



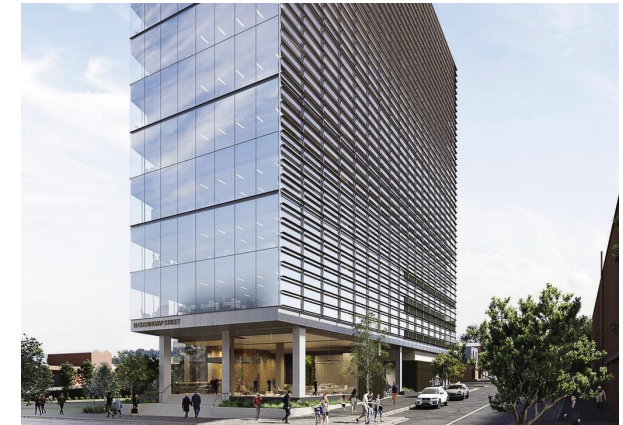
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The Glass House







Facility: Commercial Office Building
 Client: Charter Hall
 Location: Macquarie Park, NSW, Australia
 Timing: March 2020, ongoing

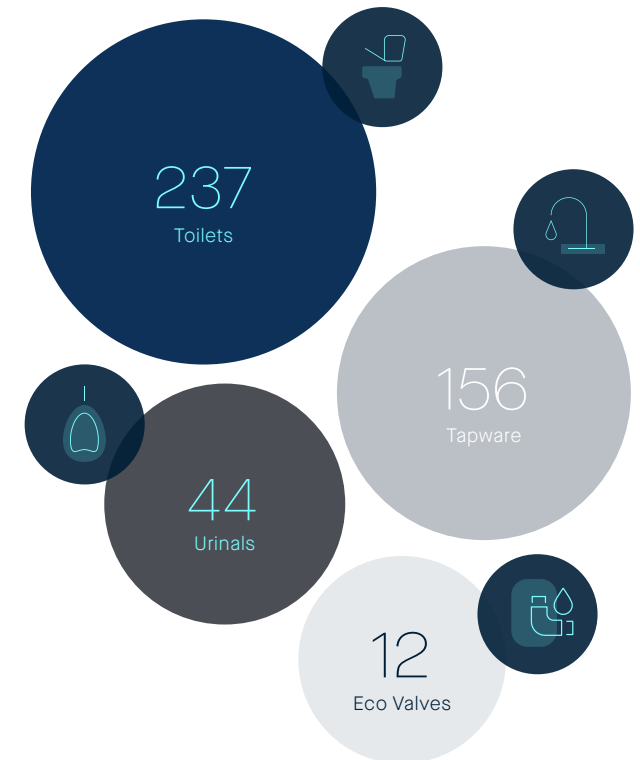
Total space	Launched	Occupancy Capacity	NABERS Water Rating	Tenant
35,144sqm	20th January 2020	3,000	★★★★	Gov Agency



A total of 449 Caroma Smart Command fixtures and fittings were installed across The Glass House.

Objectives

- 
Measure and reduce water usage
 Demonstrate water savings from the buildings planned water usage through identification of potential leaks, optimised fixtures & behavioural efficiencies.
- 
Improve the tenant's experience
 Understand how the tenants rate their bathroom experience and seek to set a high benchmark for satisfaction.
- 
Improve user hygiene
 Measure and compare hand washing compliance and enhance the tenant's bathroom experience.
- 
Understand what drives cost efficiencies
 Articulate how this building could transition to predictive maintenance and demonstrate how understanding fixture use could drive efficiencies.



Gallery

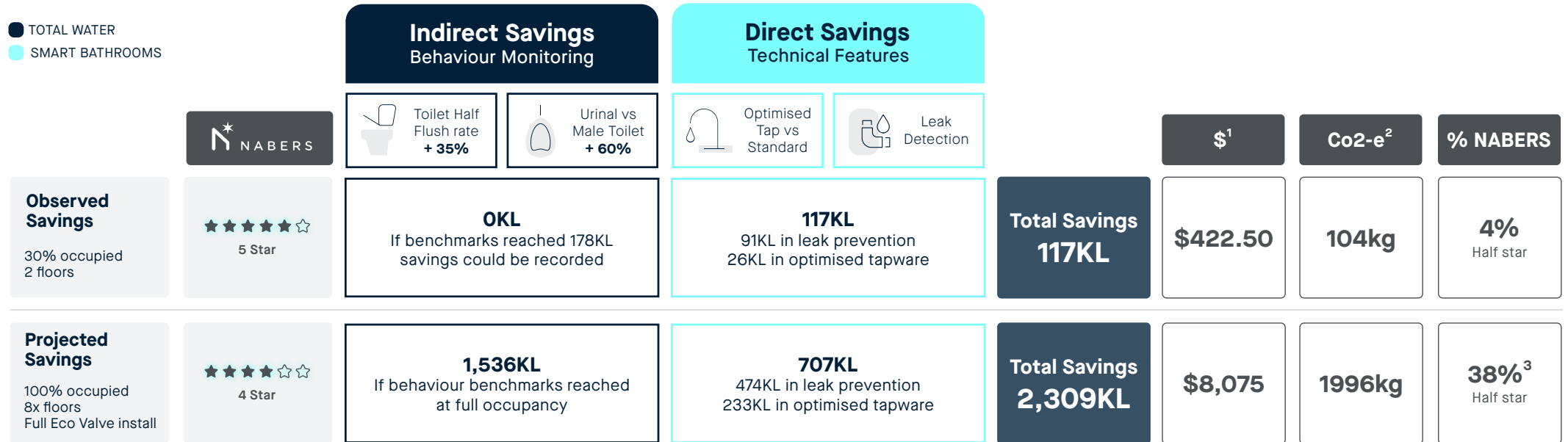


Driving Sustainability Through Water Saving

Caroma Smart Command had a water impact, but is projected to have a bigger impact when occupancy improves.

Investing in water management is a must for a sustainable future.

Caroma Smart Command is a change enabler through which behaviours can be impacted and unnecessary water use can be saved through proactive management of water consumption.



Of all water consumed at Glasshouse, Smart bathrooms represented only 10%.
At full capacity, Caroma Smart Command could contribute to 38% of a NABERS Half Star uplift³.

1. Sydney water consumption charges \$3.60 (water supply \$2.40 per kilolitre and wastewater \$1.20 per kilolitre). This does not include daily service charges, nor water treatment charges, which can add as much as 50% to the utility bill.
2. The upstream and downstream carbon emissions associated 1 kilolitre of water are approximately 0.89 kg CO2-e.
3. At full capacity, Glass House NABERS Water expected to be 4 Star.

Findings as validated by:

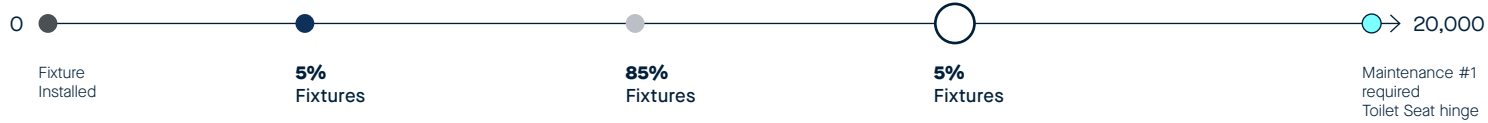
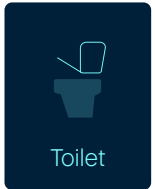


Australia's leading independent engineering consultancy delivering sustainable design solutions

Maintenance

Future Lifecycle Maintenance – We now have full visibility on where each fixture is within its lifespan.

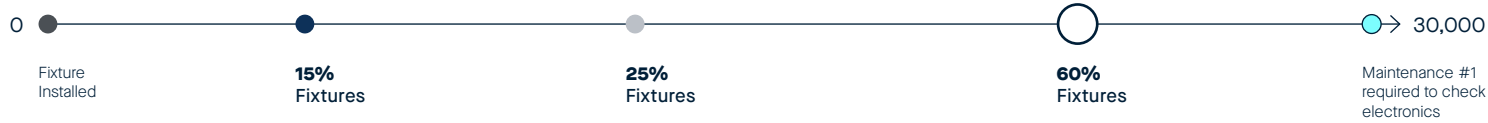
Fixtures have a predictable cycle of maintenance milestones. Number of activations is a leading indicator of a requirement to service, much like the number of kilometres your car has travelled in between services. Therefore we can predict when certain fixtures will need to be serviced & when to expect their end of life.



It's predicted that 5% of the toilets will require maintenance in 1.5 years, with the majority 4.5 years

87,742 Activations

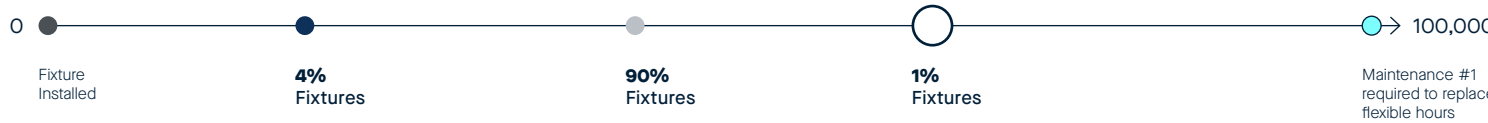
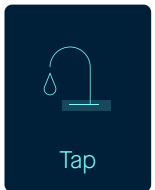
Toilets closest to the entrance are by far the most used



It's predicted that 60% of the urinals will require maintenance in 4 years, with the remaining approximately 6 years

20,237 Activations

Urinals closest to the entrance are the most used



It's predicted that 1% of the tapware will require maintenance in 4 years, with the majority approximately 6 years

237,176 Activations

Tap positioned closest to the toilets are the most used

There is a total life expectancy of 10 years or 250,000 cycles across Caroma Smart Command Toilets, Urinals, Taps and Showers

Maintenance

\$150k in savings for switching to Caroma Smart Command Fixtures.

Data collected by Caroma Smart Command means that The Glass House is able to make better informed decisions – being one step ahead of any problems whilst driving efficiency and cost savings.

Forecast Maintenance Costs

These costs are based on an average of 50 call outs per year with 5% predicated growth in maintenance issues per year.

- Average Typical Call out Fee \$350 for 3hrs
- Average Emergency Call Out Fee \$500 for 4hrs
- Caroma Smart Command savings based on reduction of leaks, and some blockages

Fixture Lifecycle Savings

Savings attributed to a better understanding of usage of fixtures and taking action to improve



\$49,772 saving
14% vs Typical

Driven by reductions in toilets running on, leaking and breakage



\$35,908 saving
37% vs Typical

Driven by reductions in urinals running on, leaking or blocking



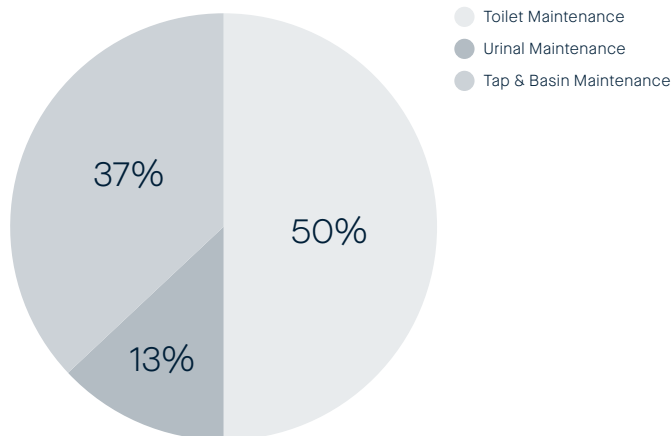
\$63,815 saving
23% vs Typical

Driven by reductions in leaking taps and blockages

Estimated 15 Year Fixture Lifecycle Saving
\$149,495

vs Traditional Fixture maintenance
20%

Typical Bathroom Maintenance



Potential Predictive Maintenance Savings

Savings attributed to shifting from reactionary maintenance to smart predictive maintenance



Reactionary Maintenance



Smart Optimised Predictive Maintenance

Estimated 15 Year saving shifting from Full Reactionary Maintenance to Full Smart Optimised Maintenance
\$473,174

User Experience

Thanks to the near real-time data at your fingertips, Caroma Smart Command ensures bathrooms are quickly up and running to their maximum potential. The Glass House tenants are able to enjoy a touchless experience that provides a new level of cleanliness and hygiene.

1.2
AVG **Hygiene Index**

The relationship between sanitaryware and tapware activations. For every sanitaryware use, 1.2 users washed their hands. A score of 1.0 is 'good'.

7.9_{sec}
AVG **Hand Wash Duration**

How long users wash their hands for on average. Consistently recorded handwash duration with small increases detected after signage was deployed.

Methodology

Cloud Data

March 2020 → March 2021
Full Bathroom (excl EOT Showers)
Caroma Smart Command Cloud Data

Behavioural Focus Study

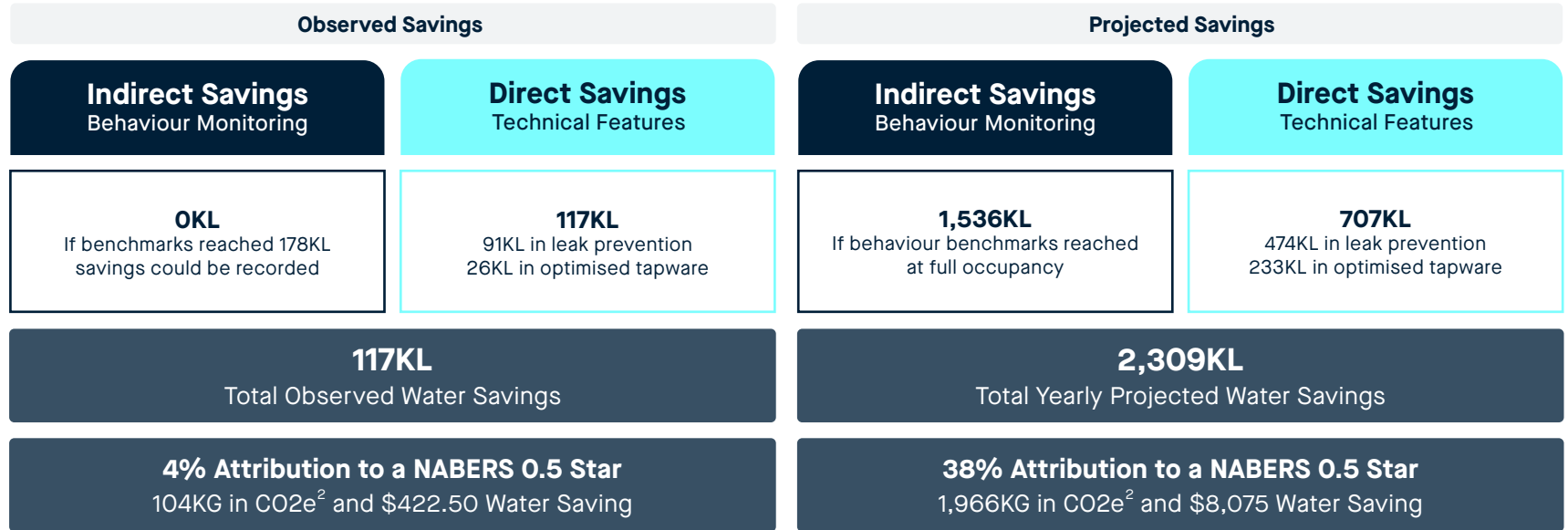
October 2020 → January 2021
Levels 1 & 2
3 week baseline, 9 week test period



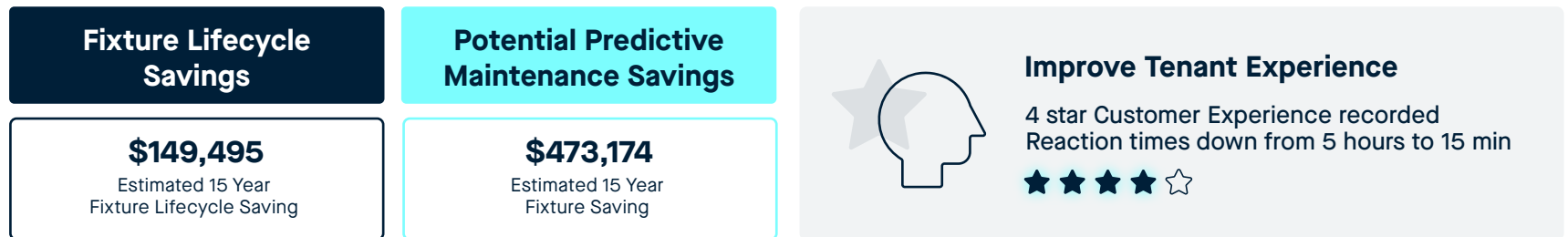
Case Study Summary



Measure and Reduce water usage



Understand how to drive costs down



Contact Us

For more information please contact our Caroma Smart Command team to see how we can help solve your business' problems.

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