

Bluefield State College Campus Planning

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Best Practice Initiative

Abstract

Bluefield State College facilities management and campus planning costs were greatly reduced by capitalizing on the skills of our own Architectural Engineering students to produce digital drawing, data, and presentation files for several campus projects. Professional architectural and engineering service contracts for these low-risk mandatory projects would have totaled more than \$150,000. By utilizing the skills of our students, the projects were completed on time and with high quality for less than \$30,000, including materials and equipment, saving the institution more than \$120,000 dollars with extremely low liability risk.

Students produced campus planning and facilities management drawing files in digital formats that can be relied upon by physical plant personnel, campus-planning entities and as preliminary information for architectural and engineering firms. The College has challenged itself to continually improve on responses to mandated requirements, while concurrently planning, growing, and adapting our campuses to meet the needs of our constituents in an atmosphere of limited resources. Obviously, purchasing the architectural or engineering services required to initiate these projects would have been a great burden for a small college, particularly in the current economic climate. From a financial and administrative perspective, the best practice in responding to the needs and challenges was to utilize in-house skills to the greatest extent possible without exposing the institution to any undue risks.

The implementation of in-house campus planning initiatives requires both the technical capacity to do the work and the discipline not to become inappropriately reliant on the same.

The benefits enjoyed by implementing this best campus planning practice are numerous and include: saving \$120,000 for the institution, increasing the efficiency and communication of physical plant personnel in locating utilities, bringing documented attention to administration, faculty, and staff regarding the importance of efficient space utilization, decreasing turn around time for pre-planning campus projects, developing paid internships for students working on real world projects, bringing dissimilar elements of campus personnel together, cementing better working relationships, helping students obtain jobs based on portfolios of experience, and creating a positive energy for doing even more work utilizing this best practice.

Introduction to the Organization

Bluefield State College was established as a Black Teacher's College by an act of the West Virginia Legislature in 1895 and was integrated after 1954. By the 1960's, the College had a comprehensive four-year program of teacher education, arts and sciences, and engineering technology. Gradually a variety of two-year technical programs evolved in response to local needs.

Bluefield State College has emerged as a four-year state supported commuter college serving southeastern West Virginia with a primary thrust in the direction of career and technical two and four year programs. The liberal arts offerings of the College are focused to enhance its unique mission.

The College offers baccalaureate and associate degrees. Instructional programs are offered in engineering technologies, business, teacher education, arts and sciences, nursing and health science professions, and a variety of career fields. Students may also complete the non-traditional Regents Bachelor of Arts degree through Bluefield State College. One of the many strengths of the College has been the two-plus-two design of many of its baccalaureate level programs whereby the two years completed for an associate degree are completely applicable toward the baccalaureate degree. Bluefield State College is also dedicated to offering a wide variety of off campus and online courses.

The mission of Bluefield State College is to provide students an affordable, geographically accessible opportunity for public higher education. The College demonstrates its commitment to undergraduate education by providing a dedicated faculty and staff, quality educational programs, and strong student support services in a

caring environment. All programs are designed to promote the student's intellectual, personal, ethical, and cultural development.

As an historically black, open admissions institution, Bluefield State College prepares students for challenging careers, graduate study, informed citizenship, community involvement, and public service in an ever-changing global society.

The College serves the citizens of southeast West Virginia by providing programs principally at sites in Mercer, Greenbrier, Monroe, McDowell, Raleigh, Pocahontas and Summers Counties and in some locations contiguous to its service area.

Statement of the Problem & Best Practices Initiative

Bluefield State College has challenged itself to continually improve on our response to mandated requirements, while concurrently planning, growing, and adapting our campuses to meet the needs of our constituents in an atmosphere of limited resources.

Several of our requirements for architectural and engineering services over the past two years have included (1) producing a college-wide space and equipment utilization and inventory study, (2) developing and updating our Facilities/Master Plan, (3) producing digital drawing and database files for national HEGIS code requirements that could be correlated with our student management software, (4) producing preliminary drawings and specifications for ongoing campus planning and construction projects, (5) creating and posting emergency exit path drawings and occupancy load notices required by the West Virginia State Fire Marshall, (6) conducting deed research for existing and adjacent campus property holdings, (7) producing two and three-dimensional CAD drawing files of existing utilities and land holdings of the College, (8) designing improved parking

layouts to gain a greater number of vehicle spaces, and (9) producing preliminary drawings for additional space on our other campuses.

Obviously, contracting with an architectural or engineering service to initiate these projects would be a great burden for a small college, particularly in the current economic climate. These projects were typical off-budget items requiring significant funds to pay for outside services. Economies of scale are difficult to achieve since most A/E firms want to bid on larger, longer-term projects that are more efficient to manage from their point of view. However, the work still needed to move forward, whether required by statute or necessary to improve efficiency.

In addition to budgetary constraints, initiating these projects in a timely manner was important. Some of the delays associated with developing Requests for Proposals for these contracts were prohibitive or ultimately unacceptable. Additionally, the data collection and campus community input necessary to complete projects within a short time frame can be more difficult for an outside firm than for an on campus team. There is also a disconnect associated with the potential exclusion of on-campus planning entities who may feel excluded from preliminary project processes by an outside firm.

From a financial and administrative perspective, the best practice in responding to the needs and challenges outlined above was to utilize in-house skills to the greatest extent possible without exposing the institution to any undue risks. This was best accomplished by utilizing the quickly accessible technical capabilities of our Architectural Engineering Technology students for the preliminary problem seeking and data collection aspects of these projects, while carefully stopping short of producing any contract documents or

drawings for construction purposes due to liability issues. It is important to note that any drawings produced on these projects were used for preliminary design, facilities management, and campus planning information only. However, it is equally important to realize that professional architectural and engineering services fees for performing the same work would have cost several times more than utilizing our own resources.

Design

Two of our most academically proficient junior level Architectural Engineering Technology students were recommended by Architectural Engineering Technology faculty and then hired under regular student employee guidelines, beginning the summer months of 2002 at a pay rate of \$8.00 per hour. The students worked full time during the summer months of 2002 and 2003, and part time during the Fall and Spring terms of 2002 and 2003. Bluefield State College surveying and CAD laboratory software and equipment were used, in addition to some minor incidental supply purchases, to complete the projects outlined above. Two Architectural Engineering Technology professors were available during this period to provide technical assistance, while working on other projects. Our Physical Plant Department provided access and direction to buildings and facilities. Other departments were made available to assist in the coordination of information and contacts and the physical location of plan elements. The students needed to make contact with local utilities and public service directors in order to gain access as necessary.

The first step in this process was to meet with students to review the HEGIS code requirements leading to further research and consultation on the space/equipment inventory and utilization study. The students had to develop expert knowledge of occupancy classifications, occupancy loading and a number of related formulas, while developing a coherent presentation of the results. Existing hard copies of drawings were gathered, if available, and as-built spaces were measured in comparison to these drawings. Equipment inventories were taken concurrently. Drawings of all campus spaces were then digitally updated in AutoCAD files and reviewed during several iterations for error. The campus facility plan drawings were then captured on CD media. The students presented their findings to the visiting West Virginia Higher Education Policy Commission in August of 2002 and the members were impressed with the results. Bluefield State College was the first institution within the state to complete the requirements.

Based on the success of this major project, the students became an increasingly valuable resource. Our accredited Engineering Technology programs have long prepared highly adaptable and resourceful students, and as the students moved on to their senior years, the challenge turned from digitally documenting primarily two-dimensional indoor elements to capturing three-dimensional outdoor utilities. First, students conducted deed research in Mercer County, West Virginia then matched layers of any existing electrical, fiber, gas, phone, sanitary sewer, storm sewer, water lines and easement mapping for our main campus. Using magnetic locators and the experience of physical plant personnel, the students added missing elements and edited others, eventually developing a large

overhead AutoCAD drawing file of the underground utility structures of our more than thirty acre campus. Again, much iteration was necessary to check and double-check the locations of these vital elements, but we now have a reliable file for reference in future projects and facilities maintenance.

Other projects developed as a result of, and in conjunction with, the two major projects described above. During the HEGIS code project, boilers were replaced in one of the buildings requiring detailed reference update of that space. Emergency exit path drawings were developed using the CAD files created during the HEGIS project. Since occupancy loads were studied during the HEGIS project, it was easier to post the necessary signage required by the West Virginia State Fire Marshal. The students surveyed the location for (80) eighty-foot tall lighting structures required for night baseball and made drawings correlating to the utility maps described above. In addition, the students produced preliminary drawings for additional space at one of our other campus locations.

Implementation

The implementation of in-house campus planning initiatives requires both the technical capacity to do the work and the discipline not to become unduly reliant on the same. Obviously, the institution would need programs in architecture or engineering with students and faculty willing to participate in campus planning and development projects. Due to the cost savings, there may be a temptation to handle larger projects in-house that would be more appropriately contracted outside the institution. If primarily relied upon

for informational purposes, this process can actually enhance the performance of A/E firms by providing preliminary design data without creating any resentment within the community. The process utilized has resulted in minimal liability risks, as long as no contract documents for construction purposes are produced. However, there is a potential timeline risk, since the institution has no contract with the students. Projects should be selected according to priority need, so as not to create the expectation that a project requires immediate design attention.

Benefits

The benefits enjoyed by implementing this best campus planning practice are numerous and include: saving \$120,000 for the institution, increasing the efficiency and knowledge of physical plant personnel in locating utilities, bringing documented attention to administration, faculty, and staff as to the importance of efficient space utilization, decreasing turnaround time for pre-planning campus projects such as, time pressures involving boiler installation; developing paid internships for two students working on real world projects; bringing campus faculty, staff and students together cementing better working relationships; assisting one student get a job in his field based on his portfolio of experience and assisting the other to gain admission to graduate school; and creating a positive atmosphere for doing more, working together, getting positive results utilizing this best practice.

Retrospect

In retrospect, the utilization of on campus Architectural Engineering Technology students for campus planning and facilities management projects worked exceedingly well. The College is obviously pleased with the performance and outcomes. Bluefield State College plans to involve more students and faculty in the campus planning in the future.

Our Center for Applied Research and Technology will help identify and direct future faculty-led student teams, in consultation with the administration. This group is also pursuing research funding to build three-dimensional modeling of the entire campus facility.

The collaborative efforts from faculty, students, and staff have made an increasing awareness of both campus planning needs and capabilities within our institution.