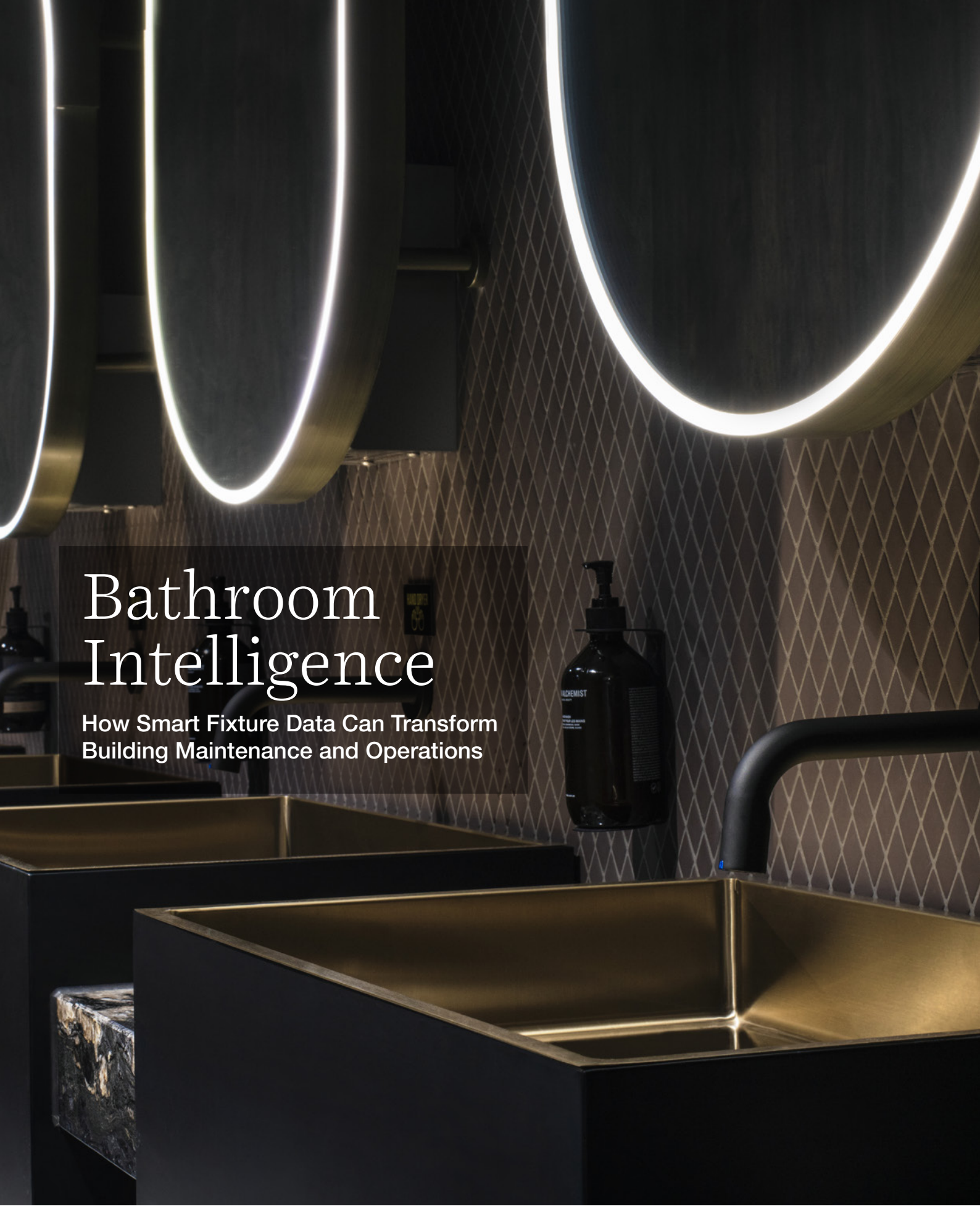


Bathroom Intelligence

How Smart Fixture Data Can Transform Building Maintenance and Operations

CAROMA

Introduction

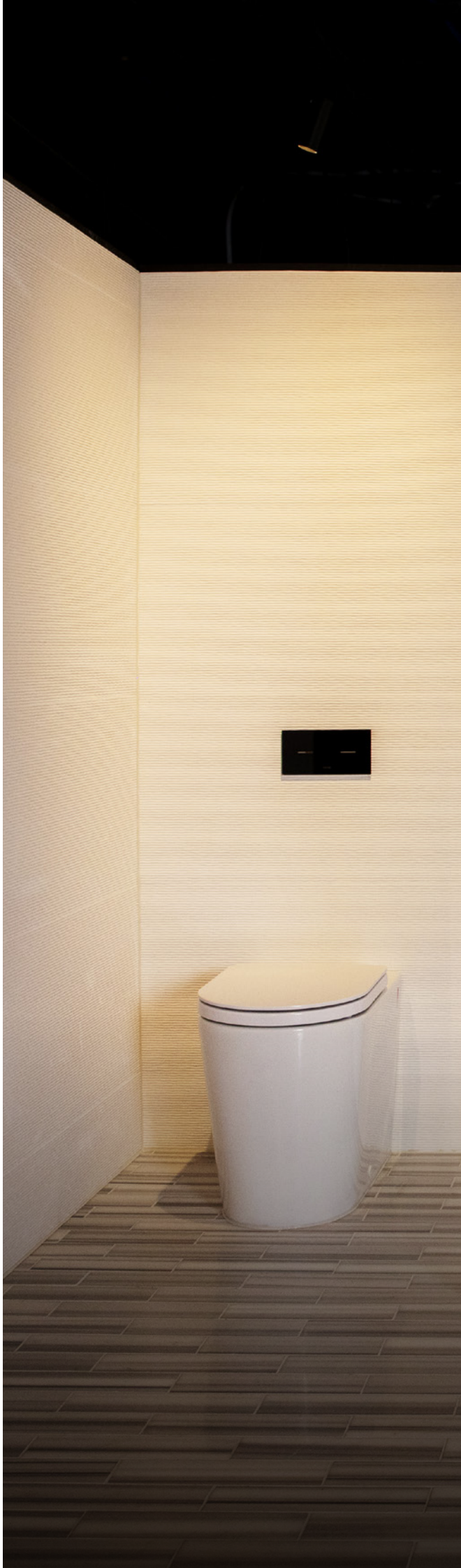
Facility managers today are challenged with providing a seamless tenant experience and ensuring that building amenities meet the needs of a diverse range of occupants. Bathrooms are among the most trafficked spaces in any building, so keeping them clean and in working order are among the highest priorities, and key to delivering an enjoyable occupant experience.

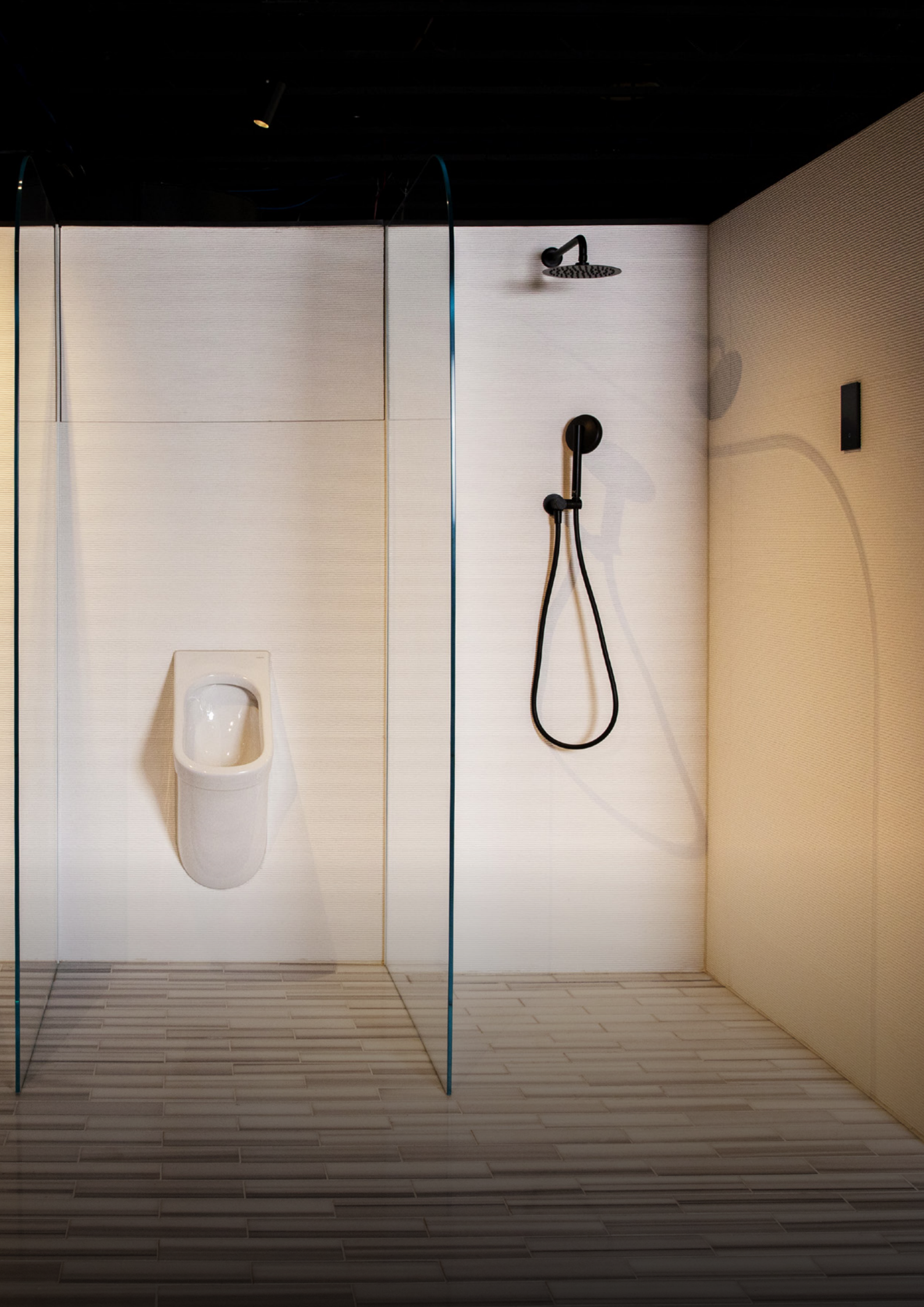
Due to the ever-present need to cut costs, facility managers are taking a close look at all aspects of their operations, especially bathrooms. Efficiencies are being sought in bathroom maintenance, cleaning, water consumption and energy use to reduce costs without compromising quality of service.

Traditionally, bathroom maintenance is conducted based on educated guesswork and a reactive approach to faults. As it is not practical to physically monitor each bathroom fixture, or clean the toilet after every use, maintenance and cleaning schedules are based on factors such as the age of the fixture or foot traffic estimates, neither of which accurately represent how often a fixture is actually being used. Repairs are conducted after a fault is discovered, often by users, and sometimes after major damage has already occurred. These inefficiencies result in greater operational costs, downtime and a poor end-user experience.

Advances in data gathering and bathroom monitoring solutions offer significant opportunities to improve bathroom maintenance and operations. Smart bathroom fixtures, including taps, urinals and toilets, can track valuable usage data including flow rate, number of activations, traffic patterns and occupancy. Data collected can be accessed locally from a mobile app or integrated into an existing Building Management Systems (BMS) or on cloud platforms, allowing facility managers to make informed decisions on maintenance and cleaning activities, and track the impact in real time.

In this whitepaper, we look at how intelligent bathroom solutions and smart fixture data can improve efficiency and accuracy in building maintenance and operations, reduce operational costs, and deliver a better bathroom experience for the end-user.





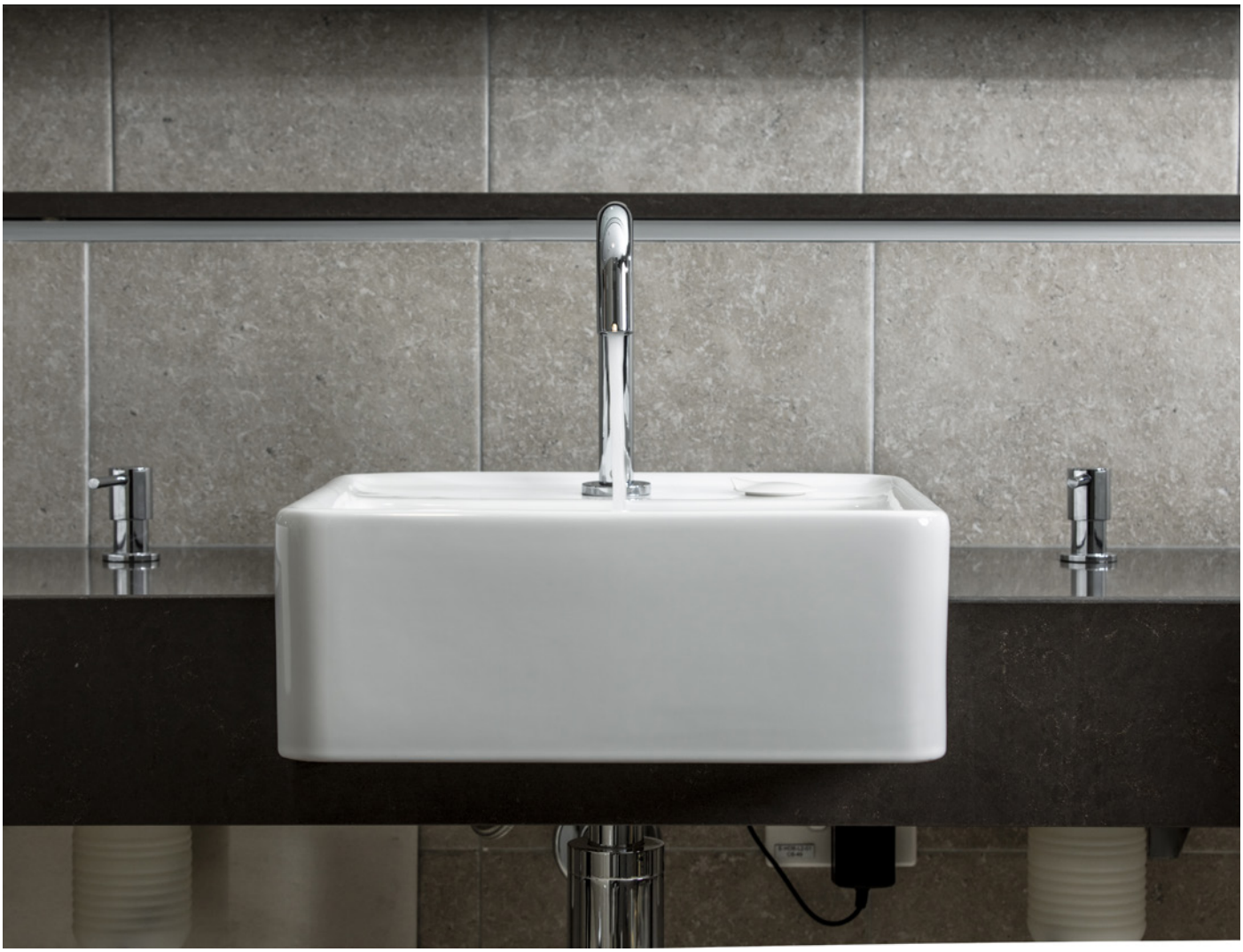
What can smart fixture data tell you?

From the development of the original dual-flush toilet, bathroom innovations have generally focused on reducing water consumption, namely efficient fixtures and fittings. In recent years, intelligent data collection has become a feature of water management with the emergence of intelligent water metering technology. Mirroring similar developments in smart electricity and gas meters, water utilities can use intelligent water metering to understand flow, pressure and demand across the network, and leverage this information to optimise operations.

The growth in smart technology has made data tracking and collection a key feature in new bathroom technologies. Innovative bathroom eco-systems like Caroma Smart Command are made up of water fittings that are networked such that they communicate via standardised data technology. A combination of Bluetooth and wireless technology enables these smart fixtures to send information to either a cloud database or BMS wherein facility managers can access real-time usage, water data and micro-services such as service alerts at fixture, bathroom or building level.

Usage data at fixture level can illuminate how a bathroom is actually used and experienced by its end-users. Anonymous activation data is collected at the fixture level, such as a toilet, urinal, shower or tap, providing a complete record of fixture use and water consumption. This data can be used to understand patterns of use for particular bathroom fixtures, for example, average use, peak use and overall volume of use, from which facility managers can ascertain long and short-term trends.

With this detailed picture of bathroom fixture use, facility managers are able to know exactly what is happening in their bathroom. A toilet that has not been recently activated may indicate a fault with the fixture. Some fixtures may be more or less used due to cleanliness, location or access issues. The privacy of a given fixture could be an issue, for example the presence or lack of urinal dividers can result in higher usage of a corner urinal or push people into higher water consuming toilet cubicles.



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Smart fixture data applications

FROM REACTIVE TO PROACTIVE MAINTENANCE

Bathroom fixtures have moving parts – the more they are used, the shorter their expected useful life is. Without the ability to monitor fixture data, facility managers have to estimate how many times a fixture has been used based on imprecise metrics such as foot track and how long it has been since the fixture was installed.

This incomplete understanding of fixture usage leads to inefficiencies in repair and replacement programs. In large commercial bathrooms, it is common practice to replace all the fixtures in a bathroom simultaneously every few years. This practice results in low-usage fixtures being swapped out even if they are in fine working order or have been used relatively rarely compared to other fixtures in the same bathroom.

Maintenance and repairs are done reactively when a fault is discovered. Faults can go undiscovered for months, resulting in water leakage, unsafe conditions, and poor sanitation and hygiene. When they are found, facility managers often need to make emergency call outs for repairs, which are expensive and can lead to extended service interruptions.

Leveraging the data generated by smart fixtures enables a proactive approach to building management centred on usage-based maintenance and automatic alarm notification of any problems within the system. A useful analogy can be made with car maintenance. Every 10,000km a car needs to be taken in for service to ensure all parts are road worthy. If you are not able to track kilometres using an odometer, you would have to guess when the car needed service or wait until something breaks.

Smart fixtures track the number of activations, which can indicate when a fixture is reaching a service milestone, should be checked for preventative maintenance or swapped if required. This information gives facility managers a real-time view of how 'healthy' their bathroom assets are and provides the opportunity to take proactive action to extend their service life. By understanding exactly which fixtures get used more, you can also target maintenance efforts, schedule batch maintenance of high-traffic fixtures together, and even swap low-use fixtures with high-use fixtures to spread the load out across all fixtures. Each of these strategies is significantly more efficient and cost-effective than traditional maintenance plans.

IMPROVE FAULT DETECTION AND RESPONSE

Smart fixtures also give facility managers the capability to quickly identify and respond to faults. Intelligent bathrooms will typically include automatic alerting systems that notify facility managers when a fault occurs. In addition, changes in usage patterns can give facility managers an indication there could be an issue with a fixture or the bathroom itself.

Faults can be identified remotely, without visiting the site, and can be pinpointed to the impacted fixture. Knowing exactly the type of fault allows for accurate maintenance reporting and more efficient repairs. Facility managers can quickly identify the correct technician to call in, not only saving money, but also reducing any potential downtime.

Facility managers can also take active steps to mitigate factors that contribute to faults. For example, Caroma Smart Command monitors and records water pressure via its Eco Valve. Too much pressure can cause excess strain on tapware, while a lack of pressure can create flushing issues. Detecting these issues at fixture level can alert facility managers to potential issues before they occur and help prolong the life of fixtures.

OPTIMISE CLEANLINESS AND HYGIENE

Understanding patterns of use for particular bathroom fixtures can allow more efficient allocation and scheduling of cleaning and maintenance staff. For example, data on fixture usage could allow facility managers to assign cleaning staff to the most-used bathrooms, and quickly respond to spikes or dips in bathroom usage.

Fixture data also enables a proactive approach to cleaning. Taps and toilets experiencing low usage may indicate an issue with cleanliness that prompts further investigation. Usage of specific fixtures and relative consumption between fixtures, such as tapware activations and flushed toilets, can provide further data points to help assess cleanliness and hygiene habits in real time.

Leading smart bathroom solutions incorporate touchless technology for optimal hygiene and efficiency. By eliminating the need to touch tap levers or flush buttons, sensor-operated taps and toilets reduce the risk of users spreading germs to bathroom surfaces, and vice versa.

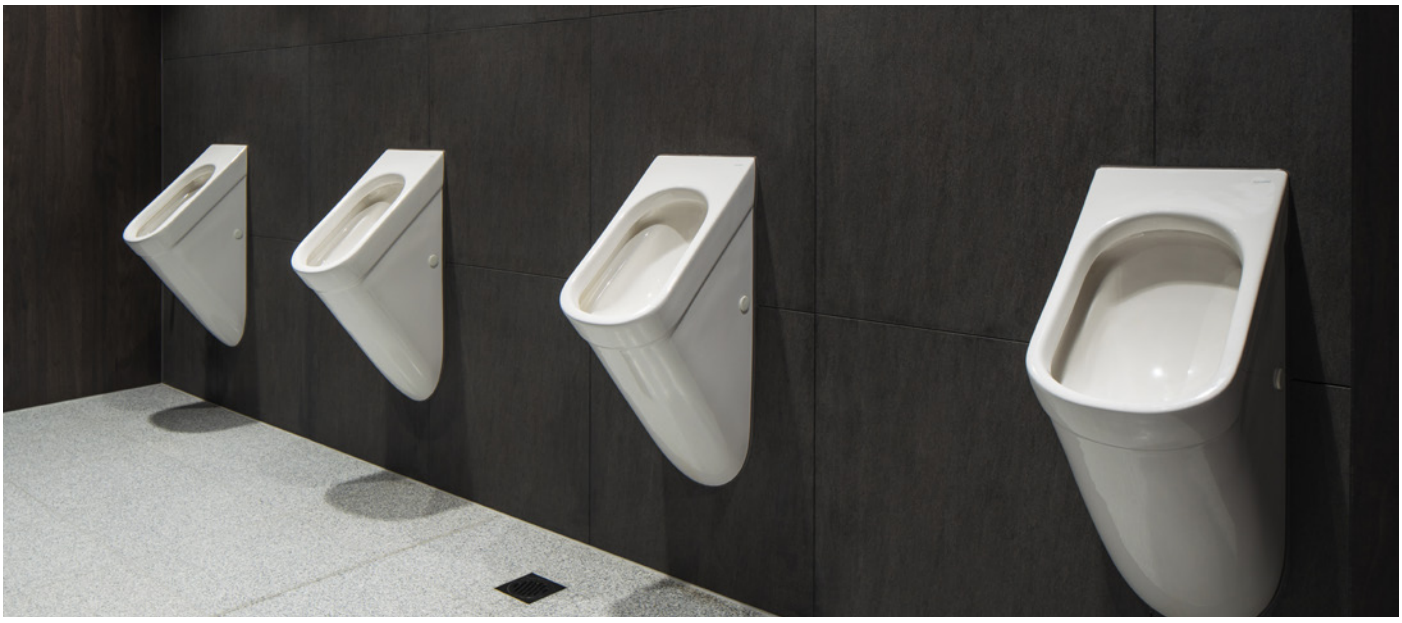
Smart bathroom fixtures can also actuate hygiene flushes if they have not been used in a set interval. This keeps water moving throughout the building and reduces stagnation and bacteria growth. In addition, if a user is detected but a subsequent flush is not recorded, smart toilet panels can actuate a flush to ensure no material is left in the toilet pan accidentally.

INCREASE WATER SAVINGS

Real-time fixture data can be leveraged to reduce utilities costs. Water consumption can be monitored at fixture-level, allowing facility managers to identify inefficiencies, take action to address those inefficiencies, and measure the impact of their actions.

Some smart fixtures can be fine-tuned to improve building sustainability and discourage wasteful user behaviours. For example, shower usage patterns can be standardised by controlling shower duration length. Temperature is controlled by thermostatic mixing valves, allowing facility managers to set a maximum shower temperature to control hot water use and reduce energy from heating water.

As noted earlier, smart fixtures allow facility manages to identify leaks and respond to them quickly before they become larger issues. Improved leak management contributes to improving network efficiency and reducing water waste within the building.



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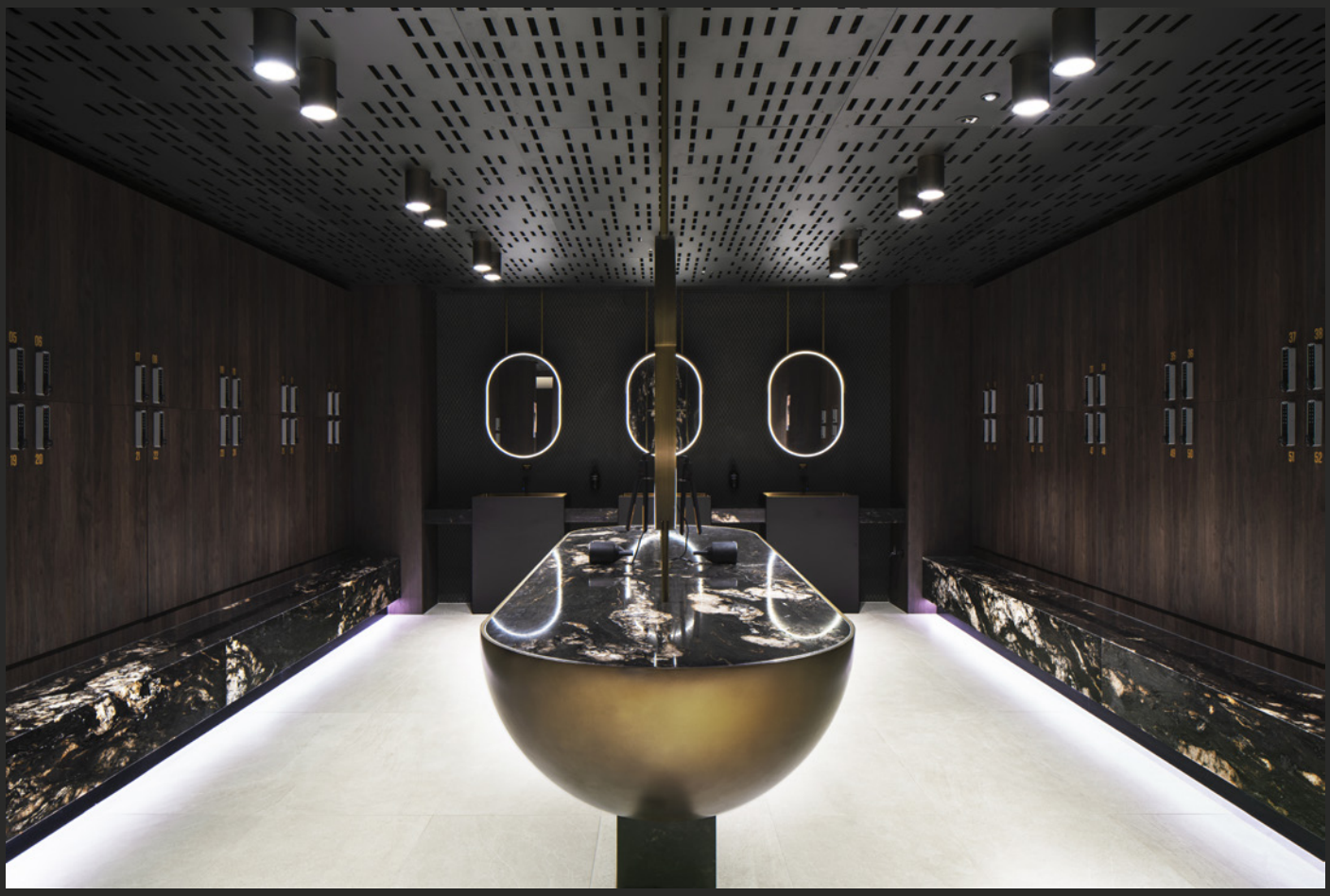


Caroma Smart Command

INTELLIGENT BATHROOM SOLUTIONS

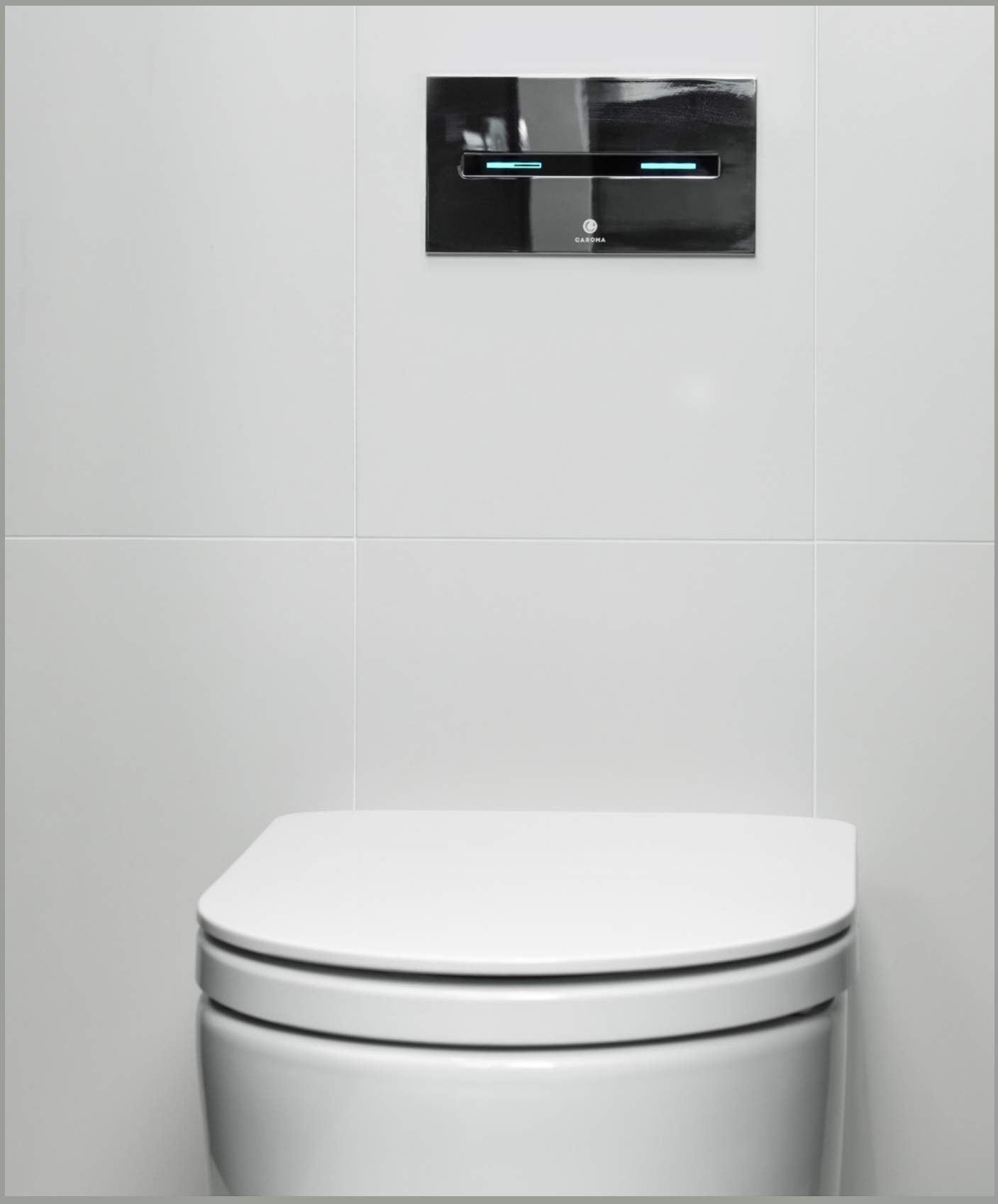
Caroma Smart Command® is an ecosystem of intelligent bathroom products that enable building managers to monitor water use in real time and make smarter decisions that reduce maintenance costs, while improving hygiene and up time. An innovative range of tapware, urinals, toilets, showers and leak detection valves integrate seamlessly with Smart Command® and incorporate touch-free technology for a more efficient bathroom design that requires less cleaning and maintenance.

Every Caroma Smart Command® fixture tracks activation data, which when coupled with flow rates and flush volume calculations, provides water consumption patterns from bathroom fixtures on the Caroma Smart Command® Cloud. This secure data can be accessed via browser on any connected device and can be simultaneously streamed to BMS to incorporate with other systems. Direct local connections to fixtures are facilitated via BlueTooth and mobile app. This information empowers the building or facility manager to make informed decisions and monitor the impact in real time, driving efficiencies such as cleaning and maintenance resourcing.

Data can enable quick identification of behavioural trends which if addressed could result in water savings, or help identify when a fixture may require maintenance based off number of activations, or it can inform on how hygienic a given bathroom is through cross-referencing sanitaryware activations with tapware usage. Environmentally-conscious design decisions may be based on historical data and feedback, delivering premium-end buildings which exceed the needs of tenants and investors.

The water savings enabled by Smart Command® are key to the sustainable bathrooms of the future. Water may be cheap, but its responsible use is important for ensuring our ecosystems have enough to operate sustainably. Through the continuous improvement of water consumption and management – buildings can increase or retain their NABERS Water rating and attract higher value tenants.

All Caroma fixtures are highly engineered and certified under WaterMark. They are also registered under the WELS scheme and designed to maximise water efficiency.



All information provided correct as of May 2022

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