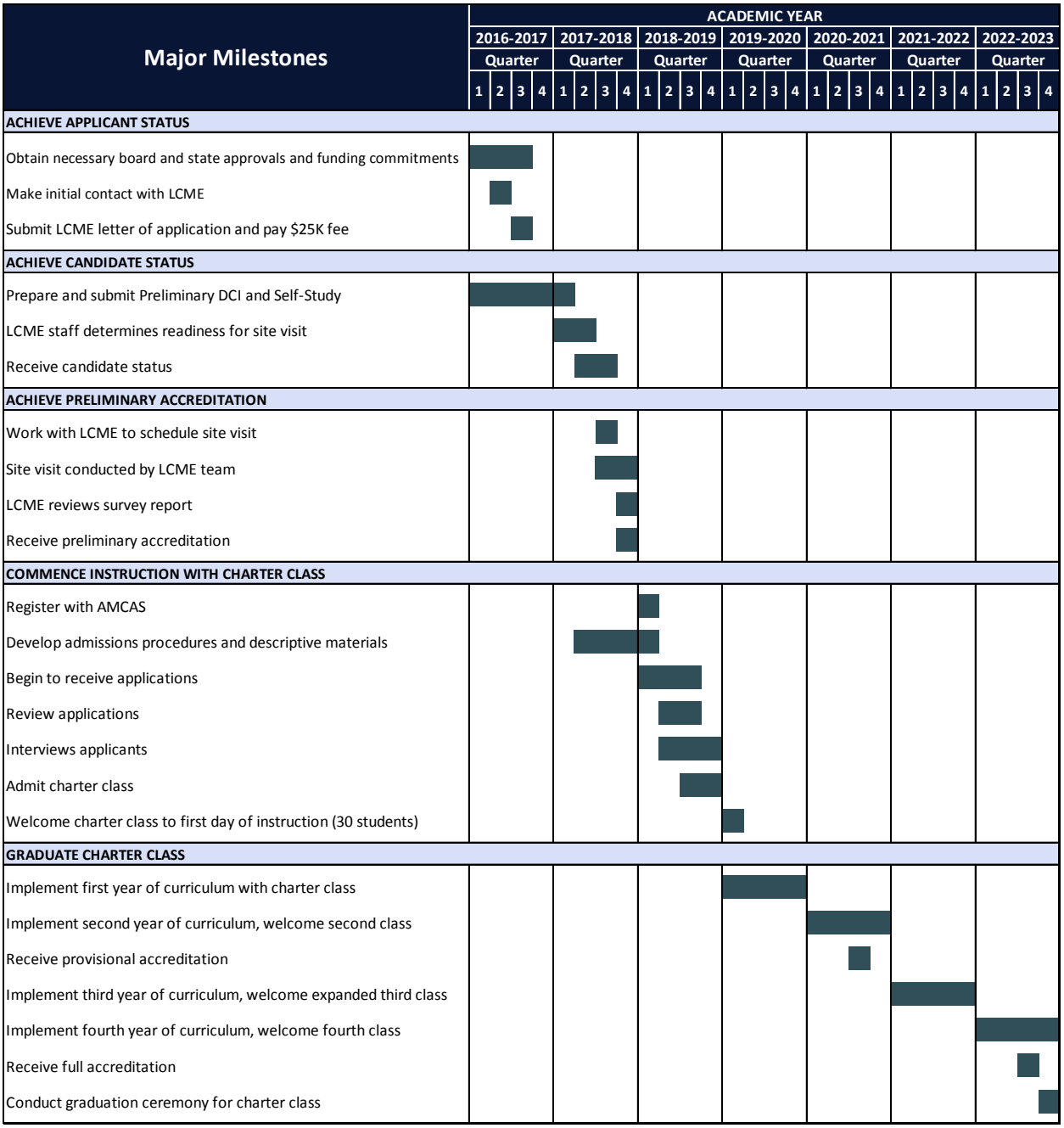
Source: LCME.org.

The *LCME Accreditation Guidelines for New and Developing Medical Schools* make clear that new educational programs do not need to comply immediately with all LCME accreditation standards nor have the resources in place for the entire program. For example, a new program preparing to admit its first class would not yet be expected to have all the faculty in place to teach third and fourth year students. Nevertheless, the LCME does expect some elements of institutional organization, operation, and resources to be in place before it will consider the program for preliminary accreditation.

3.4 PLANNING TIME LINE

Once the University makes the decision to fully pursue the creation of a new allopathic medical school, an arduous series of planning efforts must begin. This multi-year process encompasses various activities, including notifying the LCME of the university's intent as an applicant school, to data collection, curriculum plan, staffing plans and hiring, space planning, and developing clinical partners as depicted in the previous section. **Exhibit 3-4** illustrates the key activities and milestones that must occur prior to seating the inaugural entry class to various levels of buildout to target enrollment and accreditation approvals.

EXHIBIT 3-4
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
TIME LINE FOR DEVELOPMENT OF NEW COLLEGE OF MEDICINE
CURRENT UNTIL CHARTER CLASS GRADUATION



Source: MGT of America Consulting, LLC.

3.5 ENROLLMENT BUILDOUT TIMELINE

After careful consideration of several scenarios, planners have identified a carefully structured enrollment growth schedule that allows incremental increases of the entering class every two years (**Exhibit 3-5**). A maximum anticipated first-year class of 120 students would be seated by Fall 2025. At the conclusion of academic year 2028-29, the UH College of Medicine would graduate its first full class of 120 new physicians.

EXHIBIT 3-5
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
TIME LINE FOR DEVELOPMENT OF THE COLLEGE
CURRENT UNTIL FIRST FULL CLASS GRADUATION

Major Milestones	2017-2018 Quarter 1	2017-2018 Quarter 2	2017-2018 Quarter 3	2017-2018 Quarter 4	2018-2019 Quarter 1	2018-2019 Quarter 2	2018-2019 Quarter 3	2018-2019 Quarter 4	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029
Preliminary accreditation granted				■														
Admissions activities				■	■	■	■	■										
Enroll charter class of 30 students									30									
Enroll 2nd entering class										30								
Enroll 3rd entering class											60							
Enroll 4th entering class												60						
Enroll 5th entering class													90					
Enroll 6th entering class														90				
Enroll 1st complete class															120			
Graduate initial class of 30												30				120		
Graduate class of 60													30	60			120	120
Graduate class of 90															60	90	90	
Graduate 1st full class of 120																		120

Source: MGT of America Consulting, LLC.

4. ORGANIZATIONAL STRUCTURE AND STAFFING

This chapter details the proposed organization and staffing structure for the proposed academic, administrative and support units which will operate the College of Medicine, provides a timeline for recruitment and appointment of administrators and faculty, notes the numerous opportunities for clinical partnerships within Houston and the surrounding region, and identifies internal UH units which offer potential opportunities for research and service collaboration.

4.1 ACADEMIC, ADMINISTRATIVE AND SUPPORT UNITS

The administrative structure for the College of Medicine was developed after a comparative review of a number of existing medical schools and in consideration of the community model and curriculum framework proposed for the new college. The role each position will fill within the organization based on this comparative review is shown in **Exhibit 4-1**.

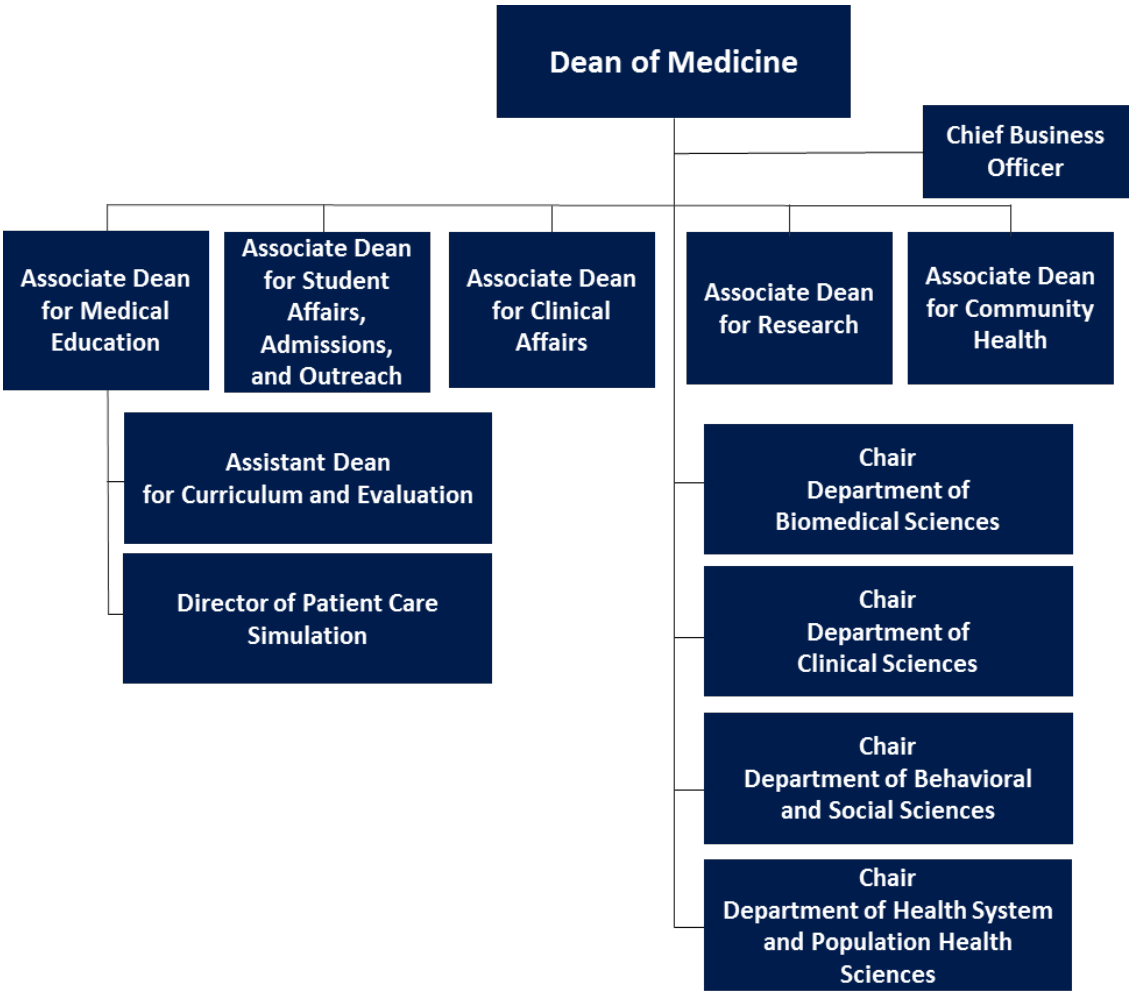
EXHIBIT 4-1
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
SENIOR ADMINISTRATION FUNCTIONAL ROLES

Functional Role	UH College of Medicine
School CEO	Dean of Medicine
	Chief Business Officer
Educational Affairs	Associate Dean, Medical Education
	Assistant Dean, Curriculum/Evaluation
	Director of Patient Care Simulation
Student Affairs	Associate Dean, Student Affairs, Admissions, and Outreach
Clinical Affairs	Associate Dean, Clinical Affairs
Research	Associate Dean, Research
Community Health	Associate Dean, Community Health

Source: UH Medical School Planning Dean and Internal Advisory Committee.

The organizational chart in **Exhibit 4-2** defines the reporting structure of the administrative and academic departments reporting to the Dean.

EXHIBIT 4-2
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
SENIOR ADMINISTRATION ORGANIZATION CHART



4.2 ADMINISTRATOR/FACULTY APPOINTMENTS

As noted in the previous chapter, following the formal notification to LCME that the University is seeking to establish a new medical school, hiring of key senior medical school administrators will begin. The chart in **Exhibit 4-3** illustrates the current plans and sequence to hire administrative leaders and faculty/staff over the course three years leading up to the initial enrollment class.

EXHIBIT 4-3
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
RECRUITMENT NEEDS AND TIMETABLE

Timeframe	Title	Responsibility
Spring/Summer 2017	Assistant Dean for Curriculum and Evaluation	LCME Faculty Lead, responsible for developing LCME preliminary accreditation application
Spring/Summer 2017	Associate Dean for Student Affairs, Admissions and Outreach	Develop "pipeline" programs, develop policies and procedures for admissions, student affairs, assist with developing LCME preliminary accreditation application
Spring/Summer 2017	Chief Business Officer	Assist with developing LCME preliminary accreditation application, develop budgets, financial systems, lead facilities planning and development, lead planning for clinical enterprise
Spring/Summer 2017	Founding Dean	Oversee LCME preliminary accreditation process, faculty recruitment, curriculum development, finalization of clinical affiliations, research program development, budget and financial plan development, philanthropic fundraising
Spring/Summer 2017	Associate Dean for Medical Education	Lead development of medical school curriculum and evaluation systems
Spring/Summer 2017	Associate Dean for Clinical Affairs	Lead finalization of clinical affiliations, develop faculty clinical practice opportunities, partnerships with community providers such as FQHCs
Spring/Summer 2017	Associate Dean for Community Health	Lead development of community engagement and partnerships, develop service learning opportunities for UH health professions students
Spring/Summer 2017	Chair, Department of Biomedical Sciences	Develop granular curriculum for Biomedical Sciences, recruit department faculty, develop strategic plan for research
Spring/Summer 2017	Chair, Department of Clinical Sciences	Develop granular curriculum for Clinical Sciences, recruit department faculty (fulltime and voluntary), work with Associate Dean of Clinical Affairs to develop faculty clinical practice opportunities and partnerships with community providers, develop strategic plan for research
Spring/Summer 2017	Chair, Department of Behavioral and Social Sciences	Develop granular curriculum for Behavioral and Social Sciences, recruit department faculty (fulltime, part-time and voluntary), develop strategic plan for research
Spring/Summer 2017	Chair, Department of Health System and Population Health Sciences	Develop granular curriculum for Health System and Population Health Sciences, recruit department faculty (fulltime, part-time and voluntary), develop strategic plan for research
Spring/Summer 2018	Director of Patient Care Simulation	Lead planning, development, and equipping of Simulation Center, develop and train panel of simulated patients
Spring/Summer 2018	Associate Dean for Research	Lead development of research programs and collaborations, faculty research space
Summer 2018 through Summer 2025	Faculty, Department of Biomedical Sciences • Gross Anatomy • Molecular/Cell Biology • Biochemistry • Physiology • Molecular Genetics • Immunology • Microbiology/Virology • Pathology • Pharmacology • Neurosciences	Finalize granular curriculum for Biomedical Sciences, prepare course teaching materials/syllabi, launch research programs.
Summer 2018 through Summer 2027	Faculty, Department of Clinical Sciences • Family Medicine • Internal Medicine • Pediatrics • Ob-Gyn • Surgery • Psychiatry • Neurology • Geriatrics	Finalize granular curriculum for Clinical Sciences, prepare course teaching materials/syllabi, participate in faculty development of voluntary clinical faculty, begin clinical practice activities.
Summer 2018 through Summer 2027	Faculty, Department of Behavioral and Social Sciences • Clinical Psychology • Medical Sociology • Medical Anthropology • Health Education/Behavior/Lifestyle Modification	Finalize granular curriculum for Behavioral and Social Sciences, prepare course teaching materials/syllabi, launch research programs, begin clinical practice activities if relevant.
Summer 2018 through Summer 2027	Faculty, Department of Health Systems and Population Health Sciences • Biostatistics/Data Analytics • Clinical Epidemiology/Evidence-based Medicine • Health Informatics • Quality Improvement/Patient Safety	Finalize granular curriculum for Health Systems and Population Health Sciences, prepare course teaching materials/syllabi, launch research programs

Source: UH Medical School Planning Dean and Internal Advisory Committee.

4.3 CLINICAL PARTNER AND STAFFING OPPORTUNITIES

The Greater Houston Area enjoys the presence of several large and excellent health systems. Despite the current existence of two medical schools in Houston, there is ample clinical teaching capacity within the current healthcare systems to accommodate additional medical students and residents from a third medical school. A number of healthcare systems have capacity and have expressed an openness to developing clinical affiliation agreements including teaching students at a new UH College of Medicine, including Memorial Hermann, Harris Health, Texas Children's Hospital, and HCA. In addition, the region is home to a number of Federally Qualified Health Centers, and UH has had positive conversations with Legacy Health, Central Care, El Centro de Corazon, and Hope Clinic about clinical affiliation agreements, as well. UH anticipates that written Memoranda of Understanding regarding clinical affiliations will be executed by December 31, 2016.

4.4 COLLABORATIVE OPPORTUNITIES WITHIN THE UNIVERSITY COMMUNITY

University leadership foresees the introduction of medical education to the institution's extensive array of health professions and health sciences programs as a critical addition to support the UH instructional, research, and services missions. There are a number of existing University of Houston colleges, departments, instructional programs, research centers, and service units that may represent viable opportunities for collaboration with the new College of Medicine, including faculty joint appointments. A preliminary list of these UH entities is displayed in **Exhibit 4-4**.

EXHIBIT 4-4
UNIVERSITY OF HOUSTON COLLEGES, DEPARTMENTS, AND PROGRAMS FOR POTENTIAL COLLABORATIVE OPPORTUNITIES AND FACULTY JOINT APPOINTMENTS

UH Colleges, Departments, and Programs	College of Medicine Departments*		
	BS	B&SS	HS
Nursing	•	•	•
Pharmacy (including: Pharmacological and Pharmaceutical Sciences, Pharmacy Practice and Translation Research, and Pharmaceutical Health Outcomes and Policy)	•	•	•
Optometry	•	•	•
Graduate School of Social Work		•	•
Education (including: Psychological, Health and Learning Sciences)		•	
Engineering (including: Biomedical Engineering, Electrical and Computer Engineering, Industrial Engineering, and Chemical and Biomolecular Engineering)	•		•
Honors (including: Honors Biomedical Sciences, Houston Premedical Academy, Medicine and Society Program, and Honors in Community Health)	•	•	•
Law Center (including: Health Law and Policy Institute)			•
Liberal Arts and Social Sciences (including: Communication Sciences and Disorders, Comparative Cultural Studies, Economics, Health and Human Performance, Psychology, and Sociology)		•	
Natural Sciences and Mathematics (including: Biology and Biochemistry, Computer Science, Chemistry, Physics, and Mathematics)	•		•
Technology (including: Computational Health Informatics, Biotechnology, Engineering Technology, Information and Logistics Technology)	•		•
Architecture (including: Community Design Resource Center)		•	
Business			•

*BS = Biomedical Sciences, B&SS = Behavioral and Social Sciences, HS = Health System and Population Health Sciences.

Research Centers, Institutes and Programs
Center for Nuclear Receptors and Cell Signaling
Biology of Behavior Institute
Center for Advanced Computing and Data Systems (fka TLCC)
Center for Advanced Materials
Texas Center for Superconductivity at the University of Houston
Texas Institute for Measurement, Evaluation and Statistics
Texas Obesity Research Center
Center for Drug and Social Policy Research
Institute for Drug Education and Research
Child and Family Center for Innovative Research
Heart and Kidney Institute
Center for Neuromotor and Biomechanics Research
Center for Neuroengineering and Cognitive Sciences
Integrated Bio and Nanosystems Center
The Heart and Kidney Institute
Center for Experimental Therapeutics and PharmacoInformatics (CETP)
Institute for Drug Education and Research
Institute of Community Health (ICH)
Health-E

Source: University of Houston.

Possible opportunities for interdisciplinary collaboration, as noted in other medical schools, might include the following:

- Existing UH faculty participating in some teaching assignments within the College of Medicine, and College of Medicine faculty who might have courtesy appointments within other University departments.
- College of Medicine faculty serving on graduate committees in other disciplines.
- Attracting new high-performing research faculty.
- Landing interdisciplinary research contract and grant dollars, which may include sharing of specialized research facilities and equipment.

- Participation in interdisciplinary entrepreneurial activities which could benefit both the University community and the greater Houston region.

5. BUDGET NEEDS

One of most significant concerns in a decision to develop a new medical school is financial viability. This chapter analyzes potential operating expenses and revenue streams available to offset those costs. Projections of annual operating expenditures once the new, community-based UH medical school reaches its planned full enrollment capacity are developed for each of the four planned academic departments, as well as for the Dean's office and central support functions. Projected revenue is developed for student tuition, state appropriations, and other major sources of revenue. As compared to budgets for medical schools embedded in academic health science centers, the projected budget for the UH College of Medicine includes only minimal amounts for patient care revenues and related expenditures since most of these activities will continue to be the financial responsibility of existing healthcare organizations in the community that will become partners with the UH College of Medicine.

5.1 BASIS FOR DEVELOPMENT OF EXPENDITURE AND REVENUE PROJECTIONS

The budget projection model for the UH College of Medicine was designed to estimate the approximate expenditure levels required for a new LCME-accredited M.D. degree program. The projected budget shows how resources could be allocated across several instructional departments and central administrative and support units. Funding levels of recently accredited programs in community-based settings were reviewed to validate overall projected amounts. The allocations across departments and units that are illustrated reflect typical distributions of recent medical schools. As more detailed curriculum planning takes place, these allocations can be expected to change to reflect the unique character of a new UH medical school.

Benchmark data from a variety of sources were compiled, including data bases developed and maintained by the Association of American Medical Colleges (AAMC), budgets and staffing plans from recently developed medical schools in Texas and other states, and budgets and staffing plans for comparable academic units at UH (i.e., professional schools and life sciences programs). These data were used to develop the following set of assumptions underlying the *expenditure* projection model for the new medical school.

Program Development Timetable. The UH Board of Regents will authorize the continued pursuit of the development of a new medical school at its August 2016 meeting and various state approvals will be granted in Spring 2017. After a two-year period of further planning and development and award of preliminary accreditation, the charter class will enroll in Fall 2019.

Transition Year Funding. The budget worksheets show modest funding for the 2016-17 fiscal year while approvals for the program are being obtained. These funds will be used to retain curriculum planning consultants and to file the program application with the Liaison Committee on Medical Education (LCME).

Program Enrollment. UH will develop a medical school which will ultimately have 120 entrants per year, for a total enrollment of 480 students in the M.D. program.

Numbers and Mix of Faculty. Faculty staffing profiles of recently accredited new medical schools were examined along with input from the UH Planning Dean to determine the number of full-time-equivalent faculty and their distribution by discipline or medical specialty.

Lead Time for Hiring New Faculty Members. After the early start-up years, funding for new faculty members is provided one year in advance of their teaching assignment. In addition to allowing new faculty the time to develop curricula and prepare courses, some of this funding might be used for recruitment and relocation expenses.

Numbers and Mix of Executive and Professional Staff. Staffing and organizational profiles of recently accredited medical schools and comparable UH colleges were examined to determine the number of executive and professional staff.

Numbers and Mix of Support Staff. Staffing profiles of new medical schools and comparable UH colleges were examined to determine the needed numbers of administrative and technical support staff. The budget model provides 1.25 FTE support staff for each 1.00 FTE of faculty in the academic departments.

Faculty Salary Rates. Faculty salary rates are benchmarked using the national median salary by discipline as reported in the AAMC Faculty Salary Report, (2014-15). Rates were inflated by 3% per year to estimate rates likely to exist in 2016-17, the first year in the budget model.

Executive and Professional Staff Salary Rates. Executive salary rates were benchmarked using data from the CUPA-HR salary survey (2014-15). Professional staff salary rates were benchmarked from analysis of salary patterns at comparable UH colleges.

Support Staff Salary Rates. Current salary rates for administrative and technical support staff in comparable UH colleges serve as benchmarks for such positions in the new medical school.

Fringe Benefit Rates. The projected expense for fringe benefits requiring cash outlay (e.g., insurance, retirement plans) is calculated at 30% of direct salary expense, a rate in line with recent UH experience as reported by the UH Division of Administration and Finance.

Maintenance & Operations Rates. The projected expenditures for operating expense are calculated at 40% of total salary costs based on analysis of experience of newly accredited medical schools and comparable UH colleges.

Assumptions concerning potential revenue streams are based primarily on practices of other medical schools in Texas and other UH professional programs with missions comparable to the new medical school. Assumptions for the revenue projection model include:

Tuition. Tuition revenue is projected using per-student rates charged by other public medical schools in Texas.

State Appropriations. State support is projected using the funding formula rates reported by the Legislative Budget Board and recommendations by the Texas Coordinating Board for new medical schools that are not part of health sciences centers.

University Support. Levels of projected university support are based on recent experience of new medical schools in Texas and current UH practice. University support is expected to come in the form of allocations to the medical school from gift and other available revenues.

Collaboration with Related UH Units. As previously described, UH has existing programs in the life sciences and health professions that have resources that could be of value to the new medical school. Collaboration between these programs and the medical school are expected to become mutually beneficial in the years ahead. However, LCME requirements and existing budget pressures on the other UH units will limit the amount of collaboration that might occur in the early years of the medical school. The budget does not yet identify specific UH resources in other programs that can be shared by the medical school, but both the new College of Medicine and existing departments can be expected to "buy" fractional FTE of faculty time from one another as needed to strengthen their respective programs.

Sponsored Research Grants. Revenue from sponsored research is calculated at 20% of Ph.D. faculty salaries and 10% of M.D. faculty salaries, based on analysis of recent experience of new medical schools and other UH programs.

Clinical Services Income. Clinical income is calculated at 25% of M.D. faculty salaries based on analysis of new medical schools. Although treated as revenue in the departmental pro forma budgets, these amounts might be recorded as an offset to direct salary requirements for clinical faculty if accounting for such salary expense is handled through a separate entity.

Current Dollar Basis. Expenditure and revenue amounts are shown on a current dollar basis (i.e., 2016 funding levels). This treatment, which assumes that rates of growth for expenditure and revenue categories due to inflation will closely align, permits easier interpretation of projected budget levels.

5.2 PROJECTED EXPENDITURES FOR MAJOR ORGANIZATIONAL COMPONENTS AT FULL ENROLLMENT CAPACITY

Plans for the new UH College of Medicine envision four academic departments along with a Dean's Office and other central program and administrative support units. Projected expenditure levels for each of these five departments/units is described below.

Biomedical Sciences. The Department of Biomedical Sciences will provide much of the instruction for the first 18 months of the M.D. program curriculum, but biomedical sciences concepts will be reinforced and amplified during the remaining months of the curriculum that are more "clinically" focused. As the new medical school develops, the Biomedical Sciences department is expected to sponsor graduate instruction for Ph.D. programs in the biomedical sciences. Sponsored research will be an additional focus of faculty efforts. The department is projected to include 32 FTE faculty and 40 FTE administrative and support staff. As seen in **Exhibit 5-1**, the department's annual expenditure level is projected to approach $11.5 million once the planned full enrollment level is reached.

EXHIBIT 5-1
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
PROJECTED ANNUAL EXPENDITURES UPON FULL ENROLLMENT
DEPARTMENT OF BIOMEDICAL SCIENCES

Budget Detail	Salary per FTE	FTE Needed	Salary Requirements	Benefits	Total Compensation
Faculty					
Anatomy	198,326	4.00	793,304	237,991	1,031,295
Molecular & Cell Biology	135,044	4.00	540,176	162,053	702,229
Biochemistry	150,732	4.00	602,928	180,878	783,806
Immunology	107,166	1.00	107,166	32,150	139,316
Microbiology/Virology	139,496	2.00	278,992	83,698	362,690
Molecular Genetics	141,298	1.00	141,298	42,389	183,687
Neurosciences	138,436	4.00	553,744	166,123	719,867
Physiology	138,754	4.00	555,016	166,505	721,521
Pharmacology	137,588	4.00	550,352	165,106	715,458
Pathology	259,594	4.00	1,038,376	311,513	1,349,889
Subtotal		32.00	5,161,352	1,548,406	6,709,758
Support Staff	40,000	40.00	1,600,000	480,000	2,080,000
Total Compensation		72.00	6,761,352	2,028,406	8,789,758
Other Expense					2,704,541
Total Estimated Expenditures					**11,494,298**

Source: MGT of America Consulting, LLC.

Clinical Sciences. Instruction in the Department of Clinical Sciences will span all four years of the M.D. curriculum. In lieu of a traditional block core clinical clerkship approach to teaching the clinical sciences, an approach will be utilized that combines a longitudinal integrated core clinical clerkship with short hospital-based clinical rotations in internal medicine, surgery, obstetrics and neonatology. Faculty in the department will also engage in sponsored research (e.g., clinical trials). Annual operating expenditures, shown in **Exhibit 5-2**, are expected to total more than $27 million. The Clinical Sciences department is projected to house 48 FTE faculty and 60 administrative and support staff at full enrollment capacity. Funding is also projected for providing stipends to community-based physicians who will supervise clerkships and serve as adjunct faculty.

EXHIBIT 5-2
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
PROJECTED ANNUAL EXPENDITURES UPON FULL ENROLLMENT
DEPARTMENT OF CLINICAL SCIENCES

Budget Detail	Salary per FTE	FTE Needed	Salary Requirements	Benefits	Total Compensation
Faculty					
Family Medicine	207,124	10.00	2,071,240	621,372	2,692,612
Internal Medicine	215,710	10.00	2,157,100	647,130	2,804,230
Pediatrics	216,240	7.00	1,513,680	454,104	1,967,784
Ob-Gyn	302,736	7.00	2,119,152	635,746	2,754,898
Surgery	430,466	7.00	3,013,262	903,979	3,917,241
Psychiatry	222,812	7.00	1,559,684	467,905	2,027,589
Subtotal		48.00	12,434,118	3,730,235	16,164,353
Support Staff	40,000	60.00	2,400,000	720,000	3,120,000
Total Compensation		108.00	14,834,118	4,450,235	19,284,353
Other Expense (includes community adjunct stipends of $2.16M)					8,093,647
Total Estimated Expenditures					**27,378,001**

Source: MGT of America Consulting, LLC.

Behavioral and Social Sciences. Faculty in the Behavioral and Social Sciences Department will teach across the four years of the curriculum and assist students in engaging and partnering with communities to improve their health and healthcare through inter-professional service learning experiences. Faculty in the department will also be expected to engage in sponsored research initiatives. The department is projected to have five FTE faculty and 6.25 FTE staff. As shown in **Exhibit 5-3**, the department's annual spending level is projected to be more than $1.5 million.

EXHIBIT 5-3
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
PROJECTED ANNUAL EXPENDITURES UPON FULL ENROLLMENT
DEPARTMENT OF BEHAVIORAL AND SOCIAL SCIENCES

Budget Detail	Salary per FTE	FTE Needed	Salary Requirements	Benefits	Total Compensation
Faculty					
Clinical Pyschology	130,062	1.00	130,062	39,019	169,081
Medical Sociology	130,062	1.00	130,062	39,019	169,081
Medical Anthropology	130,062	1.00	130,062	39,019	169,081
Health Education/Behavior/Lifestyle Modification	130,062	2.00	260,124	78,037	338,161
Subtotal		5.00	650,310	195,093	845,403
Support Staff	40,000	6.25	250,000	75,000	325,000
Total Compensation		11.25	900,310	270,093	1,170,403
Other Expense					360,124
Total Estimated Expenditures					**1,530,527**

Source: MGT of America Consulting, LLC.

Health System and Population Health Sciences. In addition to offering courses in health informatics, population health, quality improvement and patient-safety, health economics, health systems and

policy, faculty in the Health System and Population Health Sciences department will focus on the College's special mission to improve access to healthcare for the community's underserved populations. The department will house 10 FTE faculty and 12.5 FTE administrative and support staff. **Exhibit 5-4** display's the department's projected budget of more than $3.2 million once full enrollment is attained.

EXHIBIT 5-4
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
PROJECTED ANNUAL EXPENDITURES UPON FULL ENROLLMENT
DEPARTMENT OF HEALTH SYSTEM AND POPULATION HEALTH SCIENCES

Budget Detail	Salary per FTE	FTE Needed	Salary Requirements	Benefits	Total Compensation
Faculty					
Biostatistics/Data Analytics	159,636	2.00	319,272	95,782	415,054
Clinical Epidemiology/Evidence-based Medicine	131,864	1.00	131,864	39,559	171,423
Health Informatics	151,262	2.00	302,524	90,757	393,281
Quality Improvement/Patient Safety	131,864	2.00	263,728	79,118	342,846
Population Health	131,864	1.00	131,864	39,559	171,423
Community Health/Community Engagement	131,864	1.00	131,864	39,559	171,423
Biomedical Ethics	127,730	1.00	127,730	38,319	166,049
Subtotal		10.00	1,408,846	422,654	1,831,500
Support Staff	40,000	12.50	500,000	150,000	650,000
Total Compensation		22.50	1,908,846	572,654	2,481,500
Other Expense					763,538
Total Estimated Expenditures					**3,245,038**

Source: MGT of America Consulting, LLC.

Dean's Office and Central Support Units. The leadership team for the new College of Medicine will consist of the founding dean and six associate/assistant deans. Additionally, these units will have 29 other faculty and professional staff involved in curriculum planning, program evaluation, admissions, student services, library services, technology support, external relations, financial administration, and other similar central support functions. As seen in **Exhibit 5-5**, the combined expenditure level of these support units is projected to total approximately $10.1 million. Note that many of the executive and professional staff members are projected to be funded at less than 1.00 FTE for their central administration roles after the initial planning and development period. The balance of their appointments are funded for teaching and research responsibilities in the academic departments or represent time spent in medical practice that will generate income that will offset College of Medicine costs.

EXHIBIT 5-5
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
PROJECTED ANNUAL EXPENDITURES UPON FULL ENROLLMENT
DEAN'S OFFICE AND CENTRAL SUPPORT UNITS

Organizational Unit	Positions		Salaries		Benefits	Other Expense	Total
	Headcount	FTE	Rate	Amount			
Dean's Office							
Dean	1	0.75	500,000	375,000	112,500		
Chief Business Officer	1	1.00	225,000	225,000	67,500		
Support Staff	3	3.00	60,000	180,000	54,000		
Insurance						1,000,000	
Institutional Dues						250,000	
Subtotal	5	4.75	785,000	780,000	234,000	1,250,000	2,264,000
Office of Medical Education							
Associate Dean	1	0.75	225,000	168,750	50,625		
Assistant Dean, Curric & Eval	1	0.75	225,000	168,750	50,625		
Director of Patient Care Sim	1	0.75	225,000	168,750	50,625		
Medical Ed Professional Staff	2	1.50	100,000	150,000	45,000		
Technology Professional Staff	3	3.00	120,000	360,000	108,000		
Library Professional Staff	2	2.00	120,000	240,000	72,000		
Support Staff	4	4.00	50,000	200,000	60,000		
Instructional Materials						2,500,000	
Subtotal	14	12.75	1,065,000	1,456,250	436,875	2,500,000	4,393,125
Office of Student Affairs, Admissions & Outreach							
Associate Dean	1	0.75	225,000	168,750	50,625		
Professional Staff	2	2.00	100,000	200,000	60,000		
Support Staff	3	3.00	50,000	150,000	45,000		
Subtotal	6	5.75	375,000	518,750	155,625	0	674,375
Office of Clinical Affairs							
Associate Dean	1	0.75	225,000	168,750	50,625		
Support Staff	1	1.00	50,000	50,000	15,000		
Subtotal	2	1.75	275,000	218,750	65,625	0	284,375
Office of Research							
Associate Dean	1	0.75	225,000	168,750	50,625		
Professional Staff	1	0.75	100,000	75,000	22,500		
Support Staff	1	1.00	50,000	50,000	15,000		
Subtotal	3	2.50	375,000	293,750	88,125	0	381,875
Office of Community Health							
Associate Dean	1	0.75	225,000	168,750	50,625		
Professional Staff	1	1.00	100,000	100,000	30,000		
Support Staff	4	4.00	50,000	200,000	60,000		
Subtotal	6	5.75	375,000	468,750	140,625	0	609,375
General Operating Expense						1,494,500	1,494,500
Total	**36**	**33.25**	**3,250,000**	**3,736,250**	**1,120,875**	**5,244,500**	**10,101,625**

Source: MGT of America Consulting, LLC.

5.3 PROJECTED REVENUE AND EXPENDITURES AT FULL ENROLLMENT CAPACITY

As seen in **Exhibit 5-6**, the total projected expenditure level of the new UH College of Medicine is nearly $54 million. Personnel cost is the largest expenditure component and is expected to account for 68% percent of total projected spending. Slightly more than half (51%) of the budget will be devoted to the Clinical Sciences department.

EXHIBIT 5-6
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
PROJECTED ANNUAL REVENUE AND EXPENDITURES UPON FULL ENROLLMENT

Organizational Unit	Salaries	Benefits	Other Expense	Total
Projected Expenditures				
Biomedical Sciences	6,761,352	2,028,406	2,704,541	11,494,298
Clinical Sciences	14,834,118	4,450,235	8,093,647	27,378,001
Behavioral & Social Sciences	900,310	270,093	360,124	1,530,527
Health System & Population Health Sciences	1,908,846	572,654	763,538	3,245,038
College Administration	3,736,250	1,120,875	5,244,500	10,101,625
Total, College of Medicine	**28,140,876**	**8,442,263**	**17,166,350**	**53,749,489**
Projected Revenue				
Student Tuition				10,804,885
(480 students @ $22,510)				
Sponsored Research Salary Support				4,168,617
Practice Plan Salary Support				4,821,088
State Appropriations				24,964,800
(480 students @ $52,010)				
Required Internal Support and Gifts				8,990,099

Source: MGT of America Consulting, LLC.

A variety of revenue sources will be needed to cover the projected expenditures. As also listed in **Exhibit 5-6**, state appropriations are expected to account for 46% of all funding and be the largest source of revenue during the formative years of the new College. Amounts are based on typical rates per student in recent Legislative Budget Board and Coordinating Board funding formula recommendations. Student tuition is projected as the second largest revenue category, accounting for about 20% of total funds. University support (including gifts, internal allocations, and in-kind support from collaboration) is the next most significant source of funding. Revenue from sponsored research and clinical services are projected to account for 8% and 9% of total funding, respectively, in the formative years, but should become much more significant contributors to College funding as these programs mature.

6. PHASE-IN SCHEDULE OF ENROLLMENTS AND BUDGETS

Development of the new medical school to full enrollment capacity is expected to take more than a decade, with time required for planning to achieve preliminary accreditation and then to gradually expand the size of its entering class and deliver a four-year curriculum. This chapter outlines a proposed phase-in schedule for enrollment development, and describes the revenue and expenditure requirements on a year-by-year basis to implement these enrollment plans.

6.1 PROPOSED PHASE-IN SCHEDULE FOR ENROLLMENT DEVELOPMENT

Most, if not all, recently established medical schools have adopted a phased approach to enrollment development. Rather than admit a full-sized class of entering students in the first year and achieve full enrollment capacity during the fourth year of operation, they have admitted a relatively small charter class of entrants and expanded the size of each entering cohort incrementally over several additional admission cycles. The advantages of a phased approach for enrollment development have depended on each of the schools' individual circumstances, but have included the need to align class size with available facilities during early years, to test and refine curricular approaches, to recruit sufficient numbers of faculty members, and to respond to the rate at which additional state appropriations might become available.

The proposed schedule for enrollment buildout of the new UH College of Medicine spans 13 years. As seen in **Exhibit 6-1**, the charter class of 30 students would enter in Fall 2019 following a three-year period during which further planning would take place and preliminary accreditation would be attained. Per current standards of the Liaison Committee on Medical Education (LCME), new medical schools cannot begin accepting applications and admit students until preliminary accreditation is granted.

EXHIBIT 6-1
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
PROPOSED PHASE-IN SCHEDULE FOR ENROLLMENT DEVELOPMENT

Program Year	Fiscal/Academic Year												
	Year 1 2016-17	Year 2 2017-18	Year 3 2018-19	Year 4 2019-20	Year 5 2020-21	Year 6 2021-22	Year 7 2022-23	Year 8 2023-24	Year 9 2024-25	Year 10 2025-26	Year 11 2026-27	Year 12 2027-28	Year 13 2028-29
First Year Students				30	30	60	60	90	90	120	120	120	120
Second Year Students					30	30	60	60	90	90	120	120	120
Third Year Students						30	30	60	60	90	90	120	120
Fourth Year Students							30	30	60	60	90	90	120
Total	-	-	-	**30**	**60**	**120**	**180**	**240**	**300**	**360**	**420**	**450**	**480**

Source: MGT of America Consulting, LLC.

After an initial class of 30 students in 2019, the number of entrants would increase by 30 students over the next three biennia until a full entering class of 120 students are admitted in Fall 2025. When this class reaches its fourth year of enrollment by Fall 2028, the planned full enrollment capacity of 480 students will be realized.

6.2 REVENUE AND EXPENDITURE REQUIREMENTS BY YEAR DURING ENROLLMENT BUILDOUT PERIOD

Although the new medical school has a projected annual budget of $53,749,489 at full enrollment capacity, significantly lower amounts will be required during initial years of operation while further planning occurs and enrollments build on a graduated basis. **Exhibit 6-2** summarizes the projected budget levels by year, beginning with the 2016-17 fiscal year. The projected budget requirement for 2019-2020, the initial year of enrollments for the new medical school is $17,658,668. The exhibit also provides initial projections of FTE staffing levels by years.

After the initial planning period, increases in budget levels by year closely track the proposed schedule for enrollment buildout. Funding for new faculty members is projected for the year prior to when their respective teaching duties are scheduled to begin to allow time and resources for faculty recruitment and relocation, development of course plans and materials, and establishment of their assigned research laboratories.

As seen in **Exhibit 6-2**, revenues from tuition and state appropriations at formula rates will fall short of expenditures, and support from private gifts and other sources available to the University will be needed. As enrollments begin to grow toward full capacity and sponsored research and clinical services programs begin to mature, the new medical school is projected to require smaller amounts of university support that can be expected to come primarily from private gifts.

Over the entire 13-year period, the new medical school is projected to expend more than $393 million. Of this amount, state appropriations are expected to support 35% of expenditure requirements, tuition will support 15% and other sources will cover the balance.

Based on the assumptions described above and our analyses of potential expenditure and revenue streams, current plans for a new UH College of Medicine are financially feasible with only modest support required from gifts and other internal sources. As University officials continue to refine program plans and budget assumptions, the pro forma budgets presented in this report can provide a framework for monitoring the impact of any such refinements on financial feasibility.

EXHIBIT 6-2
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
PROJECT BUDGET LEVELS BY YEAR DURING FORMATIVE PERIOD

Organizational Unit	Year 1 2016-17	Year 2 2017-18	Year 3 2018-19	Year 4 2019-20	Year 5 2020-21	Year 6 2021-22	Year 7 2022-23	Year 8 2023-24	Year 9 2024-25	Year 10 2025-26	Year 11 2026-27	Year 12 2027-28	Year 13 2028-29
Projected Expenditures													
Biomedical Sciences	0	359,197	1,436,787	2,873,575	4,310,362	5,747,149	7,183,937	8,620,724	10,057,511	11,494,298	11,494,298	11,494,298	11,494,298
Clinical Sciences	0	570,375	2,281,500	3,422,250	4,563,000	6,844,500	10,266,750	13,689,000	17,111,250	20,533,500	23,955,751	27,378,001	27,378,001
Behavioral & Social Sciences	0	306,105	306,105	612,211	612,211	612,211	612,211	765,264	956,579	1,147,895	1,339,211	1,530,527	1,530,527
Health Systems & Populations Sciences	0	324,504	649,008	649,008	649,008	811,260	1,216,889	1,622,519	2,028,149	2,433,779	2,839,408	3,245,038	3,245,038
College Administration	300,000	7,439,000	9,729,750	10,101,625	10,101,625	10,101,625	10,101,625	10,101,625	10,101,625	10,101,625	10,101,625	10,101,625	10,101,625
Total, College of Medicine	**300,000**	**8,999,181**	**14,403,150**	**17,658,668**	**20,236,205**	**24,116,745**	**29,381,412**	**34,799,132**	**40,255,115**	**45,711,098**	**49,730,293**	**53,749,489**	**53,749,489**
Projected Staffing Levels													
Faculty, Executive & Professional FTE	0.00	10.75	19.25	28.25	34.25	42.25	52.25	63.75	75.63	87.50	95.38	103.25	103.25
Support Staff FTE	0.00	16.00	34.75	47.50	55.00	65.63	79.69	94.38	109.22	124.06	133.91	143.75	143.75
Total, Full-Time-Equivalent Positions	0.00	26.75	54.00	75.75	89.25	107.88	131.94	158.13	184.84	211.56	229.28	247.00	247.00
Projected Revenue													
Student Tuition													
@ $22,510 per student	0	0	0	675,305	1,350,611	2,701,221	4,051,832	5,402,442	6,753,053	8,103,663	9,454,274	10,129,579	10,804,885
Sponsored Research Salary Support	0	0	0	823,805	1,123,900	1,516,754	2,008,571	2,523,797	3,044,874	3,565,951	3,867,284	4,168,617	4,168,617
Practice Plan Salary Support	0	100,439	401,757	602,636	803,515	1,205,272	1,807,908	2,410,544	3,013,180	3,615,816	4,218,452	4,821,088	4,821,088
State Appropriations													
(@ $52,010 per student)	0	0	0	1,560,300	3,120,600	6,241,200	9,361,800	12,482,400	15,603,000	18,723,600	21,844,200	23,404,500	24,964,800
Required Internal Support and Gifts	300,000	8,898,742	14,001,393	13,996,622	13,837,580	12,452,297	12,151,301	11,979,949	11,841,008	11,702,067	10,346,083	11,225,704	8,990,099

Source: MGT of America Consulting, LLC.

The new UH College of Medicine (COM) will require a significant amount space in which to operate on the campus as it grows to enrollment buildout. Given the length of time it takes for capital budget requests, approvals, design and construction of a new facility, temporary space must be identified for the new COM. The identified space needs of the College of Medicine and the resulting preliminary capital costs required to meet those needs are offered in **Appendix C**. They are based on certain parameters and assumptions which are subject to change as plans solidify for the College's implementation. The intent of the analysis that is presented in the appendix is to provide the University with an initial estimate of capital costs associated with both interim and permanent facilities.

APPENDIX A. INTERNAL ADVISORY COMMITTEE

UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
MEMBERS OF THE INTERNAL ADVISORY COMMITTEE FOR PLANNING

Stephen J. Spann, M.D., M.B.A. - Planning Dean for the University of Houston medical school.

Muayyad Al-Ubaidi, Ph.D. - Professor of Biomedical Engineering in the College of Engineering.

Stuart E Dryer, Ph.D. - Professor and Chair of the Department of Biology and Biochemistry, College of Natural Sciences and Mathematics.

Jack M. Fletcher, Ph.D. - Hugh Roy and Lillie Cranz Cullen Distinguished Professor of Psychology and chair of the Department of Psychology.

Lynn M. Maher, Ph.D., CCC-SLP - Professor and Chair of the Department of Communication Sciences and Disorders.

William Monroe, Ph.D. - Professor of English and O'Connor Abendshein Professor and Dean of the Honors College.

Dan O'Connor, Ph.D. - Associate Professor of Health and Human Performance.

F. Lamar Pritchard, Ph.D. - Dean of the College of Pharmacy.

Jessica Roberts, J.D. - Director of the Health Law and Policy Institute and an Associate Professor of Law.

Earl L. Smith III, O.D., Ph.D. - Greeman-Petty Professor and Dean of the College of Optometry.

Nathan G. Smith, Ph.D. - Associate Professor of Psychological Health and Learning Sciences, Counseling Psychology program, in the College of Education.

Kathryn Tart, Ed.D., M.S.N., R.N. - Professor and Founding Dean of the College of Nursing.

Luis Torres, Ph.D. - Associate Professor and Associate Dean of Research and Strategic Partnerships in the Graduate College of Social Work.

George Zouridakis, Ph.D. - Founding Director of the Biomedical Imaging Lab and Professor in Engineering Technology, Computer Science, and Electrical and Computer Engineering.

APPENDIX B. LCME ACCREDITATION PROCESS

POSSIBLE LCME ACTIONS

When considering the accreditation status of a medical education program leading to the MD degree, the LCME may take any of the following actions:

- Grant an accreditation status (full, provisional, or preliminary)
- Continue an accreditation status, with or without specifying the term of accreditation
- Continue an accreditation status, but place the program on warning
- Continue an accreditation status, but place the program on probation
- Deny an accreditation status
- Withdraw accreditation

The LCME may also require one or more follow-up activities (e.g., limited survey visits, consultations, status reports) if it determines that the program is not in compliance with one or more accreditation standards or has unsatisfactory performance in one or more accreditation elements, or if the LCME has identified areas in compliance that require monitoring where the final outcome could result in noncompliance with one or more accreditation standards.

PROCESS FOR OBTAINING LCME ACCREDITATION (U.S. SCHOOLS)

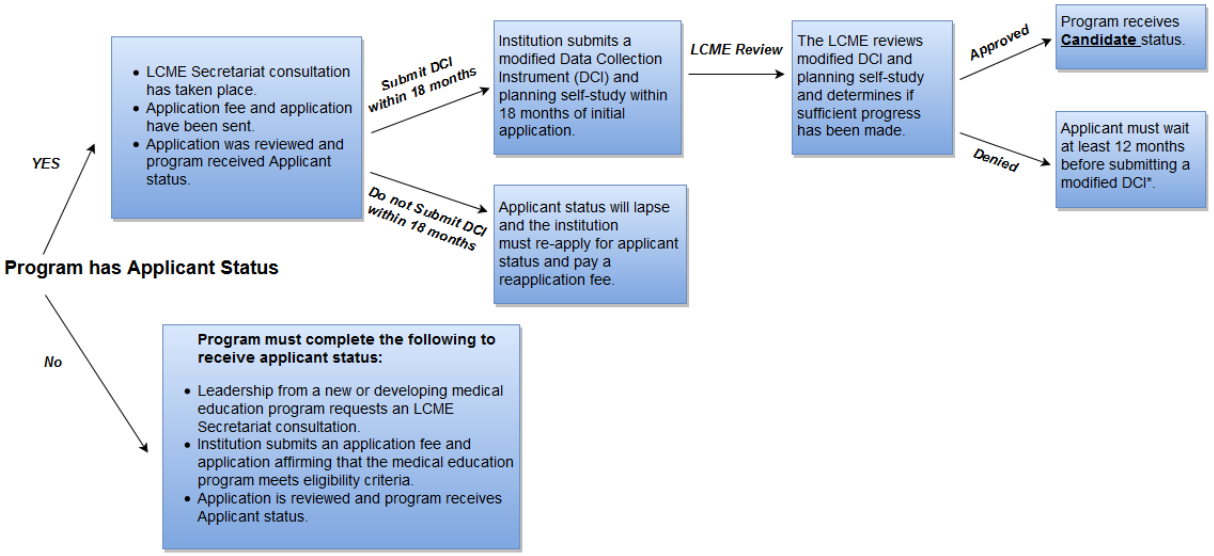
The diagram below describes the process that a new medical education program follows to achieve full accreditation status. It includes possible outcomes for each step depending on LCME determinations.

Prior to receiving preliminary accreditation, new and developing medical education programs MAY NOT:

- recruit or advertise for students
- solicit or collect application fees or applicant information
- initiate a process for reviewing admissions applications
- schedule interviews for potential matriculants
- issue letters of admission

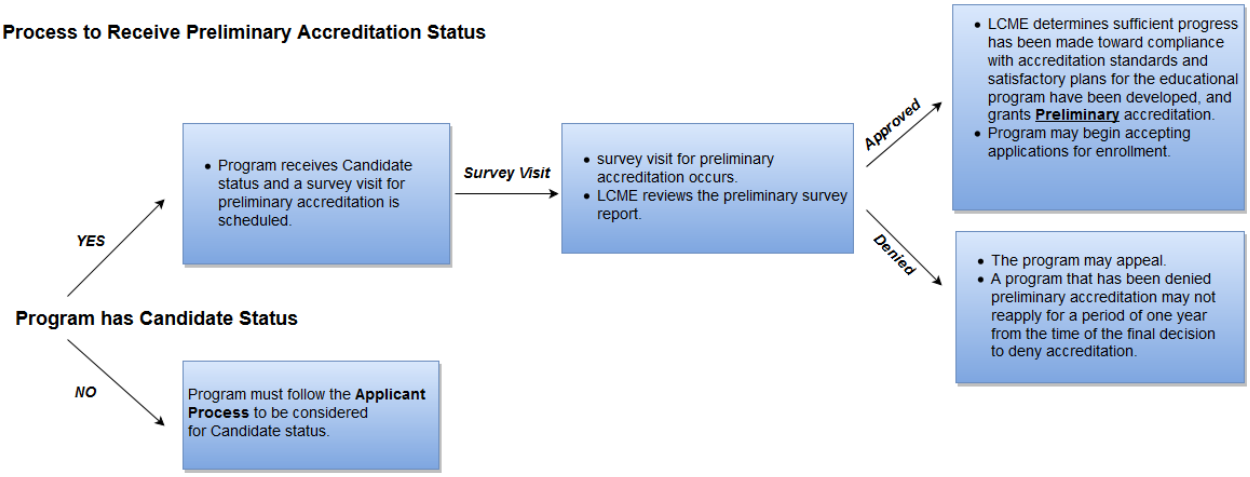
For more details about LCME policies, refer to the LCME Rules of Procedure. Questions about any step in this process should be directed to the LCME Co-Secretaries.

Process to Receive Applicant and Candidate Status

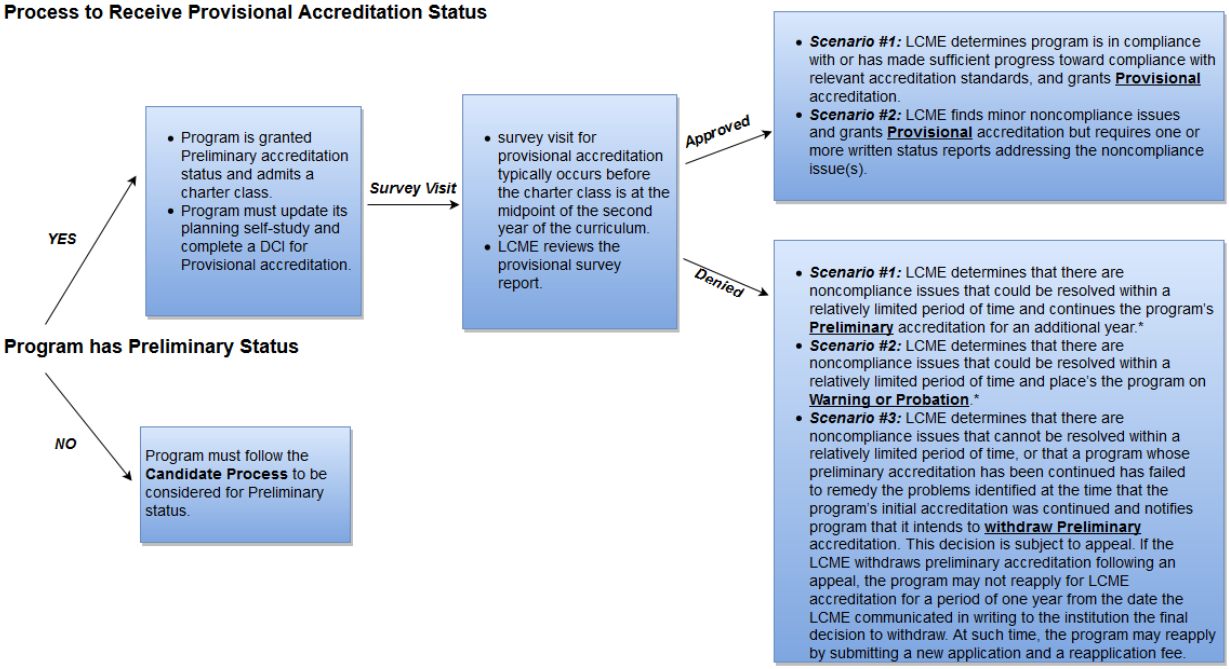


**A developing medical education program granted applicant status after July 1, 2013 may have a total of three reviews for candidate status. For such a program, the timing between reviews for candidate status will be no less than 12 months and no more than 18 months from the last date of denial. If the LCME does not grant candidate status after the third review, the program must reapply for applicant status and pay a reapplication fee.*

Process to Receive Preliminary Accreditation Status

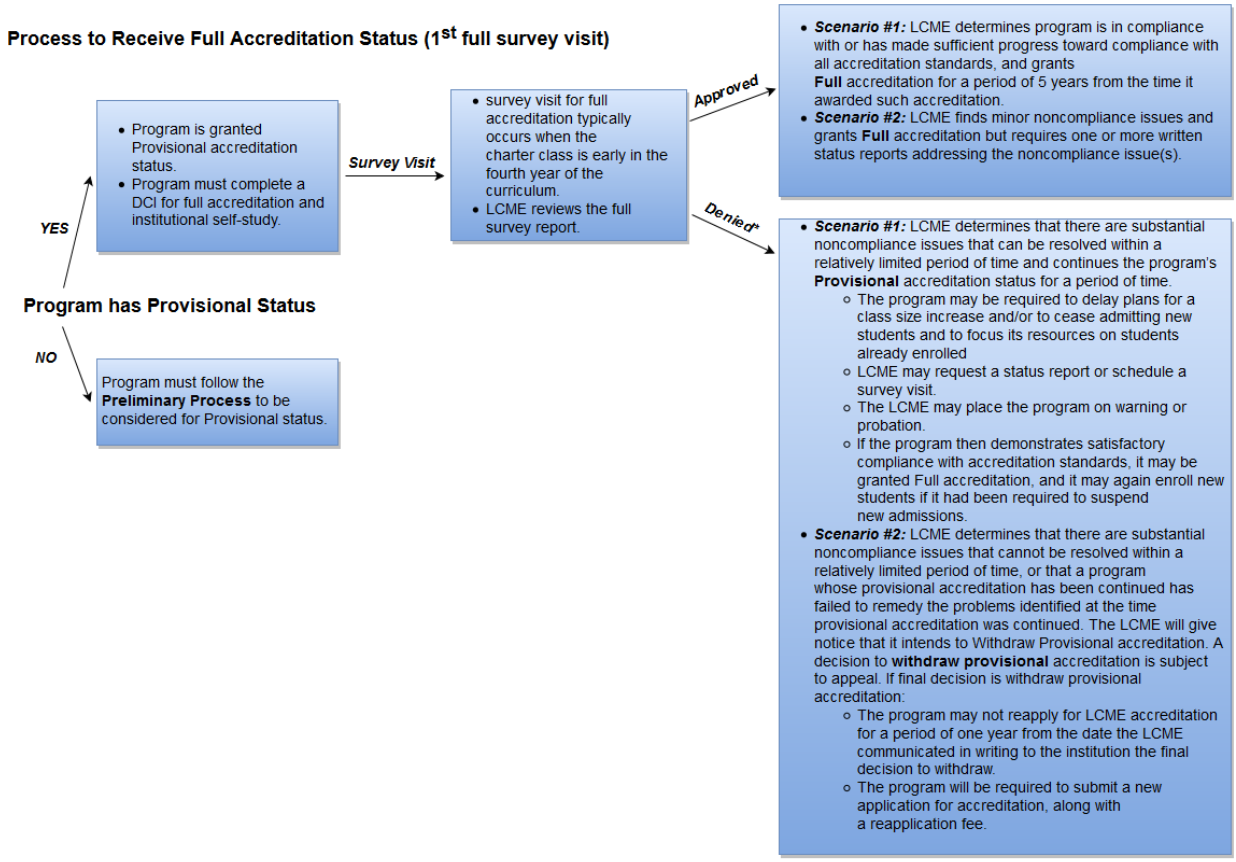


Process to Receive Provisional Accreditation Status



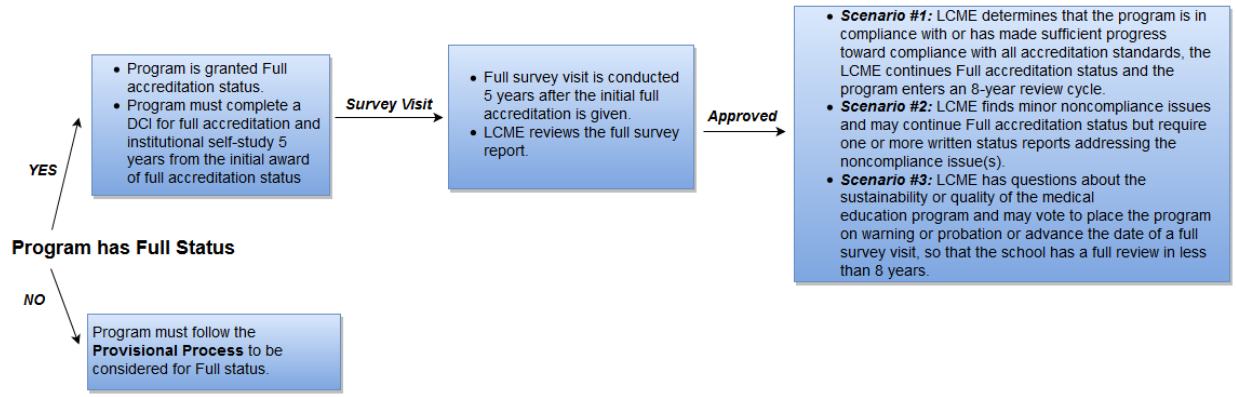
**The LCME will determine the timing of subsequent reviews, including the visit date for provisional accreditation based on the determinations it makes when it grants preliminary accreditation. If the program demonstrates satisfactory compliance, it may then be granted provisional accreditation.*

Process to Receive Full Accreditation Status (1st full survey visit)



**Accreditation as a complete medical education program must be achieved within five years from the date the decision is made to grant provisional accreditation. If this does not occur, the current accreditation status achieved by the medical education program will be withdrawn and the program will be required to wait one year to submit a new application for accreditation, along with a reapplication fee.*

Process to Receive Full Accreditation Status (2nd full survey visit)



An educational program leading to the MD degree, once accredited, remains accredited until the program voluntarily terminates its accreditation status or the LCME terminates the program's accreditation through a formal accreditation action. Accreditation status does not change until a formal action taken by the LCME is final. When the LCME withdraws accreditation, the letter transmitting that decision specifies the date at which accreditation ceases.

MAINTAINING LCME ACCREDITATION (U.S. SCHOOLS)

After full accreditation status has been granted by the LCME, there are activities that medical education programs must perform to maintain their accredited status. For more details, refer to the LCME Rules of Procedure. Direct questions about this information to the LCME Co-Secretaries.

Established medical education programs typically undergo the self-study process and a full survey visit every eight years. The LCME may request a full survey visit in less than eight years if there are questions about the sustainability or quality of the medical education program.

Following review of the survey team report and findings from each full survey visit, the LCME may require one or more follow-up activities (e.g., limited survey visits, consultations, status reports) if it determines that the program is not in compliance with one or more accreditation standards or has unsatisfactory performance in one or more accreditation elements, or if the LCME has identified areas in compliance that require monitoring where the final outcome could result in noncompliance with one or more accreditation standards.

In addition, prior notification to the LCME is required when an accredited program plans any of the following:

- A change in ownership or governance
- Creation of a new or expansion of an existing regional campus
- A new parallel curriculum (track) or major curricular modification
- A change in the balance of educational resources and class size, including increases in the size of the entering class or the acceptance of transfer students if
    - the program plans to increase their entering class size by 10%, or 15 students (whichever is smaller), in one year, or by 20% in three years, and/or
    - the program plans to accept a total of at least 10 transferring medical students into any year(s) of the curriculum.

See notification forms for submission instructions, and due dates. The LCME may request an unplanned consultation, survey visit, or status report depending on the circumstances related to any of the items above.

Source: lcme.org/about/accreditation-process-overview/

APPENDIX C. FACILITY NEEDS AND CAPITAL COSTS

The content of this appendix identifies space needs of the College of Medicine and the resulting preliminary capital costs required to meet those needs. The intent of the analysis that follows is to provide the University with an initial estimate of capital costs associated with options for both interim and permanent COM facilities. The consultant team engaged in planning discussions with university leadership, and the analysis and results which follow are based on certain parameters and assumptions which are subject to change as plans solidify for the College's implementation.

COLLEGE OF MEDICINE INTERIM SPACE NEEDS

The College of Medicine (COM) interim facility is a temporary building to house the first several years of the COM, providing the necessary facilities and resources for attaining preliminary LCME accreditation. The temporary facility would house a small number of students, faculty, and staff while the COM grows. Interim space needs to service the temporary COM facility are based on faculty, staff, and student projections that are identified in previous sections of this Business Plan. Assuming the enrollment buildout as outlined in **Exhibit 3-5** found in **Chapter 3.0**, a permanent facility would need to be available to house the COM entering class of Fall 2021.

THE TEMPORARY FACILITY – HBSB-2

In investigating possible sites for the College of Medicine interim facility, few options were possible, largely due to lack of available space that could support the COM. The team considered potential options on the north side of campus, where older Science and Research buildings exist, as well as options in the newly developing Health Science "core."

UH and the consultant team concurred that an interim facility in the Health Science "core" area made the most sense due to proximity to health sciences and pharmaceutical programs and research spaces, and newer age of the available facilities. HBSB-2 was the only facility available in this location, making it the prime candidate for temporary location of the new COM. Floors 8 and 9 of HBSB-2 were identified by the University as available spaces for this purpose, and the team concludes that these floors can be configured to meet the basic space needs for the COM to meet LCME accreditation requirements. Those two floors provide the following advantages:

- **Adaptability.** Since the project is currently under construction, it provided the opportunity to potentially adapt in the temporary COM or even slow down construction of floors 8 and 9 to minimize re-work and waste of capital funds.
- **New Construction.** The newer age of the building allows for minimized re-work, and higher floor to floor heights.
- **Existing robust infrastructure.** The building was designed for a slightly more intensive use than required for the COM. This includes a robust building infrastructure (lobby/entry spaces, shafts, vertical circulation, servicing/loading, etc.) and mechanical, electrical, and plumbing (MEP) infrastructure that can fully serve the interim needs of the COM. These factors minimize re-work of the existing facility and lessen capital costs.

- **There is available space.** Floors 8 and 9 have been earmarked for future space use by the UH Department of Research, but have not been assigned to specific principal investigators or researchers.
- **Programmatic synergies.** Floor 8 and 9 provide ideal proximity to related programs and spaces. This proximity benefits the programs in the HBSB-2 facility, as well as benefitting the College of Medicine. Specific synergies include: Integrated Health Clinic, Student Health Services, Nursing spaces, home of College of Pharmacy, Pharmacy research, and Department of Research spaces.

SPACE NEEDS

The consulting team developed a space program based on the known desires of the UH College of Medicine, and the requirements to achieve preliminary LCME accreditation. The space program presented here is to be considered an "order of magnitude" program. It is based on metrics and the team's experience planning similar facilities. It is not based on specific UH College of Medicine pedagogical needs, research initiatives, or any specific programming discussions with future COM leadership, researchers, faculty, or staff. For comparison purposes, the space program that follows (**Exhibit C-1**) provides less detail than a typical pre-design level of programming document.

At this level of analysis, we estimate a small space deficit of ~2,000 square feet of combined area on floors 8 and 9 to serve the COM interim spaces needs (as defined in the space program). The team does not see this as a significant challenge, due in part to the preliminary nature of the program analysis and the availability of other spaces in HBSB-2 that could be utilized if needed. It is our understanding from communication with the UH Facilities office that roughly 2,985 NSF of the offices currently under construction on floor 6 of HBSB-2 could be made available for use by the COM. To accommodate the COM faculty/staffing space needs identified in this document, the office area of floor 6 would be needed. The available space on floor 6 would be able to accommodate at least 18 offices/rooms which could house as many as two staff per room. The existing offices on floor 6 would not require any alteration, re-work, or additional furniture, fixtures and equipment (FF&E) to serve the COM initial needs. As noted below, our cost analysis assumes the 2,985 NSF floor 6 offices would be utilized without added cost to the COM interim facility.

Additionally, it is our understanding that the following spaces could be made available to fully fit the COM in the HBSB-2 building. The following are options that could potentially lessen space needs and capital costs. However, since these are unknowns at this time, the following were not addressed in the Cost Analysis:

- If the second floor clinic was able to be potentially retrofit or utilized for Standardized Patient exam rooms, the amount of space on floor 8 and 9 for simulation could be reduced.
- Although dedicated simulation spaces are not a specific requirement of LCME, simulations must occur somewhere in the facility. This document assumes a dedicated simulation suite will be in the facility.
- It is possible that there are nearby large classrooms which could be used to reduce the need for construction of some of the general classroom space identified in the space needs program.

EXHIBIT C-1
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
INTERIM FACILITY PROPOSED SPACE NEEDS AT YEAR FIVE

	#	Occup.	NSF	Total NSF	Comments
# Students (30 1st & 2nd Year)*					
Teaching/Learning					
60 Seat Classroom	1	60	30	1,800	
30 Seat Classroom	1	30	30	900	
Small Group**	4	15	65	3,900	
Multipurpose Space***	1	40	32	1,280	
Gross Anatomy Lab	1		1,200	1,200	
Anatomy Support (gown, wash, storage, office)	1		1,100	1,100	Office 180, cadeavor storage 270 (15 cadeavors), storage 250, gown/wash 400.
Informal Learning (mix of private and shared)****	1	40	24	960	Assume dispersed.
Information Kiosk ("library")	1	2	50	100	
Simulation					
Simulation Theater	1		2,000	2,000	Assume OR size with all support including brief and de-brief, control etc.
Standardized Patient	1		3,500	3,500	Six exam rooms plus all support - 2nd floor clinic could be retrofitted.
Part Task Trainers	1		400	400	Medium and small, storage, VR collobaration space.
Virtual Reality Immersive Learning Classroom				500	
Support	1		200	200	
Sub-total				**17,840**	
# Research Labs	10		1,200	12,000	Assume all are wet as most dry happens in office or multi-purpose space.
Sub-total	**10**		**1,200**	**12,000**	Assume 1200 nsf/pi including wet cluster and special core labs.
Administration					
Dean	1	1	250	250	
Leadership	9	1	180	1,620	
Support Staff - closed office	5	1	120	600	
Support Staff - open office	5	1	90	450	Including reception.
Conference Room	2	15	24	720	
Support	1		300	300	Copy, mail, coffee.
Sub-total				**3,940**	
Faculty and Staff Offices					
Faculty	15	1	120	1,800	
Staff - closed office	3	1	120	360	
Staff - open office	2	1	90	180	
Support	1		300	300	Copy, mail, coffee.
Sub-total				**2,640**	
TOTAL				**36,420**	

Notes:
*Per MGT enrollment buildout year five.
**Assumes four gurneys at three to four 3-4 students each.
***Dry lab space, computer testing for 30 students, multi-use.
****Includes lounge, lockers, vending, could combine with classrooms for learning "communities."

Source: NBBJ, 2016.

INTERIM FACILITY OPTION 1A – BUILD IN SHELL SPACE

Option 1A Shell Space Buildout, identified in the Capital Cost Analysis presented at the end of this chapter, assumes that floors 8 and 9 would be provided as a "shell space" prior to renovation to serve the specific room configurations and programmatic requirements of the COM. We have assumed the following breakdown of what would exist as the provided shell space, and included that in our cost analysis:

- **Included in Shell Space.** Floors 8 and 9 would be fully constructed and paid for as a part of the HBSB-2 construction project. Therefore, none of the following elements have cost identified within the cost analysis for Option 1A:

- Exterior walls, curtainwalls, vertical shafts/elevators/stairs,
- Sprinklers and general life safety equipment,
- MEP vertical risers and shafts, and
- Plumbing configuration would be constructed as currently planned.

- **Provided as a part of Option 1A.** The renovation to create the COM interim space would include the following elements, as does the cost analysis for Option 1A.
  - Interior walls,
  - Floors/walls/ceilings/finishes,
  - Horizontal distribution of MEP,
  - Limited re-work for plumbing configuration,
  - Lighting,
  - FF&E including casework, research bench, fume hoods, etc., and
  - Audio/visual, including devices, network switches, and the wireless access point hardware.

INTERIM FACILITY OPTION 1B – RENOVATE

Option 1B Renovate identifies a renovation scenario to apply to floors 8 and 9 of HBSB-2, which are currently under construction and configured as originally planned. Renovation of these floors under this scenario would accommodate the COM interim space needs. Under Option 1B, floors 8 and 9 would be fully constructed as intended Department of Research space, including interior fit-up, prior to renovations required to serve the functional and programmatic needs of the College of Medicine as its interim facility.

Most of the renovation would be focused on the teaching/learning spaces, simulation suite, and office renovation to house the COM administrative suite. A far less substantial renovation is anticipated on floor 8, as it would already contain research space that could be more readily adapted to meet the needs of the College of Medicine. In totality, the renovation would include moving walls, MEP utility re-work, and changes to FF&E.

Partial Current Buildout of Floor 8 and 9

In discussions with UH representatives and the architect of HBSB-2, various scenarios for completing a partial buildout of floors 8 and/or 9, as a part of the current HBSB-2 construction project were also considered. Since any of those scenarios would add an additional variable and level of complexity, a partial buildout option was not addressed in the Cost Analysis for interim COM space. Instead, Option 1A and Option 1B show the projected ends of the continuum reflective of the re-work, scope and budget. Cost of a partial buildout would fall somewhere between the costs estimated for Option 1A and Option 1B presented at the conclusion of this chapter.

OPTION 1A / 1B TEST FIT FLOOR PLANS

Two Test Fit Floor Plans displayed in **Exhibit C-2** were developed in order to examine how the temporary space needs of the COM could potentially manifest itself on the HBSB-2 Floor Plate. The test fits for the UH new medical school were envisioned to best match the layout for these floors that are currently underway. This allows UH to minimize the re-work of the floors, no matter what stage in design or construction that the previous layouts are executed. It also would minimize capital investment in the re-work of the spaces for the COM interim facility.

The test fits are intended to provide a general planning framework, as opposed to specific solutions. The test fits conform to the "order of magnitude" space program for the COM interim needs, but are provided in somewhat less detail than the program. Instead of showing a room-by-room configuration, the test fits are shown in blocks of similar program spaces.

EXHIBIT C-2
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
HBSB-2 SPACE TEST FIT FLOOR PLANS

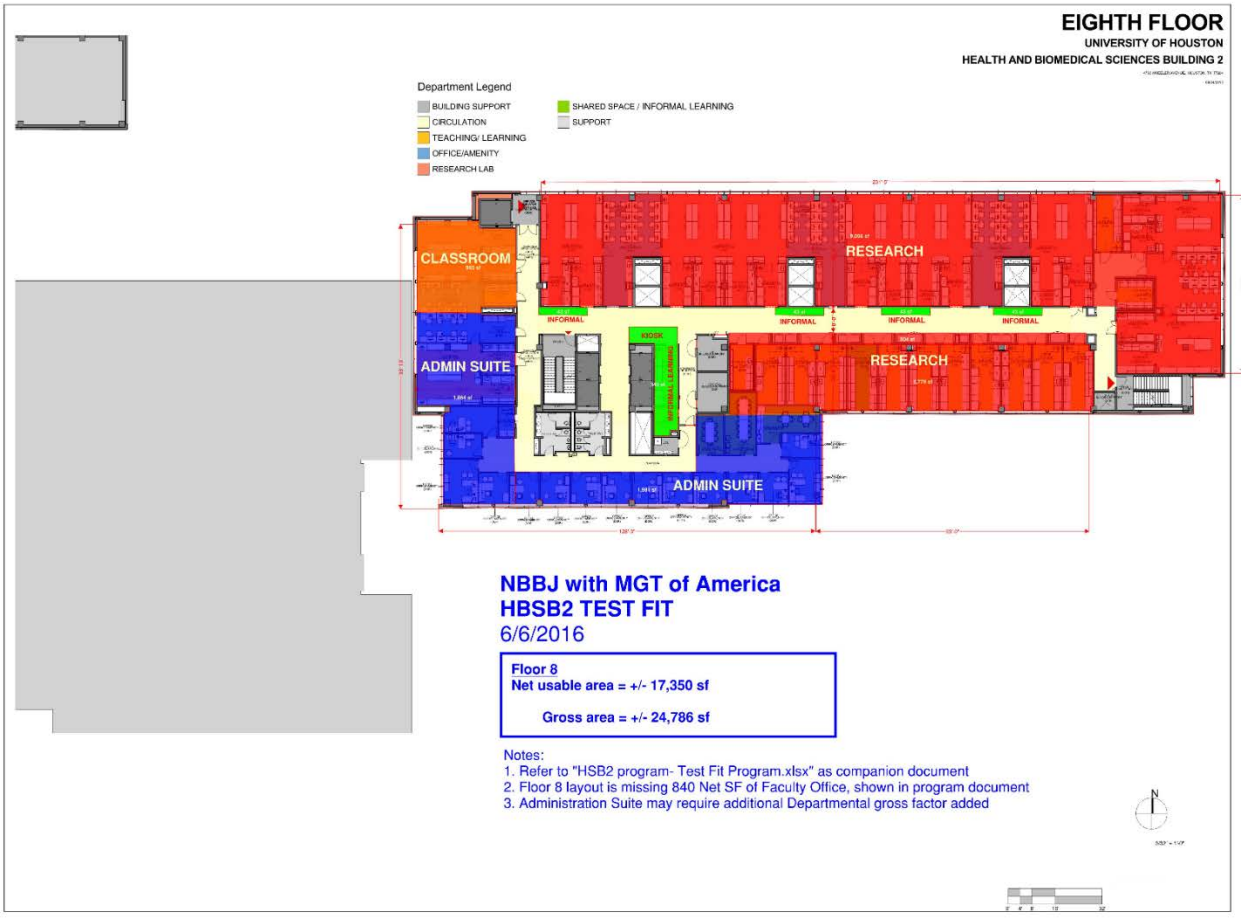
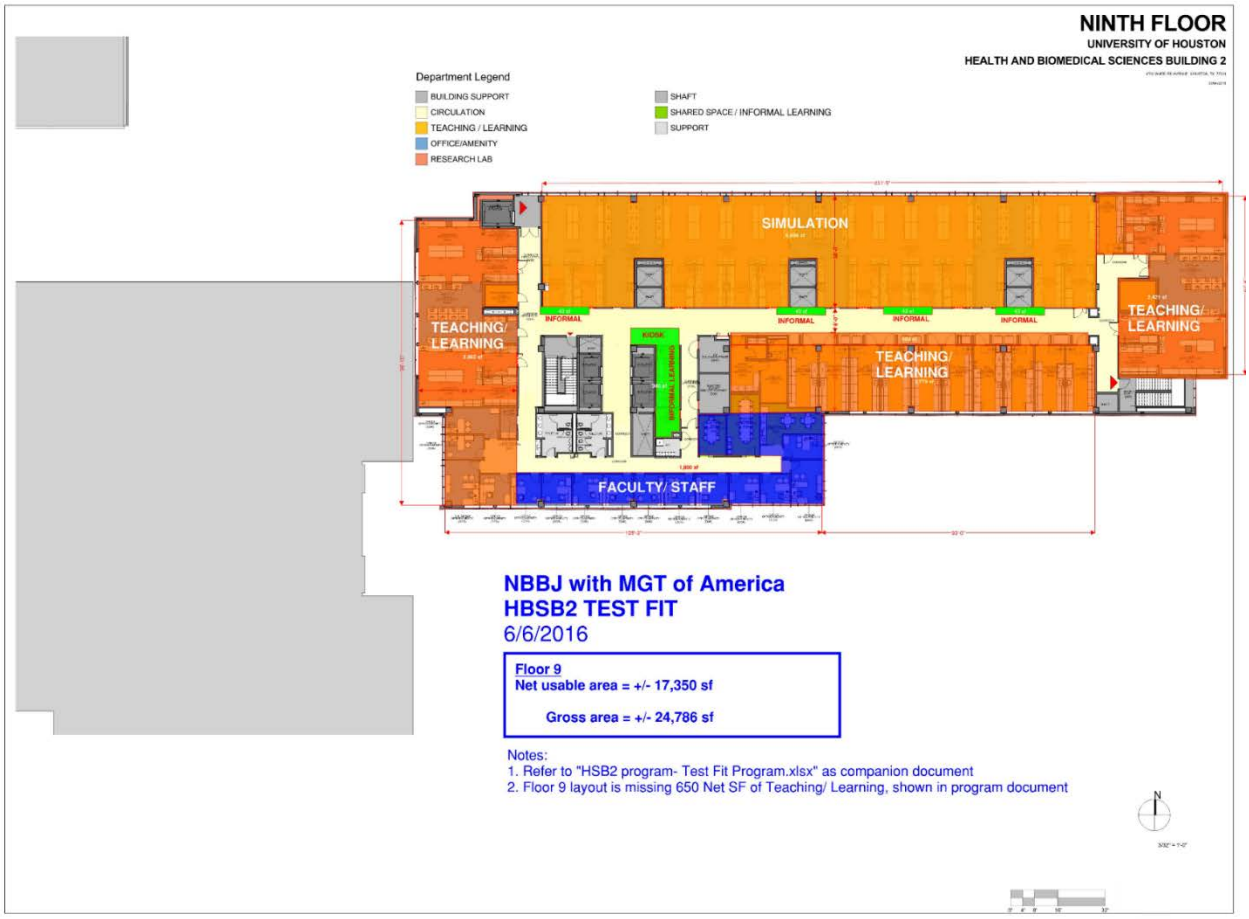


EXHIBIT C-2 (CONTINUED)
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
HBSB-2 SPACE TEST FIT FLOOR PLANS



COLLEGE OF MEDICINE – FINAL NEW BUILDING

Previous sections of the Business Plan have identified a proposed buildout of the new College of Medicine to a target enrollment capacity of 480 students across the four-year curriculum. This gradual expansion is to occur over the course of ten years, starting with the charter class of 30 in the Fall of 2019. The temporary space identified in HBSB-2 will accommodate only the first two academic years of enrollment. A new building must be in place and ready for occupancy by Fall 2021 to provide a permanent home for this new UH health education program. It would provide a facility to house the fully functional COM and provide the necessary space and physical resources for attaining full COM buildout. The space needs to service the permanent COM facility are based on faculty, staff, and student projections that are identified in other sections of the Business Plan.

SPACE NEEDS

The team developed a permanent facility space program based on the known desires and projected buildout plans of the UH College of Medicine. Once again, this space program is to be considered an

"order of magnitude" program. It is based on metrics and the consultant team's experience planning similar facilities. It is not based on specific UH College of Medicine pedagogical needs, research initiatives, or on any specific programming discussions with future COM leadership, researchers, faculty, and/or staff. For comparison purposes, the space program depicted in **Exhibit C-3** provides less detail than a typical pre-design level of programming.

EXHIBIT C-3
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
FINAL NEW BUILDING PROPOSED SPACE NEEDS BUILDOUT

UNIVERSITY OF HOUSTON COLLEGE OF MEDICINE FINAL NEW BUILDING PROPOSED SPACE NEEDS					
	#	Occup.	NSF	Total NSF	Comments
# Students (120 1st & 2nd Year)*					
Teaching/Learning					
60 Seat Classroom	2	60	30	3,600	
30 Seat Classroom	1	30	30	900	
120 Seat Auditorium	1	150	18	2,700	
Small Group**	16	15	65	15,600	
Multipurpose Space***	3	40	32	3,840	
Gross Anatomy Lab	2		1,200	2,400	Can be one large space/partionable.
Anatomy Support (gown, wash, storage, office)	1		1,830	1,830	Office 180, cadaver storage 600 (30 cadavers), storage 250, gown/wash 800.
Informal Learning (mix of private and shared)****	8	40	24	7,680	Assume dispersed.
Library	1		3,000	3,000	Based on FSU. Assume some carrels, individual and group study and research space; some stacks, but assume any major collections would be stored remotely. Could combine with Fitness Center (Stanford model).
Teaching Wet Lab	2		1,200	2,400	Can be one large space/partionable.
Simulation					
Simulation Theater	2		2,000	4,000	Assume OR size with all support including brief and de-brief, control etc.
Standardized Patient	1		3,500	3,500	6 exam rooms plus all support - 2nd floor clinic could be retrofitted
Part Task Trainers	1		800	800	Medium and small, storage, VR collaboration space.
Virtual Reality Immersive Learning Classroom	1		2,000	2,000	Including support.
Support	1		200	1,000	Including support, gas closet storage, reception and wafting, faculty breakroom.
Sub-total				**55,250**	
# Research Labs					
Wet	40		1,200	48,000	Assume all are wet as most dry happens in office or multi-purpose space; assume 1200 nsf/pi including wet cluster and special core labs and four dry labs of 500 each.
Dry	4		500	2,000	
Vivarium	1		6,000	6,000	Assume mice, rats, fish, rabbits, plan for ABSL 3 (based on WSU Spokane med school component).
Sub-total				**56,000**	
Administration ***					
Dean	1	1	250	250	
Leadership	9	1	180	1,620	
Professional Staff	12	1	120	1,440	
Support Staff - closed office	8	1	120	960	
Support Staff - open office	8	1	90	720	Including reception.
Conference Room	2	15	24	720	
Support	1		300	300	Copy, mail, coffee.
Sub-total				**6,010**	
Faculty and Staff Offices					
Faculty	95	1	120	11,400	
Staff - closed office	80	1	120	9,600	
Staff - open office	39	1	90	3,510	
Support	4		300	1,200	Copy, mail, coffee.
Sub-total				**25,710**	
Student Offices/Spaces					
Post Doc	70	1	70	4,900	
PhD and MD/PhD	60	1	40	2,400	
Lounge	1		600	600	
Student Organizations	2		140	280	
Student Fitness Center	1		1,500	1,500	
Sub-total				**9,680**	
Office Conferencing					
Sub-total	**1**		**9,000**	**9,000**	Commons, conference/meeting rooms, research floor breakouts, etc.
General Clinical Research Center GCRC					
Clinical Patient Care	1		6,000	6,000	
Clinical Research	1		2,000	2,000	
Sub-total				**8,000**	
TOTAL NSF				**169,650**	
Grossing Factor (assumes 60% efficient building)				1.667	
Total GROSS SF				**282,807**	

Notes:
*Per MGT enrollment buildout numbers.
**Assume four gurneys at three to four students each.
***Dry lab space, computer testing for 30 students, multi-use.
****Includes lounge, lockers, vending, could combine with classrooms for learning "communities."
*****Administration Suite may require additional Departmental gross factor added.

Source: NBBJ, 2016.

Given the preliminary nature of the COM permanent facility space needs, the team offers the following additional thoughts for future consideration:

- Although dedicated simulation spaces are not a specific requirement of LCME, simulations must occur somewhere in the facility. This document assumes a dedicated simulation suite will be in the facility.
- It is possible that there are nearby large classrooms which could be used to reduce the need for construction of some of the general classroom space identified in the space needs program.
- The need for a Vivarium, as well as the functionally, size, and extent of a Vivarium is not possible to define at this stage in the planning process. The team assumed a 6,000 NSF ABSL 3 Vivarium, including mice, rats, fish, and rabbits, based on benchmarking of similar facilities.
- A basic General Clinical Research Center (GCRC) is provided in the program. It would be a designated facility used to conduct clinical research, clinical trials, etc. A more expansive GCRC could be accommodated in a future facility.
- A basic Administration area was assumed in the space needs. A more robust Administration component, including spaces such as a formal board room and/or large reception area, are not assumed in the current program.

PROJECT SITE - OPTION 2A AND 2B

The project site for a permanent COM facility is unknown at this time. Therefore, the associated cost analysis is largely theoretical, and not tied to specific sites. In discussions with UH officials, two options were identified and developed for this initial Business Plan:

- **Option 2A.** This option assumes a new facility built on campus, in a similar scope/cost under which HBSB-2 was constructed, but adjusted to the smaller project size. An on-campus scope is assumed to include building on a developed site with a connection to campus utilities and with existing parking already provided (no cost for added parking is included in the Capital Cost Analysis).
- **Option 2B.** This option is similar to 2A, but is constructed on a non-developed, green field site, therefore adding site work would include clearing, grading, and utilities work. Option 2B assumes a standalone MEP system, not connected into the existing campus central plant. Tying into the existing central plant, or the creation of a new central plant would significantly increase the Site Area costs for Option 2B. Given the standalone MEP system, added cost were given to the Site Area and also the Building Cost components. A limited scope cost to account for new parking was also included.

CAPITAL COST ESTIMATES

BUILDING SCENARIOS

A Capital Cost Analysis for the four (4) scenarios introduced in previous sections of this chapter has been provided to correlate with all other UH COM planning information included within this Business Plan, including:

- **UH College of Medicine Interim Facility - Option 1A and Option 1B.** The cost analysis for each scenario is provided in **Exhibit C-4**. The following are elements or features not accounted for in either the Option 1A or 1B cost analysis:
  - The available 2,985 NSF office space on floor 6 of HBSB-2, which would serve as additional office space for the COM,
  - Work for accommodating the COM on other floors of the HBSB-2 building (since the COM space needs fit on floors 8 and 9, including limited office space on floor 6),
  - Costs savings of unspent construction dollars due to not completing full buildout as originally planned for HBSB-2 floors 8 and 9,
  - Cost to convert the College of Medicine space on floors 8 and 9 back into non-COM research space,
  - Research equipment used by principal investigators, as that equipment may be highly specialized and is separately funded.
- **Cost Comparison - Option 1A vs. Option 1B.** In order to compare the total "all in" project cost of Option 1A versus Option 1B, the university must determine the Total Project Cost (including construction, professional services, and administrative costs) that are required for the buildout of HBSB-2 floors 8 and 9, as currently planned as Department of Research space. Once this figure is identified, a parallel comparison can be made.
- **UH College of Medicine Final New Building - Option 2A and 2B.** The cost analysis for each scenario is shown in **Exhibit C-4**.

EXHIBIT C-4
UNIVERSITY OF HOUSTON - COLLEGE OF MEDICINE
PROJECTED CAPITAL COST ANALYSIS

UH College of Medicine - Interim Space HBSB-2 Option 1A - Build in Shell Space		
All new fit out of two floors in clean empty shell space. No upgrades to shell required.		
Project Area Summary		**Sub Total**
Site Area (including footprint)	0	$ -
Parking Spaces Provided	0	$ -
Building Construction Area (GSF)	0	$ -
Demo Area (GSF)	0	$ -
Fit out Area (GSF)	49,600	$ 9,920,000

COST CATEGORY		PROJECTED COST
A. Construction Costs		
Construction contract		$ 9,920,000
CCL Subtotal		**$9,920,000**
IT/Security Equipment		$158,720
A/V Equipment		$232,128
Furniture & Equipment		$923,552
Simulation & Medical Equipment		$550,000
Construction Total		**$11,784,400**
B. Professional Services		
Professional Services Total		**$1,281,168**
C. Administrative Costs		
Administrative Total		**$122,016**
TOTAL PROJECT COST (TPC)		**$13,187,584**

Not Included:
Escalation
Owner Project Contingency
Parking cost for deck or on grade
Estimating contingency
Research Equipment specific to Principal Investigators (PIs)

GENERAL NOTES:
1. All costs in 2016 dollars for Houston TX.
2. Costs derived from HBSB-2 cost values and similar benchmark projects.
3. Projected Cost is conceptual based on assumed SF and reference $/SF.

UH College of Medicine - Interim Space HBSB-2 Option 1B - Renovate		
Renovation of newly built out two floors of similar use. Will require new rooms. No upgrades to shell required.		Cost for the balance of two floors (30,000 sf) built under separate project not included.
Project Area Summary		**Sub total**
Site Area (including footprint)	0	$ -
Parking Spaces Provided	0	$ -
Building Construction Area (GSF)	0	$ -
Demo Area (GSF)	20,000	$ 700,000
Fit out Area (GSF)	20,000	$ 4,100,000

COST CATEGORY		PROJECTED COST
A. Construction Costs		
Construction contract		$ 4,800,000
CCL Subtotal		**$4,800,000**
IT/Security Equipment		$76,800
A/V Equipment		$160,320
Furniture & Equipment		$302,880
Simulation & Medical Equipment		$550,000
Construction Total		**$5,890,000**
B. Professional Services		
Professional Services Total		**$621,840**
C. Administrative Costs		
Administrative Total		**$60,720**
TOTAL PROJECT COST (TPC) Part A	*	**$6,572,560**

TOTAL PROJECT COST (TPC) Part B Cost related to currently under construction floors 8 & 9	*	**UH to determine**
The capital and soft costs associated with the currently under construction floors 8 & 9 of the HBSB-2 is not accounted for in this business plan. However adding Part A & B would provide a comparable comparison to TPC of Option 1A.		

Not Included:
Escalation
Owner Project Contingency
Parking cost for deck or on grade
Cost of HBSB 2 fit out
Phasing interruptions
Time delay to move in for renovations
Estimating contingency
Research Equipment specific to Principal Investigators (PIs)

UH College of Medicine – New Building Option 2A – New Build ON CAMPUS		
Full new build similar to HBSB2. Built on existing parking on campus with connection to campus utilities. No parking included		
Project Area Summary		**Sub total**
Site Area (including footprint)	120,000	$ 4,200,000
Parking Spaces Provided	0	$ -
Building Construction Area (GSF)	282,000	$ 111,954,000
Demo Area (GSF)	0	$ -
Fit out Area (GSF)	full	

COST CATEGORY		PROJECTED COST
A. Construction Costs		
Construction contract		$ 116,154,000
CCL Subtotal		**$116,154,000**
IT/Security Equipment		$1,858,464
A/V Equipment		$2,718,004
Furniture & Equipment		$5,006,237
Simulation & Medical Equipment		$1,200,000
Construction Total		**$126,936,705**
B. Professional Services		
Professional Services Total		**$16,039,629**
C. Administrative Costs		
Administrative Total		**$1,331,479**
TOTAL PROJECT COST (TPC)		**$144,307,813**

Not Included:
Land Cost
Escalation
Owner Project Contingency
Parking cost for deck or on grade
Estimating contingency
Research Equipment specific to Principal Investigators (PIs)

UH College of Medicine – New Building Option 2B – New Build GREEN FIELD SITE		
Full new build similar to HBSB2. Built on green field site: clearing, grading, utilities. Assume MEP as a stand alone building not tied to campus. Parking included		
Project Area Summary		**Sub total**
Site Area (including footprint)	120,000	$ 6,000,000
Parking / on grade	282	$ 1,410,000
Building Construction Area (GSF)	282,000	$ 113,364,000
Demo Area (GSF)	0	$ -
Fit out Area (GSF)	full	

COST CATEGORY		PROJECTED COST
A. Construction Costs		
Construction contract		$ 120,774,000
CCL Subtotal		**$120,774,000**
IT/Security Equipment		$1,858,464
A/V Equipment		$2,718,004
Furniture & Equipment		$5,006,237
Simulation & Medical Equipment		$1,200,000
Construction Total		**$131,556,705**
B. Professional Services		
Professional Services Total		**$16,676,496**
C. Administrative Costs		
Administrative Total		**$1,384,239**
TOTAL PROJECT COST (TPC)		**$149,617,440**

Not Included:
Land Cost
Escalation
Owner Project Contingency
Estimating contingency
Research Equipment specific to Principal Investigators (PIs)

Source: NBBJ, 2016.

CLARIFICATIONS

In addition to previously provided information, some additional clarifications are needed. The following apply to all four (4) COM scenarios:

- Space needs, associated building areas, and costs, are not based on specific UH College of Medicine pedagogical needs, research initiatives, and are not based on any specific programming discussions with future COM leadership, researchers, faculty, and/or staff.
- Projected cost is conceptual and based on assumed square footage and reference cost per square foot.
- Capital costs provided are based on benchmark cost data from other Colleges of Medicine and adjusted to the Houston, Texas location.
- The buildup from Construction Cost Limitation (CCL) to get to Total Project Cost (TPC) included owner and "soft costs" that vary greatly between institutions. Thus, the TPC was based largely on information provided by University of Houston facilities representatives from the HBSB-2 project and adjusted to the specifics of the College of Medicine scenarios.
- All cost analysis is calculated in 2016 dollars. No phasing or escalation is accounted for in these estimates.
- Our cost analysis is based on the identified space needs for the COM interim facility and COM final building.

SITE/UTILITY DEVELOPMENT COSTS

Site costs were based largely on information provided by University of Houston and adjusted to the new COM needs. Neither the University, nor the team, has done any siting analysis as no specific location(s) has been finalized. Option 2A assumed an on-campus option with utilities available.

Option 2B cost analysis was based on a standalone MEP system, not connected into the campus central plant. This made the cost analysis more predictable. Tying into the existing central plant, or the creation of a new central plant would significantly increase the Site Area costs for Options 2B.

The full extent of any off-campus site will need to be investigated at a later time to determine the civic, roads, and MEP infrastructural requirements and environmental issues that would need to be addressed in order to construct a building on that site.

FURNITURE AND EQUIPMENT COSTS

As items are the hardest to define at this early stage of pre-programming, we offer below our assumptions and clarifications, including where and which types of furniture and equipment are currently accounted for in the cost analysis and the items that are assumed to be OFOI (owner furnished, owner-installed).

- Included in the construction cost (CCL), within "Construction Contract" is large fixed equipment such as cold rooms, sterilizers, fume hoods, and lab benches

- Included in the construction cost (CCL), within the "Furniture and Equipment" line item is furniture (e.g., desks, chairs, tables, lab stools, lounge) and miscellaneous kitchen equipment (e.g., microwaves, dishwashers, refrigerator).

- A line item is provided for Simulation and Medical Equipment. Given the preliminary nature of the order of magnitude program, the provided cost is based on benchmarking analysis of similar facilities. It is not intended to be room-specific, scenario-specific, or inclusive of specific pedagogical considerations.

- Assumed OFOI (owner furnished, owner-installed), so not included in the Cost Analysis are the following:
    - Loose lab research equipment used by principal investigators (e.g., lab refrigerators & freezers, bio safety cabs, centrifuges, other lab bench top equipment)
    - Specialized imaging equipment (SEM, TEM)
    - Specialized analytical equipment (Mass Spec)
    - Fixed vivarium equipment (e.g., cage rack washer, steam sterilizer or hot air sterilizer, etc.)
    - Office equipment (e.g., PCs, laptops, displays, copiers, printers, phones, etc.)

LOW VOLTAGE COSTS

As directed by UH, the Construction Cost (CCL) includes all data and audio/visual, including devices, with the exception of the network switches and the wireless access point hardware.

Total Project Cost (TPC) includes network switches and the wireless access point hardware. Total Project Cost (TPC) does not include research equipment used by principal investigators, as that equipment is separately funded.