

**Tufts University**  
**Strategic Capital Project Delivery Guidelines**  
*Updated Pre-final Draft (July 18, 2014)*

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## 1. Executive Summary

### A. Introduction

The Tufts University *Strategic Project Delivery Guidelines* forms the foundation of an integrated system to plan, budget, design, build, and operate University capital projects. The Guidelines provide high-level guidance for Tufts Executives and Administrators as well as practical tools and business processes for Schools, Divisions, University User Groups, Project Managers, and Facilities Staff.

### B. Purpose

Tufts *Project Delivery Guidelines* has three principal objectives:

- i. To provide a standard of practice for consistent capital project delivery
- ii. To clearly define the roles and responsibilities of the project team and other University stakeholders.
- iii. To establish an accessible repository of information for University stakeholders – where and when needed

### C. Background

Capital Projects are integral to Tufts' fundamental commitment of being a student-centered research university focused on creating positive impacts on individuals and society. The University has established a comprehensive process for planning and executing capital projects to renovate and maintain existing space and to construct new facilities. The process includes the development of a five-year rolling capital plan and an annual capital budget. The Operations Division is charged with the responsibility to manage the capital planning process and to execute the University's capital program. The *Strategic Capital Project Delivery Guidelines* creates the framework for executing the capital program, defines processes, and establishes a basis for collaboration and communication.

Capital projects generally involve the acquisition, construction, or renovation of real property, equipment, and systems that have a value extending beyond one year.

Renovation projects are considered to be "capital" if they extend the service life or improve the quality of the facility. Facilities projects less than \$25,000 and capital equipment or system acquisitions less than \$50,000 are not Capital Projects.

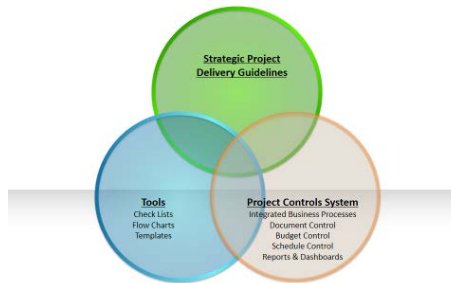
Historically, 75% of Tufts Capital Projects are valued at less than \$500,000, and 83% are less than \$1 million. Nevertheless, Tufts routinely executes large projects valued up to \$100 million and more. The *Capital Project Guidelines*, therefore, has been designed to be universally applicable to all projects regardless of size.

Authority: Capital Projects greater than \$1 million, and project designs greater than \$250,000 must be approved by the Board of Trustees. Capital Projects valued at lesser amounts are approved by the President or Executive Vice President, and may be delegated to the Vice President of Operations for approval.

**D. Integrated Approach**

The *Strategic Project Delivery Guidelines* is part of an integrated Project Delivery System.

- i. The *Guidelines* are intended to work in concert with the *Project Manager’s Tool Kit* and the *PM Web Project Controls System*.



- ii. The *Project Manager’s Tool Kit* is a compendium of Check Lists, Templates, Flow Charts, Sample Documents and Website references that are “hyperlinked” to the the *Strategic Guidelines* document. Project Managers and other Stakeholders can “click” on a hyperlink tool and be taken directly to that the tool.
- iii. The *Project Controls System* is a web-based system used to manage the development and delivery of Capital Projects. Developed by PM Web, Inc., the *Project Controls System* provides:
  - Document Management and Collaboration
  - Budget/Cost Management
  - Schedule Management
  - Automated Business Process Management
  - Integrated Program and Project ReportingThe *Project Controls System* is integrated with the Tufts enterprise system, *PeopleSoft*.

**E. Life Cycle of a Capital Project**

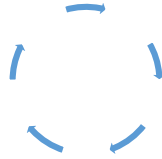
- i. Phases

The Project Delivery System has been modeled in the six phases as shown below. While these phases are shown to be discrete, the process is really continuous. Often tasks listed in one phase may start or finish in another phase. The process is truly intended to be a “Guideline” that is flexible and adaptable based on the needs of the capital program.



ii. Continuous Cycle

While the process is shown to be linear, it is intended to be a continuous, learning process that informs the entire capital program and future capital projects.



F. How the *Guidelines* document is organized

- i. The Project Delivery Process is organized into the six Phases shown above. Each Phase contains the following elements:
  - Purpose
  - Input
  - Outcomes
  - Tasks
  - Deliverables
  - Responsibilities
  - Links to forms, templates, check lists, and web references (the Project Manager's "Tool Kit")
- ii. The Guidelines is designed to be an electronic, web-based, document accessible to all parties involved in Capital Project Delivery. The Guidelines is also formatted for printing in paper form.
- iii. Links to the forms, templates, etc. (the Project Manager's Tool Kit) are intended to be Hyperlinks. They are designed to be modified, amended, and added-to over time. A summary listing of these links can be found as Appendices.

## **2. The Project Delivery Team**

### **A. Introduction**

Successful delivery of the Tufts Capital Program and individual Capital Projects is dependent upon close collaboration among members of the project delivery team, effective communication, and clear policies and procedures. This collaborative approach begins during the initial planning efforts and continues through the programming, design, construction, and operations phases of the project. Often, the Project Delivery Team must balance competing needs such as: program, cost, schedule, quality, sustainability, and stewardship. The Operations Division provides the professional leadership to achieve the right balance in support of the University mission.

### **B. Project Team Members**

#### **i. University Leadership**

Tufts leadership is involved with the authorization of Capital Projects and in providing guidance to execute the University Capital Program. Executive Leadership includes:

- Board of Trustees
  - Administration and Finance Committee
  - Buildings and Grounds Committee
- President
- Provost
- Executive Vice President
- Vice President of Finance
- Vice President of Operations

#### **ii. Key University Committees**

- Executive Capital Committee (ECC)
- Capital Planning Committee (CPC)
- Sustainability Council
- Project Sponsor Group (SPG)

#### **iii. School & Division Leadership**

- Deans and Vice Presidents
- Executive Administrative Deans
- Academic and Administrative Department Heads

#### **iv. Operations Division Leadership**

- Vice President of Operations
- Director of Campus Planning
- Director of Project Administration
- Director of Strategic Capital Programs
- Senior Director of University Facilities

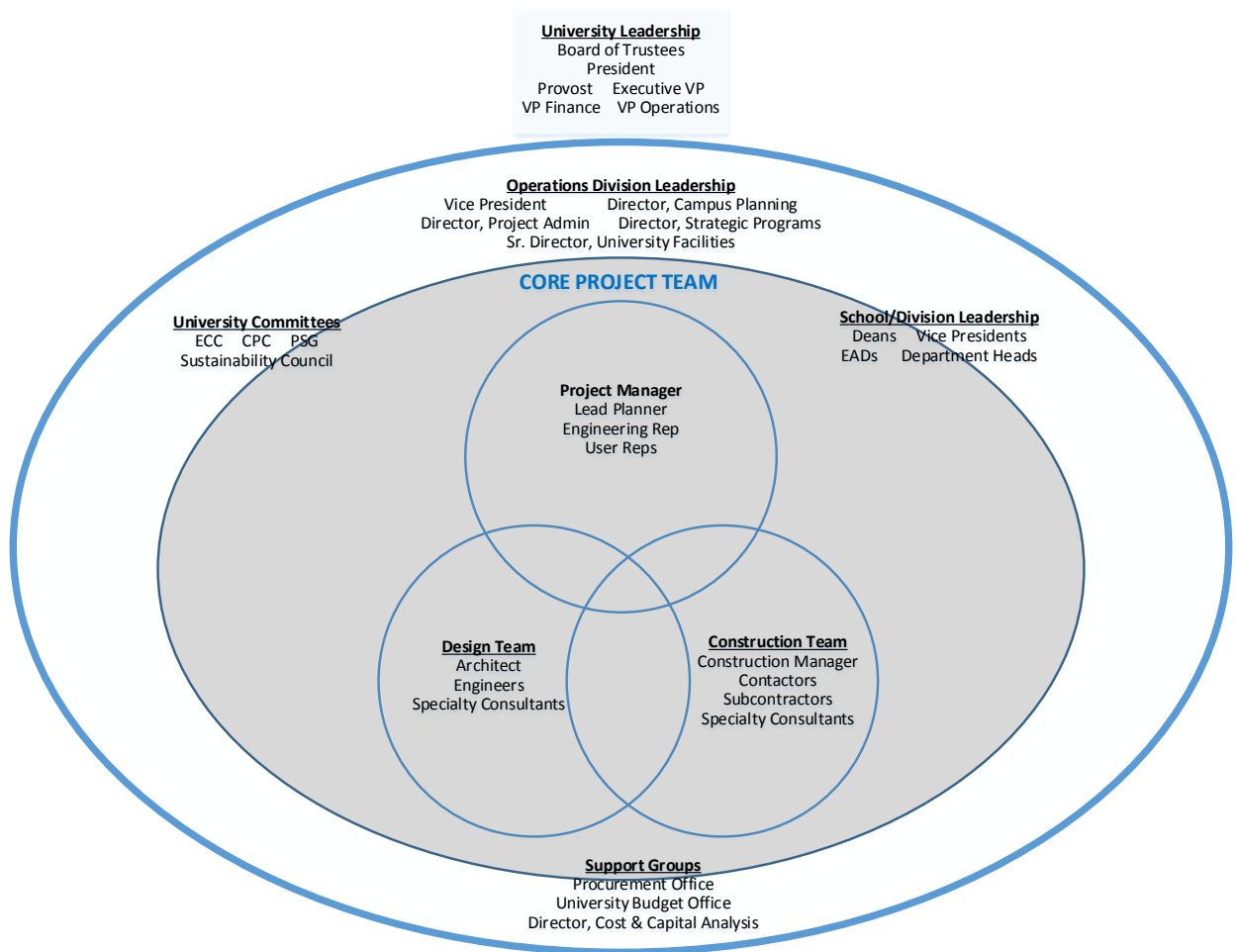
#### **v. Core Project Team**

- Project Manager
- Lead Project Planner
- Engineering Department representative

- User Group members
- Architect
- Engineers
- Specialty Consultants
- Construction Manager, Contractors, and Subcontractors
- Campus Facilities Director

**vi. Support Groups**

- Procurement Office
- Director of Cost & Capital Analysis
- University Budget Office



### 3. Sustainability

Tufts University has taken a leadership role to drive sustainability by conducting activities as responsible stewards of the physical environment and using educational activities to promote environmental awareness, local action, and global thinking. The University has committed to:

- conserve natural resources and support their sustainable use
- conduct affairs in a manner that safeguards the environmental health and safety of students, faculty, staff and communities
- reduce the use of toxic substances and the generation of wastes and to promote strategies to reuse and recycle those wastes that cannot be avoided
- purchase renewable, reusable, recyclable and recycled materials
- conduct its business practices in accordance with this policy.

Sustainable delivery of Capital Projects represents a unique and visible opportunity for Tufts to help fulfill its leadership role by building and renovating buildings to conserve resources and to inspire the University community.

There are 7 success factors critical to sustainable Capital Project delivery:

1. **Sustainable thinking in every Phase of project delivery:** Ensure that sustainability is a “forethought” and not an “afterthought”. A truly sustainable project that conserves resources and reduces the University’s carbon footprint starts with Planning and Programming and continues through the design, procurement, construction, and operations phases.
2. **Input and collaboration:** Ensure all of the necessary people are involved at the right time to inform critical decisions and that they are asking the right questions.
3. **Data and feedback loops:** Having baselines to work from (minimize being reactive), knowing what to measure and how to measure it, using the measurements to inform future decisions (investments, planning and protocols) and creating the ability to manage across a portfolio of property (dashboard)
4. **Performance goals and expectations:** Ensuring that overall performance targets (energy, waste, water, etc.) are being planned and that performance expectations (beyond equipment efficiency) are being established in the early phases of project delivery.
5. **Life cycle thinking:** Many Capital Projects have a life span of 75 years or more. First costs and the initial resource investment are much smaller than the total operating/maintenance costs and resource consumption over the life of the facility. Life cycle thinking must be part of the delivery process.
6. **Accountability:** Combination of data feedback loops and reporting/communication that keeps people's attention on the priorities of performance targets/impacts and ensures that they remain a priority -and that - if they are not being met - that is tracked.
7. **Tools & Resources:** Ensure that planners, designers, project managers and facilities staffs have access to what they need, that it’s being used effectively and full value is gotten out of it - and that the output of the tools informs ongoing achievement of targets.

#### 4. Project Phases





## Phase 1: Planning

### Purpose:

The Planning Phase develops the Capital Projects needed to execute the University's mission and to fulfill its strategic goals. The objectives of the Planning Phase are:

1. To identify capital project requirements and to match the needs with available funds.
2. To perform project planning, scoping, and feasibility analyses and set the project budgets.
3. To obtain ECC and Trustee approval of the 5-year Capital Plan and the Annual Capital Budget.

### Input:

- School & Division Strategic Plans including annual faculty hiring plans
- University T-10 Strategic Plan
- Campus master plans
- Long-range Deferred Maintenance/Capital Renewal Plan
- Energy Master Plan
- Database information including:
  - Existing facility condition report (Facility Condition Index – FCI)
  - Maximo asset data
  - Space database
  - Baseline building assessments and BIM models
  - Energy and Greenhouse Gas data
  - Close-out documentation from prior capital projects

### Outcomes:

- Project development: planning studies, scopes, budgets, and schedules for School and Division Capital Projects. Examples include:
  - *BRPH Lab Renewal Study*
  - *Cummings Animal Hospital Long Range Plan*
  - *Learning Spaces Planning Study*
  - *4 Colby Study*
- Updated School/Division Capital Plans
- ECC and Trustee approved 5-year Capital Plan that:
  - Incorporates School/Division proposed Capital Plans
  - Matches funding resources with expenses
  - Shows cash flow projections
  - Includes a master, multi-year schedule for the Capital Program
- ECC and Trustee approved Annual Capital Budget including approval of current fiscal year Capital Projects.
- “Carbon Budgets” for approved Capital Projects.

## Tasks:

- Each School and Division develops a Strategic Plan in coordination with the University T-10 Strategic Plan
- The Operations Division works collaboratively with Schools and Divisions to prepare the following long-range plans:
  - Campus Master Plans addressing planning issues such as housing, transportation, campus physical capacity and growth, etc.
  - Long-range Deferred Maintenance/Capital Renewal plans

These plans address deferred maintenance, campus physical capacity and growth opportunities, transportation, public safety, emergency planning, etc.

- Schools and Divisions work collaboratively with the Operations Division to identify the capital projects needed to support their mission-driven, strategic plans. These projects form the basis for each School's/Division's 5-Year Capital Plan.
  - The Operations Division helps to define specific Capital Project needs.
  - Schools and Divisions initiate this process through submission of a [Capital Project Initiation Form](#) which includes programmatic need, relevance to strategic plans, priority, operating budget impact, energy or carbon budget impact, and target schedule.
  - Operations conducts Planning Studies to explore the program, cost, scoping options, schedule, and deferred maintenance strategies. Consultants may be employed as required.
  - Many projects will require a Life Cycle Cost Analysis to better evaluate scoping options. See the [Life Cycle Cost Analysis](#) link.
  - For some projects, Operations will form the Project Team during the Planning Phase to facilitate planning and budgeting.
  - Informed by the planning studies and guidance from Operations, Schools and Divisions review and approve projects to be included in their 5-Year plans, matching capital costs with available funding sources and business plans.
- The EVP, in collaboration with the VPs of Finance, Operations, and Advancement, develops the University long-range funding plan.
- The Capital Planning Committee (CPC) develops the rolling University 5-Year Capital Plan, balancing strategic capital needs with available funding from multiple sources. The University 5-Year Plan integrates new construction, major renovations, equipment procurement, deferred maintenance, technology, and capital maintenance projects into a unified capital plan. The first year of the plan forms the Annual Capital Budget.
- The Executive Capital Committee (ECC) reviews and approves the 5-Year Capital Plan and the Annual Capital Budget for subsequent approval by the Board of Trustees.
- Refer to the [Planning Phase Check List](#).

## Deliverables:

- 5-Year Capital Plan with Uses and Sources of Funds and cash flow projections
- Project Specific Planning Studies

**Responsibilities:**

◆ EVP	- Long-Range Capital Funding Plan
◆ Deans/EADs/VPs	- School/Division Strategic Plan - School/Division Capital Plan
◆ VP Operations	- Campus Master Plans - University Capital Renewal Plan - University 5-Year Capital Plan - Form the Project Team for certain projects
◆ EADs	- Submit the <a href="#">Capital Project Initiation Form</a>
◆ Director of Campus Planning	- Planning Study Leadership

**Approvals:**

## 5-Year Capital Plan and Annual Capital Budget

◆ Deans/EADs/VPs	- Review & Endorse
◆ CPC	- Review & Endorse
◆ ECC	- Approval & Trustee recommendation
◆ Trustees	- Approval

**Links:**

- ◆ [University T-10 Strategic Plan](#)
- ◆ [School and Division Strategic Plans](#)
- ◆ [Capital Project Initiation and Authorization Form](#)
- ◆ [Current Master Plans:](#)
  - [Medford \(2006\)](#)
  - [Boston BRPH Lab Renewal Plan](#)
  - [Grafton \(2014\)](#)
- ◆ [Campus Energy Master Plan\(s\)](#)
- ◆ [Tufts campus maps](#)
- ◆ [Planning Phase Checklist](#)
- ◆ [Professional Services Contract templates](#)
- ◆ [Sample Planning Studies](#)
- ◆ [Energy/Carbon Budget Template](#)
- ◆ [FCI Database](#)
- ◆ [Life Cycle Cost Analysis Template](#)

## Phase 2: Programming

### **Purpose:**

The objective of the Programming Phase is to expand upon the planning done in Phase 1 by refining the project scope, finalizing the budget, confirming the project schedule, and identifying Project Team members. During Programming, the user's objectives, space requirements, and operational plans are translated into a facility program in sufficient detail to direct the design team throughout the project design process. For Deferred Maintenance projects, the Programming Phase will include expanded Due Diligence to fully define scope, identify existing conditions, and confirm the project budget. Planning and Programming are closely linked and, in many cases, Phases 1 and 2 may be combined.

### **Input:**

- Approved 5-Year Capital Plan and Annual Capital Budget including:
  - Specific project approvals
  - Approved capital project “pools” (e.g., faculty hires, minor renovations, etc.)
- Planning Studies completed in Phase 1 which include:
  - Project Scope
  - Feasibility analysis
  - Preliminary Project Budget
  - Macro Project Schedule
  - Funding plan

### **Outcomes:**

- Detailed project programs for approved projects
- Final project budgets
- Project schedules
- Project-specific procurement strategies
- Budget allocation for unidentified projects (e.g., Lab Renovations, Faculty Start-up packages, etc.)
- Project Specific procurement strategies

### **Tasks:**

- The Operations Division enters the project into the Project Controls/Management System (*PM Web*) and identifies key members of the Project Team.
- The Lead Planner, Project Manager, and School/Division work collaboratively to develop the project program. The level of detail of the Program should be sufficient to provide adequate direction to the Design Team and be appropriate for the complexities and risks associated with the project. See the [Programming Phase Check List](#) link.
  - For projects with undefined scopes, the Lead Planner takes the lead, working closely with School/Division reps and the Project Manager.
  - When the scope is well-defined, it may be more appropriate for the Project Manager to take the lead depending upon the nature of the project.
- During the programming process, the Lead Planner and the Project Manager will also:

- Identify enabling projects required to execute the basic project as well as other related projects which may follow.
- Identify Deferred Maintenance, code, and accessibility issues which should be addressed as part of the project.
- Conduct exploratory studies to better define the scope and existing conditions for deferred maintenance projects.
- Consult with campus Facilities staff regarding the operational impact of the project and any special facilities and preventive maintenance requirements which should be incorporated in to the project program.
- Determine if existing building and campus infrastructure capacity is sufficient.
- Prepare a program-level cost estimate.
- Prepare the Energy/Carbon Budget for the project.
- Once the program has been developed, the Project Manager finalizes the project budget, schedule, and procurement strategy. Use of blanket design and construction contracts should be considered as part of the procurement strategy. See the [Blanket Contracts](#) webpage.
- If the estimated cost of the fully developed program exceeds the approved Project Budget, the Project Manager will notify the VP of Operations and the EAD. Possible next steps include scope reduction or increasing the budget. Any budget increases must be approved by the EVP.

**Deliverables:**

- Project Program
- Final Project Budget, Schedule, and Procurement Strategy
- Energy/Carbon Budget

**Responsibilities:**

◆ EADs/VPs	- Provide guidance to School/Division reps regarding program development
◆ VP Operations	- Approve Budget, Schedule, and Procurement Strategies
◆ Director of Campus Planning	- Lead the Programming process - Designate a “Lead Planner” for each project.
◆ Lead Planner	- Develop the project program - Work closely with the Project Manager
◆ Director of Project Administration ◆ Director of Strategic Capital Programs	- Designate the Project Manager - Enter the Project into the Project Management system - Approve the project procurement strategy - Develop scopes for Blanket Contracts - Develop the Long List of Consultants for Blanket Contracts
◆ VP Finance/ Procurement	- Manage the procurement process for Blanket Contracts and maintain the pool of consultants and contractors
◆ Project Manager	- Support the Lead Planner - Develop the project program for certain projects - Due Diligence for Deferred Maintenance Projects - Finalize the project budget, schedule, and procurement strategy

**Approvals:**

◆ EADs/VPs	– Approve the project program and final budget
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**Links:**

- ◆ [\*Current 5-Year Capital Plan and Annual Capital Budget\*](#)
- ◆ [\*Programming Phase Check List\*](#)
- ◆ [\*Blanket Contract webpage \(list of blanket contracts and approved contractors\)\*](#)
- ◆ [\*Energy/Carbon Budget Template\*](#)

## Phase 3/4: Project Initiation & Design

### Purpose:

The Project Initiation and Design Phases are very closely linked, and as such, we've combined these phases for purposes of clarity. This combined phase entails mobilizing the project team and developing the Design (or Outline Specification) so that best value construction or equipment installation prices can be obtained.

### Input:

- Approved project program (including Deferred Maintenance scope), narrative, budget, timeline (allowing sufficient time for design and approval process), and Energy/Carbon budget.
- A preliminary determination of the project's regulatory requirements
- Tufts Design Standards and Guidelines
- Existing conditions and exploratory information
- Preliminary procurement strategy
- Blanket (Task Order) design and construction contracts

### Outcomes:

- Right-sized" project team
- Completed Owner's Project Requirements (OPR) to establish energy and building performance goals
- Completed design for construction and renovation projects
- Performance specifications for equipment installation projects
- Operational impact to cost and maintenance defined
- Waste, recycling, and re-use plan

### Tasks:

- Create the *Project Charter*
- Form the Project Team; right-sized for small projects
- Define all stakeholders, roles & responsibilities
- Prepare and Approve the design CEA (or Total Project CEA for projects that have only one Capital Expenditure Authorization)
- Select the design team from pre-approved list
- Select the construction manager (CM) for pre-construction Services from pre-approved list
- PM to review the project goals, program, budget, timeline, sustainability goals, operational requirements, IT, infrastructure needs, and potential risks with Design Team, CM, and all stakeholders
- For complex projects, ensure that roles and responsibilities are clearly defined to promote the principles of Integrated Project Delivery
- Set performance targets (energy, air quality, water conservation, etc.) in concert with the Energy/Carbon budget
- Proceed with design (SD & DD) and pre-con services
- If the project is to be commissioned, select the Commissioning Agent during SD and begin the Commissioning process in DD.
- Prepare a DD estimate. Revise design if required.
- Formal approval from Client after DD phase, review with users, facilities, and all other stakeholders. Facilities focus is on operational impact, quality, and technical adequacy.

- Prepare Construction Documents.
- Review CDs with all stakeholders
- Prepare the CD estimate. Revise design or Value Engineer if needed.
- Confirm the construction procurement strategy. Prepare appropriate procurement documents.
- Obtain competitive subcontractor prices; confirm all soft costs, and finalize the total project budget.
- Formal approval from client on scope and budget.
- Prepare and Approve the Construction CEA.
- Prepare for Maximo integration and updating the Building Profile information

**Deliverables:**

- Design CEA
- Completed design which meets program, timeline, and budget goals.
- Final Total Project Cost budget including Life Cycle Costs and O&M budget.
- Construction CEA and contract ready to award
- Project Financial Model for Large Project (generally > \$1 million)

**Responsibilities:**

<ul style="list-style-type: none"> <li>◆ Director of Project Administration</li> <li>◆ Director Strategic Capital Programs</li> </ul>	<ul style="list-style-type: none"> <li>– Form the “Right-Sized” project team</li> <li>– Define Roles &amp; Responsibilities</li> <li>– Approve the Project Charter</li> </ul>
<ul style="list-style-type: none"> <li>◆ Project Manager</li> </ul>	<ul style="list-style-type: none"> <li>– Overall project delivery</li> <li>– Develop Project Charter</li> <li>– Meet Program, Budget, Performance, &amp; Schedule Goals</li> <li>– Manage all phases from Design through Closeout</li> <li>– Project Control and Reporting</li> </ul>
<ul style="list-style-type: none"> <li>◆ Client/EAD</li> </ul>	<ul style="list-style-type: none"> <li>– Accountable for user generated scope and budget changes</li> <li>– Review/approve project design &amp; budget</li> <li>– Review/approve Energy/Carbon budget</li> </ul>
<ul style="list-style-type: none"> <li>◆ User Group</li> </ul>	<ul style="list-style-type: none"> <li>– Provide input to PM on design, for approval by EAD</li> </ul>
<ul style="list-style-type: none"> <li>◆ SR Director of University Facilities and Facilities Organization</li> </ul>	<ul style="list-style-type: none"> <li>– Operational budgeting</li> <li>– Manage Capital Maintenance Program</li> <li>– Review project designs for: <ul style="list-style-type: none"> <li>Operational impact</li> <li>Engineering quality</li> <li>Technical adequacy</li> </ul> </li> <li>– Proactive advocacy for operational issues</li> </ul>
<ul style="list-style-type: none"> <li>◆ Finance Division</li> <li>◆ Director of Cost &amp; Capital Analysis</li> </ul>	<ul style="list-style-type: none"> <li>– Develop detailed Financial Model for Large Projects</li> </ul>
<ul style="list-style-type: none"> <li>◆ Project Sponsor Group (PSG)</li> </ul>	<ul style="list-style-type: none"> <li>– Review and Approve designs for Large Projects (&gt; \$1 million)</li> </ul>



## Approvals:

◆ CEAs	Project Manager DPM*/EADs/VPs EVP	Prepare Review Approve
◆ Design	Project Manager EAD/DPM* PSG	Review Approve Approve for Large Projects
◆ Project Budget	Project Manager EAD/DPM*	Prepare Approve
◆ Budget Variance	DPM*/VP Ops EVP	Review Approve

\* DPM indicates the "Director of Project Management". This may be either the Director of Project Administration or the Director of Strategic Capital Programs.

## Communications:

- All project communications go through the Project Manager.
- Decisions regarding scope, quality, budget, and schedule are to be made by the EAD/VP and communicated to the Project Manager for action.
- Stakeholder communications will follow the protocol outlined in the [Stakeholder Review and Feedback Guidelines](#) Link.

## Links:

- ◆ [Project Charter Template](#)
- ◆ [Project Initiation Checklist](#)
- ◆ [Design Phase Checklist](#)
- ◆ [Tufts University Design Standards and Guidelines](#)
- ◆ [Capital Expenditure Authorization \(CEA\) Process website](#)
- ◆ [Stakeholder Review and Feedback Guidelines](#)
- ◆ [Blanket Contract webpage \(list of blanket contracts and approved contractors\)](#)
- ◆ [Project Organization Chart Template](#)
- ◆ [Total Project Cost Budget Template](#)
- ◆ [Architect/Engineer Selection Process Flow Chart](#)
- ◆ [Construction Manager Selection Process Flow Chart](#)
- ◆ [Project Financial Model Template](#)

## **Phase 5: Construction**

### **Purpose:**

Construction begins with contract award and concludes with completion of the Punch List and submission of closeout documents. The goal is to safely construct the project in accordance with the Contract Documents, within budget and on schedule.

### **Input:**

- Approved, permitted design, reviewed by all stakeholders
- Budget-compliant pricing (including all soft costs) with ready to award construction contract
- Approved Construction CEA
- Project-specific commissioning plan
- Project waste, recycling, and re-use plan

### **Outcomes:**

- A complete and usable project which meets these project goals:
  - Program
  - Quality
  - Budget
  - Schedule
  - Sustainability: LEED, Energy/Carbon, IAQ, Waste/Recycling/Re-use, etc.
  - Operational effectiveness
- Updated FCI data
- Updated Building Profile/BIM
- Facility O&M Manuals and Preventive Maintenance Plans
- Lessons Learned regarding: Processes, Team, Design, Construction, etc.

### **Tasks:**

- Upon approval of the CEA, award the contract and prepare the e-Req.
- Contractor obtains the building permit and all municipal approvals.
- The Project Manager:
  - Conducts the pre-construction conference and weekly OAC meetings integrating the Users and other stakeholders as appropriate.
  - Coordinates with Users, Campus Planning, and Facilities Services staffs
  - Develops a QA/QC strategy
  - Manages the Commissioning process
  - Manages the submittal/RFI process
  - Manages Change Orders and controls the expenditure of Contingencies
  - Monitors the CM/Contractor safety program
  - Manages Project Controls and Reporting through the standard Program Control System.
  - Manages the Design Team efforts during the Construction Administration phase of the A/E contract
  - Manages FF&E disposal/procurement/installation and move management
  - Coordinates inspections, punch list status, substantial completion and Certificate of

- Occupancy
    - Ensures FCI database is updated to reflect deficiency corrections.
    - Delivers the project to Facilities Services with a standardized O&M delivery format.
- Director of Campus Facilities develops the Facility Operating Plan

**Deliverables:**

- Contractor rolling schedules
- Contractor RFI, Submittal, and Change Order logs
- Design team site observations
- Punch list
- Letter of substantial completion and Certificate of Occupancy.
- Final permit sign-off
- Financial close-out documentation
- O&M Manuals and separate Finishes Manual
- Facility Operating Plan
- As-Built Drawings and formatted disks
- Operational training plan
- Actual FCI cost data

**Responsibilities:**

<ul style="list-style-type: none"> <li>◆ Director of Project Administration</li> <li>◆ Director of Strategic Capital Programs</li> </ul>	<ul style="list-style-type: none"> <li>- Overall Leadership</li> </ul>
<ul style="list-style-type: none"> <li>◆ Project Manager</li> </ul>	<ul style="list-style-type: none"> <li>- Contract Administration</li> <li>- Job site safety</li> <li>- Change Order Management</li> <li>- Project Controls &amp; Reporting</li> <li>- Project Communications</li> <li>- User Group coordination</li> <li>- QA/QC/Inspection program</li> <li>- Manage Commissioning process</li> <li>- O&amp;M Manual development</li> <li>- Operational Training</li> <li>- FF&amp;E and Move Management</li> <li>- Certificate of Occupancy process</li> <li>- Coordination with Facilities including orderly transition of responsibilities</li> <li>- Document As-Built conditions</li> <li>- Ensure Punch List is completed</li> <li>- Ensure FCI database is updated</li> <li>- Coordinate with Campus Planning regarding User requirements, Occupancy, and Campus interface issues.</li> </ul>
<ul style="list-style-type: none"> <li>◆ Campus Facilities Directors</li> </ul>	<ul style="list-style-type: none"> <li>- Proactive Advocacy</li> <li>- Refine operating budget in close coordination with Budget</li> </ul>

	<p>Cycle</p> <ul style="list-style-type: none"> <li>- Set up Service Contracts</li> <li>- Define Preventive and Predictive Maintenance tasks and enter them into Maximo</li> <li>- Develop the Facility Operating Plan</li> </ul>
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**Approvals:**

◆ Change Orders	Project Manager Director	Review Approve
◆ Budget Variance	VP Ops EVP	Review Approve
◆ Substantial Completion	User Group Project Manager	Review Approve
◆ Substantial Completion	Sr. Director of University Facilities	Review Approve

**Links:**

- ◆ [PM Web Portal](#)
- ◆ [Construction Contract Templates](#)
- ◆ [Tufts Project Folder Structure](#)
- ◆ [Project Schedule Template](#)
- ◆ [Project Report Template](#)
- ◆ [Finishes Manual](#)
- ◆ [Pre-Construction Meeting Template](#)
- ◆ [Weekly OAC Meeting Template](#)
- ◆ [Sample RFI and Submittal logs](#)
- ◆ [Sample PCO/Change Order log](#)
- ◆ [Sample QA/QC Plan](#)
- ◆ [Site Visit Check List](#)
- ◆ [Contractor's Daily Report Template](#)
- ◆ [Commissioning Plan Template](#)
- ◆ [Sample Punch List](#)
- ◆ [Closeout/Substantial Completion/C of O Check List](#)
- ◆ [Facilities O&M Check List](#)
- ◆ [Facility Operating Plan template](#)

## Phase 6: Operations

### Purpose:

The ultimate goal of a capital project is to deliver a facility that operates efficiently to meet School and University mission requirements. While the Operations Phase is shown at the end of the project life cycle, operational considerations must be part of every phase of the project delivery process.

### Input:

- Completed capital construction project with Certificate of Occupancy
- O&M Manuals and Preventive Maintenance Plans
- Fully developed and digitized asset specification documentation
- User and Facilities staff training
- Signed Architect/Contractor affidavits
- Commissioned project with completed Commissioning Report

### Outcomes:

- A Facility that:
  - Meets University needs.
  - Contributes to meeting the University’s Energy/Carbon reduction targets.
  - Is supported by appropriately trained Facilities Services resources in order to optimize the life of the asset as well as to support the strategic agenda of its occupants.
  - Has an accompanying operating budget sufficient to accommodate maintenance plans and customer service levels.
- Preventive Maintenance plans loaded into Maximo.
- Lessons Learned regarding: Processes, Team, Design, Construction, etc.

### Tasks:

	Phases				
	1	2	3/4	5	6
– User Groups and Facilities staff are key stakeholders whose input is needed throughout the life of a project – from initial planning and programming through design, commissioning, construction, and acceptance.	√	√	√	√	√
– The Project Manager structures the design review process to require formal stakeholder reviews and sign-offs at the end of each phase of the project delivery process, prior to the beginning of the next phase.		√	√		
– Campus Facilities Directors ensure that operating budgets and staffing requirements are part of the initial project planning and integrated into the University’s operating budget.	√	√			
– Designs should ensure adequate space is allocated for operations and maintenance (mechanical rooms, janitors’ closets, etc.)		√	√		
– Initial and on-going O & M training should be planned and budgeted.		√	√	√	√

- Facilities staff and the Project Team collaborate to ensure that building asset specifications are fully developed and digitally documented in a Maximo-compatible format during the Design and Construction Phases.			√	√	
- Facilities staff and the Project Team collaborate to ensure that asset specification files are delivered in sufficient time to enable maintenance plans to be developed prior to turn-over.			√	√	√
- Preventive and Predictive maintenance plans must be developed and entered into Maximo.				√	√
- Identify spare parts, attic materials, and sources for “just-in-time” delivery parts delivery.				√	√
- Manage the warranty program and conduct a 10-month post-occupancy review prior to project closeout.					√
- Financially close-out the project as quickly as possible.				√	√
- Develop a long-term capital renewal strategy. Consider plans for incremental maintenance reserves.				√	√
- Develop operational performance metrics.			√	√	√

**Deliverables:**

- Post occupancy Inspection and Evaluation Report
- Operational Performance metrics to include:
  - Program performance
  - Energy use
- Vendor Quality feedback
- Lessons Learned

**Responsibilities:**

♦ Project Manager	<ul style="list-style-type: none"> <li>- Turnover of the completed project to Facilities Services</li> <li>- Commissioning report</li> <li>- Financial Closeout</li> <li>- FCI Update</li> <li>- As-Built drawings and all completed project documentation in electronic format</li> <li>- Ensures Preventive/Predictive Maintenance and Warranty data are delivered in Maximo-compatible format</li> <li>- Post Occupancy inspection</li> </ul>
♦ Director of Campus Facilities	<ul style="list-style-type: none"> <li>- Prepare operating budget and Facilities staffing plan</li> <li>- Train Facilities staff on operation of the completed facility and provide on-going training as required</li> <li>- Accepts the completed project</li> <li>- Coordinates occupancy with User Group</li> <li>- Long term capital renewal strategy</li> <li>- Address Warranty issues</li> </ul>

◆ <i>Work Control Director</i>	- Enters Preventive/Predictive Maintenance data into Maximo
◆ Procurement	- Vendor quality feedback and performance report - Lessons learned - Spare parts inventory planning
◆ <i>Tufts Engineering</i>	- Engineering design guidelines and standards - Operational performance metrics

**Approvals:**

◆ Campus Facilities Directors	- Review and Approve Preventive Maintenance Plans
◆ Director of Project Admin ◆ Director of Strategic Capital Programs	- Financial Closeout
◆ Project Manager	- Review project-specific MEP specifications
◆ Director of Engineering	- Develops MEP guidelines/standards - Approves project-specific MEP specifications

**Links:**

- ◆ [Facilities O & M Check List](#)
- ◆ [Sample Preventive Maintenance Plan](#)
- ◆ [Sample Asset Specification Document](#)
- ◆ [Maximo electronic asset submission template](#)
- ◆ [Operating Budget sample and template](#)
- ◆ [Post Occupancy Inspection Check List](#)
- ◆ [PM Web link](#)
- ◆ [Sample New Facility Training Plan](#)
- ◆ [Design Review Check List](#)
- ◆ [Operations Key Performance Measures](#)
- ◆ [Facility Operating Plan template \(a la Harvard NW Labs\)](#)

## 5. Appendices

- A. Capital Project Initiation and Authorization Form
- B. Planning Phase Check List
- C. Professional Services Contract Templates (Architects, Engineers, Consultants)
  - i. Request for Qualifications
  - ii. Request for Proposal
  - iii. Standard Form of Contract – Architect/Engineer
  - iv. Standard Form of Contract – Consultant
- D. Energy/Carbon Budget Template
- E. Life Cycle Cost Analysis Template
- F. Programming Phase Check List
- G. Project Initiation Check List
- H. Design Phase Check List
- I. Project Folder Structure
- J. Project Charter Template
- K. Project Organization Chart Template
- L. Total Project Budget Template
- M. Architect/Engineer Selection Process Map
- N. Construction Manager Selection Process Map
- O. Construction Manager Contract Templates
  - i. Request for Qualification
  - ii. Request for Proposal
  - iii. Standard Form of Contract – Pre-Construction Services
  - iv. Standard Form of Contract – CM at Risk
  - v. Standard Form of Contract – Agency CM
- P. Competitively Bid Contract Templates
  - i. Request for Quote/Invitation for Bid
  - ii. Bid Tab
  - iii. Standard Form of Contract
- Q. Project Finance Template
- R. Monthly Project Report Template
- S. Pre-Construction Conference Agenda Template
- T. Weekly OAC (Owner-Architect-Contractor) Meeting Agenda Template
- U. Change Order Process, Forms, Logs
- V. QA/QC Plan Template
- W. Site Visit Check List
- X. Contractor’s Daily Report Template
- Y. Commissioning Plan Template
- Z. Facilities Services O&M Check List
- AA. Facility Operating Plan Template



School/Division: _____		Date: _____
Department: _____		
Requestor: _____		Project No. _____
Project Name: _____		
Campus: _____		
Building: _____		
<b>Services Requested</b> <input type="checkbox"/> Planning/Feasibility Study <input type="checkbox"/> Cost Estimate <input type="checkbox"/> Design <input type="checkbox"/> Construction <input type="checkbox"/> Other _____	<b>Type of Space</b> <input type="checkbox"/> Office <input type="checkbox"/> Classroom <input type="checkbox"/> Lab <input type="checkbox"/> Residence Hall/Food Service <input type="checkbox"/> Landscape <input type="checkbox"/> Infrastructure <input type="checkbox"/> Other _____	<b>Type of Project</b> <input type="checkbox"/> New Construction <input type="checkbox"/> Renovation (new program) <input type="checkbox"/> Maintenance/Capital Renewal <input type="checkbox"/> Equipment/FF&E Installation <input type="checkbox"/> Other _____
Need (briefly state the programmatic need or objective for this project)		
Scope/Description (attach sketches or other supporting information)		
Justification & Relationship to Tufts T-10 Strategic Plan		

Is this project in the 5-Year Capital Plan?

Yes: Fiscal Year \_\_\_\_\_  No

Cost Estimate:	Definitive: \$ _____ Range: \$ _____ to \$ _____ Basis of Estimate: _____ (Bids, Estimator, Benchmarked unit costs, guestimate,...) <input type="checkbox"/> Unknown		
Funding Source(s):	<input type="checkbox"/> School Reserves <input type="checkbox"/> School Operating Budget <input type="checkbox"/> Deferred Maintenance Budget <input type="checkbox"/> Grant	<input type="checkbox"/> Philanthropy <input type="checkbox"/> Other _____ <input type="checkbox"/> No Fund Source yet	
Impact on Operating Budget:			
	Name	Signature	Date
Requestor:	_____	_____	_____
Department Head:	_____	_____	_____
EAD/VP:	_____	_____	_____

School/Division: _____		
Department: _____		
Requestor: _____		
Project Name: _____	Project No. _____	
Campus: _____		
Building: _____		
Operations Team: _____	Lead Planner: _____	
	Project Manager: _____	
	Facilities Services Rep: _____	

**Budget Information:**

Phase		1. Planning	2. Programming	4. Design
Budget:	Hard Costs	\$ _____	\$ _____	\$ _____
	Soft Costs	\$ _____	\$ _____	\$ _____
	Contingency	\$ _____	\$ _____	\$ _____
	FF&E	\$ _____	\$ _____	\$ _____
	Other Costs	\$ _____	\$ _____	\$ _____
	<b>TOTAL PROJECT COST</b>	\$ _____	\$ _____	\$ _____
Funding Source(s):	Source 1: \$ _____	\$ _____	\$ _____	\$ _____
	Source 2: \$ _____	\$ _____	\$ _____	\$ _____
	Source 3: \$ _____	\$ _____	\$ _____	\$ _____
	<b>TOTAL</b> \$ _____	\$ _____	\$ _____	\$ _____
Impact on Operating Budget:				

**Authorization:**

	1. Planning Phase		2. Programming Phase		4. Design Phase	
	Signature	Date	Signature	Date	Signature	Date
Lead Planner						
Project Manager						
Director of Planning						
Director Proj. Admin						
Director Capital Prog.						
SR Director Facilities						
VP Operations						
EAD						
Dean						
VP Finance						
EVP						
CEA Signed			Design CEA		Const. CEA	
Authorized Next Step	Programming <input type="checkbox"/>		Design <input type="checkbox"/>		Construction <input type="checkbox"/>	
<b>Notes:</b>						

Planning Check List  
Tufts Capital Project

Date: _____		
Project Name: _____		
School/Division: _____		
Department/User: _____		
Campus: _____		
Building: _____		
Floor/Rooms: _____		
	<b>Task</b>	<b>Notes</b>
<b>Purpose</b>	<input type="checkbox"/> Long Range Planning <input type="checkbox"/> Project/Program Definition <input type="checkbox"/> System Study <input type="checkbox"/> Other: _____	
<b>Team</b>	<b>Identify Project Team members</b> <input type="checkbox"/> Planning Lead: _____ <input type="checkbox"/> Project Manager: _____ <input type="checkbox"/> Client Contact: _____ <input type="checkbox"/> User Contact: _____ <input type="checkbox"/> Facilities Contact: _____ <input type="checkbox"/> Engineering Rep: _____ <input type="checkbox"/> Is a Planning Consultant needed? _____ <input type="checkbox"/> Is a Cost Estimator Consultant needed? _____	
<b>Funding</b>	<b>Has funding for the project or study been identified?</b> <input type="checkbox"/> List the sources of funds _____ <input type="checkbox"/> Is the project in the Capital Plan? _____	
<b>Need</b>	<b>Confirm the Statement of Need</b> <input type="checkbox"/> Define the User's need <input type="checkbox"/> What is the relationship to the Client's mission? <input type="checkbox"/> Relationship to School and University Strategic Initiatives? <input type="checkbox"/> List the expected outcomes from the Capital Project <b>Array options for accommodating the program</b> <input type="checkbox"/> Space reallocation <input type="checkbox"/> Renovation/remodelling <input type="checkbox"/> New Construction/Addition <input type="checkbox"/> Move Relocation <input type="checkbox"/> Special Equipment <input type="checkbox"/> Furniture/Technology solutions <input type="checkbox"/> Leased Space <input type="checkbox"/> Scheduling	
<b>Scope</b>	<b>Determine the functional requirements</b> <input type="checkbox"/> Gather initial scope information requirements from User group <input type="checkbox"/> Determine User program activities <input type="checkbox"/> Determine physical or functional requirements <input type="checkbox"/> Number of people served <input type="checkbox"/> Applicable standards (e.g., Grant, Accreditation) <input type="checkbox"/> Faculty start-up agreement <input type="checkbox"/> Determine the applicable Tufts Space Standards <input type="checkbox"/> Review alternative ways to achieve program need	

Planning Check List  
Tufts Capital Project

	<input type="checkbox"/> Review alternative ways to achieve program need	
	<input type="checkbox"/> Review space to be vacated (if applicable) and the plan for that space	
	<b>Identify other factors which would affect scope, cost, schedule?</b>	
	<input type="checkbox"/> Are there current facility deficiencies (FCI) which should be corrected?	
	<input type="checkbox"/> Are there Code issues which need to be addressed?	
	<input type="checkbox"/> Are there permitting issues which would affect cost and schedule?	
	<input type="checkbox"/> Are there accessibility issues which should be addressed?	
	<input type="checkbox"/> Environmental/Hazmat issues?	
	<input type="checkbox"/> Historic considerations?	
	<input type="checkbox"/> Special Equipment Needs?	
	<input type="checkbox"/> Special Logistical Needs?	
	<input type="checkbox"/> Are there enabling projects required before this project can start?	
	<input type="checkbox"/> Are there any other related projects?	
	<input type="checkbox"/> Will the capacity of the existing building infrastructure support this project?	
	<input type="checkbox"/> Define the scope in writing	
<b>Site</b>	<input type="checkbox"/> Is the project consistent with the campus master plan?	
	<input type="checkbox"/> Check existing site surveys	
	<input type="checkbox"/> Property ownership	
	<input type="checkbox"/> Storm water	
	<input type="checkbox"/> Easements	
	<input type="checkbox"/> Environmental/soil conditions	
	<input type="checkbox"/> Check site utilities (availability, capacity, etc.)	
<b>Schedule</b>	<input type="checkbox"/> Identify any user needs which affect schedule	
	<input type="checkbox"/> University/School schedule requirements	
	<input type="checkbox"/> Academic Calendar requirements	
	<input type="checkbox"/> Above Average Time-Sensitivity	
	<input type="checkbox"/> Other Schedule constraints	
<b>Budget</b>	<input type="checkbox"/> Assemble cost benchmarks	
	<input type="checkbox"/> Determine rough order of magnitude construction cost	
	<input type="checkbox"/> Estimate soft costs	
	<input type="checkbox"/> Assess risk and determine project contingency	
	<input type="checkbox"/> Review schedule and determine escalation contingency	
	<input type="checkbox"/> Develop Total Project Budget Estimate	
	<input type="checkbox"/> Business Planning/Operational Impact	

Programming Phase Check List  
Tufts Capital Project

Date: \_\_\_\_\_  
 Project Name: \_\_\_\_\_  
 School/Division: \_\_\_\_\_  
 Department/User: \_\_\_\_\_  
 Campus: \_\_\_\_\_  
 Building: \_\_\_\_\_  
 Floor/Rooms: \_\_\_\_\_  
 Project Team: Planner: \_\_\_\_\_  
                   Project Manager: \_\_\_\_\_  
                   Client Contact: \_\_\_\_\_  
                   User Contact: \_\_\_\_\_  
                   Facilities Contact: \_\_\_\_\_  
                   Engineering Rep: \_\_\_\_\_  
                   Planning Consultant: \_\_\_\_\_  
                   Cost Estimator: \_\_\_\_\_  
                   Architect: \_\_\_\_\_  
                   Construction Manager: \_\_\_\_\_

	Task	Notes
	<b>Program Analysis</b>	
	Consolidate the Client Statement of Need, Objectives, Goals, Space Requirements, and Operational Requirements into the Program.	
	<input type="checkbox"/> Meet with the User Group to review the approved scope, budget and schedule.	
	<input type="checkbox"/> Identify the specific programmatic needs:	
	<input type="checkbox"/> Occupants	
	<input type="checkbox"/> Offices, labs, classrooms, restrooms, etc.	
	<input type="checkbox"/> Are there special equipment needs? Lab gasses? Other?	
	<input type="checkbox"/> Is there Food Service?	
	<input type="checkbox"/> What are the IT needs?	
	<input type="checkbox"/> Identify utility infrastructure program needs?	
	<input type="checkbox"/> What is the deferred maintenance program?	
	<input type="checkbox"/> What is the ADA/accessibility program?	
	<input type="checkbox"/> Supporting needs: Mechanical Rooms, Janitorial Closets, IT Closets, etc.	
	<input type="checkbox"/> Define the site or landscape program	
	<input type="checkbox"/> What are the sustainability goals and program elements?	
	<input type="checkbox"/> Project-specific requirements (Grant, donor, etc.)	
	<input type="checkbox"/> Square footage (NASF) needed to satisfy program requirements	
	<input type="checkbox"/> Determine the appropriate Net-to-Gross factor	
	<input type="checkbox"/> Translate the specific programmatic needs into the SF program	
	<b>Utility and IT Review</b>	
	<input type="checkbox"/> Determine energy and other utility requirements for the facility	
	<input type="checkbox"/> Determine IT requirements	
	<input type="checkbox"/> Determine whether campus Utility and IT capacities are sufficient	
	<b>Existing Conditions Analysis</b>	
	<input type="checkbox"/> Review the FCI data	
	<input type="checkbox"/> Inspect existing facilities, perform destructive testing as required	
	<input type="checkbox"/> Identify potential unforeseen conditions	
	<b>Environmental Assessment</b>	
	<input type="checkbox"/> Identify and evaluate existing environmental conditions	
	<input type="checkbox"/> Review special User environmental, health, and safety requirements	
	<input type="checkbox"/> Identify potential air emissions sources generated by the project	

Programming Phase Check List  
Tufts Capital Project

<b>Code Assessment</b>		
	<input type="checkbox"/> Identify code improvements which may be required	
	<input type="checkbox"/> Assess code requirements of research functions, types/amounts of chemicals, animal requirements, etc.	
	<input type="checkbox"/> Determine if any special permitting will be required	
<b>Schedule Review</b>		
	<input type="checkbox"/> Develop the project schedule/timeline.	
	<input type="checkbox"/> Review the schedule with all stakeholders	
<b>Operational Review</b>		
	<input type="checkbox"/> Facilities Services reviews the project program for operational impacts	
	<input type="checkbox"/> Confirm that supporting infrastructure and spaces are in the program	
	<input type="checkbox"/> Determine the impact on the operating budget	
<b>Budget</b>		
	<input type="checkbox"/> Outline schedule, program requirements, and budget goals	
	<input type="checkbox"/> Determine cost estimating method	
	<input type="checkbox"/> Develop detailed Construction Cost estimate using the budget template	
	<input type="checkbox"/> Develop a Program-level Total Project Cost to include:	
	Construction Costs	
	Enabling and related project costs	
	Soft costs	
	Escalation	
	Contingencies	
	<input type="checkbox"/> Develop the Operating Budget costs	
	<input type="checkbox"/> Prepare budget allocations for the unidentified "pool" projects	
<b>Procurement</b>		
	<input type="checkbox"/> Develop and maintain Blanket Contracts including:	
	Architecture	
	Engineering	
	Code/Permit Consulting	
	Commissioning	
	Cost Estimating	
	Construction Management	
	Testing/Inspection	
	<input type="checkbox"/> Develop project-specific procurement strategies	