

YOUR MELBOURNE 2030





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ACKNOWLEDGEMENT OF COUNTRY



"We would like to acknowledge Wurundjeri people of the Kulin Nations as the Traditional Owners of the land on which the University stands. We respectfully recognise Elders past and present."





CHALLENGES

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MELBOURNE RESIDENT JOURNEY

INTRODUCTION

Introducing "Melbourne 2030: The Moving Project" - a visionary project that seeks to shape the future of Melbourne's landscape. "MOVING" symbolizes the journey toward a future of sustainable mobility. Our purpose is to ignite the imaginations of aspiring futurists, empowering them to envision a city where mobility is connected and equitable while seamlessly aligning with the United Nations Sustainable Development Goals. By identifying challenges and opportunities to bring forth potential solutions, we will dive into sculpting a sustainable, inclusive, and dynamic Melbourne for 2030 and beyond.



CHALLENGES

⁰¹ Parking space

The City of Melbourne faces several challenges in convincing citizens to live sustainably and adopt electric vehicles. The limited availability of onstreet charging infrastructure in the central city can discourage electric vehicle adoption for residents without off-street parking, limiting accessibility. Balancing the need for charging infrastructure with high-density urban development is a complex challenge (City of Melbourne 2023).



- roads, trains, and trams.





02 Personal transport

• **Rural**: Installing and setting up electric vehicle charging infrastructure can be more challenging due to the presence of smaller low-voltage transformers and longer feeder lines (Ochoa 2021).





• Urban: High population density in city with a concentrated presence of electric vehicles results in asset congestion, leading to elevated peak demand and potential strain on the existing network infrastructure (Ochoa 2021).

Public transport

• Victorians experiencing significant congestion on

• Public transport was also projected to **get more** crowded by 2046, with more than 30% of public transport trips being undertaken in crowded conditions (Infrastructure Victoria 2020). • On-street parking in Melbourne is cheaper than off-street options, which encourages drivers to cruise for cheaper spots, worsening congestion. • In a survey, **4,000 Melburnians** expressed a wish for faster, more affordable, and more frequent services (Infrastructure Victoria 2023).





Green space 04

- The matter of unequal access to green spaces holds particular significance in urban areas in Melbourne (Cities People Love 2021).
- Climate change has brought about a rise in hot weather and heatwayes in Melbourne.
- Victoria's fire seasons have lengthened since the mid-1990s, with a projected 42 per cent annual increase in **fire days** in Melbourne by 2050, leading to the world's worst air quality in January 2020 due to bushfire smoke.
- Extended drought and extreme heat, along with water restrictions and aging trees, threaten a potential loss of 27% of trees in the next decade and up to 44% within the next 20 years (City of Melbourne n.d).

OPPORTUNITIES



⁰¹ The City of Melbourne's **Transport Strategy 2030**

The City of Melbourne's Transport Strategy 2030 to expand charging stations off-street car parks generates in opportunities and direction for the establishment of more charging points combined with smart city technology to optimize charging infrastructure, which can further encourage EV usage while addressing space limitations (City of Melbourne 2023).

The Greenline Project

The Greenline Project of the City of Melbourne's proposed primary objective is to create a seamless and interconnected journey along the riverbank, enhancing public spaces for various activities, including events, public art, and recreation.

(City of Melbourne 2023).





03 Wireless EV charging

With fast wireless charging technology, dynamic electric vehicle charging has emerged as a game-changer. It works by aligning magnetic coils in the charger and the car's underside, enabling efficient charging.

In 2023, an Australian firm led the way in introducing dynamic charging for electric mining trucks in Brisbane, showcasing its potential. Despite standardization challenges, dynamic charging offers significant benefits to electric vehicle users, especially those living in remote areas or taking long trips. This technology can alleviate range anxiety, making electric vehicles more practical for a broader range of users.





OBJECTIVES AND VISION

"The City of Melbourne's forthcoming project is dedicated to fostering sustainable living and nurturing a more cohesive, eco-conscious urban environment. In harmony with this visionary goal, our proposal sets forth a holistic urban planning strategy seamlessly integrated with the new mobility strategy."

We aspire to accomplish the following key objectives:

- Urban Planning
- Public Mobility
- Personal Mobility
- Sustainability
- Connectivity

By striving to achieve these objectives, we aim to not only reduce our impact on the environment but also create a more equitable and inclusive Melbourne, where human equality is at the core of our sustainable vision.



SUSTAINABLE SMART PARKING BUILDING Skylight Solar panel and drainage system Green space Parking space Ρ (J)O

The Smart Sustainable Parking Building is an innovative multi-level structure designed to address the growing need for electric vehicle parking while promoting sustainability and community engagement. Spanning **15 levels**, it offers unique features that contribute to a more sustainable urban environment.

The concept of the Smart Sustainable Parking Building is perfectly aligned with the **City of Melbourne's Transport Strategy 2030**, as it not only supports the city's vision to expand charging infrastructure in off-street car parks but also embraces smart city technology to optimize charging facilities. This integrated approach not only encourages electric vehicle adoption but also effectively addresses space constraints, making it a valuable asset in the city's sustainable transportation initiatives.

The building provides a **Electric bikes** (Level 1) with state-of-the-art **Sta** spaces. These stations we transfer, supporting the The building will be in includes a central contrawill dynamically guide optimizing space usage. The charging system we **system**, optimizing powe





PARKING AND CHARGING

The building provides ample space for electric vehicles, with dedicated levels for **Electric bikes** (Level 1) and **Electric cars** (Level 2 to 13). Those levels are equipped with state-of-the-art **Static Wireless Charging** coils embedded in designated parking spaces. These stations will utilize inductive charging technology for efficient power transfer, supporting the transition to electric mobility and reducing emissions.

The building will be installed with a **Smart Parking Management System** which includes a central control system to monitor parking occupancy and availability. It will dynamically guide electric vehicle drivers to available charging spots, optimizing space usage.

The charging system will be integrated with the **Building's energy management system**, optimizing power usage and reducing demand during peak hours.





SMART SUSTAINABLE PARKING BUILDING GREEN SPACE

Features:

- self-sufficiency.

 - and toluene (Aerify 2019).
 - space.

Benefits:

- transportation.
- strengthening social bonds.

• The **glass wall system** around levels 14 and 15 in the green space design allows natural sunlight to penetrate the area, reducing the need for artificial lighting and creating a pleasant environment for residents and visitors.

• Including **fruit and vegetable gardens** provides an opportunity for urban agriculture, allowing nearby residents and drivers to grow their own fresh produce, fostering a sense of community, volunteering, and promoting food

• Herbs (Basil, Mint, Rosemary): Grow a small herb garden on a shelf or wallmounted planter for fresh culinary herbs.

• **Ficus Benjamina** is highly proficient in air purification. As per NASA's Clean Air Study, this plant can effectively clean the air of formaldehyde, xylene,

• Vertical Green Wall, Verticle Planting and Hydroponic System to maximize

• Walkability space for nearby residents and electric vehicle owners supporting physical activity and outdoor relaxation, featuring well-paved paths, seating, and lighting for residents' convenience and enjoyment.

• Promoting environmental sustainability by reducing the urban heat island effect, conserving energy, and supporting local biodiversity.

• Residents can enjoy fresh, locally grown fruits and vegetables, encouraging healthier eating habits and diminishing the carbon footprint linked to food

• Fostering community engagement and interaction among residents,



SMART SUSTAINABLE PARKING BUILDING SOLAR PANEL AND DRAINAGE SYSTEM

Features:

- **Photovoltaic panels** on the roof with storage systems to store excess energy.
- A drainage system installed along the roofline collects rainwater and greywater from the building. This collected water undergoes filtration, typically facilitated by a water filtration system. The filtered water is then distributed through a network of pipes to irrigate the plants both within and around the building.

Benefits:

- Electric vehicles charged with solar energy produce no direct emissions, decreasing the carbon footprint of transportation, and stress on the grid during peak hours.
- Improve building insulation, reducing heating and cooling energy consumption.
- Helps manage rainwater efficiently, preventing flooding and erosion while nourishing the plants and vegetation on the green roof.
- Cost savings for building owners.



Constructed with a **Hexagonal structure** allowing sunlight to reach the roof from all directions.







ELECTRIFIED ROAD



In envisioning Melbourne's sustainable future, we propose the installation of an extensive network of **Electrified Roads**, utilizing dynamic induction charging technology. By 2030, Melbourne can be at the forefront of innovation by integrating charging coils directly into its road infrastructure. The Electrified Road initiative aims to revolutionize rural and suburban transportation by installing electrified roads on **main routes** connecting these areas to inner cities. This transformative approach will redefine electric vehicle mobility, offering uninterrupted charging while in motion and alleviating the need for frequent stops at traditional charging stations.



Features:

- and rural areas.
- while driving.

Benefits:

- and reducing travel times.

• Dynamic Induction Charging: Melbourne's Electrified Road system embeds charging coils directly under the roadway. Electric vehicles passing over these coils capture the magnetic field, converting it into electricity to power the vehicle while in motion, creating continuous charging wirelessly zones that connect urban

• Road Integration: Charging infrastructure is strategically installed along dedicated lanes and major roadways such as Monash Freeway and Mornington Peninsula Freeway, enabling compatible electric vehicles to charge wirelessly

• Seamless on-the-go charging reduces congestion at traditional charging stations and solves the problem of limiting charging infrastructure, improving traffic flow,

• Electric vehicle drivers enjoy uninterrupted journeys and are free of range anxiety, making urban-suburban-rural commuting faster and more efficient.



SUSTAINABLE **AUTONOMOUS MINIBUSES**

Connecting healthcare facilities, making it easier for patients and healthcare workers to access hospitals and clinics

> Partner with local universities and educational institutions to provide efficient transportation services within and around campuses

Operating along

popular **tourist** routes

Sustainable Autonomous MiniBuses is designed to complement existing transportation options, supporting the Zero Emission Busses project of the City of Melbourne, and enhancing accessibility and environmental consciousness. These MiniBuses, designed collaboratively with local artists and crafted from ecofriendly materials, represent a forward-thinking approach to urban mobility.



Features:

The MiniBuses are equipped with advanced **autonomous driving systems**, ensuring safe and efficient transportation while reducing congestion and emissions. The interior features of MiniBus are sustainable materials, including vegan leather for seating and recycled steel for the structure, indicating environmental responsibility. Local artists from Melbourne will contribute to the interior and exterior design, infusing the MiniBuses with unique cultural and creative elements like Melbourne's vibrant cultural scene, fostering community pride. The MiniBuses are powered by clean electric systems and can be charged within the Electrified Road system. The MiniBuses prioritize accessibility with features such as low-floor entry, wheelchair ramps, and designated spaces for passengers with disabilities. Passengers can request rides through the userfriendly PTV app, allowing for flexible and convenient transportation options.



Benefits:

- and reducing travel times.

• Generates opportunities for local artists, promotes technological innovation, and creates jobs, contributing to economic growth.

• Prioritizing accessibility ensures that all residents, including those with disabilities, can enjoy the benefits of sustainable transportation.

• Reduce traffic congestion by reducing single-drive vehicles, enhancing traffic flow,





The floating garden is a visionary solution designed to meet the growing demand for green spaces in urban settings while extending the reach of greenery into suburban areas, providing support for the City of Melbourne's Greenline project. These gardens not only provide inviting spaces for leisurely walks but also foster a sense of community, welcoming people from all walks of life. By diversifying local biodiversity, they enrich the urban environment and contribute to a healthier living environment for residents, making a positive impact on both city and suburban life.

Features:



Providing green spaces in densely populated urban areas, enhances the aesthetics of the cityscape and offers recreational opportunities for residents.

Benefits:



Community Engagement: Creating and maintaining floating gardens can involve community participation and engagement in urban planning. Residents can take part in planting and maintaining these gardens, fostering a sense of **ownership** and **environmental stewardship**.



Climate Resilience: Floating gardens **absorb rainwater**, reducing flooding and erosion risks. They also regulate water temperature, preventing algae blooms and supporting aquatic ecosystems. Additionally, these gardens enhance air quality by absorbing CO2 and purifying the air, contributing to urban climate resilience.



Water filtration: Through the plants' root systems and microbial activity, floating gardens filter and purify water, improving water quality and reducing pollution.



Employment opportunities: Creating employment opportunities in various fields, from design and construction to maintenance and **community engagement**.



Serve as habitats for aquatic and semi-aquatic wildlife, such as fish, birds, and insects, contributing to biodiversity in urban environments.



The extensive **root system** hangs beneath the buoyant structure, extending into the water to provide stability, absorb nutrients, and aid in water filtration.

3

UPDATE PTV APP

The new PTV app is the ultimate mobility companion. It integrates electric minibusses, offers specific routes to public destinations, provides smart vehicle parking, and keeps residents updated in real-time. Easily manage their myki, earn green rewards, and connect with your community for a smarter, greener city experience.

Features:

Green Mobility Rewards:

Embrace sustainable travel and earn rewards along the way. Collect points for choosing eco-friendly transport options and redeem them for exclusive offers, discounts, and more.

Personalized Journey Planning:

Customize journey to suit your preferences. Select eco-friendly options, set accessibility preferences, or plan routes optimized for scenic views.

Seamless Integration with Electric Minibuses:

Easily locate and book electric rides minibus for а emissions-free convenient. journey.

▲ Incomming E-r	oad
For you	
Your green rewards	50
Public destinations	
Plan your journey	
Book Minibus	
Newselses	
Nearest parking	
For you Plan Search	myki More

Tailored Routes to Public Destinations: The app provides specific routes to popular public destinations.

Smart Parking: Find available charging stations and reserve spots for your vehicles.

Dynamic charging locator: Offers up-to-the-minute information on the availability and location of dynamic charging stations.



Features:



High-efficiency solar panels are integrated into A built-in **touch-screen** display provides realthe frame of the electric bike. These panels time data on speed, distance, battery status, continuously charge the bike's battery while and solar charging performance. It also offers exposed to sunlight, extending the riding range GPS navigation and smartphone connectivity and reducing the need for charging. for app-based features.

Benefits:

- integration.
- emissions.



Benefits:

- Seamless mobility experience for all people, include disability and old people.
- Safe time to choose transport, prersonalize planning and find parking spot.
- More eco-friendly options for transportation.



THE SOLARBIKE

The City of Melbourne's Transport Strategy 2030 proposed to create a favourable environment for electric bikes for moving people and goods. Consequently, we introduce the concept of solarpowered electric bikes - SolarBike is an innovative electric bicycle designed to provide an ecofriendly and technologically advanced riding experience. It is designed to harness the power of the sun through integrated **solar panels**, enhancing convenience and sustainability.



• Riders benefit from reduced energy and maintenance costs, along with the convenience of quick charging, extended battery life, and solar power

• Promotes riding as physical activity and well-being while reducing carbon

CUSTOMER JOURNEY 1





Enjoy the fresh air and tranquillity of the green space after work.



CUSTOMER JOURNEY 2





Go out with friends.

Use PTV app to book a minibus to the floating garden.



Come in the minibus.



See other people are also exercise around the floating garden.

Arrive to the floating garden in Docklands.

The minibus drives on the electrified road.



Walk down to the floating garden, communicate with other people, and enjoy a tranquil environment. Aerify (2019) Air-Purifying Plants That Can Clean Your Home's Air, Aerify Plants, accessed 26 September 2023. <u>https://www.aerifyplants.com/post/12-air-purifying-plants-that-can-clean-your-home-s-air#:~:text=Also%20known%20as%20Weeping%20Fig</u>

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