



STANDARDIZING FACILITY DATA:

FROM RICKETY REGISTERS TO A SINGLE SOURCE OF **TRUTH**

AGENDA



Introduction

The Problem: Why Data Breaks Down

The Standards Stack That Already Exists

Asset Hierarchy & Naming Conventions

The 6 Failure Modes

The 8-Step Roadmap

Q & A



INTRODUCTION



Ayden Townsend Service Lead, Strategic Services

- **30 Years of Expertise** – Extensive experience across facility management, capital project delivery, data management, entrepreneurship, construction operations, education, and real estate in both public and private sectors.
- **Facility Management Leader** – Led CAD standards, accessibility studies, CMMS selection, FCAs and Capital Planning at a large K-12 school district .
- **Strategic Capital Planner** – leads data management strategy, QA workflows, CMMS integration, and the development of prioritized, defensible capital renewal deliverables .



THE PROBLEM: WHY FACILITY DATA BREAKS DOWN

Six root causes — and why none of them are accidental

FACILITY DATA IS BROKEN ALMOST EVERYWHERE

- *NIST: Poor facility data interoperability costs the U.S. \$15.8B/year — two-thirds borne by owners in operations*

"We own it (we think), but can't find it"

Asset records scattered across spreadsheets, legacy CMMS versions, paper files and people's memory

"The data doesn't match reality"

Equipment has been moved or replaced; buildings have been renamed, modified, added on to or sold.

"We don't trust the numbers"

FCI's built on data that hasn't been maintained. Capital plans not escalated over time and based on best guesses. Boards and auditors are pushing back.

**National Institute of Standards and Technology. <https://doi.org/10.6028/NIST.GCR.04-867>*

6 ROOT CAUSES OF FACILITY DATA FAILURE

1 Construction handover gap

BIM models delivered but COBie rarely specified. Operational data missing from day one of occupancy.

2 Fragmented systems

CMMS, CAFM, BMS, ERP, GIS all hold different versions of the truth. None reconcile with each other.

3 No naming standard enforced

"HPLC-Lab2-001" vs "High Performance Liquid Chromatograph #1 — Lab". Same asset, two systems.

4 Tool-first thinking

Platform purchased before data discipline defined. The platform doesn't create good data — governance creates good data.

5 Retirements and turnover

Skilled FM staff retire taking institutional building knowledge with them — knowledge never codified in the register.

6 Set-it-and-forget-it

One-time cleanse, no governance. Equipment is moved, upgraded, replaced — the register is never informed. Condition assessments happen every five years with no updates in between.



THE STANDARDS STACK THAT ALREADY EXISTS

Six interlocking layers — from strategy to data quality

THE 6 INTERLOCKING LAYERS

STRATEGY & GOVERNANCE ISO 55001:2024 Cl.7.6 | ISO 55013:2024 | GFMAM Subject Area 5 | IAM Capability 7 | PEMAC MDRR

LIFECYCLE PROCESS ISO 19650-3:2020 — OIR → AIR → EIR → PIM → AIM (Operational Phase BIM)

HANDOVER & EXCHANGE COBie (NIBS) — Facility, Floor, Space, Type, Component, System, Job, Resource, Spare, Document

ELEMENT CLASSIFICATION Uniformat II (ASTM E1557) | OmniClass (15 tables, ISO 12006-2) | MasterFormat | ISO 14224

NAMING & HIERARCHY Site > Building > System > Asset > Component | Functional Location vs Physical Asset | Tagging convention

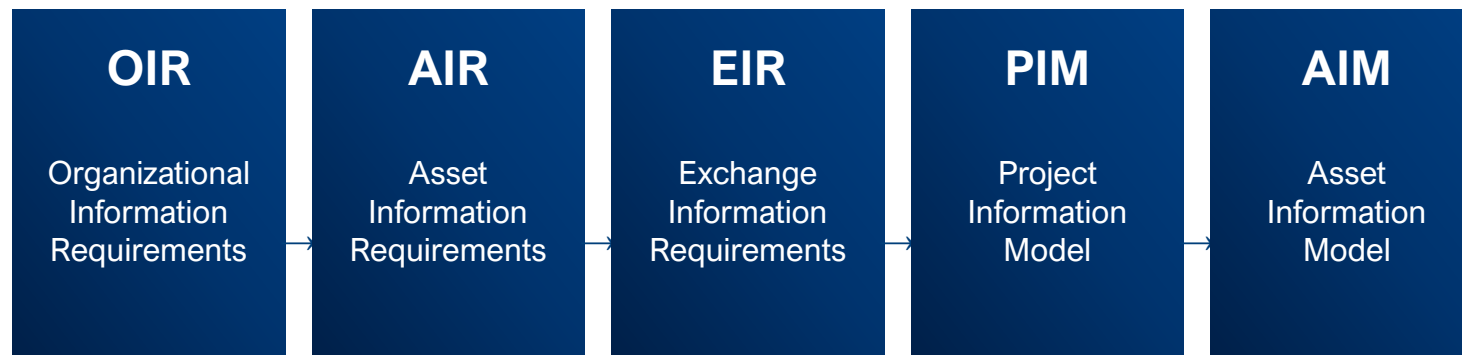
DATA QUALITY ASSURANCE NAMS/IPWEA IIMM Confidence Grades A–E | ISO 8000 Data Quality | ISO 55013 Confidence Scale

*ISO 55001:2024 Cl.7.6; ISO 55013:2024; GFMAM Landscape 3rd Ed. (2024); IAM Anatomy V4 (2024); PEMAC MDRR Framework; ISO 19650-3:2020; COBie V3 (NIBS); ASTM E1557; ISO 12006-2; ISO 14224; NAMS/IPWEA IIMM 6th Ed.

ISO 19650-3:2020 — FROM INFORMATION REQUIREMENTS TO ASSET INFORMATION MODEL

“AIM isn’t just a handover deliverable — it’s a long-term strategy. Implementing AIM turns chaotic spreadsheets and siloed PDFs into a single source of truth for your assets.”

— Desapex — Implementing AIM with ISO 19650-3



***Practical action: Specify COBie in every EIR before issuing a capital project RFP.
It costs nothing to require — and prevents years of post-occupancy data creation / recovery.***

THE CLASSIFICATION TOOLKIT — UNIFORMAT II, OMNICLASS, MASTERFORMAT & ISO 14224

Uniformat II

ASTM E1557

Capital planning,
FCI, condition assessment

Functional element hierarchy A–G+Z. Levels 1–3. De facto standard for FCA and renewal forecasting.

Omni Class

ISO 12006-2

BIM tagging,
FM cross-referencing

15 inter-related faceted tables. Embedded in BIM authoring tools. Bridges design to FM operations.

Master Format

CSI / CSC

Specifications, procurement, cost data

50 divisions, work-results based. Use Uniformat for FCI; MasterFormat for specs and procurement.

ISO 14224

ISO 14224:2016

Reliability, FMEA, RCM data

9-level taxonomy: Industry → Business → Installation → Plant → System → Equipment → Subunit → Component → Part.



DIAGRAM: NAMS/IIMM DATA CONFIDENCE GRADES — APPLIED TO FACILITY PORTFOLIOS

A	Highly Reliable Accuracy: $\pm 2\%$	Sound records, properly documented, dataset complete. Audited asset register with COBie handover.
B	Reliable Accuracy: $\pm 10\%$	Sound records with minor shortcomings, dataset mostly complete. Regular CMMS-linked inspection records.
C	Uncertain Accuracy: $\pm 25\%$	Incomplete or extrapolated from limited sample. Up to 50% estimated. Typical FCA without walkthrough verification.
D	Very Uncertain Accuracy: $\pm 40\%$	Unconfirmed verbal reports or cursory inspection. Register not verified in the field. Very common starting state.
E	Unknown Accuracy: N/A	No data or very little data held. Asset existence unconfirmed. Common after acquisitions, mergers, or old legacy estate.

*NAMS/IPWEA IIMM 6th Ed., ISO 55013:2024



THE ASSET HIERARCHY & NAMING CONVENTION

FACILITY ASSET HIERARCHY — LEVELS, CODES & NAMING CONVENTION

L1 SITE

e.g. Main Campus / South District

L2 BUILDING / FACILITY

e.g. Building 12 — Science Wing

L3 SYSTEM

e.g. B30 — Roofing | D — Electrical

L4 ASSET / EQUIPMENT

e.g. AHU-B12-HVAC-001 (RTU)

L5 COMPONENT / SUBUNIT

*e.g. Compressor,
Filter Bank*

FIVE SECTORS, ONE PROBLEM

K-12

Driver: FCA & capital reporting

Challenge: Thin staffing, no in-house taxonomy team

Over 50% of the public not confident schools have data for informed upgrade decisions

Higher Ed

Driver: FCI & APPA benchmarking

Challenge: Siloed departments; inconsistent component definitions

Campus deferred renewal and maintenance backlog now exceed \$100/GSF at public institutions

Municipal

Driver: GASB 34 / AM policy

Challenge: Hundreds of asset classes; fragmented legacy records

Calgary: ISO 55001 policy + unified CAD standard → enterprise analytics across 4 asset types

Healthcare (Ontario)

Driver: MOH FCAP

Challenge: hospitals must review and approve their FCAP

The sector is carrying accumulated deferred maintenance equivalent to 21 cents on every dollar of current replacement value

Commercial/REIT

Driver: ESG / climate disclosure

Challenge: Tenant data gaps; triple-net leases

"Two key challenges: data availability and the need for context across key metrics" — Prologis VP ESG





THE 6 FAILURE MODES

SIX FAILURE MODES & WHAT TO DO INSTEAD

✗ Boiling the ocean

- ✓ Pilot one building, one system, one decision first. Prove value before scaling.

✗ Tool-first thinking

- ✓ Define data requirements and governance before selecting or configuring the CMMS. Technology follows process.

✗ Over-classification

- ✓ Sandy Dunn's rule: only tag what you would raise a work order against. More fields = less actual maintenance completed.

✗ No data ownership

- ✓ Name a master data manager. Name site and/or platform data stewards. Tie data-quality metrics to performance reviews.

✗ Set-it-and-forget-it

- ✓ Quarterly hierarchy reviews. Block work orders without a tagged asset. PM library from equipment class.

✗ Classification ≠ hierarchy

- ✓ Uniformat tells you WHAT it is. The hierarchy tells you WHERE it lives. Both required — different decisions.



THE 8-STEP ROADMAP

THE 8-STEP FACILITY DATA STANDARDIZATION ROADMAP



*ABL Group (2023); PEMAC MDRR Framework (2024); ISO 55001:2024 Cl.7.6; ISO 19650-3:2020; NAMS/IPWEA IIMM 6th Ed.

WHAT STANDARDIZED FACILITY DATA DELIVERS

\$15.8B

Annual U.S. cost of poor facility data interoperability (NIST)

25%

Reduction in reactive work orders at universities that increased planned maintenance

89%

CMMS failure-code accuracy after taxonomy cleanup vs 41% before (industry case)

90%

of top TJC survey findings are documentation issues, not physical failures (OXMaint/TJC)

±40%

Accuracy range of Grade D facility data — the level most capital plans are built on (IIMM)

60-70%

of CMMS implementations fail for organizational reasons, not technical ones (UpKeep)



5 THINGS TO DO BEFORE YOUR NEXT CAPITAL SUBMISSION

- 1 Pick your classification stack and write it into your CMMS pick-lists. **ASTM** Uniformat II for FCI. OmniClass for BIM. ISO 14224 for reliability. Standardize the vocabulary first.
- 2 Grade your current data using IIMM A–E. Attach confidence grades to every capital forecast. Stop presenting single-point estimates built on "Grade D" data.
- 3 Name a master data manager and define data steward roles by **software**, site, and **major system**. Governance before technology — always. Tie data-quality metrics to performance reviews.
- 4 Add a COBie requirement to your next capital project EIR. Zero cost to specify. It prevents years of post-occupancy data **capture** / recovery on the other side of handover.
- 5 Run a pilot on your worst-data building. Cleanse, tag, enrich, migrate — in that order. Document time saved on the first ten work orders. That is your business case.



Q & A

THANK YOU FOR ATTENDING

Connect with us directly!

- Ayden.Townsend@rothiams.com
- **647-355-0034**

