

SPACE UTILIZATION STUDY - EXECUTIVE SUMMARY SCHOOL OF MEDICINE & HEALTH SCIENCES



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UNIVERSITY OF NORTH DAKOTA
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**PERKINS
+ WILL**

EXECUTIVE SUMMARY

INTRODUCTION & SUMMARY

The 2011 North Dakota legislative assembly authorized the University of North Dakota School of Medicine and Health Sciences (UND SMHS) to increase student enrollment. This change will result in additional medical and public health practitioners, therapists, and other health professionals to serve North Dakota's changing healthcare needs. As a partial implementation of SMHS's Healthcare Workforce Initiative (HWI), this effort will begin to address workforce shortages in North Dakota.

Full implementation of the HWI proposes an additional enrollment increase at UND's School of Medicine and Health Sciences in 2014. As a precondition for complete HWI implementation, the legislative assembly requested that the SMHS complete a facility space utilization study in order to determine:

1. The suitability of the existing space, and
2. The amount of new space required to meet the class expansion.

This summary chronicles the objectives, process and findings of that study.



An example of an overcrowded space is the gross anatomy labs. Each table is shared by 8 students; class size does not allow recommended clearances between tables to be met.

SUITABILITY OF EXISTING SPACES

UND SMHS consists of four campuses - Grand Forks, Fargo, Minot and Bismarck. Although this study focuses on the Grand Forks campus, enrollment will have a significant, but manageable, impact on the satellite campuses at Fargo, Minot, and Bismarck.

The UND SMHS learning facilities are separated on the 500 plus acre Grand Forks campus by excessive distance that creates challenges for both students and faculty in the development of learning synergies which enhance efficiency and performance.

The primary SMHS structure is a retired hospital constructed in 1952 and repurposed in 1988 as the School of Medicine and Health Sciences. It currently contains nearly 380,000 GSF (Gross Square Feet) with multiple additions over the years. The existing facility presents extraordinary challenges for accommodating the education of today's medical and health service providers. Some of the largest impediments of the existing facility include:

- **Small structural grid.** With columns only 16 feet apart, this building reflects the needs of a cast-in-place concrete structure suitable for a hospital design of 1952, but presents nearly impossible obstacles for the open space learning environment of today.
- **Low floor-to-floor heights** impede the installation of up-to-date, code-required HVAC (Heating, Ventilation and Air Conditioning) systems. Additionally, thick concrete decks create barriers to vertical pathways necessary for new HVAC lines and other utilities.
- **Lack of natural light.** The original floor plan prevents natural light from reaching the building interior, and has a significant negative impact on the quality of education spaces. Multiple studies show the positive effect of natural light on student performance, reduced absenteeism, retention of faculty and staff, as well as improved overall health of the occupants.
- **Age of major building systems and components.** The existing **HVAC system** is between 20 and 60 years old and nearing the end of its service life.
- **Aging windows and building envelope.** Although of robust construction, the original masonry structure does not provide the heating & cooling efficiencies available with modern construction. The original aluminum frame windows are difficult to operate and account for significant heating & cooling losses.
- **Limitations on technology and renovation.** The aforementioned robust construction represents real value in traditional North Dakota style, but unfortunately is a hindrance to both new technology and space renovation. As previously noted, mechanical upgrades are difficult and floor plan changes almost impossible to accommodate. In addition, wireless data transmission is blocked by the heavy concrete decks and columns.

The size, shape and configuration of most of the educational spaces are inadequate. Many of the classrooms, labs, Patient-Centered Learning (PCL) environments and lecture halls are overcrowded and recommended clearances are unobtainable – compromising the effectiveness of the learning environment and creating safety concerns in some instances. Offices are tailored around the original spacious 1952 patient care rooms, each containing their own bathroom, resulting in an inefficient use of space. Major renovations are required to reduce them to sizes that more closely represent a standard for higher education needs.

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NEW SPACE REQUIRED TO MEET THE NEEDS OF THE CLASS EXPANSION

The existing facility is at maximum capacity (and beyond) in several areas to accommodate the current student enrollment. As an example, teaching wet labs are scheduled at 173% of their capacity. As a result, the SMHS is currently unable to add any additional students, faculty or staff. To meet the needs of increased enrollment, expansion of the facility and renovations will be necessary.

Full implementation of HWI will result in a 24% increase in class size.

ENROLLMENT GROWTH - STATEWIDE IMPACT			
	Enrollment <u>2012 SMHS</u>	Enrollment <u>2014 SMHS</u>	Enrollment <u>2017 SMHS</u>
On campus	641	757	803
Off campus	<u>158</u>	<u>166</u>	<u>190</u>
	799	923	993

Existing space is over-utilized. Targets for efficiency in medical and health science education suggest that a 40% utilization rate is the “best average” obtainable based on class schedules, internal traffic patterns, dedicated use labs, and small group instructional methods. SMHS is currently utilizing the space at 46%, creating scheduling conflicts that affect learning efficiencies.

The utilization rate of a room is determined by dividing the hours the room is scheduled for use by the total hours the room is available for use. Medical and health science education facilities often have many spaces that require room set up prior to class and room clean up after class. This drops the utilization rate compared to traditional classrooms. Medical education will often occupy several rooms at one time - moving from room to room during one class period - in addition to dedicated use such as anatomy/dissection labs.

Inefficient use of space is a result of the 1952 hospital building design. As enrollment increases, the need for additional faculty, staff, and support personnel grows proportionally. As a result, space for accommodating faculty, staff, and support functions must be included with building renovation or addition plans.

Previous generations of classroom design had the instructor at the head of the class and the students in rows of desks. Today’s education model is very different. Today classrooms are designed to encourage interaction, collaboration and participation between students and instructors. This new, team based, paradigm requires a room configuration that will not fit within the confines of the existing building structural system.



Past Classroom Model



Future Classroom Model

Enrollment will drive faculty recruitment, with prime candidates requesting laboratory space for the research and instructional programs that accompany their professional discipline. To be successful, a modern and all-inclusive medical education facility includes research infrastructure and laboratories as part of its space portfolio.

EXECUTIVE SUMMARY

OPTION 1

Option #1 minimizes the investment in new facilities while maximizing renovations to meet the basic needs of the HWI student enrollment increase and maintain the existing level of service.

\$38.5M Estimated Project Cost

80,103 GSF addition with shared education space

42,311 GSF renovation of faculty offices and education space



Maintain Existing Level of Service Plan

OPTION 2

Option #2 balances investment in new facilities with renovations to optimize the educational experience of the HWI student enrollment increase and meet established standards for achieving educational excellence.

\$68.3M Estimated Project Cost

169,390 GSF addition with shared education space and student collaboration space

48,332 GSF renovation of faculty offices, collaboration, and administration



Establish Recommended Standards Plan

OPTION 3

Option #3 looks at creating an entirely new facility to provide exceptional space to meet the needs of the HWI student enrollment increase while sustaining growth and providing a facility that will remain a highly valued edifice for years to come.

\$124.0M Estimated Project Cost

376,812 GSF building with shared education space, student and faculty collaboration space, faculty and administration offices, and research facilities



Sustaining Growth Plan

Definition: Gross Square Footage (GSF) is the total building square footage measured to the outside of the exterior wall. This includes: all walls, stairs, elevators, mechanical spaces, and equipment areas.

OPTION 1 EXECUTIVE SUMMARY

Option #1 consists of an addition of approximately 80,000 GSF (Gross Square Feet) and a renovation of 42,300 GSF. The focus of Option #1 is to locate as much education space as possible into new or renovated space.

The 80,000 GSF addition will house approximately 50% of the new education spaces & associated non-assignable spaces. The construction cost of this addition is estimated at \$19.8M.

The 42,300 GSF renovation of existing space will result in another 25% of education spaces being updated. The construction cost of this renovation is estimated at \$5.8M.

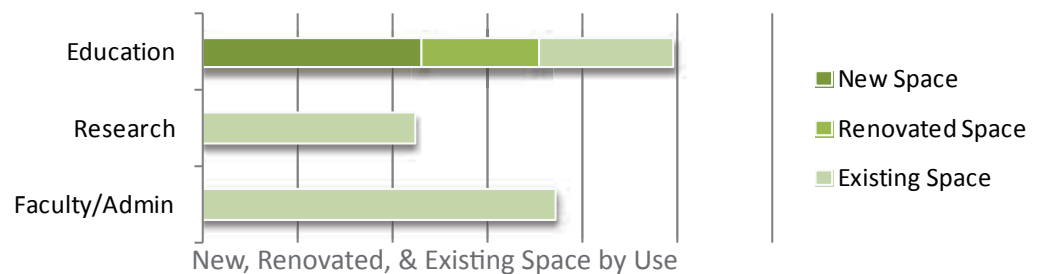
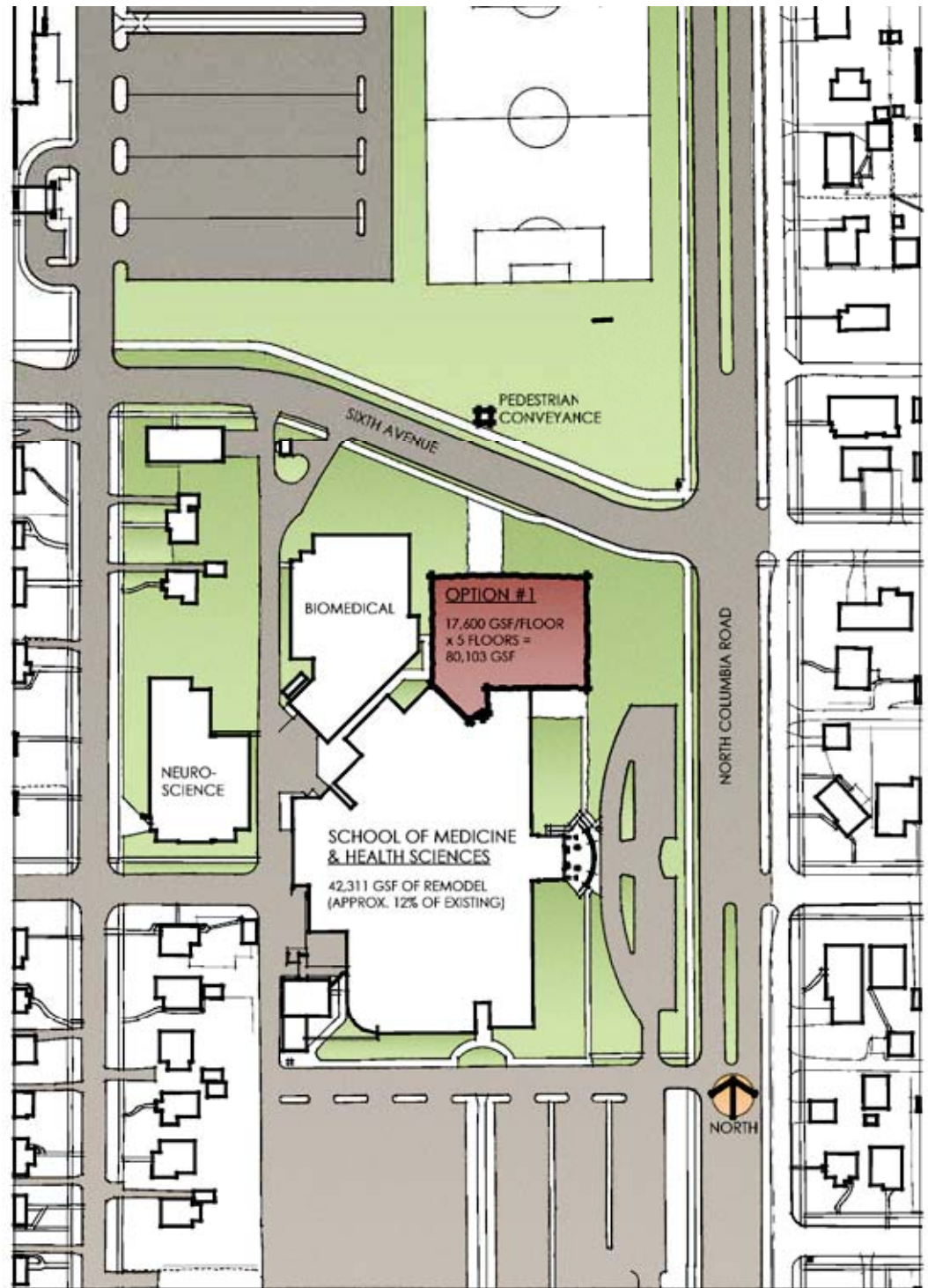
Construction costs for this option are \$25.6M. Sitework, pedestrian conveyance, technology, and additional costs bring the total project cost estimate for Option #1 to \$38.5M.

Pros:

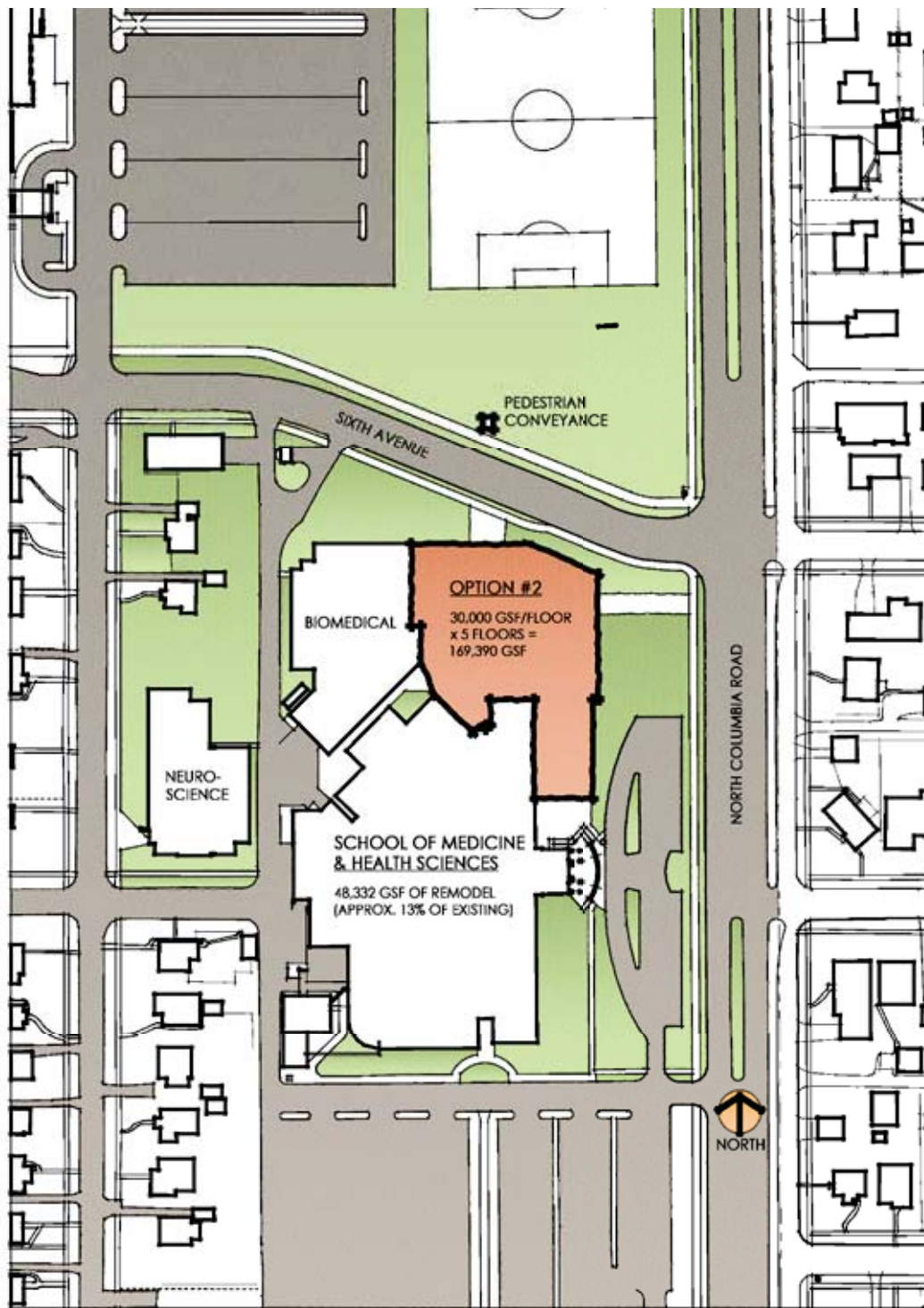
- Lowest initial investment.
- Fastest completion time for new construction.
- Provides efficient new/renovated education space.

Cons:

- Connection to existing building creates low floor-to-floor heights.
- Little new daylight added to education space.
- Close to maximizing site coverage (not much room for future expansion).
- Pedestrian conveyance required to access simulation, parking to the north, etc.
- Meets minimum program requirements, but doesn't create ideal collaboration & learning spaces.



EXECUTIVE SUMMARY **OPTION 2**



Option #2 consists of an addition of approximately 169,300 GSF (Gross Square Feet) and a renovation of 48,300 GSF. Option #2 locates all education areas in new space and renovates as much faculty/administration area as possible.

The 169,300 GSF addition will house 100% of the new education spaces. The construction cost of this addition is estimated at \$41.9M.

The 48,300 GSF renovation of existing space will result in approximately 1/3 of faculty/administration spaces being updated. The construction cost of this renovation is estimated at \$6.6M.

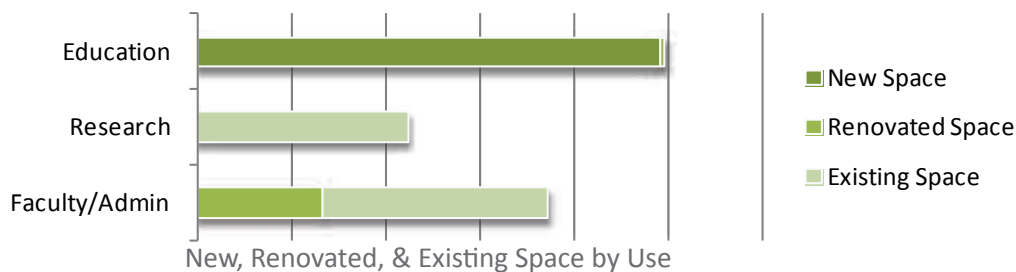
Construction costs for this option are \$48.5M. Sitework, pedestrian conveyance, technology, and additional costs bring the total project cost estimate for Option #2 to \$68.3M.

Pros:

- Meets program requirements for education spaces & creates shared collaboration & learning spaces.
- Creates a new image for SMHS along Columbia Road.

Cons:

- Connection to existing building creates low floor-to-floor heights.
- Little new daylight added to faculty/administration space.
- Maximizes site coverage (no room for future expansion).
- Pedestrian conveyance required to access clinic space, parking to the north, etc.



OPTION 3 EXECUTIVE SUMMARY

Option #3 consists of a new building of approximately 377,000 GSF (Gross Square Feet). Option #3 relocates all of the School of Medicine & Health Sciences into a new shared building.

The 377,000 GSF building will house all education, research, and faculty/administration spaces. The construction cost of this building is estimated at \$94.6M. Sitework, technology, and additional costs bring the total project cost estimate for Option #3 to \$124M.

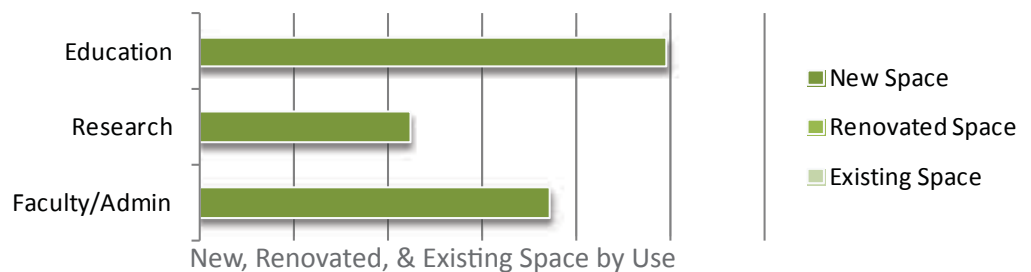
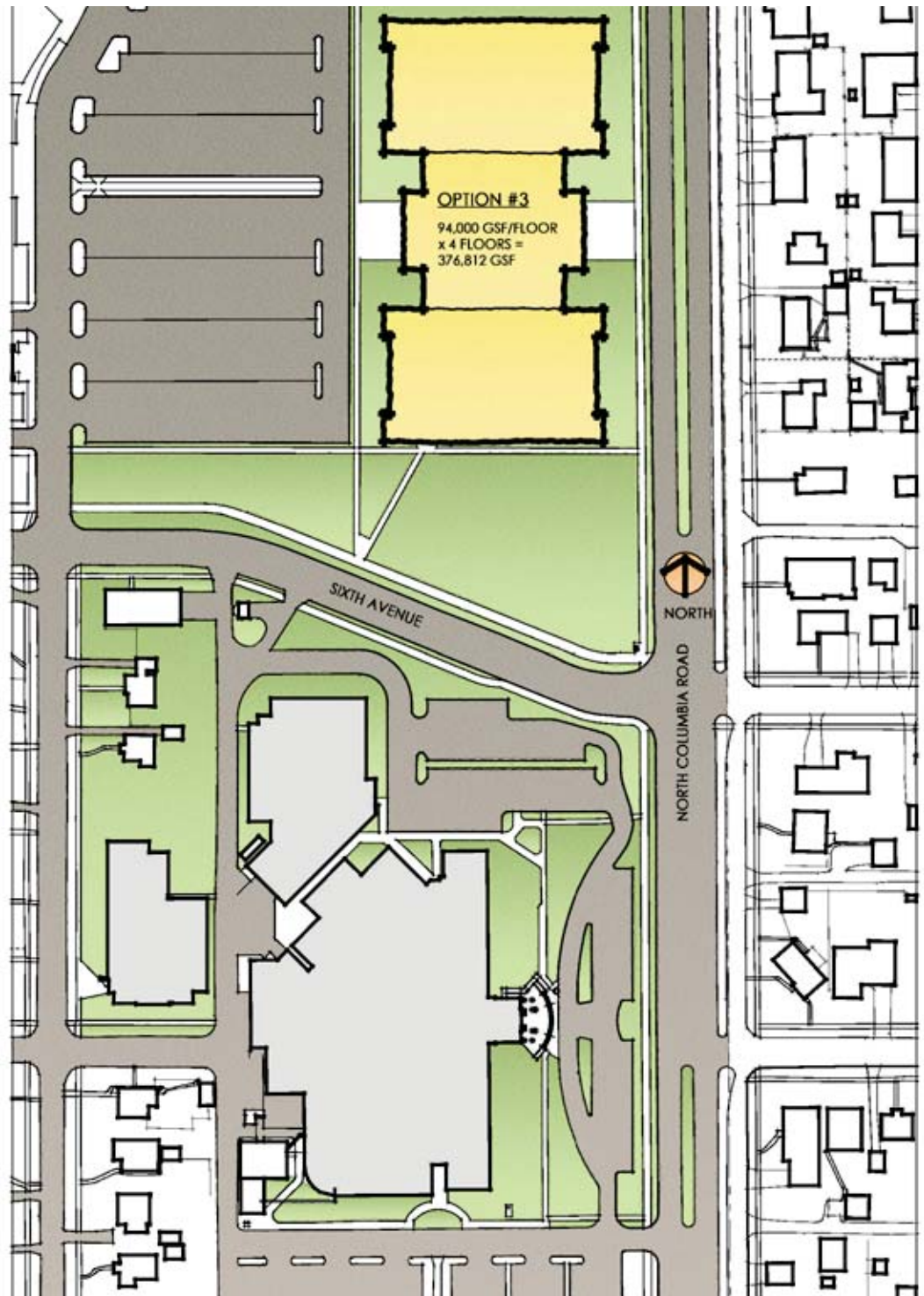
Pros:

- Least disruption to current building operations.
- Lowest maintenance and operations cost (down to one building vs. four).
- Best meets the goal for a unified & integrated School of Medicine & Health Sciences.
- Optimizes efficiencies & adjacencies of space.
- Improves UND's Facilities & Administration (F&A) rate for sponsored projects.
- Presents a totally new image & presence for SMHS.
- Fosters the recruitment and retention of the 'best and brightest' students and faculty.

Cons:

- Highest initial cost.

Note: UND is undertaking a planning process in which it is evaluating existing facilities for suitability and efficiency. When space becomes available as a result of new construction, it will be considered for repurposing, demolition, or a combination of both that results in better utilization of all campus facilities. Should the existing SMHS space be fully vacated, it will set in motion a process whereby the entire campus will become more efficient as a result of the opportunity.





THE UNIVERSITY OF NORTH DAKOTA

SCHOOL OF MEDICINE & HEALTH SCIENCES

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