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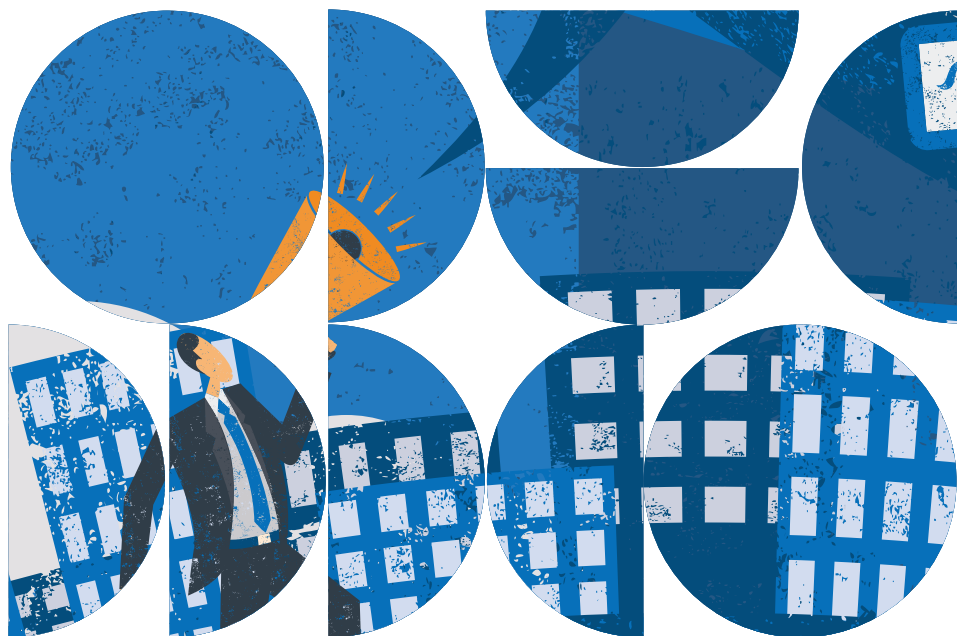
Guide to Building an Impactful **Facilities Dashboard**

Guide to Building an Impactful Facilities Dashboard

Facilities Forum

Project Director

Ann Forman Lippens

Contributing Consultants

Lisa Berglund, MPP
Kimberly Dillingham
Benjamin Wohl

Design Consultant

Kelsey Stoneham

Managing Director

John Workman, PhD

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Executive Summary

Facilities Leaders Struggle to Translate Reams of Data into Valuable Information

As colleges and universities continue to become more data-driven, Facilities leaders have been tasked with managing and tracking an unprecedented amount of data. In addition to operational and financial metrics, Facilities units increasingly track campus sustainability metrics, building condition, and utilities consumption at the campus, college, and building level. Beyond metrics, Facilities leaders also have more data systems to maintain, including customer satisfaction and post-work order surveys, building meters, and capital project databases. While Facilities leaders track more metrics today than ever before, many institutions struggle to translate reams of data into valuable information that drives operational improvements.

Dashboards an Attractive Solution, but Three Major Challenges Impede Dashboard Efforts

Dashboards are a proven tool that other industries, such as retail and finance, have long used to manage, track, and analyze data to inform decision-making. There are three main challenges in building a Facilities-focused dashboard. The first is how to determine the metrics that best measure Facilities performance. The second challenge in building a Facilities dashboard is how to display metrics in a compelling, accessible format. Poor dashboard design and layout can derail efforts by making data difficult to interpret. The final challenge is how to choose appropriate targets and action triggers. Without goals or a formal system of red flags, leaders often fail to understand metric performance or act on negative trends.

Building an Impactful Facilities Dashboard

This publication explores how institutions can overcome the challenges of building a Facilities dashboard. First, it provides guidance on deciding which metrics to elevate. Section 1 provides over 700 Facilities-centric metrics, organized across ten functions. EAB has also provided a more succinct "quick-start" guide with recommended metrics to consider first. Section 2 provides recommended metrics to share with specific audiences, including the board, president, and chief business officer (CBO). The third section provides a series of tools and guides to simplify the process of selecting core performance metrics.

Section 4 offers guidance on deploying a user-friendly dashboard format. This section includes sample dashboards from higher education institutions. The final section of this resource provides guidance on setting principled performance targets and action triggers.

Decide Which Metrics to Elevate

Section 1: **Compendium of Facilities Metrics**
700+ Facilities metrics organized into ten categories, with quick-start guides for each one

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Recommendations on the metrics to share with specific audiences (e.g., board, CBO, president)

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Strategies to set performance goals and thresholds that signal underperformance

Source: Facilities Forum interviews and analysis.

The Growing Imperative for Facilities Dashboards

Drowning in Data

Facilities Leaders Struggle to Translate Reams of Data into Actionable Insights

Facilities leaders have access to an unprecedented amount of data stemming from a wide array of sources. In addition to operational and financial metrics, Facilities units track sustainability metrics, building condition, and utilities consumption at the campus, college, and building level. And these data stem from many different systems, including customer satisfaction and post-work order surveys, computerized maintenance management systems, and capital project databases.

Facilities Tasked with Managing More Metrics and Data Sources...

Metrics

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

Data Sources

- 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

...But Struggle to Translate Data into Meaningful Insights

89%

Percentage of FM[1] Professionals Tracking Metrics

43%

Percentage of FM Professionals Using Dashboards as Decision-Making Tool

Though Facilities leaders today track more metrics than ever before, many institutions struggle to translate reams of data into valuable information that inform key operational decisions. The vast majority of Facilities Management professionals across all industries track metrics—but fewer than half are leveraging tools to extract insights from data and drive improvements.

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1) Facilities Management.

The Power of a Dashboard

Work Order Dashboard Enables Targeted Interventions at OSU

As higher education institutions tap into more data, they recognize the need for a tool to organize metrics and inform business processes. Dashboards are a proven tool that other industries, such as retail and finance, have long used to manage, track, and analyze data to inform decision-making. In fact, some higher education institutions have started to implement dashboards with great success. The Ohio State University's (OSU) work order dashboard and its impact are described below.

THE OHIO STATE
UNIVERSITY

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

374 **Fewer annual trips** to stockroom

422 **Labor hours recouped** annually

20% Reduction in **service call lead time** (from 49 to 39 days)

OSU found that service call lead time, the average number of days required to close a work order, was performing below expectations. In response, Facilities leaders developed a real-time aging work order dashboard. This enabled OSU to track work orders more closely and identify opportunities to intervene. Maintenance zone leaders also began to receive an automated monthly aging work order report to improve visibility into completion times and instill greater accountability.

Ultimately, new work order procedures led to 374 fewer annual trips to the stockroom and 422 labor hours recouped, which translated to $36,000 in avoided annual labor costs. OSU also reduced service call lead time by 20%, from 49 to 39 days. OSU's success exemplifies the power of a dashboard for leveraging data to drive tangible operational improvements.

Differentiating Dashboards from Scorecards

Importantly, dashboards should not be confused with scorecards. Although both represent tools to track progress on key metrics, dashboards and scorecards differ in their content and ultimate goal.

- **Dashboards** offer a snapshot of current performance on select performance indicators, including targets and historical trends. Dashboards are typically used by Facilities leaders to better track, manage, and improve operational performance.

- **Scorecards** track progress toward achievement of strategic objectives. The goal of a scorecard is to explicitly link unit activities to institutional goals. Facilities leaders use this tool to clearly demonstrate to other senior leaders how their unit advances broader institutional priorities.

The table below outlines the key differences and reflects how EAB uses the terminology. The remainder of this publication focuses on dashboards. For more guidance on scorecards, please visit eab.com.

Differences Between Dashboards and Scorecards
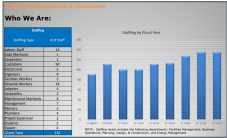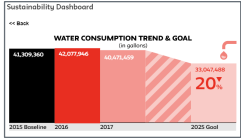
	Dashboard	**Scorecard**
Capsule Description	Overview of performance on core operational measures	Map of how Facilities activities align to and reinforce broader institutional strategic objectives
Audience	SFO, Facilities leadership, and CBO; in some cases, campus-wide audience	President, Provost, CBO, and other institutional leaders
Principal Aim	Enable Facilities leaders to pinpoint meaningful trends in core metric performance that merit responsive action	Explicitly demonstrate to senior leaders the alignment between Facilities 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 nonstrategic indicators

Three Major Types of Facilities Dashboards

There are three main types of Facilities-centric dashboards: a Facilities Management dashboard, dashboards for specific functions or departments (such as elevator maintenance or utilities), and sustainability dashboards. Sustainability dashboards are the most common type. Given widespread support for (and often an institutional commitment to) sustainability efforts, many institutions begin their dashboard efforts here.

The table below includes a brief description of each dashboard along with the recommended number of metrics, industry prevalence, and institutional examples. Note that the information provided in this publication applies to any type of dashboard; however, the examples will all come from Facilities Management dashboards.

	Facilities Management	**Function/ Department**	**Sustainability**
Description	Tracks most critical Facilities metrics; SFOs use to gauge and improve operational performance	Tracks function-specific operational metrics; department leaders use to assess performance	Tracks institution- and unit-level energy/utility metrics; shared with broad campus audience to track sustainability efforts
Number of Metrics	15-20	8-12	6-30
Industry Prevalence	30%	10%	60%
Examples	• Northwestern University • California State University-East Bay	• Western Michigan University • University of Minnesota	• The New School • Arizona State University • Columbia University

eab.com

Three Challenges in Crafting Dashboard

Senior Facilities Officers (SFOs) face three main challenges in building an impactful dashboard. The first is how to determine the subset of metrics that best measure Facilities performance. Given the countless ways to measure performance, SFOs often struggle to choose the metrics that best evaluate operational effectiveness. The second challenge in building a Facilities dashboard is how to display metrics in a compelling, accessible format. Poor dashboard design and layout can derail institutional efforts by making data difficult to interpret. The final challenge is how to choose appropriate targets and action triggers. Without performance goals or a formal system of red flags, leaders often fail to understand metric performance or act on negative trends.

Challenge 1: Decide Which Metrics to Elevate

Unclear which metrics best signal current performance and will lead to improved operational and managerial decision-making

Representative Pitfalls

- Leaders elevate **wrong metrics** to dashboard and miss alarming trends
- Leaders elevate **too many metrics** and fail to interpret actionable information
- Leaders **ignore important but hard-to-access** metrics

Challenge 2: Display Metrics in Compelling Format

Unsure how to organize and contextualize metrics in a format accessible to technical and non-technical roles

Representative Pitfalls

- Dashboard provides **too little information**, prompting questions around performance and goals
- Dashboard overloads user with **context and visualizations**, creating data fatigue and disengagement

Challenge 3: Choose Appropriate Targets and Triggers

Unsure when metric performance is sufficiently improved or has deteriorated and requires intervention

Representative Pitfalls

- **Absence of performance targets** causes leaders to explain away poor performance
- Lack of triggers leads to **analysis paralysis**, where staff analyze and reanalyze same data without intervention

Source: Facilities Forum interviews and analysis.

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Guide to Building an Impactful Facilities Dashboard

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Source: Facilities Forum interviews and analysis.

EAB

Compendium of Facilities Metrics

Introduction to Facilities Metric Compendium

This section provides a compendium of Facilities metrics pulled from a wide range of institutional dashboards and reports. The goal of this compendium is to equip Facilities teams with a common starter list of potential metrics to track. The metrics are organized into ten categories: campus operations; Facilities workforce; fiscal management; housing; planning, design and construction; safety and compliance; service delivery; space management; sustainability and utilities; and transportation.

Beyond the lists themselves, each section concludes with a **quick-start guide**. These guides provide EAB's recommendations for the short list of metrics to consider first. The goal is to provide a principled starting point for dashboard conversations. While the quick-start guides won't be right for every campus, they can jump-start dashboard conversations.

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)
	GSF of building space/GSF of roof
	Net assignable square feet (NASF)
	Net assignable square feet per student FTE
	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 cost 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 cost as a percentage of current replacement value
	Total operating cost per acre
	Total operating cost per GSF, less utilities costs

1) APPA recommends that institutions allocate between 2-4% of the aggregate current replacement value (CRV) of facilities for routine maintenance and capital renewal. APPA, "Capital Renewal and Deferred Maintenance," http://bokcms.appa.org/subchapter_view.cfm?chap_id=131&part_id=2#1454.
2) Measured per acre and/or per maintained acre.
3) Measured by building or by building type (e.g., athletic, academic, lab, recreational).

Source: Facilities Forum interviews and analysis.

eab.com

Campus Operations (cont.)

Metric Category	Measures
Operating Costs and Staffing Levels (cont.)	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
Campus Cleanliness	Average APPA cleanliness rating (typically measured through a semiannual quality assurance audit conducted by custodial supervisor or third-party vendor)
Procurement and Distribution of Staff and Materials	Aged receivables (total value and percentage total value of receivables, broken down by age of account [E.g., 1-30 days, 31-60 days, 61-90 days, 91-120 days, over 120 days])
	Average nonstock requisition to receipt time (weighted average of monthly request-to-receipt times)
	Average stock fill rate (number of stock orders filled YTD / Number of stock orders requested)
	Percentage of non-stock deliveries delivered on time
	Percentage of purchase orders made for non-stock materials
Building Condition	Current replacement value (total expenditure in current dollars required to replace the institution's educational and general facilities to its optimal condition)
	Current replacement value per GSF
	Facility Condition Index (ratio of the cost of remedying deficiencies/requirements and capital renewal requirements to the current replacement value)[1]
	Maintenance reinvestment rate (average annual capital maintenance requirements as a percentage of the current replacement value)
	Ratio of annual facility maintenance operating expenditure to current replacement value (annual facility maintenance operating expenditure / total expenditure in current dollars required to replace the institution's educational and general facilities to its optimal condition)
	Ratio of annual renewal dollars to current replacement value (annual renewal dollars represent any operating dollars toward replacement or deferred maintenance)
	Ratio of capital renewal dollars to current replacement value (capital renewal dollars represent one-time funds toward replacement or deferred maintenance)
	Ratio of maintenance expenditure to current replacement value

1) The National Research Council recommends an FCI between 5-10% for campuses with significant maintenance backlogs. The FCI can be tracked at the building, college, and/or campus level.

Campus Operations (cont.)

Metric Category	Measures
Planned and Unplanned Maintenance	Amount of money spent on new equipment due to inadequate preventive maintenance
	Average work order completion time
	Average work order completion time in hours for reactive, critical, and emergency work orders
	Follow-up work orders per 100 preventive maintenance checks (number of work orders for repairs submitted during 100 PM checks)
	Maintenance mix (ratio of preventive maintenance to reactive maintenance tasks completed)
	Number of failures by failure code (indicator of why an asset failed to facilitate better maintenance interventions)
	Number of hours spent on service calls
	Number of preventable service calls (number of customer-initiated work orders that could have been prevented)
	Number of service calls (i.e., customer-initiated work)
	Number of staff hours required to complete open work orders
	Number of unscheduled equipment replacement projects
	Number of work orders (all types)
	Number of work orders categorized as reactive, preventive, proactive (i.e., corrective work orders submitted by employees in the field), emergency
	Percentage of labor hours spent on service calls (i.e., customer-initiated work)
	Percentage of service calls completed after 21 days
	Percentage of all work orders categorized as preventive
	Percentage of all work orders categorized as reactive
	Percentage of all work orders categorized as unplanned (i.e., reactive and emergency)
	Percentage of preventive maintenance, corrective maintenance, and service call orders requiring rework
	Percentage of preventive maintenance labor hours compared to total labor hours
	Percentage of preventive maintenance work orders completed (compared to total preventive maintenance work orders)
	Percentage of reactive maintenance labor hours compared to total labor hours
	Percentage of work orders open for 21 days or more[1]
	Preventive maintenance completion rate (planned maintenance that has been completed as a percentage of goal maintenance)

1) Can be compared across Facilities functions (e.g., electrical, lighting, plumbing, HVAC, carpentry, etc.).

Source: Facilities Forum interviews and analysis.

Campus Operations (cont.)

Metric Category	Measures
Planned and Unplanned Maintenance (cont.)	Proactive work orders (percentage of work orders identified by Facilities staff)
	Renewal dollars invested as percentage of current replacement value[1]
	Response time compliance (percentage of corrective work orders that are completed within a target time frame)
	Time spent addressing work orders as a percentage of total available Facilities staff time (in aggregate and by work type)
	Time spent addressing work orders divided by budgeted staff hours for the previous seven days (in aggregate and by work type)
	Total amount spent to replace, repair, or purchase equipment
	Total custodial hours spent on requests, by priority code[2]
	Total grounds hours spent on requests, by priority code[2]
	Total hours spent completing work orders categorized as reactive, preventive, proactive (i.e., corrective work orders submitted by employees in the field), emergency
	Total hours spent on work orders, by priority code[2]
	Total number of proactive/preventive maintenance labor hours
	Total number of reactive maintenance labor hours
	Work order backlog (total number of work orders open for 21 days or more)
	Work order backlog per employee (average number of open work orders per FTE)
	Wrench time (percentage of total time worked that a maintenance technician has tools in hand and is actively performing maintenance to equipment divided by hours worked)
Real Estate	Average contract review time in days
	Net operating income from real estate
	Net operating income per GSF of real estate
	Percentage of GSF that is leased space
	Percentage of real estate GSF occupied
	Total cost of leased space per GSF

1) APPA recommends that institutions allocate between 2-4% of the aggregate current replacement value (CRV) of facilities for routine maintenance and capital renewal. APPA, "Capital Renewal and Deferred Maintenance," http://bokcms.appa.org/subchapter_view.cfm?chap_id=131&part_id=2#1454.

2) Priority code measured on a standardized scale (e.g., from 1-Emergency to 5-Routine).

Source: Facilities Forum interviews and analysis.

Campus Operations Metrics Quick-Start Guide

This guide represents the short list of Campus Operations performance indicators that EAB recommends Facilities leaders track. The list draws from the comprehensive list of metrics found with full definitions across the previous pages.

Campus Profile

1. Total GSF maintained
2. Total deferred maintenance backlog
3. Distribution of buildings by age range (number of buildings and GSF by age)

Operating Costs and Staffing Levels

4. Workload (GSF) coverage per custodial FTE
5. Acre (or hectare) per grounds FTE
6. Total operations and maintenance expenditure per GSF

Campus Cleanliness

7. Average APPA campus cleanliness rating

Building Condition

8. Facility Condition Index (FCI)[1]

Planned and Unplanned Maintenance

9. Average work order completion time
10. Percentage of work orders open for 21 days or more
11. Maintenance mix (ratio of preventive maintenance to reactive maintenance tasks completed)
12. Percentage of all work orders categorized as unplanned (i.e., reactive and emergency)
13. Percentage of labor hours spent on service calls (i.e., customer-initiated work)

Facilities Workforce

Metric Category	Measures
Workforce Demographics	Average cost per turnover
	Average employee tenure by position
	Average retirement age by position
	Average time to fill by position
	Average time to fill for hard-to-fill positions
	Average time to fill for open positions
	Average vacancy period
	Employee count by age[1]
	Employee count by function/team
	Employee count by years of service[2]
	First-year turnover rate
	Internal job movement rate[3]
	Involuntary turnover rate
	Number of demotions
	Number of employees on FMLA
	Number of employees on LOA (non-FMLA)
	Number of employees receiving disciplinary or corrective action still employed
	Number of grievances filed
	Number of grievances resolved
	Number of lateral job movements
	Number of positions vacated
	Number of terminations
	Overall turnover rate
	Overall vacancy rate
	Percentage of all facilities staff retained from prior year
	Percentage of employees over age of 50
	Percentage of employees terminated during probation period
	Percentage of leadership roles filled by underrepresented minorities
	Percentage of management staff retained from prior year
	Percentage of separations due to resignations

1) Potential age groups: <20 years of age, 21-30, 31-40, 41-50, 51-60, and >60 years of age.
2) Track both lateral moves and promotions. Potential service length groups: <5 years of service, 5-10, 11-15, 16-20, 21-25, 26-30, and >30 years of service.

Source: Facilities Forum interviews and analysis.

Facilities Workforce (cont.)

Metric Category	Measures
Workforce Demographics (cont.)	Retention rate by length of service[1]
	Retention rate by position
	Total Facilities FTEs
	Total number of probationary employees
	Turnover rate (overall and by position)
	Unionized employees as percentage of employee population
	Vacancy rate by position
	Voluntary turnover rate
Workforce Cost	Annual amount spent on wages[2]
	Average benefit expense per employee
	Average wage increase
	Average year-to-date merit increase
	Contract staff labor cost as percentage of total Facilities labor cost
	Employee health benefits as a percentage of total compensation (average across workforce and by level/role)
	Employee non-salary benefits costs as percentage of total labor costs (average across workforce and by level/role)
	Facilities labor cost
	Facilities labor cost as a percentage of Facilities expenditure
	Hours scheduled/billed for permanent employees
	Hours scheduled/billed for temporary employees
	In-house staff labor cost as percentage of total Facilities labor cost
	Market adjustment wage increase
	Number of new workers' compensation claims
	Number of open workers' compensation claims
	Number of paid administrative leaves
	Overtime expense as percentage of total labor costs
	Ratio of contract staff dollars to in-house staff dollars
	Salary per 1,000 GSF
	Total health benefit expenditure
	Total number of lost workdays from workers' compensation

1) Potential service length groups: <5 years of service, 5-10, 11-15, 16-20, 21-25, 26-30, and >30 years of service.
2) Includes salaried and hourly employees.

Source: Facilities Forum interviews and analysis.

Facilities Workforce (cont.)

Metric Category	Measures
Workforce Cost (cont.)	Total reportable workers' compensation cases
	Total workers' compensation paid
	Vacancy rate for hard-to-fill positions
	Workers' compensation costs as a percentage of labor costs
Workforce Productivity	Annual percentage increase in productivity per FTE compared to the Department of Labor's annual percentage increase in employee productivity[1]
	Average days absent per employee[2]
	DART Rate: Days Away, Restricted, Transfers (OSHA calculation: [# of DART incidents / # of hours worked]*200,000 hours)[3]
	Hours of off-campus travel per month
	Hours worked on events
	Labor productivity as defined by the Department of Labor (amount of goods and services provided compared to hours worked to produce those goods and services)
	Number of custodial FTEs per GSF
	Number of grounds FTEs per acre
	Number of maintenance FTEs per GSF
	Overtime hours as a percentage of total labor hours by hourly employees[4]
	Paid leave hours as percentage of total leave hours
	Percentage of Facilities FTEs actively working (i.e., not on FMLA, PTO, or other forms of leave)
	Percentage of overtime hours that are emergency overtime
	Percentage of overtime hours that are scheduled overtime
	Total hours worked
	Total number of sick time hours utilized
	Total paid leave hours
	Total unscheduled leave hours
	Unscheduled leave hours as percentage of total leave hours
	Worked-to-paid hours ratio
	Wrench time (percentage of total time worked that a maintenance technician has tools in hand and is actively performing maintenance to equipment / hours worked)

1) Each facilities unit determines a proxy for productivity and compares that change to the general American figure for the labor force's annual increase in productivity. From 2016 to 2017 this was 1.2% (Bureau of Labor Statistics, February 1, 2018, https://www.bls.gov/news.release/pdf/prod2.pdf).
2) Organized by exempt and nonexempt staff.
3) "Formulas for Calculating Rates," http://www.nmmcc.com/wp-content/uploads/FORMULAS_for_CALCULATING_RATES1.pdf.
4) Track both scheduled and emergency overtime.

Source: Facilities Forum interviews and analysis.

Facilities Workforce (cont.)

Metric Category	Measures
Employee Training	Annually recorded hours of professional development
	Average employee satisfaction rating with training and development offerings
	Average recorded hours of professional development per FTE
	Average training and development expenditure per FTE
	Number of external training sessions offered
	Number of in-house training sessions offered
	Number of employees attending training
	Number of supervisor/manager training hours
	Percentage of contractors undergoing compliance training annually
	Percentage of employees trained in process improvement
	Percentage of employees undergoing compliance training annually
	Percentage of managers undergoing compliance training annually
	Percentage of Facilities staff that have attained certification, license, degree, or formal professional designation
	Total number of training sessions offered
Workforce Engagement	Action plan progress (percentage complete)
	Average employee performance rating by department
	Internal manager promotion rate
	Internal staff promotion rate
	Percentage of employees 'satisfied' or 'very satisfied' working in Facilities
	Percentage of employees using tuition reimbursement
	Percentage of employees participating in wellness program
	Percentage of performance evaluations at each rating level
	Rate of on-time performance evaluations
Underrepresented Workforce	Local construction employment rate (percentage of total construction hours employing local residents on campus projects)
	Percentage of Facilities roles filled by underrepresented minorities
	Percentage of leadership roles[1] filled by underrepresented minorities
	Percentage of skilled trades roles[2] filled by underrepresented minorities
	Percentage of workforce roles filled by veterans
	Percentage of workforce roles filled by women
	Percentage of workforce roles filled by underrepresented minorities

1) E.g., supervisor, shop manager, zone manager.
2) E.g., electrician, plumber, HVAC technician.

Source: Facilities Forum interviews and analysis.

eab.com

Facilities Workforce Metrics Quick-Start Guide

This guide represents the short list of Facilities Workforce performance indicators that EAB recommends Facilities leaders track. The list draws from the comprehensive list of metrics found with full definitions across the previous pages.

Workforce Demographics

1. Total Facilities FTEs
2. Percentage of employees over age of 50
3. Vacancy rate by position

Workforce Cost

4. Facilities labor cost as a percentage of Facilities expenditure
5. Overtime expense as percentage of total labor costs

Workforce Productivity

6. Wrench time (measured as percentage of labor hours)
7. Percentage of overtime hours that are emergency overtime

Employee Training

8. Average recorded hours of professional development per FTE

Workforce Engagement

9. Percentage of employees "satisfied" or "very satisfied" working in Facilities
10. Internal promotion rate
11. Turnover rate by position

Underrepresented Workforce

12. Percentage of leadership roles filled by underrepresented minorities

Source: Facilities Forum interviews and analysis.

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Fiscal Management

Metric Category	Measures
Fiscal Responsibility	Annual change in Facilities overhead rate
	Net operating income
	Percentage of capital projects completed on budget (compare new construction and renovation projects)
	Percentage of total capital budget spent on change orders[1]
	Ratio of billable to non-billable hours
	Recapitalization rate[2]
	Renovation costs per GSF
	Total operating budget
	Total operating budget per building, per student FTE, and per GSF
	Total operating costs
	Total operating costs per building, per student FTE, and per GSF
	Total operating revenue
Capital Costs	Age of facilities ratio: accumulated depreciation / depreciation expense
	Amount of capital dollars spent to replace, repair, or purchase equipment
	Amount spent on renewal/renovation by infrastructure type
	Asset investment rate as percentage of current replacement value[3]
	Capital expenditures
	Capital project cash flow execution (comparison of projected cash flow plan to committed capital cash flow plan)
	Capital project spending per project GSF[4]
	Capital renewal needs as a percentage of current replacement value
	Construction costs per GSF
	External architectural and engineering design costs as a percentage of total facilities projects costs
	Facilities budget execution (actual facilities costs compared to estimate costs measured in +/- percentage)[5]
	Investment in renewal/renovation as percentage of current replacement value[6]
	Outstanding amount owed to Facilities unit
	Percentage of designs completed within design budgeted fee

1) Can be tracked by project or cumulatively. Change order types include scope change, error, omission, and hidden conditions.
2) APPA defines recapitalization as the level of annual funding for facility renewal and deferred maintenance expressed as a percentage of facility replacement values.
3) APPA recommends that institutions allocate between 2-4% of the aggregate current replacement value (CRV) of facilities for routine maintenance (0.5-1.5%) and capital renewal (1.5-2.5%) combined.
4) This KPI can be compared to regional, peer, and market construction cost per square foot.
5) Can be tracked at the department or unit level.
6) APPA recommends a target investment rate of 1.5% to 2.5% of CRV.

Source: APPA, "Capital Renewal and Deferred Maintenance," *Body of Knowledge;* Facilities Forum interviews and analysis.

Fiscal Management (cont.)

Metric Category	Measures
Capital Costs (cont.)	Percentage of bills owed to the Facilities unit paid in full
	Physical asset reinvestment ratio: purchased cash assets / depreciation expense
	Total amount spent on capital renewal/renovation
	Total value of capital assets
Custodial Costs	Custodial costs per employee FTE
	Custodial costs per GSF
	Custodial costs per student FTE
Grounds and Landscaping Costs	Landscaping and grounds cost per GSF
	Landscaping and grounds cost per maintained acre (or hectare)
Operations and Maintenance Costs	Actual project costs vs. project cost estimate (for uncapitalized but billable work that Facilities completes; for example, calculate what percentage of projects was within 15% of estimate, and what percentage was beyond)
	Building maintenance cost per GSF (includes all costs to maintain the interiors and exteriors of maintained buildings)
	Current replacement value (total amount of expenditure in current dollars required to replace the institution's educational and general facilities to its optimal condition)
	Current replacement value per GSF
	Operations and maintenance cost per GSF
	Operations and maintenance investment as a percentage of current replacement value[1]
	Preventive maintenance cost per GSF
	Total operations and maintenance costs
	Total operating cost as a percentage of current replacement value
Operating and Staffing Costs	Administrative cost per GSF
	Contract staff labor cost as percentage of total Facilities labor cost
	Facilities expenditure as percentage of gross institutional expenditure
	Facilities labor cost
	Facilities labor cost as a percentage of total Facilities expenditure
	Hourly chargeback rate[2]
	In-house staff labor cost as percentage of total Facilities labor cost
	Operating budget execution (comparison of total operating expenses to operating budget)

1) APPA recommends a target investment rate of 0.5% to 1.5% of CRV.
2) This rate typically varies by unit and work intensity; may draw on peer comparisons.

Source: APPA, "Capital Renewal and Deferred Maintenance,"
Body of Knowledge; Facilities Forum interviews and analysis.

Fiscal Management (cont.)

Metric Category	Measures
Operating and Staffing Costs (cont.)	Operating costs per GSF, less utilities costs
	Operations and maintenance expenditure per GSF
	Ratio of contract staff dollars to in-house staff dollars
	Total Facilities expenditure
Utility and Energy Costs	Cost per BTU (also known as energy rate; some measure per MBTU)
	Energy budget execution (actual energy costs compared to estimated costs, measured in +/- percentage)
	Energy cost as percentage of gross institutional expenditure
	Energy cost per GSF[1]
	Energy cost per student FTE
	Energy investment index (percentage of the annual expenditure for energy conservation and efficiency efforts as compared to total annual energy expenditure)
	Total annual energy expenditure
	Total expenditure on items intended to increase energy efficiency
	Total utilities cost per GSF
	Total utilities expenditure as a percentage of gross institutional expenditure
	Total utilities expenditure[2]
	Total water cost per GSF
	Utilities cost per student FTE
	Utility budget execution (actual utilities costs compared to estimated costs, measured in +/- percentage)
Real Estate	Average contract review time in days
	Net operating income from real estate
	Net operating income per GSF of real estate
	Occupancy rate by real estate segment (commercial, retail, and residential)
	Percentage of GSF that is leased space
	Percentage of office space designated as shared, hoteling, or co-working space
	Percentage of real estate GSF occupied
	Rental income percentage change
	Rental payment percentage change
	Total cost of leased space per GSF

1) Includes electrical, gas, steam, and any other energy source. Note: Does not include the cost of the utility infrastructure, only includes consumed resources.
2) Includes total energy costs plus water/sewage.

Source: Facilities Forum interviews and analysis.

Fiscal Management Metrics Quick-Start Guide

This guide represents the short list of Fiscal Management performance indicators that EAB recommends Facilities leaders track. The list draws from the comprehensive list of metrics found with full definitions across the previous pages.

Capital Costs

1. Capital project expenditure per project GSF
2. Percentage of capital projects completed on budget
3. Investment in renewal/renovation as percentage of current replacement value[1]

Custodial Costs

4. Custodial costs per GSF

Grounds and Landscaping Costs

5. Landscaping and grounds cost per maintained acre (or hectare)

Operations and Maintenance Costs

6. Operating budget execution
7. Operations and maintenance cost per GSF
8. Preventive maintenance cost per GSF
9. Operations and maintenance investment as a percentage of current replacement value[2]

Operating and Staffing Costs

10. Facilities expenditure as a percentage of gross institutional expenditure
11. Total Facilities expenditure per gross square meter

Utility and Energy Costs[3]

12. Energy cost per GSF
13. Cost per BTU

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1) APPA recommends a target investment rate of 1.5% to 2.5% of current replacement value (CRV).
2) APPA recommends a target investment rate of 0.5% to 1.5% of CRV.
3) These metrics use BTU and GSF as measurement units; leaders may need to convert metrics to their institution's preferred measurement unit.

Source: Facilities Forum interviews and analysis.

Housing

Metric Category	Measures
Housing Profile	Acceptance rate for resident assistant positions
	Number of faculty involved with residence hall programming
	Number of faculty involved with special housing options[1]
	Number of resident assistants
	Number of students applying for resident assistant positions
	Number of students in hall council positions
	Number of students living in a residence hall per residence hall staff member
	Number of students living in a residence hall per resident assistant
	Number of students living in special housing options (e.g., living-learning communities)
	Number of students participating in residence life programs
	Percentage of beds in buildings with sprinklers
	Percentage of full-time undergraduate students who live on campus
	Percentage of housing square footage dedicated to common spaces
	Total number of beds
	Total number of beds by room type (e.g., apartments, residence halls, suites, privately managed)
	Total number of residence life programs
	Total number of students who live on campus
Housing Efficiency	Annual cost of contracted residence hall operations and maintenance
	Annual cost of residence hall renewal and renovation[1]
	Annual in-house operations and maintenance cost per GSF[1]
	Number of students on housing waiting list
	Occupancy rate per semester
	Occupancy yield per semester
	Percentage of beds filled
	Percentage of common spaces recapitalized in a given year

1) This can be tracked cumulatively and/or by building type (e.g., apartment, residence hall).

Source: Facilities Forum interviews and analysis.

Housing (cont.)

Metric Category	Measures
Housing Quality	Average residence hall audit rating (0-5)[1]
	Graduation rate of resident assistant versus nonresident assistant
	Graduation rate of students who live on campus for at least two years versus students who do not
	Median GPA of on-campus resident vs. nonresident
	Median GPA of resident assistant versus nonresident assistant
	Percentage of students living on campus by year (i.e., freshman, sophomore, junior, senior)[2]
	Percentage of students satisfied with housing application process
	Percentage of students satisfied with overall housing experience
	Percentage of students satisfied with overall housing experience by residence hall
	Percentage of students satisfied with resident assistant

1) Rating system to be established by institution based on predetermined levels of housing quality.
2) This metric does not merit tracking for classes required to live on campus; however, institutions with this requirement may be interested in tracking non-required classes.

Source: Facilities Forum interviews and analysis.

Housing Metrics Quick-Start Guide

This guide represents the short list of Housing performance indicators that EAB recommends Facilities leaders track. The list draws from the comprehensive list of metrics found with full definitions across the previous pages.

Housing Profile

1. Total number of beds

2. Percentage of full-time undergraduate students who live on campus

Housing Efficiency

3. Annual in-house operations and maintenance cost per GSF

4. Occupancy rate per semester

Housing Quality

5. Percentage of students satisfied with overall housing experience

6. Median GPA of on-campus resident vs. nonresident

7. Graduation rate of students who live on campus for at least two years versus students who do not

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Planning, Design, and Construction

Metric Category	Measures
Project Management	Average number of months it takes to close out a capital project (measured from the date of "substantial completion" to the final closeout date)
	Average planning, design, and construction customer satisfaction score (typically rated on a 1 to 5 scale based on post-assessment survey taken by project sponsors)
	Average project manager customer satisfaction score (typically rated on a 1 to 5 scale based on post-assessment survey taken by project sponsors)
	Average time spent on each project phase
	Capital projects office hours worked
	Compliance with institutional space standards (percentage can be calculated by summing up net assignable square feet by room type [e.g., offices, labs] and dividing it by what the allotment of space should be based on institution's space allocation guidelines)
	Master plan execution (percentage of capital projects in current master plan completed by target year)
	Number of change orders[1]
	Number of major design awards and LEED project certifications per year
	Number of open projects (total number of projects across design, construction, punch list, closeout)
	Number of project managers
	Number of projects at each broad project stage (i.e., planning, design bid, construction bid, actual construction, closeout)
	Number of projects initiated by month[2]
	Percentage of major capital projects completed on time[3]
	Percentage of minor capital projects completed within 150 days[4]
	Percentage of projects completed on time[3]
	Percentage of projects completed within budget (percentage of projects completed within original construction amount plus 3% for new projects or 5% for renovation projects)
	Percentage of projects delivered on time by project manager[3]
	Percentage of projects delivered within budget by project manager (percentage of projects completed within original construction amount plus 3% for new projects or 5% for renovation projects)
	Percentage of projects on time by broad project stage (i.e., planning, design bid, construction bid, actual construction, closeout)[3]

1) Can be tracked on a project-by-project basis or cumulatively. Change order types include scope change, error, omissions, and hidden conditions.
2) Projects initiated in the summer tend to cost more and strain limited project manager capacity.
3) Many institutions considering which metrics to include in a dashboard or scorecard consider on-time as within 30 days of delivery deadline.
4) Depending on capital project budget threshold and how "minor" projects are defined, the time frame may need to be adjusted.

Source: Facilities Forum interviews and analysis.

Planning, Design, and Construction (cont.)

Metric Category	Measures
Project Management (cont.)	Percentage of projects that have had no discernible advancement in the last 90 days
	Project manager average project workload (current workload by project manager and average number of projects across entire team)
	Total number of active and completed capital projects within fiscal year
Project Spend	Average cost of change orders per project[1]
	Average number of change orders per project[1]
	Average professional services cost
	Average project cost per square foot by month initiated[2]
	Budget variance[3]
	Capital expenditures
	Capital investment budget execution (actual facilities costs compared to estimated costs measured in +/- percentage)
	Capital project cash flow execution (Measures committed capital cash flow plan against projected cash flow plan, target to spend +/- 2%)
	Capital project spending per project GSF[4]
	Construction costs per GSF[5]
	Cost of site surveys, investigations, and/or reports
	Current replacement value (total expenditure in current dollars required to replace facilities to its current condition)
	Number of change orders per year, by type[1]
	Percentage of dollars by project phase
	Percentage of total construction cost spent on change orders[6]
	Professional services cost as percentage of total project cost
	Project management expenses (project management unit expenses incurred)
	Project management income (fees minus expenses)
	Project management revenue (project management fees collected)
	Renovation costs per GSF
	Total budget[7]
	Total value of active capital projects
	Total value of construction contracts

1) Can be tracked by project or cumulatively. Types of change orders include scope change, error, omission, and hidden conditions.
2) Projects initiated in the summer tend to cost more and strain limited project manager capacity.
3) Organized by each part of the budget, e.g., labor, maintenance, contractual services, supplies, equipment, land, and structures.
4) Can be compared to regional, peer, and market construction cost per square foot.
5) Track globally and for different building spaces types (e.g., classroom, lab, and office).
6) Track globally and also by infrastructure category (e.g., roofing, HVAC, electrical).
7) Track by budget classification and project phase.

Source: Facilities Forum interviews and analysis.

Planning, Design, and Construction (cont.)

Metric Category	Measures
Planning and Design	Average additional cost per square foot for LEED projects
	Average time spent on each project phase (i.e., planning, design bid, construction bid, actual construction, closeout)
	Average time to receive special required design approvals (e.g., historic reviews, design reviews, planning board approvals)
	Current number of projects funded
	Master plan execution (percentage of capital projects in current master plan completed by target year)
	Number of change orders[1]
	Number of feasibility studies
	Percentage of designers under contract within 120 days of posting
	Percentage of designs complete by scheduled completion date
	Percentage of designs completed within design budgeted fee
	Percentage of total design and construction budget spent on specialty consultants (e.g., acoustic consultants, code consultants)
	Total A/E (Architect/Engineer) Design Fees
	Total amount spent on specialty consultants (e.g., acoustic consultants, code consultants)
	Total cost for design approval applications (e.g., historic reviews, design reviews, planning board approvals)
	Total cost of design contingency
Real Estate	Average contract review time in days
	Net operating income from real estate
	Net operating income per GSF of real estate
	Occupancy rate by real estate segment (commercial, retail, and residential)
	Percentage of GSF that is leased space
	Percentage of office space designated as shared, hoteling, or co-working space
	Percentage of real estate GSF occupied
	Rental income percentage change
	Rental payment percentage change
	Total cost of leased space per GSF

1) Can be tracked by project or cumulatively. Types of change orders include scope change, error, omission, and hidden conditions.

Source: Facilities Forum interviews and analysis.

Planning, Design, and Construction (cont.)

Metric Category	Measures
Vendor/Contractor Diversity	Percentage of contract value awarded to minority-owned businesses
	Percentage of contract value awarded to locally owned businesses
	Percentage of contract value awarded to veteran-owned businesses
	Percentage of contract value awarded to woman-owned businesses
	Percentage of hired A/E[1] firms that are minority-owned
	Percentage of hired A/E firms that are locally owned
	Percentage of hired A/E firms that are veteran-owned
	Percentage of hired A/E firms that are woman-owned

1) Architect/Engineer.

Source: Facilities Forum interviews and analysis.

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Planning, Design, and Construction Metrics Quick-Start Guide

This guide represents the short list of Planning, Design, and Construction performance indicators that EAB recommends Facilities leaders track. The list draws from the comprehensive list of metrics found with full definitions across the previous pages.

Project Management

1. Percentage of projects delivered on time
2. Percentage of projects delivered on time by broad project stage
3. Percentage of projects completed within budget
4. Master plan execution
5. Average planning, design, and construction customer satisfaction score
6. Average project manager customer satisfaction score
7. Project manager average project workload

Project Spend

8. Capital investment budget execution
9. Average professional services cost
10. Construction costs per GSF
11. Renovation costs per GSF
12. Percentage of total construction cost spent on change orders

Real Estate

13. Percentage of GSF that is leased space

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Safety and Compliance

Metric Category	Measures
Building Safety and Compliance	Cost of emergency maintenance
	Number of unscheduled outages
	Number of fire alarm impairments
	Number of fire sprinkler impairments
	Number of fire alarms without evacuations
	Number of fire alarms with evacuations
	Number of fire sprinkler system deficiencies
	Number of fire code deficiencies/findings[1]
	Number of emergency maintenance work orders
	Percentage of campus facilities classified as handicap-accessible
	Percentage of work orders classified as emergency maintenance
Public Safety[2]	Average time between incident report and resolution, in days
	Faculty and staff campus safety rating
	Number of alcohol transports to hospital
	Number of keys/swipe cards issued to employees and students
	Number of murder/non-negligent manslaughter cases
	Number of negligent manslaughter cases
	Number of reported aggravated assaults
	Number of reported alcohol incidents occurring in residence halls[3]
	Number of reported arsons
	Number of reported assaults
	Number of reported burglaries
	Number of reported robberies
	Number of reported sex offenses—forcible
	Number of reported sex offenses—non-forcible
	Number of reported vandalism cases

1) Sort metric into waiting to start, working, confirming, waiting to close, closed in month.
2) Selection of Clery Act Metrics. Institutions should check Federal guidelines and follow accordingly.
3) Organized by residence hall.

Source: Facilities Forum interviews and analysis.

Safety and Compliance (cont.)

Metric Category	Measures
Public Safety (cont.)	Ratio of public safety officers to student FTEs
	Student campus safety rating
	Total number of incidents reported involving students[1]
	Total number of reported alcohol incidents
Quality Assurance	Inspection-initiated corrective actions completed
	Percentage of buildings passing area inspections
	Percentage of custodial inspection compliance
	Percentage of grounds inspection compliance
	Percentage of labs found in compliance with institutional standards
	Percentage of shops found in compliance with institutional standards
Injuries	Capital projects office lost days due to incident rate (lost days per hours worked per year)
	Capital projects office recordable incident rate (accidents per hours worked per year)
	Injury-related lost workday rate (number of injury-related lost workdays per 100 FTEs)
	Number of capital projects office incidents
	Number of capital projects office lost days due to incidents
	Number of injuries by type
	Number of long-term disability cases
	Number of OSHA-reportable accidents
	Percentage of OSHA review issues corrected compared to findings (issues corrected / total issues)
Training and Qualifications	Contractor training compliance rate (number of contractors who attended training / total contractors)
	Employee training compliance rate (number of employees who attended training / total employees)
	Number of expired driver qualifications
	Number of institutional employees attending training

1) Organized according to on-campus incidents, on-campus incidents in student housing, and off-campus incidents.

Source: Facilities Forum interviews and analysis.

Safety and Compliance Metrics Quick-Start Guide

This guide represents the short list of Safety and Compliance performance indicators that EAB recommends Facilities leaders track. The list draws from the comprehensive list of metrics found with full definitions across the previous pages.

Building Safety and Compliance

1. Percentage of work orders classified as emergency maintenance
2. Cost of emergency maintenance

Public Safety

3. Total number of public safety incidents reported involving students
4. Ratio of public safety officers to student FTEs
5. Average time between public safety incident report and resolution
6. Student campus safety rating

Quality Assurance

7. Percentage of buildings passing area inspections

Injuries

8. Number of OSHA-reportable accidents
9. Injury-related lost workday rate

Training and Qualifications

10. Employee training compliance rate
11. Contractor training compliance rate

Service Delivery

Metric Category	Measures
Work Order Efficiency	Average age of open work orders
	Average time to complete work order requests by priority code[1]
	Average work order completion time
	Average work order completion time in hours for reactive, critical, and emergency work orders
	Follow-up work orders per 100 preventive maintenance checks
	Follow-up work orders per 100 project manager checks (number of work orders submitted for repairs during 100 PM checks)
	Maintenance mix (ratio of preventive maintenance to reactive maintenance tasks completed)
	Number of failures by failure code (indicator of why an asset failed to facilitate better maintenance interventions)
	Number of preventable service calls (number of customer-initiated work orders that could have been prevented through preventive maintenance)
	Percentage of preventative maintenance, corrective maintenance, and service call orders requiring corrective rework
	Percentage of work orders open for 21 days or more
	Proactive labor hours as percentage of total hours
	Ratio of number of preventive maintenance work orders to service calls
	Ratio of preventive maintenance work hours to service request work hours
	Reactive labor hours as percentage of total hours
	Response time compliance (percentage of corrective work orders that are completed within a target time frame)
	Time spent addressing work orders as a percentage of total available Facilities staff time
	Total amount of money spent on new equipment due to inadequate preventive maintenance
	Total hours spent on work orders, by priority code[1]
	Total number of open work orders
	Total number of proactive labor hours (time spent on work identified by Facilities staff)
	Total number of reactive labor hours (time spent on work identified by customers)
	Total number of work orders completed (e.g., per month, YTD)

1) Priority code measured on a standardized scale (e.g., from 1-Emergency to 5-Routine).

Source: Facilities Forum interviews and analysis.

Service Delivery (cont.)

Metric Category	Measures
Work Order Efficiency (cont.)	Total number of work orders submitted
	Work order backlog (total number of work orders open for 21 days or more)
	Work order backlog per FTE (average number of open work orders per FTE)
Customer Satisfaction	Average APPA cleanliness rating (typically measured through a semiannual quality assurance audit conducted by custodial supervisor or third-party vendor)
	Average number of elevator service calls per elevator
	Average number of too hot/too cold calls per building
	Average customer satisfaction rating by constituency (i.e., students, faculty, and staff)
	Average customer satisfaction rating by Facilities unit
	Average in-house project customer satisfaction score (This score reflects satisfaction with any work completed in-house [e.g., minor renovations and renewals], typically measured with a post-project survey.)
	Average post-work order customer satisfaction rating, by service criteria[2]
	Average post-work order satisfaction score
	Number of too hot/too cold calls
	Percentage of customer-requested projects completed on or under budget
	Percentage of customer-requested projects completed on time[2]
	Percentage of customers satisfied or very satisfied[3]
	System runtime reliability percentage (percentage of time all campus utility systems are operational)
	System runtime/downtime (number of days running without failure divided by time and extent of system shutdown)
	Total number of elevator service calls[4]
	Total number of utility outages/downtime events[5]

1) Typically measured on a 0-5 scale (criteria may include responsiveness, timeliness, communicativeness, professionalism, quality of service, cost, staff competency, website accessibility, and overall).
2) Many institutions considering which metrics to include in a dashboard or scorecard consider on-time as within 30 days of delivery deadline.
3) Typically measured through an annual customer satisfaction survey.
4) Compare equipment-related calls to other calls.
5) Track outages for electric, water, chilled water, domestic hot water, steam, natural gas.

Source: Facilities Forum interviews and analysis.

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Service Delivery Metrics Quick-Start Guide

This guide represents the short list of Service Delivery performance indicators that EAB recommends Facilities leaders track. The list draws from the comprehensive list of metrics found with full definitions across the previous pages.

Work Order Efficiency

1. Average time to complete work order requests by priority code
2. Average age of open work orders
3. Percentage of work orders open for 21 days or more
4. Ratio of number of preventive maintenance work orders to service calls

Customer Satisfaction

5. Average number of too hot/too cold calls per building
6. Average number of elevator service calls per elevator
7. Average post-work order satisfaction score
8. Percentage of customer-requested projects completed on time
9. Percentage of customer-requested projects completed on or under budget
10. Percentage of customers satisfied or very satisfied
11. Average APPA campus cleanliness rating
12. System runtime reliability percentage

Space Management: Classrooms

Metric Category	Measures
Classroom Profile	Average course capacity by department
	Average room capacity by type of space/building
	Average section capacity by department
	Net assignable square feet (NASF) of classroom space[1]
	Number of classrooms
	Number of classrooms by maximum capacity[2]
	Number of classrooms by square footage range
	Number of courses offered
	Number of sections offered
	Total NASF of classroom space currently offline for improvements
Classroom Efficiency	Annual operations and maintenance cost for classrooms per student credit hour[5]
	Annual operations and maintenance cost per classroom NASF[1,3]
	Average enrollment per course
	Average number of courses per student
	Average room utilization
	Average seat utilization
	Average section fill rate[4]
	Average sections per course[5]
	Average time to complete programming/planning/design projects
	Classroom NASF per student credit hour[1,5]
	Departmental accuracy of course enrollment vs. assigned room capacity
	Number of unplaced courses at start of registration
	Room utilization at prime time
	Room utilization by day and/or hour
	Room utilization by term
	Room utilization rate outside of prime time

1) For the majority of metrics that require square footage measurements, gross square feet (GSF) is the most common. However, space management metrics focus more on activity and assignment. As a result, many institutions prefer to use net assignable square feet (NASF). Institutions can use either GSF, NASF, or any preferred measurement.
2) Measure capacity in ranges of ~10 (e.g., <10, 10-20, 20-30).
3) Measure by budgeted cost, actual cost, recovered cost from colleges, and cost per classroom student.
4) Track at the institutional, college, departmental, and course level.
5) Track at the institutional, college, and departmental level.

Source: Facilities Forum interviews and analysis.

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Space Management: Classrooms (cont.)

Metric Category	Measures
Classroom Efficiency (cont.)	Seat utilization at prime time
	Seat utilization by day and/or hour
	Seat utilization by term
	Seat utilization outside of prime time
Classroom Quality	Average classroom audit rating (0-5)
	Average classroom student satisfaction score (0-5)
	DFW[1] rate by instructional space type
	Enrolled class count by room type
	Number of classrooms renovated per year
	Percentage of classroom issues resolved within 24 hours
	Percentage of classrooms inspected
	Percentage of classrooms meeting established classroom standards by category (e.g., accessibility, acoustics, furniture, lighting, and technology)
	Percentage of classrooms passing initial inspection
	Percentage of classrooms renovated each year
	Percentage of inspection requests corrected on the spot
	Percentage of inspections generating Facilities work order

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Space Management Metrics Quick-Start Guide: Classrooms

This guide represents a portion of Space Management (classrooms) performance indicators that EAB recommends Facilities leaders track. The list draws from a comprehensive list of metrics, which can be found with full definitions across the previous pages.

Classroom Profile

1. Number of classrooms by maximum capacity

Classroom Efficiency

2. Average section fill rate
3. Annual operations and maintenance cost per classroom NASF
4. Room utilization by day and/or hour
5. Seat utilization by day and/or hour
6. Classroom NASF per student credit hour

Classroom Quality

7. Percentage of classrooms renovated each year
8. Percentage of classroom issues resolved within 24 hours
9. Average classroom student satisfaction score (0-5)
10. Average classroom audit rating (0-5)

Space Management: Office Space

Metric Category	Measures
Office Space Profile	Net assignable square feet (NASF) of office space[1]
	Percentage of office space by department/unit
	Percentage of office space by staff type (e.g., faculty, student, administrators)
	Percentage of office space by work station type
	Space vacancy rate
	Total number of conference rooms
	Total number of offices
	Total number of offices by square footage range
	Total number of private offices
	Total number of shared offices
	Total occupied office space square feet
Office Space Efficiency	Annual operations and maintenance cost per office NASF[1,2]
	Average faculty office space NASF per instructor[1,3]
	Average office size (in NASF) for administrative staff[1]
	Average office size (in NASF) for instructional staff[1,4]
	Average office space square foot per FTE
	Compliance with institutional space standards (Percentage can be calculated by summing up NASF by room type [e.g., offices, labs] and dividing it by what the allotment of space should be based on institution's space allocation guidelines.)
	Number of occupied offices
	Number of tenure-track offices per tenure-track faculty member
	Number of unassigned offices, by square footage range
	Number of unoccupied offices
	Operations and maintenance budget execution (actual Facilities costs compared to estimated costs measured in +/- percentage)
	Percentage of cubicles assigned
	Percentage of office space by staff type (e.g., faculty, student, administrators)
	Percentage of office NASF assigned[1]
	Percentage of offices assigned
	Percentage of offices within office size target for role

1) For the majority of metrics that require square footage measurements, gross square feet (GSF) is the most common. However, space management metrics focus more on activity and assignment. As a result, many institutions prefer to use net assignable square feet (NASF). Institutions can use either GSF, NASF, or any preferred measurement.
2) Measure by budgeted cost, actual cost, recovered cost from colleges, and cost per FTE.
3) Track by types of faculty (e.g., tenure-track, adjunct, teaching assistant).
4) Including tenure-track faculty, non-tenure-track faculty, and graduate students; including faculty that don't have offices at all.

Source: Facilities Forum interviews and analysis.

Space Management: Office Space (cont.)

Metric Category	Measures
Office Space Quality	Average office audit rating (0-5)
	Average office customer satisfaction score (0-5)
	Percentage of inspection requests corrected on the spot
	Percentage of inspections generating Facilities work order
	Percentage of offices inspected
	Percentage of offices passing initial inspection

Space Management Metrics
Quick-Start Guide: Office Space

This guide represents a portion of Space Management (office space) performance indicators that EAB recommends Facilities leaders track. The list draws from a comprehensive list of metrics, which can be found with full definitions across the previous pages.

Office Space Profile

1. Total number of offices
2. Percentage of office space by department/unit

Office Space Efficiency

3. Percentage of offices within office size target for role
4. Number of tenure-track offices per tenure-track faculty member
5. Average office size (in NASF[1]) for instructional staff
6. Average office size (in NASF[1]) for administrative staff
7. Annual operations and maintenance cost per office NASF[1]
8. Percentage of office space by staff type (e.g., faculty, student, administrators)

Office Space Quality

9. Average office audit rating (0-5)
10. Average office customer satisfaction score (0-5)

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1) For the majority of metrics that require square footage measurements, gross square feet (GSF) is the most common. However, space management metrics focus more on activity and assignment. As a result, many institutions prefer to use net assignable square feet (NASF). Institutions can use either GSF, NASF, or any preferred measurement.

Source: Facilities Forum interviews and analysis.

Space Management: Research Labs

Metric Category	Measures
Research Lab Space Profile	Average lab area by research lab type, department, and/or building
	GSF of research lab space
	Linear square feet of lab bench space[1]
	Net assignable square feet (NASF) of research lab space[2]
	Net assignable square feet (NASF) of research lab space by principal investigator[2]
	Number of assigned research labs
	Number of research lab benches
	Number of research labs by department
	Number of research lab rooms by type
	Number of research labs
	Number of unassigned research labs
	Percentage of lab space by purpose[3]
	Percentage of research lab space by field
	Percentage of total space dedicated to research labs
	Total number of research laboratories by NASF range[2]

1) Can be measured by principal investigator and cumulatively.
2) For the majority of metrics that require square footage measurements, gross square feet (GSF) is the most common. However, space management metrics focus more on activity and assignment. As a result, many institutions prefer to use net assignable square feet (NASF). Institutions can use either GSF, NASF, or any preferred measurement.
3) Categories include unassigned, research, and teaching.

Source: Facilities Forum interviews and analysis.

Space Management: Research Labs (cont.)

Metric Category	Measures
Research Lab Space Efficiency	Annual operations and maintenance cost per research lab net assignable square foot (NASF)[1,2]
	Average NASF per staff member[2]
	Compliance with institutional space standards (Percentage can be calculated by summing up NASF by room type [e.g., offices, labs] and dividing it by what the allotment of space should be based on institution's space allocation guidelines.)
	Externally sponsored research expenditure per NASF of lab space
	Indirect cost recovery per NASF of lab space[2]
	Median research expenditure per NASF by principal investigator
	NASF of lab space per full-time research faculty[2]
	NASF of lab space per lab occupant[2]
	NASF of lab space per principal investigator[2]
	Operations and maintenance budget execution (actual facilities costs compared to estimated costs measured in +/- percentage)
	Research expenditure per NASF of lab space[2]
	Research revenue per NASF[2]
	Total research expenditure (regardless of funding source) per NASF[2]
Research Lab Quality	Average research lab audit rating (0-5)[3]
	Average research lab customer satisfaction score (0-5)[3]
	Percentage of inspection requests corrected on the spot
	Percentage of inspections generating Facilities work order
	Percentage of research labs inspected
	Percentage of research labs passing initial inspection

1) Measure by budgeted cost, actual cost, recovered cost from colleges, and cost per FTE.
2) For the majority of metrics that require square footage measurements, gross square feet (GSF) is the most common. However, space management metrics focus more on activity and assignment. As a result, many institutions prefer to use net assignable square feet (NASF). Institutions can use either GSF, NASF, or any preferred measurement.
3) Rating levels predetermined by institution.

Source: Facilities Forum interviews and analysis.

Space Management Metrics
Quick-Start Guide: Research Labs

This guide represents a portion of Space Management (research labs) performance indicators that EAB recommends Facilities leaders track. The list draws from a comprehensive list of metrics, which can be found with full definitions across the previous pages.

Research Lab Space Profile

1. Number of research labs by department
2. Percentage of total space dedicated to research labs

Research Lab Space Efficiency

3. Indirect cost recovery per net assignable square feet of lab space[1]
4. Net assignable square feet of lab space per principal investigator[1]
5. Annual operations and maintenance cost per research lab NASF[1]

Research Lab Quality

6. Average research lab customer satisfaction score (0-5)
7. Average research lab audit rating (0-5)

---

1) For the majority of metrics that require square footage measurements, gross square feet (GSF) is the most common. However, space management metrics focus more on activity and assignment. As a result, many institutions prefer to use net assignable square feet (NASF). Institutions can use either GSF, NASF, or any preferred measurement.

Source: Facilities Forum interviews and analysis.

Space Management: Teaching Labs

Metric Category	Measures
Teaching Lab Space Profile	Average lab area by teaching lab type, department, and/or building
	Average number of stations in teaching labs
	Net assignable square feet (NASF) of teaching lab space[1]
	Number of teaching lab rooms by type
	Number of teaching lab stations
	Number of teaching labs
	Number of teaching labs by department
	Percentage of teaching lab space by field
	Total number of teaching labs by square footage range
Teaching Lab Space Efficiency	Annual operations and maintenance cost per teaching lab NASF[1,2]
	Compliance with institutional space standards (Percentage can be calculated by summing up NASF by room type [e.g., offices, labs] and dividing it by what the allotment of space should be based on institution's space allocation guidelines.)
	Number of lab seats per student FTE
	Number of lab seats per student credit hour
	Operations and maintenance budget execution (actual facilities costs compared to estimated costs measured in +/- percentage)
	Room utilization at prime time
	Room utilization by day and/or hour
	Room utilization by term
	Room utilization outside of prime time
	Seat utilization in at prime time
	Seat utilization in by day and/or hour
	Seat utilization in by term
	Seat utilization in outside of prime time

1) For the majority of metrics that require square footage measurements, gross square feet (GSF) is the most common. However, space management metrics focus more on activity and assignment. As a result, many institutions prefer to use net assignable square feet (NASF). Institutions can use either GSF, NASF, or any preferred measurement.

2) Measure by budgeted cost, actual cost, recovered cost from colleges, and cost per classroom student.

Source: Facilities Forum interviews and analysis.

Space Management: Teaching Labs (cont.)

Metric Category	Measures
Teaching Lab Quality	Average teaching lab audit rating (0-5)
	Average teaching lab customer satisfaction score (0-5)
	Percentage of inspection requests corrected on the spot
	Percentage of inspections generating Facilities work order
	Percentage of teaching labs inspected
	Percentage of teaching labs passing initial inspection

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Space Management Metrics
Quick-Start Guide: Teaching Labs

This guide represents a portion of Space Management (teaching labs) performance indicators that EAB recommends Facilities leaders track. The list draws from a comprehensive list of metrics, which can be found with full definitions across the previous pages.

Teaching Lab Profile

1. Number of teaching labs by department

Teaching Lab Space Efficiency

2. Seat utilization by term
3. Room utilization by term
4. Annual operations and maintenance cost per teaching lab NASF[1]

Teaching Lab Quality

5. Average teaching lab customer satisfaction score (0-5)
6. Average teaching lab audit rating (0-5)

---

1) For the majority of metrics that require square footage measurements, gross square feet (GSF) is the most common. However, space management metrics focus more on activity and assignment. As a result, many institutions prefer to use net assignable square feet (NASF). Institutions can use either GSF, NASF, or any preferred measurement.

Source: Facilities Forum interviews and analysis.

Sustainability and Utilities[1]

Metric Category	Measures
Energy and Utility Consumption	Campus electrical usage (measured in kilowatt-hours or megawatt-hours)
	Campus steam usage (measured in kilo-pounds)
	Campus water usage (measured in cubic meters or gallons)
	Energy consumption (BTUs)[2]
	Energy consumption per GSF
	Energy consumption per GSF compared to previous year
	Heat rate[3]
	Kilowatt consumption
	Kilowatt-hour per GSF
	Median gallons of water use on a daily basis estimated annually per FTE student enrolled
	BTUs per electric megawatt-hour (or kilowatt-hour)[4]
	Natural gas consumption (measured in therms)
	Oil consumption
	Percentage change in water usage
	Total chilled water (measured in ton-hours)
	Utilities condensate return percentage
	Utility chilled water conversion (measured in kilowatts per ton)
	Utility outages per month[5]
	Water use intensity (measured in gallons per GSF)

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Sustainability and Utilities (cont.)

Metric Category	Measures
Energy Costs	Annual expenditure on items intended to increase energy efficiency
	Cost per BTU (this is also known as energy rate; some measure per MBTU)
	Energy budget execution (actual energy costs compared to estimated costs, measured in +/- percentage)
	Energy cost as percentage of gross institutional expenditure
	Energy cost per student FTE
	Energy expenditure per square foot
	Energy investment index (percentage of the annual expenditure for energy conservation and efficiency efforts as compared to total annual energy expenditure)
	Natural gas expenditure per square foot
	Sewer cost
	Total cost of water and sewer
	Total energy cost per GSF (includes electrical, gas, steam, and any other energy source)[1]
	Total energy cost per student FTE (includes electrical, gas, steam, and any other energy source)
	Total energy expenditure
	Total utilities cost avoidance (Cost avoidance includes costs avoided based on retrofit projects, ESCO energy-savings projects, consumption changes, and landfill charges.)
	Total utilities cost per GSF
	Total utilities expenditure (includes total energy costs plus water/sewage)
	Utilities cost per student FTE
	Utility budget execution (actual utilities costs compared to estimate costs, measured in +/- percentage)
	Water cost
	Water cost per gallon
	Water cost per GSF

Sustainability and Utilities (cont.)

Metric Category	Measures
Energy Efficiency and Sustainability	Annual storm runoff (measured in gallons)[1]
	Campus power plant emissions (measured in tons)
	Construction and demolition diversion rate (percentage of construction and renovation trash diverted from landfill)
	Greenhouse gas emissions (measured in metric tons CO_2e)
	Median garbage waste per FTE student enrolled
	Median recycled waste per FTE student enrolled
	Metric ton carbon emissions per student FTE
	Number of acres of natural areas that are actively managed to improve ecological health
	Number of major design awards and LEED Project certifications per year
	Number of natural area volunteer hours
	Number of solar panels installed
	Percentage change in energy usage
	Percentage of custodial products that are "green" products
	Percentage change in $MgCO_2$e Scope 1 and 2 Greenhouse Gas emissions (direct emissions and purchased utilities including power plant, buildings, vehicles, landfill, and fugitive gases)[2]
	Percent change in $MgCO_2$e Scope 3 Greenhouse Gas emissions (all other emissions; e.g., emissions from an employee's commute)[2]
	Percentage of employees biking and walking to work
	Recycled waste compared to garbage sent to landfill[3]
	Renewable energy as percentage of total energy consumption
	Renewables (kilowatt/hour)
	Total waste production per student FTE[4]

1) Could also be measured monthly.
2) These metrics use $MgCO_2$e as a measurement unit; this can be converted to the institution's preferred measurement unit.
3) Recycled waste measured in pounds, garbage measured in cubic yards.
4) Organized by recycled materials, diversion rate, compost, e-waste.

Source: Facilities Forum interviews and analysis.

Sustainability and Utilities Metrics Quick-Start Guide

This guide represents a portion of Sustainability and Utilities performance indicators that EAB recommends Facilities leaders track. The list draws from a comprehensive list of metrics, which can be found with full definitions across the previous pages.

These metrics use BTU and GSF as measurement units; institutions may need to convert these metrics to their preferred measurement units.

Energy and Utility Consumption

1. Energy consumption (BTUs)
2. Energy consumption per GSF
3. Kilowatt-hour per GSF
4. Water use intensity
5. Utility outages per month

Energy Costs

6. Total energy cost per GSF
7. Energy Rate (cost per BTU)
8. Utilities cost per student FTE
9. Total utilities cost avoidance

Energy Efficiency and Sustainability

10. Renewable energy as percentage of total energy consumption
11. Total waste production per student FTE
12. Recycled wasted compared to garbage sent to landfill
13. Metric ton carbon emissions per student FTE

Transportation

Metric Category	Measures
Parking	Number of accidents in parking areas
	Number of crime incidents in parking areas
	Number of lot overfills per month
	Number of people on the waiting list for parking spots
	Parking utilization (percentage of spaces utilized; can be measured across various time frames)
	Percentage of citations by type (e.g., uncontested, warning, appealed, waived, and upheld citations)
	Percentage of parking spots by type[2]
	Revenue from parking fines
	Revenue from parking permits
	Revenue from short-term parking
	Revenue from special event parking
	Revenue from other sources (e.g., farmer's market lease, flea markets)
	Total number of campus parking spots
	Total number of parking spots by type (e.g., faculty/staff only, visitor parking, student parking)
	Total number of vehicles registered with campus parking
	Total parking citations[1]
	Total revenue from parking
Fleet Management and Shuttles	Average age of fleet
	Average number of shuttle passengers each hour
	Average number of shuttle riders per day
	Average travel time for each shuttle route
	Number of vehicles in campus fleet[2]
	Percentage of fleet vehicles by age group[3]
	Percentage of fleet vehicles receiving regular maintenance

1) Track subtotals of uncontested, warning, appealed, waived, and upheld citations.
2) Both total number and broken down by type.
3) Potential age ranges: 0-5 years, 6-10 years, 11-15 years, and 15+ years.

Source: Facilities Forum interviews and analysis.

Transportation (cont.)

Metric Category	Measures
Sustainable Commuting	Distribution of faculty and staff commuter choices, by transit type[1]
	Distribution of student commuter choices, by transit type[1]
	Number of car charging stations
	Number of designated ride-sharing pickup locations
	Percentage of vehicles registered with campus parking that are electric
	Percentage of vehicles registered with campus parking that use diesel
	Percentage of vehicles registered with campus parking that use gasoline

1) Options include walk, rideshare, drive alone, carpool, bicycle, take public transit, or take institutional transit to campus.

Source: Facilities Forum interviews and analysis.

Transportation Metrics Quick-Start Guide

This guide represents a portion of Transportation performance indicators that EAB recommends Facilities leaders track. The list draws from a comprehensive list of metrics, which can be found with full definitions across the previous pages.

Parking

1. Total number of vehicles registered with campus parking
2. Total revenue from parking
3. Total number of campus parking spots
4. Parking utilization (percentage of spaces utilized)
5. Percentage of parking spots by type (e.g., faculty/staff only, visitor parking, student parking)

Fleet Management and Shuttles

6. Average number of shuttle riders per day
7. Number of vehicles in campus fleet (total and by type)
8. Percentage of fleet vehicles by age group

Sustainable Commuting

9. Distribution of student commuter choices, by transit type[1]
10. Number of car charging stations

Source: Facilities Forum interviews and analysis.

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Leader-Centric Facilities Metrics

Introduction to Leader-Centric Facilities Metrics

This section outlines EAB's recommended Facilities metrics to share with various senior leaders. These lists reflect the approximately dozen metrics to consider first when sharing Facilities data with five audiences: president, board, CBO, provost, and other academic leaders (i.e., deans, department chairs, and faculty). While these metrics will not be perfect for every campus, EAB's recommendations serve as a strong starting point when crafting dashboards or reports for non-Facilities audiences.

President-Centric Facilities Metrics

Campus Operations

1. Total GSF maintained
2. Total deferred maintenance backlog
3. Facility Condition Index (FCI)[1]

Fiscal Management

4. Total operating costs per GSF
5. Total operations and maintenance expenditure per GSF
6. Investment in renewal/renovation as percentage of current replacement value[2]
7. Net operating income per GSF of real estate

Housing

8. Percentage of full-time undergraduate students who live on campus
9. Median GPA of on-campus resident vs. nonresident

Planning, Design, and Construction

10. Percentage of projects delivered on time
11. Average planning, design, and construction customer satisfaction score

Service Delivery

12. Percentage of customers satisfied or very satisfied

Space Management

13. Seat utilization by day and/or hour

Sustainability and Utilities

14. Total utilities cost avoidance

Board-Centric Facilities Metrics

Campus Operations

1. Total GSF maintained
2. Total deferred maintenance backlog
3. Facility Condition Index (FCI)[1]

Fiscal Management

4. Investment in renewal/renovation as percentage of current replacement value[2]
5. Net operating income per GSF of real estate

Housing

6. Percentage of full-time undergraduate students who live on campus
7. Median GPA of on-campus resident vs. nonresident

Planning, Design, and Construction

8. Percentage of projects delivered on time
9. Average planning, design, and construction customer satisfaction score
10. Percentage of contract value awarded to minority-owned businesses

Service Delivery

11. Percentage of customers satisfied or very satisfied

Sustainability and Utilities

12. Total utilities cost avoidance
13. Renewable energy as percentage of total energy consumption
14. Metric ton carbon emissions per student FTE

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1) The National Research Council recommends an FCI between 5-10% for campuses with significant maintenance backlogs. The FCI can be tracked at the building, college, and/or campus level.
2) APPA recommends a target investment rate of 1.5% to 2.5% of current replacement value.

Source: APPA, "Capital Renewal and Deferred Maintenance," *Body of Knowledge;* Facilities Forum interviews and analysis.

CBO-Centric Facilities Metrics

Campus Operations

1. Total deferred maintenance backlog
2. Facility Condition Index (FCI)[1]
3. Maintenance mix (ratio of preventive maintenance to reactive maintenance tasks completed)
4. Percentage of work orders open for 21 days or more

Fiscal Management

5. Total operating costs per GSF
6. Operations and maintenance cost per GSF
7. Investment in renewal/renovation as percentage of current replacement value[2]

Planning, Design, and Construction

8. Capital investment budget execution
9. Percentage of total construction cost spent on change orders
10. Percentage of projects delivered on time

Service Delivery

11. Percentage of customers satisfied or very satisfied

Sustainability and Utilities

12. Energy expenditure per GSF

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1) The National Research Council recommends an FCI between 5-10% for campuses with significant maintenance backlogs. The FCI can be tracked at the building, college, and/or campus level.
2) APPA recommends a target investment rate of 1.5% to 2.5% of current replacement value.

Source: APPA, "Capital Renewal and Deferred Maintenance," *Body of Knowledge;* Facilities Forum interviews and analysis.

Provost-Centric Facilities Metrics

Campus Operations

1. Total deferred maintenance backlog
2. Investment in renewal/renovation as percentage of current replacement value[1]

Planning, Design, and Construction

3. Percentage of capital projects delivered on time
4. Master plan execution

Service Delivery

5. Percentage of customer-requested projects completed on time
6. Average planning, design, and construction customer satisfaction score
7. Average APPA cleanliness rating

Space Management

8. Average section fill rate
9. Room utilization by day and/or hour
10. Seat utilization by day and/or hour
11. Percentage of offices within size target for role

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1) APPA recommends a target investment rate of 1.5% to 2.5% of current replacement value.

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Academy-Centric Facilities Metrics for Deans, Department Chairs, and Faculty

Campus Operations

1. Percentage of work orders open for 21 days or more

Planning, Design, and Construction

2. Percentage of customer-requested projects completed on or under budget
3. Percentage of customer-requested projects completed on time

Service Delivery

4. Percentage of customers satisfied or very satisfied

Space Management

5. Average section fill rate
6. Room utilization by day and/or hour
7. Seat utilization by day and/or hour
8. Percentage of classrooms renovated each year
9. Percentage of classroom issues resolved within 24 hours
10. Percentage of offices within office size target for role
11. Number of offices per tenure-track faculty member
12. Net assignable square feet (NASF) of lab space per principal investigator

![EAB logo]

Select Core Performance Metrics

SECTION

3

- Filtering Step 1: Apply a Reality Check
- Filtering Step 2: Map to Strategic Objectives
- Filtering Step 3: Swap Lagging for Leading Metrics
- Filtering Step 4: Account for High-Priority Imperatives
- Filtering Step 5: Ensure Balance of Metric Categories

Bringing Metric Selection to Life

Screening Process Helps Narrow Core Metrics from Long Starting List

This section outlines the five-step filtering process to help Facilities leaders identify the right group of metrics to elevate to a dashboard. The first two considerations filter metrics based on pragmatic limitations and strategic priorities, respectively. The third consideration ensures Facilities leaders identify leading rather than lagging indicators, and the fourth consideration accounts for unit- or institution-specific circumstances. The final consideration ensures an equitable distribution of metrics across functional or strategic categories.

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

Source: Facilities Forum interviews and analysis.

Begin with Preliminary List of Metrics

There are two phases to determining which metrics to elevate to a Facilities dashboard, outlined below. The first phase is to move from the full list of 700+ possible metrics to a more manageable preliminary list of roughly 100 metrics. While moving from over 700 to only 100 metrics may seem like a significant reduction, most Facilities units will find it to be a straightforward process. Leaders can quickly eliminate a large swath of metrics that are low-priority or extraneous for their campus.

Outline of the Metric Selection Exercise

700+ Facilities metrics	~100 metrics on starter list	15-20 metrics on dashboard

Phase 1: Build Preliminary List Of Metrics

Institutions can either…

Option 1: Use EAB's Quick-Start Recommendations
Begin with curated metric recommendations that accompany function-specific lists (≤135 metrics)

Option 2: Craft Campus-Specific Starter List
Review metrics function-by-function and curate campus-specific starter list of metrics (aim for ~100 metrics)

Phase 2: Apply Five-Step Filtering Process

Use guidance and tools provided in this resource to whittle down metric list

To aid this process, most institutions can use EAB's quick-start guides. These guides represent the 7 to 13 function-specific metrics the majority of institutions will find most relevant. So, some leaders will find they can simply use the quick-start guides as is for their preliminary list. Other units may find the quick-start lists are mostly right for the campus, but they need to swap out a few metrics to reflect campus-specific issues. Of course, if the quick-start guides include too many irrelevant or low-priority metrics, campuses can review the metrics provided in Section 1 of this publication and craft their own starter list.

Regardless of how institutions opt to craft a preliminary list of metrics, the second phase is to whittle the preliminary list down to the final 15 to 20 metrics to elevate onto the dashboard. Counterintuitively, even though this phase requires a much smaller reduction in metrics, it is more challenging, as the metrics being eliminated are all good options. As such, this phase requires a more rigorous decision framework. To aid members in this phase, this resource includes a five-step filtering process. The filters will ultimately enable leaders to eliminate metrics and land on a rigorously vetted final list.

Getting from Metrics to KPIs

Metrics That Measure Progress Toward Your Strategic Objectives Are KPIs

Once institutions have applied the filtering process to a starter list of metrics, they will transform hundreds of potential metrics into a list of 15 to 20 key performance indicators (KPIs). KPIs are defined as the institution-specific metrics that indicate progress toward strategic and operational objectives.

Going one step further, Facilities leaders must strike the right balance between two types of KPIs: **volume** and **relative indicators**.

100's of Potential Metrics

Metrics are quantifiable measurements collected to track organizational activities and processes

15-20 KPIs

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)

Volume indicators are raw numbers that provide information on scale. Conversely, **relative indicators** relate two or more metrics, thus providing comparative information (e.g., ratios, percentages). For example, "total number of work orders completed" is a volume indicator, whereas "percentage of work orders categorized as emergency" is a relative indicator. Note that EAB considers time-bound metrics, such as "number of emergency work orders in past seven days," to still be volume metrics. By comparison, averages are relative indicators. So while dashboards should include a handful of volume indicators, the majority of KPIs should be relative indicators, as these provide more valuable insight into operational performance. EAB recommends a 20%/80% split between volume indicators and relative indicators.

To support the filtering process, use the **Master Metric Selection Tool** on pages 90-911 as a working document.

Apply a Reality Check

Goal

Eliminate metrics that fail the majority of "reality check" screens.

Owner

Function/unit expert[1]

Stakeholders Involved

- Function/unit expert
- Reporting partner(s), as needed
  - IT
  - Institutional Research

Overview

This step checks the feasibility of tracking metrics that you are considering for inclusion in your dashboard. It involves a one-by-one consideration of each metric and elimination of any that fail a majority of reality checks.

Step Is Completed When...

...the remaining metrics on your list are all accessible, frequent, reliable, and able to be explained.

Plan Your Time Requirements:

Action	Hours
Evaluate each metric against screens	
Exclude discarded metrics and update list	
Total	

---

1) The person with content expertise over a given function, such as maintenance or grounds/landscaping. This is typically the director/executive director over that function.

Source: Facilities Forum interviews and analysis.

Apply a Reality Check

Recognizing Pragmatic Limits of Certain Metrics

The first step in identifying core performance metrics is to set aside any measures that are only infrequently updated, based on untrustworthy data sources, or potentially confusing to leaders and staff. Four pragmatic screens to quickly eliminate such metrics are provided below. The first two screens—accessibility of data and frequency of tracking—serve as a litmus test to confirm the availability of data at regular intervals. The second two screens—reliability of data and communicability of concept—test quality and metric relevance.

Four Pragmatic Screens to Determine Metric Viability

Metric Screen	Description	Rationale
Accessibility of Data	Information system must possess the capability to generate data on metrics.	Unrealistic to expect manual data collection and analysis in timely manner 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 impact performance in real time.
Reliability of Data	Data available from information system should be accurate, consistently defined, and measured across the organization.	Absence of trustworthy data results in manager suspicion toward performance, often resulting in inaction.
Communicability of Concept	Definition and rationale for metrics should be easy to understand and replicate.	Lack of understanding about metric drivers and relevance hinders manager's ability to inflect performance.

Reality-Check Red Flag Questions

The following questions will help Facilities leaders test each metric against the four pragmatic screens. A majority of "no" answers for any one screen or at least one "no" for each of the four screens suggests that a metric should be eliminated from consideration as a core performance metric.

	Yes	No
Screen 1: 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?	☐	☐
Screen 2: 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?	☐	☐
Screen 3: Reliability of Data		
6. Do all departments (e.g., Finance, HR) use the same definition for this metric?	☐	☐
7. Is the metric calculated by an automated system?	☐	☐
8. If not, are you certain the reported data is accurate?	☐	☐
9. Do managers trust the data for decision-making?	☐	☐
Screen 4: Communicability of Concept		
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?	☐	☐

Source: Facilities Forum interviews and analysis.

Map Metrics to Strategic Objectives

Goal

Pinpoint the metrics that indicate progress against the unit's contributions to strategic goals.

Owner

Function/unit expert

Stakeholders Involved

- Function/unit expert
- Project lead
- Senior Facilities officer (SFO)

Overview

This step provides a framework to evaluate which potential metrics truly measure progress against your institutional goals. It equips you to differentiate between and prioritize metrics that focus on the desired outcome rather than the means.

Step Is Completed When…

…your most important strategic objectives have a metric or metrics associated with them.

Plan Your Time Requirements:

Action	Hours
[If needed] Convene project lead, senior Facilities officer, and senior leaders to agree upon cascaded goals	
Identify Facilities' strategic objectives	
Map metrics that connect with strategic objectives	
Total	

Source: Facilities Forum interviews and analysis.

Mapping Facilities Priorities to KPIs

Confirm Metrics Directly Measure Strategic Objectives Rather Than Initiatives

The second filtering step is to ensure that chosen measures directly link to strategic objectives. Without this strategic filter, the chosen metric may not reflect institutional or Facilities priorities and could even promote counterproductive initiatives. The framework below depicts how to effectively cascade broad strategic priorities into Facilities-specific objectives, metrics, and initiatives.

First, list out your institution's strategic priorities. Then, write your corresponding objectives. Identify the metric most closely related to each individual objective. (Note: It might not be possible to have a metric for every objective.)

Framework to Map Metrics to Institutional Strategic Priorities

	Strategic Priorities	Strategic Objectives	Metrics	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 importance of assets

Metrics should flow directly from strategic objectives

Many institutions mistakenly track metrics that assess strategic initiative progress

Note that you do not have to fill out the **Targets** and **Strategic Initiatives** columns yet; however, thinking through the strategic initiatives is helpful because it can help you differentiate between metrics that advance the objective (the ends) versus those that track progress against the initiative (the means). In this example, tracking the PM/RM ratio is the key metric. By comparison, tracking the number of preventive maintenance work orders completed by criticality would track progress against the initiative (in this case, revamping the PM schedule).

Finally, review your list and give extra weight to metrics that appear multiple times, as these measurements support core activities that deliver value. Similarly, cross out any metric that does not map to strategic objectives.

Source: Facilities Forum interviews and analysis.

Swap Lagging for Leading Indicators

Goal

Identify metrics that enable you to see ahead, proactively signaling when to intervene (before performance drops).

Owner

Function/unit expert

Stakeholders Involved

- Function/unit expert
- Project lead (optional)

Overview

This step outlines how to identify leading (versus lagging) metrics. Leading indicators are more valuable in preventing underperformance because they track data upstream of the desired outcome.

Step Is Completed When...

...you have metrics that will proactively alert you to off-track performance in critical operational areas.

Plan Your Time Requirements:

Action	Hours
Apply brainstorming questions to list of metrics	
Update metrics list with leading metrics where available	
Total	

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Pushing Upstream for Leading Indicators

The third step is to assess metrics on their ability to predict emerging challenges or opportunities and stimulate proactive rather than reactive action. Namely, where feasible, leaders should push lagging metrics "upstream" to identify leading indicators. Unfortunately, it is impossible to sort indicators into separate leading and lagging picklists, as categorization is largely dependent upon the rationale for tracking metrics. For example, leaders typically consider vacancy rate a lagging indicator of insufficient recruitment efforts. However, vacancy rate is also a leading indicator of a possible spike in payroll expenses due to future increased reliance on overtime or temporary labor.

Comparing Leading and Lagging Indicators in Facilities

Potential Leading Metrics		Lagging Indicator
Percentage of buildings passing area inspections → Employee training compliance rate →		OSHA recordable injuries
Percentage of offers accepted → Time to fill →		Vacancy rate
Vacancy rate → Total number of overtime hours utilized →		Payroll expense

Whether metrics leading or lagging depends on purpose for tracking
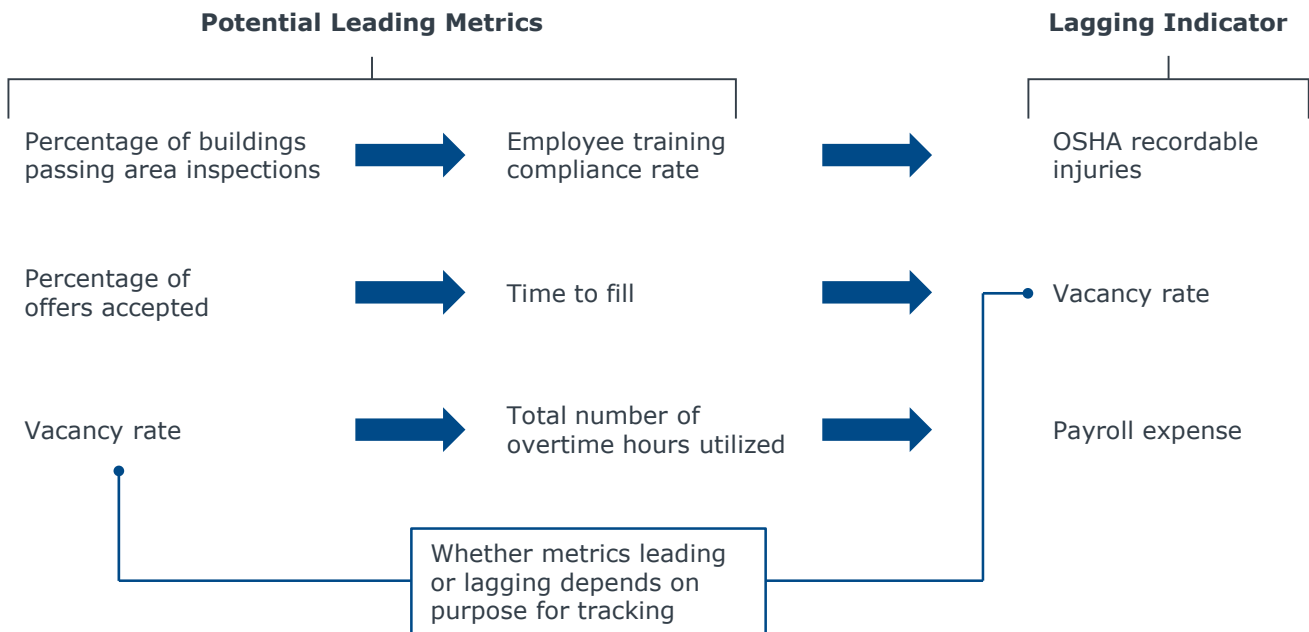
The questions below are designed to help Facilities leaders determine if selected core metrics are leading or lagging measures, and if lagging, potential related leading indicators to replace them.

Identifying Leading Metrics

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

Goal

Ensure metric list accounts for short-term, local priorities.

Owner

Project lead

Stakeholders Involved

- Project lead
- Function/unit expert
- Senior Facilities officer (SFO)

Overview

This step walks through how to ensure a portion of your dashboard accounts for time-bound initiatives of high importance. These can either be leader-driven priorities or Facilities-specific imperatives. In either case, these metrics should be short-term areas of focus and will change as new initiatives launch.

Step Is Completed When…

…local, high-priority imperatives have metrics reflected in final list.

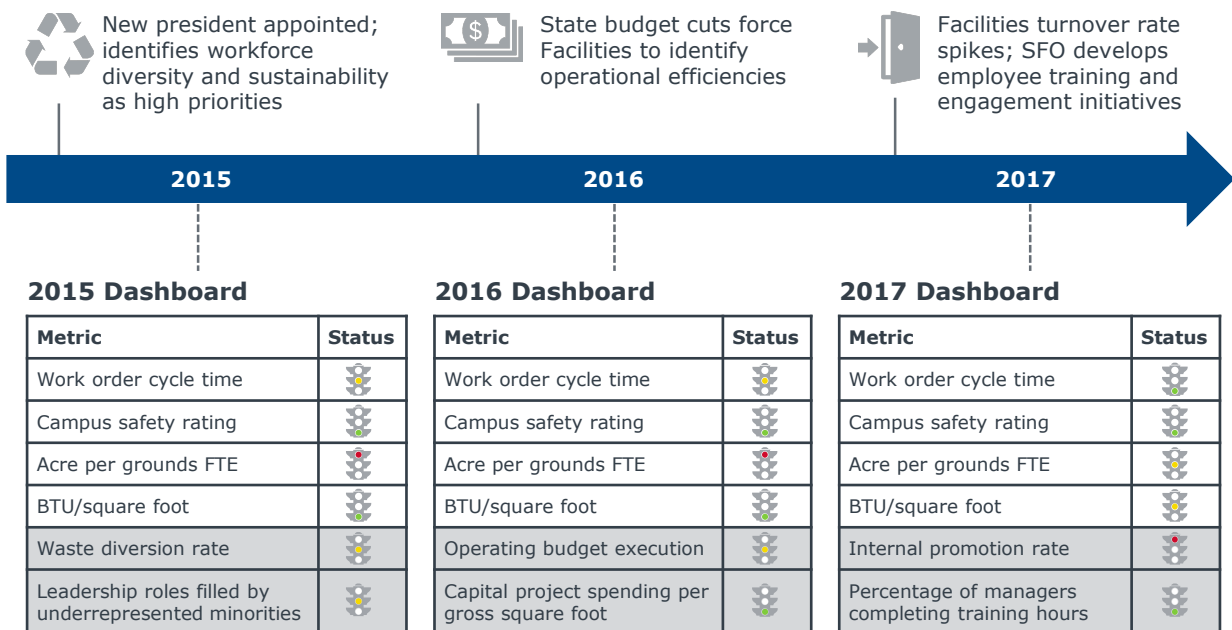### Plan Your Time Requirements:

Action	Hours
Meeting with SFO, function expert, etc. to identify important initiatives	
Apply prioritization questions to each initiative	
Select final hot-seat metrics	
Total	

Weighing What to Place in the Hot Seat

The fourth consideration encourages Facilities leaders to place a heightened focus on short-term, acute challenges not captured by other selected metrics. Facilities leaders should reserve one to three slots for time-bound "hot-seat" metrics—indicators representing acute challenges that institutions can meaningfully impact in a fixed time period, ideally less than 12 months. Dedicated slots for such measures not only guarantee a focus on critical priorities but also make Facilities dashboards dynamic documents that evolve and keep staff attention.

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	
BTU/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	
BTU/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	
BTU/square foot	
Internal promotion rate	
Percentage of managers completing training hours	

The timeline above depicts the evolution of a sample Facilities dashboard over a three-year period in response to shifting priorities. In 2015, a new president begins with a focus on workforce diversity and sustainability, which compels the SFO to elevate waste diversion and underrepresentation in leadership roles to the Facilities dashboard. In response to budget cuts one year later, the SFO swaps in operating budget execution and capital project spending metrics to identify potential inefficiencies. Finally, in response to staff turnover in 2017, the SFO adds promotion and training metrics to the dashboard to better track employee engagement.

Source: Facilities Forum interviews and analysis.

Hot-Seat Metrics Due Diligence Checklist

Identifying Time-Sensitive Imperatives

Beyond defined strategic objectives, list below any other imperatives that demand a more dedicated focus over the next 6 to 12 months. Place a check next to each imperative that your unit can effectively address in fewer than 12 months.

_____ ☐   _____ ☐

_____ ☐   _____ ☐

Prioritizing Competing Imperatives

Keeping in mind that the final metrics list should include no more than 15-20 metrics, it may be necessary to limit the number of hot-seat metrics selected. Below are some questions to consider when selecting the imperatives to target as hot-seat metrics.

Questions to Consider:

• Of the imperatives, which is likely to have the greatest impact on the institution?

• Given limited resources, which imperative is most critical to achieve in the next 12 months?

• Is this an imperative Facilities can meaningfully impact without obtaining greater institutional support?

• If it requires greater institutional support, how difficult will it be to secure senior executive buy-in to the imperative?

• If senior executive support is needed, is limited political capital worth expending on this imperative?

Identifying Corresponding Metrics

The final step requires identification of targeted metrics that address the existing imperatives, providing a means of consistently tracking the efficacy of performance improvement efforts.

Questions to Consider:

• For each imperative, is there an associated metric that could be added?

• Is this imperative currently reflected on the dashboard by an alternative metric?

• If currently reflected, is the existing metric sufficient, so that it is not necessary to add an additional measure?

• Does the metric meet the reality check criteria: accessibility, communicability, credibility, and frequency?

• If you've identified a lagging metric, is there a more instructive leading metric to replace it?

• Would you feel comfortable removing this metric once a target has been achieved?

Ensure Balance of Metric Categories

Goal

Ensure equitable distribution of metrics across categories.

Owner

Project lead

Stakeholders Involved

- Project lead
- Senior Facilities officer

Overview

This step is the final check on your list of metrics. So that leaders have a comprehensive view of Facilities, this step outlines how to assess the balance of metrics across different categories.

Step Is Completed When...

...the final list includes metrics that represent all Facilities functional areas, strategic priorities, or whatever preferred check you use.

Plan Your Time Requirements:

Action	Hours
Determine preferred evaluation criteria	
Evaluate final list of metrics	
Tweak metrics so final list is balanced across all categories	
Total	

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Compartmentalizing Our Thinking

Equitably Distribute Metrics Across Facilities Functions or Strategic Pillars

The final step is to ensure an equitable distribution of metrics across the Facilities department. Without such a distribution, institutions run the risk of overlooking emerging problems within underrepresented unit areas.

Broadly, Facilities leaders have two main options for organizing Facilities metrics, outlined below.

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

The most common approach is to sort metrics into functional areas such as campus operations or safety and compliance. This ensures that chosen metrics represent the full range of Facilities capabilities and responsibilities. The second approach is to organize metrics by strategic perspective. This ensures that metrics map to strategic goals such as student success or enrollment and enables Facilities leaders to demonstrate Facilities' impact on institutional priorities.

Source: Facilities Forum interviews and analysis.

Metric Balancing Exercise

Ensuring Strategic Balance

After Facilities leaders have chosen a tentative list of 15-20 core metrics, this exercise will ensure an equitable distribution of metrics across categories and allow for final changes to the metrics list, as necessary.

Step 1: Select one of the categorization methods listed on the previous page and write down the main categories for unit metrics in the top row of the charts below.

Step 2: Assign each of your tentative metrics to the most appropriate category. If using the Master Metric Selection Tool on pages 90-91, transfer metrics according to these guidelines:

• Transfer hot-seat metrics

• Transfer metrics that are not crossed off without leading indicators

• For metrics with leading indicators, determine which metric (i.e., leading or lagging) to select; consider benchmarking capability, pragmatic limits, and underlying purpose for tracking

Step 3: Look across categories and cross off the least valuable metric(s) from columns with a surplus, and add metrics to underrepresented columns as necessary.

Potential Core Metrics

Category: _____	Category: _____	Category: _____	Category: _____

Category: _____	Category: _____	Category: _____	Category: _____

Source: Facilities Forum interviews and analysis.

Master Metric Selection Tool

Instructions

Preliminary Step: Begin with Starter List of Metrics

Identify a starting list of Facilities metrics for consideration (see two options on page 75) and add them to the **Metric Master Selection Template** on page 91.

Apply a Reality Check
Ability to generate data needed to report on metric in a timely, trustworthy manner.

See Filtering Step 1 on pages 77-79.

➡ Cross off metrics failing to meet reality check criteria: accessibility, communicability, credibility, and frequency

Map to Strategic Objectives
Direct linkage between improvement on metric and progress on key institutional objectives.

See Filtering Step 2 on pages 80-81.

➡ Cross off metrics that do not map to strategic objectives

Swap Lagging for Leading
Capacity of metric to provide "the scoop" on emerging challenge or opportunity.

See Filtering Step 3 on pages 82-83.

➡ Where available, fill in leading indicators for metrics not crossed off

Account for High-Priority Imperatives
Need for heightened focus on short-term, acute challenges facing organization, not effectively tracked by any remaining metrics.

See Filtering Step 4 on pages 84-86.

➡ Add "hot-seat" metrics

Ensure Balance of Metric Categories
Ensure equitable distribution of metrics across categories.

See Filtering Step 5 on pages 87-89.

➡ Sort metrics into functional/strategic categories and adjust metric list as necessary

Illustrative Example

Facilities Workforce Metrics	Leading Metric	
Hard to fill vacancy rate		Crossed off due to lack of agreement on common definition
Percentage of leadership roles filled by underrepresented minorities		Hot-seat metric added due to focus on workforce diversity
Wrench time (measured as percentage of labor hours)	~~Overtime hours as a percentage of total labor hours~~	Leading indicator selected over lagging indicator
Percentage of employees "satisfied" or "very satisfied" working in FM	Internal promotion rate	Metrics both deemed valuable; both selected for tracking

Source: Facilities Forum interviews and analysis.

Master Metric Selection Template

Metric	Leading Metric

Metric	Leading Metric

Hot-Seat Metrics			

Source: Business Affairs Forum interviews and analysis.

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Deploy User-Friendly Dashboard Layout and Format

4

More Questions Than Answers

The second major challenge with building a dashboard to effectively communicate the data in a visual format. While elevation of right metrics is a critical first step, poor design can make or break efforts to better leverage data. The graphic below captures three common design mistakes. The first is to provide insufficient context. This often manifests as dashboards that over-rely on raw data and exclude helpful context such as performance targets or historic trends. This makes it difficult for the audience to know if a metric is trending in the right direction or how current performance compares.

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?

The second dashboard design mistake is to include too much information. For instance, dashboards that include 30 to 40 metrics or extend over several pages or rely too heavily on text to explain visualizations. This creates data fatigue as the audience doesn't know where to focus their attention.

The third dashboard design mistake is to use overly complex visualizations and graphics. These dashboards contain convoluted visualizations that may include multiple targets and trend lines, different time frames, and multi-chromatic color schemes. Though intended to provide sufficient context, overly complex graphics create more confusion rather than add clarity.

Source: Facilities Forum interviews and analysis.

Maximize Dashboard Impact

To help institutions avoid common design mistakes, the table below pinpoints seven characteristics of effective dashboard layouts. Along with a brief description, the characteristics are mapped to example dashboards that best exemplify them. All dashboards are available for download at eab.com.

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 • Northwestern Univeristy • 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; time frames 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

To access and download sample institutional dashboards, visit **eab.com/ffdatadictionary**.

Source: Facilities Forum interviews and analysis.

eab.com

Northwestern University

Northwestern Relies on Microsoft Suite for Simple Yet Effective Dashboards

Beyond layout, another important aspect of dashboard design and format is the type of tool to use. The next several pages explore this question by highlighting three different tools through institutional dashboard examples. One option is to use Microsoft suite products. Northwestern University uses Excel and PowerPoint to build their dashboards, previewed below. Northwestern's Vertical Transportation Equipment unit (elevator shop) uses the dashboard on the left, which is built in Excel. The second example is the Facilities Management dashboard, assembled from various data sources and compiled into PowerPoint on a monthly basis.

Northwestern

Screenshot of Vertical Transportation Equipment (VTE) Dashboard in Excel

Northwestern | FACILITIES MANAGEMENT

FY17 VTE Monthly Metrics Report

VTE Goals:		Baseline (1/2016)	FY17 Goal	This Month's Result
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	0.16	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: EVELEV, 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%	80%	-2%
SD2. Preventative Maintenance Closure	75%	60%	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%

Although Microsoft products require manual data entry and editing, they represent the most straightforward, lowest-cost option. Since implementing their dashboards, Northwestern has seen tangible improvements in Facilities operations, such as a significant reduction in overtime hours, as well as recognition from other campus leaders for their data-driven improvement efforts.

University of Minnesota (UMN)

## UMN Uses Tableau for Interactive Classroom Utilization Dashboard

Another option is to purchase software to build a dashboard. The University of Minnesota built a space utilization dashboard (shown below) using a software called Tableau. Originally, Minnesota shared the same data with deans in printed spreadsheets. However, the cumbersome format made it difficult and time-consuming for deans to interpret and leverage the data to make decisions.

Screenshot of UMN's Classroom Utilization Dashboard
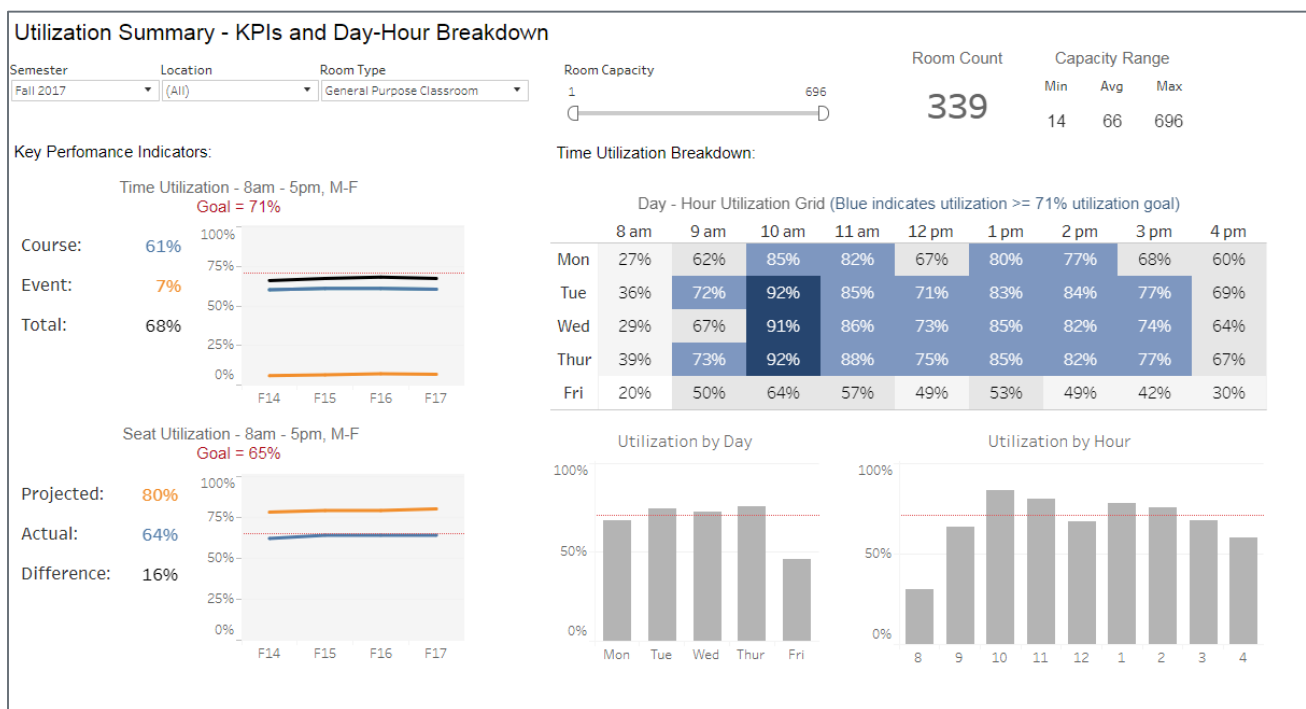
Minnesota's new format is much more accessible, driving greater utilization. Their dashboard allows users to filter the data by semester, location, room type, and capacity so they can focus on the data most relevant to their needs. This has led to greater information uptake and improved decision-making. For example, academic leaders have since returned 50 classrooms to central ownership and now schedule more courses during off-peak hours.

Columbia University (CU)

External Software Generates CU's Interactive, Public Sustainability Dashboard

Columbia University is another institution that opted to purchase a dashboard software. They partnered with Lucid to develop their sustainability dashboard (shown below) in 2014. The dashboard monitors utilities in 15 undergraduate residence halls in real time to encourage energy savings, displaying the rankings for sustainability competitions across campus. Going one step further, Columbia's dashboard is highly interactive. Plug-and-play variables enable users to create customized trend graphs that compare usage across different time frames and buildings.

Screenshots of Columbia University's Sustainability Dashboard
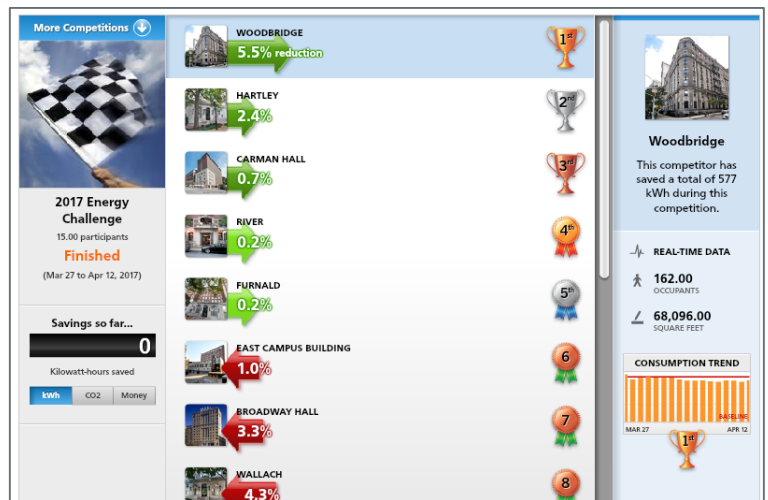
Although software requires a high up-front time and cost investment, institutions most commonly invest in software for public-facing sustainability dashboards given the strategic importance of sharing sustainability data with campus constituents.

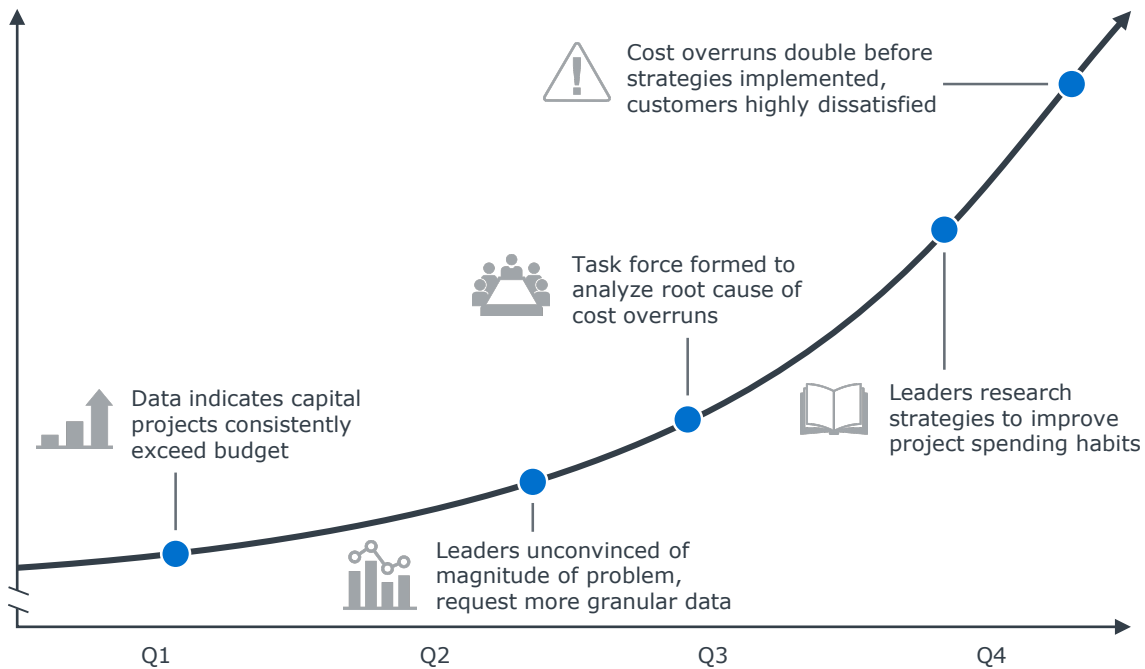# Set Principled Performance Targets and Action Triggers

Failing to Act on Troubling Data

Rigorous metric selection and a compelling dashboard format do not necessarily compel corrective action when performance lags. In fact, dashboards can be dramatically undermined by the failure to stipulate associated performance targets or "action triggers"—thresholds that signal underperformance on core metrics and mandate a response or action. As illustrated below, Facilities departments that monitor data without establishing thresholds that signal the need for corrective action often overanalyze or explain away negative trends while the situation worsens.

Capital Project Cost Overruns Double at Representative Institution

Data indicates capital projects consistently exceed budget

Leaders unconvinced of magnitude of problem, request more granular data

Task force formed to analyze root cause of cost overruns

Leaders research strategies to improve project spending habits

Cost overruns double before strategies implemented, customers highly dissatisfied

Q1 Q2 Q3 Q4

Differentiating Targets and Triggers

Targets Drive Performance on Metrics, Triggers Mandate Corrective Action

To ensure progress on selected metrics and compel action when performance lags, institutions should establish two distinct metric thresholds: **performance targets** and **action triggers**. While often used synonymously, performance targets and action triggers serve different purposes. Performance targets are fixed or ranged goals that drive progress on core metrics. Action triggers (though less common than performance targets) represent the single-most effective tracking mechanism to ensure leaders respond to concerning data in a timely fashion. Targets clarify performance goals, while triggers signal when goal achievement is highly unlikely without immediate corrective action.

Performance Target	Action Trigger
Definition	*Definition*
Fixed or ranged performance goal set by leaders each year	Threshold that signals underperformance on core metrics and mandates corrective action
Purpose	*Purpose*
Provides concrete goals and drives performance on core metrics	Clarifies when corrective action is required to maintain minimum performance levels
Example	*Example*
Performance target to complete **90%** of monthly preventive maintenance (PM) work orders	Action trigger to intervene if monthly PM work order completion rate dips below **60%**

Performance Target Options

Institutions have four main options when establishing performance targets to drive metric improvement. The first approach is to defer to **institutional mandates**. Though typically only applicable for sustainability goals or safety and compliance metrics, institutional mandates take highest precedent when setting targets.

The next option is to use **benchmarks**. From industry association standards, peer data, and out-of-industry insights, external benchmarks offer a principled approach for setting targets. However, institutions must consider the limitations of benchmarks, including non-standardized data definitions and institution-specific factors that prevent true comparisons.

Performance Target Option	Pros	Cons
Institutional Mandate Defer to institutional requirements when applicable (e.g., carbon footprint reduction, workforce diversity, safety and compliance)	Mandates take highest precedent for setting targets, requiring less effort from Facilities	Very rare; most applicable for sustainability goals or safety and compliance metrics[1]
Industry Benchmarks Leverage industry association standards (e.g., APPA, FEA[2]), peer performance, and regional standards (e.g., construction costs for local businesses)	Industry standards, peer data, and out-of-industry benchmarks offer a principled approach to set metric targets	Benchmarks not available for all metrics; institution-specific circumstances and lack of standardized definitions makes comparison difficult
Crowdsource with Staff Rely on frontline staff expertise to establish aspirational yet realistic metric goals	Taps frontline staff expertise, which can create buy-in for dashboard efforts	May yield overly aggressive or less ambitious targets
Continuous Improvement Establish ambition to continually improve metric within defined time frame (e.g., monthly, quarterly)	Most straightforward approach for establishing targets	Goals can be vague; may create low standards for improvement

The third approach is to **crowdsource targets with Facilities staff**. Frontline staff possess valuable knowledge about metric performance, and staff inclusion helps secure buy-in for dashboard efforts. However, as this approach is less structured than the previous two, it may result in overly aggressive or less aspirational targets.

The final option is to require **continuous improvement**. This represents the most straightforward approach, as institutions simply set a goal to improve performance within a specific time frame. However, this approach can be vague and may create low standards, as even marginal metric improvements technically achieve the continuous improvement goal. To avoid creating low standards, institutions can set both short-term and long-term goals, such as reducing the deferred maintenance backlog by 10% in five years with specific dollar figures attached to each year.

1) Note that some leaders specifically exclude compliance metrics from institutional dashboards because they represent a minimum performance threshold; what is more, including them in a dashboard may unnecessarily elevate mandatory activities.
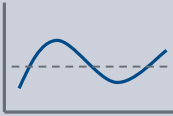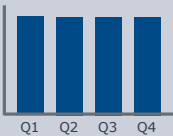2) Facility Engineering Associates.

Source: Facilities Forum interviews and analysis.

eab.com

Action Trigger Options

To establish principled action triggers, institutions must match each metric to the most appropriate trigger type: fixed, relative, or specialty. As their names suggest, fixed triggers maintain constant threshold levels, while relative triggers self-adjust based on targets, performance trends, and related metrics. In general, fixed triggers are easier to communicate and therefore manage against, but they are not always applicable for Facilities metrics.

Three Types of Action Triggers

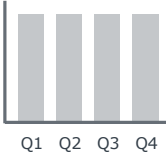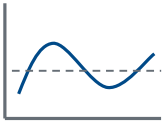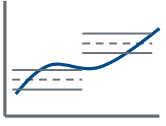| Trigger Type	Definition	Benefits	Limitations
Fixed Triggers	Minimum performance thresholds designed to guard against significant performance declines that, without corrective action, would likely cause units to miss nonnegotiable targets	Easy to calculate and communicate	Not applicable for many Facilities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

The least common type is specialty triggers, which fall into two categories. Static action triggers require continuous improvement on metrics to guard against performance plateaus. On the other hand, 100% triggers apply to metrics where perfect performance is the only acceptable outcome, such as the percentage of buildings meeting OSHA[1] standards.

The remainder of this section details how to choose and apply fixed, relative, and specialty triggers.

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1) Occupational Safety and Health Administration.

Source: Facilities Forum interviews and analysis.
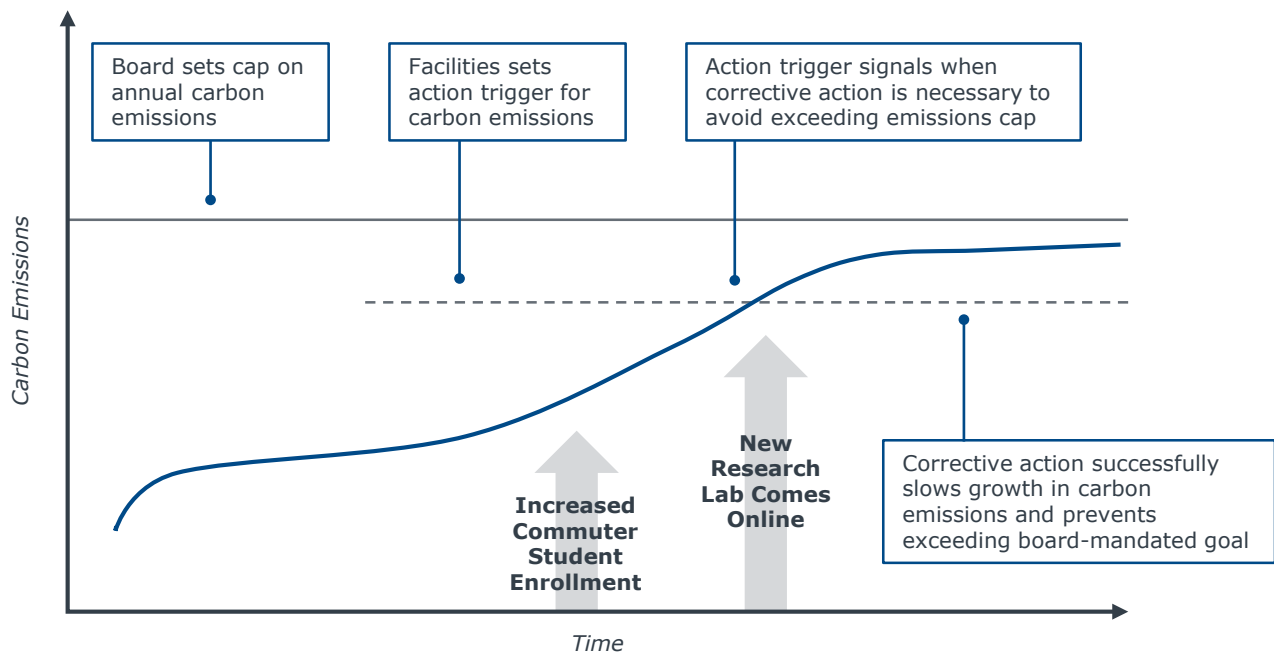
Action Trigger Diagnostic

The diagnostic below is designed to help Facilities leaders select the most appropriate trigger type for performance metrics. Questions should be answered sequentially. A series of "no" answers within an action trigger category suggests that the trigger type is not well suited to the metric. Answering "no" to all questions below suggests an action trigger should not be attached to the metric and perhaps the need to reassess inclusion of the metric as a core measure.

Trigger Type	Questions	Yes	No
Static and 100%	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%?	☐	☐
	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; see page 109 for directions.		
Fixed Triggers	3. Are you working toward an absolute (and nonnegotiable) target?	☐	☐
	4. Are you guarding against exceeding an absolute (and nonnegotiable) cap on performance?	☐	☐
	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; see page 105-106 for directions.		
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 toward target?	☐	☐
	8. Are you seeking to uncover simultaneous changes in performance among related metrics?	☐	☐
	If "yes" is answered for any question, then establish a relative trigger; see pages 107-108 for directions.		

Source: Facilities Forum interviews and analysis.

Deploy Fixed Triggers for Nonnegotiable Targets

Fixed triggers are most applicable for metrics with truly nonnegotiable targets, such as compliance with regulatory requirements. Where current performance on a metric is satisfactory, a fixed trigger can guard against significant performance declines that would likely cause Facilities to miss nonnegotiable targets without corrective action.

Setting a Fixed Trigger to Ensure Compliance with Executive Mandate

Board sets cap on annual carbon emissions

Facilities sets action trigger for carbon emissions

Action trigger signals when corrective action is necessary to avoid exceeding emissions cap

Carbon Emissions

Increased Commuter Student Enrollment

New Research Lab Comes Online

Corrective action successfully slows growth in carbon emissions and prevents exceeding board-mandated goal

Time

In the example above, Facilities leaders created a fixed action trigger for a board-mandated cap on annual carbon emissions. Later in the year, the trigger signaled a concerning trend and allowed sufficient time for leaders to take corrective action.

Source: Facilities Forum interviews and analysis.

Considerations for Setting Fixed Triggers

For metrics that require fixed triggers, the following tool will help determine where to set triggers relative to nonnegotiable limits. As described below, the distance of a trigger from the limit is determined by the speed and certainty of intervention. Each "no" answer to a question below indicates a greater need to shift the trigger toward a more defensive posture—further away from the nonnegotiable limit.

— — — — — — — Target

— — — — — — — Trigger

— — — — — — — Target

— — — — — — — Trigger

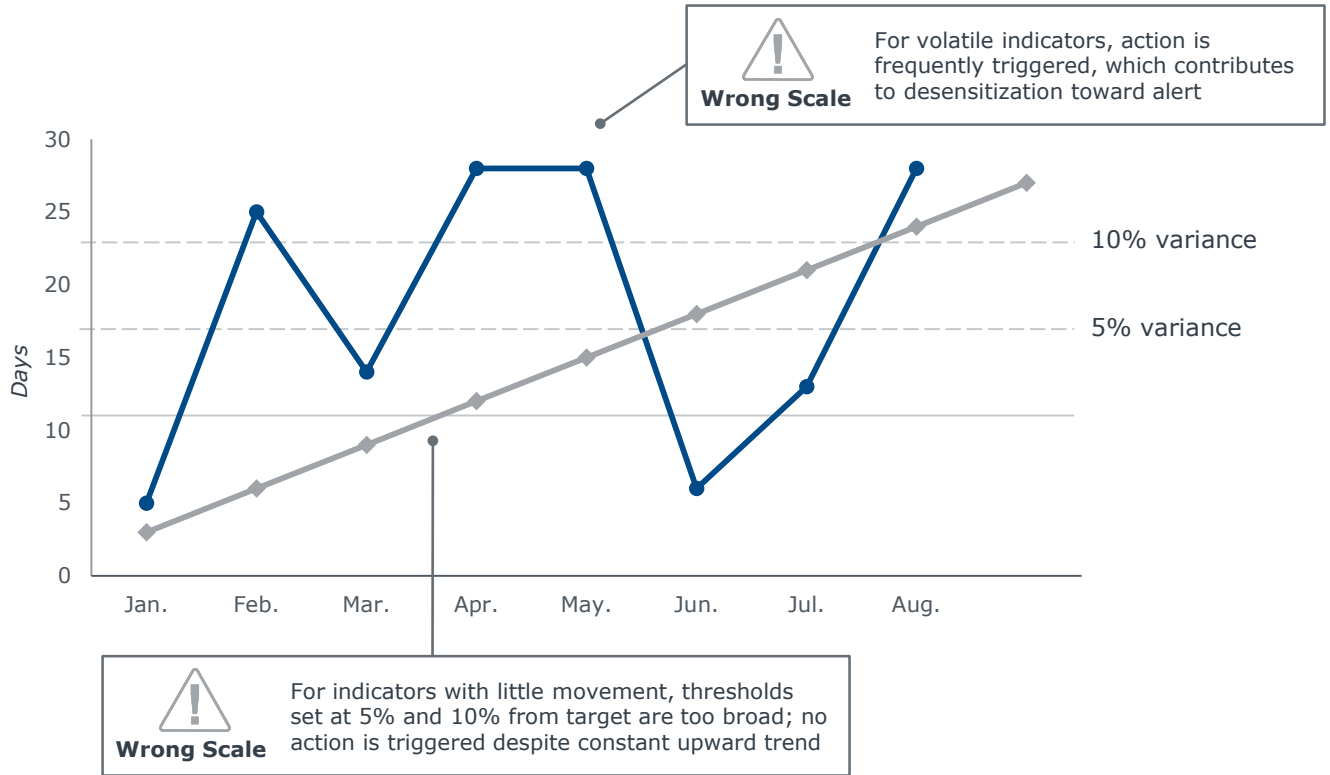| Trigger Posture	Defensive Posture	Aggressive Posture
Definition	Trigger set further from nonnegotiable metric limit	Trigger set closer to nonnegotiable metric limit
Advantage	Institutions receive more time to solve performance problem	Increased credibility that trigger signals need for immediate intervention
Disadvantage	Greater risk of erroneously detecting a problem, diverting time and resources from more pressing priorities	Overlooking emerging problems, and less time to implement interventions

	Yes	No
1. Can the metric be measured frequently (at least every two weeks)?	____	____
2. Is the lag time between when the metric is measured and when it is reported less than two weeks?	____	____
3. If a problem in metric performance is detected, does the institution have a predetermined intervention strategy?	____	____
4. Has the predetermined intervention strategy been successfully implemented in the past?	____	____
5. Are all the resources/individuals required to support the intervention immediately accessible?	____	____
6. Will the intervention strategy correct performance within one month of introduction?	____	____

Source: Facilities Forum interviews and analysis.

Use Relative Triggers for Performance Downturns

Resulting Errors from a Common Misstep

Unlike fixed targets, relative triggers are based on meaningful performance declines on core metrics. More specifically, relative triggers consider current performance relative to the target, past performance, and/or related metrics to differentiate normal performance fluctuations from concerning trends that warrant action.

Average Work Order Completion Time

⚠ **Wrong Scale** — For volatile indicators, action is frequently triggered, which contributes to desensitization toward alert

10% variance

5% variance

⚠ **Wrong Scale** — For indicators with little movement, thresholds set at 5% and 10% from target are too broad; no action is triggered despite constant upward trend

Unfortunately, the most common application of relative action triggers is flawed. Many institutions base relative triggers on performance deviations of more than 5% or 10% from a target. However, there is no principled rationale behind this rule. As illustrated above, such variance could be harmless for naturally volatile metrics or mask an emerging crisis for slow-moving metrics.

Source: Facilities Forum interviews and analysis.

# Strengthening Relative Triggers

Fortunately, straightforward statistical principles can be applied to establish relative triggers at levels that signal meaningful performance changes. Triggers based on standard deviations (SDs) from the mean, rather than arbitrary percentage variance, account for metric volatility. Performance on any metric should fall within two standard deviations of the mean 95% of the time.

Alternatively, Facilities leaders can create principled triggers based on statistically significant trends rather than on a single point falling outside the norm. For example, declining performance on a key metric across six successive time periods represents a meaningful decline warranting attention.

Average Time Between Incident Report and Resolution

Upper and lower control limits set at two to three standard deviations from the mean

Values above the upper control limit trigger corrective action

Legend:
- Lower Control Limit
- Upper Control Limit
- Average Time Between Incident Report and Resolution
- Mean

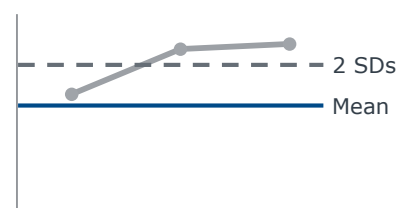X-axis labels: Q1 00, Q3 00, Q1 01, Q3 01, Q1 02, Q3 02, Q1 03, Q3 03

Examples of Statistically Significant Trends
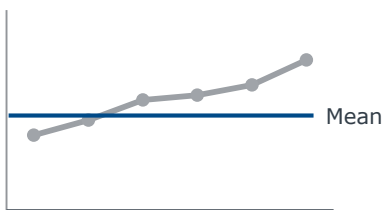
Six successive points increasing or decreasing
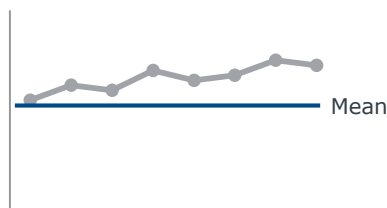
Eight successive points on one side of the mean

Two out of three consecutive points more than two standard deviations from mean

2 SDs — Mean

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Exceptions to the Rule

The final trigger type is a specialty action trigger. While used very rarely, two types of specialty action triggers serve specific purposes. First, static action triggers guard against performance plateaus. For example, Facilities shops committed to continuous improvement in specific areas can effectively use "lack of improvement" on key metrics as a trigger for action. However, it is vital to clearly communicate the rationale underlying static action triggers, as well as the executive commitment to enforce this type of trigger. Absent this transparency, static action triggers risk being perceived as unprincipled and subsequently ignored.

Second, 100%-triggers serve as the one exception to the critical distinction between targets and triggers. As illustrated in the examples below, some select metrics require perfect performance as the only acceptable outcome. In these cases, it may be appropriate to equate targets and triggers and require immediate action when performance falls below 100%.

When Only 100% Will Do

Facilities staff completing safety training

Percentage of facilities meeting OSHA standards

Number of fire alarms passing inspection

Facilities employee payroll processed on time

Source: Facilities Forum interviews and analysis.

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