

# What to Expect in the Existing Building Commissioning Process



**BUILD. CONNECT. ACHIEVE.**

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.



# Course Description



- What to expect when you undergo an Existing Building Commissioning process in your building; what are the deliverables you should receive; what staff time needs to be planned in the process; and what are the outcomes and possible payback periods? What is the difference between EBCx and Commercial Building Auditing? You will leave this session with an in depth understanding of what the owner should expect from the process.



# Learning Objectives



- Define the steps in the Existing Building Commissioning process.
- Demonstrate the differences between EBCx and an Audit.
- Describe deliverable for the owners in the Commissioning process.
- Show examples of Facility Improvements with the information necessary to make implementation decisions

# Just Imagine...



"...glad this  
isn't one of  
**MY**  
buildings..."



# The All-Encompassing Definition of Existing Building Commissioning

- Existing Building Commissioning (EBCx)
- Retro-Commissioning
- Re-Commissioning
- Ongoing Commissioning
- Monitoring-Based Commissioning



# The All-Encompassing Definition of Existing Building Commissioning

What EBCx it is not:

- Auditing
- Energy Auditing
- Any Level of ASHRAE Auditing
- Building Assessments
- Building Tune-ups

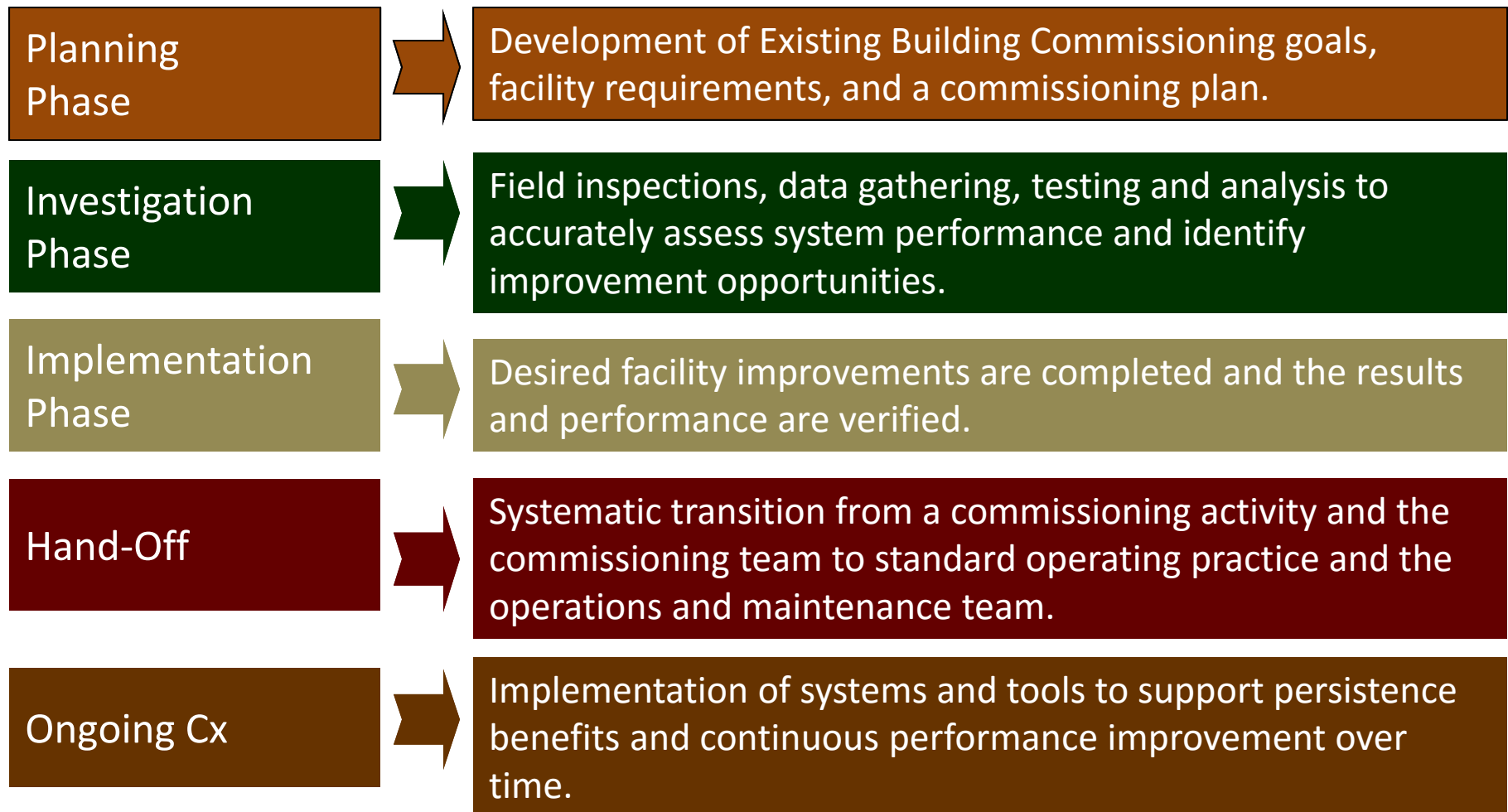
# EBCx vs. Audit

	EBCx	Audit
Walkthrough	X	X
Document Review (As built, Tenant Interviews, TAB reports, CFR, Submittals, Previous System Manuals, review O&M work request, Energy Audits/Facility Assessment documents, etc. )	X	
Utility Bill Analysis	X	X*
O&M Practices: Interviews & Reviews	X	X*
Facility Improvement Measurements (FIM) Identified	X	X*
Identifying Capital Improvement Opportunities	X	
System Sequence Testing	X	
System Functional Testing	X	
Data & Trend Logging & Analysis	X	

\* *ASHRAE Level II or Higher*



# EBCx Process for Improved Performance



Source: Building Commissioning Association –  
Existing Building Commissioning Best Practices

# EBCx Phases

Planning

Investigation





# How EBCx Improves Operations

Sample Goals Developed by the Owner

## Facility Improvement

- Resolve O & M issues
- Improve Indoor Air Quality (IAQ)
- Identify staff training needs

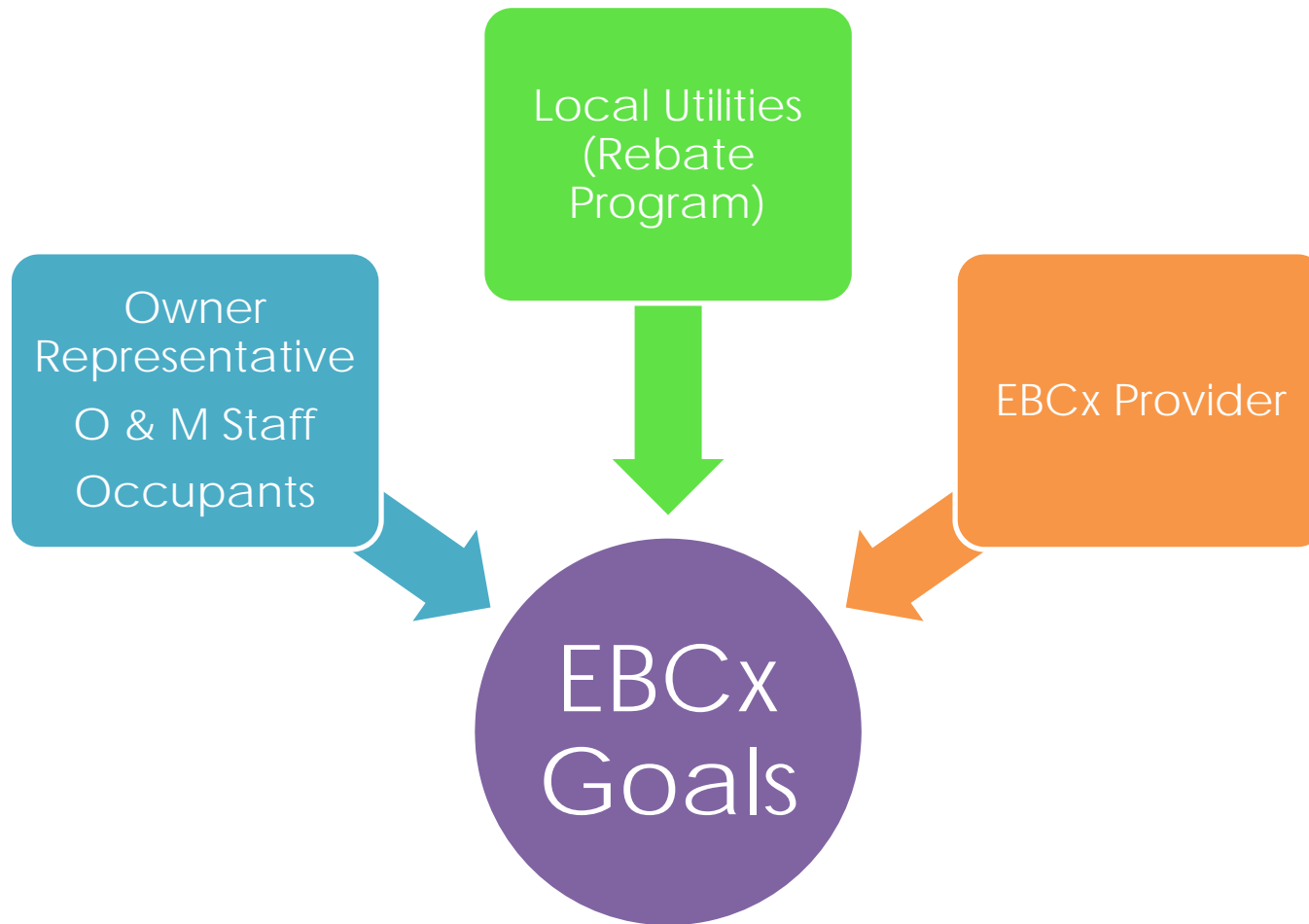
## Energy Savings

- Reduce utility bills
- Reduce overall operating costs

## Sustainability

- Reduce carbon footprint
- Improve Energy Star rating or other benchmarks

# Major Stakeholders





# Is Your Building a Candidate for EBCx?

## Must Have

- Functioning Building Automation System (BAS)
- Higher than expected energy use
- Mechanical cooling
- Complex HVAC systems
- Owner support with funding available

## Nice to Have

- Existing metering
- Available documentation
- Known problems
- Relationships with established contractors
- Knowledgeable, motivated, and available building staff

# The Commissioning Team

- Owner/Representative
- Users/Tenants
- Operations and Maintenance Staff
- Contractors
- Commissioning Provider



BCA 2015 Board of Directors at Busch Stadium for Annual Meeting – Picture Credit Jake Fischer

# The EBCx Provider

## Specialized Skill Sets:

- MEP field experience
- Communications, especially verbal
- Ability to interact equally with all levels of personnel
- Proven EBCx experience
- Commissioning certification

## Owner's Selection Process:

- Use Qualifications-Based Selection (QBS) – *not low bid!*





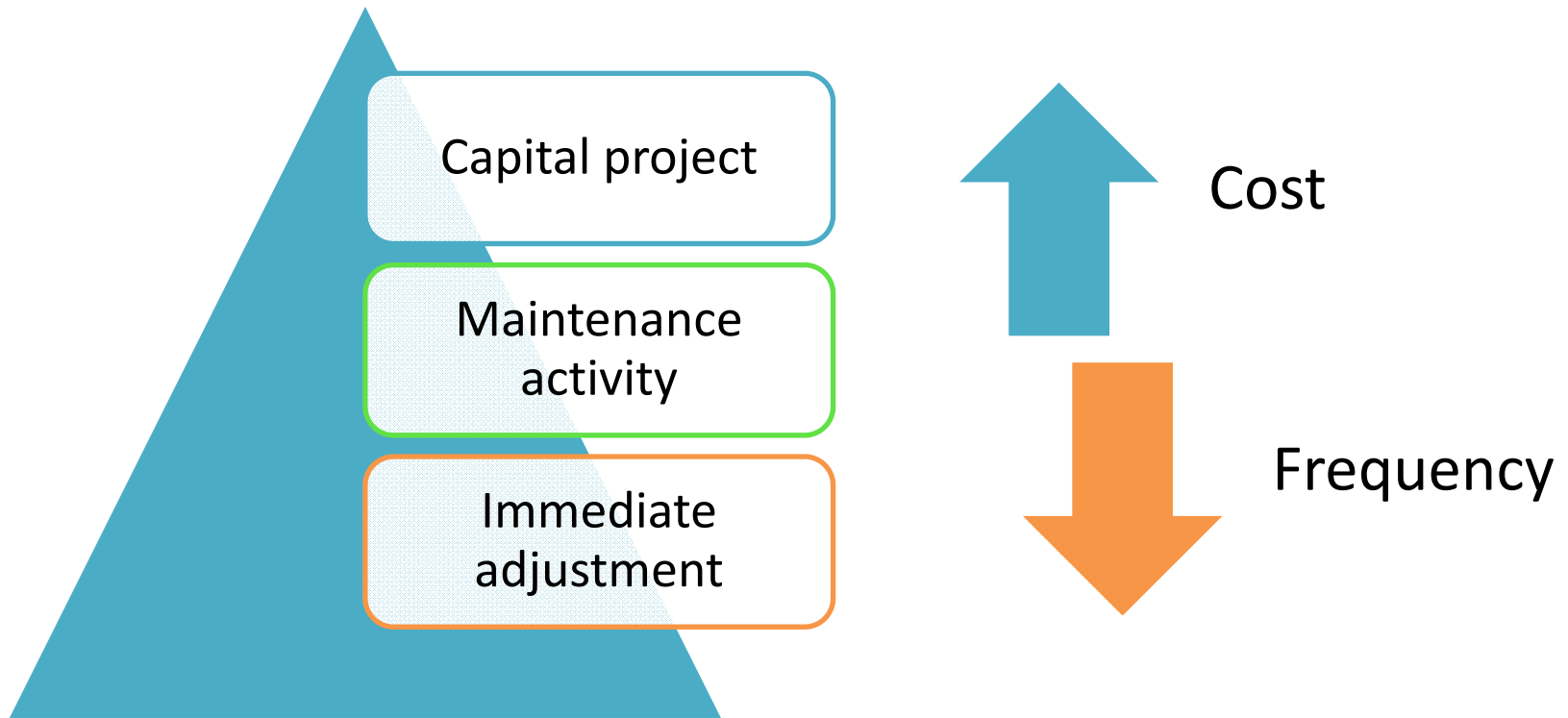
# Deliverables from the EBCx Project

- Current Facility Requirements (CFR)
- EBCx Commissioning Plan
- Master List of Findings with Facility Improvement Measures (FIMs)
- FIM Implementation
- Systems Manual (updated)
- O & M Staff Training Manual
- EBCx Final Report
- Ongoing Commissioning Plan





# Facility Improvement Measures (FIM) Pyramid





# Types of FIMs

FIM #	Title	Implementation Time Frame	Operational Benefit
M-025	Failed Controls Components	0-1 year	Improve building operations and occupant comfort
M-033	Medical Gas Routing in Open OR Area	0-1 year	Code compliance
E-001	Transformer Overheating	0-1 year	Extend life 20 years
E-002	Leaking Oil-Filled Transformer	0-1 year	Extend life 20 years
E-004	Panel BC Missing Breaker Space Cover	0-1 year	Code compliance
E-005	Panel GX Broken Handles on Circuit Breakers and Cotter Pin Ties	0-1 year	Extend life 10 years
E-006	Panel GEX4 Missing Panel Blanks and Insufficient Clearance	0-1 year	Code compliance
E-007	Panel GE4 Missing Panel Blanks	0-1 year	Code compliance
E-008	Two Panels Tapped from One Transformer	0-1 year	Extend life 20 years

# Types of FIMs

FIM #	Title	Implementation Time Frame	Operational Benefit
M-002	Replace Steam System Pressure Reducing Valves	1-5 years	Extend life 10-20 years
M-003	Replace Air Handling Unit Coils	1-5 years	Extend life 10-20 years
M-008	Replace Chiller 3	1-5 years	Extend life 20 years
M-010	Dietary Chiller Chilled Water Buffer Tank	1-5 years	Extend life 20 years
M-014	Chilled Water Buffer Tank for Heart/Vascular CH-1	1-5 years	Extend life 20 years
M-013	Increase Chilled Water System Capacity	5-10 years	Meet building capacity and requirements
M-017A	Patient Room Ventilation, Building A	5-10 years	Extend life 20-30 years
M-001	Add Boiler Economizer	Discretionary	Improve building energy efficiencies
M-004	Add Boiler Exhaust Backdraft Dampers	Discretionary	Improve building energy efficiencies
M-012	Chilled Water Buffer Tank for ACC-1	Discretionary	Improve building energy efficiencies

# Representative FIM

MEP EVALUATION AND RECOMMENDATIONS		
<b>LOCATION:</b> Roof	<b>DISCIPLINE:</b> MECHANICAL	<b>ISSUE:</b> M-012
<b>PRIORITY:</b> MEDIUM	<b>ESTIMATED COST:</b> \$4,000	
<b>TITLE:</b> Chilled Water Buffer Tank for ACC-1		
<b>DESCRIPTION OF FINDING:</b> There is short cycling of chiller caused by low water volume resulting in diminished life of the chiller.		
<b>PROPOSED IMPROVEMENT MEASURE:</b> Install a chilled water buffer tank that provides storage capacity for 10 minutes of chilled water flow.		





# Training: YES YOU MUST!

*The single most important sustainable and energy saving measure  
you can provide to improve the life of your building is....*

***TRAINING YOUR BUILDING STAFF!***



# Training

Determine Level of Involvement:

- Who in your organization needs training

Focused training should be on:

- Associated FIMs implemented
- System optimization techniques
- Strategies for persistence and continuous improvement
- Updated maintenance methods and procedures

# Training

Consider post-training needs:

- Document the training - consider contracting with a videographer.
- Provide lessons for follow-up
- Electronic file storage for easy lookup - manufacturer literature library
- “Refresher” training for existing employees
- Continuous improvement skills training
- Create plan for future employees



# Ongoing Commissioning: Optimizing Operations

## Ongoing Cx Process – What is Ongoing Cx?

- Implement Persistence Strategies with the BAS
- Consider AFDD Tools
- Implement Re-Cx Process
- Baseline Monitoring

## Why Ongoing Cx?

- Building Systems Deteriorate
- Control Systems Deviate
- Equipment Performance Degrades







# Ongoing Commissioning: Optimizing Operations

## Ongoing Cx Goals

- Identify issues early, resolve them quickly
- Increase productivity
- Condition-based maintenance vs. schedule-based



# Thank You

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