

LIVEABLE AND HEALTHY CITIES

The USS domain encompasses not only the built environment but also the people who live, work, and interact within these urban spaces. Our fundamental mission is to create a liveable, healthy city that serves all residents. This zone explores how stakeholders across the USS domain collaborate and innovate to achieve this vision.

Our research spans multiple interconnected areas: examining how built environments affect residents' mental health and disease transmission patterns, developing sophisticated environmental models that empower urban planners to optimise their designs, studying novel ways to create and optimise space to support our people's needs, and creating integrated solutions for urban challenges. These collaborative efforts work towards a common goal—to build a sustainable living environment that enhances the quality of life for every resident.

Through this holistic approach, we bridge the gap between physical infrastructure and human wellbeing, ensuring that Singapore's urban development serves both present needs and future aspirations.



TRANSFORMING THE BUILT ENVIRONMENT

Singapore's built environment faces unprecedented challenges from urban densification, manpower shortages, and climate change. Transforming how we design, construct, and manage our buildings and infrastructure is essential for achieving productivity and sustainability goals while maintaining liveability in our dense city. This requires reimagining traditional approaches through innovative materials, smart technologies, and integrated systems that reduce carbon emissions, enhance resource efficiency, and improve resilience.

By harnessing cutting-edge research and fostering collaboration across government, industry, and academia, Singapore can develop and demonstrate novel solutions that address our unique constraints while setting new benchmarks for sustainable urban development. These transformative efforts will shape a greener, more adaptive built environment for future generations.



CLIMATE RESILIENCE

Given Singapore's physical and environmental constraints as a small island state, climate change poses an existential challenge to our food security, infrastructure, and liveability. This exhibition zone highlights innovative solutions that stakeholders are developing to build resilience against climate impacts, showcasing Singapore's proactive approach to climate adaptation across multiple fronts.

The coastal protection & flood resilience projects showcase adaptable and resource-efficient solutions and monitoring systems. These measures safeguard Singapore against rising sea levels and mitigate flood risks, ensuring the protection of critical infrastructure.

Innovative approaches such as autonomous urban farming, genetic crop improvement, sustainable aquaculture, and novel food production methods are being explored to enhance food security while ensuring food safety and sustainability.

Cutting-edge research in weather and climate science is improving predictive capabilities to better understand and respond to climate variability. Targeted heat resilience initiatives such as smart cooling technologies, optimised building designs and urban planning, are creating more comfortable urban environments while addressing heat stress and its impacts on public well-being.

Collectively, these efforts illustrate how Singapore is not merely responding to climate change but proactively adapting to its challenges, ensuring our city remains safe, secure, and sustainable for future generations.



ENVIRONMENTAL SUSTAINABILITY

To meet the growing demands from the population and industry, Singapore is strengthening its efforts in environmental sustainability and exploring innovative approaches to maximise resource efficiency. This exhibition zone highlights transformative solutions addressing challenges posed by environmental constraints and increasing resource demands.

The water management projects exemplify innovative approaches to maximising efficiency and reuse in municipal and industrial applications, showcasing how Singapore sustainably optimises water resources to meet growing demand.

For waste circularity, advanced technologies are transforming waste streams into valuable resources, reducing the amount of waste to landfill and incineration. These efforts reflect Singapore's dedication to minimising waste, closing resource loops and progressing towards net zero carbon emission solutions.

Research into air quality is deepening our understanding of pollutant formation and sources within Singapore's tropical urban environment. This includes the development of low-cost sensors integrated with street-level modelling capabilities, enabling comprehensive island-wide monitoring.

Together, these initiatives underscore Singapore's dedication to address environmental constraints through resource circularity, and effective water and waste management, paving the way for a greener and more sustainable future.



ENERGY & DECARBONISATION

Singapore has committed to ambitious decarbonisation targets to do our part against climate change, including peaking emissions before 2030 and reaching net zero by 2050. Achieving these goals requires a comprehensive decarbonisation journey with two critical components: an energy transition towards a resilient, net-zero electricity grid, and a carbon transition to reduce emissions across emissions-intensive sectors.

As an alternative energy-disadvantaged city-state, technological innovation will be essential to overcome our resource limitations and enable energy and carbon transitions. The projects in this zone showcase the innovative technologies that can drive Singapore's energy and carbon transformations. These span large-scale carbon capture and utilisation systems, new forms of low-carbon power generation, and power grid enhancements designed to support the electrification of emissions-intensive activities.

Collectively, these cutting-edge solutions demonstrate how Singapore can navigate its unique constraints whilst achieving its climate commitments through technological advancement.

