

Guide to Building an Impactful Facilities Dashboard



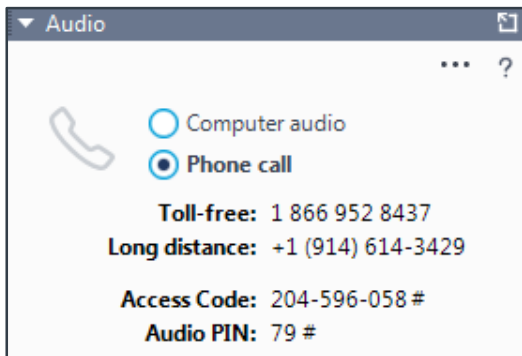
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Audio Options



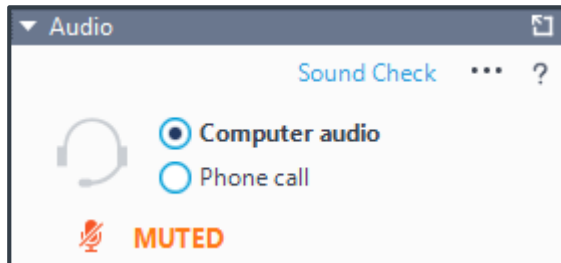
Using Your Telephone

If you select the “Use Telephone” option, please dial in with the phone number and access code provided.



Using Your Microphone and Speakers

If you select the “Use Mic & Speakers” option, please be sure that your speakers or headphones are connected.



Questions Panel and Minimizing GoToMeeting

Asking a Question

To ask the presenter a question, type it into the question panel and press send.



A screenshot of the GoToMeeting Questions Panel. The panel has a dark blue header with a downward arrow and the text "Questions". Below the header is a large white text area. At the bottom of the text area is a light gray input field with the placeholder text "[Enter a question for staff]". To the right of the input field is a gray button labeled "Send".

Minimizing and Maximizing Your Screen



- Use the orange and white arrow to minimize and maximize the GoToMeeting panel.
- Use the blue and white square to make the presentation full screen.

Winning on a Shoestring Budget

Oakland A's Use "Moneyball" Metrics to Make Playoffs, Despite Low Budget

Oakland Athletics Recruit Undervalued Players Based on Key Metrics



Following 2001 season, Oakland Athletics **lose three talented free agents** to larger market teams



Rather than traditional **scout observations**, A's recruit inexpensive players based on **data analyses** of key metrics



A's General Manager Billy Beane identifies on-base percentage and total bases earned as **key indicators of player performance**



Oakland A's execute **20-game winning streak** and make 2002 playoffs with one of **lowest budgets in the league**

Data Overload

Facilities Struggles to Translate Reams of Data into Actionable Insights



Facilities Tasked With Tracking More Data...

- Utilities
- Sustainability
- Building Condition
- Facilities Workforce
- Operating and Capital Costs
- Campus Cleanliness
- Work Orders and Maintenance
- Space Management
- Capital Projects
- Safety and Compliance



...and Has More Data Sources to Manage

- Computerized Maintenance Management Systems (CMMS)
- Geographic Information Systems (GIS)
- Space Information Management Systems (SIMS)
- Building Meters
- Project Management Databases
- Customer Satisfaction Surveys
- Post-Work Order Surveys
- Fiscal Management Systems

Private Companies Across All Sectors Use Dashboards to Inflect Performance

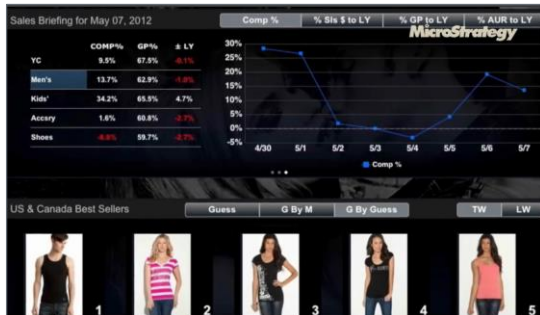
McDonald's



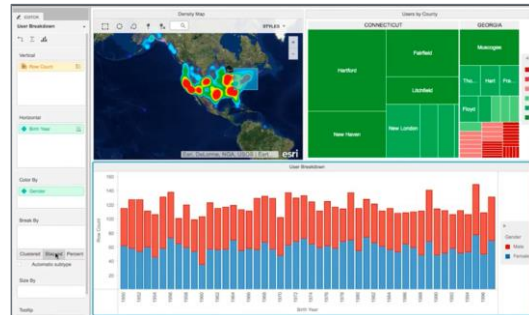
The Container Store



GUESS



e-Harmony



Source: Mazzotta J, "[Web Design](#)"; MicroStrategy, "[Customer Case Study: Retail](#)"; MicroStrategy, "[MicroStrategy and eHarmony](#)"; MicroStrategy, "[MicroStrategy and GUESS](#)"; Facilities Forum interviews and analysis.

The Power of Data



Work Order Dashboard Facilitates Targeted Interventions at OSU



Slow Work Orders Frustrate Customers



Multiple Facilities shops not meeting **service call lead time** expectations



Shops not following standard procedures for planned work



Delayed work orders fuel customer dissatisfaction

SFO Implements New Dashboard and Processes



Facilities develops real-time work order aging dashboard



Dashboard helps SFO pinpoint new processes and procedures to accelerate work orders



Begins sending automated monthly aging work order report to maintenance zone leaders to facilitate continuous improvement

Changes Save Time and Money at The Ohio State University (OSU)

374

Fewer annual trips to stockroom

422

Labor hours recouped annually

20%

Reduction in **service call lead time** (from 49 to 39 days)

Differentiating Dashboards from Scorecards



Dashboard



Scorecard

Capsule Description	Overview of performance on core operational measures	Overview of progress toward strategic objectives
Audience	SFO, Facilities leadership, and CBO; in some cases, campus-wide audience	President, Provost, CBO, and other institutional leaders
Principal Aim	Uncover meaningful trends in core metric performance that merit responsive action	Demonstrate the alignment between unit activities and institution's strategic goals
Contents	Data on metric performance relative to targets, historical performance, and related metrics	Strategic objectives, initiatives, and performance on associated progress measures
Limitation	Does not measure strategic initiative impact on advancement of key priorities	Does not allow for analysis of pace of progress or of non-strategic indicators

Three Major Types of Facilities Dashboards

Facilities Management



Description

Tracks most critical Facilities metrics; SFOs use to gauge and improve operational performance

Number of Metrics

15-20

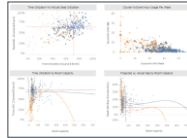
Industry Prevalence



Examples

- [Northwestern University](#)
- [California State University-East Bay](#)

Function/Department



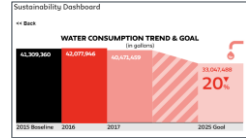
Tracks function-specific operational metrics; department leaders use to assess performance

8-12



- [Western Michigan University](#)
- [University of Minnesota](#)

Sustainability



Tracks institution- and unit-level energy/utility metrics; shared with broad campus audience to track sustainability efforts

6-30



- [The New School](#)
- [Arizona State University](#)
- [Columbia University](#)

Building an Effective Facilities Dashboard

Strategies to Overcome Common Dashboard Challenges

Three Main Challenges

1 Deciding which metrics to elevate



Select Key Performance Indicators (KPIs)

2 Displaying metrics in compelling format



Employ User-Friendly Layout and Format

3 Choosing appropriate targets and triggers



Set Principled Targets and Action Triggers

1

Select Key Performance Indicators (KPIs)

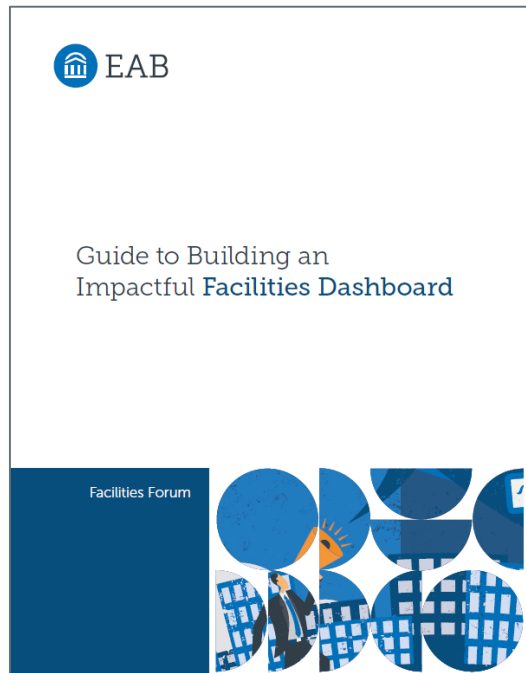
2

Employ User-Friendly Layout and Format

3

Set Principled Targets and Action Triggers

Introducing EAB's Dashboard Guide



Compendium of Facilities Metrics

700+ distinct metrics, organized into nine functional categories



Functional Quick-Start Guides

EAB's take on the ~15 most impactful metrics within each category to accelerate dashboard implementation



Metric "Shortlist" by Audience

Recommendations on ~12 metrics to share with CBO, academic leaders, President, and Board



Metric Selection Exercise

Four-step filtering process to identify core metrics and KPIs

Download EAB's *Guide to Building an Impactful Facilities Dashboard* [here](#).

Providing the Full Menu of Metric Options



Functional Categories

Contains **700+** distinct metrics organized into nine categories:

- Campus Operations
- Facilities Workforce
- Fiscal Management
- Housing
- Planning, Design, and Construction
- Safety and Compliance
- Service Delivery
- Space Management
- Sustainability and Utilities
- Transportation

Snapshot of the Metric Lists

Safety and Compliance	
Planning, Design, and Construction	
Campus Operations	
Metric Category	Measures
Campus Profile	Average age of buildings ¹ Distribution of buildings by age range (Number of buildings and GSF by age) Net assignable square feet Total acres Total deferred maintenance backlog Total GSF (Includes both maintained and non-maintained spaces) Total GSF maintained (Includes both owned and rented space) Total GSF of owned space (Represents space owned by the institution) Total GSF of rented or leased space (Represents space used for institutional purposes, but not owned by institution) Total number of acres maintained Total number of buildings Value of capital assets
Operating Costs and Staffing Levels	Acre (or hectare) per grounds FTE Building maintenance cost per GSF (Includes all costs to maintain the interiors and exteriors of maintained buildings) Custodial cost per student Custodial costs per GSF Facilities administrative cost per GSF GSF per maintenance FTE Landscape and grounds cost per acre (or hectare) ² Number of custodial FTEs per building ³ Number of custodial FTEs per GSF Number of grounds FTEs per acre (or hectare) Number of maintenance FTEs per GSF Total facilities expenditure as a percentage of gross institutional expenditure Total operating costs per GSF, less utilities costs Total operations and maintenance budget (Includes buildings and equipment) Total operations and maintenance expenditure per GSF Total preventive maintenance cost per GSF Workload (GSF) coverage per custodial FTE

1. GSF represents the total square feet of space owned by the institution.
2. GSF represents the total square feet of space owned by the institution.
3. GSF represents the total square feet of space owned by the institution.

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Jump Starting Your Efforts

Quick-Start Guides Identify the Most Impactful KPIs by Facilities Function

Functional Categories and Totals		Quick-Start Guide Totals
Campus Operations (<i>83 metrics</i>)	➡	13 metrics
Facilities Workforce (<i>105 metrics</i>)	➡	12 metrics
Fiscal Management (<i>63 metrics</i>)	➡	13 metrics
Housing (<i>36 metrics</i>)	➡	7 metrics
Planning, Design, and Construction (<i>49 metrics</i>)	➡	13 metrics
Safety and Compliance (<i>47 metrics</i>)	➡	11 metrics
Service Delivery (<i>41 metrics</i>)	➡	12 metrics
Space Management (<i>135 metrics</i>)	➡	33 metrics
Sustainability and Utilities (<i>59 metrics</i>)	➡	13 metrics
Transportation (<i>31 metrics</i>)	➡	10 metrics

Bringing Metric Selection to Life

Screening Process Helps Narrow Core Metrics from Long Starting List

Five-Step Metric Selection Filtering Process

Consideration	Description
1 Apply a Reality Check	Set aside metrics not readily accessible, regularly tracked, supported by reliable data, or easily communicated to others
2 Map to Strategic Objectives	Identify metrics that most directly measure progress on Facilities' strategic objectives
3 Swap Lagging for Leading Metrics	Where feasible, identify leading indicators in lieu of measures providing information "after the fact"
4 Account for High-Priority Imperatives	Add "hot-seat" metrics that shed light on pressing yet temporary areas of concern
5 Ensure Balance of Metric Categories	Force trade-offs in overrepresented areas by sorting metrics by function or strategic perspective

100's of Potential Metrics



15-20 KPIs

Apply a Reality Check

Four Pragmatic Screens to Determine Metric Viability

Suggested Screens

Metric Screen	Description	Rationale
Accessibility of Data	Information system must possess the capability to generate data on metrics.	Time-consuming to manually pull and analyze data for each metric.
Frequency of Tracking	Metrics elevated to unit dashboard should be monitored at regular intervals (e.g., monthly or quarterly).	Infrequent (e.g., annual) data updates hamper ability to assess performance at regular intervals.
Reliability of Data	Data available from information system should be accurate, consistently defined, and measured across the institution.	Absence of trustworthy data results in stakeholder suspicion toward performance, often resulting in inaction.
Communicability of Data	Definition and rationale for metrics should be easy to communicate and understand.	Lack of understanding about metric drivers and relevance hinders ability to inflect performance.

Tool: Reality Check Screening for Metrics

Ideal Metrics Prompt “Yes” for Every Question in List

Accessibility of Data

1. Is the data for this metric collected via an automated system?
2. If not, can someone collect and report the data within a few hours?
3. Is the system capable of calculating and reporting the results for this metric?

Frequency of Tracking

4. Can this metric be tracked more than once a year?
5. Can this metric be tracked frequently enough to inform action?

Reliability of Data

6. Do all departments use the same definition for this metric?
7. Is the metric calculated by an automated system?
8. Can you ensure the accuracy of the reported data?
9. Do managers trust the data for decision making?

Communicability of Data

10. Is this metric easily explained to and understood by leaders outside your unit?
11. Do managers typically agree on the definition of this metric?
12. Are managers aware of the importance of tracking the metric?
13. Do managers understand how performance on this metric impacts institutional goals?

Map to Strategic Objectives

Confirm Metrics Directly Measure Strategic Objectives Rather than Initiatives

Framework to Map Metrics to Institutional Strategic Priorities

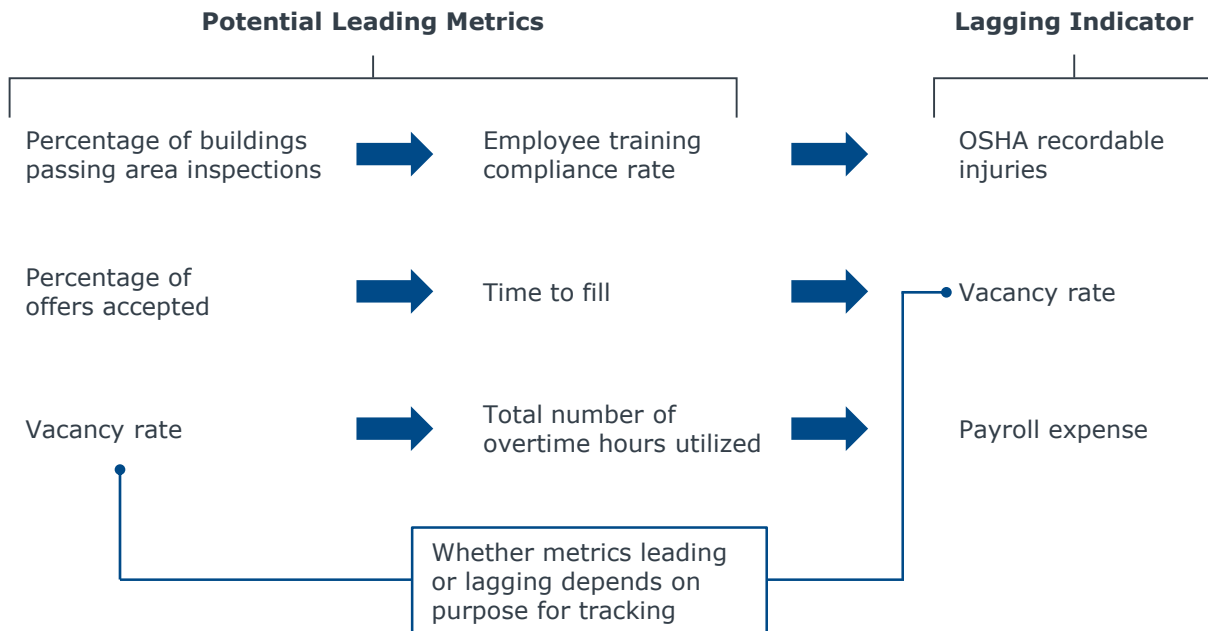
	Strategic Priorities	Strategic Objectives	KPIs	Targets	Strategic Initiatives
Description	• Backbone for strategy; roughly four to eight • Usually derived from mission statement	• Stem from strategic priorities; typically 40 to 60 • Adapted annually to every few years	Indicators that track progress toward objectives	• Indicator goals that motivate performance • Frequently reset to ensure continuous improvement	Set of actions to raise metrics above target levels
Example	Operational Efficiency	Prioritize preventive maintenance (PM) work to decrease resources spent on reactive work	PM/RM Ratio (Ratio of preventive maintenance to reactive maintenance tasks completed)	70%/30%	Develop prioritized PM schedule that reflects condition and strategic important of assets

Metrics should flow directly from strategic objectives

Many institutions mistakenly track metrics that assess strategic initiative progress

Swap Lagging for Leading Metrics

Comparing Leading and Lagging Indicators in Facilities



Identifying Leading Metrics

Questions to Consider

For each core metric, brainstorm potential leading metrics, considering the questions below.

- What are the key drivers of the core metric?
- Which metrics make up the formula for the core metric?
- Which metrics have a defensible link to the challenge the original metric was intended to monitor?
- What processes drive success or failure in the core metric?
- Is there a leading metric for the leading metric—a metric even further upstream?

Account for High-Priority Imperatives

Elevate “Hot-Seat” Metrics in Response to External and Internal Pressures

Example Pressures that Drive New Metrics to Dashboard



New president appointed; identifies workforce diversity and sustainability as high priorities



State budget cuts force Facilities to identify operational efficiencies



Facilities turnover rate spikes; SFO develops employee training and engagement initiatives

2015

2016

2017

2015 Dashboard

Metric	Status
Work order cycle time	
Campus safety rating	
Acre per grounds FTE	
MBTU/square foot	
Waste diversion rate	
Leadership roles filled by underrepresented minorities	

2016 Dashboard

Metric	Status
Work order cycle time	
Campus safety rating	
Acre per grounds FTE	
MBTU/square foot	
Operating budget execution	
Capital project spending per gross square foot	

2017 Dashboard

Metric	Status
Work order cycle time	
Campus safety rating	
Acre per grounds FTE	
MBTU/square foot	
Internal promotion rate	
Percentage of managers completing training hours	

Ensure Balance of Metric Categories

Equitably Distribute Metrics Across Facilities Functions or Strategic Pillars

Option 1:

Function or Capability

The most straightforward categorization scheme is to group metrics based on Facilities functions or capabilities, ensuring a balance of metrics across all responsibilities.

Sample Facilities Functions

- Campus Operations
- Fiscal Management
- Service Delivery
- Safety and Compliance

Option 2:

Strategic or Institutional Perspective

A second categorization scheme sorts metrics by institutional strategic pillars, which helps illustrate the link between Facilities initiatives and overall institution success.

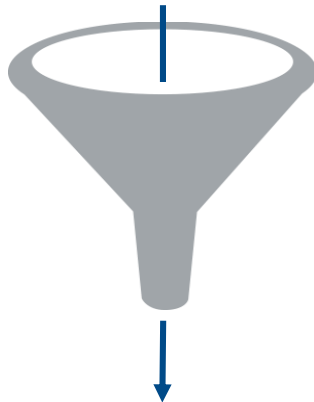
Sample Strategic Pillars

- Student Success
- Enrollment
- Research and Scholarly Excellence
- Financial Strength and Stewardship

Getting from Metrics to KPIs

Metrics that Measure Progress Toward Strategic Objectives Become KPIs

100's of Potential Metrics



15-20 KPIs

Metrics are quantifiable measurements collected to track organizational activities and processes

Key performance indicators (KPIs) are metrics that indicate progress toward strategic and operational objectives. KPIs should break down to be:

20% Volume indicators: raw numbers that provide information on volume or scale (e.g., number of work orders completed annually)

80% Relative indicators: calculations of multiple metrics that provide relative information (e.g., percentage of work orders categorized as emergency)

1

Select Key Performance Indicators (KPIs)

2

Employ User-Friendly Layout and Format

3

Set Principled Targets and Action Triggers

More Questions Than Answers

Effective Dashboard Design Critical to Convey Information and Drive Action

Three Major Dashboard Design Mistakes Lead to Stakeholder Confusion



Insufficient Context



Too Much Information



Overly Complex Visualizations



Representative Stakeholder Questions

- *Is the metric above or below the target?*
- *Should the metric increase or decrease?*
- *How does this compare to historical data?*
- *Where should I focus my attention?*
- *What are the most important metrics?*
- *Can you summarize this for me?*
- *What do the different colors mean?*
- *How do I interpret this graph?*
- *What's the difference between the trend lines?*

Maximizing Dashboard Impact



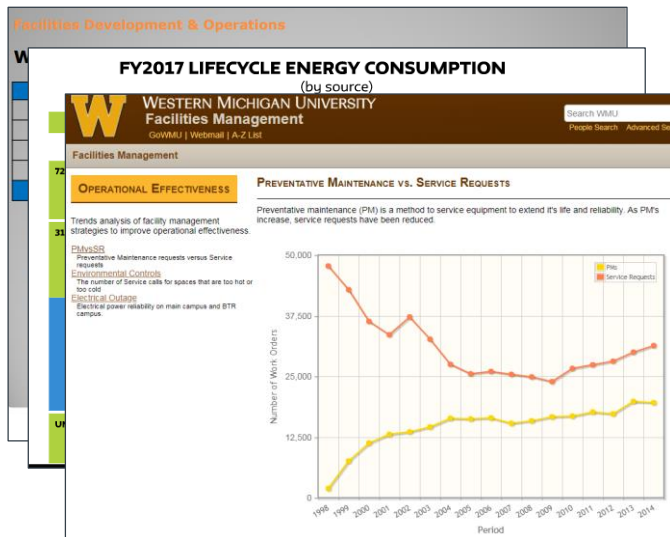
Characteristics of Effective Dashboard Layouts

Characteristic	Description	Sample Dashboard
Concise	Static dashboards limited to three pages or less; interactive dashboards include drop-down menus or variable inputs to allow audience to display desired amount of information	• Arizona State University • Columbia University • Western Michigan University
Accessible Data Visualizations	Uses visualizations to simplify complex metrics and trends; most effective elements are bar charts, pie graphs, and trend line graphs	• Columbia University • The New School • University of Washington
Metrics in Context	Includes trends over time, performance targets, action triggers, clearly labeled graphic titles, and brief metric definitions when necessary	• Northwestern University • The New School • University of Washington
Directionality	Uses arrows or icons to convey metric trend and/or goal directionality	• Northwestern University • University of Washington
Color-Coded	Deploys color-coding to indicate progress and enhance visualizations; binary color scheme (e.g., red and green) the simplest way to track progress, but multi-chromatic scheme can enable more complex data visualizations	• The New School • Northwestern University • CSU-East Bay
Consistent Time Frame	Clearly indicates time interval for metric collection and assessment; timeframes may differ based on metric type and goal (e.g., monthly work order completion rates, annual customer satisfaction scores)	• Northwestern University • University of Washington • University of Minnesota
Mapped to Strategic Goals	Where possible, maps metrics to broader Facilities themes or goals; some dashboards signal metric owner (i.e., Facilities staff member accountable for metric)	• University of Washington • Northwestern University

Resources Available Now

Institutional Dashboard Examples to Support Implementation Efforts

Screenshots of Institutional Dashboards



Example Institutional Dashboards Available



Access examples of institutional dashboards [here](#) or by clicking on the logos above.

Northwestern University (NU)

NU Relies on Microsoft Suite for Simple Yet Effective Dashboards

Northwestern

Screenshot of Vertical Transportation Equipment (VTE) Dashboard in Excel

Northwestern FACILITIES MANAGEMENT				
FY17 VTE Monthly Metrics Report				
		Baseline (1/2016)	FY17 Goal	This Month's Result
VTE Goals:				
VTE G1	Install SCADA 20 cabs by end of FY2017	0	20	0
VTE G2	Achieve and maintain entrapment rate of 0.01 entrapments per cab	0.04	0.01	0.00
VTE G3	Reduce % cabs with controllers over 20 years old	26%	15%	19%
VTE G4	Achieve and maintain maximum callback rate of .25 per cab for controllers <20 years old	0.15	0.25	26%
VTE G5	Achieve and maintain maximum callback rate of .5 for controllers >20 years old	0.23	0.5	0.21
VTE Key Performance Indicators—Informed by the volume indicators.				
		Baseline (1/2016)	FY17 Target	Sep-16
VTE 1	% SCADA installed	0.0%	5%	0.0%
VTE 2	% cabs, age of controller, <20 year	75.3%	85%	77.5%
VTE 4	% cabs age of controller >20 years	25.6%	15%	22.0%
VTE 5	Avg # WO's/cab (WO's: ELEV, CHELEV, & elevator related ENG & EVENG)	0.33	0.10	0.41
VTE 6	Avg # Entrapments/cab	0.04	0.01	0.005
VTE 7	Avg # Repairs/cab	0.17	0.10	0.09
VTE 8	Avg # Callbacks/cab (Controller <20 years old)	0.16	0.25	
VTE 9	Avg # Callbacks/cab (Controller >20 years old)	0.23	0.5	
VTE 10	% time out of service	0.5%	0.5%	0.5%

Screenshot of Facilities Management Dashboard in PowerPoint

Key Performance Indicators				
KPI Description	Annual Goal	Dec-17 Goal	Actual	Trend
SD1. Service Request Closure	90%	89%	86%	-2%
SD2. Preventative Maintenance Closure	75%	66%	82%	+2%
SD3. Proactivity: FM-Identified Work Orders	30%	30%	31%	+3%
LO1. Common Space Program	10%	5%	6%	+1%
LO2. Facilities Connect Implementation	90%	63%	53%	+3%
LO3. Engagement: Sustainability Outreach	15%	5%	11%	+1%
CE1. Energy Use Intensity (kBtu/SF)	-5%	-5%	-5%	0%
CE2. Recordable Injury Incident Rate	2.90	2.90	3.35	-0.30
CE3. Injury-Related Lost Workday Rate	1.34	1.34	0.56	0.00
CE4. Waste Diversion Rate	42%	42%	38%	-1%
CE5. Overtime	<5%	<5%	11%	0%
CE6. Minority and Female Enterprise Use	15%	15%	TBD	TBD
CE7. Local Business Enterprise Use	15%	15%	TBD	TBD
CE8. Evanston Resident Employment	5%	5%	1%	-1%
F1. Capital Project Cash Flow Execution	+/-2%	+/-2%	-1%	-3%
F2. FM Operating Budget Execution	+/-1%	+/-1%	5%	-2%
F3. Utility Commodity Budget Execution	+/-5%	+/-5%	-14%	4%
F4. Invoices: Number of Days to Pay	90%	90%	67%	-10%

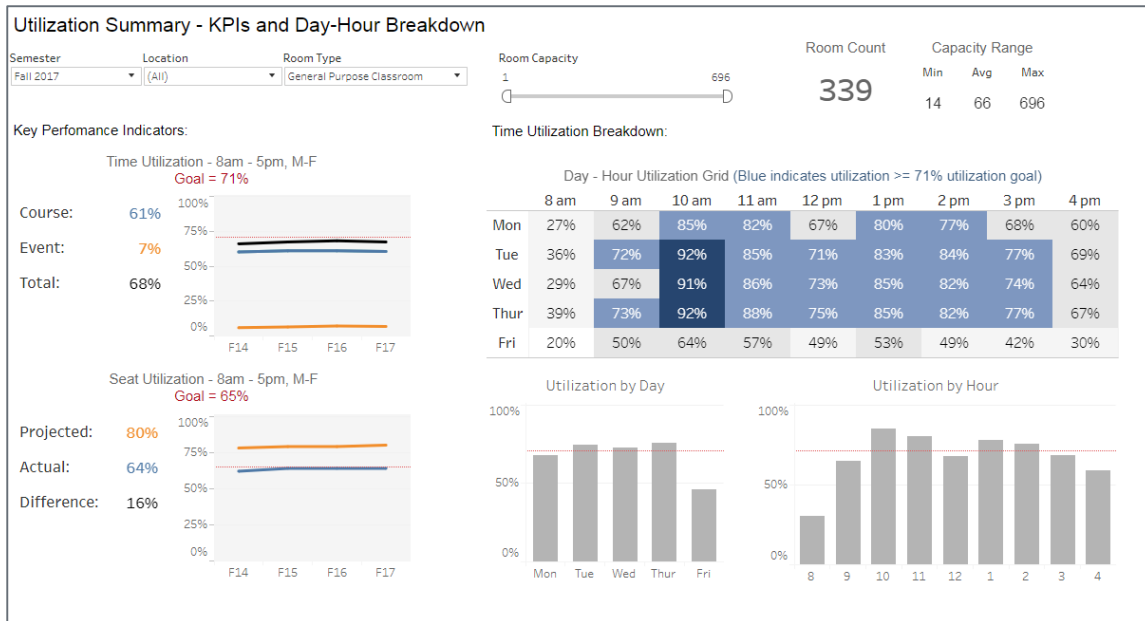
University of Minnesota (UMN)

UMN Uses Tableau for Interactive Classroom Utilization Dashboard



UNIVERSITY OF MINNESOTA

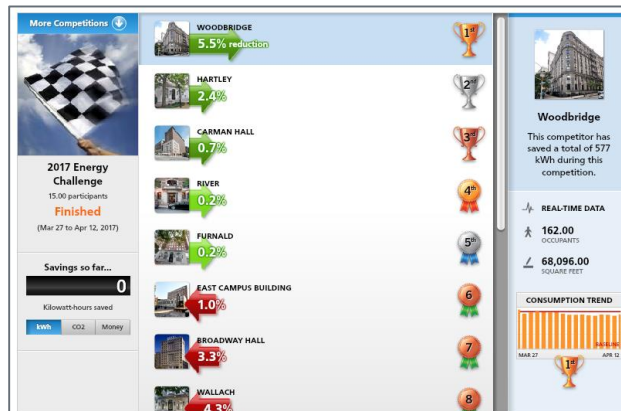
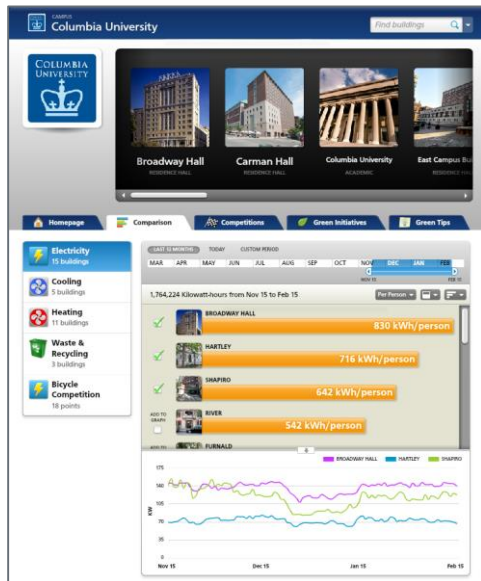
Screenshot of UMN's Classroom Utilization Dashboard



Columbia University (CU)

External Software Generates CU's Interactive, Public Sustainability Dashboard

Screenshots of Columbia University's Sustainability Dashboard



1

Select Key Performance Indicators (KPIs)

2

Employ User-Friendly Layout and Format

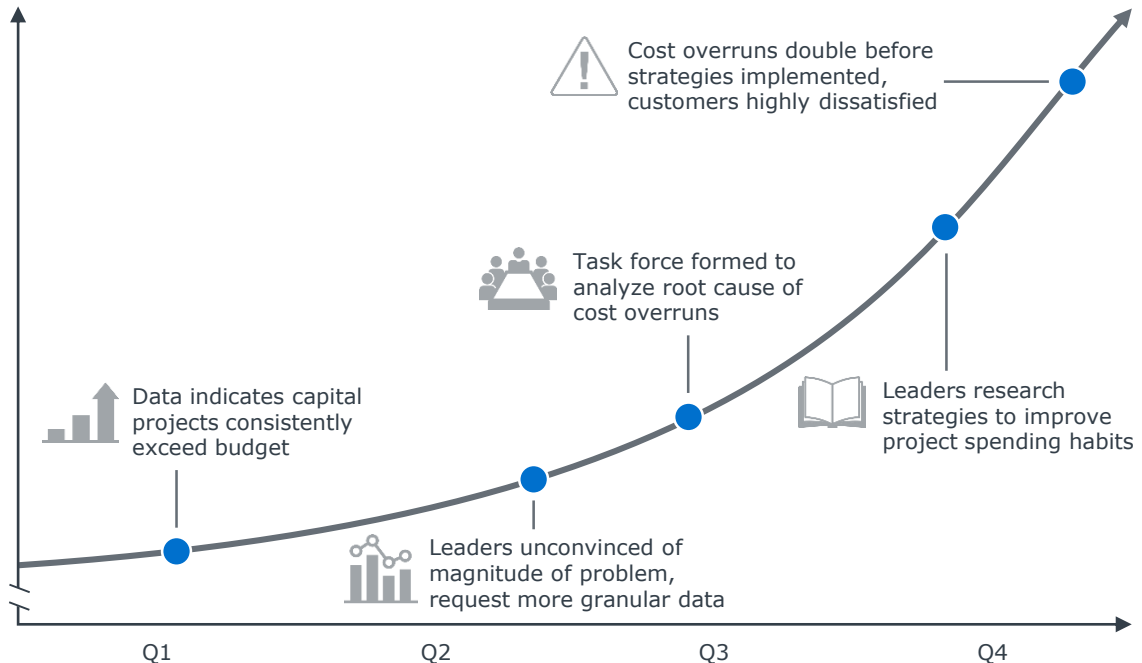
3

Set Principled Targets and Action Triggers

Analysis Paralysis

Data Alone Does Not Force Action

Capital Project Cost Overruns Double at Representative Institution



Differentiating Targets and Triggers

Targets Drive Performance on Metrics, Triggers Mandate Corrective Action



Performance Target

Definition

Fixed or ranged performance goal set by leaders each year

Purpose

Provides concrete goals and drives performance on core metrics

Example

Performance target to complete **90%** of monthly preventive maintenance (PM) work orders



Action Trigger

Definition

Threshold that signals underperformance on core metrics and mandates corrective action

Purpose

Clarifies when corrective action is required to maintain minimum performance levels

Example

Action trigger to intervene if monthly PM work order completion rate dips below **60%**

Performance Target Options

Four Main Options for Setting Metric Targets



Institutional Mandate

Defer to institutional or compliance requirements when applicable (e.g., carbon footprint reduction, workforce diversity, safety and compliance)



Benchmarks

Leverage industry association standards (e.g., APPA, FEA¹), peer performance, and regional standards (e.g., construction costs for local businesses)



Continuous Improvement

Establish ambition to continually improve metric within defined timeframe (e.g., monthly, quarterly)



Crowdsource with Staff

Rely on frontline staff expertise to establish aspirational yet realistic metric goals

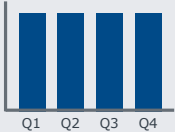
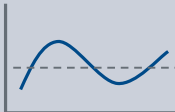


1) Facility Engineering Associates.

Action Trigger Options

Type of Action Trigger Dependent on Metric Goal

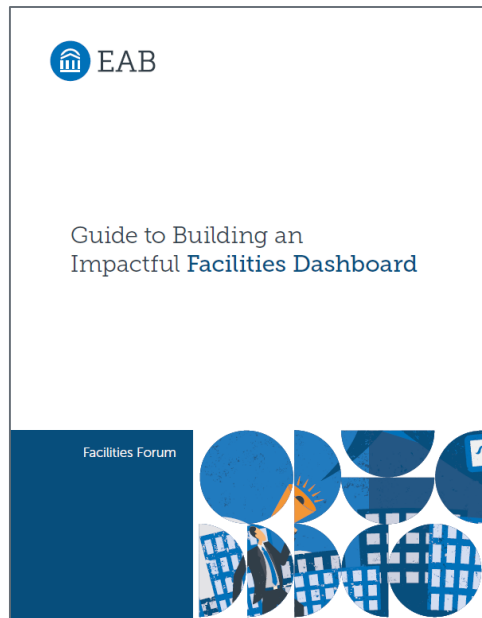
Three Types of Action Triggers

Trigger Type	Definition	Benefits	Limitations
Specialty Triggers 	Static action triggers mandate continuous improvement to guard against performance plateaus (e.g., "lack of improvement" as a trigger)	Easy to calculate and manage against	May be perceived as unprincipled and therefore ignored by stakeholders
	100% triggers signal metrics that demand perfect performance (e.g., employees completing safety training)	Avoids significant negative consequences	Only applicable for specific metrics (e.g., safety, compliance)
Fixed Triggers 	Minimum performance thresholds designed to guard against significant performance declines that, without corrective action, would likely cause units to miss non-negotiable targets (e.g., trigger for a board-mandated budget cap)	Easy to calculate and communicate	Not applicable for many Facilities metrics
Relative Triggers 	Self-adjusting thresholds that consider current performance relative to the target, past performance, and/or related metrics to identify concerning trends (e.g., average parking shuttle wait time)	Applicable for a wide range of metrics; self-adjustment ensures longevity	More complex and difficult to manage than other triggers

36

Trigger Type	Questions	Yes	No
Specialty Triggers 	1. Is continual improvement (regardless of degree) in metric performance a strategic priority? 2. Is it a strategic priority that metric performance be at 100%?	☐ ☐	☐ ☐
<i>If "no" is answered for both questions, continue to questions 3-4. If "yes" is answered for either question, then static or 100% trigger is most appropriate.</i>			
Fixed Triggers 	3. Are you working toward an absolute (and non-negotiable) target? 4. Are you guarding against exceeding an absolute (and nonnegotiable) cap on performance?	☐ ☐	☐ ☐
<i>If "no" is answered for both questions, continue to questions 5-8. If "yes" is answered for either question, a fixed trigger is most appropriate.</i>			
Relative Triggers 	5. Are you seeking to identify when current performance deviates significantly from past performance? 6. Are you seeking to detect statistically significant performance trends? 7. Are you seeking to routinely compare a metric's current performance against cumulative performance towards target? 8. Are you seeking to uncover simultaneous changes in performance among related metrics?	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
<i>If "yes" is answered for any question, then establish a relative trigger.</i>			

Access the Full Research Study Online



Guide to Building an Impactful Facilities Dashboard



To learn more about how institutions can effectively build a Facilities dashboard using principled metrics and clear reporting, download our guide [here](#).

Contact Information



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Evaluating Today's Session



Please take a minute to provide your thoughts on today's presentation.

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