(Source: Google 2024)

Your Melbourne

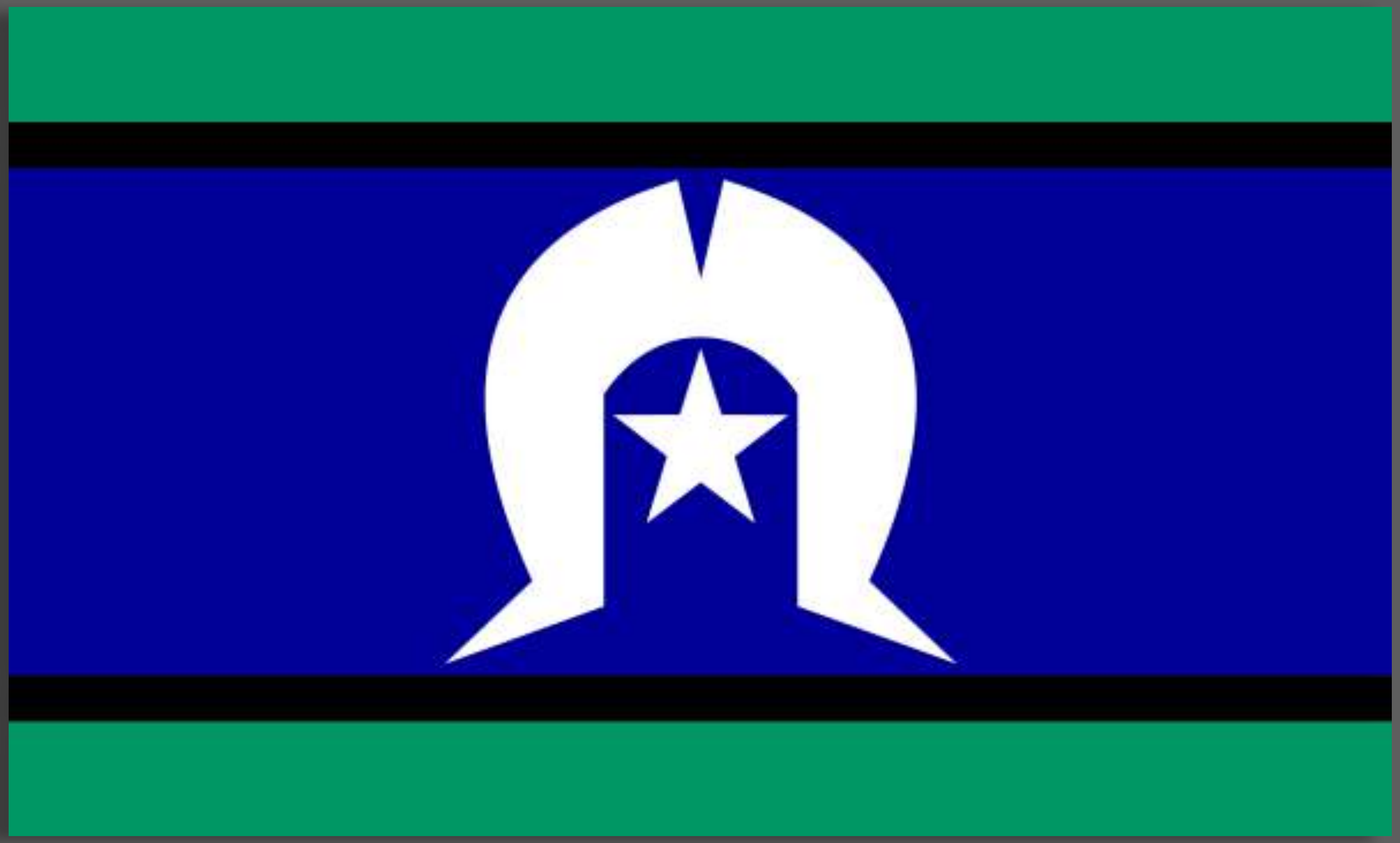
S.M.A.R.T City

Sustainable, Multi-dimensional, Adaptive, Resilient & Technologically-Advance

S4083528 | Siddhant Dharwadkar

Acknowledgment of the Country.

"I acknowledge the Wurundjeri people of the Kulin Nation as the Traditional Custodians of the land on which I live and work. I pay my respects to their Elders past, present, and emerging, and recognise their ongoing connection to the lands, waters, and culture.



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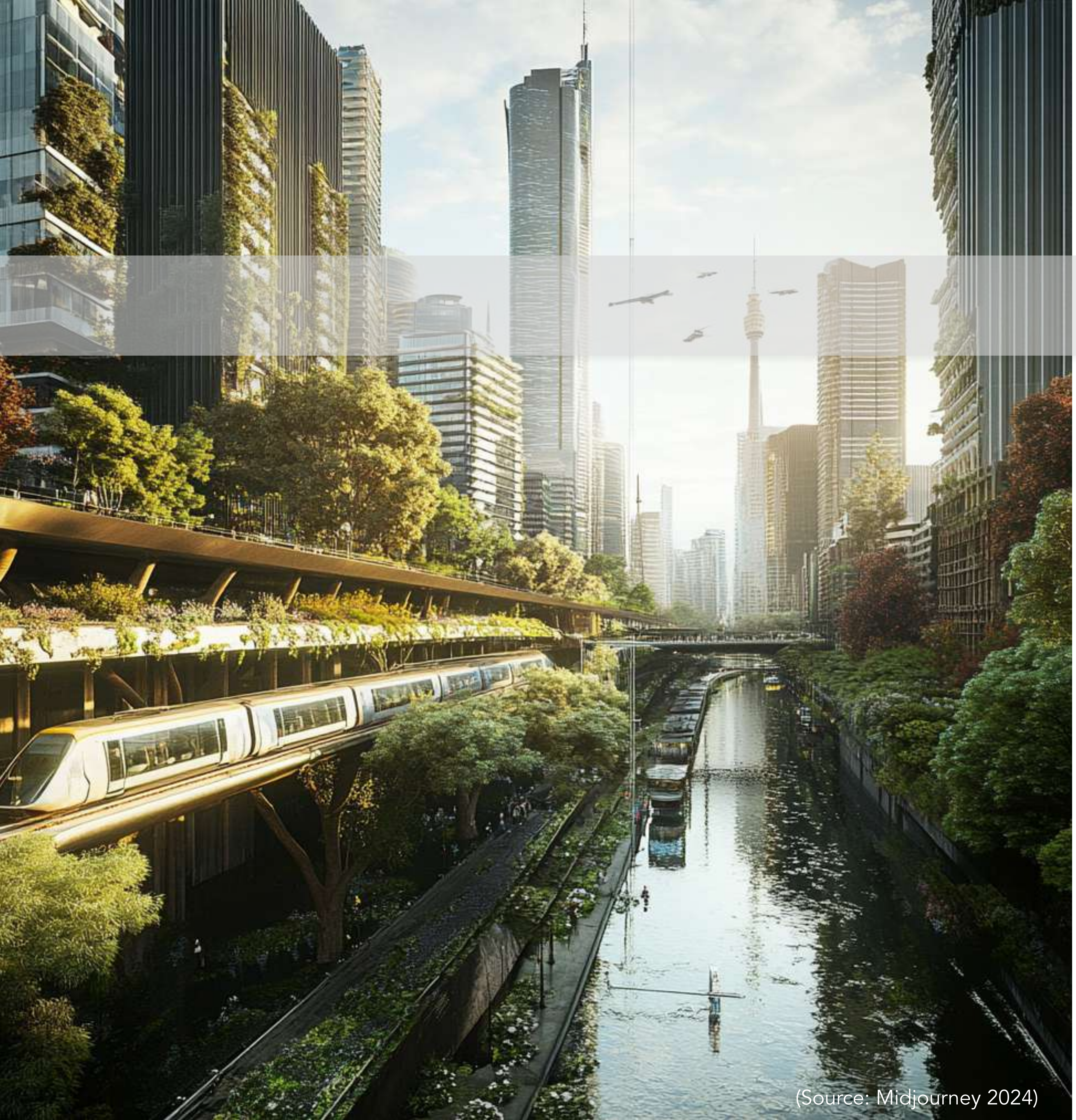


(Source: Midjourney 2024)

Introduction

The **S.M.A.R.T City** project envisions a **sustainable, multidimensional, adaptive, resilient, and technologically advanced** Melbourne, fully aligned with the **17 UN Sustainable Development Goals**. This concept focuses on integrating innovative, green technologies with urban living to create a city that thrives both socially and environmentally. By addressing challenges like urban sprawl, mobility, and environmental degradation, the project seeks to enhance Melbourne's liveability, inclusivity, and sustainability by 2030. The vision combines cutting-edge technology with human-centred urban design, fostering a healthier, more resilient city.

"If I have seen further, it is by standing on the shoulders of giants."

Newton, I. (1676) Letter from Sir Isaac Newton to Robert Hooke. In: Turnbull, H.W., ed. (1959) The Correspondence of Isaac Newton. Vol. 1. Cambridge: Cambridge University Press, p. 416.

Melbourne in 2024 – A City of Contrasts

- **Cultural Diversity**: Melbourne stands as one of the most culturally diverse cities globally, with **over 140 cultures represented**. This rich diversity adds to its global appeal and inclusive urban fabric.
- **Population & Employment Growth**: The city's population is forecasted to reach **328,000 by 2040**, with an additional **145,000 residents** and **228,000 new jobs** expected from 2020. This brings pressing demands for infrastructure, services, and sustainable urban expansion.

Wastage:

In **2020**, **Victoria wasted 2.4 million tonnes of food**, contributing to **25% of Australia's total food waste**.
A significant **1/3 of food produced** globally is lost or wasted, adding to environmental and economic strains.

2.4 million tonnes of food waste in Victoria (2020)

25% of Australia's total food waste occurs in Victoria

Public Transport & Road Congestion:

Melbourne boasts the world's largest tram network, covering **250 km** of tracks.
Despite this achievement, **85% of trips to the city are still made by car**, leading to severe congestion, with annual costs nearing **$4.6 billion** and forecasted to **grow to $10 billion by 2030**.

High road congestion costs: **$4.6 billion** (2023), expected to rise to **$10 billion** by 2030

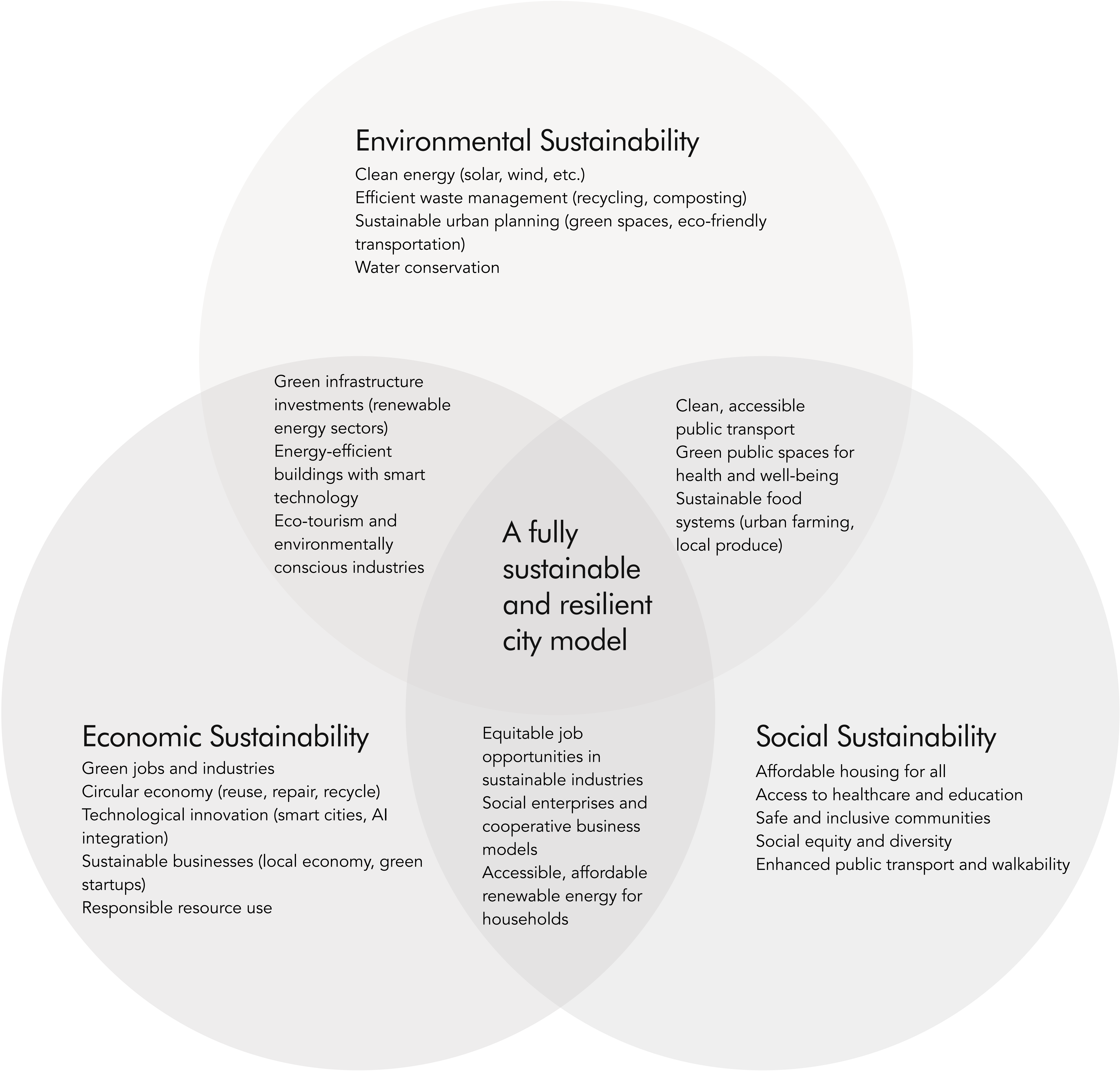
85% of city trips made by car despite having the **largest tram network** in the world

Urban Sprawl & Connectivity:

As Melbourne's CBD remains the hub of amenities, a growing number of people are moving to outer suburbs, where access to education, healthcare, and even basic connectivity (like cell coverage) is limited. The sprawling nature of the city's growth has created pockets of inequity and isolation, especially for suburban residents.

Projected population: **328,000 people** and **663,000 jobs** by 2040

Why S.M.A.R.T


Environmental Sustainability
Clean energy (solar, wind, etc.)
Efficient waste management (recycling, composting)
Sustainable urban planning (green spaces, eco-friendly transportation)
Water conservation
Green infrastructure investments (renewable energy sectors)
Energy-efficient buildings with smart technology
Eco-tourism and environmentally conscious industries
Clean, accessible public transport
Green public spaces for health and well-being
Sustainable food systems (urban farming, local produce)
A fully sustainable and resilient city model
Economic Sustainability
Green jobs and industries
Circular economy (reuse, repair, recycle)
Technological innovation (smart cities, AI integration)
Sustainable businesses (local economy, green startups)
Responsible resource use
Equitable job opportunities in sustainable industries
Social enterprises and cooperative business models
Accessible, affordable renewable energy for households
Social Sustainability
Affordable housing for all
Access to healthcare and education
Safe and inclusive communities
Social equity and diversity
Enhanced public transport and walkability

Research.Challenges Addressed

Energy and Environmental Sustainability

Increasing energy demand and reliance on non-renewable resources, leading to higher carbon emissions.

Urban Growth and Resource Management:

Rapid urbanisation leading to overcrowded cities, insufficient green spaces, and pressure on resources.

Mobility and Congestion

Increasing traffic congestion and pollution due to reliance on private cars, and outdated public transport systems.

Research.Challenges Addressed

Waste Management and Pollution

Inefficient waste management systems causing pollution, landfill overflow, and environmental degradation.

Social Inequality and Housing

Homelessness and lack of affordable housing options, leading to increased inequality and urban strain

Research. Solutions

Energy and Environmental Sustainability

Solutions:

- **Kinetic tiles in pavements** for generating clean energy from pedestrian movement.
- **Solar panels on Rooftops of bus/tram stops** to harness renewable energy, reducing dependence on fossil fuels. Along with charging bikes Stations at the rear and providing security services to passengers in time of need.

Urban Growth and Resource Management

Solutions:

- **Vertical latch-on gardens** and **green skyscrapers** to maximise green spaces and improve air quality in dense urban areas.Also fitted with water filtration systems
- **Urban farming hubs** in suburban barren spaces to address food security, provide local produce, and generate employment opportunities.

Mobility and Congestion

Solutions:

- **Autonomous buses** to create efficient, eco-friendly public transport.
- **Electrifying highways** to charge electric vehicles, encouraging a shift away from petrol/diesel cars.Along with **Wind turbines** to provide Natural renewable energy.

Research. Solutions

Waste Management and Pollution

Solutions:

- **AI waste management** systems to optimise sorting, recycling, and waste reduction, minimising environmental impact.
- **Hydro Turbines** for cleansing river pollutants to give clean water.

Social Inequality and Housing:

Solutions:

- **Smart parking structures with recreational and habitable spaces for the homeless,Under-educated** providing shelter and support services in under-utilised urban areas.

Key Insights.

Harnessing Renewable Energy

By integrating **kinetic tiles**, **rooftop solar panels**, and **solar-powered tram stops**, the city can generate clean, sustainable energy, reducing dependency on fossil fuels and promoting energy efficiency across urban infrastructure.

Greening Urban Spaces

Vertical latch-on gardens and **green-friendly skyscrapers** will not only improve air quality but also provide sustainable urban habitats, contributing to climate action and enhancing the city's resilience to environmental challenges.

Innovative Mobility Solutions

The introduction of **autonomous buses**, an **advanced tram system**, and **electrified highways powered by wind turbines** will drastically reduce carbon emissions while improving public transport efficiency and accessibility, aligning with sustainable mobility goals.

Urban Farming & Employment

Urban farming hubs in under-utilised suburban spaces can revitalise local economies, create jobs, and provide fresh produce, advancing sustainable agriculture and community well-being.

Smart City Infrastructure

AI waste management systems and **smart parking with multi-use spaces** (for recreation and homelessness support) emphasise technological integration and social equity, addressing urban challenges while promoting inclusivity and adaptive resource management.

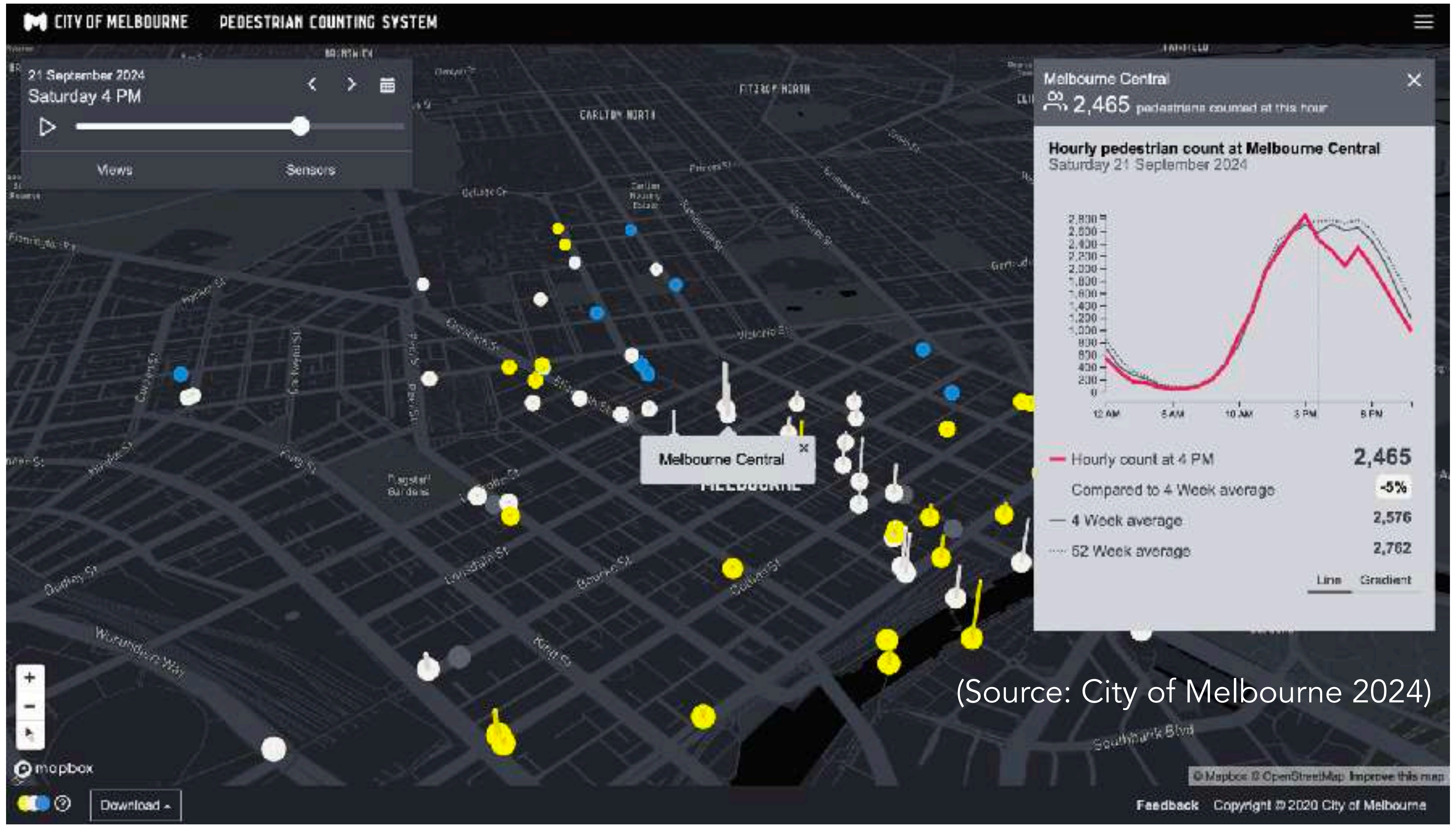
Design. Solution with concepts

Kinetic tiles In Sidewalks In High Pedestrian counting areas

for generating clean energy from pedestrian movement.

will be made with materials which allows it to be permeable pavements

and stick in line with the future goals of the City of Melbourne



(Source: City of Melbourne 2024)

Pedestrian count of 21st sep 2024 @ 4PM

Kinetic Dance floors In Coldplay concerts

Coldplay's new world tour is putting sustainability on the main stage. The Music Of The Spheres World Tour (MOTSWT) aims to reduce greenhouse gas emissions by 50% compared to the band's last tour. We are helping Coldplay boost their sustainability initiatives with fan power.

Design. Solution with concepts

Kinetic tiles In Sidewalks

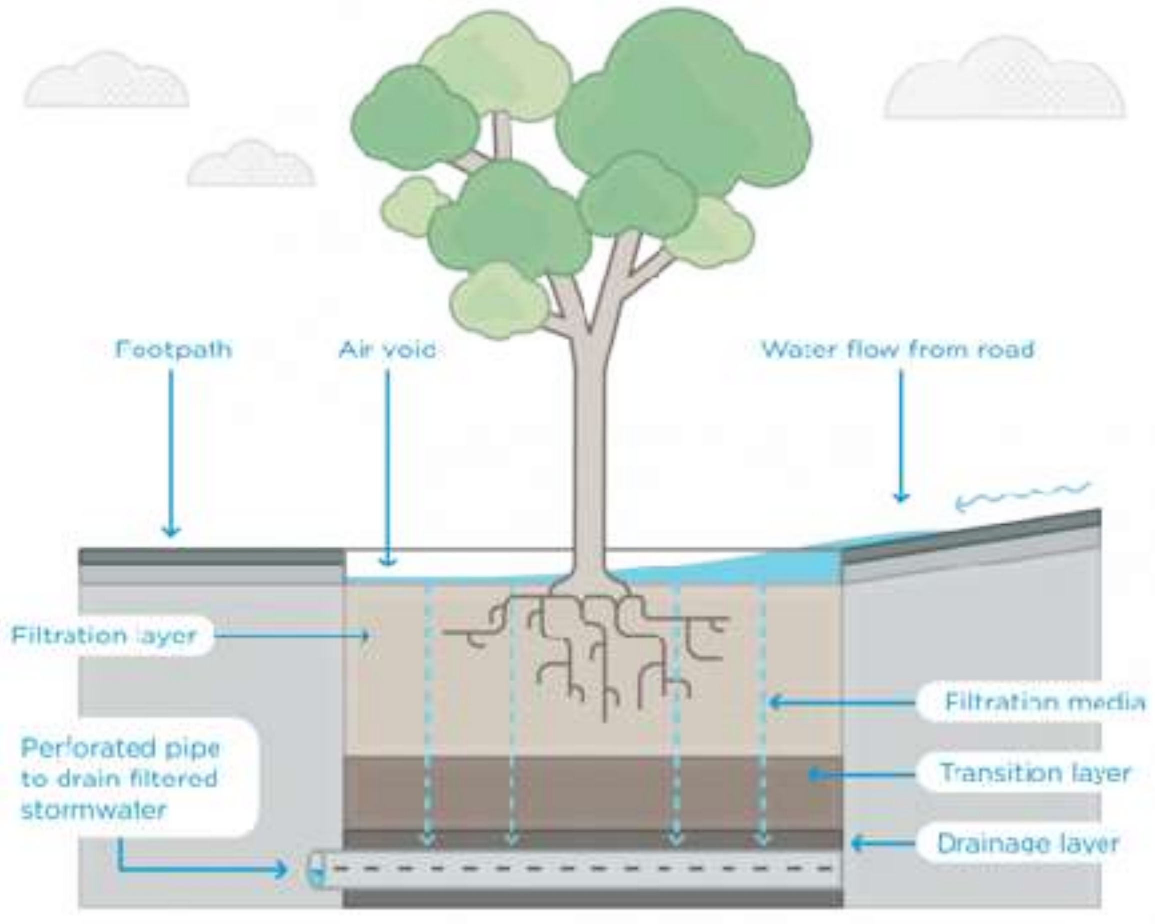
Storing energy and making the side-walks in collaboration with the current on going projects

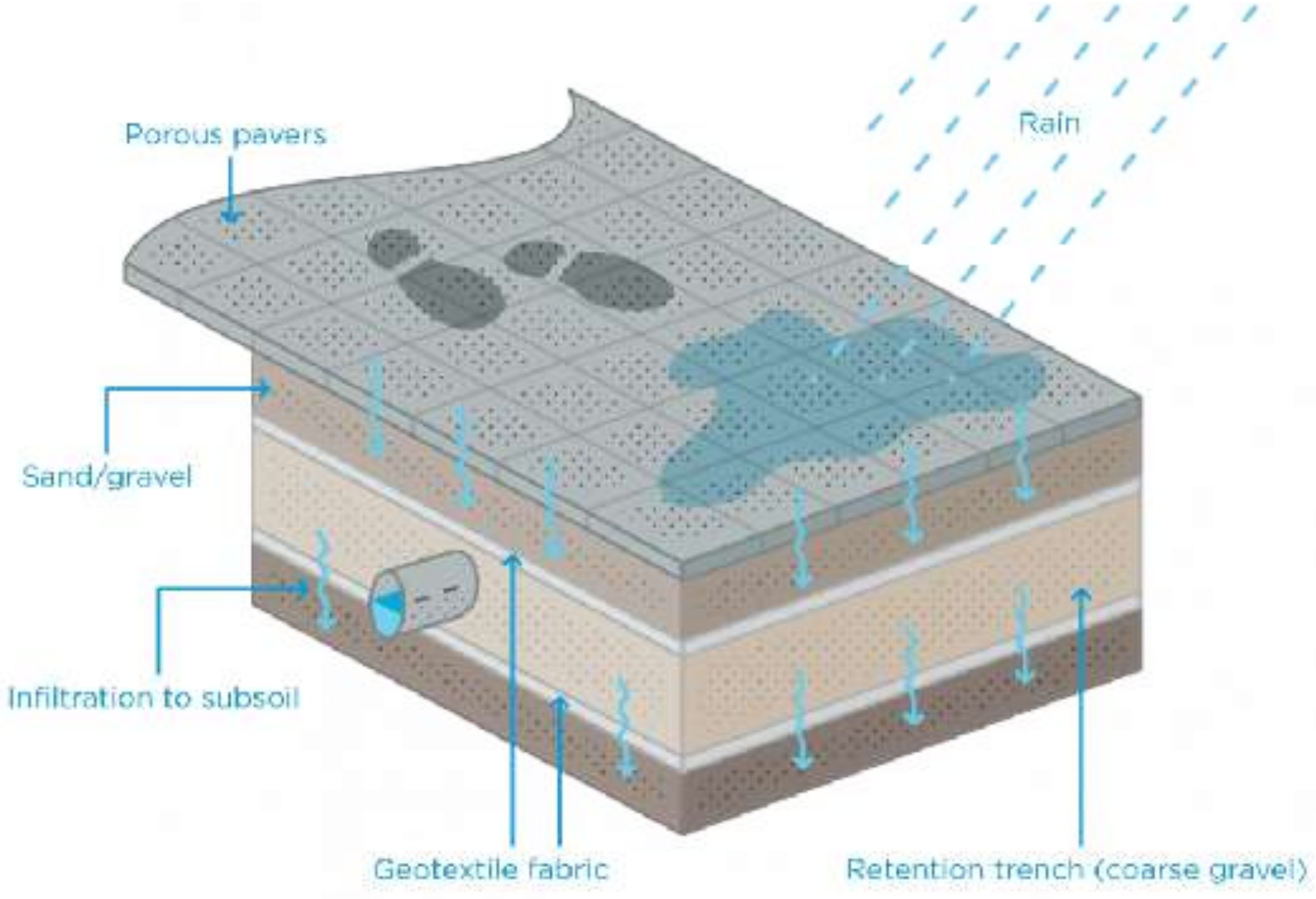
Power Melbourne's pilot phase will see a network of three battery energy storage systems – with a combined capacity of 480 kW / 1.1MWh – installed at Library at the Dock, Boyd Community Hub and Council House 1 in 2024.

Urban areas are typically covered by impervious surfaces, such as footpaths and roads, which prevent rainwater from soaking into the ground. As a result, soil moisture is lower than it should be, making it more difficult to grow trees and cool the city.

Permeable paving – also known as porous paving – allows rainwater to pass through and infiltrate the soil below. This recharges soil moisture and ground water. By directing stormwater away from the drainage system, permeable paving also reduces flood risk.
Rain-garden tree pits work like small rain-gardens using stormwater to support healthy trees. They are set into the kerb to intercept and clean stormwater before it goes into the drain.

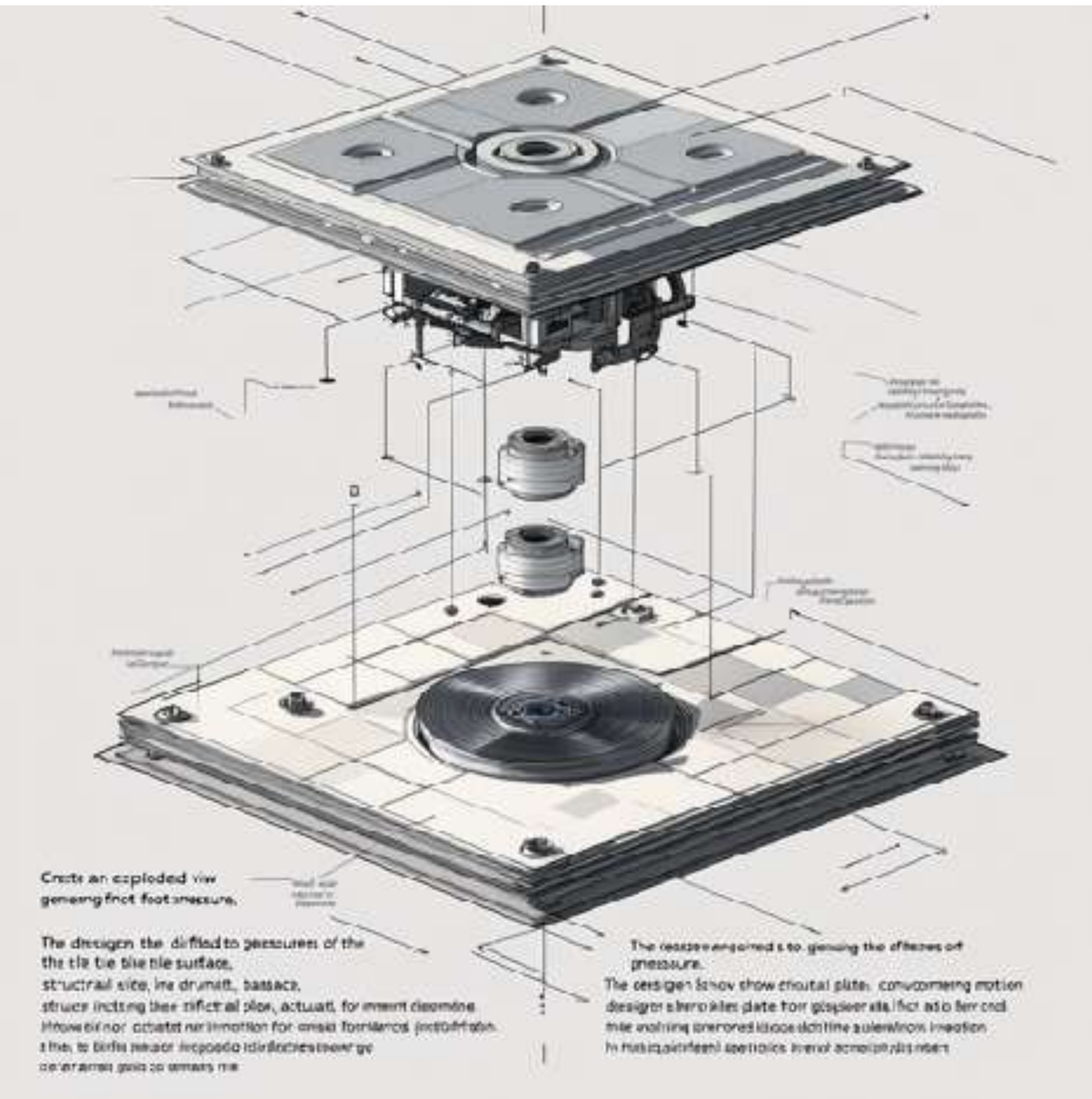
Adhering to these given precedents and using them to seamlessly collaborate as well as store clean generated energy from kinetic side-walks





(Source: City of Melbourne 2024)

Design. Solution with concepts



(Source: Midjourney 2024)

Kinetic tiles In Sidewalks

In High Pedestrian counting areas

Conceptual designs

(Source: Midjourney 2024)

Design. Solution with concepts

Solar panels on Rooftops of bus/tram stops

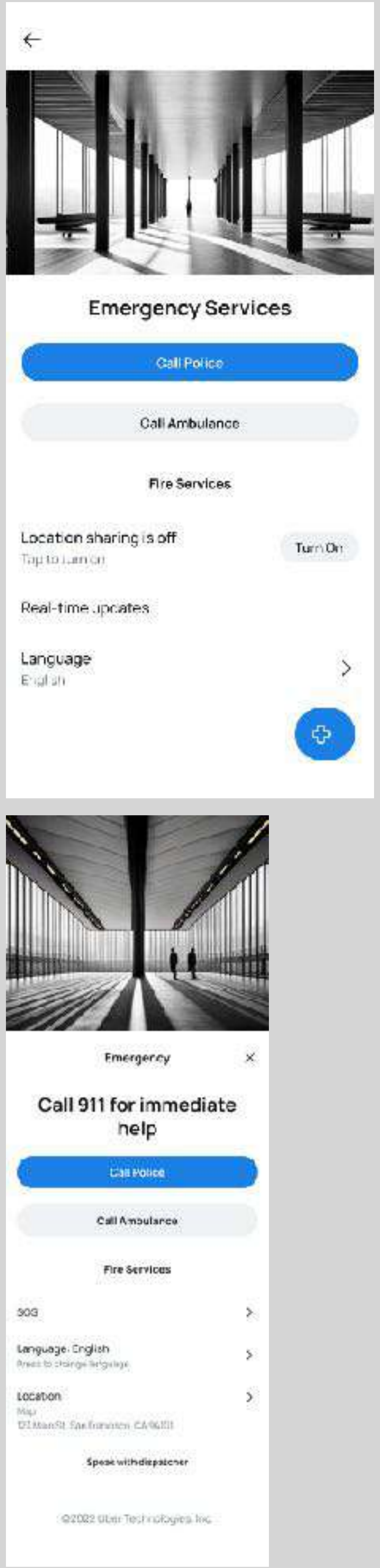
Safety/ Efficient Energy/ Employment

The **solar-powered rooftops** on bus and tram stops are designed to harness renewable energy, reducing reliance on fossil fuels and supporting the city's sustainability goals. These solar panels provide power for various services, including **E-bike charging stations** located at the rear, allowing commuters to charge their electric bikes while waiting.

In addition to charging services, the solar energy also powers **free Wi-Fi** and an **emergency contact system**, ensuring passengers have access to vital communication tools and support in case of emergencies. This setup improves both safety and convenience for commuters, offering an eco-friendly, self-sufficient stop that enhances the overall public transport experience. The renewable energy generated also contributes to the local grid, further reducing the environmental footprint of daily commuting. By implementing this solution, the city creates jobs for maintenance and operations while promoting clean, efficient energy use across its transport infrastructure.

(Source: Midjourney 2024)

(Source: Midjourney 2024)



UI screens for emergency contact on stops

Design. Solution with concepts

Solar panels on Rooftops of bus/tram stops

Safety/ Efficient Energy/ Employment

to harness renewable energy, reducing dependence on fossil fuels. Along with charging bikes Stations at the rear and providing security services to passengers in time of need.

Provide free Wifi and Emergency contact service on this station

Provide charging for E-bikes

Provide Renewable energy to the charge station and Contact services

(Source: Midjourney 2024)

(Source: Midjourney 2024)

Design. Solution with concepts

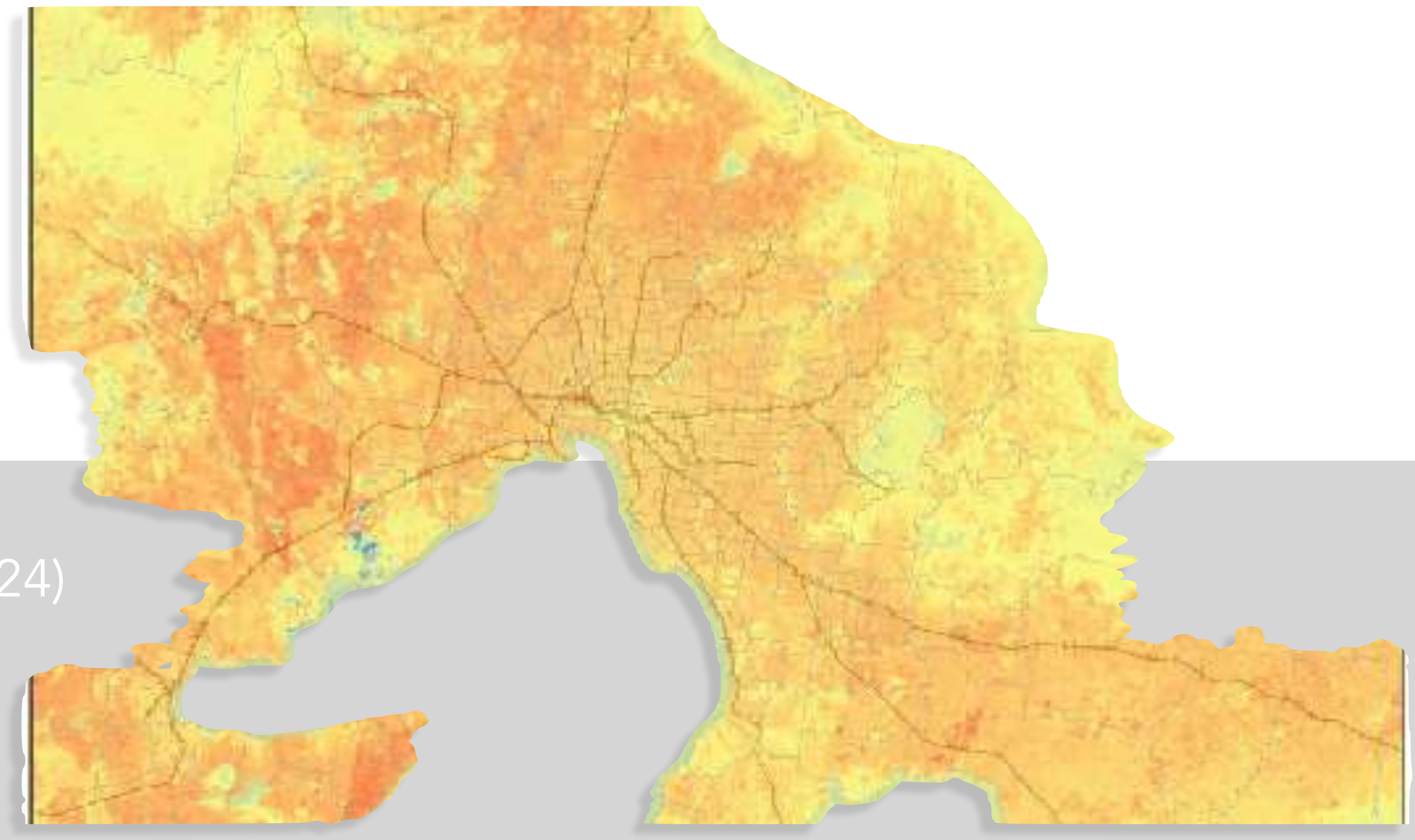
Heat Island effect on the city

Enormous rise in temperatures,

Statistics of current planted trees

The **urban heat island effect** refers to the significant rise in temperatures in cities compared to surrounding rural areas, largely due to heat absorption by buildings, roads, and other infrastructure. In Melbourne, this effect is becoming increasingly problematic, contributing to higher energy consumption for cooling, increased air pollution, and negative impacts on public health.

As temperatures continue to rise, the city faces more frequent heatwaves and a decline in livability, especially in densely built urban areas. To combat this, Melbourne has initiated urban greening projects, including the planting of **over 77,000 trees** as of 2024. The goal is to increase canopy coverage to reduce surface temperatures, enhance air quality, and improve the resilience of the city to climate change.

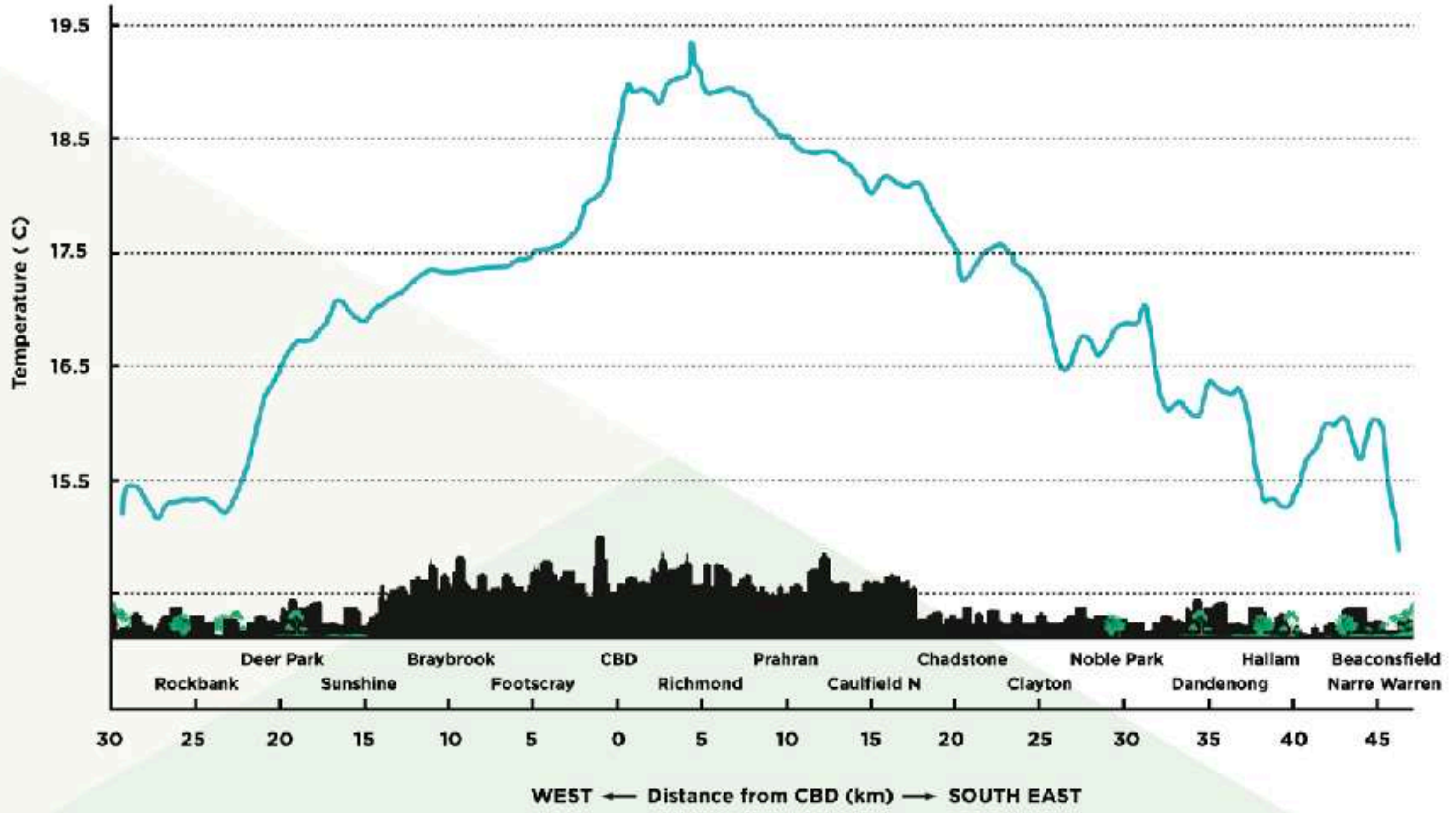


(Source: URBAN FOREST STRATEGY 2024)

Most prominent trees in the City of Melbourne's streets	
Planes (Platanus x acerifolia, P. occidentalis, and P. orientalis 'digitata')	24%
European elms (Ulmus cornubiensis, U. glabra, U. minor and U. procera, but excluding U. parvifolia)	11%
Spotted Gum (Corymbia maculata)	8%
Angophora costata	4%
Lophostemon confertus	3%

Most prominent species within the City of Melbourne

Family	Common name	Total	%
Myrtaceae	Myrtle	29742	42.3%
Mimosaceae	Acacia	7920	11.3%
Ulmaceae	Elm	7245	10.3%
Platanaceae	Plane	6485	9.2%
Casuarinaceae	She-Oak	4750	6.8%
Fagaceae	Beech	1829	2.6%
Moraceae	Fig	1440	2.0%
Rosaceae	Rose	1164	1.7%
Meliaceae	Melia	916	1.3%
Pinaceae	Pines	832	1.2%
Oleaceae	Olives	829	1.2%
Araucariaceae	Araucaria	774	1.1%
Aceraceae	Maples	696	1.0%
Proteaceae	Grevillia	668	1.0%
Anacardiaceae	N/A	609	0.9%



Design. Solution with concepts

Vertical latch-on gardens and **green skyscrapers**

Safety/ Efficient Energy/ Employment

Vertical latch-on green gardens convert skyscraper facades into vibrant, eco-friendly spaces. These modular systems attach directly to building exteriors, creating sustainable, low-maintenance green walls. Powered by automated irrigation and using recycled water, they absorb CO2, reduce heat, and improve air quality. The gardens not only enhance urban aesthetics but also lower energy costs by insulating buildings.

These green spaces support biodiversity and can include a mix of plants for aesthetic appeal or small-scale urban farming. Easily adaptable to new or existing buildings, they contribute to a greener, more sustainable urban environment, promoting well-being and environmental health in densely populated cities.

(Source: Midjourney 2024)

Design. Solution with concepts

Vertical latch-on gardens and **green skyscrapers**

Fitted with Solar panels on the top doe generate energy for the filtration

The **vertical latch-on green gardens** on skyscrapers are enhanced with **solar panels** integrated into the building's design. These solar panels power the automated irrigation systems, ensuring efficient water distribution using renewable energy. By harnessing solar power, the system operates independently of the city grid, reducing energy costs and furthering the building's sustainability goals. The automated system efficiently monitors moisture levels and optimises water usage, contributing to water conservation. This combination of **solar energy and vertical greenery** not only promotes environmental sustainability but also transforms skyscrapers into self-sustaining eco-structures, supporting biodiversity and improving air quality in urban areas.

(Source: Midjourney 2024)

Design. Solution with concepts

Urban farming hubs

Utilising baren spaces

The **Urban Farming Hub** transforms previously unused, barren spaces in suburban areas into productive green zones, powered by **wind turbines** to ensure sustainability. These farming hubs would focus on growing fresh, organic produce that can be distributed locally, reducing the carbon footprint associated with food transportation.

Strategically located in between suburban residential areas, these hubs would utilize renewable energy from **small-scale wind turbines** to power irrigation systems, lighting, and processing equipment. The wind energy ensures that the farming operations are fully sustainable, with minimal environmental impact.

In addition to contributing to local food security, these hubs would also create employment opportunities for the community. Local residents can engage in farming activities, from planting to harvesting, and assist in the distribution of fresh produce to nearby households and markets. This setup not only promotes **local food production** but also encourages the **urban circular economy**, supporting livelihoods while enhancing access to healthy, locally grown food.

With their proximity to residential areas, these hubs provide easy access to fresh produce while contributing to a greener and more resilient suburban ecosystem. The integration of **wind-powered urban farming** fosters community involvement, environmental consciousness, and sustainable living.

Generating employment connecting back to the previous

E-bike solution - for delivering those goods.

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(Source: Midjourney 2024)

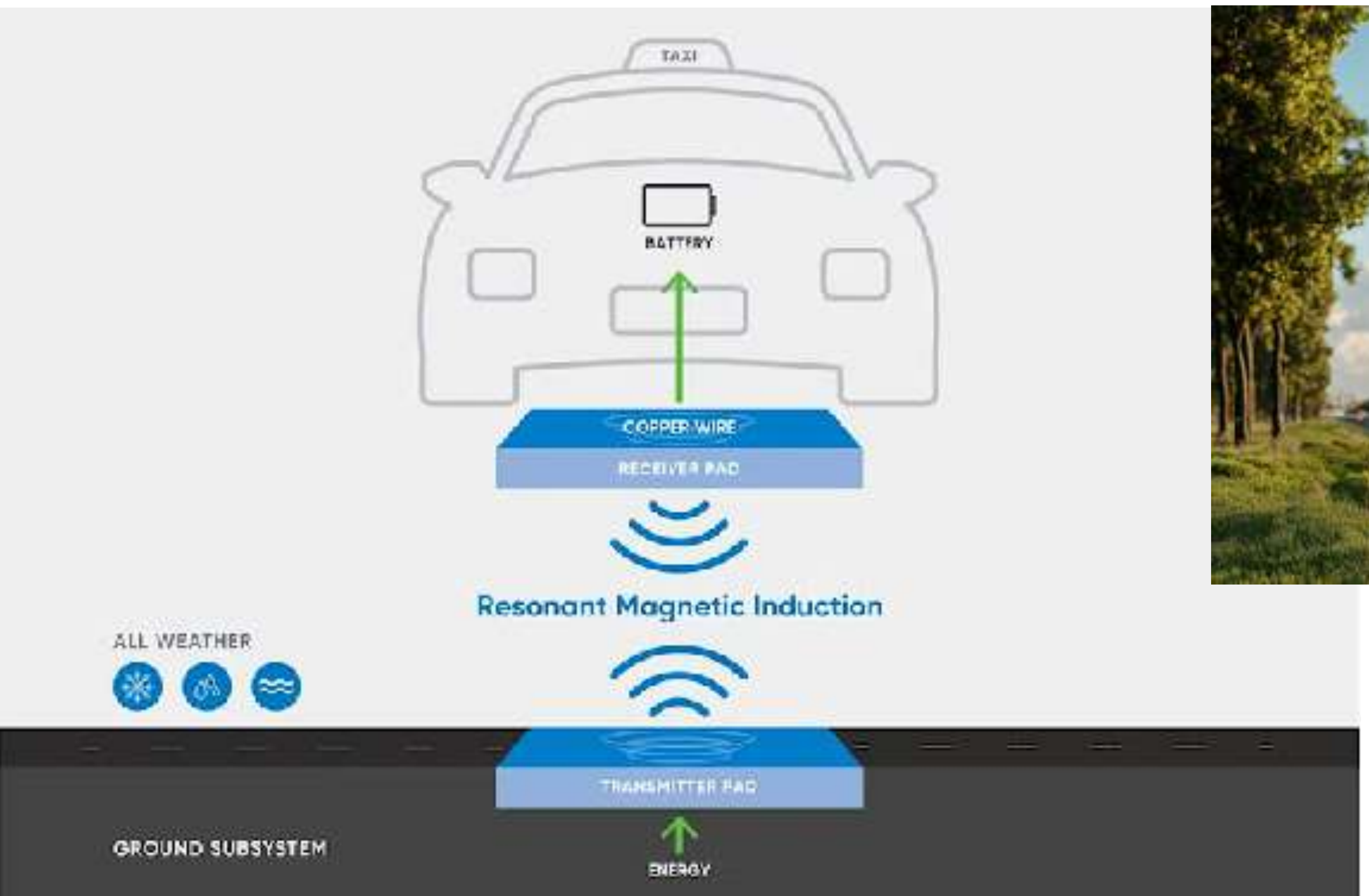
Design. Solution with concepts

Electrifying highways

Attached Wind Turbines along the road

The concept of **electrifying highways** aims to revolutionise transportation by providing on-the-go charging for electric vehicles (EVs), reducing the need for frequent charging stops and encouraging a shift away from petrol and diesel cars. These highways would feature **embedded charging infrastructure**, allowing EVs to charge wirelessly as they drive.

To make the system even more sustainable, **wind turbines** positioned along the highways would generate renewable energy, powering the charging infrastructure. These turbines harness natural wind energy, providing a continuous, eco-friendly source of electricity for the highways. This combination of **electrified roads and renewable wind power** creates a closed-loop system that supports green transportation, reduces emissions, and further accelerates the transition to electric vehicles. The result is a cleaner, more efficient road network that contributes to both **mobility** and **environmental sustainability**.



(Source: Midjourney 2024)

Design. Solution with concepts

Autonomous buses

AI, and real-time data to navigate safely and efficiently

Autonomous buses provide a highly efficient, eco-friendly solution for public transport by operating without human drivers, using advanced sensors, AI, and real-time data to navigate safely and efficiently. These buses reduce traffic congestion and emissions, as they run on electric power, contributing to cleaner air and lower energy consumption. They also optimize routes based on demand, improving service reliability and reducing wait times for passengers. By streamlining public transport, autonomous buses help create a more sustainable urban mobility system that is both convenient and environmentally friendly.

(Source: Midjourney 2024)

Design. Solution with concepts

AI waste management

systems to optimise sorting, recycling, and waste reduction, minimise

AI waste management systems use advanced sensors and machine learning to automatically sort and segregate waste into recycling, compost, and general waste bins. This technology ensures more efficient waste separation, reduces contamination in recycling, and minimises landfill use. By optimising waste handling, these systems help cities lower their environmental impact, increase recycling rates, and contribute to sustainability efforts, while also providing real-time data to improve waste management operations.

(Source: Midjourney 2024)

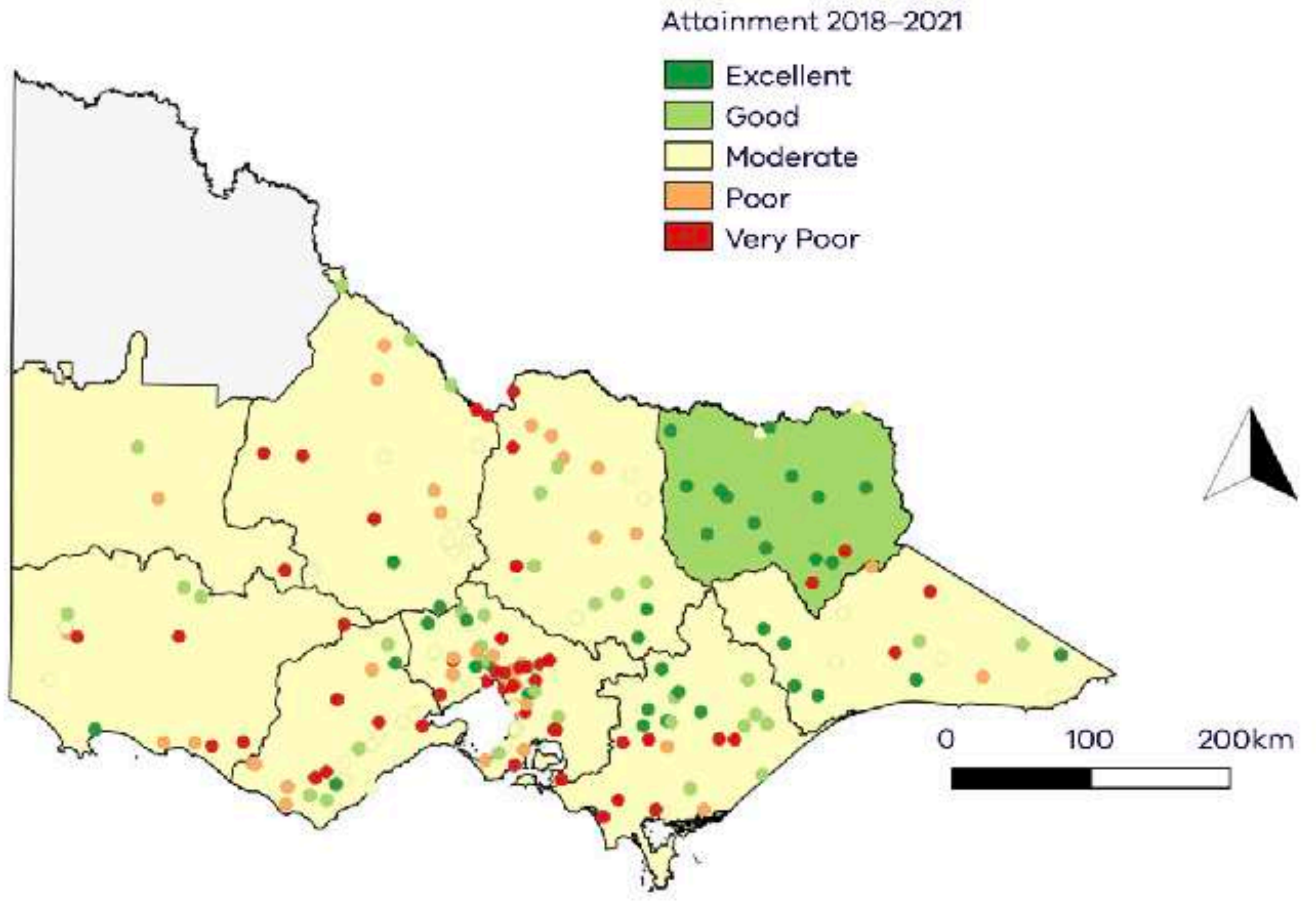
Design. Solution with concepts

Hydro Turbines

for cleansing river pollutants to give clean water.

Hydro turbines designed for **cleansing river pollutants** work by harnessing the natural flow of the river to power filtration systems. These turbines are placed strategically in the water to capture and remove pollutants such as plastics, chemicals, and debris. As water flows through the turbine, it powers integrated filters and purification systems that trap contaminants while allowing clean water to pass through.

The **eco-friendly turbines** are designed to operate without disrupting aquatic life or the natural flow of the river. By using the river's own energy, the system requires no external power sources, making it a sustainable solution for water purification. Over time, these turbines help to significantly reduce pollution levels, improving water quality and contributing to the overall health of the ecosystem, providing cleaner, safer water for both wildlife and human use.



E 2: ERS combined water quality score for Victorian CMA regions (2018-2021) showing scores ividual sites[1]. No fill colour indicates no data.

TABLE 2: Percentage of sites across the study where the *underlying trend* in a parameter has increased, decreased or not changed with statistical significance.

	Percentage of sites (green shading indicates the category with the largest number of sites) where *underlying trend* over 27 years was significantly:		
	Decreasing	Not changing	Increasing
Salinity	46%	39%	16%
Turbidity	7%	13%	80%
Total phosphorus	24%	36%	40%
Total nitrogen	28%	47%	26%
pH	13%	29%	58%
Dissolved oxygen	35%	48%	17%

(Source: Victorian Water Quality Report 2022)

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(Source: Midjourney 2024)

Design. Solution with concepts

Smart parking structures with recreational and habitable spaces for the homeless,Under-educated

providing shelter and support services in under-utilised urban areas.

Smart Parking Structures are designed with a dual-purpose approach to address both urban parking needs and social welfare.

These innovative structures feature **multi-level designs**, where the **lower floors** are dedicated to **parking** for commuters, optimizing space and reducing street congestion in densely populated urban areas.

The **upper floors** are transformed into **recreational and habitable spaces** that provide shelter, education, and support services for the homeless and under-educated populations. These spaces are equipped with basic housing facilities, community centres, and classrooms, offering opportunities for skill development, education, and rehabilitation.

To ensure sustainability, the entire structure is **powered by solar panels**, which provide clean energy to run lighting, heating, and other essential services. This not only minimises the environmental footprint but also offers a self-sustaining solution for energy efficiency.

By integrating **parking with social services**, this smart infrastructure maximises the utility of **under-utilised urban areas**, addressing both mobility challenges and social inequities, while fostering a sense of community and support for vulnerable populations.

(Source: Midjourney 2024)

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(Source: Midjourney 2024)

Bibliography.

City of Melbourne - Pedestrian counting system. (n.d.). https://www.pedestrian.melbourne.vic.gov.au/#date=21-09-2024&sensor=Swa295_T&time=16

Energy Floors. (2024, May 21). *Energy Floors support Coldplay with Kinetic Dancefloors*. https://energy-floors.com/coldplay/ aptic,through%20vibration%20or%20other%20means.>.

Saberi, M. (2018, August 3). How do people use the city? Comparing temporal variation of pedestrian activities, on-street parking usage, traffic volumes, and tweets in Melbourne. https://www.linkedin.com/pulse/how-people-use-city-comparing-temporal-variation-on-street-saberi/

Commercial waste and recycling | City of Melbourne. (n.d.). https://www.melbourne.vic.gov.au/commercial-waste-and-recycling

Taking bold action on climate change | City of Melbourne. (n.d.). https://www.melbourne.vic.gov.au/taking-bold-action-climate-change

Raingarden tree pits | City of Melbourne. (n.d.). https://www.melbourne.vic.gov.au/raingarden-tree-pits

Green roofs | City of Melbourne. (n.d.). https://www.melbourne.vic.gov.au/green-roofs

Constructed wetlands | City of Melbourne. (n.d.). https://www.melbourne.vic.gov.au/constructed-wetlands

Permeable pavement | City of Melbourne. (n.d.). https://www.melbourne.vic.gov.au/permeable-pavement

Sustainable water projects | City of Melbourne. (n.d.). https://www.melbourne.vic.gov.au/sustainable-water-projects

United Nations Sustainable Development goals. (n.d.). Participate Melbourne. https://participate.melbourne.vic.gov.au/united-nations-sustainable-development-goals

Taking bold action on climate change | City of Melbourne. (n.d.-b). https://www.melbourne.vic.gov.au/taking-bold-action-climate-change

Sustainable energy | City of Melbourne. (n.d.). https://www.melbourne.vic.gov.au/sustainable-energy

City resilience | City of Melbourne. (n.d.). https://www.melbourne.vic.gov.au/city-resilience

Climate change mitigation Strategy | City of Melbourne. (n.d.). https://www.melbourne.vic.gov.au/climate-change-mitigation-strategy

Waste reduction | City of Melbourne. (n.d.). https://www.melbourne.vic.gov.au/waste-reduction

Reducing litter | City of Melbourne. (n.d.). https://www.melbourne.vic.gov.au/reducing-litter

Waste and recycling for residents | City of Melbourne. (n.d.). https://www.melbourne.vic.gov.au/waste-and-recycling-residents

Carbon neutral operations | City of Melbourne. (n.d.). https://www.melbourne.vic.gov.au/carbon-neutral-operations

Caulhub. (2021, March 6). *Urban vegetation, urban heat islands and heat vulnerability assessment in Melbourne, 2018*. The Clean Air and Urban Landscapes Hub. https://nespurban.edu.au/publications/urban-vegetation-urban-heat-islands-and-heat-vulnerability-assessment-in-melbourne-2018/

Power Melbourne community battery project | City of Melbourne. (n.d.). https://www.melbourne.vic.gov.au/power-melbourne-community-battery-project

Guthrie, S. (2021, August 12). Wireless electric car charging explained: How it works and why it's the future. *Drive*. https://www.drive.com.au/news/wireless-electric-car-charging/

Bleakley, D. (2023, May 31). Australian company pioneers dynamic charging for electric mining trucks. *The Driven*. https://thedriven.io/2023/05/31/australian-company-pioneers-dynamic-charging-for-electric-mining-trucks/

City of Melbourne. (2012). URBAN FOREST STRATEGY. In *City of Melbourne*. https://www.melbourne.vic.gov.au/sitecollectiondocuments/urban-forest-strategy.pdf

Carey, A. (2019, July 28). Melbourne's green spaces are being lost in rush to build more housing. *The Age*. https://www.theage.com.au/politics/victoria/melbourne-s-green-spaces-are-being-lost-in-rush-to-build-more-housing-20190728-p52bir.html#

https://1ps.technology/i3-energy-storage/

Victorian Department of Environment, Land, Water and Planning 2022, *Victorian water quality analysis: 2022 summary report*, Victorian Government, Melbourne. Available at: https://www.water.vic.gov.au/__data/assets/pdf_file/0036/685890/Victorian-water-quality-analysis-2022-summary-report.pdf [Accessed 26 September 2024].