

APPENDIX F

TECHNOLOGY MASTER PLAN

N|V|5

EXECUTIVE SUMMARY

Stephen F. Austin State University is reevaluating how technology supports its academic mission, administrative operations, and campus life. As part of a broader master planning initiative, the University commissioned a detailed assessment to gain a clearer understanding of its current technology landscape and to identify opportunities for improvement.

The assessment process was both comprehensive and collaborative. It involved direct engagement with a wide range of campus stakeholders, including Information Technology Services (ITS), Audiovisual Services, Facilities Management, Athletics, University Police, Residence Life, faculty, staff and students. Interviews and focus groups were complemented by walk-throughs of academic buildings, residence halls, and shared spaces to observe how technology is being used in real-world settings. This approach helped surface not only technical conditions but also user experiences and operational challenges.

What emerged is a clear picture of a University that has made steady investments in foundational technologies but is now encountering the limits of those systems. Many components remain functional and continue to support day-to-day activities; however, aging infrastructure, fragmented deployment practices and limited scalability are beginning to impact reliability and flexibility. In several cases, the physical layout and design of

systems—such as cabling, network spaces, security and audiovisual installations—pose constraints to modernization and expansion.

Stakeholder feedback reinforced these observations. Faculty and staff noted areas where technology is dependable and well-integrated, while also pointing out inconsistencies in performance, support, and access. Students shared perspectives on connectivity, classroom tools and residential technology, highlighting both strengths and areas for improvement. Technical teams described challenges in maintaining legacy systems, coordinating upgrades and responding to evolving institutional needs with limited resources.

Taken together, these findings suggest that a more strategic and coordinated approach to technology planning would be beneficial. There is a strong case for rethinking how core systems are planned, not only to address current limitations but also to support future growth, flexibility and resilience. This includes considering life cycle planning, standardization, and integration across platforms and departments.

This overview is intended to support informed decision-making and guide future investments. It reflects current conditions and provides a foundation for developing a technological environment that is reliable, adaptable and aligned with the University's long-term goals.

In addition to the recommendations listed in this section, it is recommended that the campus maintain an accurate geographic information system (GIS) of their existing technology infrastructure. GIS would allow the campus to have centralized utility data showing where each asset is, when it was installed and its maintenance history. This will lead to efficient maintenance repairs and damage prevention. This also allows for smooth collaboration between the campus and architects/engineers when designing future projects.

This document is organized as follows:

- A high-level identification of the principal areas of focus.
- A review of technology systems on campus with recommendations.
- An examination of user groups, their unique needs and recommendations.
- A discussion of financial planning with recommendations to improve service delivery.
- Appendices
 - Budget considerations for the projects identified in the Master Plan.

FOCUS AREAS

REFRESH CYCLES

Technology refresh efforts need to be more intentionally planned and properly funded. The current approach is inconsistent, with many technology refresh activities embedded within capital projects. This practice obscures the true cost of technology updates, inflates capital construction budgets, and complicates the scheduling of necessary upgrades—ultimately doing a disservice to the institution.

STAFFING

The current IT staff at SFA is highly capable and well aligned with the University's needs. However, staffing levels are not sufficient to support the growing demands of the institution's technology infrastructure, which has expanded significantly over time while staffing has remained largely unchanged. This imbalance is increasingly unsustainable.

Recruitment and retention continue to be major challenges, largely due to SFA's rural location. The limited local talent pool and reluctance of candidates from urban areas to relocate—given the risk of needing to move again if the role does not work out—make it difficult to attract qualified professionals.

For those who do commit to SFA, career advancement opportunities have been identified as limited. This is reflected in internal movement within IT branches, as staff seek new challenges and growth. As

employees gain experience and take on more responsibility, their value to the University increases substantially. However, there are few formal mechanisms to recognize or reward this growth.

In the technology sector, skills are highly transferable, and compensation benchmarks are easily accessible across industries. This makes it easy for staff to identify pay disparities, which can lead to attrition. While SFA fosters a culture of learning and development, the recognition and reward structures do not currently align with industry standards.

Addressing these issues will require strategic investment in staffing, career development pathways, and competitive compensation to ensure SFA remains a viable and attractive workplace for top IT talent.

FUNDING

While funding challenges are common across institutions, they are particularly evident when planning for technology replacement cycles and staff compensation. Historically, spending has often been tied to capital construction projects, resulting in uneven and reactive investment patterns. A more deliberate, evenly distributed funding strategy would promote greater stability and enable more accurate forecasting of long-term needs.

As capital improvements slow—due to reduced demand or shifts in macroeconomic conditions—maintaining sustainable technology refresh cycles and competitive compensation becomes increasingly difficult. Without a proactive funding model, the university risks falling behind in both infrastructure and talent retention.

TRANSITION TO UNIVERSITY OF TEXAS (UT) SYSTEM

The transition to the UT System has had a broad impact across the University, though its effects on the IT department have been less immediately visible. While the department stands to benefit from the system-wide resources and standards, the transition also introduces new challenges. The UT System mandates a range of policies and procedures that all member institutions must adopt. While the value of these policies is clear, their timing and prioritization do not always align with SFA's immediate operational needs.

To navigate this effectively, a more comprehensive and strategic approach is needed—one that aligns SFA's IT priorities with UT System requirements in a phased and thoughtful manner. This would allow SFA to continue advancing its highest-priority initiatives while progressively building toward full compliance and integration with system-wide standards.

PHYSICAL INFRASTRUCTURE

OUTSIDE PLANT

Almost all newly installed outside communications media is fiber optic these days. There are, however, some legacy needs for copper circuits. At this point, ITS typically installs minimal copper cable pairs to provide for the legacy needs in or surrounding new buildings. For existing buildings with many more copper pairs already installed, we recommend keeping copper cabling in place. This cable represents a significant investment by the institution, and the cost of removing the cable is significant. As new construction disrupts or congestion inhibits the use of existing pathways, removing cable is warranted. Otherwise, the expense of cable removal is difficult to justify.

The goal of the outside plant is to provide two independent pathways to each building. This minimizes the likelihood of service interruptions to these buildings. For smaller, outlying buildings, this will be impractical.

In general, all branching of cabling should happen outside buildings. The buildings themselves should not be used as part of the outside pathway system. Should a building become unavailable, due to planned renovation or a catastrophic incident, only that building is impacted.

As changes take place on campus, capitalize on all opportunities when the ground is opened, to expand the outside plant pathway system. The more pathways available, the more resilient the network.

INTRA-CAMPUS

Installation of new outside plant cabling is often done by ITS. They place cabling in duct banks, fusion splice the glass and test the cabling for damage and proper connections.

Most of the network topology follows the preferred fiber ring topology. This offers much greater flexibility for the network infrastructure and affords an easy means of providing path diversity. Having path diversity allows segments of the ring to be “opened” without disrupting service. As this Master Plan envisions numerous changes to the campus, having this flexibility is crucial. As the campus expands, continued emphasis on ring topology is important. This opportunity should also be leveraged to complete rings and “unfold” rings, which, while logically diverse, physically share common pathways.

Installation of air-blown fiber (ABF) should be considered for future installations. This technique has the potential for faster installation and replacement of optical fibers.

INSIDE PLANT

SFA has recently been deploying Cat 6 cabling for all new installations. We recommend considering installation of Cat 6A, especially in new buildings. Furthermore, installation of shielded cabling, F/UTP, should also be considered.

TELECOM SPACES

Telecom spaces should provide properly sized and environmentally controlled space with limited access. New construction on campus has embraced these requirements, but many legacy spaces do not. Legacy spaces are often shared with mechanical equipment or housekeeping materials and often lack environmental controls appropriate for technology.

A plan for systematically upgrading telecom spaces should be developed. All telecom spaces should be documented to identify those inconsistent with industry standards.

TELECOM PATHWAYS

Pathways are often an overlooked aspect of the structured cabling system. At least 50% of the cost of installing new data outlets is the cost of placing the cable. When appropriately sized, easily accessible pathways are available,

the cost of placing that cabling is dramatically decreased. Since structured cabling systems are much more dynamic than other utilities, upfront investments that decrease future operating costs yield net savings for the institution. As mentioned earlier, SFA IT staff is undersized relative to the demands placed on it. Decreasing the time required to install new cabling provides both cost savings and improved utilization of available staff.

CABLING

The useful life of data cabling is typically considered 10 – 15 years. The cost of replacing data cabling is dominated by labor costs. To maximize investment, the institution should strive to maximize the time between cable replacement and minimize the labor required to do so. Providing adequate, easily accessible cabling pathways is the best investment for decreasing labor costs. Installing a higher category of cabling implies a longer useful life for the cabling. Over the last 20 years, a shielded version of a category of cabling has yielded performance equivalent to the performance of the next higher category of unshielded cabling. Shielded cabling represents approximately 10% premium (fully loaded cost) over the unshielded version. Considering that shielded cable performs like the next generation of cabling, this can defer re-cabling by several years. The cost of cabling has remained relatively stable over the past 20 years. Extending useful life by 50% for a 10% premium makes good fiscal policy.

Additionally, metal-shielded cabling offers better heat dissipation than unshielded, UTP, cabling. As more power is supplied over

ethernet cabling, this advantage becomes significant.

CONNECTIVITY

End-user connectivity is increasingly shifting toward wireless technologies. Wi-Fi has become the primary gateway to the internet, cellular networks keep us connected socially, and Bluetooth links our earbuds, printers and even unlocks our doors. Additional technologies support functions like wayfinding and cashless payments, further enhancing the wireless experience.

WIRELESS

It is increasingly rare for students to carry Ethernet cables, making ubiquitous Wi-Fi coverage essential throughout campus buildings. In addition to broad area coverage, high-density coverage must also be prioritized, particularly in classrooms, meeting spaces and student housing where device usage is most concentrated.

The recent deployment of “hotel-style” access points has proven highly effective. This approach, which is gaining traction in student housing, places SFA ahead of the curve. These access points not only deliver excellent wireless coverage but also provide wired Ethernet ports for added flexibility. With dense deployment, the network can automatically compensate for individual access point failures by allowing devices to seamlessly roam to nearby units.

To support this performance, it is recommended to provision two 10 Gbps connections per access point. As wireless

radio technologies continue to advance and more devices rely on Wi-Fi, this bandwidth is necessary to ensure each access point can operate at full capacity.

CELLULAR

Cellular coverage is very important to the current generation of college students. Although a cellular site is located on campus, coverage within buildings is often poor.

Improving poor cellular coverage within buildings is often a complex and time-consuming process. Enhancing signal strength typically requires coordination with the cellular carrier, which holds the radio spectrum license, making the effort lengthy and often tedious. To help address this challenge, the FCC has authorized the use of cellular spectrum over Wi-Fi, which is expected to significantly improve indoor connectivity. Given this development, traditional, in-building cellular solutions should be approached with caution.

Athletic venues, however, present a unique case. The high concentration of devices in a confined area during events can easily overwhelm the macro cellular network. In these environments, collaboration with cellular carriers is essential to ensure reliable coverage. This not only supports the operational needs of SFA Athletics but also helps meet the expectations of attendees and enhances the overall fan experience.

PRIVATE LTE

For a campus the size of SFA, the installation of a private LTE network should be explored. This offers some interesting opportunities for the institution. The opportunity is two-fold. Private LTE offers a mechanism to extend and expand the carrier macro network. This supports events that bring large numbers of visitors to campus, such as sporting events or commencement. The macro network is not designed to accommodate such large changes in system demand. Similarly, providing access deep into campus buildings or cellars is also difficult to support from the macro network. Extending service into these areas helps not only students, but also employees and contractors who work in these spaces.

Private LTE also offers economical technology for extending network services. Registered devices can be connected to campus IT resources in the same way that devices connect to Wi-Fi. This can be leveraged for providing emergency alerts, supporting mobile data, providing connectivity for blue light phones and surveillance cameras in parking lots, and mobile data for the campus police. Since this technology is collected and managed by the campus, emergency communications can be prioritized and managed.

Historically, these systems were challenging to set up and manage, and negotiations with carriers were difficult to impossible. With the introduction of CBRS spectrum, carrier negotiations are streamlined. Connecting to the carrier network is handled via third-party

aggregators. Much of the newer technology is easier to set up and deploy, with many vendors such as Ericsson and Celona referring to the transceivers as “access points” rather than nodes.

EMERGING TECHNOLOGY

NFC (Near Field Communication) technology is rapidly gaining traction. It is most seen at point-of-sale (POS) terminals, where users make payments using their smartphones. Beyond payments, NFC is also becoming increasingly popular for secure building and room access, offering a convenient alternative to traditional keys.

DATA CENTER

The main data center in the Human Services building is well-managed and has ample available space. Currently, additional expansion within this facility is not anticipated. It has also been used to store spare IT equipment and material, likely due to space limitations elsewhere. Establishing dedicated storage and staging space on campus, or near campus, would improve operations. We estimate at least 15,000 SF is required for this function.

In contrast, the data center in the Boynton Building is older and in need of modernization. As the Master Plan envisions this area becoming part of the arts hub, relocating the data center to another part of campus is advisable.

Relocating the Boynton data center to the Facilities Services & Operations + Academic Building is the preferred location. Including the data center in this new building will make provisioning much easier. Although this location does little to mitigate the tornado threat, the building is expected to include an emergency generator, so this does mitigate the risk of a power loss to campus. As this location will be a principal command center for the campus, having data services collocated is extremely beneficial.

NETWORK

NETWORK ELECTRONICS

Network switching, routing and firewall management appear to be well-executed. The current topology reflects a strong emphasis on redundancy and resilience, and patching is performed in a timely manner. To maintain this level of performance and security, it is essential to ensure continued funding for timely hardware replacement that meets evolving throughput and cybersecurity requirements

WORKSTATIONS

As noted elsewhere, technology refresh cycles require more consistent and adequate funding. Some users have expressed concerns that upgraded machines do not always align with their specific needs. ITS leadership is aware of this issue and has adjusted their criteria to better match equipment with user requirements.

SERVERS

The principal server infrastructure at SFA is well-supported, with current hardware that is regularly patched and maintained. The ITS team demonstrates strong expertise in both Linux and Microsoft environments, enabling efficient deployment of virtualization and emerging microservices architectures.

However, there is evidence that some emerging computational needs are not being adequately supported. In certain cases, retired production servers are being repurposed to meet these demands—an approach that may not be sustainable. To address this, the computing environment should incorporate greater elasticity to support innovation and evolving workloads. While long-term funding will be necessary to accommodate major shifts in computing capacity, establishing flexible resources for exploratory initiatives and proof-of-concept projects would be highly beneficial.

VOICE COMMUNICATIONS

SFA currently maintains an NEC hybrid PBX system. All voice trunks and most stations rely on VoIP. The system is also able to provide analog communication services. This is an asset since commercial carriers, such as ATT and Verizon, are retiring their analog service offerings. The primary challenge of this change lies in supporting legacy analog systems, such as elevator phones, fire alarm monitoring and emergency (blue light) phones.

The long-term solution is clear: replace these legacy devices with modern communication technologies. While maintaining support for existing services is practical in the near term, the industry's trajectory toward IP-based and cellular solutions demands proactive planning.

For non-critical services, analog gateways and ATAs offer viable interim options. For mission-critical systems, IP communications—alone or in combination with cellular redundancy—provide the reliability and resilience required.

Most importantly, POTS replacement must be approached holistically. NV5 has observed projects where multiple cellular POTS replacement devices were installed within a single building, creating unnecessary expense and management complexity. A unified, campus-wide strategy will optimize costs, simplify administration and ensure long-term scalability. By adopting this forward-thinking approach, SFA positions itself to lead in modern communications infrastructure while safeguarding operational continuity and emergency responsiveness.

INTERNET OF THINGS (IOT)

The rise of the IoT presents significant challenges to campus network environments. While this shift has been anticipated for years, its real-world impact is only now becoming fully apparent.

Major concerns of the change are the management and security risk posed by these devices. Their affordability makes them attractive but also leads to their treatment as disposable commodities—often with minimal attention to patching or upgrades.

Increasingly, service providers and equipment vendors rely on remote access for monitoring, troubleshooting and updating systems on campus. This introduces complex security considerations that require dedicated time and resources to manage effectively.

Several strategies for addressing these challenges are available. Implementing these strategies requires up-to-date systems and staff resources to manage the plethora of devices. Until those criteria are met, the best course of action is to implement strict authentication and patching requirements. This is likely to slow the rate of adoption of these devices and ensure the security of the network.

PHYSICAL STORAGE

ITS staff repeatedly brought up the need for storage and staging of new equipment as well as the accumulation of retired equipment. The central warehousing facility is not conducive to this need as it offers neither long-term storage, nor does it offer the inventory security required for these costly assets.

Storage requirements are both short-term and long-term. Short-term space is needed to receive technology shipments supporting

technology refresh cycles. Often, several hundred devices arrive at once. The devices need to be stored, configured and then deployed. The retired devices likewise need to be collected, wiped and stored for proper disposal. Long-term storage includes tools and materials for building network cabling systems. Cable boxes, reels of cables and ducts, cabling vehicles and trailers, tuggers, splicing equipment and other items. Since ITS does much of the cabling installation on campus, these assets are necessary and need secure, accessible places for storage.

DISASTER RECOVERY/ BUSINESS CONTINUITY VS. AVAILABILITY

Relocating the Boynton data center to one of the planned new buildings, such as the proposed Facilities Services & Operations + Academic Building would improve the resilience of SFA's core IT infrastructure. Approximately 750 SF of space is required for this data center. The data center should have a separate entrance, so it is accessible by ITS 24/7, and to control access to the space. This building is expected to be provisioned with an emergency generator.

To ensure long-term institutional viability, leveraging the UT System's disaster recovery (DR) site is a prudent strategy. This approach would provide geographic redundancy and greater protection against regional disruptions. Implementing this solution will require increased funding—for initial setup, ongoing operational costs and future hardware refresh cycles. While not an immediate need, this is a critical long-term investment that should be incorporated into strategic planning and budget forecasts.

AUDIOVISUAL

DIGITAL SIGNAGE

Like many higher education institutions, SFA's digital signage infrastructure has grown organically, resulting in a fragmented and inefficient system. Individual monitors rely on small system-on-a-chip devices—such as Raspberry Pi—loaded with content via USB drives. For security reasons, these devices remain disconnected from the campus network, forcing staff to physically visit each sign for updates. This approach not only consumes valuable time and resources but also limits the institution's ability to deliver timely, consistent messaging.

Recognizing these limitations, SFA has taken decisive action by investing in Rise Vision, a robust, centralized digital signage solution. This strategic move establishes a unified hardware and software platform, streamlines support, and accelerates content refresh cycles. Beyond operational efficiency, the platform introduces copyright management safeguards and ensures cohesive, brand-aligned messaging across campus. Most importantly, it creates a powerful communication channel for urgent alerts and visitor engagement—positioning SFA as a forward-thinking institution committed to leveraging technology for enhanced campus experience and safety.

CLASSROOM TECHNOLOGY

The audiovisual (AV) systems are currently adequate for supporting academic and operational needs. The university maintains an on-site inventory of spare parts and replacements, which helps ensure timely maintenance and system continuity. Newer buildings are being outfitted with modern AV technologies, aligning with current industry standards. However, to fully leverage these systems, staff training remains a critical area for improvement, as many users are not yet equipped to utilize the technology to its full potential. A limitation is the lack of access to the source code for AV control systems, which prevents the University's AV team from making necessary ad hoc adjustments. To address this, future AV contracts should include a requirement for contractors to provide complete source code and system documentation to the university upon project completion, ensuring long-term flexibility, autonomy and effective system management.

Since the onset of COVID-19, the number of Zoom-enabled spaces has grown significantly from just four rooms to 86, creating a new demand for additional microphones to support hybrid learning and remote collaboration. Meeting this requirement will require

dedicated funding to ensure these spaces are properly equipped and continue to function effectively. Addressing this need is essential to maintaining the quality and accessibility of AV services across campus.

REFRESH CYCLES

To keep pace with evolving technology and maintain consistent performance across campus, SFA should follow a structured AV refresh cycle every five to seven years. This timeline allows the University to stay current without overextending resources.

The process should begin with a detailed review of existing AV systems to identify outdated equipment and areas where performance is falling short. Spaces with high usage or mission-critical functions should be prioritized for upgrades.

Procurement should focus on systems that are compatible with existing infrastructure and flexible enough to support future needs. New buildings should continue to be outfitted with modern AV solutions that align with current SFA standards and expectations.

After implementation, a review phase should be conducted to evaluate system performance and ensure that spare parts and replacements are stocked appropriately in the on-site inventory. This helps reduce downtime and supports ongoing maintenance.

STAFFING

The University is experiencing growing demand for audiovisual support as AV systems become more integrated into classrooms, meeting spaces and campus-wide events. To effectively support this expansion, additional staffing is needed to manage day-to-day operations, provide timely technical assistance and maintain system reliability. This need extends beyond regular business hours, as many University events and activities take place in the evenings and on weekends. Expanding the AV team to include after-hours coverage will help ensure consistent support, reduce response times and enhance the overall user experience across campus.

AUXILIARY SYSTEMS

FIRE ALARM SYSTEMS

Fire alarm systems fall into the category of critical infrastructure that we hope never to use, making them easy to overlook until a failure occurs. This appears to be the case with many of the campus systems, which are now beyond end-of-support, cannot be upgraded, and are increasingly difficult to maintain. Some rely on outdated multimode fiber optics that ITS is actively working to retire. With the extensive campus changes envisioned in this plan, maintaining reliable physical connections for these systems presents an ongoing challenge.

Upgrading these legacy fire alarm systems will not only enhance building safety but also reduce the time and resources spent by ITS and Facilities staff on maintenance and troubleshooting. Additionally, many institutions are now leveraging fire alarm systems for urgent campus-wide announcements. We strongly support this trend, as it increases the utility of these systems and keeps them more visible and actively maintained.

BUILDING AUTOMATION SYSTEMS (BAS)

BAS has been widely used on university campuses, but it has functioned in a space separate from other information systems. The cabling, cabling pathways and signaling protocols have all been unique to that system. This is beginning to change. Increasingly, BAS is integrated with lighting, AV, fire alarm and other systems. Also, there is interest in mining these systems for insights into building usage, energy efficiency and other things correlating with other data.

We anticipate that BAS systems will increasingly migrate to Ethernet protocols using single pair Ethernet (SPE) and wireless media. SPE should use the same pathways and spaces as the general use network. Planning for this migration will have some impact on space planning and should be considered when planning new spaces.

FACILITIES OPERATIONS

SECURITY DOOR HARDWARE

Replacing batteries in wireless locksets has been an ongoing challenge. Many other schools have experienced similar challenges. Residence Life is adamant about not managing keys for the students, so migrating to a wired lock system for student rooms is recommended.

WORK ORDER MANAGEMENT SYSTEM

Upgrades to the work order management system would service Facilities well. The system is challenging to use and extract reports. Better data exchange with this and other systems would also be helpful.

SECURITY SYSTEMS

GENERAL

Electronic security systems have experienced the same challenges as other technologies on campus. Initial installation has been fine, but technology refresh has been largely neglected.

Current systems offer better feature sets, improved functionality, better integration and improved reporting. As the systems have migrated to IP communications, they have been much more open and interoperable.

VIDEO SURVEILLANCE

Modern surveillance cameras are smaller, with higher resolution and better low-light sensitivity. Advanced analytics in the cameras offer tagging of images to make it easier to locate individuals or incidents in the archive. With higher resolution, cameras offer digital pan/tilt/zoom capabilities. This gives security the control and real-time situational awareness they want while continuing to record the entire scene without gaps. Virtual perimeters, motion sensors, and the like make the surveillance system more valuable for **detecting** incidents in progress rather than merely providing a record of the past. This changes the workload of the observer from trying to find potential issues to drawing their attention to areas that meet some threshold of interest.

Interest was expressed for establishing a campus perimeter, or at least, constraining vehicular access to campus to as few points

as possible. Much of this will be accomplished with landscaping and managing roadways. This will be supplemented by surveillance systems. Some interest was also expressed for license plate recognition technology. Placing these systems at the campus perimeter could allow campus police to be alerted when vehicles of interest enter campus.

ACCESS CONTROL

Access control has not been a funding priority on campus. However, with the changing environment on campuses, this perception is changing. Certainly, all residential buildings need to have access control at the entrances. Academic buildings increasingly need access control for “after-hours” access, especially programs in which students work on projects at all hours. The library has been experimenting with never-late hours so that students can study whenever they wish. Adding access controls and duress buttons is crucial to maintaining student safety during these times.

ALERT AND EMERGENCY COMMUNICATIONS

Mass notification is increasingly a necessity on campuses. There are many systems available to aid with this. Some systems and components are installed in the places

where the campus community is, while others leverage computers and mobile devices. More recently, these systems also incorporate alerting and duress buttons with the application. Some of these systems also offer features such as a virtual escort, which will verify that the individual reached their destination safely.

Ideally, these systems should tie-in to other systems on campus to allow a single alert to be communicated across all campus systems, such as digital signage and fire alarm paging systems.

SFA currently uses the Rave Guardian system to push alerts to constituents. Continued use and expansion of this system is encouraged.

CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN

As the Master Plan is executed, it is important to keep in mind the principles of Crime Prevention Through Environmental Design (CPTED, pronounced “cep ted”). Fundamentally, people who are intended to be in a space should have a sense of ownership and control, and those who are not should feel exposed and vulnerable.

TRAINING

Despite the best efforts of the security staff, the security of the University systems ultimately comes down to the users of those systems. Training of the users is a critical element of system security. For those of us who have sat through security training, getting users to listen, understand and modify their behavior is not a trivial task. Providing effective training requires creativity, thoughtfulness, careful observation and considerable perseverance. This is not a task that can be done as an afterthought. It must be deliberate.

It is important to develop a culture of good security practices at the institution. This needs to be built upon positive reinforcement rather than creating a punitive environment, as is most common. A number of anti-phishing campaigns have shown promise in this area. Expanding these lessons to all aspects of security is necessary.

REPLACEMENT AND SPARES

For retrofit situations, an electric strike or cylindrical lockset make sense. For new construction, we recommend including door frame pathway system, such as [FrameFrog.us](https://www.framefrog.us/), to prepare for future additions and changes.

CYBER SECURITY

The campus experienced a cyber security incident in 2023. Through the tremendous efforts of the ITS staff, the campus was able to return to normal operations in just a few weeks

with little loss of information. This should be contrasted with the months of curtailed operations and significant loss and damages experienced by major corporations.

This incident must serve as a warning to the institution. As a knowledge-based organization, access to and sharing of information is critical to the mission. Isolating the campus is not an option, so threats cannot be avoided. The institution must rely upon vigilance, strong operational policies and good training of all users.

STAFFING

Maintaining vigilance requires additional, dedicated staff to monitor, assess, learn and teach security protocols. The threat is constantly evolving and maintaining a strong defense requires staff dedicated to this function.

ATHLETICS & RECREATION

SUMMARY

The University's ESPN studio and athletic venue infrastructure are significantly outdated, limiting broadcast quality, operational efficiency and the fan experience. Key issues include aging control systems, poor venue communications, inadequate lighting and connectivity, outdated scoreboards and sound systems, outdated medical technology and IT infrastructure. These limitations hinder modern sports broadcasting, student-athlete support and game-day operations.

BROADCAST & COMMUNICATIONS INFRASTRUCTURE

BROADCAST STUDIO & CONTROL SYSTEMS

SFA currently operates a broadcast studio, located in the Coliseum and built to ESPN's requirements, which has been in use for approximately 13 years. While it continues to support basic broadcast functions, the studio is dated and requires an upgrade to align with current production standards. The control systems and equipment show signs of wear and technological lag, which limit flexibility and scalability for modern sports broadcasting.

Connectivity from each of the sports venues to the studio is needed. Relocating the studio from the Coliseum to a more centrally located facility should be considered.

Additionally, each venue requires a local control room to support an upgraded in-venue experience. The ability to produce features such as pre-game, halftime, and post-game segments was mentioned specifically.

VENUE COMMUNICATIONS

Talkback Systems: Limited or no announcer connectivity.

SIDELINE COMMUNICATIONS

Wireless headsets are available, but only on home sidelines. Visitor sideline support is absent.

BROADCAST TRUCK ACCESS

This is currently available at the Coliseum. Access is also required at each of the athletic venues.

IN-VENUE VIDEO

Separate control systems exist for in-venue and broadcast operations, requiring both technical separation and dedicated staffing.

VENUE TECHNOLOGY & INFRASTRUCTURE

STADIUM & PRESS BOX

Both the Stadium and Press Box are due for replacement. Environmental conditions and outdated infrastructure limit functionality and expansion.

SCOREBOARDS & SOUND SYSTEMS

Scoreboards: Many are outdated, including the one in Shelton Gym (late 1950s). The Coliseum scoreboard is heavy (3,500–12,000 lbs.) and lacks rigging support for speakers, limiting concert capabilities.

SOUND SYSTEMS

Poor audio quality across venues. Cameras on the field lack infrared lighting, impacting night broadcasts.

LIGHTING & CONNECTIVITY

Poor lighting in the Coliseum affects broadcast quality.

CONNECTIVITY

Fiber is available in some areas, but copper extensions are still used (e.g., across the bridge to the commuter lot). Wi-Fi is available in at some seating in the Coliseum, but needs to be expanded to more seats and at all venues. Wi-Fi also needs upgrades to

support mobile ticketing and fan engagement. Providing private LTE at the venues could address many of these challenges, possibly at a better price point than Wi-Fi.

TICKETING & FAN EXPERIENCE

To support mobile ticketing, reliable Wi-Fi is needed for both ticket downloads and scanning. NFC-enabled ticketing pedestals would also be beneficial, helping to streamline entry and reduce staffing requirements.

GAME-DAY ENHANCEMENTS

To enhance the game day experience, several upgrades should be considered across all venues, including digital signage and screens at concession areas, updated seating and integrated tech in end zones. Providing studio environments or mobile “studios” to support pre-game, halftime and post-game coverage would enhance the experience in-venue as well as for broadcast viewers.

ACCESS SYSTEMS

Currently, biometric locks are used at some locker rooms to control access. Expanding access control throughout the facility, potentially using wristbands should be explored.

Additionally, the implementation of electronically controlled doors for restrooms in the spectator areas should be considered.

SURVEILLANCE

Security cameras are currently installed throughout the athletic facilities; however, the existing coverage is insufficient in certain

areas. Enhancing camera placement to eliminate blind spots and improve overall visibility should be considered.

SHELTON GYM & TRAINING FACILITIES

Shelton Gym is due for upgrades, including the removal of certain walls to open the space and make it more functional for performance training purposes. These changes would help improve the layout and better support the needs of athletes and staff.

Currently, communication between Shelton Gym and the main athletic training room is limited, which can make coordination difficult. It would be worth looking into solutions like intercoms, wireless communication systems or other tools to improve connectivity between the two areas.

MEDICAL EQUIPMENT

The X-ray machine is still operating on outdated Windows XP systems and relies on manual “sneaker-net” file transfers. Due to security concerns, the system cannot be connected to the campus network, making information transfer slow and inefficient. Upgrading these systems to modern platforms with secure, network-based data transfer should be prioritized.

Mobile X-ray and fluoroscopy units are currently in use and provide valuable flexibility; however, their integration with centralized systems could be improved to streamline workflows and data access.

Diagnostic ultrasound devices also require enhancements, particularly in image transfer

capabilities and appointment scheduling. Implementing a more robust digital infrastructure would help ensure timely access to imaging data and improve coordination of patient care.

AUXILIARY SERVICES & IT SYSTEMS

Typically, Auxiliary Services are responsible for the initial purchase of equipment, while SFA (Student Financial Affairs or relevant department) manages replacements and life cycle upgrades. This arrangement applies to a range of technology assets, including:

- Computers
- Sound systems
- Cameras
- CATV and server infrastructure

CATV service has been discontinued on campus which leaves an entertainment gap at the Student Recreational Center. Establishing an alternative content delivery solution is of interest to the students.

Additionally, servers are still running on Windows 7, which presents significant security vulnerabilities and compatibility issues. Upgrading these systems to support operating platforms is critical to maintaining a secure and efficient IT environment.

COMMUNITY AND ORGANIZATIONAL DEVELOPMENT

USER SUPPORT

Users generally maintain a positive relationship with ITS. Support services are readily accessible and offer multiple avenues for engagement. Any shortcomings in this area are more reflective of limited staffing resources than of capability or willingness to assist.

UNIVERSITY POLICE

As previously noted, the surveillance system presents ongoing challenges. Enhancing control at campus entry points and deploying license plate readers would help address these issues.

To respond to evolving threats and improve situational awareness, mobile technology must be expanded. Patrol vehicles are increasingly serving as technology hubs and communication relays. The department plans to implement FirstNet cellular services for data transmission and expand the use of body cameras. Considerations around powering, connectivity and data upload infrastructure are essential.

Growth in roles and staffing has outpaced the capacity of the current facility. A new location for the University Police is identified in the Campus Master Plan. Within the new space, the dispatch center requires modernization and expansion, with flexibility in design to accommodate future technological changes.

Interrogation rooms also need upgraded digital recording systems.

RESIDENCE LIFE

The recent wireless upgrade in residence halls has been highly successful. Each student room now features a hotel-style wireless access point, providing robust Wi-Fi coverage and wired Ethernet access. This has significantly reduced wireless-related support requests. Some additional training for students and staff on optimal connectivity was identified. Planning for the renewal of this \$3 million investment should begin now.

As the University expands its Purple Promise initiative to support underprivileged students, additional public computing spaces will be necessary. Each residence hall should include accessible machines to complement larger computer labs in residences and the library.

LIBRARY SERVICES

Like many academic libraries, the focus has shifted from printed materials to digital resources. Staying ahead of this transition requires proactive planning.

The library has extended its operating hours in recent years and aims to offer 24-hour access in select areas. Achieving this will require architectural modifications and updates to security systems.

FACULTY

Faculty feedback highlighted the need for improved onboarding processes and better organization of resources to help new faculty navigate available support.

As is common in higher education, IT support staff are often assigned to individual schools but may not report directly to the CIO. At SFA, several of these positions remain vacant. While school-specific IT support is beneficial, operating outside the CIO's purview undermines efforts to manage and protect the University's intellectual property. Centralized oversight is essential.

From the schools' perspective, maintaining adequate staffing is critical to supporting academic programs. Onboarding challenges are symptomatic of broader staffing deficiencies.

STUDENTS

Student feedback indicates a generally positive view of IT services, with enthusiasm for the WePA printing service and interest in its expansion. Students also expressed a desire for more public computing locations.

Cellular signal strength remains a concern, especially in outdoor areas where Wi-Fi is less effective and large gatherings occur.

A significant communication gap exists between students and faculty/staff. Staff are frustrated by low student response rates, while students feel that information is not delivered in formats they prefer. A task force should be established to address this disconnect. Leveraging social media could enhance communication and provide valuable feedback channels.

Students also noted the closure of the local public movie theater. While a movie space exists in the student union, it requires a technology refresh. Hosting movie nights for the community could strengthen town-gown relations.

UNIVERSITY STAFF

Staff discussions revealed diverse perspectives, with student communication emerging as a key theme. A campus-wide digital signage system was proposed. Consolidating the various systems currently in use into a unified platform with layered publishing roles is recommended. However, content creation and management must be carefully planned before investing in infrastructure. Considerations around technology refresh cycles, staffing and potential advertising revenue should be addressed.

Staff also shared numerous ideas for new technologies, though IT teams are already stretched supporting existing systems. Ad hoc

reporting from the ERP system was discussed, and while solutions have been acquired, implementation has been delayed due to resource constraints.

Some staff have advocated for migrating to the ERP system used by most of the UT system. While this may offer incremental benefits, such migrations are costly, often tens of millions of dollars, and take years to complete. A more effective strategy is to invest in optimizing the current system and improving user training.

IT STAFF

TEAM DYNAMICS

The IT team demonstrates a strong sense of collaboration and mutual support. Their request to be co-located reflects a commitment to improving internal communication. This cohesion is largely driven by staff members transitioning across sub-disciplines in pursuit of growth and new challenges, which fosters a deep understanding of the unique demands within each area.

This cross-functional awareness enhances the team's adaptability and strengthens the institution's overall resilience. Through cross-training, staff are better equipped to respond to unexpected needs and to fill gaps caused by personnel changes.

RIGHT SIZING

To effectively meet the evolving needs of the institution, staffing levels must be aligned with demand. As certain disciplines expand, corresponding increases in support staff are necessary. Establishing metrics to evaluate workload and staffing adequacy is critical. Additionally, the impact of new technologies and services on workload must be acknowledged and factored into staffing decisions.

PATH FOR GROWTH

Many IT staff members feel limited in their opportunities for advancement. Due to the team's close-knit nature, turnover is low, resulting in long tenures in the same roles. Over time, employees develop skills that surpass the scope of their original positions, yet their compensation often fails to reflect this growth. This disconnect can be discouraging and may reduce motivation to continue learning.

As their expertise grows, so does their marketability, prompting some to explore opportunities outside the institution. It is well understood that compensation in the private sector often exceeds that in higher education. A common principle in IT management within academia is: "Don't give your staff a reason to look elsewhere." Once staff become aware of the financial advantages in the industry, retaining them becomes increasingly difficult.

SUCCESSION PLANNING

Many IT group leaders are approaching or have surpassed retirement age, making succession planning a priority. A smooth transition requires proactive strategies, including maintaining adequate staffing levels and securing funding to fairly compensate those assuming new responsibilities.

Reducing the learning curve between roles not only stabilizes operations but also creates more opportunities for internal advancement.

COMPENSATION

Compensation has long been a challenge for IT roles in higher education. Historically, the sector offers lower salaries, and many positions are unique to academia. However, IT skills are highly transferable and in demand across industries. Unlike for-profit organizations, higher-ed institutions often lack the ROI-driven justification for competitive salaries, especially when compared to other internal roles.

While some progress has been made, compensation remains a persistent issue. Non-monetary benefits such as tuition reimbursement, retirement plans and healthcare have traditionally helped retain staff, though these advantages are gradually diminishing.

What continues to attract and retain IT professionals in higher education is the work environment. The variety of tasks, autonomy in execution and more manageable deadlines contribute to a less pressured and more fulfilling workplace experience.

FINANCIAL PLANNING

FUNDING MODELS

The challenges surrounding refresh cycles and staffing are closely tied to the institution's IT funding models. Frequently, capital IT purchases are embedded within broader capital projects, which may be more expedient but ultimately obscure the true cost of maintaining IT infrastructure. This approach complicates long-term planning and makes it difficult to sustain the functionality of critical systems.

Staffing alignment is another concern. When IT infrastructure expands—often in unpredictable bursts—staffing levels rarely adjust accordingly. A prime example is the rapid growth of technology-enabled classrooms during the COVID-19 pandemic, which increased from fewer than 20 to over 80 rooms to support remote instruction. This expansion was unplanned, and staffing levels have remained unchanged since, despite the significant increase in technology to manage. Moreover, no funding model has been established to refresh this equipment. As it is nearing end-of-life, support demands rise, and the user experience for faculty and staff deteriorates. Without a consistent and well-funded refresh cycle, the institution experiences boom-and-bust cycles in technology, leading to

frustration, diminished trust in ITS, and the proliferation of ad hoc solutions that may not align with institutional goals.

To address these issues, we recommend a comprehensive assessment of the true cost of campus technology investments and the establishment of realistic funding for ongoing refresh cycles. Future investments should include refresh funding as part of the initial budget. While this may slow the pace of technology adoption in the short term, it will encourage more thoughtful evaluation of new tools and a clearer articulation of their long-term value to the institution. Too often, technology is adopted for its novelty or to match peer institutions, rather than for its ability to enhance productivity. In knowledge-based environments, measuring productivity gains is inherently difficult—time saved on one task is often reallocated to others that previously lacked attention.

Economic uncertainty further complicates efforts to increase staffing or compensation. Non-salary funds are generally easier to reallocate, but knowledge-based industries have limited discretionary budgets, making reductions particularly challenging. A common response is to outsource roles with more interchangeable skill sets. While this strategy

is widespread in higher education, it must be approached with caution to avoid losing critical institutional knowledge. SFA's rural location adds complexity, as local technology support options are limited, and few providers can match the scale and sophistication required. As a result, staff augmentation at SFA presents unique challenges.

APPENDICES

Figure 1. High Level Technology Opinion of Cost

Project	Levels	Size (GSF)	IT	Security	AV LOW	AV HIGH	NOTES:
Academic							
Science Building	3	160,000	\$1,920,000	\$1,024,000	\$1,250,000	\$2,000,000	AV Cost dependent on final number of classrooms, labs, etc.
Boynton Music Expansion	2	28,500	\$342,000	\$183,000	\$2,000,000	\$3,500,000	Academic spaces (music, media, radio/TV stations) - Addition Only
Art Building	3	113,500	\$1,362,000	\$726,000	\$1,200,000	\$2,000,000	AV Cost dependent on final number of classrooms, labs, etc.
Facilities Services & Operations/Academic Building	2	105,000	\$1,560,000	\$672,000	\$120,000	\$250,000	AV Low Assumes Conference Rooms + Digital Signage; AV High Assumes Training Center + Meeting Spaces; Assumes \$300,000 for new data center.
Athletics/Recreation							
Tennis Venue					\$250,000	\$500,000	(12) lighted courts, PA, scoreboards; AV dependent on level of Audio and scoring systems
South Operations Building	3	87,360	\$700,000	\$315,000	\$500,000	\$700,000	
Baseball Venue		35,457	\$310,000	\$165,000	\$350,000	\$500,000	2285 seats; AV dependent on level of Audio and scoring systems
Softball Venue		28,868	\$245,000	\$130,000	\$250,000	\$500,000	1,552 seats; AV dependent on level of Audio and scoring systems
Recreation Support – Field Services Building		4,000	\$48,000	\$26,000	\$100,000	\$300,000	
Loop Trail and Challenge Course							Asphalt Trail Area: 37,550 SF; Ropes Course: 15,000 SF; Bonfire area
Recreation Fields							Synth turf and grass fields.
Fieldhouse Building	4	190,081	\$1,372,000	\$610,000	\$1,000,000	\$5,000,000	AV High includes sports broadcast suite for Outdoor Fields.
Football Stadium		122,667			\$1,500,000	\$5,000,000	10,438 Seat - AV Low includes Basic Scoring and Sound System, High End includes Multiple LED, Game Day Broadcast Suite, Etc.
Soccer Stadium		25,700	\$130,000	\$70,000	\$350,000	\$650,000	1,417 seat bowl; AV dependent on level of Audio and scoring systems

Figure 1 (cont.) High Level Technology Opinion of Cost

Project	Levels	Size (GSF)	IT	Security	AV LOW	AV HIGH	NOTES:
Indoor Practice	1	95,260	\$564,000	\$300,000	\$75,000	\$125,000	90' tall for punting; AV dependent on level of Audio and scoring systems
Track & Field + Practice		22,926	\$140,000	\$74,000	\$75,000	\$125,000	938 seats; AV dependent on level of Audio and scoring systems
Student Experience							
Auditorium/Welcome Center	2	32,500	\$390,000	\$208,000	\$1,500,000	\$2,500,000	AV Cost dependent on final number of meeting spaces, classrooms in addition to Auditorium
Student Housing A	5	191,250	\$1,380,000	\$710,000	\$100,000	\$150,000	530 beds
Student Housing B	5	281,750	\$1,970,000	\$1,015,000	\$100,000	\$150,000	780 beds
Student Housing C	10*	280,030	\$1,950,000	\$1,004,000	\$100,000	\$150,000	775 beds, *includes two buildings with 5 stories each
Student Housing D	4	115,150	\$806,000	\$415,000	\$100,000	\$150,000	335 beds
University Police Facility	1	10,500	\$126,000				
Garages							
Garage A	5	165,600	\$87,000	\$86,000		N/A	1 cam/ 8kSF, 2 blue lights /floor, 3 WAPS
Garage B	5	203,000	\$87,000	\$93,000		N/A	
Garage C	5	241,500	\$250,000	\$137,000		N/A	Includes 10,500 SF police facility
Outside Plant							
Additional 8500 ft of pathways		\$350,000					This is combination of trenching, microtrenching and directional boring.

Assumptions:

Academic & Athletic Buildings

IT

- 2 data outlets/100 SF
- Some athletic spaces 2 data outlets/200 SF
- 1 MDF per building & 1 IDF/floor
- Network access switches included
- WiFi included throughout buildings
- DAS cost is excluded

Security

- Access Control \$2.50/SF
- Surveillance System: \$1.50/SF
- Intrusion Detection System: \$0.10/SF
- No blue light phones

Residential Buildings

IT

- 1 MDF per building & 2 IDF/floor
- Data for computer lab space
- Hotel-style WAPs in student rooms
- WiFi in common spaces
- DAS cost is excluded

Security

- Keyless entry to student rooms
- Exterior access control
- Exterior Surveillance, minimal inside
- No intrusion detection

Parking Structures

IT

- 3 WAPs per structure
- 2 blue light phones/floor

Security

- Vehicle control system
- 1 cam/8000 SF