

New Zealand's Approach to Warm, Safe and Dry Learning Environments



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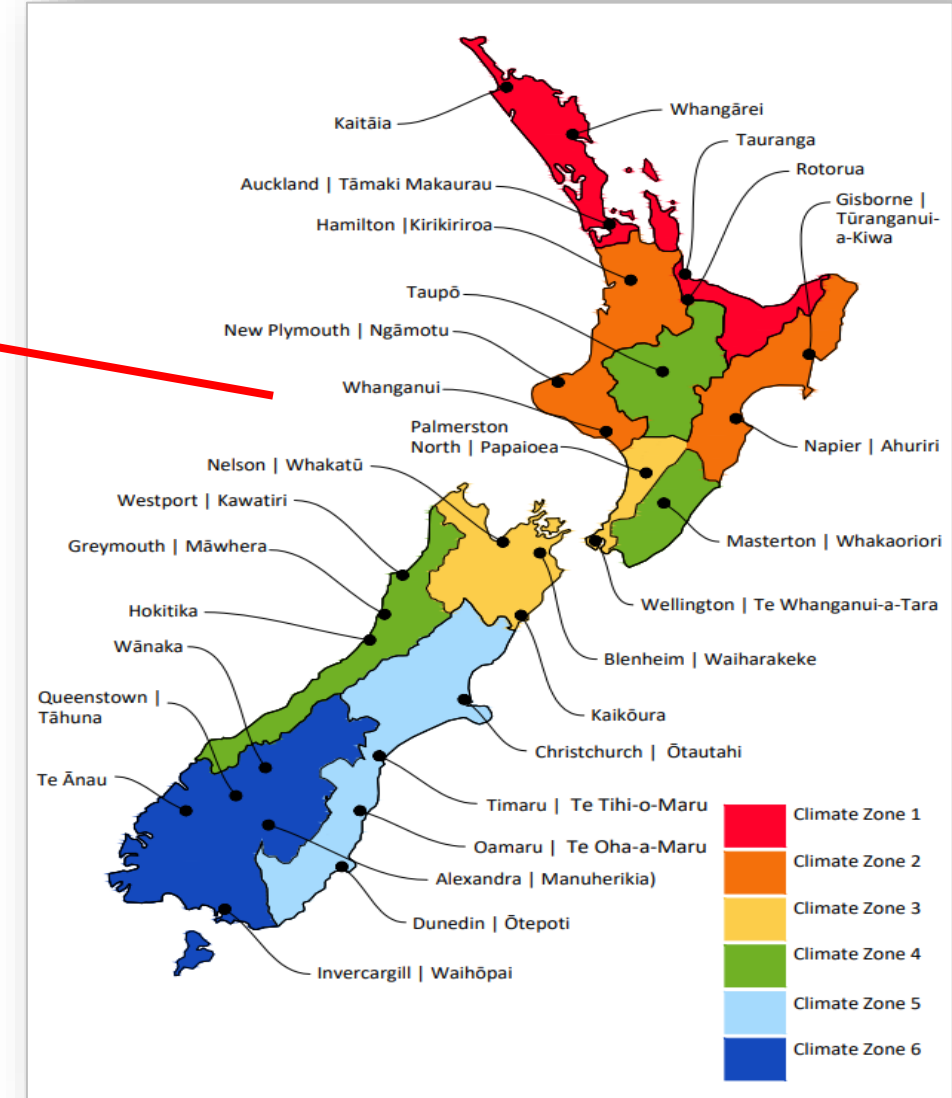


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New Zealand Geographically



- New Zealand has a climate that is quite complex in many ways. It ranges from warm subtropical in the north to cool temperate in the south.
- It is a country exposed to the cold polar blasts from the Antarctic as well as the tropical storms driven down from the tropical Pacific. There are six climate zones.
- Compared to Japan's pronounced climate range, including humid summers and cold winters, New Zealand's complex climate is generally milder.

The School Property Portfolio



2100
Number of schools
-
16,500
School buildings
-
37,500
Teaching spaces
-
8,000
Hectares of land



2nd largest
Social property portfolio in NZ



\$28B
Book Value
-
\$49B
Replacement Value



\$1.9B
Capex expenditure
-
\$1.8B
Forecast for next Financial
Year



113,872
Estimated additional student
places needed in high-growth
areas by 2030

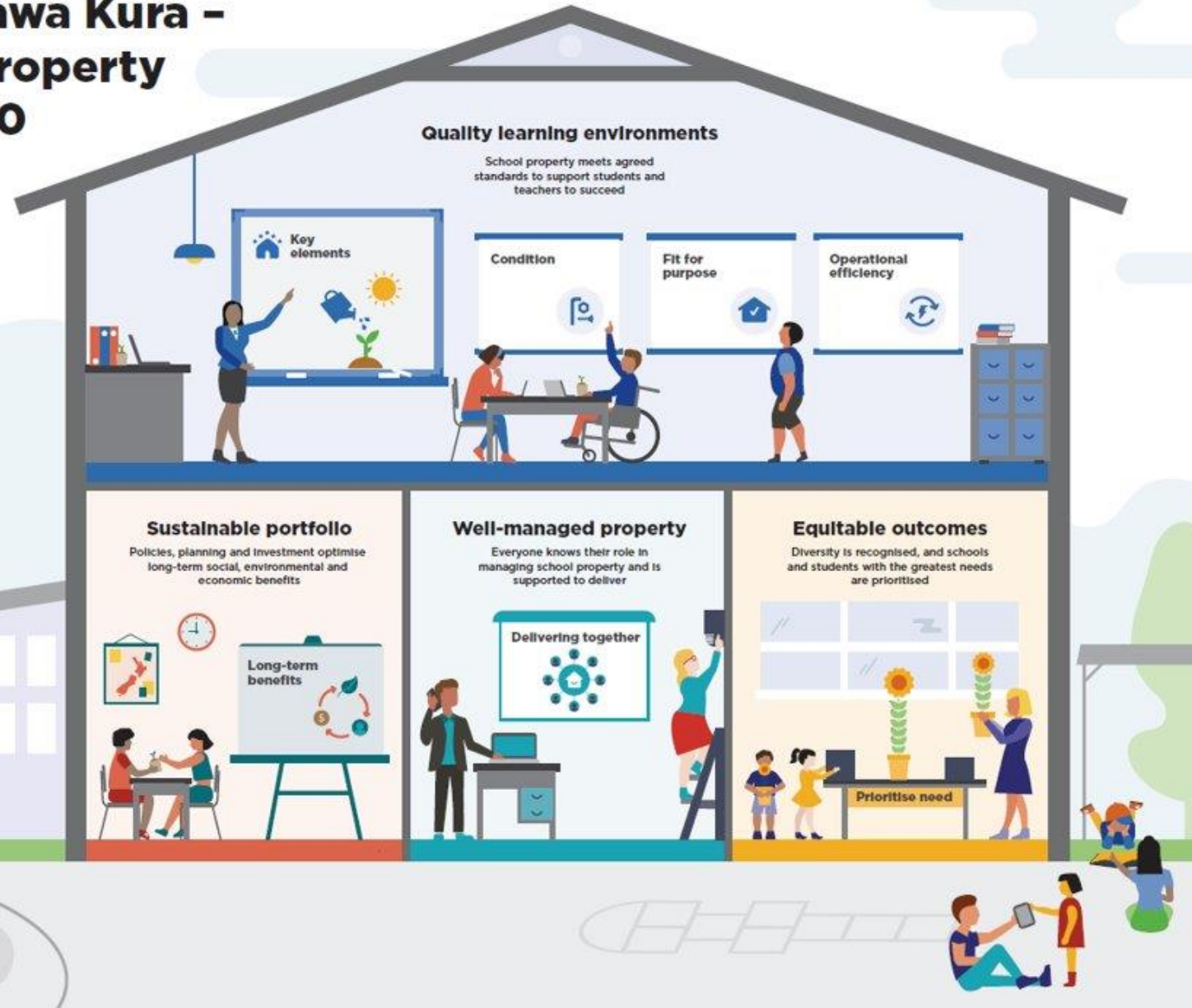


60%
Percent of school buildings
aged between 30 – 100 years
-
45%
Percent of schools with a roll of
less than 200
-
10%
Percent of schools with a roll
greater than 750

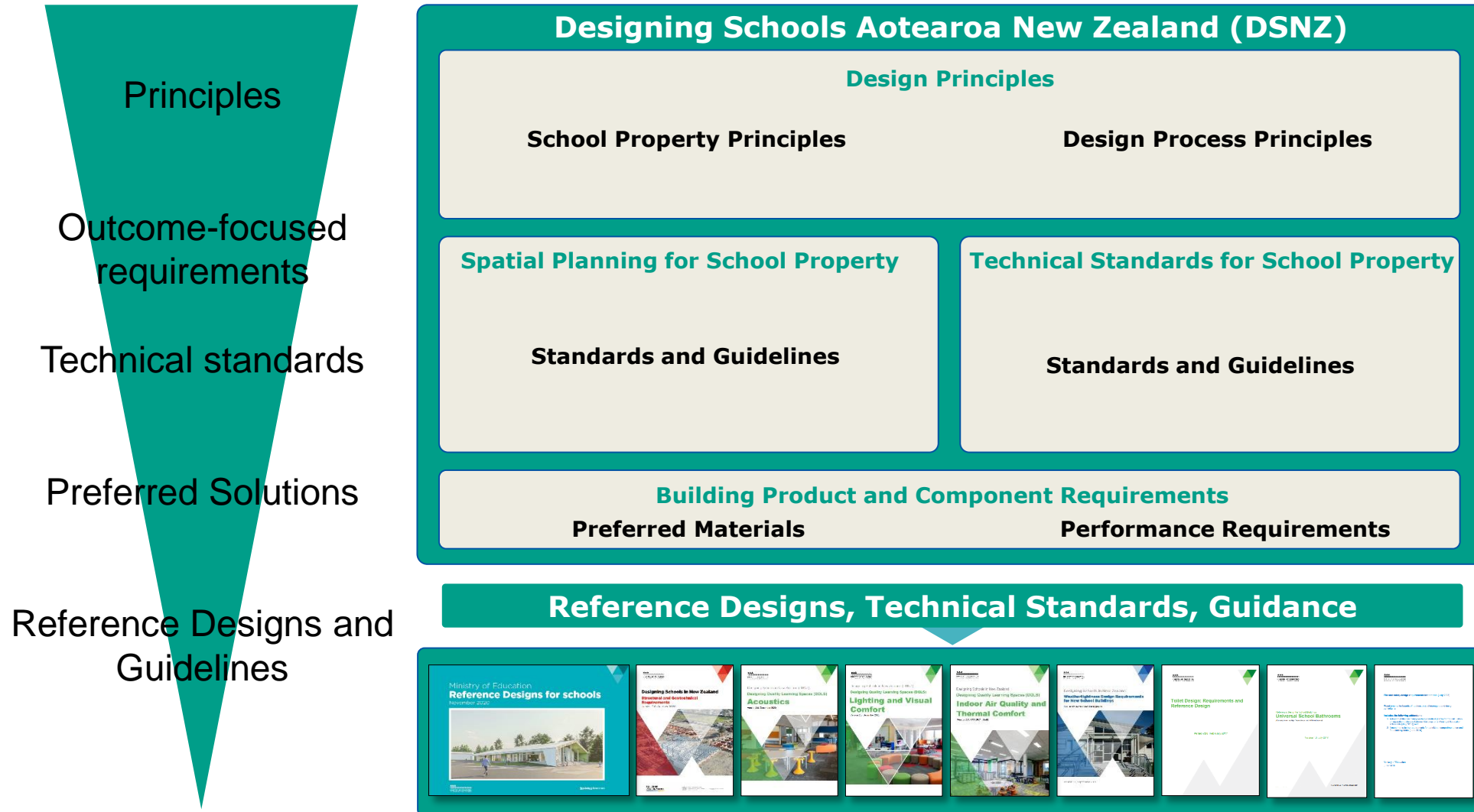


Te Rautaki Rawa Kura - The School Property Strategy 2030

All schools will have quality learning environments as part of a well-managed and sustainable portfolio that helps deliver equitable and excellent outcomes for every child



NZ Design Standards Framework



Images of NZ School Buildings



Learnings from our COVID-19 Ventilation Studies



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Quality Learning Environment Model



COVID-19 Ventilation Approach



Ventilation Study Findings



Natural Ventilation



Opening all windows and doors can fully refresh the air in a room in 2-6 minutes (10-30 ACH)



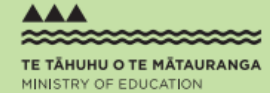
Partially opening windows by 5cm in winter can fully refresh the air in the room in 10-12 minutes (5-6 ACH)



Adding fixed air extract and/or supply fans increases airflow alongside, or as an alternative to, opening windows and doors (+2-5 ACH)

VENTILATION IN NEW ZEALAND CLASSROOMS

Why do we recommend opening the windows?



Mechanical Ventilation



Ducted ventilation systems can consistently clean and/or fully refresh the air in the room in 10-20 minutes (3-6 ACH)



Portable Filtration

A high-performance HEPA air cleaner (purifier) does not provide fresh air, but can clean the air in the room in 20 minutes (3 eACH)

ACH: Air changes per hour
eACH: Effective air changes per hour

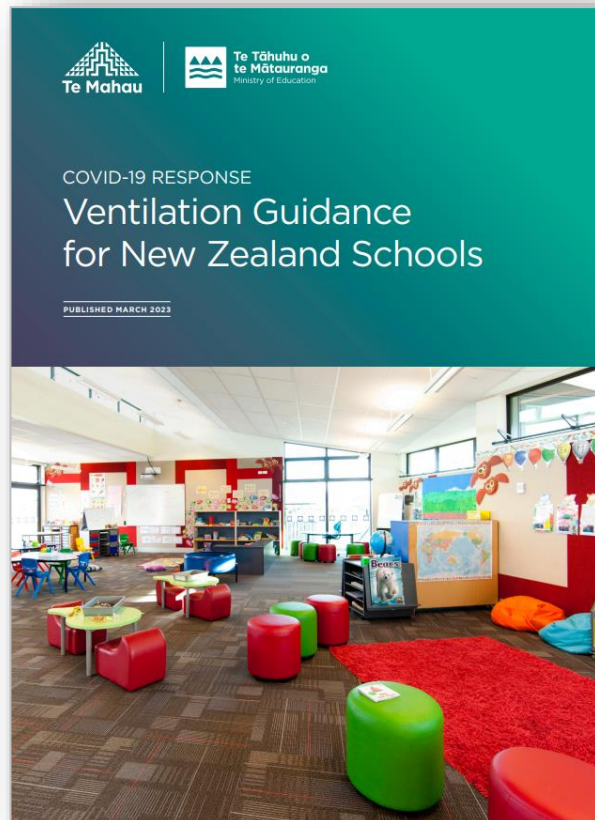
While this is energy efficient and will reduce operational cost, it is highly dependent on human behaviour and affected by ambient conditions.

These systems give you consistent ventilation performance, while also managing thermal comfort, but in doing so limit more ACH, and may add to operational cost.

Air cleaners have an additive effect on natural or mechanical ventilation but are not a substitute for ventilation.

Well-developed Indoor Air Quality Standards

- New Zealand's Ministry of Education has had well-developed Indoor Air Quality (IAQ) and Thermal Comfort design standards for school buildings prior to the COVID-19 pandemic.
- This standard was developed and applied to school design in 2007, then updated in 2017 and 2022.

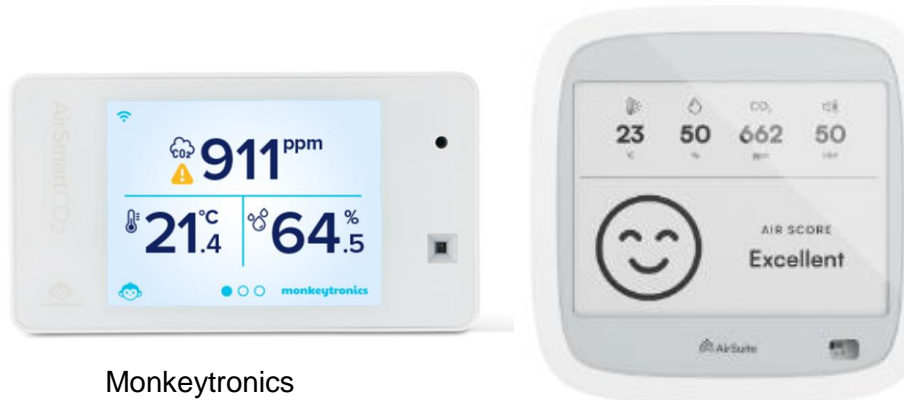


Summary of Short vs. Long Term Strategies



Internal Environmental Monitoring(IEM)

- New Zealand has deployed IEMs in schools to monitor CO₂, temperature, humidity, lighting, and sound levels in real time.

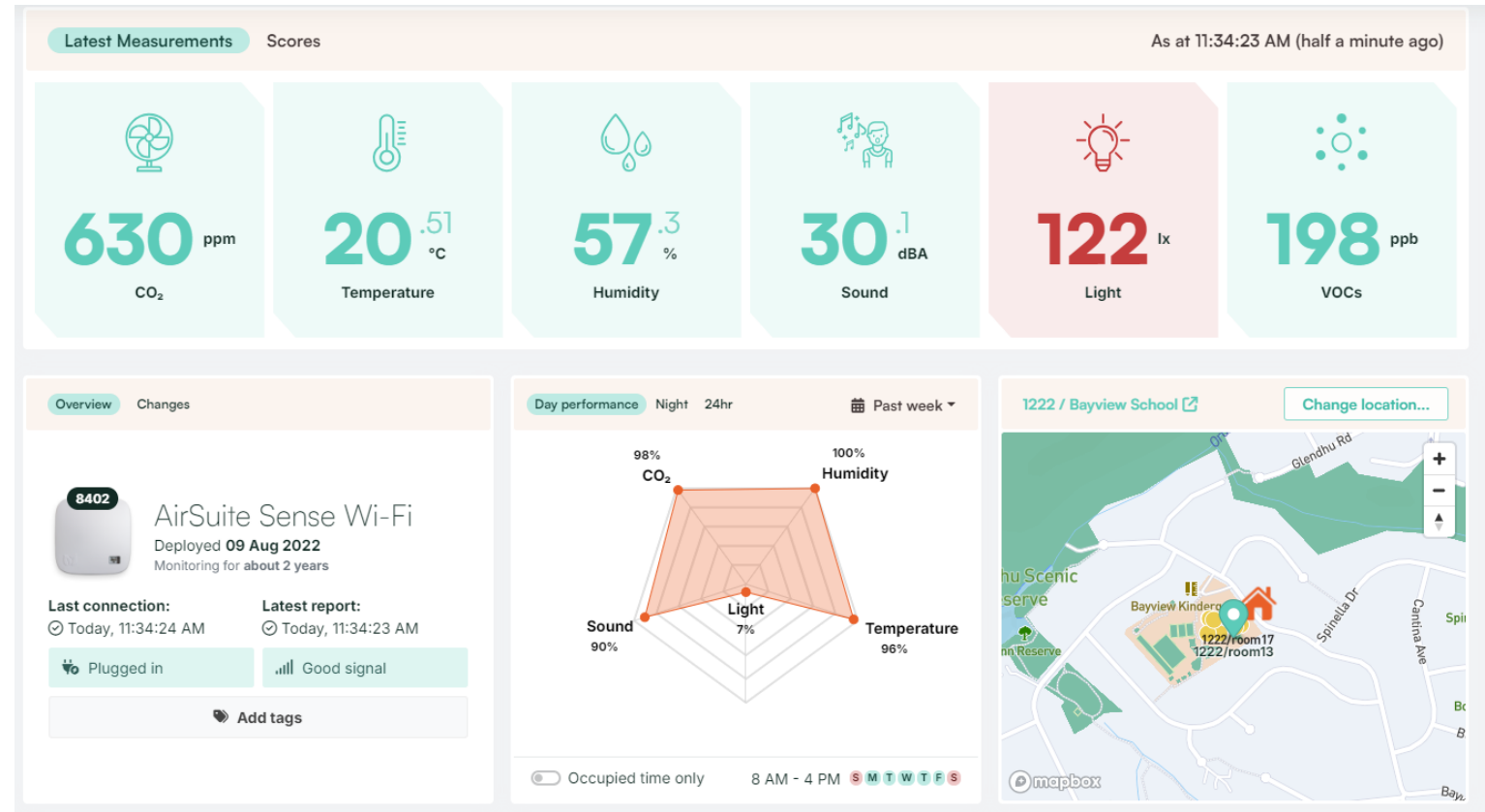


Monkeytronics

Airsuite



Aranet4



Improving system performance



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Solution



Outcome



Set clear criteria for property response selection

Link funding to Levels of Service to ensure decisions are robust and equitable



Long-term planning is robust and consistently driven by Levels of Service

Develop a delivery framework which enables programme-level planning/ procurement/ delivery to enable economies of scale

Develop standardised, repeatable, scalable design solutions which meet the Ministry's predefined minimum requirements

Establish robust contract management and quality assurance



The school property system enables value-for-money delivery

Increase oversight and reporting on maintenance activities and expenditure

Set clear maintenance strategies and targets

Provide additional support to schools to carry out maintenance



The maintenance of existing school property is sufficient





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He mea **tārai** e mātou te **mātauranga**
kia **rangatira** ai, kia **mana taurite** ai ōna **huanga**

