University of Wisconsin-La Crosse

Employee Enrichment Day
June 19, 2017

UNIVERSITY of WISCONSIN
LA CROSSE

Presentation Overview

- UWL Campus Profile
- Campus Overview
- Current Projects
- Future Projects
- Building Performance Strategies
- Facilities Management

Aerial View of UWL Campus

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UWL Campus Profile 2016-17

- Enrollment: 10,408 (UG: 9,650/GR 758)
- Faculty & Staff: 1,156
- 118 Acres
- 34 Buildings (19 GPR & 15 PR)
- 2.7M GSF (GPR/PR ⟶ 56%/44%)
- 3,180 Beds, 10 Residence Halls
  (Fall '15 Occupancy: 3,555 ⟶ 112%)
- 2,850 Parking Spaces

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Current Projects

- FPM Project List

Cowley Science Labs Building
Phase 1

Start: 2016
Complete: 2018

Cost: $82M
189,490 GSF

Campus Planning for Teaching & Learning

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Cowley Science Labs Building

North Elevation

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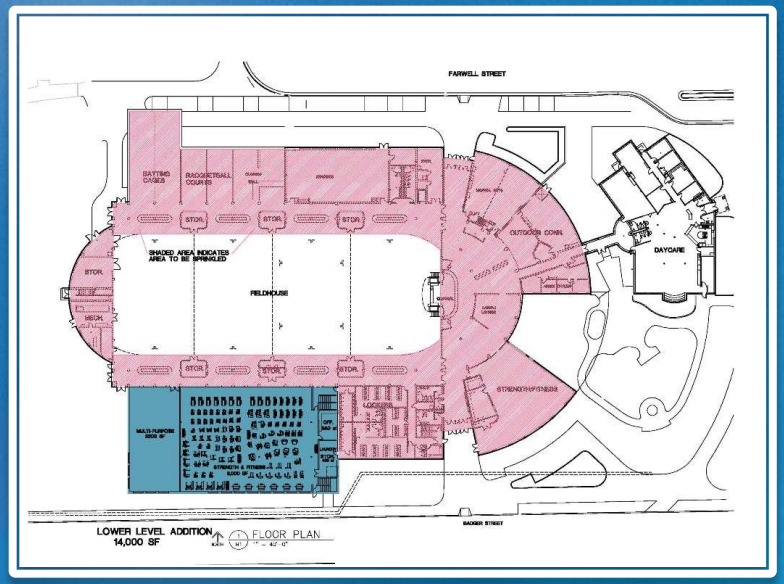
Recreational Eagle Center Addition



Start: 2016 Cost: $8.6M

Complete: 2017 30,000 GSF

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Graff Main Hall
Storm Water Improvements

Complete: 2017

Cost: $275,000

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Wittich CBA Renovation Project

Start: 2016 Cost: $25M

Complete: 2020 53,770 GSF

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Graff Main Hall
Storm Water Improvements

Complete: 2017

Cost: $275,000

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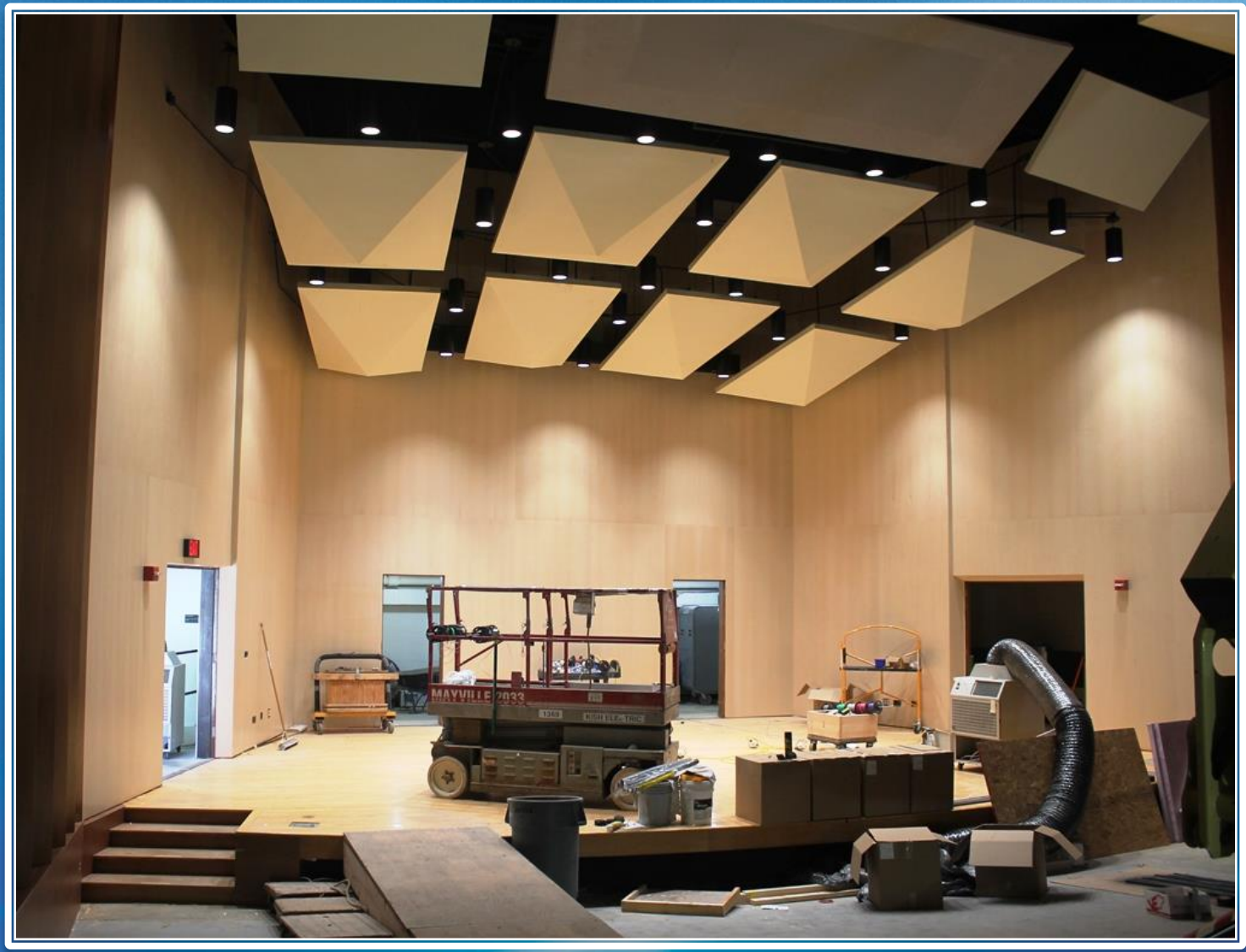
CFA Annett Recital Hall



Complete: 2017

Cost: $869,000

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La Crosse Street Landscape Improvements

Complete: 2017

Cost: $100,000

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Synthetic Surface Soccer Field

Complete: 2017

Cost: $1,551,000

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Maintenance & Stores Addition

Complete: 2017

Cost: $2,789,000

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Murphy Library Emergency Generator

Complete: 2017

Cost: $281,930

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Baseball Field Improvement

Complete: 2017

Cost: $400,000

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Wimberly Hall Classroom Renovations

Complete: 2017

Cost: $400,000

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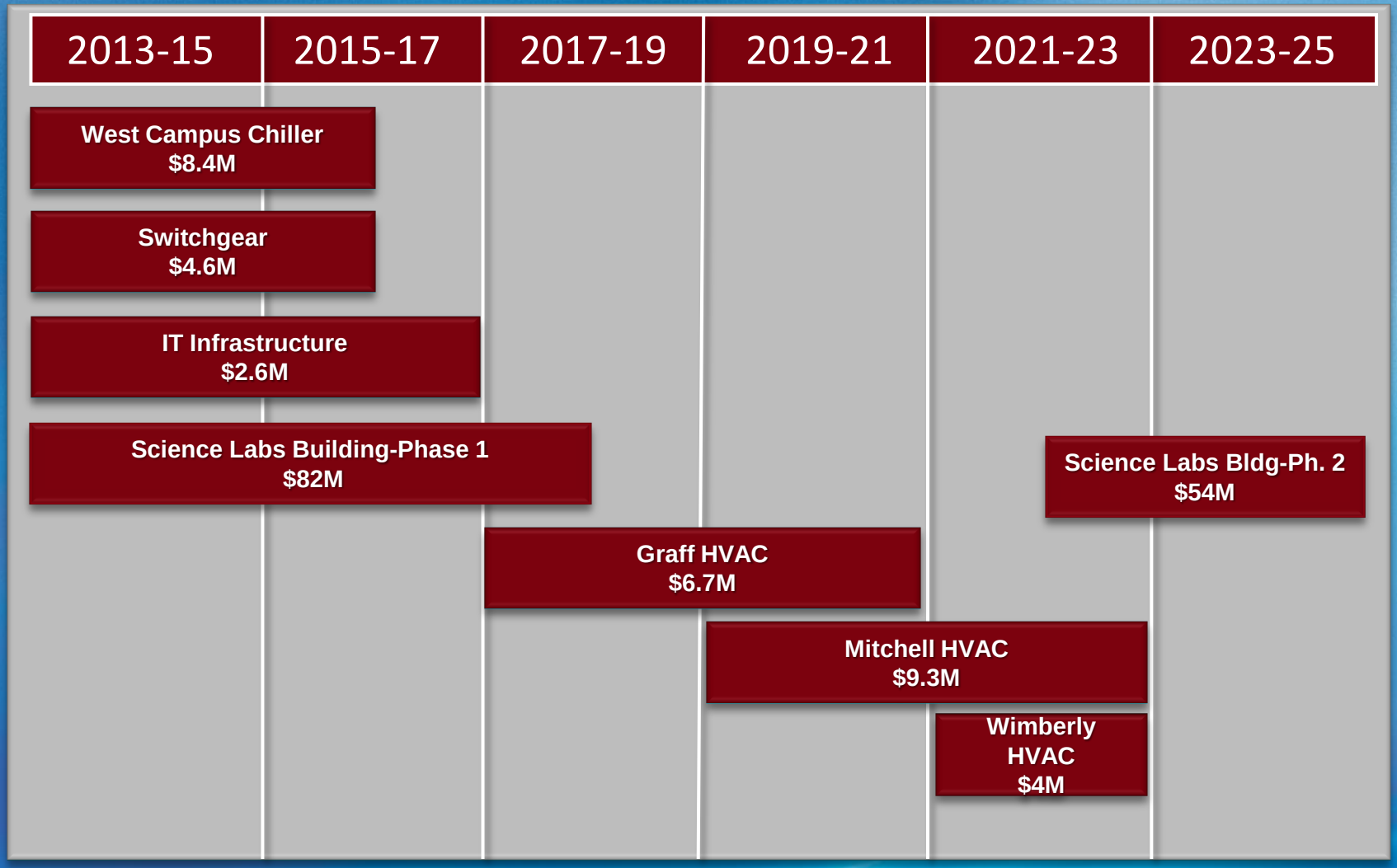
GPR Capital Planning



Project Sequencing Chart

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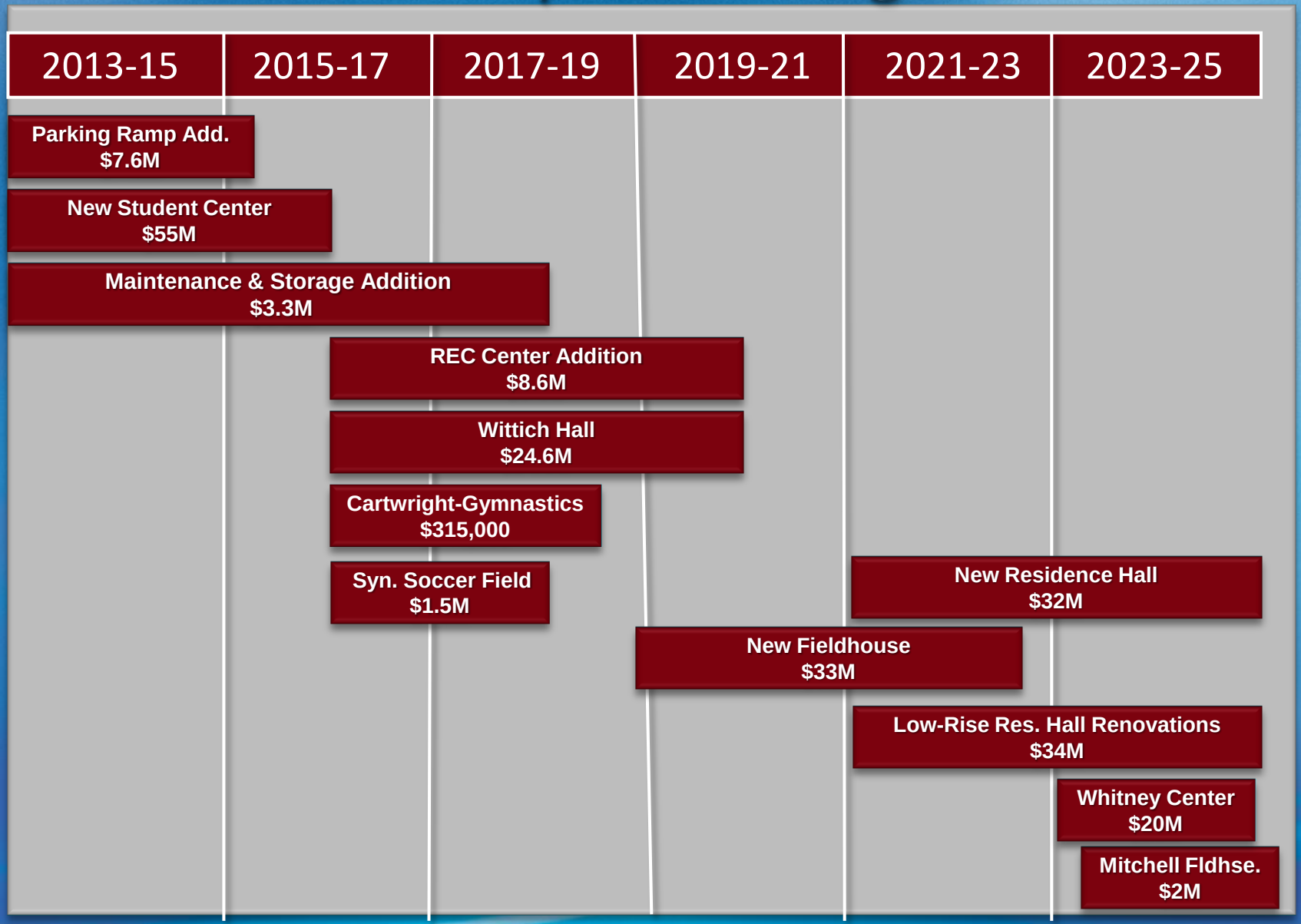
PR Capital Planning



Project Sequencing Chart

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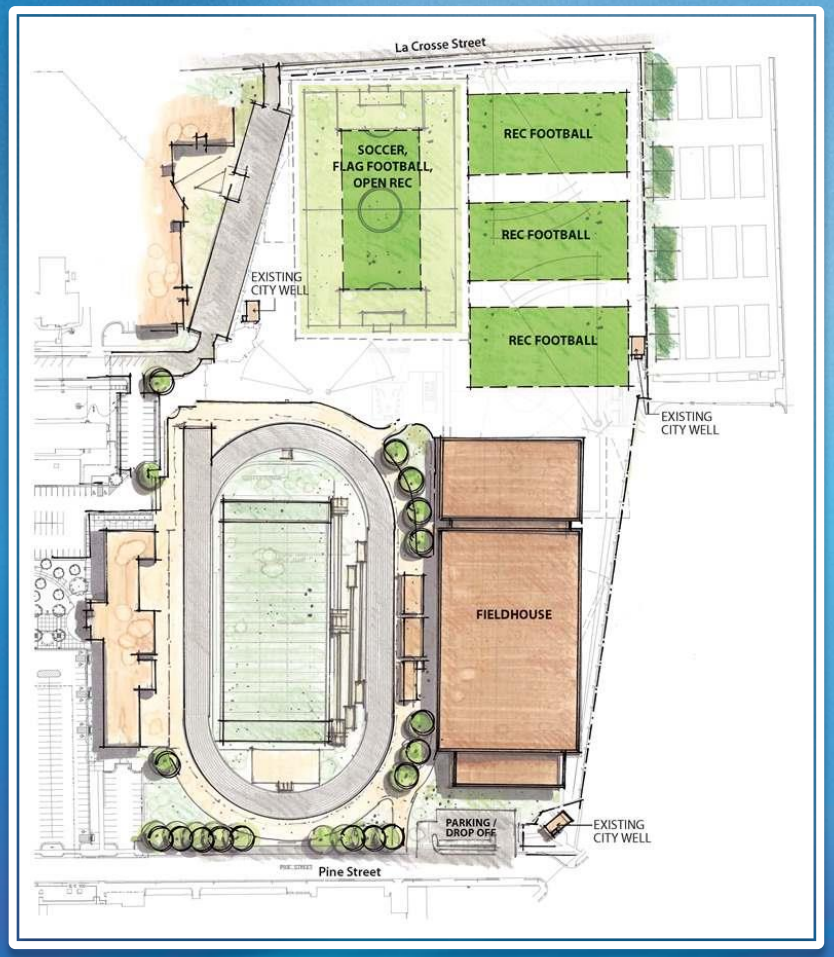
Student Fieldhouse



Start: 2016

Cost: $34.5M

Complete: 2020

104,000 GSF

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New Residence Hall

Start: 2017

Complete: 2020

Cost: $32M

111,200 GSF

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Residence Hall Renovations

- Life Safety (Fire Sprinklers)
- Electrical Upgrade
- Elevator Additions
- Bathroom Renovations
- Room Finishes & Furniture

Start: 2021 Cost: $34M

Complete: 2029 448,982 GSF

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Health Science Center 2000

- LMHSC Consortium (UWL, WTC, Gundersen, Mayo, Viterbo, La Crosse School District)
- Community Health Collaboration
- 168,555 GSF
- HSC 2020 Initiative
- Facility Assessment
- Building Renovation Plan

Long-Term Capital Planning

- Cowley Science Building Phase 2
- Future Land Acquisition
- CFA Performance Hall
- Tennis Courts
- Badger Street & Campus Malls
- Mitchell Hall
- Campus Master Plan Update

Cowley Science Building Phase 2

- 10% Concept Design
- 2015 Classroom Mix & Space Needs Analysis
- Cartwright Center Backfill Space
- $5M Project Savings ⟶ Construction Phasing

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What Goes Into A Building Design?

Building Performance Strategies

- What are Building Performance Strategies (BPS)?
- Why Use BPS
- Strategies:
  - Accessibility
  - Aesthetics
  - Cost-Effectiveness
  - Functionality
  - Productivity
  - Safety and Security
  - Sustainability

What Are BPS?

- Building Performance Strategies (BPS) are categories of design parameters aimed at optimizing the use and operation of a building.
- Building performance strategies can cover a wide range of topics. Each building performance strategy is significantly important, yet it is just one aspect of what it takes to achieve a successful project.
- A truly successful project is one where project goals are identified early on and where the interdependencies of all building systems are coordinated concurrently from the planning and programming phase.

What Are BPS?

Following the defined building performance strategy can result in:

- 25% less energy
- 19% lower operating costs
- 27% higher occupant satisfaction
- 36% fewer CO2 emissions

How to Build a Green Building

TED Talk

What Are BPS?

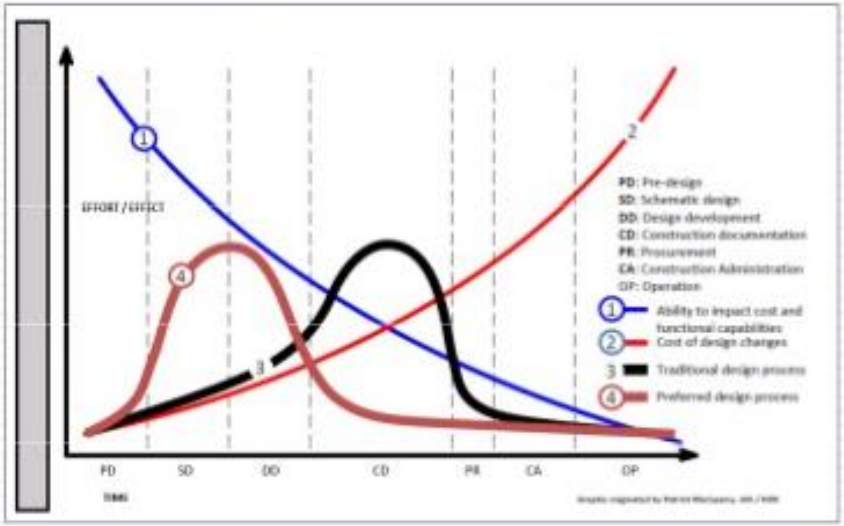
Many Resources:

- The USGBC's WELL Building Standard® is a performance-based system for measuring, certifying, and monitoring features of the built environment that impact human health and wellbeing, through air, water, nourishment, light, fitness, comfort, and mind. WELL is managed and administered by the International WELL Building Institute (IWBI), a public benefit corporation whose mission is to improve human health and wellbeing through the built environment.
- Whole Building Design Guide, National Institute of Building Sciences
- EPA Green Building Standards
- IFMA
- State Standards

Why Use BPS?

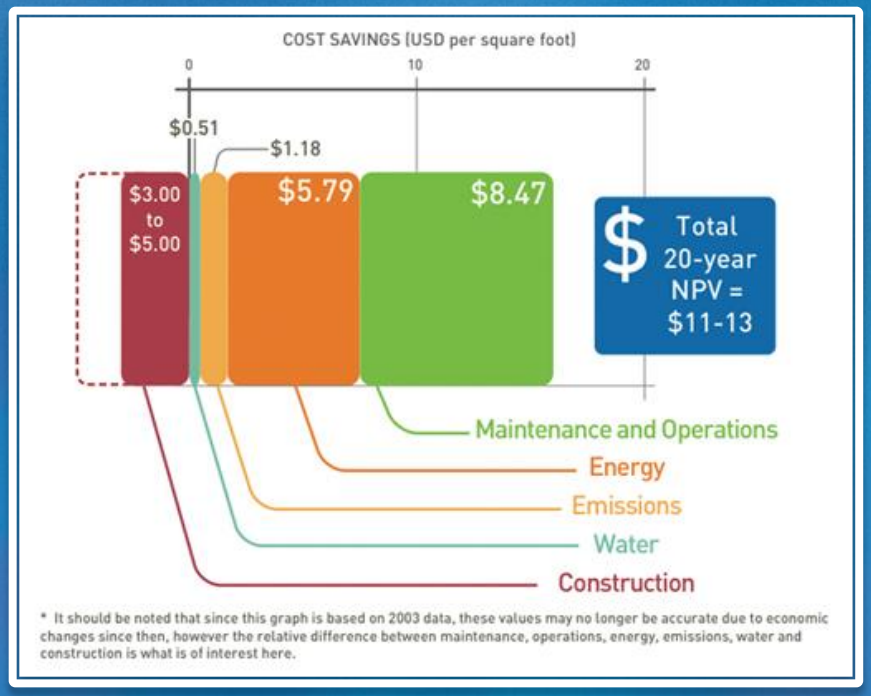
Improve overall effectiveness, efficiency, and life cycle costing of the facility.

MacLeamy Curve



The MacLeamy Curve is a graph of the cost of decisions mapped along the timeline of a typical construction project. It clearly shows that decisions made early in a project (during design) can be made at lower cost and with greater effectiveness. A reasonable inference to draw from this graph is in fact the idea that projects will benefit by having more diverse expertise (i.e., more interested parties) in the room during design, so that value engineering decisions, especially ones that affect the life cycle costs of the project, can be moved forward in time, when decisions are relatively inexpensive.

Why Use BPS?


COST SAVINGS (USD per square foot)
0
10
20
$0.51
$1.18
$3.00 to $5.00
$5.79
$8.47
$ Total 20-year NPV = $11-13
Maintenance and Operations
Energy
Emissions
Water
Construction
* It should be noted that since this graph is based on 2003 data, these values may no longer be accurate due to economic changes since then, however the relative difference between maintenance, operations, energy, emissions, water and construction is what is of interest here.

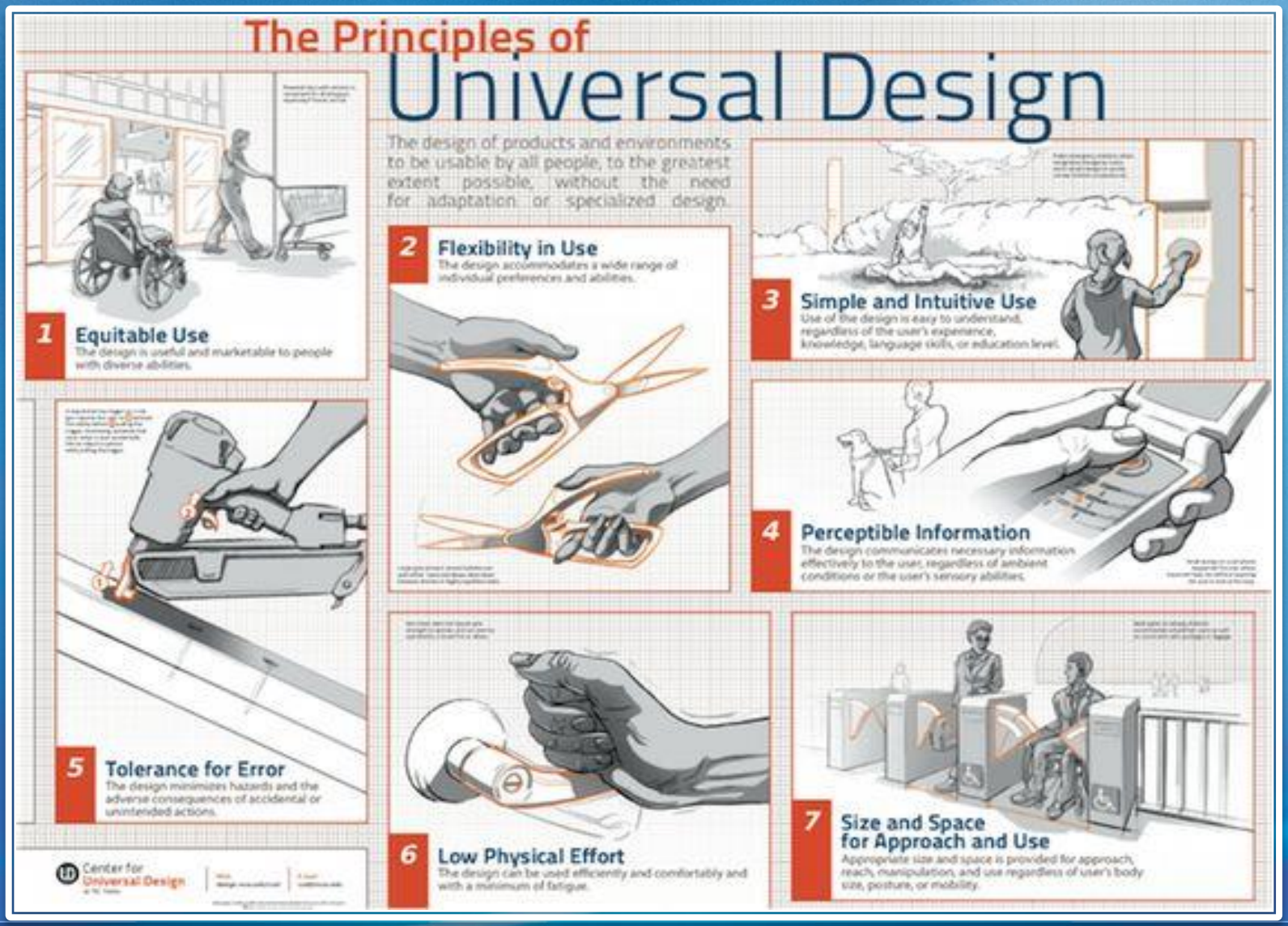

AVERAGE SAVINGS OF A GREEN BUILDING
ENERGY SAVINGS
30%
CARBON SAVINGS
35%
WATER SAVINGS
30% to 50%
WASTE SAVINGS
50% to 90%

BPS

Accessibility - This should go beyond the minimum as defined under the Americans with Disabilities Act (ADA) to address universal design, equal access and flexibility

- Gender neutral restrooms.
- Adjustable desks – sitting is the new smoking.
- Center for Universal Design t NCSU - The Center for Universal Design (CUD) is a national information, technical assistance, and research center that evaluates, develops, and promotes accessible and universal design in housing, commercial and public facilities, outdoor environments, and products. Our mission is to improve environments and products through design innovation, research, education and design assistance.
- Universal Design:
  - Principle 1: Equitable Use
  - Principle 2 : Flexibility in Use
  - Principle 3: Simple and Intuitive Use
  - Principle 4: Perceptible Information
  - Principle 5: Tolerance for Error
  - Principle 6: Low Physical Effort
  - Principle 7: Size and Space for Approach and Use

Accessibility



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Accessibility

Principle 1: Equitable Use

The design is useful and marketable to people with diverse abilities.

Guidelines:

1a. Provide the same means of use for all users: identical whenever possible; equivalent when not.

1b. Avoid segregating or stigmatizing any users.

1c. Provisions for privacy, security, and safety should be equally available to all users.

1d. Make the design appealing to all users.

Accessibility

Principle 2: Flexibility in Use

The design accommodates a wide range of individual preferences and abilities.

Guidelines:

2a. Provide choice in methods of use.

2b. Accommodate right- or left-handed access and use.

2c. Facilitate the user's accuracy and precision.

2d. Provide adaptability to the user's pace.

Accessibility

Principle 3: Simple and Intuitive Use

3a. Eliminate unnecessary complexity.

3b. Be consistent with user expectations an intuition.

3c. Accommodate a wide range of literacy and language skills.

3d. Arrange information consistent with its importance.

3e. Provide effective prompting and feedback during and after task completion.

Accessibility

Principle 4: Perceptible Information

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

Guidelines:

- 4a. Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- 4b. Provide adequate contrast between essential information and its surroundings.
- 4c. Maximize "legibility" of essential information.
- 4d. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
- 4e. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

Accessibility

Principle 5: Tolerance for Error

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

Guidelines:

5a. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.

5b. Provide warnings of hazards and errors.

5c. Provide fail safe features.

5d. Discourage unconscious action in tasks that require vigilance.

Accessibility

Principle 6: Low Physical Effort

The design can be used efficiently and comfortably and with a minimum of fatigue.

Guidelines:

- 6a. Allow user to maintain a neutral body position.
- 6b. Use reasonable operating forces.
- 6c. Minimize repetitive actions.
- 6d. Minimize sustained physical effort.

Accessibility

Principle 7: Size and Space for Approach and Use

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Guidelines:

7a. Provide a clear line of sight to important elements for any seated or standing user.

7b. Make reach to all components comfortable for any seated or standing user.

7c. Accommodate variations in hand and grip size.

7d. Provide adequate space for the use of assistive devices or personal assistance.

BPS - Aesthetics

The building aesthetic needs consider design elements that fit into the community, campus, and represent the desired architectural style.

- Form vs Function
- Duck vs. Decorated Shed (Venturi & Brown)
- Aesthetics can help in student, employee, and customer recruitment.
- The act of creating architecture is indeed a wonderful opportunity to create memorable places. It is more than meeting the functional, technical, and financial criteria established at the outset. There is a more nuanced aspect to architecture that deals with aesthetics and symbolism. In every project, opportunities exist to consider aesthetic issues. Internal to the design process are countless opportunities to make aesthetic decisions, from the selection of window types to the choice of trim color.
- In higher education, a recent Carnegie Institute study shows that high school seniors make their decision to attend a university in the first 15 minutes on campus. This is related to the aesthetic.

Aesthetics

FORM

Walt Disney Concert Hall, Los Angeles, CA
Frank Gehry

FUNCTION

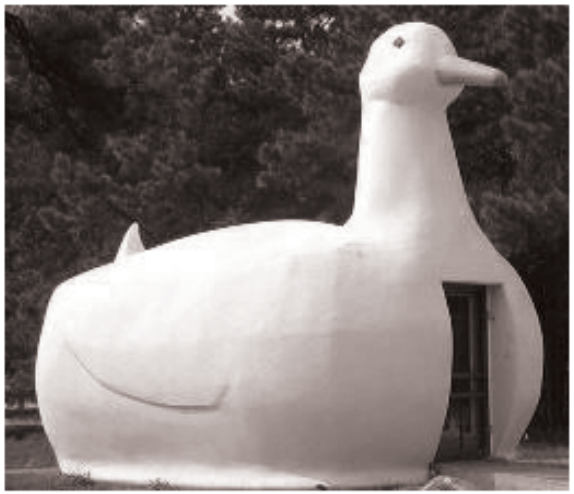
United Nations, New York, NY
Le Corbusier

Aesthetics

Longaberger Company, Foreclosed 2016

Aesthetics

DUCK



VS

DECORATED SHED

Which is more sustainable?

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Aesthetics

BPS – Cost Effectiveness

Cost effectiveness will set the building materials, utilize life cycle costing and consider non-monetary benefits such as aesthetic, historic preservation, safety, security, flexibility, resiliency, and sustainability.

- Are you building a 20 year facility or a 75 year facility.
- Some retail developers – 7 years
- Are you energy neutral, or carbon neutral.
- Total operating costs need to be considered, not just construction costs.
- Maintainability.

BPS – Cost Effectiveness

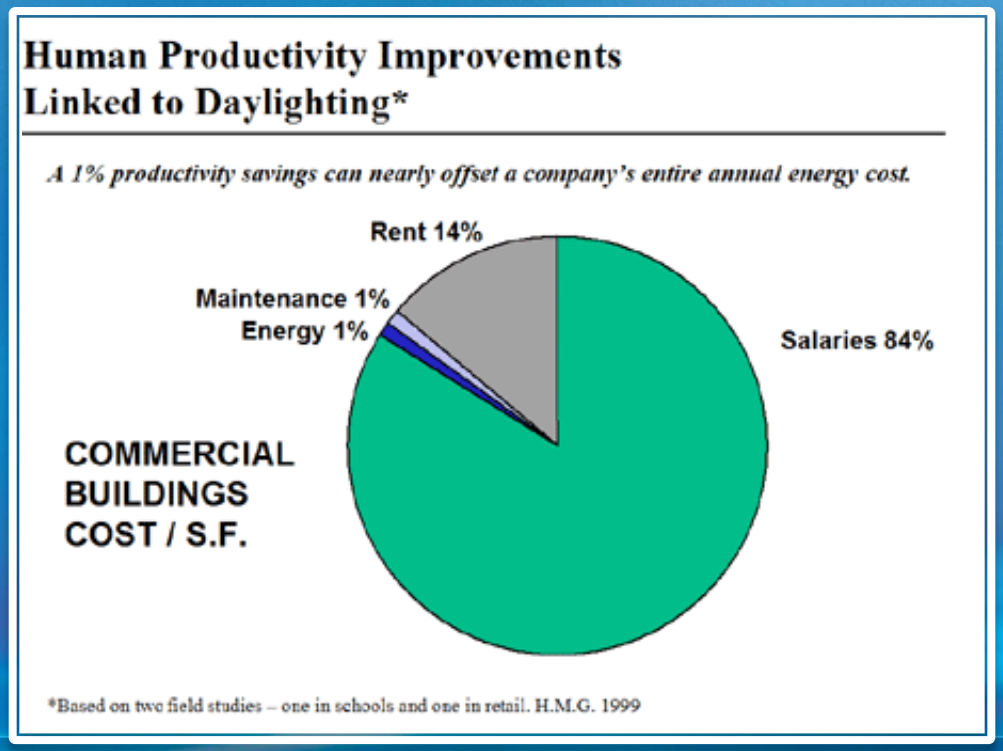
- Long term maintenance costs
  - Rule of thumb – 10% of replacement cost on maintenance
- Utilities are extremely variable, even if you build a LEED Certified building, you must control user behaviors
- Corrective, Preventive, Predictive Maintenance
  - 80/20 Rule
- Building cost effective zero energy buildings:
  - National Renewable Energy Laboratory – High Performance Design and Construction on a Budget
  - http://www.nrel.gov/docs/fy14osti/62752.pdf

BPS - Functionality

Functionality needs to account for the functional needs of the **owner**, ensure appropriate product and systems integration and meet the performance objectives.

BPS - Productivity

Productivity needs to integrate technology, audio/visual systems, promote health and wellbeing of the occupants, provide comfortable environments for the intended tasks, and assure reliable systems and spaces.



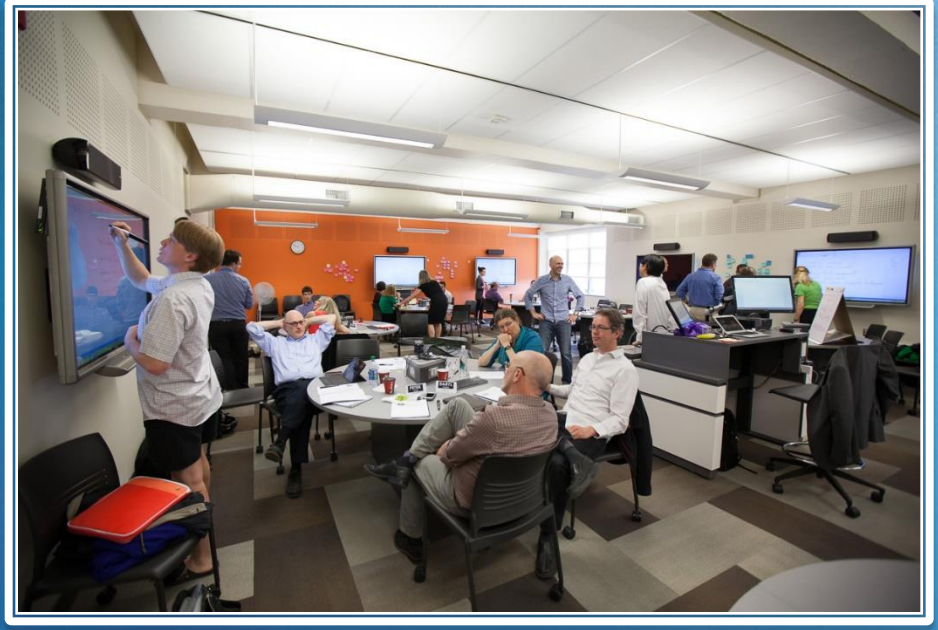
BPS - Productivity

Productivity:

- Flexibility
- Advanced Technology
- Collaboration
- Docking Spaces
- Remote working trends
- Amenities
- Productive spaces are specific to use, active learning vs. lecture, collaborative vs. individual work spaces.

BPS - Productivity

Traditional



Active Learning

BPS – Safety & Security

Safety and security needs to address fire safety, indoor air quality, natural hazard mitigation, disaster preparedness, active shooter, and security for the occupants and assets.

- Have a safety and security review by local authorities
- There needs to be a balance achieved through a risk assessment, the function and location of the building will dictate the risk level
- Crime Prevention Through Environmental Design (CPTED) -. Today's cosmopolitan centers have become vital areas where civil society is evolving and our global economy developing. Considering the importance modern urban centers play economically, socially, and politically, it is critical leaders for both the public and private sectors meaningfully invest in the advancement and promotion of public safety and security.

BPS – Safety & Security

BPS - Sustainability

Finally, and most importantly, the strategy of sustainability needs to optimize energy use, conserve water, optimize the site potential, control long term maintenance costs, and reduce the impact on the environment through sustainable building materials. This can all be achieved through the use of USGBC's Leadership in Energy and Environmental Design (LEED) standards.

- Green Building Quiz

Sustainability

Energy Use

- LED
- VFD's
- Motion Sensors
- Alternative Energy
- Benchmark energy density against know resources Energy Star, USGBC, AEE

Sustainability

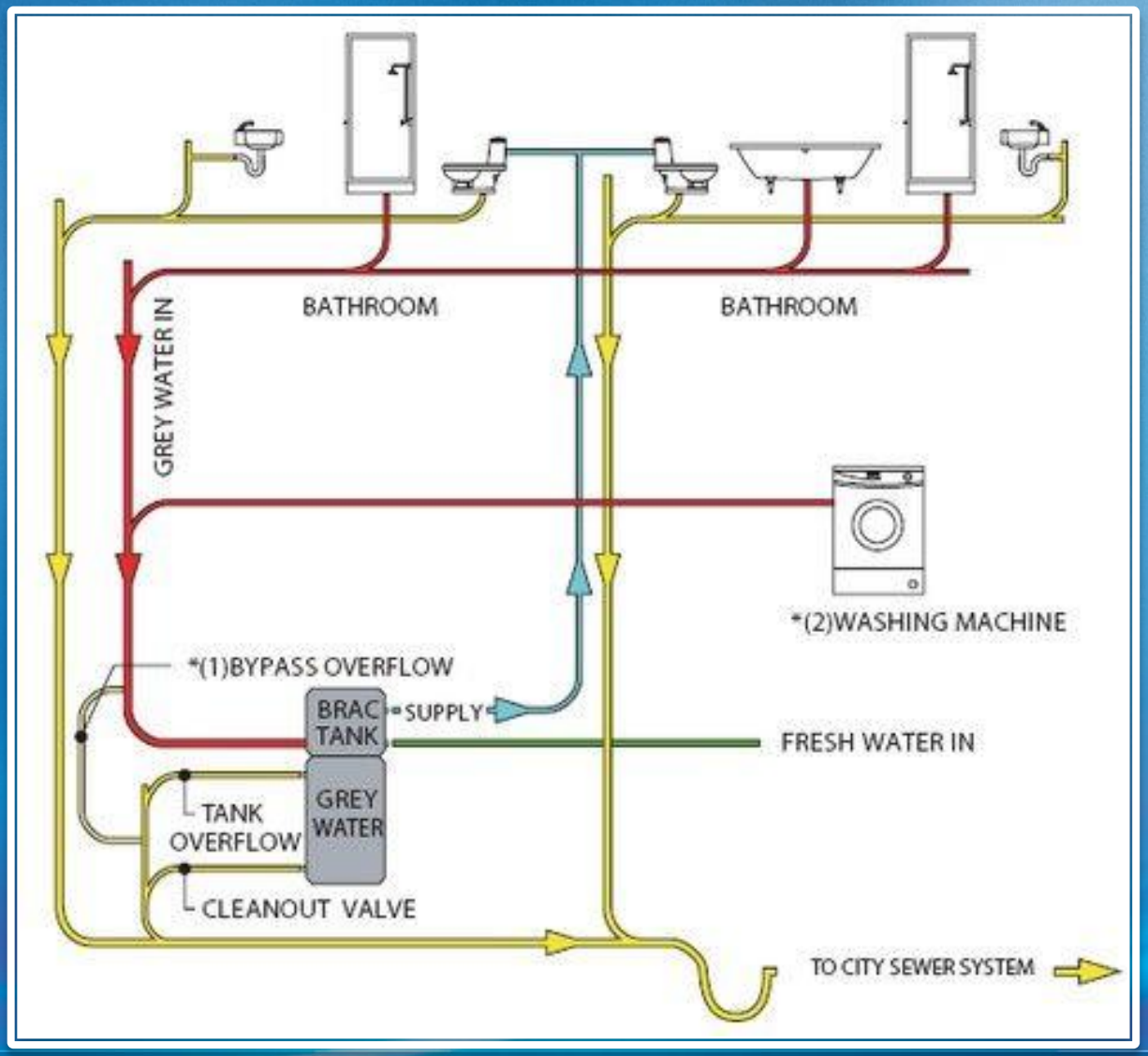
Conserve water

- Low flow fixtures
- Gray water systems
- Recycle rain water
- Bottle water fill stations

Optimize Site Potential

- Provide alternative vehicle parking
- Provide access to mass transit
- Partner with community & other organizations for shared spaces
- Preserve green space & natural landscapes

Gray Water System



Sustainability

Control long term maintenance costs

- Considered in design, equipment & system selection
- Low maintenance products such as concrete flooring

Sustainable building materials

- Locally sourced
- Recycled content building materials

Recycled Content Building Materials

- Carpet
- Cellulose Insulation
- Ceiling Tile
- Ceramic/Porcelain Tile
- Concrete Masonry Units
- Countertop
- Dock Bumpers
- Ductwork
- Exterior Sheathing
- Fences/Posts
- Fiberboard
- Fiberglass Insulation

Recycled Content Building Materials

- Floor Joists
- Floor Mats
- Flooring
- Lumber
- Paint
- Pilings
- Plastic Lumber
- Recycling Containers
- Roofing
- Structural Steel
- Underlayment Wallboard

Recycled Content Site Materials

- Asphalt
- Base Coarse
- Compost and Soil Amendments
- Concrete
- Drainage or Backfill aggregate
- Fill Material
- Ground colored glass pipe
- Bedding
- Glassphalt
- Parking Stops

BPS - Summary

Building Performance Strategies

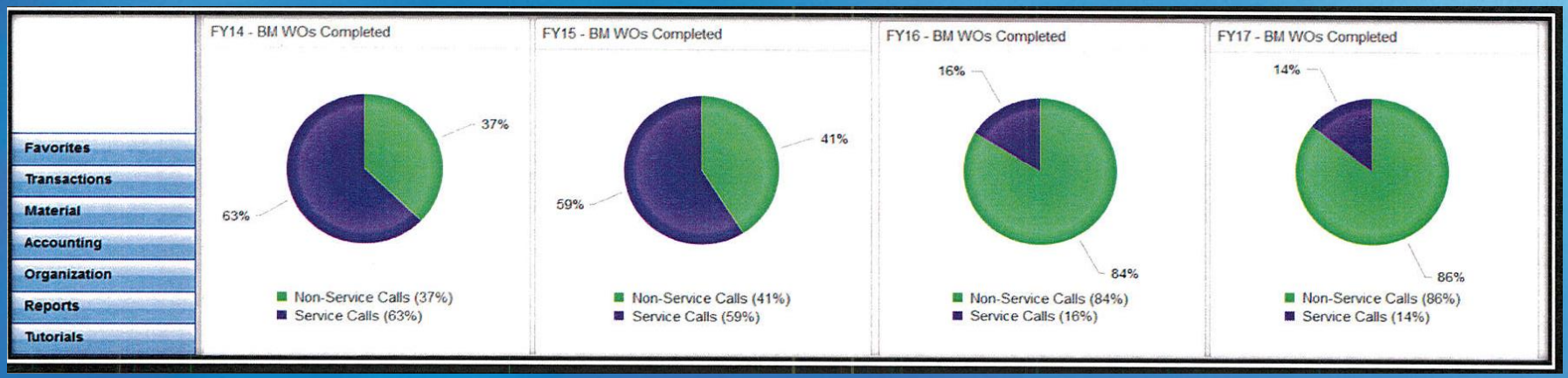
- Accessibility
- Aesthetics
- Cost-Effectiveness
- Functionality
- Productivity
- Safety and Security
- Sustainability

Resources

- http://www.usgbc.org/buildingperformance
- http://www.usgbc.org/articles/what-well
- https://network.aia.org/tdbp/home
- https://www.epa.gov/smartgrowth/comparison-green-building-standards
- https://www.ifma.org/know-base/browse/sustainability/standards-and-reporting/page/4
- http://www.creativebloq.com/design/design-offices-912828

Facilities Management

- Work Orders – TMA , 1200 per month
- PM/CM – Graph



Days to Close

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Facilities Management

- Budget - $1.3M plus $4.5M in salaries and $2.5M in fringe, total $7M
- Sales Credits - $100,000/month
- Utility Bills - $3.4M annually
- Sustainability
- Custodial $120,000 Annually
- Custodial Operations – 2.25 on APPA Scale of 1-5