THEME 2.3

BAYLOR SCIENCES BUILDING-FUTURE RENOVATION SCENARIOS Lee Nordt, Craig Moehnke, Ken Wilkins, Viola Osborn March, 2015

BACKGROUND

A&Spire, the College of Arts and Sciences strategic plan, proposes that 40 new faculty lines across six departments in the Baylor Sciences Building (BSB) will be needed in the sciences during the coming decade: 1) to contribute to Baylor's *Pro Futuris* aspiration of becoming a Carnegie Very High Research University, and 2) to address the high student-to-faculty ratio in many science departments that is a consequence of the Baylor brand in the health sciences. Here are the relevant Acts of Determination from A&Spire:

THEME 2 – Becoming a Nationally Recognized Research Institution

AOD 4 – Acquiring new faculty in the Arts & Sciences STEM departments

By Spring 2015 the Dean will form a taskforce to study different space plans for growth in A&S STEM for new and replacement faculty hires considering three options (see below).

AOD 5 – Creating and enhancing research centers in Arts & Sciences STEM

By Spring 2015 the Dean will identify enhancements for existing centers to better serve faculty and identify new centers needed to facilitate faculty and student research (current centers – Molecular Biosciences, Mass Spectrometry, Microscopy and Imaging)

THEME 4 – Investing in the Health Sciences

- AOD 1 Creating a space plan for health science-related departments (BIO, CHE, PSY)
- AOD 3 Achieving more favorable student-to-faculty ratios in the sciences (currently 20-50:1)

The design of the BSB when it opened in 2004 included expansion space for classrooms and research laboratories (labs). With the addition of faculty lines since that time, BSB is now near capacity with respect to research lab space. Steps to reallocate research lab space from less productive faculty will address only a small portion of the projected space needs. Also, office space will be needed for the new faculty hires and new staff lines.

The purpose of this report is: 1) to compute the total space needed to hire 40 new faculty for the sciences, 2) to determine the number of faculty that can hired before all expansion space is utilized, and 3) to offer recommendations for acquiring additional space to hire faculty beyond which can be accommodated with the current expansion space.

TOTAL SPACE NEEDED

The estimated space requirements for the 40 new faculty lines are based on the following assumptions:

- Three-quarters (30) of the faculty lines will be entry level (assistant professor) hires, requiring four modules of space (330 ft² per module) for research and graduate student space (1320 ft²) per faculty hire;
- One-quarter (10) of the faculty lines will be senior level hires, requiring eight modules (2640 ft²).
- Office space per faculty line is 150 ft².

With these assumptions, the 40 new faculty will require the following square footage:

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30 entry faculty	lines: 30*(1320 +	150) =	$44,100 \text{ ft}^2$

10 senior faculty lines:	10*(2640 + 150) =	$27,900 \text{ ft}^2$
40 faculty lines		$72,000 \text{ ft}^2$

Based on recent faculty hiring and expected future faculty hiring per targeted areas shown in A&Spire, we will need to plan for an additional 5000 ft^2 for two new Research Centers (core facilities). Total space needed is **77,000 ft**².

EXPANSION SPACE

The first question is how much of the needed space to hire 40 new faculty (and two Research Centers) can be offset by remaining expansion space in BSB. Existing expansion space in BSB can be divided into two categories: remaining research lab expansion space and remaining classroom expansion space. Expansion space originally designed for research labs with accompanying HVAC system is shown in Figure 1 (Top and Bottom panels). A total of 11 and 1/3 expansion modules are available for new hires in the C-wing of the first floor (3740 ft²), plus another 12 expansion modules on the A-wing of the fourth floor (3960 ft²), resulting in a total of 7700 ft². If we repurpose the expansion classroom space on the first and second floors (15 modules), this will provide another 4950 ft². The total current expansion space in BSB, the sum of the research and classroom expansion space, is 12,650 ft².

Research Expansion Space	23 1/3 modules	7700 ft ²
Classroom Expansion Space	15 modules	4950 ft^2
	38 1/3 modules	$12,650 \text{ ft}^2$

Even if all the available space, both research expansion space and classroom expansion space, is used only for entry level faculty (1320 ft² research space, plus 150 ft² office each), the available space will be adequate for approximately **8 new hires before BSB is considered at capacity.** It is estimated that this capacity will be reached within 5 years, but with the assumption that the expansion space is only filled with entry level faculty. Thus, additional space (64,350 ft²) will be needed in order to hire the 32 additional new lines, requiring a space plan for this growth beginning in approximately 5 years.





Figure 1. Top – First floor plan view showing outlined in blue expansion research lab space and outlined in white expansion classroom space. Middle – Second floor plan view showing outlined in white classroom expansion space. Bottom – Fourth floor plan view showing outlined in blue research lab expansion space.

THE FOUR SPACE SCENARIOS

We propose four possible scenarios for acquiring approximately 64,350 ft² of space for the 32 additional faculty lines and two Research Centers in the sciences: 1) build a new science annex to house the additional faculty and their research labs plus two Research Centers, 2) move teaching lab and expansion classroom spaces to a new science annex, 3) move one or more academic departments to a new science annex, or 4) extend the A and C research wings for additional research laboratory space. A fifth possibility, converting all classroom space to research laboratory space, is rejected because all of these spaces are in low HVAC areas of the building and such an option would diminish student activity. The assumption is that a science annex would be built on the footprint of the Clinical Health Sciences facility as shown adjacent to BSB on the master space plan of the University (Fig. 2).

Scenario 1 – Build a Science Annex for 32 New Research Faculty

A new Science Annex (Fig. 2) could be constructed to house the needs of 32 new faculty lines and two Research Centers for the departments currently occupying the BSB. Research labs and office spaces would be designed to total approximately 64,350 ft². This option, however, would split departmental faculty and their activities into two locations.



Figure 2. Master space plan of Baylor University north campus showing location of the Clinical Health Science facility. One space scenario for the sciences is to redesign this facility to a science annex to accommodate the needs of the hiring of 32 new science faculty.

Scenario #2 – Move All Teaching Labs to a Science Annex

The BSB contains teaching lab space ranging from the freshman to senior level. Most of this space is located between the research wing and hub of each floor. Freshman and sophomore lab space includes 86 modules or approximately 28,380 ft² (see Fig. 1 for examples). If vacated, this space could be made available for new faculty hires in BSB and could accommodate **16 new faculty hires (13 entry level hires and 3 senior level hires)**. The science annex as a new facility could be programmed uniformly for teaching lab space and also allow for redesign and expansion of existing teaching labs.

By moving the freshman and sophomore teaching lab space $(28,380 \text{ ft}^2)$ to a science annex, less than one-half of the 64,350 ft² needed for 32 new faculty hires will be available. To provide the additional space, some combination of the following areas would need to be moved to the science annex: 1) teaching lab space from the junior and senior level, 2) core facilities or research centers (the Center for Microscopy and Imaging and Mass Spectrometry Center, for example, representing approximately 2,140 ft²), and 3) other academic program areas.

Scenario #3 – Move One or More Academic Departments to a New Science Annex

The science annex could be designed to house one or more academic units currently in the BSB. For example, if PSY/NEU were to occupy the science annex, that move would free approximately 24,000 ft² of space, still far short of the approximately 64,350 ft² needed in BSB. Alternately, the entire fourth floor of BSB could be moved to a Science Annex (ENV, CRASR, GEO) freeing approximately 61,000 ft², the closest single scenario of meeting the 64,350 ft²

benchmark. Building a new facility for two or more departments, however, would be a costly proposition because of the complexities in architectural design. An alternative would be to move one academic unit along with all of the freshman and sophomore teaching labs.

Scenario 4 – Extend Research A and C research wings in BSB

The initial design of the BSB includes a plan to extend the A and C research wings towards the intramural fields to the north (Fig. 3). The two wings could be expanded to accommodate the hiring of an additional 32 new faculty across the BSB science departments and two Research Centers. Each floor of the current outer research wings constitutes approximately 8,800 ft². In order to build the required research lab space (64,350 ft²) the equivalent of seven to eight floors (3 or 4 floors per wing) would need to be added. This represents an extension of each of the two wings to the north for an area equal to the current footprint of each outer wing. Another option is to connect the space between the A and C wings, leaving the current configuration of the A and C wings intact.



Figure 3. Master space plan of Baylor University north campus showing potential expansion of the A and C wings of BSB to accommodate the hiring of 32 new science faculty. This space replicates the space of the current outer research wings.

CONCLUSIONS

The science chairs in the College of Arts and Sciences have a preference for building a science annex on the current footprint of the clinical health sciences facility as shown on the University master space plan. This would allow for uniform programming of new space that would not divide departmental activities into two locations or divide departments in the BSB that currently have collaborative synergies. Moving teaching labs to a new science annex is preferred by the science chairs. This space could be designed to accommodate the growing needs of teaching lab space in both quantity and in design. The kind of space would also be more cost efficient, not requiring the added complexities of architectural design for departments nor requiring installing expensive HVAC systems for research laboratories. The problem, however, is that unless some junior and senior teaching labs or one of the academic departments currently within BSB are also moved to the new facility, moving freshman and sophomore teaching labs alone will not provide enough space to hire 32 new faculty in BSB.