

# Guide to data-driven property maintenance

The future of maintenance is data-driven. Harness the transformative power of AI and analytics to align your maintenance with industry best-practice.

Prepared by  **CIM**





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# Why the current maintenance approach falls short

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Contracts based purely around Planned Preventive Maintenance (PPM) or Unplanned Maintenance (UPM), are common but highly inefficient. PPM contracts revolve around rigidly scheduled checks that all too often equate to time and resources spent on inspecting equipment that is working just fine. Bryce Anderson, BMS/BAS technical consultant, added: “PPM is a complete waste of time. Driving the control valve open then closed each year, for 20 years, doesn't make the actuator last longer. It will still fail regardless of how many times it was 'serviced' over the years.”

UPM, or the “absence of an ongoing maintenance strategy”, occurs purely on a random or reactive basis resulting in highly uncertain budget allocation. These traditional methods of maintenance are becoming increasingly misaligned with the contemporary needs and challenges of asset management. This results in two significant pitfalls:



**Missed issues:** While a contractor may be occupied inspecting functional equipment, other items in need of attention could remain unaddressed for months. This oversight not only compromises system efficiency but can also escalate to more severe problems or tenant impact if not promptly addressed.



**Misaligned objectives:** These traditional maintenance routines don't necessarily align with the primary objectives of today's Asset Managers, which prioritise tenants, sustainability, and cost management. This misalignment can jeopardise the tenant experience, compromise an asset's sustainability, or trigger unplanned capital expenditure.

# A new era of maintenance

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Data-Driven Maintenance (DDM) is the integration of advanced AI-powered analytics into the realm of property maintenance. Unlike traditional strategies, which rely heavily on preset schedules or reactionary measures, DDM employs continuous data collection and analysis to guide maintenance decisions. [DA19](#) summarises the workflow of this smarter form of maintenance as:

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“...analytics pulled from big data, relayed by wireless sensor networks, analysed by cloud-based algorithms and visualised on mobile computing devices, which is effectively changing maintenance, disrupting traditional practices and creating new value opportunities.”

- DA19, Australian Institute of Refrigeration Air Conditioning and Heating

To truly grasp DDM, let's unravel its key components:

- **Real-time data monitoring:** DDM is grounded in the principle of continuously monitoring the billions of data points produced by operational plant and equipment. Real-time in nature, as data is gathered, it's simultaneously normalised and analysed. This ongoing monitoring allows for an ever-updated operational snapshot of a building, allowing for issues or dips in performance to be flagged as soon as they arise.
- **Integration of advanced AI and analytics:** At the heart of DDM lies sophisticated data analysis. This isn't just about collecting numbers but about understanding them. Advanced algorithm-based rules process this continuous stream of data, deciphering patterns, spotting anomalies, and making sense of the vast amount of information flowing in.
- **Predictive plus reactive:** Instead of a broad preventive stance, where checks are made based on set intervals, DDM utilises the analysed data to

predict when and where maintenance might be needed next. It's a shift from 'time-based' to 'condition-based' checks. Further, While DDM is largely proactive, it doesn't discard reactive measures. Instead, these reactive actions are informed by data-backed alerts rather than tenant complaints or anecdotal feedback.

- **Adaptability & flexibility:** DDM is inherently adaptive. As data flows in and is analysed, the derived insights might prompt changes to maintenance schedules or resource allocations. This adaptability ensures that the maintenance approach is always in tune with the building's current needs and critical issues are prioritised based on impact.
- **The role of technology:** It's crucial to note that DDM isn't just about data. It's also about the technological ecosystem that facilitates this data-driven approach. From the sensors that gather data to the cloud infrastructures that store it, and the AI analytics software that analyse it – each plays a pivotal role in bringing DDM to life.



## Considerations when determining strategy

When setting the strategy for issues concerning maintenance of building services, the Chartered Institution of Building Services Engineers (CIBSE) lists these factors as central to deciding on the most appropriate approach:

- The level of risk the organisation is willing to tolerate: e.g. financial, business loss, health and safety, employee satisfaction.
- Method of resourcing maintenance: e.g. in-house, outsourced, mixed.
- Budgets: e.g. level of finance available for maintenance, financial targets.
- Benchmarks: cost targets, performance targets.

Source: CIBSE Guide M: Maintenance engineering and management

# The benefits of data-driven maintenance

Data-driven maintenance harnesses the power of analytics to optimise equipment upkeep, transforming the traditional maintenance model. By proactively analysing data, companies can predict failures before they occur, reducing downtime and operational costs. This approach not only extends the lifespan of equipment but also promotes a more efficient and cost-effective strategy. Some of the top benefits observed by our clients include:

Optimised maintenance contracts	Reduced equipment downtime
<p>The advent of data-driven maintenance can have a profound impact on the negotiation of maintenance contract costs. Fewer reactive callouts and a closer focus on the real issues facilitates a more optimised strategy and in many cases, reduced contract costs by more than 20%. Beyond just cost savings, this data-centric approach offers 24/7 smart monitoring - almost like having a virtual engineer on standby at all times. This supplements the financial savings with improved overall efficiency of operations.</p>	<p>A data-driven approach directly reduces equipment downtime. Constant monitoring complemented by automated fault detection and diagnosis (AFDD) ensures issues are picked up before they impact building users. For tenants, this equates to fewer disruptions and a consistently superior indoor environment across all zones, elevating their overall experience, satisfaction and productivity.</p>

## Team productivity

By minimising onsite maintenance hours, enabling contractors to directly address the root causes of issues, and facilitating centralised issue resolution, the workflow of the on-site operations team is made more efficient. This newfound efficiency affords the team more time to other priorities, like meaningful engagement with tenants. Further, a digital history ensures the seamless transfer of intelligence between team members, creating a continuous cycle of knowledge-sharing.



<p><b>Extension of equipment life cycle</b></p>	<p><b>Improved sustainability</b></p>
<p>Adopting a data-driven approach goes beyond immediate operational benefits; it plays a pivotal role in extending the life cycle of equipment. Through continuous monitoring and timely interventions, wear and tear are mitigated, allowing plant and equipment to function optimally for longer periods. For end users, this means a more reliable system in place, minimising the inconvenience of frequent upgrades or repairs. The overarching advantage? A long-term solution that also promotes sustainability by reducing waste.</p>	<p>Data-driven maintenance primes operations teams to maximise efficiency in the utilisation of electricity, gas, and water. This not only curbs a portfolio's carbon footprint but also facilitates elevated sustainability ratings. This has positive implications for meeting Net Zero targets, assisting tenants with their Scope 3 responsibilities, and meeting green lease commitments. The cherry on top? Enhanced eligibility and access to green finance.</p>
<p><b>Contractor accountability</b></p>	
<p>Data-driven maintenance also reshapes the dynamics of contractor management. By enabling a more transparent evaluation of contractor performance against predetermined KPIs ensures they adhere to set standards. It provides full oversight over tasks assigned, allowing for real-time tracking of their progress and status. The result is a heightened level of contractor accountability, ensuring optimal performance, timely deliverables, and adherence to quality standards.</p>	

## How much can DDM actually save?

**20%**

Cut planned maintenance costs by 20% through streamlined contracts.

**19%**

Reduce energy consumption by an average of 19%.

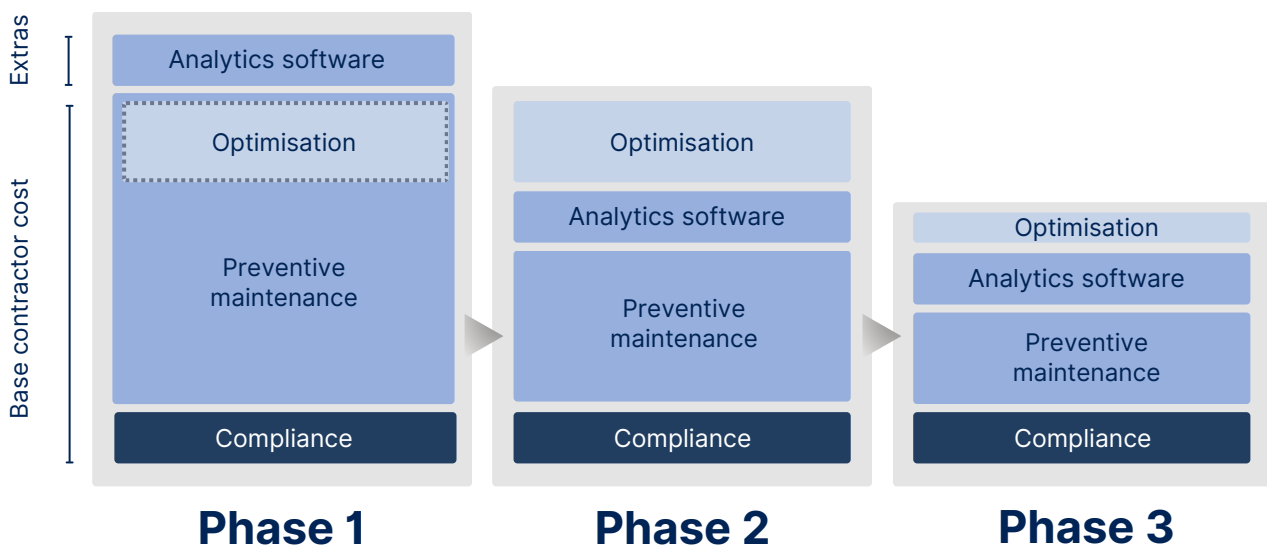
**2 years**

Extend equipment life cycle by an average of 2 years.



# Implementing DDM

A transition to DDM unfolds over three stages: from initial integration, through contract evolution, to mastery and refinement. To illustrate this over a series of implementation phases, the figure below breaks down plant and equipment maintenance costs as DDM, contracts and analytics software are gradually embedded across a portfolio. Phase 3 reflects the ideal ‘sweet spot’.



## 1

### Transition phase

- Recognises the extensive costs associated with traditional PPM.
- Sees the initial integration of analytics software, which incurs a small licencing fee, facilitating the transition to a more data-driven approach characterised by targeted maintenance and optimisations.
- Costs associated with actioning optimisation initiatives are captured within the base PPM budget, hence the dotted line above. In essence, this phase reflects an attempt to adopt DDM with a PPM contract still in place.
- The early identified faults and optimisations will typically add initial expense, but will set the foundation for future savings.
- The compliance layer remains constant.

2

## Contract evolution

- Maintenance contracts undergo a transformative revision to integrate all of the principles of DDM.
- The cost allocated to the core PPM contract now captures both the analytics fee and optimisations, with the added benefit of reduced routine maintenance expenses.
- Optimisations are no longer contained within the base contract, forming a separate line item.
- The compliance layer remains constant.

3

## Mastery & refinement

- DDM becomes the backbone of a building's maintenance strategy. Any existing backlogs or inefficiencies are addressed and cleared.
- The system operates at peak efficiency, leading to further reductions in costs, heightened equipment lifespan, and increased tenant satisfaction.
- The PPM costs, optimisations and analytics fee are all now less than the initial base contract cost.
- The compliance layer remains constant.

# Bringing DDM to life with PEAK

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For the fundamental merits of data-driven maintenance to be realised at a building or portfolio level requires the deployment of an advanced AI-enabled analytics solution underpinned by automated fault detection and diagnosis (AFDD). This is where CIM's market-leading PEAK Platform thrives. PEAK is a best-in-class building analytics SaaS technology, unleashing the power of existing building data, AI, intelligent automation, and machine learning to provide visibility and control over property portfolios while improving efficiency, sustainability, and tenant comfort.

PEAK surfaces the '**data**', integrating with a building's control systems and sensors to collect data from:

- Building Management Systems, such as HVAC, lighting, indoor air quality, sub-metering and hydraulics;
- Utility metering providers, including electricity, water and gas providers;
- Third-party APIs, such as weather stations and Energy Management Systems.

Critically, not only does PEAK facilitate the collection of important data but it also empowers operations teams to use it more intelligently. Closing the operational and maintenance loop, PEAK's centralised workflow functionality enables meaningful **collaboration** to resolve real issues through PEAK Alerts and Actions.

## What is PEAK Alerts?

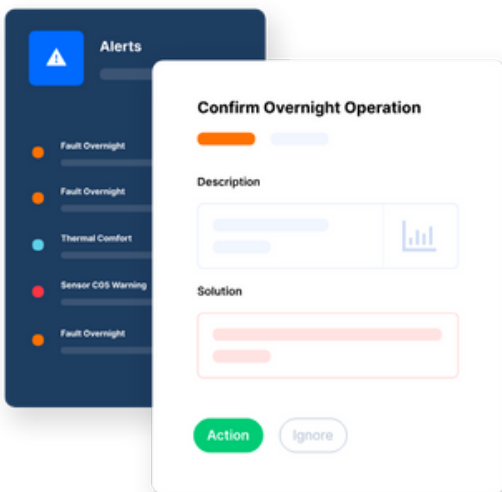
PEAK Alerts are insights that are generated from the PEAK Rules Engine when a deployed rule goes into fault. The Rules Engine includes a growing library of thousands of FDD template algorithms which are deployed across all building equipment to monitor performance. Examples include overnight operation, mechanical failure, energy wastage, safety and compliance, tenant comfort, sensor performance and more.

Alerts when triggered are displayed as tickets and include a detailed explanation of the issue, affected equipment, recommended solution and data trend history. Alerts can be actioned and assigned to someone to investigate or ignored.

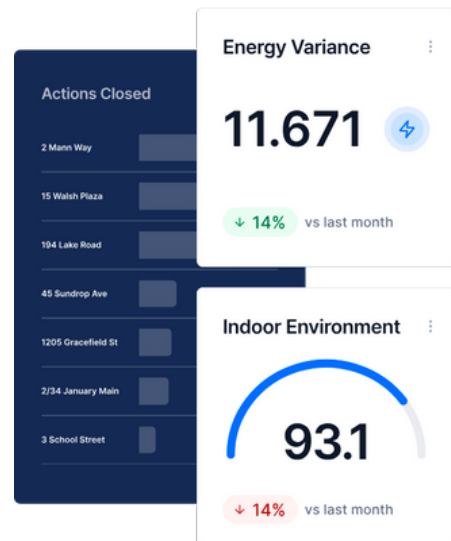
### What is PEAK Actions?

PEAK Actions is a simple-to-use cloud workflow tool where site teams, contractors and analysts can raise tasks, track progress and maintain a complete digital history of tasks and opportunities for a building. PEAK Actions are linked to PEAK Alerts allowing site teams to automatically escalate Actions from PEAK's advanced FDD Rules Engine and keep track of progress.

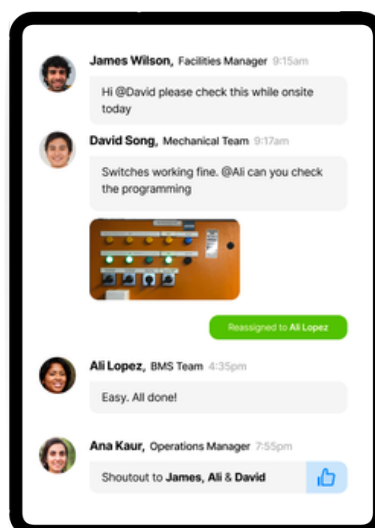
#### PEAK Alerts



#### PEAK Actions



#### Collaboration





## DDM transforms HVAC technician’s workflow

To demonstrate the real-life application of DDM, let’s look at how PEAK has transformed an HVAC technician's workflow. In this [case study](#), David explains how PEAK’s analytics engine guides him as to when and where maintenance and repairs are required.

David explained, “I wouldn’t get nearly as much done if it wasn't there. I normally have to go through and find all the issues myself, but the platform makes some really good pickups for me to prioritise.”

David identified four key areas in which PEAK has markedly improved the efficiency of his maintenance checks and boosted productivity:

- Greater **focus** on the most critical issues.
- Ease of use in the field or **remotely** with the ability to review a digital history of all jobs.
- Elimination of the back-and-forth between different trades, as all **communication** happens on the platform.
- Less time spent writing service **reports**.



"We have learned about issues related to our facilities which we never knew we had! As a manager of the facility, I have far more visibility and awareness than I would have with the BMS alone. Working with the CIM team is a pleasure and a learning experience every day."

**Facilities Manager, UK**



"I love the fault alert system and the fact that we can create actions for those faults and assign them to specific contractors for follow up. The actions tab also has a graph to see the trend and the fault trigger logic. The overall workflow is efficient and user friendly."

**Services Manager, Australia**

## In our client's own words

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In an era where data is the cornerstone of informed decision-making, the leading players in the property industry recognise its transformative influence on facilities management. Dive in and hear directly from some of our esteemed clients who are already reaping the benefits of data-driven maintenance, facilitated by CIM's [PEAK Platform](#).



“Scheduled maintenance checks and servicing is now a thing of the past as the data helps us determine precisely when and where maintenance is needed. We can now actively anticipate and prevent equipment breakdowns which means equipment is more likely to last its specified lifespan and we don't have to resort to costly fixes or replacements.”

**Damien Stacey, National Capital & Planning Manager, QIC**

“We want maintenance time to be better spent in a more productive fashion. It's impossible to check every sensor and every actuator every month. We want our BMS and Mech to investigate real alerts. We want time for them to look into the things our FM's care about. That's where analytics like CIM have helped. It finds what's broken and guides better maintenance man-hours.”

**Executive Manager, Building Services & Operations for university**



“The platform goes one step further than simply delivering data and analytics; it supplies the insights and central intelligence required to manage our portfolio sustainably and efficiently. This elevates the resilience and long-term viability of our assets, accelerating our approach to addressing climate change and unlocking environmental value.”

**Andrew Cole, Group Head ESG at Charter Hall**



“Brisbane Airport Corporation was pleased to engage CIM to assist with delivering energy savings, optimising building performance and improving our operations through data-driven decisions.”

**Ken Hughes, Head of Airport Facilities, Brisbane Airport Corporation**

# About CIM

CIM's award-winning PEAK Platform is an AI-powered SaaS solution that improves the financial and environmental performance of property portfolios. PEAK unlocks value by improving the efficiency of operations teams and maximising the performance of plant and equipment. Assets operating at peak performance boast industry-leading tenant satisfaction, occupancy metrics, net operating income and sustainability ratings.

## Improving Financial and Environmental Performance



### Maximise income

Advanced FDD ensures buildings operate to an efficient, comfortable and non-disruptive standard, facilitating high levels of tenant satisfaction, occupancy and NOI.

Lift occupancy

Green premium

Improve NOI

Tenant satisfaction



### Reduce outgoings

Optimise operational performance for reduced energy consumption, streamlined maintenance contracts and extended equipment lifecycle.

Delay capex

Streamline maintenance

Decrease energy

Boost productivity



### Improve sustainability

Operations teams are empowered to maximise operational and energy efficiency, curbing a portfolio's carbon footprint and lifting its sustainability ratings.

Improve ratings

Green finance

Green leases

Meet Net Zero targets

## Delivering results

**19%**

average saving in electricity per building

**20%**

reduction in maintenance costs via DDM\*

**2 year**

extension of equipment lifecycle

*\*Data-driven maintenance*

Trusted by industry leaders





**Transition to a data-driven maintenance strategy and start saving today.** Get in touch with the experts at CIM to discover how.

 [Email us at smarterbuildings@cim.io](mailto:smarterbuildings@cim.io)

 [Request a callback](#)

 [Learn more at cim.io](https://cim.io)