URBAN MOBILITY CONCEPT FOR MELBOURNE 2030

A SUSTAINABLE, CONNECTED VISION FOR MELBOURNE'S FUTURE

SOPHIA LI
UNIVERSITY OF MELBOURNE

AGENDA

01
Melbourne’s Mobitlity Challeneges

02
SWOT Analysis of Current Mobility

03
Solutions Overview

04
Public Mobility Solutions

05
Private Mobility Solutions

06
Urban Planning Solutions

07
Connectivity Solutions

08
Next Steps for Implementation

09
Conclusion: Melbourne’s Sustainable Future

10
References

MELBOURNE'S MOBILITY CHALLENGES

Melbourne's Current Context:

- Rapid **population growth** (expected to reach 6 million by 2030).
- Increasing **urban sprawl, congestion, and emissions**, particularly in outer suburbs.
- Rising **climate change** risks, including heatwaves and flooding.
- **Inequity** in public transport access, with some areas underserved.

Challenges:

- **Congestion**: Growing traffic volumes are leading to longer commute times and reduced liveability.
- **Car Dependency**: Suburban residents heavily rely on private vehicles, increasing carbon emissions.
- **Sustainability**: Melbourne must achieve carbon neutrality and reduce its environmental footprint.

Goal: Create a holistic **mobility strategy** for Melbourne by **2030**, focusing on **sustainability, equity, and resilience**.

SWOT ANALYSIS OF CURRENT MOBILITY

Strengths:

- **Strong Transport Network:** The iconic tram system and well-established public transport infrastructure provide a foundation for innovation.
- **Engaged Population:** Melbournians are open to sustainable, tech-driven solutions.

Weaknesses:

- **High Car Dependency:** Outer suburbs heavily rely on private vehicles, increasing congestion and pollution.
- **Uneven Access:** Public transport coverage is concentrated in inner areas, leaving outer regions underserved.

Opportunities:

- **Technological Advancements:** New developments in electric vehicles (EVs), autonomous transport, and AI can help address mobility challenges.
- **Sustainable Infrastructure:** Growing public interest in urban greening and renewable energy presents opportunities for eco-friendly mobility.

Threats:

- **Climate Change:** Melbourne is vulnerable to rising temperatures, heatwaves, and flooding.
- **Population Growth:** An expanding population risks overwhelming existing infrastructure, reducing liveability.

SOLUTIONS OVERVIEW

Vision for 2030:

Melbourne will adopt **green, smart, and connected mobility systems** that address both current weaknesses and future needs. This holistic concept focuses on **four key areas:**

1. **Public Mobility**: Flexible, eco-friendly public transport systems.
2. **Private Mobility:** Reduced car dependency and a shift towards shared, clean transport.
3. **Urban Planning:** Resilient, sustainable city design to combat climate impacts.
4. **Connectivity**: Integrated, smart systems connecting suburbs to the city and beyond.

Key Targets:

- **Reduce emissions** from transport by **50% by 2030**.
- **Expand public transport coverage** to outer suburbs.
- Integrate **AI** and **renewable energy** into Melbourne's mobility infrastructure.
- Align with the **United Nations Sustainable Development Goals (SDGs).**

PUBLIC MOBILITY SOLUTIONS

Problem: Congestion and Limited Public Transport in Growing Suburbs

Melbourne's traditional transport network is **strained by rapid population growth**, especially in outer suburbs where **public transport options are limited**, leading to **over-reliance on cars**.

SOLUTION 1: GREEN PODS ON DEMAND

Description:

Small, electric autonomous shuttles that provide **on-demand, shared** public transport. These pods dynamically **adjust routes** based on **real-time commuter demand** (via an **app**), offering flexible, eco-friendly transport across urban and suburban areas.

Benefits:

- **Solar-powered** charging stations for sustainability.
- Reduced reliance on private cars.
- Seamless **integration** with existing public transport.

Feasibility: Leverages existing AI and autonomous vehicle technology. Pilot programs for similar systems have been successful in other cities.

SOLUTION 2: SOLAR SKYWALKS AND SKYTRAMS

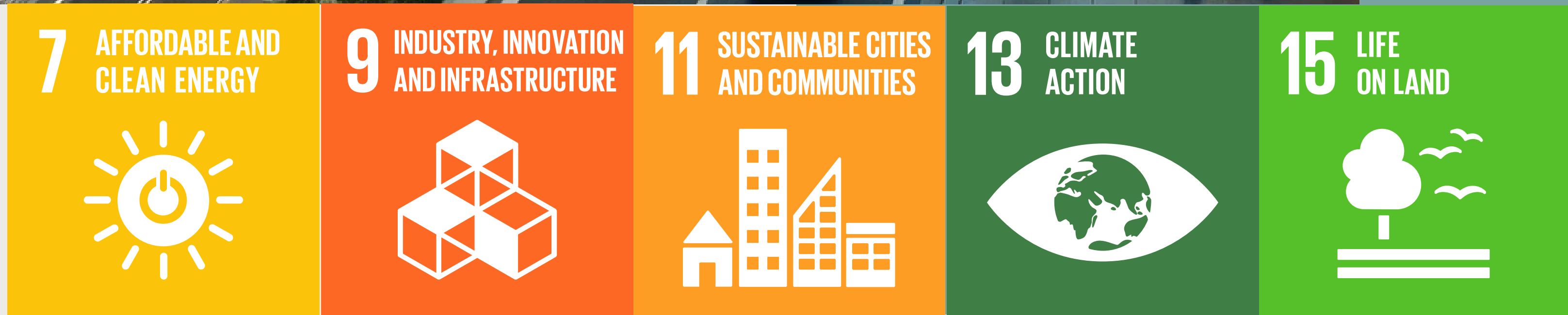
Description:

SkyWalks are **elevated pedestrian walkways** lined with **solar panels** to generate renewable energy. ***SkyTrams***, powered by solar energy, operate on these elevated tracks, providing a **fast, congestion-free** alternative to ground-based transport.

Benefits:

- Integrates **green infrastructure** into the urban landscape.
- Encourages walking and reduces the **heat island effect.**
- Power generated is **fed back into the grid** to support other transport systems.

Feasibility: Solar panel technology is widely available, and elevated tram systems are technically feasible with infrastructure adjustments.



PRIVATE MOBILITY SOLUTIONS

Problem: Heavy Car Dependency and Rising Emissions

The **outer suburbs** are highly reliant on **private vehicles**, contributing to Melbourne's congestion and air pollution. A shift is needed to **sustainable, shared modes of transport**.

SOLUTION 1: CYCLING SUPERHIGHWAYS WITH E-BIKE STATIONS

Description:

Dedicated, wide **bike lanes** connecting **outer suburbs to urban centres**, designed for **safety** and **speed**. **E-Bike rental stations** are positioned along these routes, powered by **solar energy**, allowing commuters to cover longer distances with ease.

Benefits:

- **Reduces reliance** on private cars for short- to medium-distance travel.
- Encourages **healthier, active** transport options.
- **Affordable, low-maintenance** transportation powered by renewable energy.

Feasibility: Many cities (e.g., Copenhagen, Amsterdam) have successfully implemented cycling superhighways. Melbourne's infrastructure can be adapted with relatively low costs.

3 GOOD HEALTH AND WELL-BEING
7 AFFORDABLE AND CLEAN ENERGY
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
11 SUSTAINABLE CITIES AND COMMUNITIES
13 CLIMATE ACTION

SOLUTION 2: ECOLANES - SMART ROADS WITH DYNAMIC EV CHARGING

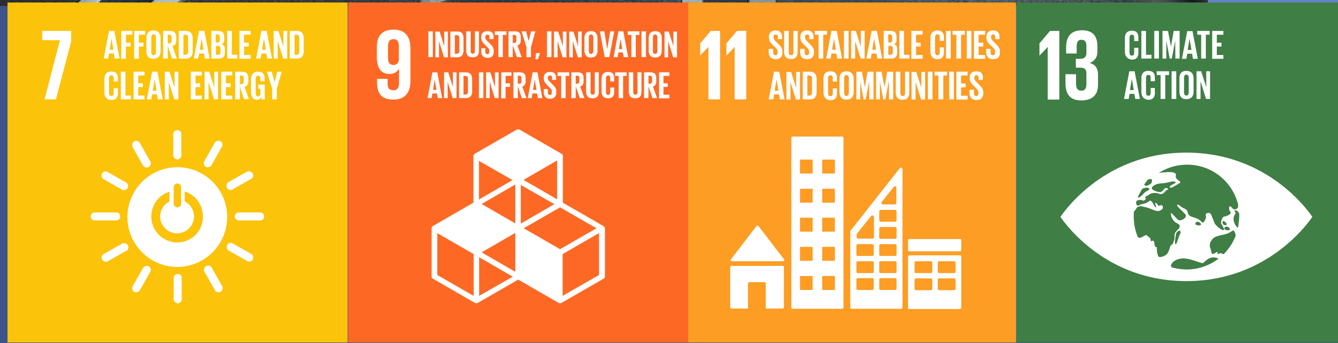
Description:

EcoLanes are roads embedded with **wireless charging infrastructure**, allowing electric vehicles (EVs) to **charge as they drive**. This technology uses **induction coils** beneath the road surface, reducing the need for stationary charging stops. These lanes prioritise **shared EVs** and **public transport vehicles.**

Benefits:

- Promotes EV adoption by **eliminating range anxiety**.
- **Reduces congestion** by supporting more shared vehicles on the road.
- Ensures that EVs are always charged and ready to go.

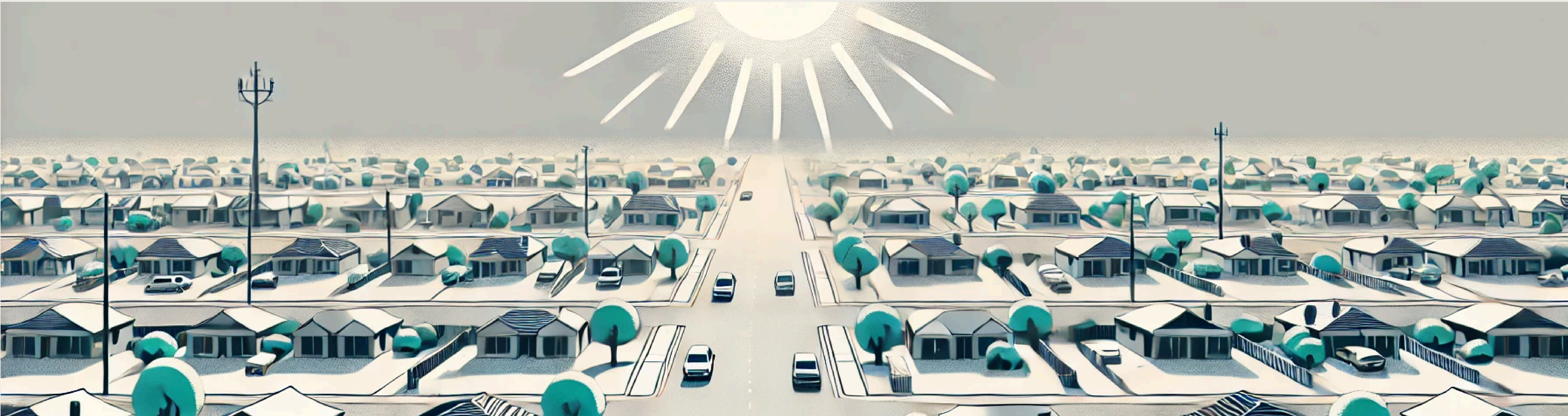
Feasibility: Dynamic charging lanes are in development and have been piloted in countries such as Sweden and Germany.



URBAN PLANNING SOLUTIONS

Problem: Urban Sprawl and Vulnerability to Climate Change

Melbourne's **sprawling development** has contributed to a **reliance on cars** and worsened the **heat island effect**. There is a need for **climate-resilient infrastructure** and more compact, sustainable development.



SOLUTION 1: URBAN FORESTS – VERTICAL FARMS AND GREEN TOWERS

Description:

Multi-functional towers that serve as **vertical farms, air purifiers**, and **biodiversity habitats**. These green towers would be distributed throughout **high-density** areas and provide **local food production**, **reduce heat,** and **capture rainwater** for reuse.

Benefits:

- Reduces the **urban heat island effect** by increasing greenery.
- Provides **sustainable, local food production**.
- Supports **biodiversity** in urban areas.

Feasibility: Vertical farming is a growing industry with successful implementations worldwide. Melbourne's climate is ideal for urban greening.

SOLUTION 2: CLIMATE-RESILIENT NEIGHBOURHOODS - SPONGE CITY DISTRICTS

Description:

Neighbourhoods designed with **permeable materials, green roofs, and urban wetlands** to absorb excess rainwater, reduce flooding, and cool the environment. These ***Sponge City Districts*** help mitigate climate risks while improving urban aesthetics and functionality.

Benefits:

- Reduces the risk of **flooding** during extreme weather.
- Improves **water management** by capturing and purifying stormwater.
- Enhances **liveability** with green spaces and cooler neighbourhoods.

Feasibility: Sponge city techniques have been tested in cities like Shenzhen, China, and could be adapted for Melbourne's needs.

CONNECTIVITY SOLUTIONS

Problem: Disconnected Suburbs and Fragmented Mobility Systems

Melbourne's outer suburbs are **poorly connected** to the central business district (CBD), creating **inequalities** in access to jobs and services. Mobility systems are **fragmented** and **inefficient**.

SOLUTION 1: HYPERLOOP LITE - HIGH-SPEED, LOW-ENERGY SUBURBAN RAIL

Description:

A **Hyperloop-inspired "Lite" system** uses **magnetic propulsion** to connect **outer suburbs** to the city centre with f**ast, low-energy rail**. This system operates at moderate speeds and is powered by **renewable energy**, offering a clean and efficient alternative to traditional commuting.

Benefits:

- Drastically **reduces travel times**.
- Promotes the **decentralisatio**n of employment, encouraging suburban development.
- Powered by renewable energy, making it sustainable for the future.

Feasibility: While full-scale Hyperloop systems are still in development, "lite" versions focused on moderate speeds and lower energy requirements are feasible within the 2030 timeline.

SOLUTION 2: CITYBRAIN - AI-POWERED INTEGRATED MOBILITY HUB

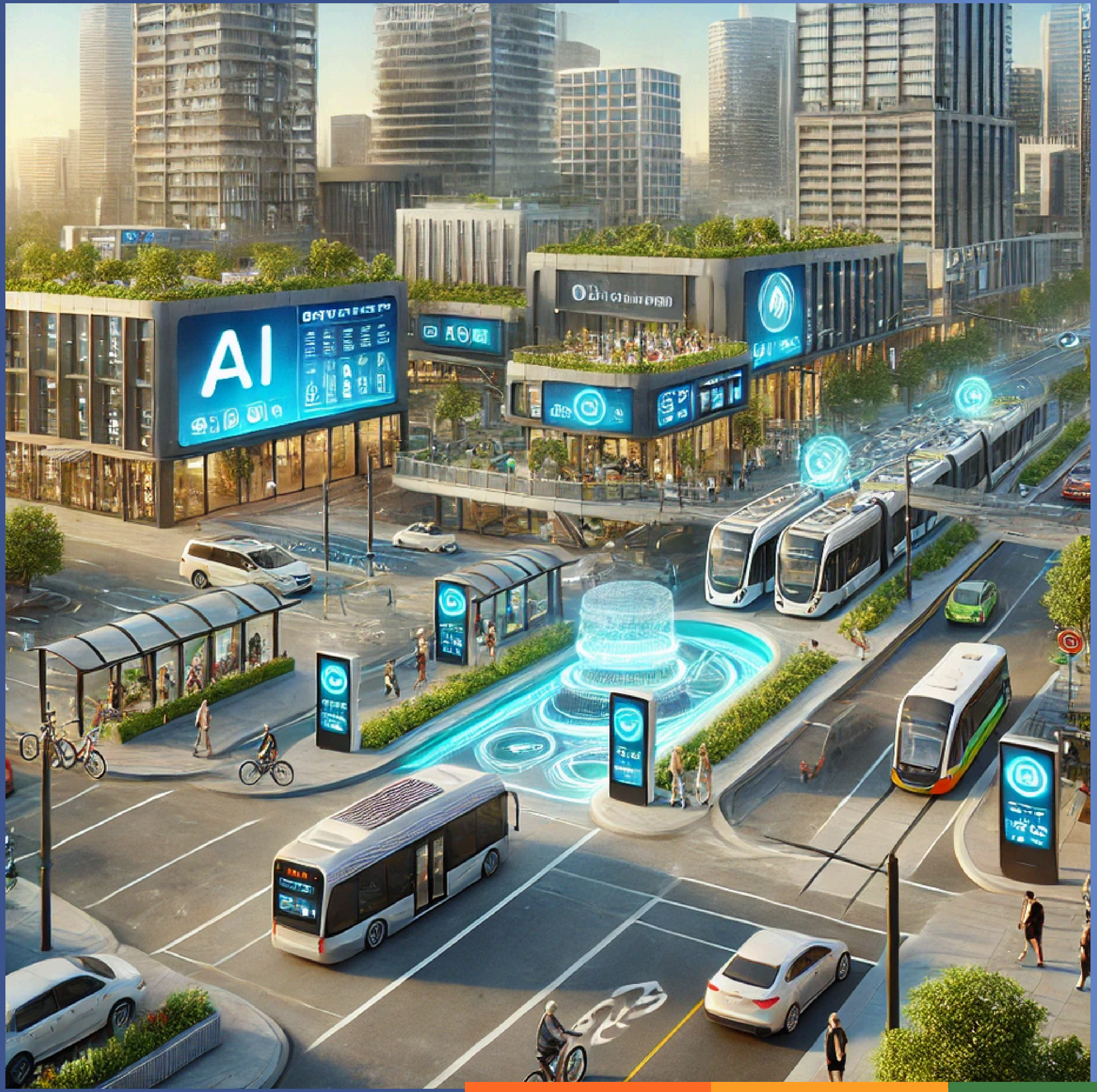
Description:

CityBrain is an **AI-powered platform** that **integrates all modes of transport**—trams, buses, EVs, bikes, and autonomous shuttles—into a seamless system. CityBrain uses **AI to optimise routes** in real time, predict congestion, and offer **personalised mobility recommendations**.

Benefits:

- Improves the **efficiency** of public and private transport.
- Provides **real-time updates** and route optimisation for commuters.
- Reduces travel times and costs by **minimising congestion and inefficiencies.**

Feasibility: AI-driven systems have already been piloted in cities like Singapore, and Melbourne can implement similar platforms using existing data.



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

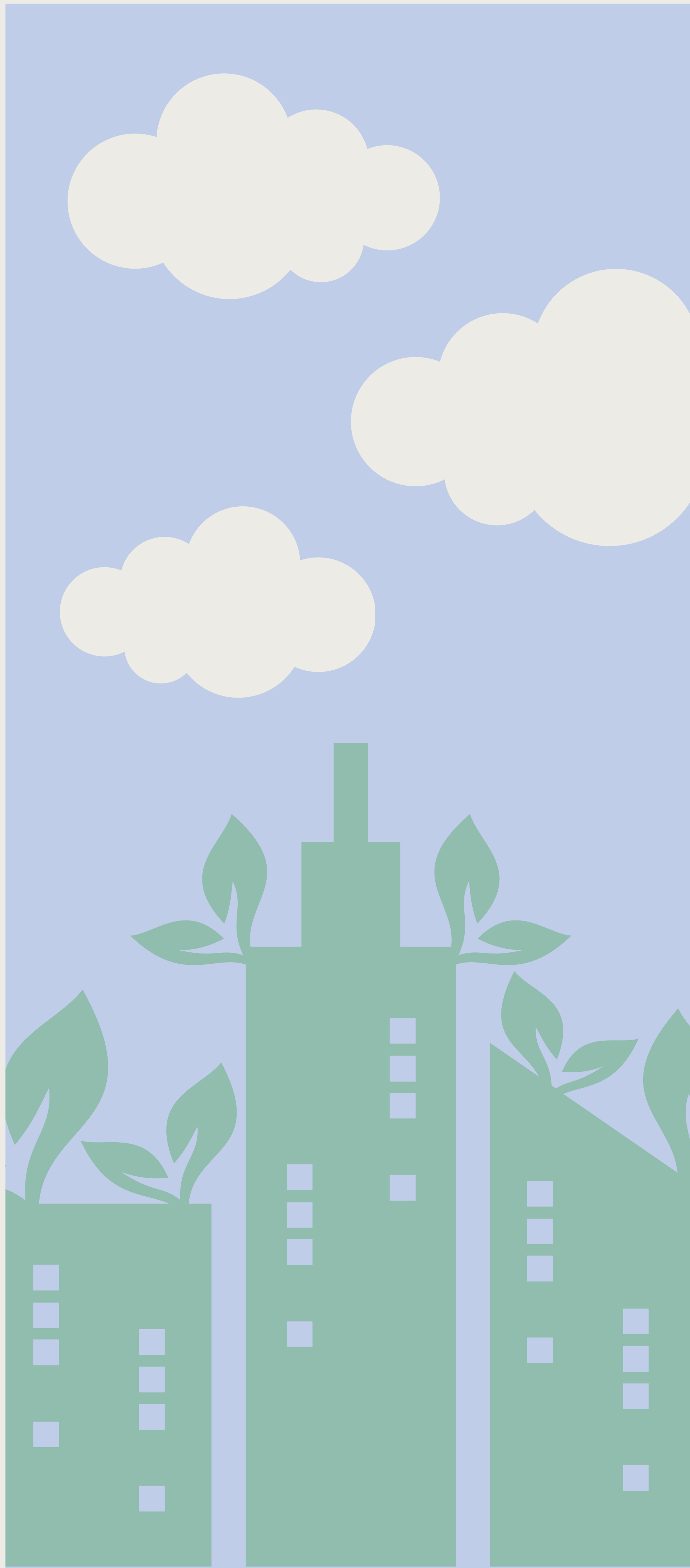
11 SUSTAINABLE CITIES AND COMMUNITIES

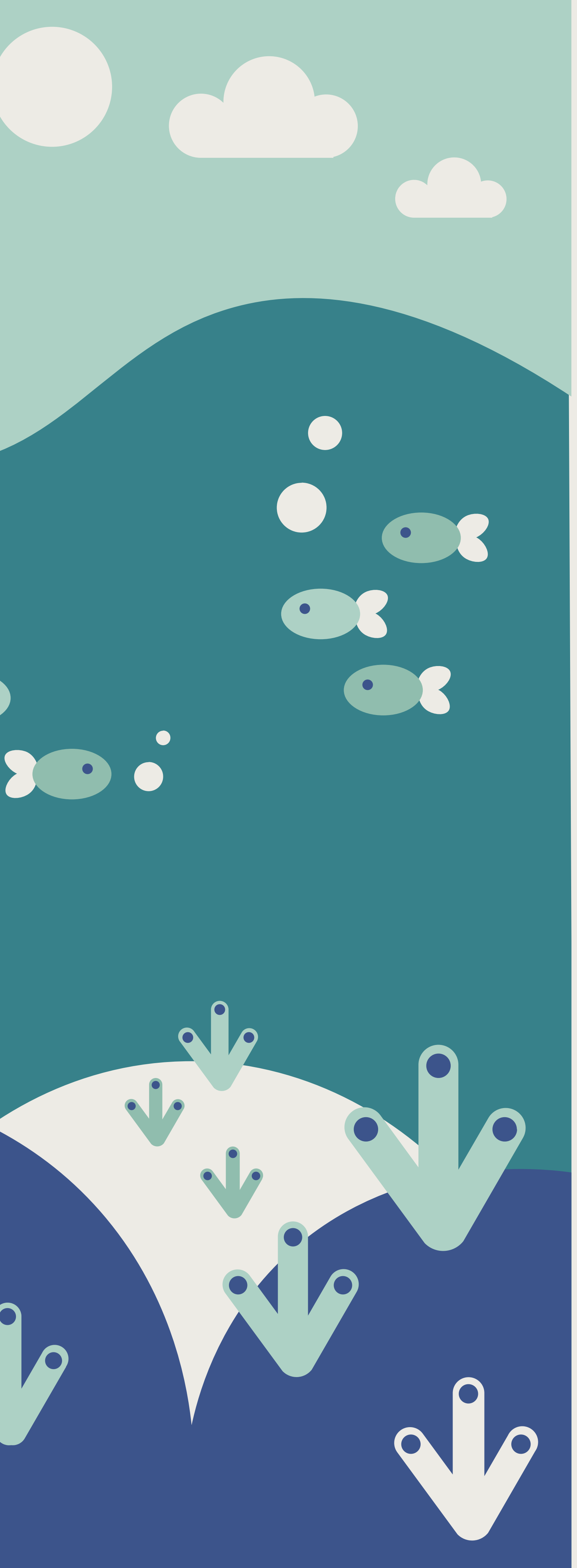
13 CLIMATE ACTION

NEXT STEPS FOR IMPLEMENTATION

Next Steps for Realising the Vision

1. **Feasibility Studies:** Conduct detailed analyses for Green Pods, Cycling Superhighways, and EcoLanes.
2. **Pilot Programs:** Begin small-scale trials for Green Pods and E-Bike stations in key suburban areas.
3. **Stakeholder Engagement:** Partner with local councils, businesses, and community groups to support project rollouts.
4. **Funding and Policy Development:** Secure government funding and create supportive policies for sustainable infrastructure development.
5. **Phased Implementation:** Roll out full-scale solutions based on the results of pilot programs and stakeholder input.





MELBOURNE 2030: A SUSTAINABLE, CONNECTED CITY

Final thought...

By integrating **dynamic, green public transport systems**, **sustainable private mobility options**, **climate-resilient urban planning**, and **AI-driven connectivity**, Melbourne can reduce emissions, enhance liveability, and create a more sustainable future for its residents.

Melbourne's future mobility vision aligns with **global sustainability goals**, ensuring a **resilient, accessible, and green urban environment by 2030**.

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