



# **Technology and Computer Services (TeCS)**

## **Comprehensive Program Review 2012 - 2017**



**8/15/2018**

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## General Information

### Citrus College Mission Statement

Technology at Citrus College is an integral component of multiple aspects of learning, teaching and student support as well as the foundation and infrastructure for administrative processing. As a result, the Technology and Computer Services (TeCS) department must respond directly to the college's mission and values.

#### *Citrus College Mission*

Citrus College provides innovative educational opportunities and student support services that lead to the successful completion of degrees, transfer, career/technical education and basic skills proficiency. The college fosters personal and professional success through the development of critical thinking, effective communication, creativity, and cultural awareness in a safe, accessible and affordable learning community. In meeting the needs of our demographically diverse student population, we embrace equity and accountability through measurable learning outcomes, ethical data-driven decisions and student achievement.

#### *Mission Objectives*

Citrus College is a safe, friendly, accessible environment where all students and community members may optimize their academic, career, and cultural development.

As Citrus College continues to advance as a dynamic center for life-long learning, we will:

- provide general, lower division coursework leading to an associate degree in the arts or the sciences;
- prepare students to transfer to four-year colleges and universities;
- offer technological services and support for students, faculty, and staff;
- deliver programs to improve basic math, reading, communication, and ESL skills;
- grant opportunities for students to develop a global perspective through a curriculum with international and multicultural applications;
- furnish support services for the intellectual and personal development of all Citrus College students, including opportunities to participate in campus governance;
- foster a comprehensive and enriching program of extracurricular activities;
- conduct community education programs that encourage learning at every stage of life;
- award occupational certificates and degrees for career preparation and advancement;
- administer customized training programs for business and industry;

- increase career development support for students, faculty, and staff through career exploration, counseling, job preparation, job opportunities, and academic and classified staff development;
- collaborate with local high schools in articulation and curriculum development;
- advance cultural and personal enrichment programs for the college and community members, and promote inter-collegiate competition opportunities for students.

### *Vision Statement*

Citrus College will provide excellent educational opportunities that are responsive to the needs of the community and help students meet economic, social, and environmental challenges to become active participants in shaping the world of the future.

### *Values*

1. Student Focus: Meeting community and student needs by creating an educational environment and culture so students can attain a variety of goals.
2. Excellence: Maintain a high standard of integrity and performance leading to the achievement of academic and professional goals.
3. Collaboration: Seeking input from all sectors of the college and the community.
4. Diversity: Fostering a learning community in which the values, goals, and learning styles of all students are recognized and supported.
5. Life-Long Learning: Serving enthusiastic, independent thinkers and learners striving for personal growth.
6. Integrity: Behaving ethically in all interactions at all levels.
7. Technological Advancement: Keeping pace with global technology trends and enhancing traditional instruction with technology to prepare students for success in the work place.

### **Program Mission/Description**

#### *Mission:*

Citrus College technology resources provide an environment that enables the college to, as stated in the college mission statement, “deliver high quality instruction to students both within and beyond traditional geographic boundaries.” To this end, technology supports and enables multiple aspects of learning, teaching, and student support as well providing the foundation and infrastructure for administrative and business processing.

*Description:*

The Technology and Computer Services (TeCS) Department manages the college network and related infrastructure, the central server room, the telephone system and related infrastructure, desktop computers and related peripherals for faculty, staff, classrooms and laboratories, and the administrative applications including the Banner WingSpan system and related connected support applications.

The foundation for technology applications and data processing is the Banner Enterprise Resource Planning (ERP) system known at the college as WingSpan. The initial implementation of WingSpan included the student, financial aid and human resources modules. The TeCS Department integrated many instructional and student support services applications with WingSpan. In support of college business processing, the Fiscal Service and Human Resources departments, working with the TeCS department added the financial module to WingSpan during the spring of 2015.

Citrus College integrates technology planning into the overall planning process as described in the Integrated Planning Manual. The College Information Technology Committee (CITC) develops the Information Technology Master Plan as well as annually reviewing and updating the plan. CITC ensures that the Technology Master Plan is responsive to the Strategic Plan and Education and Facilities Master Plan in addition to considering the new opportunities that technology advancement provides to the college.

**Program Review Team**

Leigh Buchwald - Network, Central Computing and Telecommunications Supervisor

Tom Cheng - Technology Operations and Support Services Supervisor

Bob Hughes - Chief Information Services Officer

Sean Osborn – Instructional and Administrative Systems Development Lead

Joel Cheng – Programmer Analyst III

**Department Functions**

The TeCS Department manages the college network and related infrastructure, the central server room, the telephone system and related infrastructure, desktop computers and related peripherals for faculty, staff, classrooms and laboratories, and the administrative applications including the Banner Wingspan system and related support applications.

The TeCS Department is organized into two functional areas:

*Network, Central Computing and Telecommunications*

Led by the Network, Central Computing and Telecommunications Supervisor, this area is responsible for networks, email, central hardware, software systems, databases, interfaces between systems, security,

and application programming. This group also supports campus construction projects, ensures that state and federal reporting requirements are met, and manages the college's website.

### *Technology Operations and Support Services*

Led by the Technology Operations and Support Services Supervisor, this area performs all tasks and activities related to desktop hardware and software in classrooms, labs and offices; supports Academic Affairs with technology in classrooms; staffs and operates the help desk; manages the work order system; and delivers technology training to staff.

This department organization structure was implemented in 2017. During the period of time covered by this comprehensive program review, two additional functional areas (Instructional and Administrative Application Systems Development and Enterprise Resource Planning (ERP) Project) were in place. The current structure is an improvement in that it allows for clear lines of communication and oversight by the two supervisors in the department.

### Special Accomplishments

#### Implementation of the ShoreTel Voice Over Internet Protocol (VOIP) system

In 2012, a construction mishap resulted in the destruction of the campus telephone system. The TeCS department worked with the vendor to completely replace the infrastructure for the telephone system and replace handsets on every desktop during the single week of Spring Break. This effort earned the telephone team the "Shining Star for Technological Advancement" award for that year.

#### Implementation of Banner Finance

In 2014, the college acquired the Banner Finance module. Implementing Banner Finance and integrating it into our existing Banner ERP system was not a simple task, but TeCS worked closely with our Fiscal Services department and the consultants to complete this implementation. Banner Finance is now a robust and fully-functioning component of our ERP system

#### Implementation of DegreeWorks

In 2013, a multi-year project to implement the DegreeWorks system for degree audit and student educational planning was initiated. TeCS installed an additional server and worked closely with consultants and team members from Admissions and Records and Counseling to ensure that the Citrus College curriculum was configured properly. The ERP coordinator led regular meetings of the project team and since 2017 the system has been used by faculty, staff and students for progress to degree and educational planning.

#### Implementation of Alertus

In 2015, the Alertus emergency messaging system was installed. The system provides the ability to alert and communicate to all campus constituents in the event of an emergency. This was a significant project

that required additional wiring of phones in classrooms, installation of software on staff, faculty and podium computer systems, and the installation of sixty beacons in buildings across campus. The Alertus system is an important improvement to the safety and security of the college.

## Service Recipients

The TeCS Department serves all members of the Citrus College community. Current and prospective students use technology to apply to the college, complete orientation and educational plans, register for classes, make payments, and complete coursework. Faculty use technology to develop curriculum, obtain class rosters, input course grades and provide content for the online education system. Staff use technology to make purchases, schedule courses, manage student data, for communication, and for management of daily work. Managers rely on technology for data and statistical analysis to support planning and decision-making.

The TeCS Department also serves the general public by providing a robust public website ([www.citruscollege.edu](http://www.citruscollege.edu)) with general information about the college. The website provides community members with information on events and college business, information about rentals and important information related to governance. Community members are also served by the technology provided in the Hayden Memorial Library and the Haugh Performing Arts Center.

## Data Related to Service Recipients

### *Computing Infrastructure*

Technology and Computer Services (TeCS) maintains and supports a computing infrastructure that serves both the administrative and instructional needs of the campus. Included in this infrastructure are 17 physical servers and 113 virtual servers which serve to store files and documents, host email, provide authentication, and support several applications including the Banner Enterprise Resource Planning (ERP) system. The production database is replicated into a number of training and test environments. The Banner ERP system contains over 10 years of data and consists of over 425,000 person records. Approximately 35 Terabytes of data are archived on a nightly basis.

A robust wireless network was installed and expanded during the evaluation period. Two hundred fifty-two wireless access points provide connectivity to mobile users in buildings across campus.

### *Computer Desktop Support*

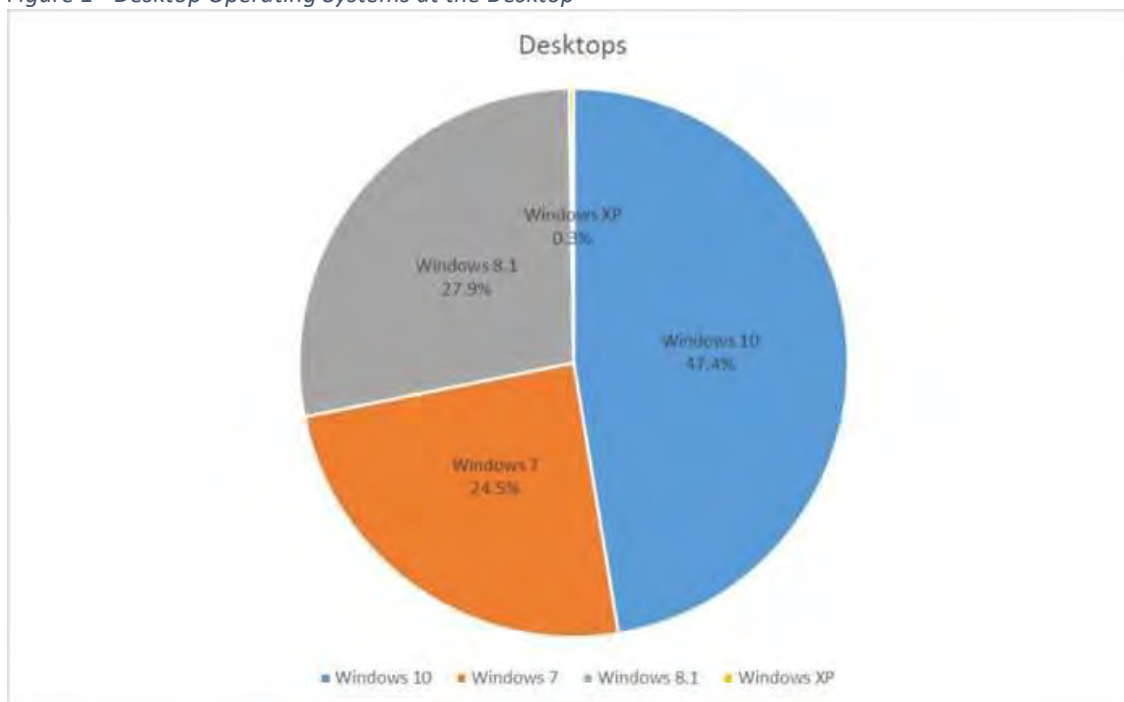
TeCS maintains and supports 1,732 desktop computers which includes computers used by staff and managers for administrative purposes and computers used by faculty and students for instructional purposes. One hundred twenty-five (7.2%) of these computers are podium computers used in

classrooms that were replaced during the evaluation period. One hundred sixty-two (9.4%) of the total computer count consists of Mac computers deployed in labs; the remaining 90.6% are Windows PC's.

Two hundred fifty-four printers are deployed for administrative use and 255 printers are deployed for instructional use.

The desktop computers vary in their currency. Computers used for instructional purposes are on a 5-year replacement cycle, but administrative computers are replaced as department budgets or program review funds allow. The newest computers are installed with the latest operating system (Windows 10) but a majority of systems are still running a legacy version of Microsoft Windows. Figure 1 shows the current breakdown of the distribution of Microsoft operating systems at the desktop level at Citrus College.

*Figure 1 - Desktop Operating Systems at the Desktop*



### *Classroom Technology*

TeCS provides support for the technology used in the classroom. One hundred thirty classrooms across campus are equipped with data projectors as well as switching equipment that allows the projectors to be used from the podium computers or from a secondary device. Many of the classrooms also come equipped with document cameras which can be presented through the classroom projection systems

### *Student Support Applications*



## Technology and Computer Services Comprehensive Program Review 2012 - 2017

Technology and Computer Services (TeCS) provides technology resources to all students from application to college to the completion of their college degree or certificate program and/or transfer to another institution. The number of applications received during the evaluation period are listed in Table 1.

*Table 1- Counts of Applicants for Admission and Financial Aid*

<b>Application</b>	<b>2012-13</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>
Credit Admission	28,568	30,201	19,109	24,513	24,916
BOG Fee Waiver	22,438	23,188	22,476	19,194	18,309
Federal Financial Aid (FAFSA)	22,706	22,911	22,161	18,616	17,593

*(source: counts from selected tables in Banner)*

All students at Citrus College use technology supported by TeCS to register for classes, make payments, complete classroom assignments, and interact with the college administration, their peers, and their instructors. The number of students enrolled at Citrus College during the evaluation period are listed in Table 2.

*Table 2- Unduplicated Student Counts and FTES*

<b>Metric</b>	<b>2012-13</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>
Enrolled Students (Unduplicated Headcount)	16,399	18,615	19,035	20,002	20,176
Full-Time Equivalent Students (FTES)	10,736.78	11,537.46	12,224.43	12,633.90	12,643.42

*(source: California Community College Data Mart: <https://datamart.cccco.edu/DataMart.aspx>)*

The TeCS Department collaborates with Student Services and Academic Affairs to provide technology to support students in the academic pursuits, and manages or supports many applications that enable students to enter the college and obtain successful outcomes. Significant applications used to support students during the evaluation period are listed in Table 3.

*Table 3- Student Related Applications*

<b>Application</b>	<b>Function</b>	<b>Local or Remote (hosted)</b>
CCCApply	Application to college	Remote
Accuplacer	Placement testing	Remote
SARS Suite	Counseling data management	Local
Cynosure	Online orientation	Remote

<b>Application</b>	<b>Function</b>	<b>Local or Remote (hosted)</b>
Credentials	Transcript ordering	Remote
Banner Student	Registration, Scheduling, Academic History, Transcripts	Local
Banner Accounts Receivable	Application of fees and payments	Local
Banner Financial Aid	Financial aid processing	Local
Banner Xtender	Document Management	Local
Blackboard	Learning Management System	Remote
Citrus Alert	Emergency Notification	Remote
Microsoft Office 365	Email, Productivity Applications	Remote

The TeCS Department supports all faculty and staff technology needs on campus. This includes desktop computers, network access, printers and desktop peripheral devices, authentication, email and productivity applications. The number of faculty and staff supported during the evaluation period are listed in Table 4.

*Table 4- Count of Employees by Employee Group*

<b>Employee Group</b>	<b>Fall 2012</b>	<b>Fall 2013</b>	<b>Fall 2014</b>	<b>Fall 2015</b>	<b>Fall 2016</b>
Administrator	23	23	24	26	26
Academic, Tenured/Tenure Track	156	153	153	192	172
Academic, Temporary	195	269	355	366	388
Classified	280	261	269	283	300
<b>Total</b>	<b>654</b>	<b>706</b>	<b>801</b>	<b>867</b>	<b>886</b>

(source: California Community College Data Mart: <https://datamart.cccco.edu/DataMart.aspx>)

### *Administrative Applications*

Technology and Computer Services (TeCS) supports software applications that are used by deans, directors, supervisors, managers, staff and faculty to process employment applications, complete purchasing processes, create documents, conduct research, and administer daily operations. Significant applications used for administrative purposes by staff and faculty are listed in Table 5.

*Table 5- Administrative Applications*

<b>Application</b>	<b>Function</b>	<b>Local or Remote (hosted)</b>
Microsoft Outlook	Email	Local
Footprints	Work Orders for IT, External Relations	Local
Microsoft SharePoint	Intranet – Document Repository	Local
Banner Xtender	Document Imaging	Local
Crystal Reports	Report Writer	Local

<b>Application</b>	<b>Function</b>	<b>Local or Remote (hosted)</b>
Argos	Report Writer	Local
Banner Finance	Purchasing, Fiscal Management	Local
Banner Human Resources	Human Resources Data Management	Local
PeopleAdmin	Employment Application Processing	Local
Adobe Acrobat Suite	Document Creation, Editing	Local
Microsoft Office Suite	Document Creation, Editing	Local
iParq	Parking permits and citations	Remote
Heartland	Payment processing	Remote
Sophos Endpoint	Desktop Antivirus	Local
Microsoft Active Directory	Authentication	Local
Bulk Mailer Professional	Bulk Mailing (Email)	Local

## Staff Resources

### *Staffing*

The Technology and Computer Services department consists of 21 staff members, a significant increase from the 16 staff members reported in the Spring 2011 comprehensive program review. The department is organized into two primary areas - Technology Operations and Support Services and Network, Central Computing and Telecommunications. Each area consists of 8 staff members reporting to a supervisor. The Chief Information Services Officer, who reports directly to the Superintendent/President, leads the department and has two direct reports. Student workers are hired to staff a help desk and provide office support.

### Organizational Changes

Technology and Computer Services (TeCS) had a number of organizational changes both during and after the evaluation period.

Prior to August 2016, TeCS had four IT Support Specialist III positions. Staff in these positions provide the primary technology support to the classrooms and offices, and maintain the college technology infrastructure. In Fall 2016, three additional employees were hired in this classification, giving the college seven IT Support Specialist III positions (a 75% increase). As a result of this investment, wait times to service computers at desktops and in classrooms have decreased significantly.

Prior to August 2016, TeCS had three Programmer/Analyst III positions. Staff in these positions provide software support for the Banner ERP system, develop local applications and create reports. In Fall 2016, two additional employees were hired in this classification, giving the college five Programmer/Analyst III positions (a 67% increase).

In 2017 the ERP Coordinator position was converted to a second Database Administrator position, and the department was reorganized to better align with reporting duties and supervisory roles. Organization charts as of January 2017 and May 2018 are attached (See attachment A and B).

### Assignments and Specialties

The TeCS Department is responsible for the implementation and maintenance of the college network infrastructure; the physical hardware in the server room; the virtual servers and databases that support the information needs of the college; and the software applications used by faculty, staff and students. The staff is composed of individuals with expertise in their assigned area of specialization, consistent with their position descriptions.

*Table 6- TeCS Department Staff Assignments*

<b>Count</b>	<b>Position</b>	<b>Assignment or Specialty</b>
1	Chief Information Services Officer	Department Leadership
1	Network, Central Computing and Telecommunications Supervisor	Supervises Database Administrators, Programmer Analysts, Instructional and Administrative Systems Development Lead and Web Page Specialist. Primary responsibility for infrastructure, the ERP system and interfaces, authentication, security, email and network performance.
1	Technology Operations and Support Services Supervisor	Supervises IT Support Specialists and student workers. Responsible for desktop hardware and software support, classroom technology support, telecommunications support, help desk staffing, hardware recommendations, bulk e-mail distribution and training
1	Instructional and Administrative Systems Development Lead	Provides data, technical expertise and coordination to Programmer Analysts; develops and maintains applications and programs for administrative and instructional support systems.
5	Programmer Analyst III	Develops and maintains applications and programs for administrative and instructional support systems. Develops reports and interfaces between systems.
7	IT Support Specialist III	Provides workstation technical support for classrooms and offices; supports and maintains system hardware, network and telecommunication equipment and related applications.
1	IT Support Specialist I	Provides workstation technical support for classrooms and offices
2	Database Administrator	Administers both production and non-production databases including installation, configuring interfaces, applying patches and updates, monitoring system performance and troubleshooting.

Count	Position	Assignment or Specialty
1	Web Page Specialist	Maintains and updates the college web site and web pages; trains end users on web page use and updates; assists in designing new web pages.
1	Administrative Secretary II	Supports technology purchasing; maintains all department records and paperwork; tracks department budgets and provides all administrative support for the department.

### Staff Training and Professional Development

Technology and Computer Services staff received training as new hardware and software initiatives are implemented. In addition, ongoing training is provided in a number of settings to ensure currency of staff knowledge and expertise.

During the evaluation period, staff members attended a number of training sessions and conferences to learn the latest technology and network with other IT professionals. Following is list of these activities:

- California Community College Banner Group (3CBG) - Banner Training
- CCCApply - Workshop on the California Community College common application
- Corporation for Education Network Initiatives in California (CENIC) - Conference for K-20 technology professionals
- Chief Information Services Officer Association (CISOA) - Conference and professional development for California Community College information technology staff
- DegreeWorks - both local training and national conference
- Deploy System Center - Microsoft Training
- EDUCAUSE - national conference for higher education technology professionals
- Extron - training on classroom projection technology equipment
- Virtualization IT Camp - training on virtual server technology
- SmartSheet Engage - conference and training for the SmartSheet online project management application
- SSSP Implementation Summit - training on the Student Success and Support Program initiatives and reporting requirements

### Committee Participation

Members of the TeCS Department participate in governance committees including:

- Steering Committee
- President's Council
- College Information Technology
- Financial Resources

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- Educational Program
- Student Learning Outcomes and Assessment (Hotshots)

Members also participate in standing working groups and committees including:

- Enrollment Management
- Classified Staff Development
- Program Review
- Student Success and Support Program (SSSP) Strike Team
- Student Services

### Awards

2012 Shining Star - Collaboration: Joyce Miyabe

2012 Shining Star - Technological Advancement: Telephone Team (Leigh Buchwald, Tom Cheng, Millie Franco, Vince Herrera, Glenna Johnson, Linda Welz)

### Physical Resources

#### *Buildings and Facilities*

##### Buildings

The TeCS Department is housed in the Information Services (IS) building. All department offices and the main server room are located in the building. Additionally, network and communications equipment is located in equipment closets throughout the campus. IS 109 serves as a training and conference room. A large storage bin located on the south side of the IS building provides storage for surplus and spare equipment.

##### Network and Infrastructure

The TeCS Department administers the college's technology infrastructure including the network, data center, and telephones. The Citrus College computer network has a backbone connected via fiber-optic cable. The network core is a switched 100-gigabit Ethernet with 1-gigabit or 10-gigabit Ethernet fiber connecting individual buildings to the core and a gigabit with a redundant DS3 fiber-optic connection to the Internet. The TeCS department maintains computer servers in a secure data center with environmental control and uninterruptible power supply, and a backup generator on the east side of the Information Services building provides emergency power.

To ensure the reliability of the college's data resources, the TeCS department has clustered major application servers. TeCS also maintains the storage area network (SAN) for the Banner ERP system on a

multi-tiered cluster. The college has a contract for same day replacement for severe server failures. A robust, redundant virtual server environment assures that servers can be replicated and restored with minimal loss of service.

The Citrus College network infrastructure is designed to protect our information assets from malicious activity. Networks are physically separated into multiple segments. The instruction network is used by students and faculty and the admin network is used by staff for business and administrative purposes. The admin network is more highly secured to prevent student access to administrative machines. The wireless network is physically connected to the instruction network, but the firewall on the wireless controller prevents general access to the wired network. The critical servers on the college's network cannot be accessed from off campus except through the use of virtual private network (VPN) software specifically installed and configured for limited purposes. All users of the network (both wired and wireless) must log in with a Citrus College account, and access to Banner, Argos and other critical enterprise applications can only be made through a wired connection.

Citrus College regularly and automatically backs up all network shares. Each server on the network is backed up nightly by an Avamar backup appliance, and the backups include all data files, the operating system and SQL database files, which covers both Microsoft and Oracle databases. Users are encouraged to save their important files on network shares to ensure they are backed up, and TeCS is able to restore selected files as of a particular date if requested. Backups are stored as encrypted, compressed files within the Avamar device.

#### System Security

A secure technology infrastructure is a high priority for the college and security is a consideration for all technology facilities. Public access to the Information Services department is restricted to a single entrance on the west side of the building which is monitored by staff at the help desk. Access to the campus data center is limited to network and system administration personnel.

Citrus College has a Sophos email appliance that filters all incoming and outgoing e-mails for spam, viruses, malware and other malicious content before it reaches our internal exchange server. This eliminates approximately 80% of incoming email that has been identified as something other than legitimate e-mail. The appliance is automatically updated several times per day to update its filtering algorithm. Some additional filtering is also done directly within exchange to catch malicious e-mails that make it through the Sophos appliance. This helps prevent 'phishing' e-mails from reaching end users.

Citrus College runs Sophos anti-virus software on desktop computers which blocks access to malware, potentially unwanted applications, web threats, malicious behavior, controlled items and malicious traffic. This prevents users from inadvertently accessing and downloading ransomware, viruses and other types of malware while browsing the web. The Sophos Endpoint Advanced software used at Citrus College is very highly regarded - rated in the 'magic quadrant' by the Gartner Group for Endpoint protection. Both anti-virus and software update practices are defined by Administrative Procedure 3722 - Computer and Network Connectivity and Access.

Several firewalls protect the campus network. The primary firewall is a Palo Alto appliance. All traffic coming into and out of the campus goes through this device, and by practice is implemented with a 'deny all' policy, where all traffic is denied to certain destinations unless specifically allowed. The firewall

also serves as our virtual private network (VPN) server which provides privileged access to external clients when necessary. A Juniper firewall serves internally as a routing device to route addresses to different segments of the campus.

TeCS regularly patches and updates software on desktop computers. System Center Service Manager is used to push out software and important updates to computers across campus on a regular basis. A number of virtual desktop computers are in use on campus, which allows TeCS to update the software image once on a server for use by multiple computer desktops. Operating systems and software on enterprise servers are updated on a regular basis.

TeCS as a general practice does not provide administrator accounts for users on college desktop computers. User accounts are provided that prevent installation of software by most end users. When a staff or faculty member needs a special software application installed, they can log a ticket with our help desk and an IT Support Specialist will install the application for them using an administrator account.

Access to network shares are restricted only to users who have been granted permission to access those resources. The Citrus College Intranet environment is set to allow create, update and delete access only by specific permission. Access to Banner and other enterprise systems is similarly restricted. The principle of least privilege is a key component of Administrative Procedure 3721 - Computer and Network Account and Password Management.

#### Desktop Environment

The TeCS department manages the desktop equipment in the computer classrooms and labs across campus as well as in staff and faculty workspaces. Computers used by students and in classrooms for instructional purposes are replaced on a 5-year cycle, while computers used by faculty and staff are replaced as departmental budgets allow or as provided for by the program review process. Grant funds periodically provide funding for new computer equipment outside the standard replacement cycle.

The TeCS department licenses desktop and general use software for the entire campus. The college purchases the majority of the licenses through the Foundation for California Community Colleges. Prior to each academic term, instructional software is updated and/or replaced in the classrooms and labs based upon requests made by faculty through their respective deans.

The Technology Operations and Support Services group within TeCS provides general maintenance and support for all desktops. Staff and faculty can request service through the online technology work order system (Footprints) available through the intranet and can track the status of their work orders. Non-TeCS department personnel provide technical support to a few areas of the college. Staff members from the Fine and Performing Arts division support technology in the Recording Arts program, the Haugh Performing Arts Center and the Music department. Staff from the Hayden Library's Audiovisual (AV) Services provide projector service support in classrooms.

#### *Applications and Software*

The TeCS department implements and maintains all administrative software applications and is responsible for supporting all state and federal reporting requirements.



The core of the administrative system is the Ellucian Banner Enterprise Resource Planning (ERP) system. The system was given the name 'WingSpan' when it was implemented and includes the student, financial aid, human resources, and finance modules. The financial module was the latest module implemented, and was integrated into the existing components during the spring of 2015. Citrus College uses the California Community College's version of Banner, which provides the ability to do MIS reporting, process Board of Governors fee waivers, generate Full Time Equivalent Student (FTES) reports for funding purposes and comply with state regulations regarding course repeatability. Students and faculty can interact with WingSpan remotely through the Banner Self-Service modules.

The Banner Operational Data Store (ODS) is a system that provides a nightly repository of data from WingSpan to be used for reporting purposes. The ODS simplifies the process for gathering and linking data in the database and is used extensively by the Office of Institutional Research, Planning and Effectiveness (IRPE) to provide data for student learning outcomes, program review, and other research activities.

The Banner Xtender document imaging system provides for the ability to store scanned documents, such as transcripts, indexed to records in WingSpan. Two reporting tools - Crystal Reports and Argos - were interfaced to the system during the evaluation period, providing departments on campus the ability to run reports on demand. Other applications that are or were integrated with WingSpan during the evaluation period include third party support applications for forms printing (FormFusion), online payment processing (Heartland), and computer job scheduling (AppWorx).

The Ellucian DegreeWorks system was implemented during the evaluation period and provides an electronic educational planning tool for counselors and students. This system is tightly integrated with Banner and provides a comprehensive look at student transcripts, catalog and schedule data, and curriculum rules. Counselors and students can identify courses to take in the future that will apply to students' educational goals and complete 'what if' simulations to determine the effect that a change of major would have on time to degree. Evaluators in Admissions and Records utilize the degree audit process in DegreeWorks to determine student eligibility for degrees and certificates at graduation.

The SARS (Scheduling and Reporting System) group of programs provides counselors with appointment tracking, reminder calls and text messages to students, and reporting support. The CollegeNet Resource25 application is used to coordinate academic room scheduling with meeting and event management. The CI Tracker application records courses and time spent on assignments in certain labs requiring attendance tracking.

A critical application for Citrus College is the electronic mail system. TeCS supports the Microsoft Outlook mail service, which provides an e-mail address and inbox to every staff and faculty member, as well as for a number of retirees. The Microsoft Outlook system runs on exchange servers located in the data center, and are backed up on a nightly basis. Another critical system maintained by TeCS is the Microsoft Active Directory system, which provides user accounts and access permissions for network and e-mail access.

#### Supported Hosted Applications

Citrus College has implemented several systems that are hosted in the cloud by application service providers. During the evaluation period, the college used the Blackboard Learning Management System

for online education. TeCS maintained an interface to populate current classes, faculty and student information between the Banner WingSpan system and Blackboard. Blackboard has since been replaced by Canvas, and TeCS maintains a similar interface with that system.

Each Citrus College student is provided with an Office 365 account. This is a hosted system that provides students with a Citrus College e-mail address, as well as access to the Microsoft suite of applications (Word, Excel, PowerPoint, etc.) Office 365 also provides students with OneDrive - a site to securely store up to one terabyte of data. TeCS supports this system by creating accounts and managing password changes.

Assessment testing is supported by the College Board's Accuplacer Testing system. Students access this hosted system from the Testing Center on campus and when testing is complete, their scores are loaded twice a day into the relevant tables in the Banner WingSpan system. Curriculum rules in WingSpan then provide students the ability to register into courses that have prerequisites based on assessment scores.

During the evaluation period, Citrus College implemented Blackboard Connect, a hosted system that provided emergency alert notifications in the form of text messages, e-mail messages and phone calls. TeCS maintained a regularly scheduled upload from the Banner WingSpan system to populate the Blackboard Connect system (known as Citrus Alert). This system has recently been replaced by Rave Alert, and TeCS maintains a similar interface with that system.

The California Community College Chancellor's Office provides the CCCApply system which allows students to apply on-line to Citrus College. TeCS maintains an interface between this system and Wingspan, automatically loading admissions applications into the student module on a daily basis. TeCS also provides support for the integrations between Citrus College and the LA County Office of Education (LACOE) and the hosted PeopleAdmin employment application tracking system used by Human Resources.

## Fiscal Resources

The TeCS department budget from the general fund supports department salaries and supplies, college wide software licenses, support contracts, consulting arrangements and equipment purchases for both new and replacement equipment. Equipment purchases are primarily for the data center, campus-wide infrastructure and larger applications.

The TeCS department also purchases, installs and maintains desktop equipment used for instructional purposes. A five-year computer replacement cycle for instructional equipment was implemented in 2014 and allocations are made annually to replace systems that become obsolete. Software licenses used for instructional purposes college-wide, such as the Blackboard Learning Management System, were funded through Proposition 20 Lottery funds that are restricted to instructional-related expenditures.

Revenue Construction Bond funds from Measure G funded the original purchase and implementation of the Banner WingSpan ERP system as well as support through 2015. Upon renewal of the maintenance

agreement, the software and maintenance licenses were funded through the TeCS general fund allocation.

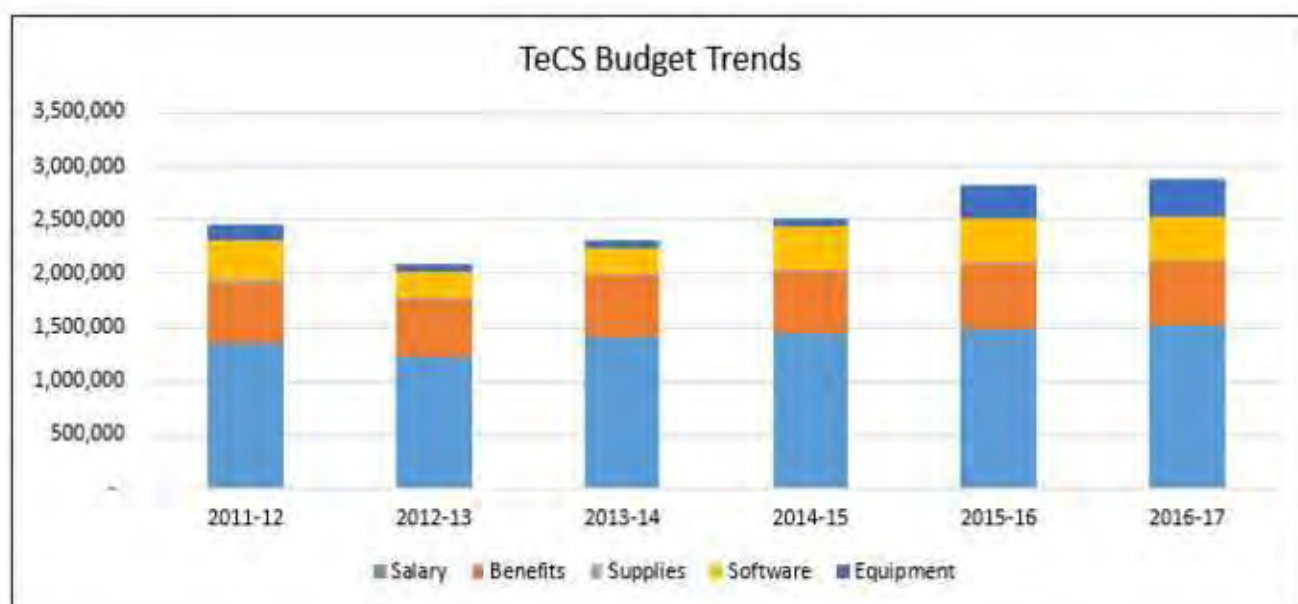
Table 7 shows the budget allocated to Technology and Computer Services from 2011-12 to 2016-17. The overall budget for the department was reduced by 14.6% in 2012-13 over the prior year. The overall budget was restored in 2014-15, although this was primarily a result of the increase in the software budget line for the Banner WingSpan ERP renewal.

*Table 7 - TeCS Budget 2011-12 to 2016-17*

	<b>2011-12</b>	<b>2012-13</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>
Salaries	1,363,333	1,219,728	1,413,620	1,438,129	1,479,436	1,513,783
Benefits	536,951	542,308	563,319	580,585	606,472	592,946
Supplies	37,000	22,000	22,000	22,000	23,000	23,000
Software	370,000	240,000	240,000	400,000	400,000	400,000
Equipment	150,000	75,000	75,000	75,000	325,000	350,000
<b>Total</b>	<b>2,457,284</b>	<b>2,099,036</b>	<b>2,313,939</b>	<b>2,515,714</b>	<b>2,833,908</b>	<b>2,879,729</b>

Figure 2 shows the breakdown of the budgeted items each year in a bar chart. Salaries and benefits make up the greatest portion of the budget for the department, accounting for over 80% of the budget in years prior to 2015-16. In 2015-16 and 2016-17, salaries and benefits account for approximately 73% of the department budget, due to the increased allocation for equipment and software line items.

*Figure 2 - TeCS Budget Trends 2011-12 to 2016-17*



Funding for TeCS was significantly increased beginning in 2015. As a response to the Citrus College Accreditation report in 2015, an Actionable Improvement Plan (AIP) was developed as follows:

## Technology and Computer Services Comprehensive Program Review 2012 - 2017

*In order to further advance the College technology plan, Citrus College will make resources available in a timely manner to address critical training, manage personnel and financial resources, and procure, replace, sustain, and expand services.*

One-time Capital Outlay funds were made available in 2015-16 to fund several large computer infrastructure projects including the Emergency Notification Project (\$318,200) ; the Campus-wide Technology Infrastructure Upgrade Project (\$385,000) ; the Email System Upgrade Project (\$200,000) ; the Campus-wide Wireless Access Project (\$350,000) ; and the Campus-Wide Cell Service Enhancement Project (\$575,000).

In 2016, Student Services and Support Program (SSSP) and Student Equity grant funding was allocated to hire three additional IT Support Specialist III positions and two additional Programmer/Analyst III positions, significantly increasing the ability of TeCS to support the growing technology support needs in these areas.

### Program Student Learning Outcomes

Outcome	Mapping
<u>Total number of work orders closed per year</u> - Citrus College uses an online work order system called Footprints. Requests for service are entered by staff and faculty across campus, or are entered by help desk staff. Tickets include requests for the purchase and installation of new desktop equipment. A large number of closed tickets each year are expected to ensure technology issues are being addressed.	<b>USA- WASC- ACCJC- Accreditation Standards (2017): III.C.1</b>
<u>Service tickets are resolved quickly</u> – Faculty, staff and students should receive a prompt response to their service tickets entered into Footprints, measured by the length of time between when a ticket is opened by the customer and closed by the assigned technician. Tickets should be resolved (closed) in a timely fashion.	<b>USA- WASC- ACCJC- Accreditation Standards (2017): III.C.1</b>

## Past 5 Years Assessment Cycle/Upcoming 5 Years Planning Cycle

### Executive Summary

Technology and Computer Services achieved significant accomplishments during the prior 5 years including the implementation of the Voice Over IP (VOIP) telephone system, the implementation of Banner Finance, the implementation of DegreeWorks and the implementation of the Alertus emergency notification system. However, the department struggled to maintain service levels in terms of the number of service tickets closed and average length of time to resolve a service ticket. These challenges were exacerbated by the departure of key, long-time personnel in the department and delays in getting the positions replaced.

In 2016, Citrus College leadership responded to these issues by funding five additional staff members in the department and by allocating funds for equipment replacements and upgrades. The transformation of the department continued in 2017 with the retirement and replacement of the Chief Information Services Officer and the replacement of 6 other staff members as a result of retirements or resignations. The department is currently fully staffed except for a single IT Support Specialist III vacancy, a result of an internal promotion. This position will be transformed into an IT Security Analyst position in order to respond to regulatory requirements and improve the security of the college's critical information systems.

EDUCAUSE is the primary professional organization for information technology professionals in higher education. Each year the organization publishes a list of 'Top Ten Issues,' informed by a nation-wide survey and the expert opinions of senior professionals on the issues committee. The Top Ten IT Issues for 2018 (see Attachment C) will be addressed at Citrus College in a number of initiatives planned for the next five years:

**1. *Information Security: Developing a risk-based security strategy that keeps pace with security threats and challenges***

Initiatives planned for improving information security include the hiring of an Information System Security Specialist, implementation of two-factor authentication software, and completion of an in-depth security assessment.

**2. *Student Success: Managing the system implementations and integrations that support multiple student success initiatives***

Initiatives planned for improving student success include implementation of DegreeWorks 5.x, development of an interactive web page for Guided Pathways, development of DegreeWorks educational plan templates for Guided Pathways, and implementation of class scheduling software to better align class offerings to students needs with respect to Guided Pathways.

**3. *Institution-wide IT Strategy: Repositioning or reinforcing the role of IT leadership as an integral strategic partner of institutional leadership in achieving institutional missions***

TeCS staff will continue to participate in key committees and workgroups such as the Guided Pathways initiative, the Enrollment Management committee, and workgroups focused on matriculation, student success and assessment in order to better align technology with the college's strategic plan.

**4. *Data-enabled Institutional Culture: Using business intelligence and analytics to inform the broad conversation and answer big questions***

Initiatives planned for improving data for decision-making include the acquisition and implementation of software to monitor network traffic and monitor the wireless network and expanding the use of the Power BI Business Analytics software

**5. *Student-centered Institution: Understanding and advancing technology's role in defining the student experience on campus***

Student-centered institution initiatives include implementing DegreeWorks and Banner 9 to provide the ability for students to register for classes directly from their student educational plans; developing an interactive web page for Guided Pathways, and developing Guided Pathways templates in DegreeWorks.

**6. *Higher Education Affordability: Balancing and 'rightsizing' IT priorities and budget to support IT-enabled institutional efficiencies and innovations in the context of institutional funding realities***

TeCS will continue to maintain efficiencies and work within the funding limitations that are a feature of California Community Colleges. TeCS will plan an evaluation of our current Banner Wingspan ERP system in 2021 prior to the 2024 contract expiration to ensure that the college's needs will be met in the future with a highly reliable and cost-effective ERP system. On a student level, TeCS will help maintain affordability for our students by developing systems to improve retention in the Citrus College Promise Program.

**7. *IT Staffing and Organizational Models: Ensuring adequate staffing capacity and staff retention in the face of retirements, new sourcing models, growing external competition, rising salaries and the demands of technology initiatives on both IT and non-IT staff***

TeCS will continue to maintain a fully staffed department, leverage consultants in a strategic fashion to ensure goals are met and will provide staff development, cross-training and documentation to prepare for retirements of key, long-time personnel.

**8. *(tie) Data Management and Governance: Implementing effective institutional data governance practices***

TeCS will develop processes to ensure our information systems are providing reliable data, including the development of reports and systems to report accurate counts of Pell Grant recipients, California College Promise Grant recipients, and counts of students completing degrees and/or certificates in order to maximize allocations under the new funding formula for California Community Colleges.

**8. *(tie) Digital Integrations: Ensuring system interoperability, scalability, and extensibility, as well as data integrity, standards, and governance, across multiple applications and platforms***

Initiatives planned for digital integrations include an interface between Banner and the International Student Admission Application and an on-line application for the Associate Degree in Nursing program.

*10. Change Leadership: Helping institutional constituents (including the IT staff) adapt to the increasing pace of technology change.*

Perhaps the largest and potentially most disruptive activity in 2018-19 is the upgrade to Banner 9. This upgrade will require every user of the Banner WingSpan ERP System (staff, faculty and students) to learn a new user interface. TeCS will partner with departments on campus to roll out Banner 9 in a thoughtful manner to minimize disruptions and allow for adequate training and testing. The planned implementation of the Cornerstone Learning Management System for staff development can help ensure that training requirements are being met.

Technology and Computer Services will continue to provide excellent levels of customer service and respond quickly and efficiently to support all areas of the college with relevant, reliable and effective information technology resources and services during the next five years.

## Summary of Past Learning Outcomes Assessments

Figure 3 shows the total number of tickets in the Footprints work order system closed each year. In 2012, 3,911 tickets were closed. This count dropped to 3,135 in 2014 and rebounded slightly to 3,438 in 2016.

Figure 3 - Total Tickets Closed 2012-2016



Figure 4 shows the average number of work orders closed per work day (based on 250 work days/year) were 15.644 in 2012. This metric dropped to 12.540 in 2014 and rebounded slightly to 13.752 in 2016.

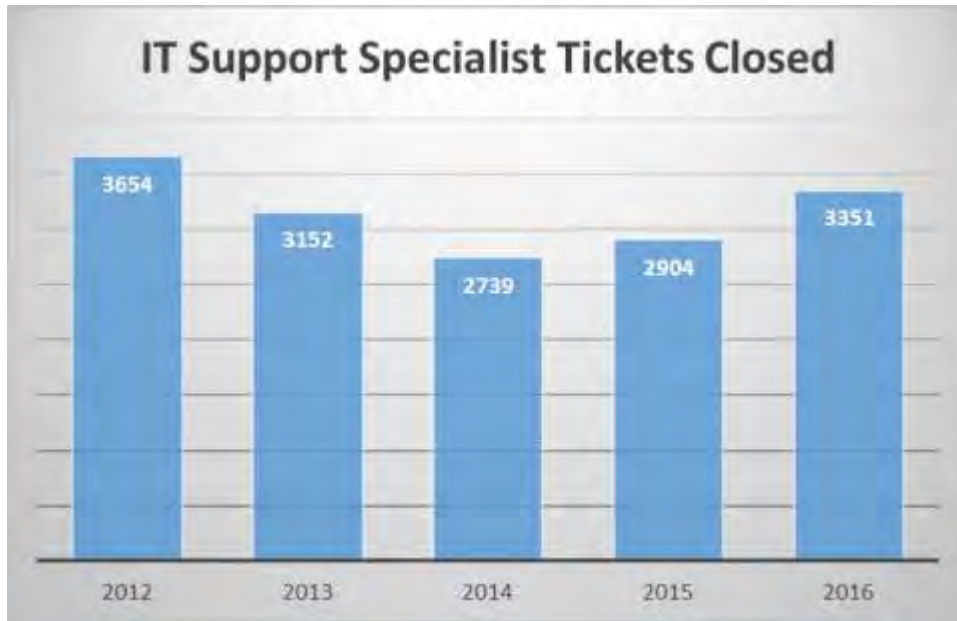
Figure 4 - Average Work Orders Closed Per Day 2012-2016





For the IT Support Specialist group (responsible for phones, hardware issues and desktop and classroom support) the number of tickets closed declined 25% from 3,654 in 2012 to 2,739 in 2014 before rebounding to 3,351 in 2016. This is shown in figure 5 below.

Figure 5 - IT Support Specialist Tickets Closed 2012-2016



As shown in figure 6, average time to close a ticket improved from 34 days to 11 days in 2013, but by 2016 the average time to close an IT Support Specialist ticket increased to 36 days (a negative outcome).

Figure 6 - IT Support Specialist Average Time to Close (Days) 2012-2016



This decline in productivity is a direct reflection of staffing issues that impacted the department. In 2014, a key IT Support Specialist II resigned from the college after 20 years to take a position at a neighboring District. This individual was serving in the primary Database Administrator role and his departure had a significant impact on the productivity of the unit. This position remained vacant until the summer of 2016. A second key IT Specialist resigned from the college in early 2016. During this period, work orders were not being consistently tracked and closed, resulting in unreliable numbers being tracked for the Programmer/Analyst unit.

Citrus College made a strategic investment in 2016 to hire 5 additional staff members in TeCS. This action had a positive effect, as 3,233 IT Support Specialist tickets were closed in 2017 with an average time to close dropping from 36 to 13 days and 366 software projects were completed in 2017-18. Outcomes are expected to continue to improve as these new staff members gain experience.

## Summary of Past Recommendations and Goals

The Citrus College Strategic Plan (CCSP) from 2011-2016 contained a number of goals for the college for which Technology and Computer Services was responsible or played a major role in implementation. Some of these goals were also identified in the Information Technology Master Plans (ITMP) for 2009 – 2014 and 20013 - 2017

***CCSP Goal 1.2.1: Establish equipment replacement cycles and training for innovative instructional technology; 2013-2017 ITMP Goal II.A: Establish a replacement cycle for classroom and lab technology equipment***

In 2013, a formal replacement cycle was defined for replacing desktop computers used for instruction, funded at a rate of approximately \$225,000 per year. This replacement cycle began in 2014-15 and continues through 2018-19. As a result of this investment, at the end of the replacement cycle all desktop computers used for instruction will be no more than 5 years old.

In 2014-15, \$250,000 was provided to upgrade storage capacity in the Banner WingSpan ERP system; upgrade servers used in the virtual computer environment, and increase wireless coverage on campus. Several training sessions for innovative instructional technology were held. Topics included Introduction to Blackboard 2014; Accessibility Issues for Online Teaching; How to Create Your Own Accessible Videos Using YouTube; Feedback – Discussion Posts; and Gradebook in Blackboard.

***CCSP Goal 2.3.3: Utilize technology to assist students in completing programs, including degree audit, online counseling and online educational plans; 2013-2017 ITMP Goal I.C: Implement new technologies to provide services to students in support of matriculation and educational goal achievement***

Implementation of DegreeWorks began in 2013, and counselors were piloting the program in fall 2013. Training for users of the system continued into 2014. TeCS provided custom development for the system, expanded the system capacity and the TeCS ERP Coordinator was a key resource in the implementation of the system by leading work groups and attending conferences. Since 2016, DegreeWorks has been used by counselors in live counseling sessions with students to develop initial and comprehensive educational plans. Evaluators are using the degree audit component for assessing graduation completion requirements. As of Fall 2017, students are able to complete their own educational plan online and evaluate their progress in DegreeWorks.

In Fall 2013, the Scheduling and Reporting System (SARS) Grid system was utilized to track counseling appointments and for managing online counseling.

***CCSP Goal 3.1.2: Increase technical support for Academic Affairs and Student Services, such as providing wireless access to the whole campus; expanding online access to one's own personnel information; incorporating into technology planning a procedure for evaluating and testing new instructional technology; 2013-17 ITMP Goal III.B: Provide mobile access to data and services across the college***

A wireless network was installed and expanded building by building during the years covered by this comprehensive review. Today, 252 wireless access points provide connectivity to mobile users in buildings across campus. New instructional technology was piloted and tested by means

of an Instructional Technology Committee which began meeting in 2012 and investigated options for lecture capture.

*CCSP Goal 4.1.1: Continue to maintain and improve buildings and classrooms on campus with a focus on cleanliness and repairs. Keep classrooms and technical equipment up-to-date with new instructional technologies when appropriate; 2009-2014 ITMP Goal II.A: Support integration of technology in classrooms, teaching labs and online instructional environments based on curricular and instructional needs*

In Fall 2012, all workstations in the library were replaced with virtual desktops, and desktop operating systems and applications have been upgraded each year. In 2016, all podium computers in classrooms were replaced. Desktop computers continue to be replaced per the computer replacement cycle implemented in 2014, and in 2017 the workstations in the library were replaced once again with traditional PCs to improve reliability and performance.

*CCSP Goal 4.1.4: Improve safety standards in classrooms and offices on campus, such as the addition of panic buttons and/or telephones in all offices and classrooms.*

TeCS participated in a working group beginning in 2014 to review options for emergency notifications. In 2015, the Alertus application was loaded on desktops and the first emergency beacons were installed. By 2016, wiring to support the installations of phones in classrooms was completed and sixty emergency beacons were installed throughout campus.

*CCSP Goal 5.1.3: Automate data collection for routine and repetitive tasks to enhance productivity whenever possible; ITMP 2013-2017 Goal I.B: Implement technology tools and processes that improve the efficiency of staff work processes*

A non-credit admission application was developed in the Banner WingSpan ERP environment and went live in Summer 2014, allowing students to apply online for non-credit programs. In 2016-17, several new applications were introduced, including:

- CourseLeaf – an online catalog and curriculum management system;
- Citrus College Mobile – a mobile application for students, staff and faculty;
- Terradotta – a system for processing and tracking International Students;
- Taskstream – a system for managing student learning outcomes and program review;
- OrgSync – a system for processing student life and club activities; and
- OneCampus – a portal ([my.citruscollege.edu](http://my.citruscollege.edu)) that simplifies access to online resources

## Long Term Recommendations/Goals

Outcome	Mapping
<b>Server Room Physical Upgrades</b> A full server room upgrade is needed as part of the IS building renovation or replacement.	<b>Strategic Plan Focus Areas:</b> 8.2 Robust, secure, accessible infrastructure, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.2
<b>Server Room - AC Unit Replacements</b> The air conditioning equipment, which was installed in 1998, is not reliable. Failures resulted in system downtime. A Fire Suppression System is also needed.	<b>Strategic Plan Focus Areas:</b> 8.2 Robust, secure, accessible infrastructure, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.3
<b>Banner 9 Implementation</b> Implement the latest releases of all modules of the Banner ERP System, including software installation and staff training.	<b>Strategic Plan Focus Areas:</b> 5.1 Enhance services through technology, 8.2 Robust, secure, accessible infrastructure, 8.3 Leveraging technologies that support success, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.1, III.C.2
<b>Information System Security Specialist.</b> The Department of Education has determined that colleges are required to comply with federal regulations governing financial institutions. These regulations mandate that a college have a designated individual responsible for institutional IT security and provide ongoing security awareness training. Having a designated individual in this role is a requirement now, and Citrus College does not have an individual with this job description.	<b>Strategic Plan Focus Areas:</b> 8.2 Robust, secure, accessible infrastructure, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.3, III.C.4
<b>Implement Cornerstone Learning Management System</b> The CCC Chancellor's Office is offering a pilot of the Cornerstone Learning Management System for facilitating faculty and staff training and documenting learning. Pending cabinet approval, TeCS will join the Palomar College pilot and implement Cornerstone LMS in 2018-19.	<b>Strategic Plan Focus Areas:</b> 3.3 Professional development opportunities and resources, 8.3 Leveraging technologies that support success, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.4

Outcome	Mapping
<p><b>Software for Network Management</b> TeCS is limited in our ability to efficiently monitor the network. Adopting software for network management will allow us to improve the college's computing environment by automating the backup of network equipment configurations, monitor traffic and pinpoint bottlenecks.</p>	<p><b>Strategic Plan Focus Areas:</b> 8.2 Robust, secure, accessible infrastructure, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.3</p>
<p><b>Wireless Network Monitoring Software.</b> The Citrus College Wireless Network continues to expand and is becoming more of a critical resource. TeCS lacks the ability to troubleshoot connectivity issues, map wireless coverage, and provide convenient and safe guest access to the network. Given resources, TeCS will implement wireless network monitoring software.</p>	<p><b>Strategic Plan Focus Areas:</b> 8.2 Robust, secure, accessible infrastructure, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.3</p>
<p><b>Two-factor Authentication</b> Passwords are being rendered less effective for securing data due to the advancements in processing power. The CCC Technology Center reported in 2018 that they successfully hacked into the networks of 22 campuses using password exploits during their security assessments. All password exploits would be halted with the adoption of two-factor authentication. Given resources, TeCS will implement software to provide two-factor authentication for critical systems, improving security.</p>	<p><b>Strategic Plan Focus Areas:</b> 8.2 Robust, secure, accessible infrastructure, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.3</p>

Outcome	Mapping
<p><b>Upgrade networking hardware to accommodate 10g connectivity</b> The CCC Chancellor's office recently upgraded our connectivity to the internet to 10 gigabit - a 10-fold increase over our 1 gigabit connection. In order for our systems to take advantage of this bigger 'pipe' our networking hardware will need to be replaced. Part of this cost will be offset through a \$50k mini-grant. Given resources, TeCS will upgrade the Citrus College networking equipment to accommodate 10g connectivity.</p>	<p><b>Strategic Plan Focus Areas:</b> 8.2 Robust, secure, accessible infrastructure,  <b>USA- WASC- ACCJC- Accreditation Standards(2017):</b> III.C.1, III.C.2</p>
<p><b>Place staff, faculty and infrastructure equipment on an annual replacement plan</b> Computers used in computer labs and used by students is on a 5-year replacement cycle. Staff, faculty and infrastructure equipment are not funded on an annual cycle, which means that they often become obsolete and require replacement through office budgets, program review or one-time funding requests. Given resources, TeCS will implement regular and systematic replacements of obsolete hardware in staff and faculty offices, podium systems, projectors, in the network and in the data center.</p>	<p><b>Strategic Plan Focus Areas:</b> 8.2 Robust, secure, accessible infrastructure, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.2</p>
<p><b>Provide for Staff Development in order to stay current in technology</b> advancements, annual training must be provided to TeCS staff. In 2018, recommended training opportunities include training on Banner 9 page extensions, training on security monitoring tools, and training on the latest versions of operating systems, databases, networking equipment and development practices to facilitate cloud computing. Attendance at the CISOA/3CBG Conference and Ellucian Live conferences should be an annual event for designated staff.</p>	<p><b>Strategic Plan Focus Areas:</b> 3.3 Professional development opportunities and resources, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.A.14, III.C.4</p>

Outcome	Mapping
<p><b>Develop an integration between Banner and the International Student Admission Application.</b> The Terradotta system for managing international students was implemented in the International Student Center in 2016-17, and international applicants to the college can complete an application on-line through this system. However, staff is still required to manually enter the data collected from Terradotta and enter it into Banner. TeCS will develop a system to automatically load international student applications into Banner in a manner similar to that used for domestic applicants.</p>	<p><b>Strategic Plan Focus Areas:</b> 8.2 Robust, secure, accessible infrastructure</p>
<p><b>Complete an in-depth security assessment</b> The CCC Information Security Center provides vulnerability scanning and security assessments at no cost to California Community Colleges. One of the first tasks for the Information Technology Security Analyst will be to coordinate an assessment and identify security vulnerabilities that need to be addressed. The goal would be to complete this task in Fall 2019.</p>	<p><b>Strategic Plan Focus Areas:</b> 8.2 Robust, secure, accessible infrastructure, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.3</p>
<p><b>Implement DegreeWorks 5.x</b> The latest version of the Banner WingSpan ERP system, Version 9, will be rolled out beginning in Fall 2018. One of the most promising features of the new system is a student registration experience similar to a 'shopping cart' with the ability to populate the 'shopping cart' from courses in the student's educational plan. It is expected that this feature will improve the ability of students to stay on course for graduation. Implementation of Student Registration in Banner 9 will be completed by Summer 2019.</p>	<p><b>Strategic Plan Focus Areas:</b> 8.2 Robust, secure, accessible infrastructure, 8.3 Leveraging technologies that support success, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.2</p>



Outcome	Mapping
<p><b>Plan for the 2024 Ellucian (Banner) Contract Expiration.</b> The Banner WingSpan ERP system was originally purchased in 2004, and renewed for 10 years in 2014. This system is still based on a software infrastructure from the early 1990's and carries with it increasing support costs and declining service delivery from our vendor. Recently, new options for college ERP systems have emerged including a new competitor in the market (Workday) and the option to have the entire system hosted by the vendor (Ellucian) and running on remote servers in the cloud. In 2021, a work group will be formed to evaluate options and work with a consultant to generate a Request for Proposal (RFP) to evaluate options and ensure that the needs of Citrus College will be met in the future with a highly reliable and cost-effective ERP system.</p>	<p><b>Strategic Plan Focus Areas:</b> 8.2 Robust, secure, accessible infrastructure, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.2</p>
<p><b>Expand the use of the Power BI Business Analytics Tool.</b> In Summer 2018, Power BI Pro licenses were acquired for Institutional Research, Planning and Effectiveness (IRPE) and TeCS to develop interactive dashboards for program review activities and research queries. Work on this tool set is just beginning and has the potential to transform the ability of staff and faculty to understand the data connected to their programs. The goal is to pilot the tool in 2018-19 with a more expanded roll-out in 2019-20.</p>	<p><b>Strategic Plan Focus Areas:</b> 8.2 Robust, secure, accessible infrastructure, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.1</p>
<p><b>Develop an interactive web page for Guided Pathways.</b> The Guided Pathways project is poised to transform the way students choose a major and interact with support services on campus. A web page is needed to explain Guided Pathways at Citrus College, and have it serve as an interactive tool to guide students through the process in an engaging manner.</p>	<p><b>Strategic Plan Focus Areas:</b> 5.1 Enhance services through technology, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.1</p>

Outcome	Mapping
<p><b>Develop DegreeWorks templates for Guided Pathways.</b> The Guided Pathways project will require that curriculum paths be defined for students to minimize time to degree. DegreeWorks has the ability to store student educational plan templates with the ideal set of courses to take each semester to meet the desired educational goal. This will better inform students and should reduce the length of time spent in counseling sessions creating educational plans.</p>	<p><b>Strategic Plan Focus Areas:</b> 5.1 Enhance services through technology, 8.3 Leveraging technologies that support success</p>
<p><b>Implement class scheduling software to better align class offerings to student needs with respect to Guided Pathways.</b> A workgroup has been meeting during the 2017-18 academic year to identify software applications that would improve and streamline the process of scheduling classes in Banner. A software application called Infosilem has been identified and would meet the needs of Citrus College. The software has the ability to identify and reduce potential conflicts in scheduling classes that would increase the time to degree for students. The software application also eliminates the double-entry of data that occurs in the current scheduling process.</p>	<p><b>Strategic Plan Focus Areas:</b> 2.1 Scheduling, 8.3 Leveraging technologies that support success, <b>USA- WASC- ACCJC- Accreditation Standards (2017): III.C.1</b></p>
<p><b>Develop systems to improve retention in the Citrus College Promise Program.</b> The Citrus College Promise program officially began in Fall 2018. The program pays for enrollment and mandatory fees for fall and spring semesters during the first two years, and provides a textbook loan program to reduce the cost of textbooks for the student. Students in the program must apply for financial aid, enroll in a minimum of 12 units, enroll in math and English courses and satisfy GPA and progress requirements. Reports in Argos and</p>	<p><b>Strategic Plan Focus Areas:</b> 8.3 Leveraging technologies that support success, <b>USA- WASC- ACCJC- Accreditation Standards (2017): III.C.1</b></p>

Outcome	Mapping
<p>automated processes in Banner are required to alert students who are in danger of losing their grant. Reports and processes (such as automated e-mails) will be developed to help students stay in the program.</p>	
<p><b>Develop reports and systems to ensure quality data to maximize allocations under the new funding formula</b> The State of California will begin phasing in a new funding formula for California Community College in 2018. The new funding formula will include funding based on enrollment (Full-Time Equivalent Students), funding based on the number of low income students the district enrolls based on fee waivers and Pell grants, and number of degrees and certificates granted. Reports are needed to predict and improve accounting for the non-FTES factors to ensure optimal funding.</p>	<p><b>Strategic Plan Focus Areas:</b> 2.3 Fund FTES strategies, 8.2 Robust, secure, accessible infrastructure, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.1</p>
<p><b>Develop an on-line application for the Associate Degree in Nursing Program</b> Systems have been developed in 2018 to enable students to apply on-line for the Extended Opportunities Programs and Services (EOP&amp;S) program and for the Honors program. The Associate Degree in Nursing program has a manual application that requires significant staff time to manage, track and process. This application will be made into an on-line application and store information collected into a database to improve accuracy and streamline processing.</p>	<p><b>Strategic Plan Focus Areas:</b> 8.2 Robust, secure, accessible infrastructure, <b>USA- WASC- ACCJC- Accreditation Standards (2017):</b> III.C.1</p>

### Budget Planning

Software licenses and maintenance agreements often have built-in escalation clauses that result in cost increases year after year. Our largest expense is the cost of maintenance and licensing for the Banner WingSpan ERP system, which escalates at a rate of 4% annually. Hardware systems are sold with maintenance agreements that are initiated following expiration of the warranty period. These costs can impact the departmental budget in significant ways.

To offset these increases, Technology and Computer Services (TeCS) will monitor our software licenses on an annual basis and look for opportunities to cancel maintenance agreements for software applications that are no longer in use. In 2017, the college canceled the Ellucian Banner and Workflow applications that were not being used. In 2018, the college replaced the ERP scheduling software AppWorx with a more cost-effective EnterpriseSCHEDULE application and replaced our legacy Cobol compiler from MicroFocus to a less expensive NetCOBOL solution. The Resource 25 event management system is under evaluation for possible replacement in 2018. In 2021, TeCS will lead a work group to evaluate alternatives to the Banner WingSpan system before committing the college to a contract extension when the current agreement expires in 2024.

TeCS will also look to leverage capital funds to include extended maintenance and licensing agreements with hardware acquisitions, further reducing annual costs. We will also leverage grant funds and special allocations where appropriate. These actions will ensure that Citrus College has the means to invest in innovative technology solutions going forward.

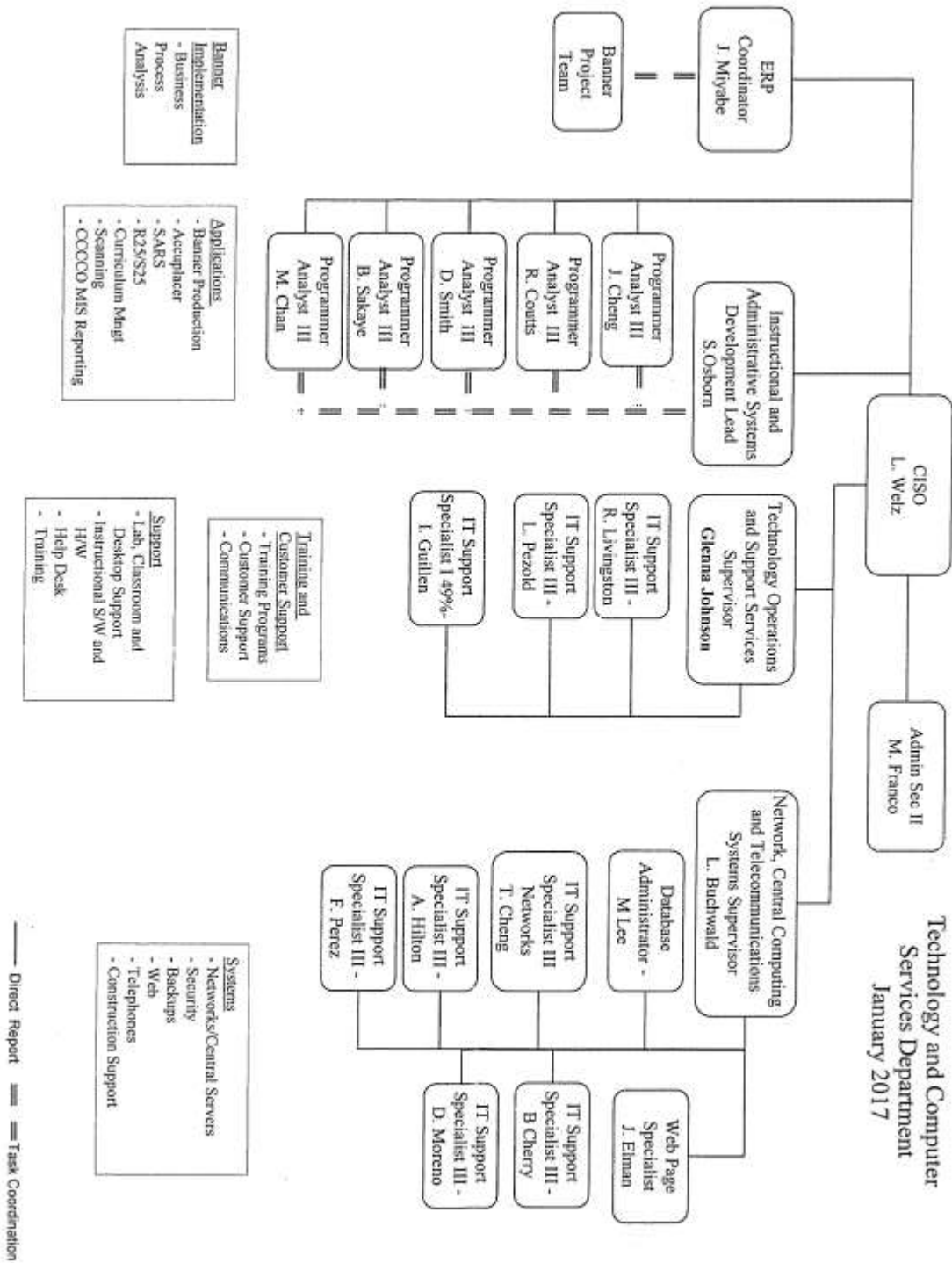
While many of the recommendations and goals identifies in this program review can be accomplished with current staff and budget, some will require additional budget resources. These are listed in table 8.

*Table 8 - TeCS additional resource recommendations*

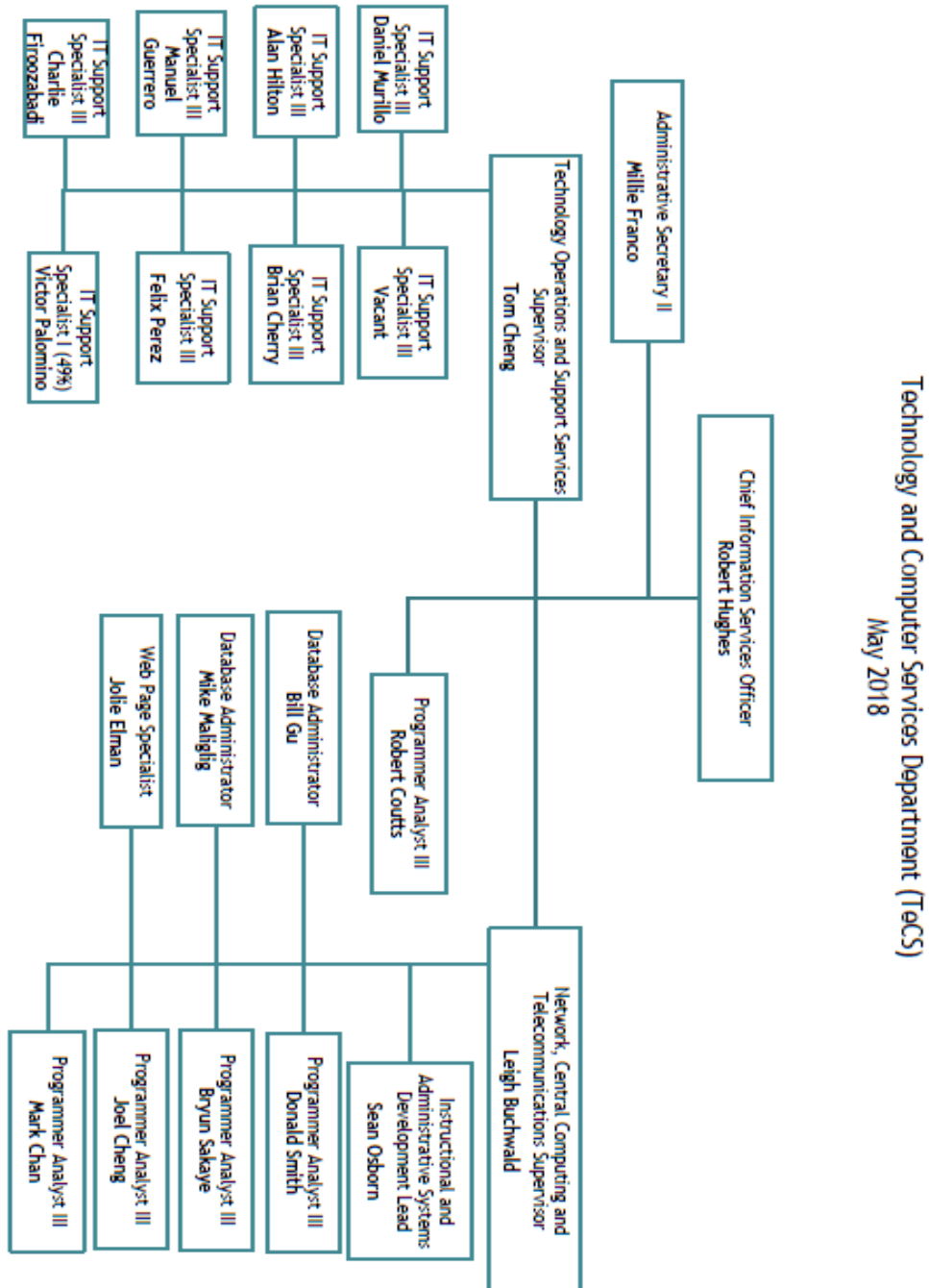
<b>Recommendation</b>	<b>Estimated Cost</b>	<b>Funding Source</b>
Software for Network Management	\$50,000	General Fund
Wireless Network Monitoring Software	\$60,000	General Fund
Two-Factor Authentication System	\$50,000	General Fund
Budgeted Allocation for staff, faculty and infrastructure replacements	\$650,000	General Fund
Consultant for RFP Development	\$50,000	General Fund
Expanded Licensing of Power BI Pro	\$5,000	General Fund
Interactive Web Page for Guided Pathways	\$10,000	Guided Pathway Allocation
DegreeWorks Templates for Guided Pathways	\$25,000	Guided Pathway Allocation
InfoSilem Class Scheduling Solution (software, training and installation)	\$150,000	Guided Pathways Allocation

## Attachments

Attachment A: Organization Chart as of January, 2017.



Attachment B: Organization Chart as of May, 2018.



Attachment C: EDUCAUSE Top Ten Issues for 2018

(<https://www.educause.edu/~media/files/educause/research/2018/2018-top-ten-infographic.pdf?la=en>)

