Administrative Process Redesign (APR)

"Working Together for Service Excellence"

Facilities Planning & Management (FP&M) Work Order and Service Process

Final Report & Recommendations

June 2016

Background

Leadership within Facilities Planning & Management (FP&M) has received feedback that some customers perceive FP&M Physical Plant as not being timely or within cost estimates when addressing service requests, providing required maintenance, or delivering in-house remodeling projects. As a result, it was decided that a thorough review of the FP&M Physical Plant Work Order process was necessary. As a first step, and to assist in defining the approach to the overall project, a work team with cross-campus representation was formed in Spring 2015 to reach out to campus customers to help better understand the customer experience with the current FP&M Work Order and Project Administration Center (PAC)[1] processes.

Three key themes for improvement emerged from these interviews: Communication, Cost/Billing, and Timeframe for completion of work. By contrast, customers reported that the quality of the workmanship is where FP&M excels. This data validates what FP&M leadership had heard anecdotally and can be summarized as follows:

1. The work order process is neither responsive nor user friendly for customers.
   - A significant difference exists between the expectations of the customers and that of the staff providing the service. Currently, there is no consistent upfront explanation of services or instruction for how customers should enter the process.
   - Several gaps exist in the current process: between the time of request and the start of the work, between PAC and shop staff, between different shops, and between handoffs of work when staff is on-site.

2. Customers report being frustrated by the lack of transparency and access to timely data and tools.
   - There is no definition for when work is completed or a consistent path for the Work Order or project billing that follows. Customers reported that they are not always informed of delays in work. Additionally, they reported that there is often a significant gap in time before billing. This is exacerbated when cost increases are involved and the customer is unaware of the additional charges until significant time has passed.
   - Customers do not understand the labor rates or the 'B' number used for billing.
   - Numerous customers have shadow systems that address the Work Order process, billing, and project management and scheduling in order to better meet their needs.

3. A gap exists between customer expectations and the constraints of the Work Order process.
   - FP&M staff providing estimates may not have enough information to provide an accurate estimate to customers.
   - Customers do not necessarily like the fact that they have no choice but to work with FP&M for their facilities requirements.
   - Customers commented on staffing patterns. They think some units are understaffed and unable to perform well. FP&M trades staff are split between maintenance and project work, and sometimes pulled away from one project for another priority.

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[1] PAC has been widely adopted across campus as synonym for the small project delivery process. For the purpose of this report PAC and small project delivery will be used interchangeably. The Project Administration Center was recently combined with Physical Plant Architecture/Engineering and renamed Campus Renovation Services.

- It takes longer to schedule and coordinate work in an occupied building than in a location under construction or an unoccupied space. This needs to be taken into consideration when scheduling and setting the timeline for the work.
- Customers noted that it was often up to them to communicate project details or initiate follow up with FP&M staff and/or between various groups at FP&M.

4. Generally, the frontline staff is exceptional and the quality of FP&M's work is excellent.

The goal of the project was to improve the current Service Request/Work Order and PAC processes within FP&M Physical Plant in order to increase customer satisfaction with service requests, scheduled maintenance, and the management of in-house projects. Specific improvements should be made to the intake process, communication, cost estimates, and timeliness.

The **deliverables** included:
- Redesigned processes for Work Orders, PAC and customer billing within FP&M Physical Plant.
- Requirements for new technology/system to support the redesigned processes.
- A plan to implement the new Work Order processes, including specific points of customer communication.
- A set of metrics to support and control the new processes.

The team consisted of the following individuals:

Jennifer Badtke	FP&M Physical Plant
Pam Barrett	FP&M Physical Plant
Josh Cutler	School of Pharmacy
Kirstin Fosdal	FP&M Physical Plant
Stefanie Freyberger	APR
Alice Gustafson	APR
Randy Hager	FP&M Physical Plant
Bruce Hellmich	School of Human Ecology
Robert Lamppa	FP&M Physical Plant (Co-Team Leader)
Geb Lefeber	University Housing
Margaret Maly	FP&M Physical Plant
Mike Pena	FP&M Physical Plant
Jeanne Schneider	School of Education (WCER)
Hope Simon	Nelson Institute for Environmental Studies
Margaret Tennessen	FP&M Administration (Co-Team Leader)
Mike Warren	Recreational Sports
Jesse Winters	School of Education

Subject Matter Experts included:

Sally Hansen	FP&M Administration
Sharlene Heacox	AIMS
Cindy Statz	FP&M Physical Plant
Duane Marlette	FP&M Physical Plant
Faramarz Vakili	FP&M Physical Plant

Project Methodology

The team applied the methodology of Lean Six Sigma to its work. The DMAIC (define, measure, analyze, improve, and control) framework was used to form the project plan.

Since the previous team engaged campus in a "Voice of Customer (VOC)" exercise, this team incorporated the results of the VOC into this project and began by defining and outlining stakeholders and customers, creating a current state process map, and seeking data from the Facilities Maintenance Enterprise (FME) Work Order system, PAC database, and the third-party after-hours contractor Integrated Communications Services (ICS).

While defining the current state by means of process mapping and walking the process in small groups, the team discovered three distinct processes which are being supported by the Work Order system:

- The Service process – the operations and maintenance process supported by Central Answering and Response Service (CARS).
- The After-hours process – the extended service provided outside of regular business hours, often in response to urgent or emergency calls to ICS or the UW Police Department (UWPD).
- The PAC process – the process in which non-capital campus renovation projects are planned, scheduled, and executed.

The project team decided to explore all three of these areas individually and eventually divided into two subgroups; one to redesign the Service and After-Hours processes, and another to design a new process for small projects. At the conclusion of walking the process, the team identified a list of observations and issues that were categorized into common themes (Appendix A), validating the VOC results. This document provided the foundation throughout the remainder of the project for multiple activities such as root-cause analysis, process map design, and brainstorming for solutions.

Service and After-Hours

This sub-team was able to generate a substantial set of root causes from which it developed and brainstormed numerous recommendations. These recommendations anchored the redesigned process.

PAC

The PAC subgroup took on the task of designing a new process, emphasizing improved communication within the PAC unit and with customers. The team focused on how each process step affected both the staff completing the work and the customer.

While the technical system supporting the PAC process provided some valuable data, overall consistent and dependable data were not available so the sub-teams used the available data for general direction only. Instead, the sub-team relied on the information gathered in process walks and interviews with internal staff to anchor the work. No level of agreement could be reached in diagraming the current PAC process even after walking it with staff, so the team decided to treat the project as one of design rather than redesign and moved directly into creating a future state.

For the purpose of this report, each team's work will be presented in a separate section.

Service and After-Hours

This sub-team grouped its observations and recommendations into five categories. Included at the end are the related items accomplished by FP&M staff during the life of the project.

Data

As previously noted, consistent and dependable data were not available, therefore the sub-team used the available data (Appendix B) for general direction only.

Findings and Recommendations

1. Intake and Work Requests

The significant observations and findings related to intake and work requests are outlined below.

- The current process does not work well for anyone; customers, dispatch, or FP&M employees.
- Customers use a "whatever works" approach to make the process work for them because the current process is not bringing them the results they need.
    - After hours, customers often skip the third-party dispatch (ICS) step to request assistance, and instead contact the person they know and trust, or UWPD.
    - When customers are unclear about the process, they call someone they perceive will get the job done.
- The work-arounds developed by both customers and FP&M result in confusion, separate tracking systems, and collisions in responsibilities.
- Some clients migrate away from using the services of the Physical Plant because they perceive it as quicker and more cost-effective to do it themselves.
- When walking the process, the team found that the after-hours process broke at the first step.
- The process was not well-defined and often was not used. This contributes to the creation of work-arounds and fewer calls made to ICS, the third-party dispatch center. Specific findings related to the after-hours intake included:
    - Calling ICS adds extra time to the process.
    - ICS staff is not knowledgeable about facilities and maintenance issues.
    - ICS was not able to provide any meaningful useable data.
    - There is no formal "on-call" protocol within Physical Plant so it is very difficult to get people to come in after hours.
    - There is no call-in policy or incentive for staff to be on-call and respond to after-hours call.
    - Holidays and legitimate time off impact the ability to provide premium overtime pay.
    - UWPD security officers are not trained for maintenance triage.
    - There is no communication back to customers on the status of their work order.

Recommendations - Intake and Work Requests:
- *Establish a new FP&M dispatch center, available 24 hours/day. This dispatch center will replace ICS, the current third-party system used for intake of after-hours calls.*
- *Create a 24/7 staffing model with a strengthened role for supervisors, including the following:*
  - *A supervisor will be available on all shifts to manage assignments and the priority of work.*
  - *Supervisors will need to supervise shop areas outside of their own expertise. In other words, their expertise is now in supervision rather than in any one trade.*
  - *Supervisors will manage and approve all overtime for their staff.*
  - *Supervisors will be on-site, connecting with staff as work is underway and completed.*
- *Create a true on-call process with clear expectations written into position descriptions. This will ensure that if a specified trade is needed but not employed on a given shift, someone is always available.*

2. FP&M Leadership and Management

Current FP&M leadership will face significant challenges in adopting new policies and procedures, and improving efficiencies due to long standing cultural practices.

- Cultural inertia may prevent changes from happening. Leaders will need to be prepared for staff at many levels of the organization to thwart change efforts.
- The work environment has become more about the knowledge holders than the transparency of the process and the ability of people to carry out their work. In the current system, many staff must rely on power users to get information.
- The team was told there are no checks and balances to verify accuracy of reported work hours.
- Supervisors appear to lack information needed to provide appropriate supervision to their staff.
  - Time worked is recorded in the work order system before it is approved by supervisors.
  - Overtime is not always approved in advance.
  - Each shop supervisor is allowed to create his or her own work flow process.
  - There is no standard method for assigning work.
- It is difficult for supervisors to be accountable for their performance or the performance of their staff.

The organization is lacking clear policies, an effective management structure, defined roles, a common vocabulary, and standard expectations for behavior and accountability.
- Guiding principles and values supported by standard operating procedures are not consistently communicated and enforced.
- FP&M staff perceives there are not enough resources to manage the workload. They do not seem to understand they are the resource and managing their time effectively is a significant part of the solution.

Recommendations - FP&M Leadership and Management:
The mission, vision and core values should be reviewed and restated. These should drive a customer service philosophy for FP&M which needs to be reflected in the policies, procedures, staff expectations and performance measures of the organization.

Specifically, FP&M will need to:
- *Recognize the extent of the culture change for the organization and, if necessary, employ outside expertise to assist with establishing the new foundational principles.*
- *Call out customer service as a priority in all aspects of the work.*
- *Create a common philosophy for business operations.*
- *Determine the organizational metrics needed to maintain service excellence.*
- *Restructure the organization, establish policies, clarify roles, and set expectations for behaviors and accountability.*
- *Strengthen the role of the supervisors.*
  - *Supervisors should be responsible for the portfolios of work of their staff.*
  - *Supervisors should make staff assignments and readjust the work assignments as necessary.*
  - *Supervisors should approve the timesheets of their staff.*

3. Work Order System

The sub-team found the current work order system (FME) to be an antiquated, legacy system with a series of software bolt-on systems that are no longer supported.

Data integrity proved to be a problem.
- The team discovered that changes can be made in FME with no tracking of who made a change.
- Even after repeated requests, the team was unable to receive reliable data from the system.
- The team recognized the data it was able to pull from the system was directional at best. However, it did not contradict the team's understanding of the process gained through process walks.

In addition, the sub-team realized that very few people understand the entire FME system.
- There is one master user with a global view. The team noted that having just one person in this role does not provide enough backup or transparency to the process.
- The staff person managing the work order system is responsible for the entire process. There appears to be no separation of duties within the system.
- It appears that processes were built around the FME system, rather than the system supporting the most effective process.
- Well-intentioned people trying to resolve customer or other process issues cannot solve problems because of their lack of access to the FME system or data flowing from it.
- The current system requires too many manual touch points. There is not enough automation supporting work order status, tracking, or reporting.

> *Recommendations - Work Order System:*
> - *A new workflow and automated system should be selected and installed to replace the current FME system.*
> - *The new system should be designed around the requirements of the newly created process.*
> - *All entries and changes to the system should be logged with time, date, and identification of the person making the change.*
> - *Separation of duties needs to be established such that the person taking the request is not the same person initiating or approving the charges/billings.*
> - *Work order status should be a visible point of data available to the customer and the staff working within the process.*
> - *Work order information should be pushed to supervisors to assist in assignments and management of priorities.*
> - *A new work order system should enhance customer communication.*

4. Billing

The sub-team observed that billing practices do not fit a customer service model, nor provide what the customer expects or deserves. Specifically, the team identified the following:

- The FP&M billing process is inwardly focused. Very little information is available to the customer.
- The FME data feeding the billing process is not dependable and varies from report to report.
- The current process and system make it difficult to track costs.
  - Generally, there is no agreement in place prior to the initiation of work.
  - There is no tracking of change orders or requests for additional work by the customer at the work site.
  - The existing rate schedule is complicated and difficult for customers to find.
  - Customers do not know if something is maintenance or if the work will be charged back.
  - Timekeeping is mixed into the billing process and is dependent on the staff member's reporting of hours worked.
  - Time charges are transferred too infrequently; currently every two weeks.
  - Bills are often negotiated due to confusion and poor documentation, making it difficult for staff and customers to develop an understanding of the billing process.
  - It is difficult for FP&M to defend or explain the charges billed after time has passed.
- The billing process is a point of frustration for customers.
  - There is little understanding of the billing cycle.
  - There is a separate billing number for FP&M charges. Each customer has a "B" number but there is no security or control maintained on that number.
  - There is no definition of a project end. Customers are surprised by unexpected charges.
  - There is no customer approval process. Money gets pulled from the customer account and a statement is sent after the transfer of funds.
  - Customers do not have access to the cost cycle and do not know the percentage of the project that is being billed.
  - Final bills are not sent until all of the vendors within the project have billed FP&M.
- FP&M has not established a path of escalation for adjustments or appeals.

Recommendations - Billing:
- *A rate sheet should be established and published for the customer's use.*
- *The explanation of when a project is charged and not charged should be simplified and published.*
- *A set of estimated standard charges for routine work should also be established and published.*
- *Eliminate the "B" number used only by FP&M. Instead bill to funding strings confirmed at the time of the work order request.*
- *Charges should be visible to customers at all time.*
- *Customers should have a chance to review and approve bills prior to payment being taken from their account.*
- *A detailed explanation of charges should be sent to the customer with the bill.*
- *A bill should not be delayed due to payroll adjustments or a delay in billing from an outside vendor.*
- *FP&M may receive a payment by funding transfer if the customer does not pay or disputes the bill within a set period of time.*
- *A monthly billing cycle should be established and maintained.*
- *A billing adjustment and billing appeals process should be created.*

5. Communication

The sub-team discovered customers are seeking and cannot find information related to their work orders.
- There is very little information "pushed out" to campus customers.
- Customers must know to look for the status of their project within a poorly designed portal.
- It is unclear who the customer should call if there is need for explanation or follow-up.
- The process itself is complicated and not transparent to the customer.
- There is no expectation that FP&M staff members need to communicate with customers.
- Staff may choose not to communicate since it may be uncomfortable for staff to receive difficult questions and negative feedback.
- Supervisors' contact information is not available to customers.
- FP&M staff and their customers do not share a common vocabulary.

The sub-team also observed that communication within FP&M needs to be improved.
- Supervisors are not part of the flow of information. They are given selective information by workers.
- Handoffs between staff may or may not happen.
- Communication tends to stop at the end of a shift.
- It is unclear how priorities for work orders are established. There is some indication that priority may be set by the trades person assigned the work order.
- It is unclear when a work order is complete.
- Communication tools and technology seem out of date and hinder the immediate flow of information between supervisors, staff and customers. For example, work orders cannot be updated in the field.
- It does not appear that anyone is assigned responsibility for owning the coordination of a work order or its close.

Recommendations - Communication:

- *Transparency should exist for all parties to the process at all times.*
- *Customers should be able to see the status of their work order and the running bill of charges. Information should be sent to customers; they should not need to search for it.*
- *A customer liaison should be assigned to a customer at the initiation of each work order.*
- *A process for escalating questions and appealing bills should be created.*
- *Supervisor contact information should be published and available to customers.*
- *Supervisors should be able to see the status of the work orders for all trades persons at any given time. Information should be sent to supervisors; they should not need to search for it.*
- *FP&M leadership should be able to see the status of all work orders and associated performance metrics. Information should be sent to leadership; they should not need to search for it.*
- *Expectations should be set within the organization for internal communication.*
- *Standard Operating Procedures (SOPs) need to be created for handoffs between shifts.*
- *Project managers need to be assigned when multiple trades are involved in a work order.*
- *Training for the new workflow and new process will need to be put in place and staff held accountable for it.*
- *New tools should be in place for managing the information related to the work order, and communication with customers and between staff.*
  - *Each staff member in the field should be assigned a tablet or cell phone as a communication tool.*
  - *Supervisors and customers should be notified when staff is on the work site and again when the work order is completed.*
  - *Time metrics should be automatically recorded and used to charge accurately and also to measure service delivery.*
  - *Supervisors may send assignments to staff in priority order and make adjustments as necessary.*
  - *Urgent assignments should be labeled as urgent and remain visible to everyone in the process until completed.*
  - *Work orders should not be able to be closed until confirmation has been sent to the supervisor and the customer.*

Future State Process Map

The recommendations outlined in this section of the report are anchored by a new future state process map which can be found in Appendix E.

Accomplished to Date

While the sub-team has been engaged in the design of the future state for the work order process, a number of activities have been taking place within FP&M, many of them laying the groundwork for the new processes.

- The Executive Director of the Physical Plant has set the stage for upcoming cultural change through a number of Physical Plant employee and supervisor meetings.

- Multiple vendor informational presentations on CMMS/Project Management software have been provided but no specifications have been developed yet.
- Due to some immediate concerns, all supervisors were interviewed by FP&M management to determine the current practices and systems used to manage employee overtime. The results clearly indicated that neither does a process exist nor do the supervisors have the technology tools to maintain control of overtime worked by their assigned staff. This aligns with the observations of the team. Currently, an overtime management policy has been drafted and is being reviewed.
- In response to a request from our facility clients and in collaboration with the UWPD, Physical Plant has implemented an ID badge program. A policy is in draft and has been submitted for approval to the FP&M policy and review committee. This effort is to assist in the identification of Physical Plant employees while assigned activities in a client's facility.
- Service Outage Notification and Restoration Response (SONARR). Physical Plant Operations is collaborating with the UWPD, DoIT to create structured communications at the onset and during primary utility service outages (electrical, heating, cooling, water supply, and sanitation) that affect one or more facilities. Service responders will communicate with the DoIT operations center and relay pertinent information related to the restoration efforts. The DoIT staff member will post the status and transmit the data to the applicable audience.
- CARS has been renamed as Physical Plant Customer Service to align with a renewed focus on the customer.

PAC - Small Project Delivery

This sub-team reviewed available data to lead their discussions and guide the design of a new process for small project delivery. Observations from the process walks formed the basis of the team's discussions and anchored all findings for the future state recommendations. Included at the end of this report are the related items accomplished by FP&M staff during the life of the project.

Data

Data was collected from FME and the PAC project database. The project load was analyzed based on the number and size of projects completed in the fiscal year 2015 (FY15) based on a set of metrics defined by the sub-team.

In addition, total costs of projects were compared to initial estimates plus the total of change orders for a random sample of projects completed in FY15. Post-completion customer project evaluation comments were compiled as well. The team analyzed various tables and charts, which helped generate discussions, inquiries about further detail, and eventually identification of solutions to areas of concern.

The sub-team found that the data results did not match what was heard in the Voice of the Customer phase. The team questioned the integrity of the data not only for this reason, but also because the data had to be manually manipulated and sorted at various points during the data-gathering process. As a result, the data were used sparingly and with great caution in developing the new process.

With the aforementioned limitations in mind the sub-team was able to use some of the data and from it draw the following conclusions:
1. One-third of the customer-requested estimates created by the PAC group did not progress to become construction projects (Appendix C).
2. Most customers received a detailed estimate as a product, regardless of whether they requested a detailed estimate or a preliminary estimate (Appendix D).
3. Change-orders during design and construction were not well-documented. It is not easy to compare the final cost of a project to the initial estimate because it is rarely known if the scope is the same or how much it has changed.

Findings and Recommendations

All findings and corresponding recommendations can be summarized into four categories.

1. Leadership and Organizational Change

The PAC sub-team supports all findings and recommendations regarding leadership and organizational change identified by the Service and After-Hours sub-team. Therefore, this section will only highlight those additional findings and recommendations that are specific to the PAC process.

- Historically, the small project delivery group operated as a sub-unit of the Physical Plant Operations and Maintenance area with separate Architect and Engineers (A&E) and PAC groups. Additionally, the trades persons moved between remodeling and maintenance jobs and had no formal reporting lines to anyone involved in the execution of remodeling projects.
- Until 2015, the PAC process lacked a dedicated director to oversee the various functions involved in the planning and execution of small project renovations. As a result, there was a lack of accountability.

Recommendations - Leadership and Organizational Change:
- *Small project delivery leadership should be able to see the status of all work orders and associated performance metrics.*
  - *Information should be sent to leadership; they should not need to search for it.*
- *Leadership should support uninterrupted construction and adherence to project timelines through regular internal reviews of active projects.*
- *Clearly defined performance metrics should be established:*
  - *To monitor adherence to project budgets and schedules;*
  - *For internal decision making; and*
  - *For sharing with customers.*
- *A philosophy of process transparency and partnership between the FP&M small project delivery group and our campus customers should be implemented through a commitment to:*
  - *Shared information;*
  - *Mutual agreement/understanding;*
  - *Flexibility to change;*
  - *Ongoing two-way communication;*
  - *Cost transparency; and*
  - *Clear documentation of changes to project budget, scope, and/or schedule.*
- *Stronger internal accountability to the process with consequences for non-compliance should be established.*
- *There is a need to set a standard for communication across FP&M and with customers.*
- *A formal escalation and dispute processes should be instituted.*
- *Leadership should clarify roles and responsibilities for all staff using a role and responsibility matrix.*
- *There should be a dedicated trades staff created.*
- *There is a need to create a fulltime estimator role whose duties will include tracking active projects for estimate accuracy and developing a cost database to provide greater consistency in estimating.*
- *Schools, colleges, and divisions should be required:*
  - *To identify dedicated customer liaisons that are authorized to approve projects, scope changes, funding, and change orders; and*

> - o *To prioritize their projects in times of heavy workloads.*
> - *A process should be identified to deliver materials to a job site in a timely fashion and implemented.*
>   - o *Have Central Stores staff make deliveries to reduce travel time of trades staff.*
>   - o *Provide on-site staging areas for materials.*
>   - o *Have trades staff order materials using mobile devices.*
> - *There is a need to create a fulltime Scheduler role whose duties will include assignment of staff resources to better align staff, workloads, and project timelines.*

2. Information Technology (IT)

The sub-team observed that the current IT environment supporting the small project delivery process is a patchwork of systems. A/E, project administrators, construction managers, shop supervisors and trades staff all use different tools to manage work and project delivery. Work orders for small projects are ultimately generated from FME, but the variety of overlapping systems creates confusion and does not provide a consistent record of a small project from start to finish.

- The IT systems and databases supporting the small project delivery process are not integrated with each other or FME.
- Multiple systems within FP&M and on the customer side are used to track project information requiring repeat data entry.
- Processes have been built around existing IT system.
- The existing FME system is no longer a supported product.

In addition, the customer experience with the current IT environment is not positive.

- Customers are frustrated by the tools available to them.
  - o The interface is not intuitive and it is difficult to find information.
  - o Data is not presented in a way that is useful.
  - o There is no way to view work progress or work billed versus budget.
  - o There is a lack of integration with existing IT systems, i.e. WISDM, WALMS, INSITE.
- There is no way to view a summary of multiple projects.
- There are very few standard reports available and it is difficult to find, generate, and reconcile information within a project and across project with other relevant data.

Finally, there is a lack of data management and integrity within the current IT structure.

- Changes to project information can be made at any time by any staff member who has access to the FME system, including after project completion, making exported data unreliable.
- Data that is exported requires several manual steps and extensive historical knowledge to create understandable reports.
- Systems and processes rely heavily on manual data entry and paper records.
  - o Staff members often spend time manually copying data from one system to another or from paper forms to IT systems.
  - o Task lists and timesheets are paper-based which delays the assignment and reporting of work and limits the ability of customers and supervisors to track progress.

Recommendations - Information Technology (IT):

Implement a dedicated project management IT system that serves all aspects of small project delivery. This could be part of an overall service order and maintenance IT solution, if such a system satisfies the requirements of the small project delivery process. If such a system is not available, or is impractical to implement and manage, then a stand-alone IT solution should be identified for small project delivery.

Information technology should be woven into all aspects of the small project delivery process to support transparency and communication with customers and FP&M staff. The new IT system must be customizable to meet the requirements of the small project delivery process.

- *Implement a project management system that is designed to support all phases of small project delivery, including:*
  - o *Drawings and design documents storage.*
  - o *Construction planning and management.*
  - o *Change orders, submittals, and requests for information (RFIs).*
  - o *Budgets, bids, and cost tracking.*
  - o *Communication records.*
- *The new system should:*
  - o *Ensure a high level of data integrity.*
  - o *Be holistic, avoiding repetitive data entry in multiple places.*
  - o *Allow for data viewing by various users at differing levels of detail.*
  - o *Allow for interconnection of or co-residence of project construction information with project financial and billing information.*
- *Critical features for a new IT system should include:*
  - o *Customizable permissions for different types of FP&M staff and customers.*
  - o *Integrated project approvals.*
  - o *Functional across common mobile devices, browsers, and operating systems.*
- *Mobile technology for all small project delivery staff should be deployed to.*
  - o *Emphasize use across all areas of small project delivery.*
  - o *Use this technology to maximize productivity in the field and allow for real-time tracking of project resources.*
  - o *Examples of mobile technology uses could be:*
    - ▪ *Time tracking-check in/out at job site*
    - ▪ *Ordering Materials*
    - ▪ *Providing progress updates*
    - ▪ *Providing and/or reviewing change order information*
- *The IT system must be maintained as the single, authoritative repository for all project information and records.*
  - o *Supervisors, staff, and customers must be held accountable for using the IT system consistently.*
- *An IT management plan should be developed to sustain system performance over time.*
  - o *Ensure the IT system is updated and modified as processes and procedures change.*
  - o *Ensure the IT system is fully supported by the manufacturer and/or vendor.*
  - o *Identify and evaluate new features and technologies that might improve processes.*
- *A dedicated IT support team needs to be established who should be responsible for maintenance, upgrades, and training.*

Recommendations - IT (continued):

- *Customer project and portfolio dashboards should be created that show:*
  - o *Active and historical projects;*
  - o *Status of work and budget; and*
  - o *Project schedule information.*
- *Project Managers and experts portfolios should be visible in the system to all FP&M staff.*
- *There is a need to design a new intake form containing:*
  - o *A designated field for Approval Authority.*
  - o *A progressive pull-down list.*
  - o *The ability to submit photo/files.*
- *Contact information should be maintained for customers, approvers, and project managers.*
- *A website needs to be created and maintained where customers can educate themselves on the small project delivery process:*
  - o *Include an estimate formula matrix.*
  - o *Provide sample schedules by project type.*
  - o *Provide and explain the options for project delivery.*
  - o *Explain project management practices and metrics.*
  - o *Make available project categories including code and review requirements.*
  - o *Detail how each phase of the project (intake, design, construction, close out, and billing) works.*
  - o *Provide guidelines for maintenance funding on small projects.*
- *Single electronic intake interface should be considered that serves both project and service order requests. This could be either an integrated feature of the small project delivery IT system or a stand-alone interface that feeds data into the project management system after a request is reviewed. Critical features include:*
  - o *Intuitive interface;*
  - o *Mobile device capability;*
  - o *Ability to upload documents and photos;*
  - o *Drop down menus and pre-populated fields based on customer inputs;*
  - o *Automated flags based on custom criteria (historic building, hazardous materials, etc.); and*
  - o *Automated request routing based on custom criteria.*
- *There should be an automated workflow in one system from design to construction to billing.*
  - o *Data should not require manual transfer or entry at each project phase.*
- *An approval process and decision schedule should be created.*
- *An authenticated approval process needs to be investigated.*
- *There should be automated notifications in place that are customizable for organizational needs and sent within FP&M and to customers.*
- *All changes and actions should be logged with user information, date, and timestamp.*
- *There is a need to create one project identifier that ties all aspects of the project together.*
- *Customizable reports should be developed such as progress reports (e.g. percentage complete, percentage of budget spent, schedule attainment).*
- *Data in existing IT systems such as WISDM, WALMS, INSITE, Resource 25 should be leveraged via integration or automated data transfer.*
- *Data should be retained according to accepted records retention standards.*
- *Any deletion or significant alteration of data must require approval from FP&M leadership.*

3. Communication

The sub-team discovered customers are seeking and not able to find information related to their work orders.
- There is very little information "pushed out" to campus customers.
- Customers must know to look for the status of their project within a poorly designed portal.
- It is unclear who to call if there is need for explanation or follow-up.
- The process is complicated and not transparent to the customer.
- There is no clear expectation set if and when PAC staff should communicate with customers.
- Staff may choose not to communicate since it may be uncomfortable for staff to receive difficult questions and negative feedback.
- Supervisors are given selective information by workers and are not part of the information flow.
- Small project delivery staff and their customers do not share a common vocabulary.

Recommendations - Communication:
- *Customers need to be better informed of the process.*
- *Customers need to know what they can expect, and how the process works.*
- *Customers need to understand the vocabulary the small project delivery group uses.*
- *The approval process should be improved to ensure all parties involved are on the same page.*
- *Customers should be able to see the status of project and the running bill of charges. Information should be sent to customers; they should not need to search for it.*
- *A customer liaison should be assigned to a customer at the initiation of each project request and remain consistent throughout the process.*
- *New tools should be in place for the management of information related to projects and communication to the customer and between staff.*
  - *Supervisors and customers should be notified when staff is on-site and again when the work is completed or changes occur.*
  - *Communication with the customer about when the work is complete should be clear and consistent.*
  - *Customers should be informed when the work is done and occupancy can occur.*

The sub-team also observed that communication within the small projects delivery team needs to be improved.
- Communication is not mandated or outlined and it varies significantly based on who is communicating.
- Handoffs between staff may or may not happen.
- Priority seems arbitrary and it is unclear how priorities for work are established. There is some indication that priority may be set by the trades person who may not have updated information.
- It is unclear when work moves between statuses within the small projects delivery group and who is assigned to and responsible for it.
- Communication tools and technology seem out of date, and hinder the immediate flow of information between supervisors, staff, and customers.
- Small project delivery staff and their customers do not share a common vocabulary.
- It does not appear that anyone is assigned the responsibility for owning the coordination of the process or when it is done.

Recommendations - Communication:

- *Transparency to the process should exist for all parties at all times.*
- *Management should introduce consistent vocabulary and standard definitions.*
- *Supervisors should be able to see the status of all projects for all trades at any given time.*
    - *Information should be sent to supervisors; they should not need to search for it.*
- *Expectations should be set within the organization for internal communication.*
    - *Create accountability for communication.*
- *Training for the new workflow and new process will need to be put in place and staff held accountable for it.*
- *The new process should facilitate (immediate) communication of changes requested by customers to all parties involved.*
- *A standard for communication among all parties involved in the process should be defined.*
- *There should be clear visibility of all projects in the pipeline (master schedule) to all PAC personnel.*
- *Time metrics should be automatically recorded and used to charge accurately and also to measure service delivery.*
    - *Supervisors should send assignments to staff in priority order and make adjustments as necessary.*
    - *Urgent assignments should be labeled as urgent and remain visible to everyone in order to measure service delivery.*

4. Policies & Procedures

A new process must be designed with accompanying policies and procedures to act as a backbone for the process and give it strength. In this case, several weaknesses within the current system led to the suggestion of several policies and procedures. The sub-team found:

- Estimating methods differ between process work groups, making it difficult for customers to compare costs and track charges.
- Gaps between estimated costs and final charges are difficult to account for due to lack of consistent documentation for changes requested/required during design and construction.
- Final billing statements provided to customers do not include the detail necessary to compare final charges with estimated costs. There is currently no process for customers to dispute charges before funds are transferred.
- It is unclear to customers how project priority is determined and there is currently no policy that addresses urgent or high priority projects.
- Deadlines and targets for deliverables (estimate, design, construction, etc.) are difficult to rely on and are often missed.
- The current process does not clearly differentiate between a rough estimate and a detailed estimate. The result is that detailed estimates are provided for the majority of projects. On average, preliminary estimates require 60 days to complete which is significantly longer than a rough estimate.
- A Lack of clarity on who has authority to make decisions regarding project scope and budget creates confusion for FP&M staff. Large or changing customer groups often result in disruptions to the project's anticipated schedule and/or budget.
- Construction work has a tendency to start and stop causing longer periods of disruption for customers and building occupants.

- o There is no formal handoff procedure when transitioning a project from design staff to construction staff.
  - o Trades staff gets pulled off of remodel projects to carry out service work orders.
  - o Sometimes construction comes to a standstill because materials have not been ordered in a timely manner or because a project has been started without enough preplanning or preordering.
- Project completion is not formally communicated.

Recommendations - Policies & Procedures:

Policies:
- *Introduce a policy which requires State approval prior to the start of demolition and construction for projects that require DSPS[2] review (IEBC[3] Level 2 or higher).*
- *Require punch list creation before post-renovation tenant occupancy.*
- *Lead designer will hold primary responsibility for customer budget and project status communication for entire duration of project, from initial project assignment to construction conclusion.*
- *Customer must designate a single point of contact who holds authority to designate funding (or designee) and who will be required to make all decisions regarding project progress, scope, and budget.*
- *Require submittal of requests for and approvals of projects by certain deadlines in order to guarantee winter break and summer construction.*
- *Require occupancy permit inspection and signoff by an architect on applicable projects before post-renovation tenant occupancy.*
- *Create a group of trades staff dedicated to remodeling projects and develop a policy for occasions in which cross-utilization with service and maintenance staff is required.*

Procedures:
- *Hire multiple estimators to create and maintain a clear rate structure.*
- *Formalize the design and construction change order processes and documentation.*

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[2] Department of Safety & Professional Services.

[3] The International Existing Building Code defines three levels of alterations to a building:

- Level 1 alterations include the removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment or fixtures that serve the same purpose.

- Level 2 alterations require DSPS approval and include the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment.

- Level 3 alterations comply with the provisions of a Level One and a Level Two alteration, and;

  - o Where the work area exceeds 50 percent of the aggregate area of the building;
  - o Any and all work areas whether or not they include exits and corridors if they are shared by more than one tenant regardless of occupant load unless remodel is strictly for accessibility;
  - o Certain cases in high rise buildings having occupied floors more than 75 feet above the lower level of fire department vehicle access (HVAC and elevators); and
  - o Boiler and furnace equipment rooms in certain occupancies.

Recommendations - Policies & Procedures (continued):

- *Review the billing process and create more transparency.*
    - o *Introduce progress billing to include customer approval and a process for disputing charges.*
    - o *Introduce final billing to include customer approval and a process for disputing charges.*
    - o *Review and address concerns related to funding that is limited by fiscal year.*
    - o *Consider issues of cost reporting versus billing and the appropriate frequency of each to customer (i.e., monthly reporting and quarterly billing).*
- *Introduce an expedited/high priority process.*
    - o *College/division may be asked to reprioritize their projects in order to accommodate urgent requests.*
    - o *Priorities between colleges or divisions will be decided in consultation with campus leadership.*
- *Define clear expectations on turnaround time for deliverables and utilize design reports to measure compliance.*
- *Reduce time spent on estimates by formalizing the rough estimate process. Include language stating the purpose of a rough estimate, a cost range, and period of time for which the estimate is valid for.*
- *Introduce and communicate a fee structure for estimating and design services.*
- *Create a cost catalog.*
    - o *Provide customers visibility to old projects for comparison.*
- *Define a campus standard for material and a worklist based on campus standards.*
- *Utilize a graduating contingency on estimate accuracy.*
- *Introduce a triage process to review new projects and determine the most appropriate and efficient route to achieve the project and customer goals.*
- *Identify college/division facilities representative to formally delegate approval authority to the department/unit level for project decisions and budget.*
- *Formalize handoffs from one step in the process to the next.*
- *Improve continuity of construction work.*
    - o *Formalize a pre-construction meeting with trades, design staff and customer to address the staging area, site access restrictions, construction schedule, site safety, etc.*
    - o *Develop site signage to notify building occupants of the project scope, access restrictions, estimated completion and main project contacts.*
    - o *Reduce on-site disruptions and safety risks by introducing an occupancy policy restricting construction site access and defining when the space may be occupied (including DSPS approval where applicable).*
- *Institute a formal punch list process that includes meeting with customer, resulting in a punch list agreement document to include:*
    - o *Punch list scope as compared to original project scope plus change orders;*
    - o *Estimated occupancy date;*
    - o *Sign off by the customer and FP&M to document the agreement of final scope; and*
    - o *Clearly communicate and document warranty information and warranty claim responsibilities on purchased items and the work of the trades.*

Future State Process Map

The recommendations outlined in this section of the report are anchored by a newly designed future state process map which can be found in Appendix F.

Accomplished to Date

At approximately the same time that it was determined to request this APR study of the small project and work order processes, FP&M coincidentally removed small project design and administration from the maintenance portion of the Physical Plant and hired a new director to manage the area as a separate entity. In March of 2015, Pamela Barrett came on staff as director of this newly-formed group. Since that time, she has been a participant in this APR process, and has been working with others in FP&M and the small project group with parallel goals.

As a result of this organizational update, several changes to the group name, staffing structure, and administrative tools have been implemented. While the APR team is focused on crafting a future-state process, they acknowledge the updates that have been made to strengthen the current process. It is important to note that while these accomplishments may have been informed by the APR team's work, they were not initiated by the team.

- Project administrators and construction managers were moved from the Service Building to 30 N. Mills Street, which means that the entire group is now together in one place where they joined the groups architects, engineers, and other staff.
- To address existing confusion regarding definition of the term PAC, the group has been renamed to Campus Renovation Services. Progressive announcement and campus awareness is being made through a deliberate communications campaign being driven by the FP&M communications director.
- A new organizational chart is almost finished for the new department. The new chart reflects the goals of interdepartmental integration and communication and continuity of flow of information for customer awareness.
- First steps have been taken towards the goal of allocating a specific trades force to the campus renovation services group. Data analysis has been done to determine desired group sizes (i.e., the number of carpenters needed, etc.). Contracts for outside services (for additional manpower) in each trade are now in place beginning this year. (Previously, these contracts had been in place for select trades only).
- A construction scheduler was hired to populate and run scheduling database of all projects to help the group better allocate resources and to allow the group to eventually provide and update schedules for customers.
- In an effort to shorten turnaround times and catch up on backlog, an additional architect and an additional project administrator were hired, both as two-year project appointments.
- In alignment with the need to address the one-third of estimate requests that do not proceed to actual projects, and with the need to improve turnaround times, a new Preliminary Budget Form and a Feasibility Evaluation Form were designed and the group has begun using them.
- A project estimator was hired to convert current project estimates to materials-and-labor for entry into the scheduling software (done), study historic project pricing (done), study create metrics for and produce the rough estimates (in process), and eventually purchase and populate estimating software.

- Purchased lightweight laptops with connectivity to all project documents for construction managers to use on job sites with the goal of cutting down on travel time for construction managers.
- Multiple vendor informational presentations on CMMS/Project Management software have been provided but no specifications have been developed yet.

Next Steps

This team report is an important way to document the team accomplishments and recommendations for improving the current state. After submission of this report, a meeting will be held to update the sponsors on the outcome of this project. Following the sponsors' approval of the solutions an implementation plan will have to be developed providing a detailed outline of key milestones.

Appendices

Appendix A: Process Walk - List of observations/issues categorized by themes - Last revised 11/11/15

Observations/Issues	Themes
Accountability (lack of communication)	Communication
Communication with customer	Communication
Communication within FP&M	Communication
Handoffs confusing/did not happen	Communication
How is priority determined/communicated	Communication
Supplemental systems	Communication
Never know when work is complete	Communication
Customers do not know where to find information	Communication
Customers do not know that information exists	Communication
Unclear who is the process owner	Communication
Management of the resources vary by shop	Communication
There is no process where the customer can look and approve charges/bill	Communication
Building manager role is unclear - lots of variance	Communication
People are building/using their own tools to keep track of projects	Communication
Not sure about policies and guidelines	Communication
No clear escalation path	Communication/Timeliness
Responsiveness from initial request	Communication/Timeliness
No on-call policy	Communication/Timeliness
Unclear on-call process	Communication/Timeliness
Inconsistent assignment of staff (may depend on maintenance budget)	Communication/Timeliness
Accountability with respect to cost	Cost
Estimate accuracy	Cost
Gap between estimate and final bill	Cost
No price sheet/ costs are hard to anticipate	Cost
Lack of clarity of which costs are maintenance related vs. departmental costs	Cost
Who is making decisions whether something costs vs. no costs	Cost
Lack of transparency in rates	Cost
Lack of transparency in billing (lack of meaningful detail)	Cost
Bypass the process all together	Intake
First review of the issue - triage team	Intake
Timeliness of the full process	Timeliness
Lack of reasonable targets	Timeliness
Deadlines/targets are moving	Timeliness
Urgent process has too many steps	Timeliness
Many manual steps	Timeliness
It takes too long to receive an estimate	Timeliness
Projects which generate revenue get priority	Timeliness
Timeliness of the closeout process - when is the project done	Timeliness
Building access is an issue	Timeliness
People seem to have very heavy portfolios	Timeliness
Duplication of efforts/data entry	Timeliness

Appendix B: Work Order (WO) Lead Time for Service calls - Last revised 1/13/16

# Shops	Avg # Days - WO create to *last timecard*	Avg # Days - WO create to *last charge*	Avg # Days - WO create to *complete*	# WO	% Total WO
WO lead time					
All Service/Maintenance WOs with timecards*					
1	13	31	161	22362	80%
2	23	42	192	4241	15%
3	25	44	175	1308	5%
4	69	99	250	156	1%
5	84	129	278	36	0%
6	113	158	307	11	0%
7	68	132	144	1	0%
8	99	117	175	2	0%
Total	**16**	**34**	**167**	**28117**	**100%**

Days - WO create to last timecard	# WO	% Total WO
`After Hours WO		
<0	350	44%
0	315	40%
1	36	5%
2	17	2%
3	14	2%
4	9	1%
5	1	0%
6	6	1%
7	3	0%
8	2	0%
9	2	0%
10	4	1%
>10	35	4%

*excl. After Hours WOs (last timecard may be before WO create date)`
*excl. WOs without timecard (e.g., key cutting)

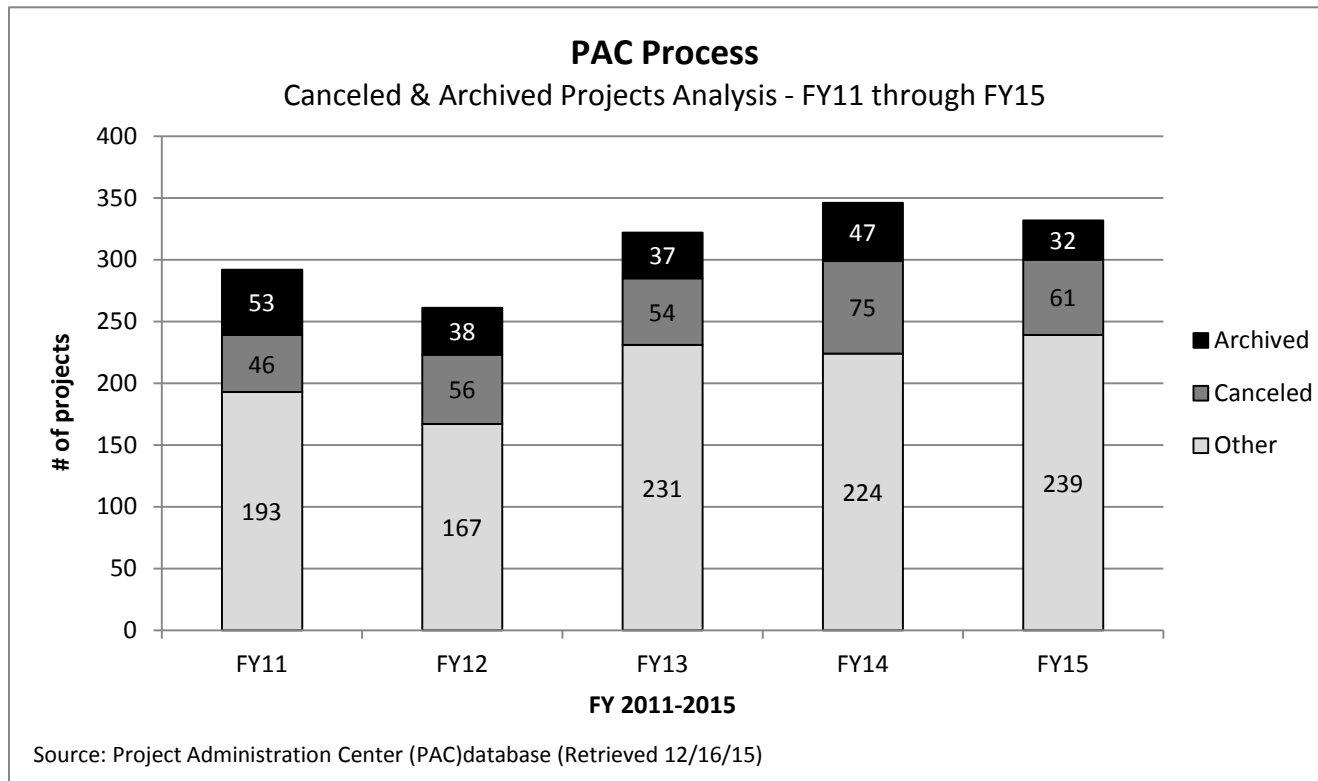Source: Facilities Maintenance Enterprise (FME) (Retrieved: 12/16/15)

Appendix C: PAC Process - Canceled & Archived Projects Analysis - FY11 through FY15 - Last revised 01/06/16

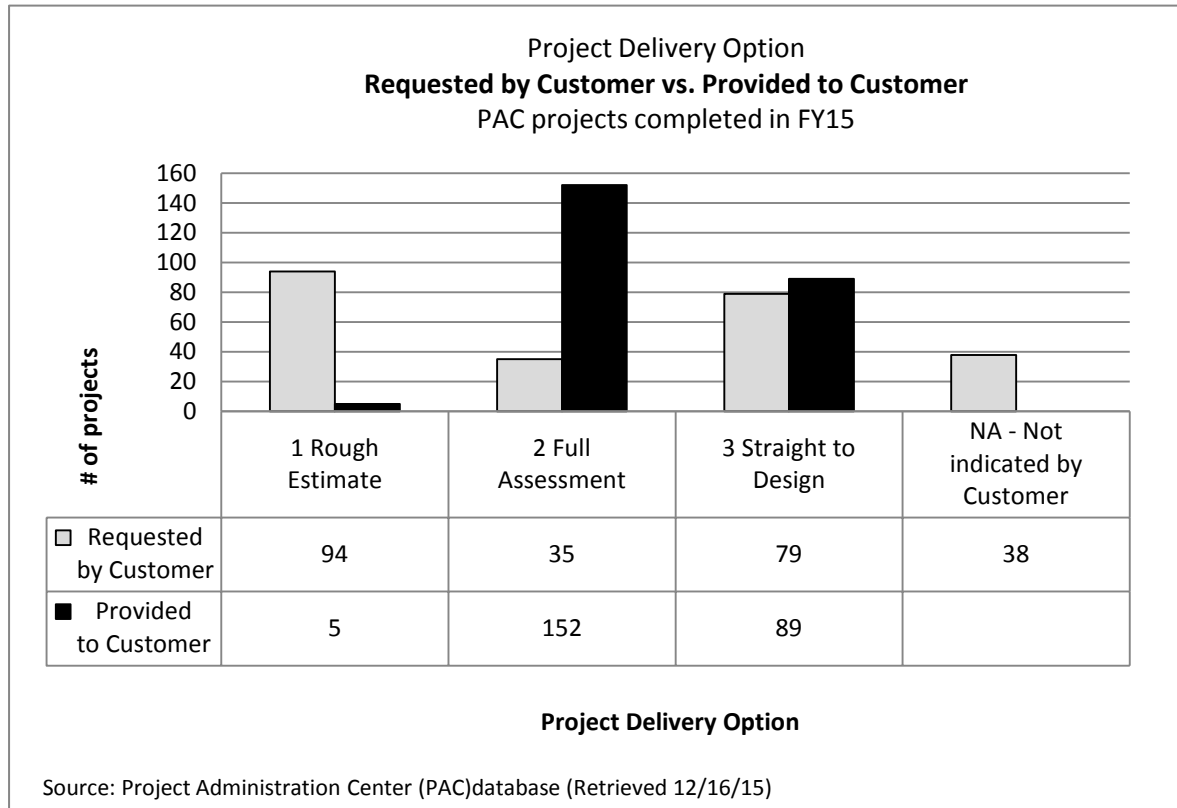| Fiscal Year	Total Projects	Canceled	% Canceled	Archived	% Archived	Returned from Archive	% Returned from Archived
2011	292	46	16%	53	18%	4	1%
2012	261	56	21%	38	15%	0	0%
2013	322	54	17%	37	11%	2	1%
2014	346	75	22%	47	14%	2	1%
2015	332	61	18%	32	10%	1	0%
	1553	292	19%	207	13%	9	1%

Main findings
Less than 1% of archived projects are returned to active status.
1/3 of all PAC projects were canceled or archived.

PAC Process

Canceled & Archived Projects Analysis - FY11 through FY15

Source: Project Administration Center (PAC)database (Retrieved 12/16/15)

Appendix D: Comparison - Project Delivery Option Requested by Customer vs. Provided to Customer - Last Revised 1/27/16

Types of Delivery	Requested by Customer	Provided to Customer	% Requested	% Provided
1 Rough Estimate	94	5	38%	2%
2 Full Assessment	35	152	14%	62%
3 Straight to Design	79	89	32%	36%
NA - Not indicated by Customer	38		15%	
Total # Projects completed in FY15	**246**	**246**		

Main findings

62% of all projects completed in FY15 were given a full assessment while only 14% were requested.

38% of the projects were requested to start with a rough estimate but only 2% received the delivery option requested.

Project Delivery Option
Requested by Customer vs. Provided to Customer
PAC projects completed in FY15

# of projects	1 Rough Estimate	2 Full Assessment	3 Straight to Design	NA - Not indicated by Customer
☐ Requested by Customer	94	35	79	38
■ Provided to Customer	5	152	89	

Project Delivery Option

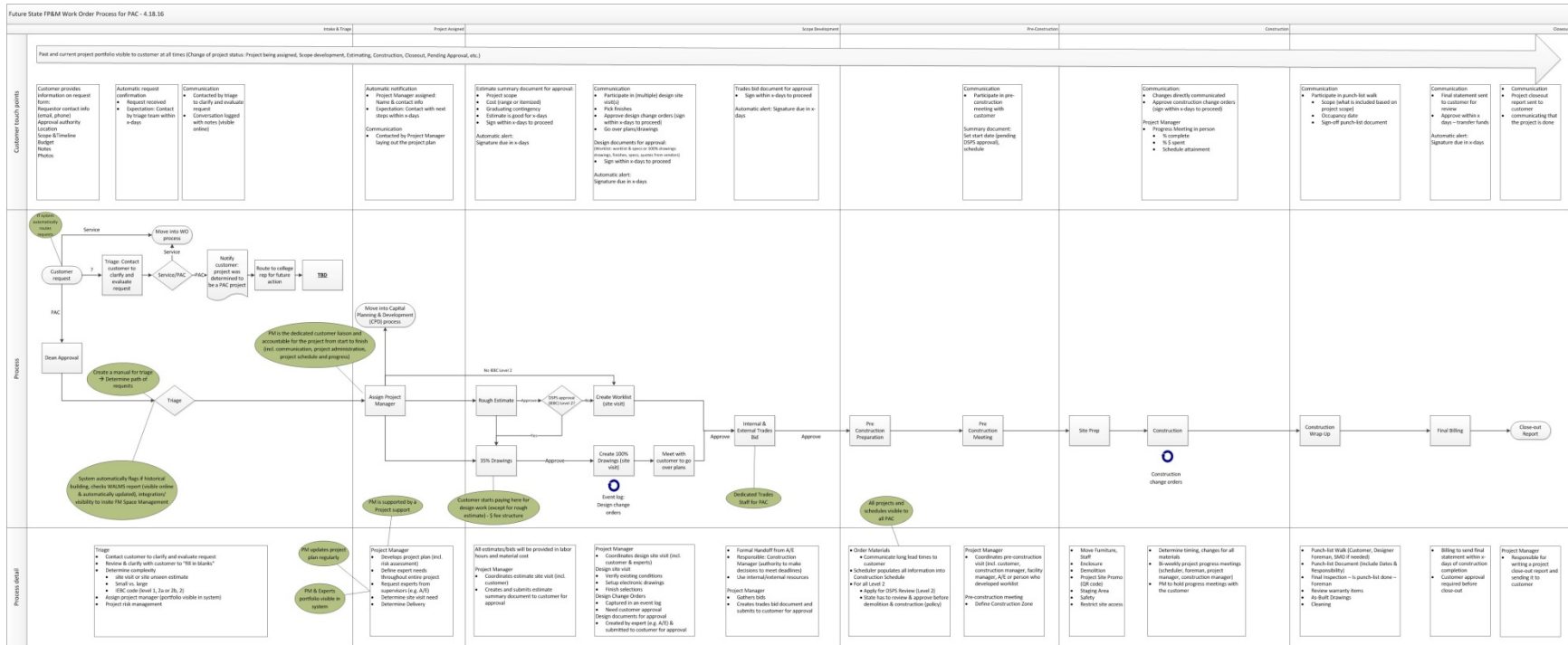Source: Project Administration Center (PAC)database (Retrieved 12/16/15)

Appendix E: Future State FP&M Work Order Process for After-Hours and Service - Last revised 3/2/16
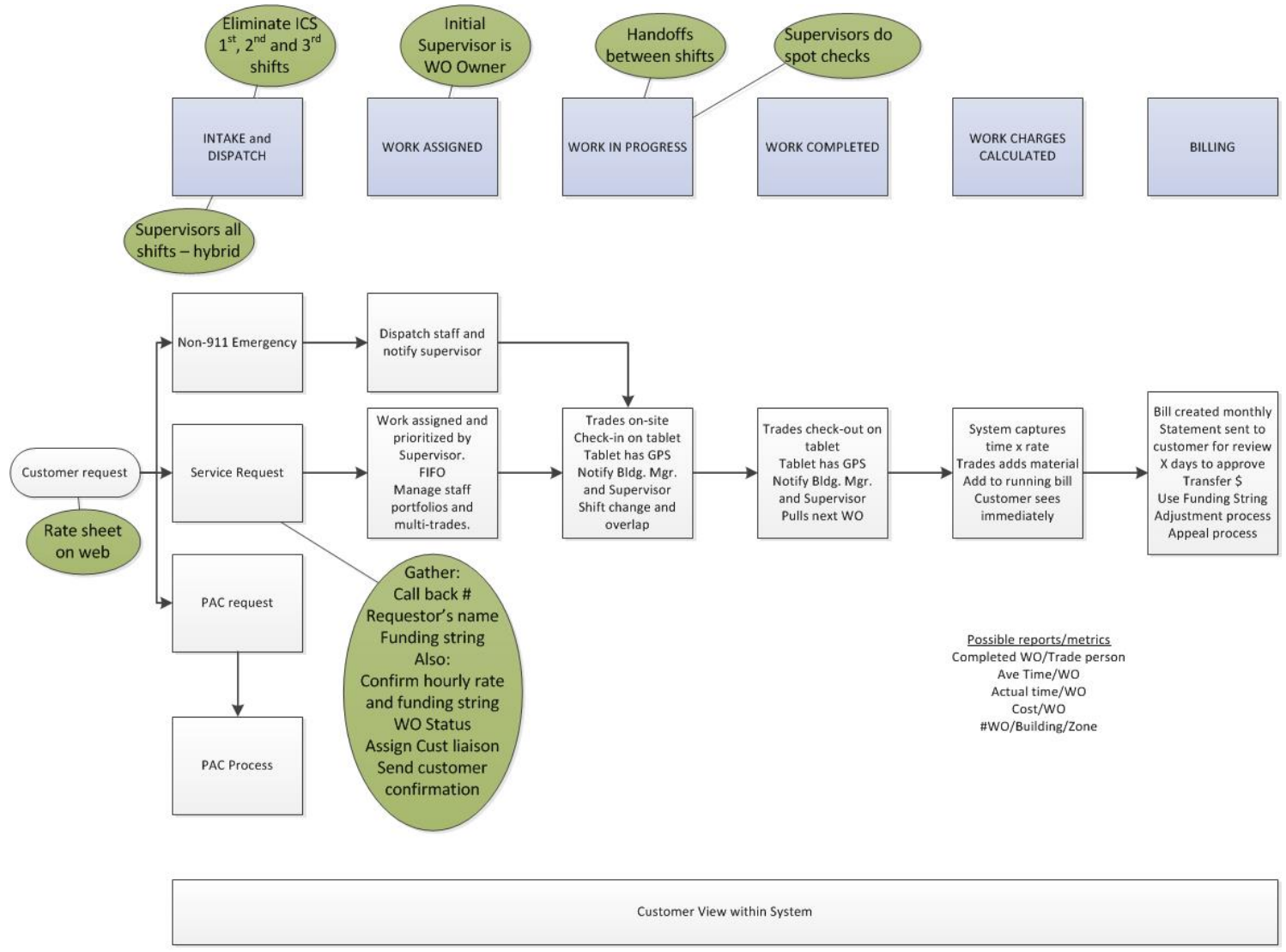
Future State FP&M Work Order Process for After-Hours and Service
3.2.16

Appendix F: Future State FP&M Work Order Process for Campus Renovation Services - Last revised 4/18/16

Note: A larger version of this process map is available upon request