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Evaluation of Innovative Medical School Facilities and Consultant Recommendations

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EVALUATION OF INNOVATIVE MEDICAL SCHOOL FACILITIES AND CONSULTANT RECOMMENDATIONS

Prepared for The Lincy Institute and UNLV School of Medicine

October 11, 2018
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INTRODUCTION

In August 2018, The Lincy Institute\(^1\) retained Tripp Umbach\(^2\) to provide consultation to evaluate and identify best practices for medical school facilities and development models as the University of Nevada Las Vegas (UNLV) and the community embarks on the development of a home for the UNLV School of Medicine. To complete this assignment, Tripp Umbach completed a comprehensive process involving secondary data analysis and actively sought and received input from stakeholders including leadership at The Lincy Institute, UNLV School of Medicine, previous Tripp Umbach clients, leading design professionals with experience developing medical schools, and potential donors to the proposed project.

This report allows the UNLV School of Medicine, donors, representatives from the Nevada System of Higher Education, and the state of Nevada to understand innovations in medical education facility design and development to guide their decision-making on future medical education facility investments. The report begins by reviewing UNLV’s current proposal to build a medical school. We then compare the proposal to recent medical school construction projects at other universities. The report concludes with a series of recommendations for UNLV to construct its new medical school building.

Summary of Services provided by Tripp Umbach include:

- **Primary Data:** Tripp Umbach reviewed 11 medical education facilities within the United States, including new and established top-tier medical schools. Through this research, Tripp Umbach identified finance structure and sizes of buildings and reviewed the Liaison Committee on Medical Education’s (LCME) space utilization guidelines and challenges.

- **Benchmarking Data:** During the last 15 years, Tripp Umbach created numerous medical school business plans and benchmarking analysis throughout the United States. For this assignment, Tripp Umbach partnered with SLAM\(^3\) to complete detailed benchmarking analysis. This knowledge base and experience with other comparable institutions provided the necessary foundation to evaluate UNLV School of Medicine’s facility plans.

Tripp Umbach analyses and recommendations are based on data collected, interviews conducted, as well as interface with the UNLV School of Medicine throughout the study process. The analyses included in Tripp Umbach’s report provide an important foundation and context for state-of-the-art facility recommendations.

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1. The Lincy Institute at UNLV conducts and supports research that focuses on improving Nevada’s health, education, and social services. The Lincy Institute’s mission is closely aligned with UNLV’s strategic priorities and its existing academic, research, and service programs.
2. Tripp Umbach is the nation’s most experienced consulting firm in academic medicine, serving national associations, 75 existing medical schools, more than 500 hospital systems, and 200 universities since 1990. In the past 15 years, Tripp Umbach has been involved in the majority of medical school development and expansion projects in the United States.
3. The S/L/A/M Collaborative is a 160-member planning and design firm with offices in Atlanta, Boston, Glastonbury and Syracuse. SLAM has designed academic and research facilities for some of the country’s leading universities and academic medical centers, including Johns Hopkins, Duke, Emory, Cornell, MIT, and Georgia Regents University. SLAM’s work, while broad and comprehensive, is particularly notable for a depth of expertise in the health sciences and includes some of the most current and diverse medical education and research design experience in the country.
UNLV CURRENT MEDICAL EDUCATION FACILITY PROFILE

The UNLV Shadow Lane Campus currently houses UNLV School of Medicine classrooms, clinical skills, health simulation, virtual anatomy, fitness, lounge, student organization/support, and other facilities that support the UNLV School of Medicine’s LCME provisionally accredited curriculum for 60 students per class. The facility also contains a broad range of educational, clinical, and other spaces for other UNLV Health Sciences programs, such as the School of Dental Medicine and the School of Nursing. The UNLV School of Medicine, housed in temporary space at the Shadow Lane Campus, and completed in 2016-17, provides high-quality, needed, and sufficient initial square footage space to support 60 students per class. Concurrently, UNLV developed a long-term vision for the UNLV School of Medicine facilities at the Shadow Lane Campus site, for a permanent physical plant for the UNLV School of Medicine, and for development of academic, research, and administrative space to support a collaborative health sciences model for medical and health sciences education and research.

The existing UNLV School of Medicine space at the Shadow Lane Campus was designed to meet academic, student support, LCME accreditation, and other needs/requirements for a the UNLV School of Medicine start-up program with 60 students per class. A portion of this space, most notably the Clinical Simulation Center of Las Vegas (CSCLV), supports medical and health sciences teaching, instruction, and training activities in a collaborative team model of medical and health sciences professionals, including medical, nursing, and other students. The CSCLV accomplished this task by providing collaborative and multi-disciplinary medical and health sciences space for clinical skills, surgical skills, high-fidelity simulation, standardized patient, and other skills and simulation training.

Additionally, the UNLV School of Medicine occupies office/administrative and medical resident support space on the University Medical Center (UMC) campus, adjacent to the Shadow Lane Campus. The UNLV School of Medicine’s practice plan operates a variety of clinical practice and patient service sites throughout Southern Nevada to support clinical activities, medical student/resident training, patient service, and other academic and clinical activities important both to UNLV School of Medicine curriculum/training needs and to the community.
UNLV SCHOOL OF MEDICINE FACILITIES EXPANSION PLAN

In 2017, the Nevada State Legislature passed Senate Bill 553, which allocated $25 million of state funds to support the complete planning and beginning of construction of the UNLV School of Medicine. This sum was allocated in response to an anonymous donation of $25 million, with the donor asking the state to provide matching funds. To use these funds committed by the state, UNLV School of Medicine engaged TSK and CO Architects to provide a feasibility study for the development of two projects on the 9 acres at 625 Shadow Lane.

Tripp Umbach reviewed UNLV School of Medicine’s initial facility plans to develop a medical school through the two-project process. The Medical School/Health Sciences Building (HSL), referred to as Project 1, would be the first project on the site, a “Collaborative Learning Center” in the heart of the Las Vegas Medical District (LVMD). Project 1 would be designed and constructed utilizing the $50 million for funding, and Project 2 would be designed and constructed separately, as fundraising continues for Project 2.

UNLV proposes a two-stage project. Project 1 consists of a stand-alone two- to three-story, 48,628 gross square feet building. The plan allows medical, dental, nursing, and health sciences students at both the Shadow Lane and Main campuses to use the new facility. Within the HSL the following space is allocated: instruction (2,920 ASF); open study (9,000 ASF); study rooms (4,880 ASF); and library and support offices (9,540 ASF). The timeframe for completion of Project 1 is May 2022.

UNLV’s proposal for Project 2 consists of a stand-alone two- to three-story, 182,057 GSF building. Within the Medical Teaching and Educational Building (MTE), referred to as Project 2 the following space is allocated: classrooms (24,579 ASF); clinical skills (8,879 ASF); simulation (15,044 ASF); virtual anatomy (5,813 ASF); community life (14,098 ASF); administrative workplace (22,270 ASF); department and clinician offices (8,460 ASF); and building support (4,630 ASF). The timeframe for completion of Project 2 is May 2022.

4. Allocated space is in Assignable Square Feet verses Gross Square Feet.
UNLV SCHOOL OF MEDICINE’S VISION FOR PROJECT 1

After initial negative reactions from the donor community that Project 1 for the medical school was mostly a university library facility, the UNLV School of Medicine undertook a vision process to reposition the new facility as the first of two medical education facilities. The thinking behind a two-pronged solution is for space in Project 1 to enhance current medical education facilities on the Shadow Lane Campus and to position UNLV School of Medicine for a fully developed medical school, which could house more than 120 students per class. Tripp Umbach was retained by The Lincy Institute to develop an independent report and recommendations for medical school facilities, through this study our firm received the following information from the UNLV School of Medicine. Therefore, the following plan for Project 1 is not to be viewed as Tripp Umbach’s recommended approach.

Based on information received from the UNLV School of Medicine, the revised vision for Project 1 provides the following:

- Instruction and meeting spaces to support the Problem Based Learning (PBL) portion of the UNLV School of Medicine’s curriculum provisionally accredited by the LCME. Students will work collaboratively in technology-rich spaces to learn problem solving for medical items and scenarios.

- Student study spaces of various types and configurations to support the variety of student study styles and needs common among medical and health sciences students.

- Technology-enabled spaces and support to assist students, residents, faculty, and medical/health care professionals in learning about, studying, and/or practicing medical scenarios and procedures (i.e., patient care and interaction, surgery, other items).

- Media production labs and support spaces to assist students and faculty in development of materials for educational and research activities.

- Research consultation and support spaces.

- Spaces that can be available to medical and health sciences students, faculty, and professionals for extended hours to support education and research, while maintaining the integrity and security of spaces that operate during standard university hours.

- Spaces for the UNLV School of Medicine and members of the broader Southern Nevada Medical and Health Sciences community to interact and to support medical/health sciences education, research, and academic/research/professional program connectivity.

- Wellness, fitness, and café spaces that support UNLV School of Medicine student and faculty well-being and support other activities and uses of the facility – providing some of the “glue” that promotes interaction and collaboration.

- Technology infrastructure spaces that support the extensive technology-based resources and assets required to provide students, faculty, and community members with digital information and technology access, in support of educational and research activities.

Project 1, renamed the “Collaborative Learning Center,” provides medical and health sciences information resources, technology, collaboration space, and other assets necessary for the education of UNLV medical and health sciences students, support of academic and research faculty, and ongoing development and education of residents and medical/health care professionals in Southern Nevada. According to UNLV, there is no major medical or health sciences Collaborative Learning Center of this nature in Southern Nevada. This Collaborative Learning Center will fulfill a major need for the higher education, medical, and health sciences communities in the region – one that commonly exists in communities across the United States that have major populations and medical/health sciences education, research, and professional programs.

This center will support existing UNLV School of Medicine’s and UNLV Health Sciences facilities at the Shadow Lane Campus, which is a five-minute walk from this facility site. UNLV sees the Collaborative Learning Center as the first part of a long-range facilities master plan for UNLV School of Medicine to develop a medical education campus that will ultimately support the development of the full range of contemporary and forward-focused medical education facilities to support more than 120 students per class (or Project 2).
Since 2005, more than 30 new medical schools have opened in the United States with more planned. Tripp Umbach has been involved in more than 20 of these projects, including completing the economic impact study for the proposed UNLV School of Medicine and a statewide graduate medical education plan for the Nevada System of Higher Education.

Both new and established medical schools include familiar components such as classrooms, labs, lecture halls, and food service. Although they continue to serve important functions, these spaces are being transformed to educate and train future physicians and other health professionals.

In the 21st century, the wealth of information available to help prepare students for careers as physicians and health professionals is not limited within a dedicated space. Cadaver labs where students perform surgery with preserved human bodies are replaced with high-tech simulation systems. Lecture halls are supplanted by high-tech classrooms with round tables to facilitate both large- and small-group learning and with “huddle spaces” for more intimate discussion and interaction among students and faculty.

Traditional private offices for faculty and large suites for the dean and other senior administrators are replaced with open office space models. The space most conspicuously absent is the library, a hub for research and study that historically has been located in a separate building on academic medical center campuses. Gone, too, are the private study cubicle and computer labs. These spaces have disappeared as students and faculty have virtual access to information once housed in the library on their iPhones, tablets, watches, etc.

The medical school facility data collected throughout the process should serve as a foundation for developing state-of-the-art medical school facilities. The below benchmark data indicates that the average start-up medical school facility includes approximately 50,000 square feet, which is in the range of what is proposed by the UNLV School of Medicine in Project 1. The majority of space in both start-up medical school and renovated space at established medical schools is dedicated to teaching and clinical simulation functions. After reviewing the facilities plans provided by the UNLV School of Medicine and data provided by SLAM, Tripp Umbach believes the university could have a full medical school facility within Project 1.
Tripp Umbach’s review of LCME accreditation standards and challenges during the accreditation process for new start-up medical schools clearly demonstrates that a modern library concept and learning resources must be accessible throughout the facility rather than as a large, traditional, stand-alone dedicated space. Facilities studied have limited space allocation to traditional library functions and instead use advanced technology to make learning available to all learners inside and outside the facility.

**Recent LCME Space Concerns:**

1. **Active Learning Classrooms**
   - concern with students spending too many hours in lectures

2. **Social & Wellness Spaces**
   - concern with student stress levels

3. **Modern Library & Learning Resources**
   - concern with access to information and technology

While 21st-century medical school facilities share some of the characteristics of traditional medical schools developed at the turn of the 20th century, the minimal nature of the medical library is the most striking difference, as information is no longer housed in a separate spaces but is available to all learners. Tripp Umbach research shows that the traditional library functions at medical schools are diminished and facilities are transformed to incorporate active learning, simulation, virtual reality, and other advanced technologies.

### National Medical School Library Benchmarks

**PROGRAM AREA (NSF)**

- **Established Top Tier Schools**
- **Start-up Schools**

**NSF / CLASS SIZE**

*Approximate program yield (NSF) of a 50,000 GSF library building*
Tripp Umbach identified the following examples of medical schools that have transformed their traditional medical education libraries to state-of-the-art facilities.

- In 2015, **University of Michigan School of Medicine** transformed its traditional medical library to a state-of-the-art medical education hub that supports in-person, collaborative, active learning. Notable features include an anatomage table, technology-enhanced study and group spaces, computer stations, clinical simulation suite, café, and a dedicated medical student lounge.\(^5\)

- **Duke University School of Medicine’s** original medical library building is about 75,000 GSF and, as of today, 40 percent is actually used for library functions with the remainder converted to clinical offices, medical education space, conference center, and support uses.\(^7\)

- **University of Minnesota Academic Health Center's** current Biomedical Library is almost 200,000 GSF and is being demolished and replaced with the equivalent of 32,000 GSF (19,750 NSF), of which less than 50 percent will be located in a “library” center with the remainder distributed throughout the new medical education building.

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5. The anatomage table is the most technologically advanced anatomy visualization system on the market. It is both a virtual library of human and animal cadavers, as well as a clinical diagnostic tool with visualization of any Medical CT, CBCT or MRI scan.
6. https://medicine.umich.edu/medschool/about/facts-figures/facilities
7. https://medschool.duke.edu/education/medical-center-library
TRIPP UMBACH RECOMMENDATIONS

As the UNLV School of Medicine embarks on a construction project to create a home for the medical school, its leaders should learn from other medical schools. Best practices identified in the Tripp Umbach report should serve as a foundation for developing state-of-the-art medical school facilities.

1. **Private Approach:** In conversations with key donors, we have determined that there is little interest in partnering with the Nevada System of Higher Education on a medical education building. Donors do not believe that the State of Nevada has the resources to build a medical education facility to match the vision of the UNLV School of Medicine, especially if the school wishes to expand to more than 120 students per class. Thus, the UNLV School of Medicine should reach out to major donors and seek their input on how to build a privately constructed main medical school facility. The university risks developing Project 1 in a way that alienates the donor community for involvement in future medical education facilities (Project 2). Therefore, bringing the donors immediately into the planning process will diminish the risk that Project 1 will be developed in a way that forfeits major donor investment in Project 2.

2. **Focus Project 1 on Medical Education:** The UNLV School of Medicine should focus on medical education requirements for the LCME. While interprofessional education and community interface are laudable goals and may be incorporated, Tripp Umbach’s national benchmarking analysis shows that the original and revised vision for Project 1 could fall short of accreditation standards if spaces are overly dedicated to non-medical students. Therefore, Tripp Umbach recommends that if Project 2 is not developed on the same timeline as Project 1, that Project 1 be revised to include the following spaces: simulation; clinical skills; and virtual anatomy.

UNLV and the State of Nevada possesses limited resources to build one or more medical education facilities. The UNLV School of Medicine should allocate funds provided by the state and an anonymous donor for direct support of medical education. Current proposals call for a facility to be built that is equivalent in size to most start-up medical schools and therefore it is possible for Project 1 to achieve the space program for a fully accredited medical school with 60 students per class. However, spaces dedicated to non-medical students and or community uses will dilute the medical education program and risk accreditation.

A private sector approach could use creative finance options and federal funding tools to leverage the current $50 million for the project. Given that the proposed location for the UNLV School of Medicine education building lies within a federally designated low-income community, the project is eligible for “New Market Tax Credits (NMTC).” NMTC could provide up to $10 million in additional funds for the UNLV School of Medicine education building. Should UNLV’s clinical facility provide services to low income patients, it will be a good candidate to receive “Social Impact Bonds (SIBs).” SIBs are tied to the delivery of results. Achieving such results delivers payments to investors who assume the upfront risks. We strongly encourage the UNLV School of Medicine to explore this option.

3. **Have Private Sector Drive Project 2:** Tripp Umbach recommends that the donor community and private sector development leaders form a working partnership with the UNLV School of Medicine to begin immediately on the planning and financing for Project 2 – a comprehensive Medical Education and Teaching Building. Tripp Umbach recommends that the private sector work closely with the UNLV School of Medicine to design, finance, and construct state-of-the-art medical school facilities to open in May 2022 at the same time as Project 1. Tripp Umbach also recommends that Project 2 include clinical office and ambulatory patient space to enhance the medical school’s clinical education program.

Tripp Umbach recommends that the UNLV School of Medicine use the facilities made available to the school by the private sector developer under a negotiated lease and secure ownership of the buildings after a set period of time. Examples from higher education of private sector involvement with facilities on public universities include the Coda Building at Georgia Tech and the Bloomberg Center at Cornell Tech in New York City. This approach must be rooted in the UNLV School of Medicine formalizing, strengthening, and reinforcing relationships with current donors and exploring relationships with other interested donors.
CONCLUDING REMARKS

Tripp Umbach’s recommendations are presented to guide dialogue among multiple parties with a goal of developing a state-of-the-art, nationally recognized UNLV School of Medicine in Las Vegas, Nevada. The key to success in this endeavor is collaboration and mutual vision among the medical school and donors throughout Las Vegas. This solution best provides the UNLV School of Medicine the opportunity to build state-of-the-art medical school facilities. Importantly, Tripp Umbach believes that its recommendations not only will provide UNLV School of Medicine the best chance to be fully recognized as an asset to the university, but also offer the potential for significant growth in economic impact to the city and state as a result of its activities.

A study process put in place by The Lincy Institute is intended to encourage renewed discussions between UNLV School of Medicine and multiple donors throughout Southern Nevada. It is in the best interest of UNLV School of Medicine and regional donors to develop facilities that will benefit of the region and the state. The collaboration of the UNLV School of Medicine and the private sector will remove a significant obstacle to the development of state-of-the-art facilities. Tripp Umbach also strongly suggests that the UNLV School of Medicine establish a workable but aggressive timetable for Project 1 and Project 2 to reach a successful conclusion to UNLV School of Medicine’s facilities planning. If this is accomplished, UNLV School of Medicine and the Las Vegas region would be at the cutting-edge of training for the next generation of health care professionals.