Capital Project **Planning Toolkit**

Five Tools to Educate Project Sponsors on the
True Costs and Processes of Capital Projects

EAB

Capital Project Planning Toolkit

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True Costs and Processes of Capital Projects

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How to Use This Toolkit

Most higher education institutions complete a significant number of medium- to large-scale capital projects each year. Oftentimes, these projects are coordinated by staff in the capital planning, design, and construction division in conjunction with an academic project sponsor (e.g., dean, department chair). While their input is valuable to ensuring the final project meets end-user needs, effectively incorporating their feedback and input is difficult to balance with the project budget and timeline.

Exacerbating this challenge is the reality that most project sponsors are involved in only one or two capital projects over the course of their academic careers. This inexperience may lead sponsors to hold unrealistic expectations about capital costs and processes. Ideally, project managers (PMs) and Facilities leaders use early conversations to calibrate expectations; however, many campuses report their PMs are stretched thinly across many projects. They lack the time to sufficiently educate involved stakeholders.

This toolkit is designed to simplify conversations between project managers and campus stakeholders. It offers five tools to help Facilities staff better educate sponsors about capital projects. The table below outlines each tool and what it helps PMs and Facilities leaders accomplish.

Outline of Capital Project Planning Toolkit

Tool	Description
Tool 1: Expectation-Setting Conversation Guide	Helps project managers obtain valuable information about project goals from sponsor and pull forward challenging conversations about realities of limited budgets
Tool 2: Guide to Creating Stakeholder-Centric Process Map	Advises how to create a process map that clearly explains the major stages of a capital project and stakeholder responsibilities to lay audience
Tool 3: Capital Project Charter Template	Provides institutions with a framework to map out project scope, stakeholder roles, and deadlines. The goal is to ensure all project participants are on the same page before breaking ground
Tool 4: Cost and Funding Source Cheat Sheet	Defines the most important and potentially confusing components of capital project costs in nontechnical terms
Tool 5: Capital Project Cost Model	Generates preliminary cost estimates for proposed projects through an interactive budget calculator

Source: Facilities Forum interviews and analysis.

Expectation-Setting Conversation Guide

Goal

Use this tool to set upfront expectations with capital project sponsors (e.g., academic or other administrative leaders).

Intended User

Project manager or director of capital projects

Overview

This tool helps project managers (PMs) obtain valuable information about project goals from the sponsor and pull forward challenging conversations about realities of limited budgets. This interview guide includes both the questions a PM should pose to the sponsor and guidance to help the PM conduct the interview. Users can adopt the guide as is or adapt to their institutional context.

▶ Electronically access this tool at eab.com.

Source: Facilities Forum interviews and analysis.

Tool 1: Expectation-Setting Conversation Guide

Discussion Questions	Guidance for Leading the Discussion

Context

1. What has been your past experience (if any) with higher education capital projects?

> This question helps PMs establish what level of baseline knowledge the sponsor has. As many sponsors have limited to no experience with capital projects, the PM should provide more detailed explanations to less experienced sponsors.

2. If you have been previously involved in a capital project:

   a. What did you most appreciate about past projects? Project managers?

> Frank conversations about past collaborations help reset the clock on the faculty/PM relationship.

   b. What were your biggest frustrations with past project managers?

Project Scoping

3. What does your department/unit want to accomplish with this project?

> Faculty often struggle to understand the relationship between project scope and cost. This question helps faculty focus on the outcome rather than propose Facilities solutions (e.g., "We want more open collaboration space" vs. "I want you to reconfigure this room.")

4. Overall, what are your department/unit's strategic priorities across the next five to ten years?

> By fully scoping a unit's long-term goals, PMs can more effectively help sponsors build the right space.

5. What are your top three priorities for this project? How would you rank-order them?

> Guided prioritization exercises help sponsors choose upfront between inevitable resource trade-offs.

Stakeholder Impact Assessment

6. Outside of the project site, what units and people do you expect to be impacted by construction/renovation sites?

> Campus stakeholders near renovation and construction sites often become frustrated when they are not notified early. PMs may already be aware of the project's impact on other users, but this question signals to the sponsor that the PM cares about the impact of the project on others.

7. Are there any sensitive occupants in the affected area or building (e.g., a professor about to apply for tenure, a particularly delicate research lab, etc.)?

> It is helpful to get a heads-up on what users might be the most upset about regarding possible construction externalities (e.g., noise, dust). This also shows that Facilities is thinking proactively and holistically about how to minimize disruption to the core academic mission.

Tool 1: Expectation-Setting Conversation Guide (cont.)

Discussion Questions	Guidance for Leading the Discussion

Communication Plan

8. Who should be the primary contact for day-to-day challenges of the project (e.g., temporary power outage)?

> Day-to-day project challenges are often better delegated to administrative assistants and building coordinators rather than senior administrators.

9. Are you the right person for the project's more strategic questions, or should it be someone on your staff?

> Sometimes very senior project sponsors (e.g., provost) want to set the project vision; however, they may not want to weigh in on strategic questions that require prompt turnaround time.

10. How often would you personally prefer to receive status updates (e.g., weekly, monthly)?

11. How often would you like us to update affected stakeholders on the project (e.g., weekly, monthly)?

> Allowing sponsors to define their communication frequency allows Facilities to avoid issues with under- or over-communication with stakeholders.

12. Is an info session or open house required for this project?

> For larger projects, public events can be effective ways to share project vision, rendering, and impact to a wide audience of campus stakeholders.

Source: Facilities Forum interviews and analysis.

Guide to Creating Stakeholder-Centric Process Map

Goal

Use this tool to create a public-facing, accessible process map that helps campus stakeholders better understand the stages of a capital project and their role in the process.

Intended User

Project manager or director of capital projects

Overview

This step-by-step guide helps you create a process map that clearly explains the major stages of a capital project—as well as stakeholder responsibilities—to project sponsors. Institutions that currently have an internal process map for project management staff can use that as a starting point. Otherwise, users should consider codifying the steps to aid the creation of an externally facing process map.

▶ Electronically access this tool at eab.com.

Tool 2: Guide to Creating Stakeholder-Centric Process Map

Step 1 — Outline current capital project process

Capture the primary steps involved in the capital project process. This should include steps that the project manager and professional services staff own, as well as the parts owned by the project sponsor. Institutions that have an existing process map (e.g., one used by project managers) can use that as a starting point. Otherwise, map out the broad steps involved from the beginning to the end of a typical capital project.

Step 2 — Reorganize map into a limited number of accessible steps

Translate the capital project process into a limited number of steps (ideally no more than 10). Organizing the process into a series of broadly scoped steps ensures that the final process map is not too detailed. The goal is to take a complex, technical process and translate it into easy-to-comprehend steps that are accessible to a lay audience.

Sample Project Steps:
- Project Idea Inception
- Feasibility Study
- Feasibility Study Review
- Design Development
- Construction

Step 3 — Craft jargon-free descriptions of each step

Provide enough context for each step to help stakeholders understand what it involves, including examples where relevant. Jargon-free language bolsters lay-user understanding and reduces questions directed toward Facilities. When it is necessary to include Facilities-specific terms in the report, define them within the report or in a glossary of terms so the reader can understand.

Example:
- Before: Ensure that FM and A/E teams agree that final design aligns with UDCS
- After: Facilities ensures that the external architect's and engineer's plans conform to university-wide design standards (e.g., office size standards)

Source: Facilities Forum interviews and analysis.

Tool 2: Guide to Creating Stakeholder-Centric Process Map (cont.)

Step 4   Add explicit sponsor responsibility descriptions

Indicate at each step what the sponsor's role is and what (if any) documentation he or she will be expected to produce or review. Explicit responsibility descriptions clearly signal what the stakeholder's role is at every stage of the process, enabling him or her to budget time accordingly.

Details to Include:
- Who: Define the key decision-maker (e.g., Vice-Provost of Academic Planning rather than just "academic affairs")

- What: Describe the required input, decision, and/or documentation (e.g., "Project sponsor must include funding plan in the feasibility stage.")

- When: Provide time frame to help prepare sponsors for when their input will be needed (e.g., "CBO approval of budget must occur at least one month before board meets to approve project.")

Step 5   Indicate approximate time frame and milestones

Indicate approximately how long each stage lasts, as well as the milestone that signals the culmination of that stage. These ranges help manage stakeholder expectations on the typical length of each project stage.

Example:
- Step 2: Feasibility Study; typically takes one month to complete

- Step 4: Design Selection; typically takes three weeks to complete

- Step 7: Construction Documents; typically takes two months to complete

Step 6   Compile steps into an attractive, single-page document

Compile the steps into a single-page handout. The document should clearly outline the steps and deploy sufficient white space so as not to overwhelm the reader.

Guidance on Creating an Attractive Poster:
- Bullet out important information.

- Use consistent fonts and colors. Align the font and color choices with either the institutional brand or the Facilities brand (if established). Check with the departmental or central communications office for a report template (e.g., PowerPoint or Word templates with institution's approved colors and layouts).

- Balance graphics and text with ample amounts of white space. Incorporating white space into a document creates more "hooks" for the reader's eye and reduces the effort required to digest the information. Increasing line spacing and margins (of both text and graphics) allows for more white space in a document.

Source: Facilities Forum interviews and analysis.

Sample Stakeholder-Centric Process Map from Tulane University

MAJOR CAPITAL PROJECT PROCESS

Major Projects are defined as New Construction Projects, Major Renovations, High Visibility Projects, or any project with a total project budget over $5 Million. Finance Committee Approval is required.

Approval Process: Feasibility & Planning Activities

Step 1 — Project Idea Inception
- School or department initiates the need for capital project by filling out and submitting the project request form
- After approval from PRES/COO/PROV, UA and PD&C define scope
- UA presents to PRES/COO/PROV

Milestones
- Formal request to PRES/COO/PROVOST for approval to begin project planning work
- Preliminary budget is developed with PD&C to take project through Step 3.

Step 2 — Feasibility Study
- UA reviews project for compliance w/ Master Plan
- UA works with client to prepare Feasibility Study
- Establishes the Project Scope

Documentation Needed
- User's program
- Initial cost studies
- Concept design for fundraising (optional)

Milestone
- Budget developed with PD&C for funding to take project through Steps 4 & 5.

Step 3 — Feasibility Study Review
- Feasibility Study is distributed and discussed with PRES/COO/PROVOST as appropriate by the UA.
- Provide adjustments & revisions as required
- Completed Study is shared with PRES/COO/PROV, Physical Plant & Campus Development Committee, and the Finance Committee for approval

Milestone
- Project Manager is chosen once project is funded and approved to move forward into design.

Step 4 — Program Document
Develop program document including:
* Detail space program/scope criteria
* Site limits, utilities, conditions and exterior or spaces
* Total project budget
* A/E scope of work/consultants
* Preliminary schedule
* Environmental/LEED analysis

Milestone
- Review of this document by PRES/COO/PROV and establish final scope of work.

Step 5 — Consultant Selection
- Selection Committee identifies A/E long list for consideration
- List is presented and approved by VP FM&CD
- Selection Committee solicits for qualifications proposals, then short lists and interviews the firms being considered
- A/E selection is made and a contract is negotiated

Milestone
- Final A/E contract is submitted to VP FM&CD for approval and to the COO for signature (only authorized though Schematic Design)

Development Process: Design & Construction Activities

Step 6 — Schematic Design
- Architectural design developed using University Planning Performance Guidelines(PPG).
- Cost estimate is updated and PD&C refines project budget.
- Renderings/models created

Milestones
- Design presentations and approvals: PRES/COO/PROV and PD&C Committee
- Comments incorporated into drawings & Budget revised
- UA reviews project for compliance w/ Design Guidelines
- Funding Identified and Finance Committee Approval of Project to move forward through completion
- In some scenarios, Contractor may be selected

Step 7 — Design Development
- Design work continues
- Early site package prepared at the end of DD (optional)
- Commissioning agent hired
- Cost estimate is reconciled by third party, A/E team and cost consultant

Milestone
- Completed DD documents are shared within FS for compliance with design and construction standards

Step 8 — Construction Documents
- A/E team completes drawings and specifications for Contractor's use.
- Final Cost estimate prepared
- Project Bid or Negotiated
- Contractor selected and contract negotiated

Milestone
- Complete documents released for construction
- Project presented to PRES/COO/PROV for final budget approval
- GC contract is finalized

Step 9 — Construction
- Construction begins
- PD&C project manager oversees the project

Milestones
- Construction is completed
- Certificate of Occupancy issued
- End users move in
- LEED application submitted
- Building turned over to FS

Participants

Abbreviation	Meaning
A/E	Architects and Engineers
PD&C	Planning, Design & Construction
FS	Facility Services
PRES/COO/PROV	President/COO/Provost
UA	University Architect
VP FM&CD	VP Facilities Management & Campus Development

Source: Tulane University, New Orleans, LA; Facilities Forum interviews and analysis.

Capital Project Charter Template

Goal

Use this tool to build a framework to articulate scope, budget, deadlines, and stakeholder roles before breaking ground on a capital project.

Intended User

Project manager or director of capital projects

Overview

When institutions undertake capital projects, they often find project participants do not understand their role in the project or that disputes arise due to an unclear execution plan. This tool is designed to ensure project stakeholders, including the project manager and sponsor, come to agreement upfront about the scope, budget, and timeline for the capital project. It also includes prompts to clarify the roles and authority of different people involved, ensuring all participants have a common understanding of the project and minimizing disputes as the project progresses.

Note: An editable version of this tool is available at eab.com.

▶ Electronically [access this tool](#) at eab.com.

Tool 3: Capital Project Charter Template

How to Use This Tool

This tool can serve as a template for institutions looking to create a new capital project charter or a resource for those seeking to improve their existing one. An **editable** version of this tool is available at eab.com.

The tool consists of five sections, detailed below. Institutions can either use the template in full or pick and choose the questions or sections most relevant for their process.

Section	Description
A. Project Information	Establishes basic project goals and priorities and ensures the project aligns with the broader institutional mission. Agreeing on priorities up front is important in case budget cuts or other obstacles arise later in the process. The charter ensures that participants have agreed on their priorities and know which elements of the project are most important to preserve.
B. Project Participants and Communication Strategy	Clarifies the roles and responsibilities of everyone involved in the project and designates who will be responsible for communicating changes and updates. This avoids later confusion and ensures everyone stays informed of progress.
C. Implementation Plan	Establishes a concrete plan for implementing the project, including who is responsible for which steps and projected completion dates for each phase, helping the project stay on track. The section also calls for funding and budget information, ensuring all participants understand how the project will be funded and how money will be spent.
D. Considerations	Pushes project leaders to think about the conditions necessary for successful completion as well as how the project will impact everyone on campus.
E. Approval	Requires all participants to sign off on the charter, signaling their agreement to the defined parameters and process. While not legally binding, this step can be helpful if project focus starts to drift later in the process. Facilities can refer anyone with questions back to the guiding rules that they approved.

Tool 3: Capital Project Charter Template (cont.)

A. Project Information

A1. Project Name

Assign each project a concise but unique name that captures the nature of the project and where it is taking place. Include a project number if applicable.

A2. Project Summary

Provide a basic outline of what the project will accomplish.

A3. Background

State the problem(s) that the project seeks to solve and explain how and why the project came about to solve them.

A4. Project Goals

Establish a prioritized list of goals and objectives for the project, ensuring that goals are specific, measurable, and realistic. This list should include not only the goals for the physical completion of the project but also the broader academic and institutional objectives the project seeks to advance. List the goals in order of priority; prioritizing the goals helps the Facilities team know where to make trade-offs if budget cuts or other obstacles arise.

Tool 3: Capital Project Charter Template (cont.)

A. Project Information

A5. Project Scope

Describe what the project will include and define the limits of the project. Be sure to also flag anything the project will not address, for example, if a building renovation will not include IT upgrades.

A6. Master Plan Alignment

Explain how the proposed project aligns with the campus master plan.

A7. Strategic Plan Alignment

Explain how the proposed project aligns with the campus strategic plan.

Tool 3: Capital Project Charter Template (cont.)

B. Project Participants and Communication Strategy

B1. Lead Roles and Responsibilities

Identify the project manager and other decision makers who will be involved in project planning and execution. Describe each person's project responsibilities. As a starting point, common roles are included below.

Role	Name	Responsibility	Contact Information
Project Manager		Manages the project from initiation to completion and oversees the project budget and schedule	
Consultant		Creates the site plans and provides design and technical expertise throughout the project	
General Contractor		Directly manages the actual construction process and oversees all subcontractors	

B2. Approval and Oversight

List the individuals or groups that have approval or oversight authority over any part of the project and specify the scope of their authority. As a starting point, common roles are included below.

Role	Name	Authority	Contact Information
Project Sponsor		Approves strategic project decisions on behalf of academic or administrative unit	

B3. Customers

List the constituencies that will use the completed project. Identify one representative from each constituency who is willing and able to serve as a point of contact.

Customer	Representative	Contact Information

B4. Interested Parties

List any other individuals or groups who have a vested interest in the project, even if they are not directly involved. Explain why they might be interested and include a point of contact for each group.

Party	Representative	Contact Information	Reason

B5. Communication Strategy

Assign responsibility for communicating updates and points of contact for questions about different project components. This section can be used to elaborate on reporting relationships among participants to avoid ambiguity about who should be communicating with whom about updates and changes.

Source: Facilities Forum interviews and analysis.

eab.com

Tool 3: Capital Project Charter Template (cont.)

C. Implementation Plan

C1. Project Milestones

List major project milestones and target completion dates.

Milestone	Target Completion Date

C2. Project Timeline

Map out the project from start to finish, including both major milestones and smaller progress targets. Elaborate on what should be accomplished at each stage and include information about who is responsible for approval and completion of each phase.

C3. Funding Sources

List each funding source for the project and how much funding will come from each. If additional funding is necessary, list possible sources and plans for obtaining those funds.

C4. Budget

Include the project budget as an addendum to the charter.

Tool 3: Capital Project Charter Template (cont.)

D. Considerations

D1. Assumptions

List and describe any conditions on which the progress and ultimate success of the project depend. Where possible, outline a contingency plan.

Assumption	Contingency Plan

D2. Constraints

List and describe current or future challenges that could impede the successful completion of the project.

Constraint	Contingency Plan

D3. Campus Impact

Explain how the project will affect campus, both during construction and after completion. List all possible negative ramifications of the project and propose plans to minimize them.

Tool 3: Capital Project Charter Template (cont.)

E. Approval

Charter Approval

By signing the final page of the charter, all approval authorities and stakeholder groups agree to the charter's contents.

Name	Signature	Date

University of British Columbia Project Charter Template

Project Charter

THE UNIVERSITY OF BRITISH COLUMBIA

University of British Columbia
Project Services | Infrastructure Development
1100 - 2329 West Mall, Vancouver, BC V6T 1Z4

Project Number:
Location (Building and Room/Address):
Project Name:

Please refer to Attachment A for a list of the key contact's responsibilities.

Section A. Contact Information
A1. Project Contacts

Key Contact

Name:	
Position:	
Faculty/Department:	
Telephone:	
Email:	

Project Sponsor

Name:	
Position:	
Faculty/Department:	
Telephone:	
Email:	

A2. Project Manager (UBC Project Services)

Name:
Position:
Faculty/Department:
Telephone:
Email:

Source: University of British Columbia, Vancouver, BC.

Tool 3: Capital Project Charter Template (cont.)

University of British Columbia Project Charter Template

Section B. Project Requirements

Scope:

Assumptions:

Constraints and Risks:

Budget Upset (Client nominated pre-estimate):

Project Completion/Occupancy Required By:

Schedule Constraints:

Section C. Agreement

1. I agree that the above items have been discussed and agreed to.
2. I understand that the initial estimate cannot be issued until this document has been signed.
3. I understand my roles and responsibilities during this project.
4. I understand that this document cannot be modified once signed. Any scope changes shall be documented as attachments to the original charter using a Budget Amendment Form.

	Name	Position	Signature	Date
Project Manager				
Project Contact				

University of British Columbia Project Charter Template

THE UNIVERSITY OF BRITISH COLUMBIA

PROJECT ROLES AND RESPONSIBILITIES:

Who is responsible for what during the project?

The Project Lead Team

You are a member of the Project Lead Team. This team is comprised of four key members who will be involved throughout the project:

- **You, the Project Sponsor and our Client –** represent, and approve project decisions on behalf of, the UBC unit, department or faculty for which work has been requested.

- **Project Manager (PM) –** manages the project from initiation to completion, oversees the Project Lead Team, and monitors and controls the project budget and schedule (UBC Project Services).

- **Consultant** – creates the site design plans, provides design expertise, particularly during the planning and design phases but throughout the project and reviews and ensures plans adhere with regulations. This role is appointed to the relevant qualified specialist (such as an architect or engineer).

- **Contractor –** the contracted expert who leads the construction of your project. They manage the construction process and ensure that the design, regulatory, site safety and other quality requirements are met. This role is contracted out to a construction company through a tendering process. A competitive bidding process ensures you receive the most qualified contractor for the job.

You: the Project Sponsor and our Client

You are a crucial member of the Project Lead Team. Project Services will do the leg work to help you to achieve your project goals, but we will need you to be involved in key decisions that will determine the quality of your final product. Your ability to commit time to meetings, project input and feedback will be required for the duration of the project.

COMMUNICATION

➢ Keep in touch with your Project Manager (PM) and include them in any discussions you have with other project lead team members.

SHARING INFORMATION WITH YOUR BUILDING AND NEIGHBOURS

➢ Act as the main point of contact for your colleagues affected by the project and update them on the project status. If you are not the most appropriate person for your PM to be communicating with on this project, please advise them at the beginning of the process.

➢ Notify your building occupants and neighboring buildings that the project is happening or speak to your Facilities Manager about how to share this information. This is especially important if the project will involve loud noise or vibrations which may affect students' exam or class timetabling or researchers conducting sensitive research.

LEAVE/VACATION NOTIFICATIONS

➢ Notify your PM in advance when you are going on leave and let them know who they should contact during your absence.

University of British Columbia Project Charter Template

REQUIREMENTS

➢ Explain your project requirements in as much detail as possible to your PM throughout the initial, planning and design phases. Before construction begins, a contract will be agreed to proceed with the appointed contractor, and any changes to that contract, due to changes in your requirements, will lead to changes in the value of the contract and the construction schedule. While we carry a contingency for changes, these are highly restricted in terms of what they can support.

➢ Report any site specific safety requirements and hazards to your PM.

UNIQUE CONDITIONS

➢ Notify your PM of any unique conditions at the project site, such as the presence of animals or specific temperature settings.

OTHER PROJECT NOTIFICATIONS

➢ Inform your PM if you have any other projects happening in the next few months.

Your Key Responsibilities

THE CHARTER

➢ Sign the project charter document which your PM will prepare after your initial discussions. This document will outline the project scope, key contacts and other details which you have both agreed to.

FUNDING

➢ Confirm who the funding approver is for the project (if this is not you) and provide their details to your PM. You will be responsible for ensuring that your funding approver signs off on estimates in a timely manner. Your PM is not responsible for following up on this. Delays to estimate sign-offs may impact project timelines.

MEETINGS

➢ Attend important project meetings. Your PM will advise you which meetings you are required to attend. Note that some project meetings will be ad hoc with little notice.

APPROVALS

➢ Review and approve project plans and documentation in a timely manner. If you would like more information about when you will be requested to review documentation, please ask your PM. Review and approve finalized deficiencies list after site walk-through at substantial completion. This document must be signed by you, the consultant, contractor and PM.

CONSTRAINTS

➢ Inform your PM of any constraints regarding budget, schedule and other unique requirements.

FEEDBACK

➢ Provide us with feedback at any time during the project. If you are really happy with how your project is running or have suggestions on how we can do things better, we would like to know. You can provide feedback directly to your PM or contact our Client Relations Specialist.

University of British Columbia Project Charter Template

Project-specific responsibilities:

If your project involves:

a) rekeying an area or the creation of a new lockable space, your responsibility will be to **request keys and/or the (re)programming of fobs for your employees through UBC Access Control** upon completion of the project. Project Services will manage the keying of your project but we are not authorized to request the keys on your building's behalf. Each unit on campus designates individuals responsible for the management of access, including key issuance, to their assigned building space.

b) an office move, your responsibility will be to **submit a work order to IT Services**

   ➢ **Physical movement of any computer equipment** as well as the **transfer of the computer address**

   ➢ **Transfer of current staff phone numbers** to a new location, if not done automatically by IT Services.

c) a laboratory area, your responsibility will be to assign a Safety Officer who will monitor the laboratory safety and obtain clearance from UBC Risk Management Services.

Project Manager (PM), UBC Project Services
Your key point of contact for the duration of the project.

Your PM undertakes a wide range of tasks over the course of a project. Your PM's key responsibilities include to:

➢ **Assemble the Project Lead Team**, establish lines of communication between team members and confirm each team member's responsibilities.

➢ **Create the initial project schedule and budget** and **update these documents** throughout the project.

➢ **Prepare estimates** and **monitor and control the project budget.**

➢ **Keep you updated** at regular intervals on the progress of the project.

➢ **Prepare permit applications** and **obtain permits** where necessary.

➢ **Drive the tendering process** to obtain project bids and award the construction contract.

➢ **Coordinate a pre-tender site meeting** which the Consultant and the bidding contractors attend.

➢ **Arrange** the pre-construction meeting.

➢ **Provide and maintain onsite supervision**, **inspection and monitoring** of the work during the construction phase.

➢ **Manage the financials and legal requirements** of the project including but not limited to: creating and issuing contracts, reviewing and certifying final invoices from contractors, suppliers and other sources, and obtaining insurance certificates.

➢ **Coordinate handover** of the completed project to you.

Cost and Funding Source Cheat Sheet

Goal

Use this tool to brief executive leaders and/or project sponsors on the most commonly misunderstood capital project costs and funding sources.

Intended User

Senior facilities officer, director of capital projects, or project manager

Overview

This resource defines the most important and potentially confusing components of capital project costs. The goal is to proactively educate project sponsors on the limitations of capital budgets, as well as define some of the least accessible terms that often appear in the project plan.

Note: There are two components of the cheat sheet. First, the **Executive-Level Capital Project Cost Briefing** explains the major forces that drive higher education construction costs. Second, the **Cost and Funding Source Glossary** concisely explains the most commonly confused line items in budgets.

▶ Electronically [access this tool](#) at eab.com.

Source: Facilities Forum interviews and analysis.

Tool 4: Cost and Funding Source Cheat Sheet

Part I: Executive-Level Capital Project Cost Briefing

Description: This resource explains the major forces that drive higher education construction costs. This briefing can be given to academic and administrative leaders to generally explain why higher education construction costs more than expected.

Factors Driving Construction Costs in Higher Education Industry

Category	Explanation	Example
Aged Infrastructure	Historic, outdated buildings and infrastructure cost more to operate, maintain, and repair	1960s-era boiler's age means replacement parts are not readily available; as a result, Facilities must custom-order or custom-make parts
Regulatory Building Compliance	Federal, state, and local regulations hold higher education institutions and their contractors to more stringent construction and building standards	Larger renovations must include expensive retrofits to fully comply with numerous Americans with Disabilities Act (ADA) ordinances. Higher education contractors also must maintain a certain level of bonding and insurance required by procurement policies
Advanced Safety Features	Institutions strive for the highest level of safety for mission and to ensure the security of students, faculty, and staff	Complex keycard lock systems cost a great deal because they must seamlessly operate across multiple levels of access and all parts of campus
Durability and Design Requirements	High-utilization environment entails more costly, institutional-grade items to avoid constant replacement. Institutions also often require more rigorous design standards	All external door replacements must be of the highest durability because they need to resist damage from being opened thousands of times a day
Long-Term Mindset	Campuses must construct buildings to last for a hundred years, when most other sectors build for 30 to 40 years on average	Research labs must include costly infrastructure such as compressed air or chilled water connections so the space can be converted to support new equipment

Source: Facilities Forum interviews and analysis.

Factors Driving Construction Costs in Higher Education Industry (cont.)

Category	Explanation	Example
Sustainability	Sustainability goals often require institutions to invest in costly but energy-efficient infrastructure and equipment	Updating current lights to LED lights might align with institutional goals, but bulbs and installation take time and dollars
Building Control Systems	Systems that monitor and control building mechanical and electrical equipment such as ventilation, lighting, and fire alarms	University buildings require more sophisticated systems to protect sensitive research labs and achieve a comfortable environment at the lowest possible energy cost
Centralized Systems	Campus-wide systems that serve multiple buildings are more efficient to operate but cost more to build	Constructing a new building sometimes requires a costly upgrade to the central steam plant so it can effectively support new load demand
Academic Calendar Inflexibility	Facilities must sometimes work around staff, faculty, and class schedules, which changes the cost of goods and services	Facilities often must complete projects with shorter-than-normal timelines and during higher-cost summer months
Labor Costs[1]	Facilities must cover high-benefit (and often unionized) workforce costs; can be 30-50% beyond cost of salary. Many schools must also pay prevailing wages to both their employees and can select only contractors that do the same	College custodians receive educational and retirement benefits not typical in private sector, which improves retention but increases cost

1) Sharing labor costs may raise more questions than answers for customers. Only share if it will lead to a productive conversation.

Source: Facilities Forum interviews and analysis.

Part II: Cost and Funding Source Glossary

Description: This resource concisely explains the most commonly confused line items in capital project budgets. This resource is most helpful to academic and administrator sponsors who are often working on construction projects only for the first or second time in their careers.

Note: This glossary contains many selected terms from APPA's official glossary (which are starred) that have been slightly modified to serve a non-Facilities audience.

Cost and Funding Source Glossary

Term	Definition
Americans with Disabilities Act (ADA)*	A federal law that prohibits discrimination on the basis of disability. For higher education organizations, the ADA contains extensive and expensive requirements for new construction and renovations to buildings and facilities.
Appropriated Funds	The state-funded portion of the capital project. State capital funds come with significant restrictions on their spending, such as the requirement to pay construction contractors prevailing wages. This can limit project budget flexibility.
Architectural/ Engineering (A/E) Firm	An architectural and/or engineering professional design firm that is retained by Facilities to program and design a project. A/E firms are essential to project success and their fees can range from 5-15% of total project costs, depending on project type and complexity.
Capital Project/Construction*	A new building, renovation, or major maintenance project that increases the value of the site or extends the useful life of a building.
Capital Renewal Project*	A large project that replaces aged or obsolete equipment and building systems or utility and plant infrastructure. Capital renewal also refers to remodeling, renovation, and exterior restoration of buildings. Much of what is classified by universities as deferred maintenance is actually a capital renewal need of the campus.
Change Order (C.O.)*	A written order to the contractor signed by the owner and the architect and issued after the execution of the contract, authorizing a change in the work or an adjustment in the contract sum or contract time. Change orders can add significantly to the final costs of new projects and should be limited as much as possible. To limit costs, best practice is for only one point of contact (typically Facilities project manager) to request any change order from a contractor. Furthermore, the departmental project sponsor may request a change in scope from the project manager, but may not discuss specific project scope changes or cost implications directly with any contractor associated with the work or outside contractor not associated with the work.
Commissioning	Commissioning is the systematic process of verifying that building systems are designed and installed correctly. Commissioning goes beyond a typical building inspection to confirm that external contractors have delivered on all efficiency and usability requirements. Although it adds to capital budgets, commissioning saves money in the long term through lower operations and maintenance costs.

Term	Definition
Common Support Areas*	The portion of a building's usable area not attributed to any one occupant but that provides support for several or all occupant groups. Examples are cafeterias, vending areas, auditoriums, fitness facilities, building mailrooms, and first-aid rooms. Often, all of a building's occupants must share in renovation costs for common support areas.
Contingency Funds*	Funds reserved purely to provide for unforeseen expenditures in construction projects. Due to the uncertainties inherent in any project, these funds should be dedicated only for unexpected expenses and cannot be spent on discretionary components such as luxury furniture or ornate interior finishings. Projects with high uncertainty of conditions, such as renovations of an older facility, will typically incorporate higher contingencies than new construction. These funds cannot be used to expand the scope of the project.
Contractor	The company awarded a contract to construct a project. Higher education contractors are typically more expensive since they are held to higher quality and financial stability requirements than typical construction vendors.
Designated Funds*	Monies expendable only for purposes designated by an institution's board.
FF&E (Furniture, Fixtures, and Equipment)	Furniture, fixtures, or other equipment that have no permanent connection to the structure of a building. They cost more in higher education because project managers must purchase institutional-grade items to cope with the higher-utilization of higher education users. Buying institutional-grade items costs more upfront but saves on future maintenance costs.
Hard Costs	Also known as "brick-and-mortar costs," hard costs include all labor and building materials required for capital project construction. They also include all utilities, safety systems, and equipment. They typically make up around 70% of a project's total costs. See entry on "soft costs" for comparison.
Indirect Costs*	Costs that have been incurred for purposes common to some or all of the specific programs of an institution but that cannot easily be identified and charged directly to end users. Examples include heating, air conditioning, and janitorial services of buildings, plus Facilities administrative services such as accounting and purchasing.
Infrastructure*	The necessary components that allow buildings to function. These items may include water, power, sewers, and roadways.
Operations and Maintenance (O&M)	Tasks required to ensure building functions properly on a daily basis and all its components and systems (e.g., heating, cooling, roof) are serviced frequently enough to optimize its life span. Funded annually through institutional operating budget.
Overhead*	Elements of cost needed to perform a Facilities Management service that cannot be easily connected to any one particular task. Examples are heat, light office supplies, and insurance.
Prevailing Labor Rates	Mandatory rates that some institutions (or states) require must be used by contractors and for in-house Facilities employees. These wage rates are in many cases higher than those employed for similar work performed on private residences and small businesses in the local community. Please note that such reduced local labor rates may not be legally used for in-house work on campus.

Tool 4: Cost and Funding Source Cheat Sheet (cont.)

Term	Definition
Project Management Fees	Facilities units often charge projects for the use of internal project managers. At public institutions, project managers' compensation often cannot be directly drawn from state-appropriated monies, so it is important to charge back those costs to the specific projects. These fees are essential to making sure the university completes the highest-quality projects on time and on budget.
Project Manager	Essential project coordinators who ensure that the university completes projects on time and on budget. Employed by the Facilities unit, project managers also act as the intermediary between internal stakeholders and outside contractors.
Renewal*	The periodic replacement of major building components or campus infrastructure at or near the end of their useful life. Renewal work ensures that buildings will function at levels consistent with the institution's academic priorities and mission.
Renovation*	The improvement, modernization, or expansion of buildings so that they can be used more effectively, be adapted for new use, or comply with existing codes. Especially expensive in higher education because budgets must include the total expenditures required to meet evolving technological, programmatic, or regulatory demands.
Reserve*	An account is allocated or set aside for a future possible use. In capital projects, such funds are intended only for emergencies or unexpected, required changes.
Restricted Funds*	Funds limited to a specific use by outside agencies or persons. These are to be distinguished from funds over which the institution has complete control or freedom of use (i.e., unrestricted funds). In capital projects, such restricted funds must be carefully allocated to avoid violating the terms of the state grant or alumni gift.
Soft Costs	Construction costs that cannot be visibly seen, such as professional fees for architects, surveyors, engineers, lawyers, and accountants; government fees and permits; utility hookup fees; and construction period interest and loan fees. Typically, soft costs make up around 30% of project costs. They are much more variable than hard costs and harder to accurately estimate in advance.
Unfunded Capital Renewal	Due to the age and significant deferred maintenance of many campus buildings, renovation projects frequently must include extra funds for capital renewal projects. Such items include utility line replacements; HVAC replacement; code compliance issues for fire; safety and disability; roof repairs; and carpeting. These extra expenses are necessary to ensure the long-term viability of the space.
Unrestricted Funds*	Monies over which the institution has complete control or freedom of use.

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Capital Project Cost Model

Goal

Use this tool to quickly translate project sponsor requests into cost estimates.

Overview

This interactive budget calculator, built by the University of Colorado, Boulder, can be used to generate preliminary cost estimates for proposed projects, to help choose between building new and renovating existing space, or as a model for developing a campus-specific construction cost calculator.

Intended User

Project manager or director of capital projects

▶ Electronically access this tool at eab.com.

Tool 5: Capital Project Cost Calculator

Tool Objective

Although the Facilities unit is responsible for overseeing construction projects, they rarely have the authority to decide where and how to invest project dollars. Instead, budget allocation and investment decisions are typically made by academic or senior campus leaders, who often lack a nuanced understanding of design and construction. As a result, construction projects involving multiple stakeholders are more likely to run over budget or reallocate funding from building infrastructure to surface finishes.

To overcome these challenges, the University of Colorado, Boulder uses an interactive budget calculator to estimate project costs. This tool also enables them to communicate how decisions such as choosing to build new versus renovating an existing space will affect a project's budget.

How to Use This Tool

This tool provides an overview of the University of Colorado, Boulder's interactive budget calculator and outlines three ways institutions can use it: to generate preliminary cost estimates for proposed projects, choose between building new and renovating and existing space, and as a model for developing a campus-specific construction cost calculator. Given the tool's complexity, the Facilities Forum recommends that project managers or other staff involved with design and construction manage the tool.

Note: This tool is a downloadable Excel spreadsheet available at eab.com.

Tool 5: Capital Project Cost Calculator (cont.)

Overview of the Capital Project Cost Calculator

The calculator is an Excel spreadsheet with eight tabs. The table below outlines the information provided on each page and recommends how project managers use each one. The Facilities Forum recommends that project managers start with the Tables tab, which maps out data tables that inform many of the calculations throughout the rest of the spreadsheet.

Name (Abbreviation, Where Applicable)	Description
Tables	Captures fixed construction costs that are incorporated into formulas throughout the document to inform cost estimates. (Note: The Tables tab is prepopulated with Boulder-specific data.)
Assumptions	Asks for baseline inputs about the scope of and costs associated with the project. Can also be used to generate initial project estimates based on the type and amount of space requested in the project.
Building Construction (Bldg. Construction)	Estimates costs for new construction, renovation, remodeling, and demolition projects based on the types and amount of space included in the project.
Site Construction	Outlines the total cost of purchasing and preparing a site for new construction.
Utilities	Allows for more detailed estimates of the cost of civil utility infrastructure running up to and underneath the building envelope. (Internal systems such as water pumps, HVAC, and electric switchboards are not included in this section.)
Detail	Captures supplemental expenses such as design estimates, site surveys, consultant fees, certifications, land purchases, human labor, construction materials, interior finishes, and room furnishings and equipment.
Capital Construction Costs by Fiscal Year (CC-C)	Calculates how annual inflation increases construction costs using the project start and midpoints. (Note: The CC-C tab is prepopulated with Colorado-specific data.)
City Fees	Estimates and tracks the cost of city fees and permits necessary for project construction and completion.

Three Ways to Use the Capital Project Cost Calculator

Institutions that have used the cost calculator have found it most valuable when used for one of the following three purposes:

1. **Generate Preliminary Cost Estimate for Capital Project**
   The calculator can be used to generate an early estimate for project costs. While no calculator can fully predict project costs, the University of Colorado, Boulder and other institutions report that the calculator provides a helpful starting point.

   Implementation Guidelines

   - Note: The calculator generates the most accurate estimate for projects over $3 million.

   - First, review the Tables tab to determine whether the prepopulated cost assumptions fit your region. More detail about baseline construction costs is available in the Building Construction, Site Construction, and Utilities tabs.

   - If cost assumptions appear significantly but consistently different from those in your region, update the percentage difference between costs in your region and prepopulated costs. This metric can be found in cell P6 of the Building Construction tab. Project managers at institutions across the country found they could generate accurate early estimates using this shortcut.

   - Return to the Assumptions tab and fill in the Project Construction Information, Project Site Information, and Project Space Information tables to generate a project cost estimate in the Project Cost Information table. The Project Revenue Assumptions can be used to calculate a rough estimate of the funds the institution is responsible for generating to finance this project.

2. **Compare Cost Difference of Renovating Existing Space Versus New Construction**
   The calculator can also be used to help project managers compare the cost of new construction versus renovating an existing space.

   Implementation Guidelines

   - Use the Project Space Information table in the Assumptions tab to calculate the cost of new construction versus renovation. Use the Scope Factor (column Q) to indicate the renovation intensity using one of the following five values:
     - 10%: minor appearance upgrades
     - 25%: total finish upgrades
     - 50%: total finish upgrades plus minor plumbing and HVAC work
     - 80%: total finish upgrades plus major plumbing and HVAC work
     - 90%: total reconstruction

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3. **Source Material for Institution-Specific Capital Project Cost Calculator**
   The final way institutions have used this tool is as a model for creating their own cost calculators, with inputs customized to the prices and regulations in their region. Institutions seeking a tool that they can use frequently should take this approach.

Implementation Guidelines

- This is the most complex use of the cost calculator. Since many of the cells are connected to other cells through built-in equations, users may find that deleting information makes the tool fail. The University of Colorado, Boulder recommends slowly tweaking the inputs and testing throughout the process.

- First, update the Tables and City Fees tabs to reflect city- and region-specific costs.

- Next, review each tab and update any built-in cost assumptions. With the exception of the Assumptions tab (which pulls from cells throughout the spreadsheet but does not include any tables with regionalized inputs), each tab has built-in cost assumptions.

Source: University of Colorado, Boulder, Boulder, CO; Facilities Forum interviews and analysis.

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