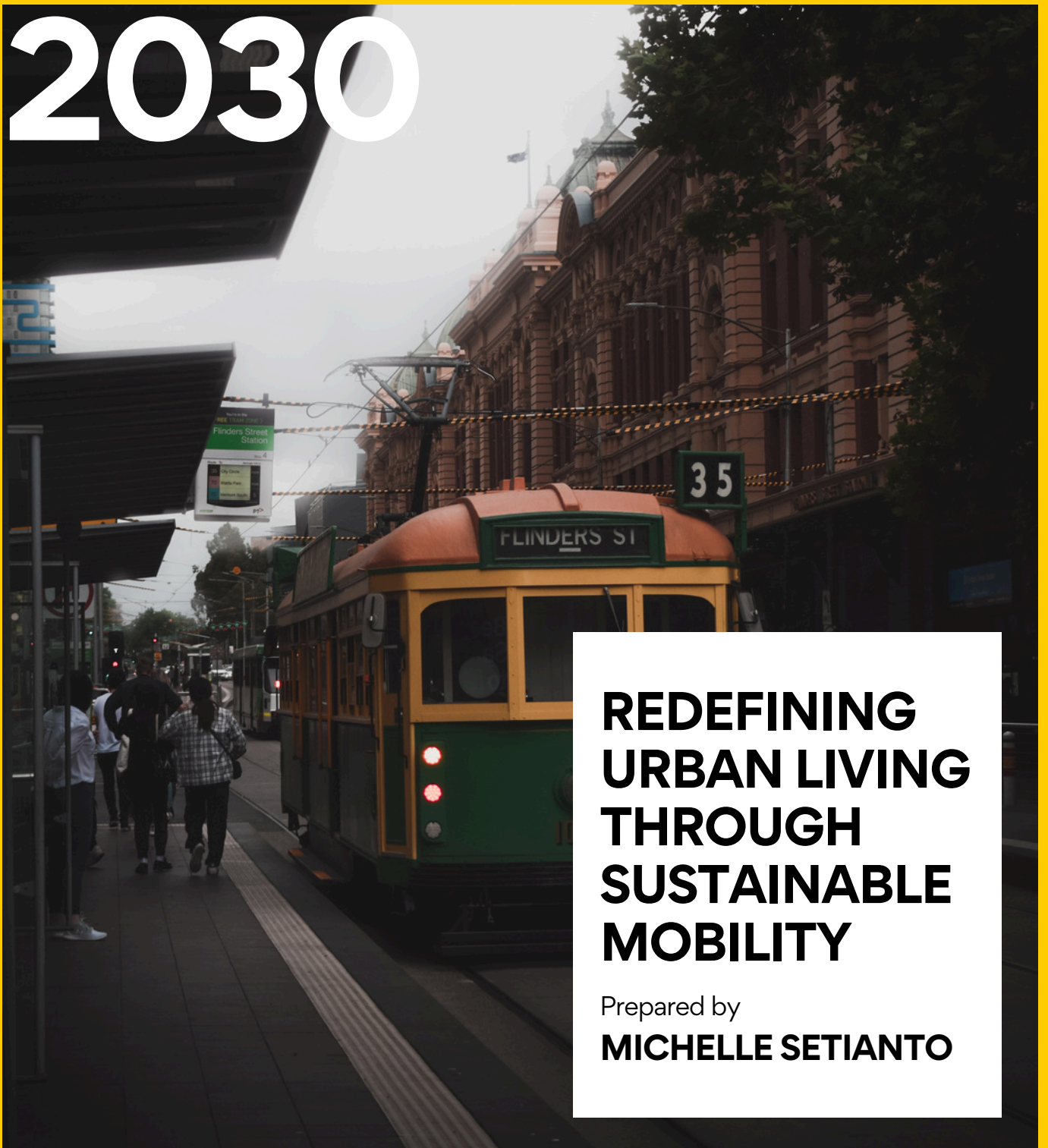# MELBOURNE REIMAGINED 2030

REDEFINING URBAN LIVING THROUGH SUSTAINABLE MOBILITY

Prepared by

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INTRODUCTION: THE CONTEXT

Melbourne is facing significant challenges from rapid population growth, urban sprawl, and climate change. These pressures are resulting in higher carbon emissions, poor air quality, and environmental degradation. If left unaddressed, these issues will negatively impact residents' health, widen social inequalities, and undermine Melbourne's livability. Longer commutes, rising emissions, and disjointed suburban communities are becoming everyday realities for many.

THE PROBLEM

THE SOLUTION

As Melbourne continues to expand, urban sprawl and a lack of sustainable public transport options are leading to a rise in carbon emissions and pollution. Many suburban areas remain underserved by clean public transport, forcing residents to depend on fossil-fuel-powered cars. This over-reliance on traditional vehicles contributes to rising emissions, worsening air quality, and increasing public health risks. Without intervention, Melbourne risks facing growing inequality, declining air quality, and a future where the city's environmental sustainability is at stake.

Our proposed urban mobility strategy integrates sustainable transport solutions with cutting-edge EV technology and smart infrastructure. By expanding AI-powered public transport systems, increasing EV infrastructure, and creating green corridors, we can drastically reduce carbon emissions, improve air quality, and enhance urban connectivity. These solutions are aligned with Melbourne's policy goals and are essential for maintaining the city's sustainability and livability, while preventing future environmental and public health crises.

"Imagine a future where AI-powered public transport connects every corner of the city, green spaces link neighbourhoods, and electric vehicles glide along clean energy corridors. This is the Melbourne of 2030—where sustainability meets innovation for the benefit of all."

VISION FOR MELBOURNE 2030

Melbourne 2030: A city where innovative, sustainable mobility connects communities, reduces environmental impact, and enhances quality of life for all its residents, fostering a resilient, equitable, and eco-friendly urban landscape.

Core SDGs Supporting a Broader Sustainability Vision

7 AFFORDABLE AND CLEAN ENERGY	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	11 SUSTAINABLE CITIES AND COMMUNITIES	13 CLIMATE ACTION
Accelerate EV adoption to replace fossil-fuel vehicles.	**Implement smart, AI-driven infrastructure to optimise transport networks .**	**Expand public transport access to underserved suburban areas, ensuring that all communities are connected.**	**Emission Reduction.**
Renewable Integration to Public Transportation.	**Resilient City:** Urban areas connected via smart systems.	**Green Space Expansion.**	**Community Engagement:** Recycling participation through educational programs.

CURRENT STATE OF URBAN MOBILITY

## A. Public and Private Transport Usage

Monthly Public Transport Patronage By Mode
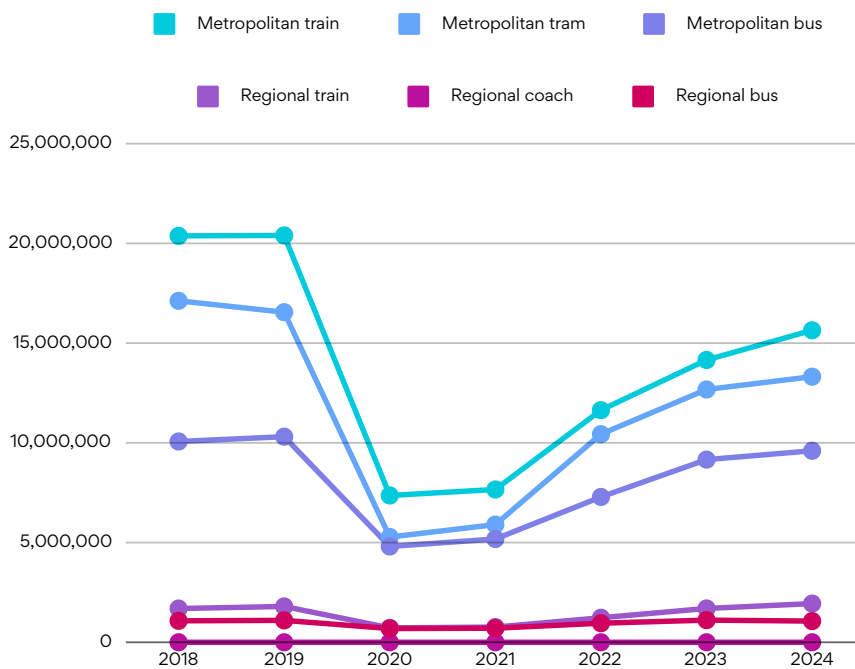
The data (Victorian Government Data Directory, 2024) shows a strong recovery in Melbourne's public transport usage from 2021 to 2024, with metropolitan trains reaching 15.6 million riders (38%) and trams at 13.3 million (32%). While public transport usage is recovering, over 90% of trips in Melbourne are still made by fossil-fuel-powered vehicles, driving high carbon emissions and worsening air quality. To meet sustainability goals, Melbourne must accelerate the shift to electric vehicles (EVs) and clean public transport options, such as electric buses and trams, supported by expanded EV infrastructure.

How People Travelled to Work

Despite growing investment in public transport, which offers a more sustainable alternative, fossil-fuel-powered cars remain the dominant choice for commuting. To lower Melbourne's carbon footprint, a greater emphasis on electrification of both private and public transport is needed. Expanding EV adoption, particularly in underserved areas, and providing accessible EV charging infrastructure will be key to reducing the city's emissions and improving air quality.
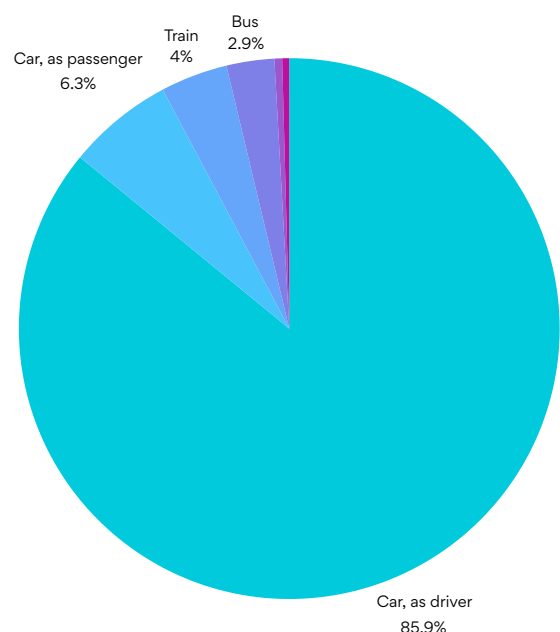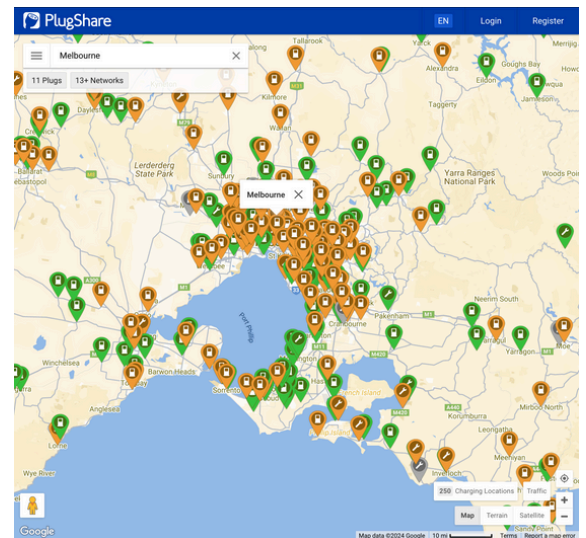
B. Insufficient EV Adoption

EV Adoption & Infrastructure

Metric	EVs	Non-EVs (Petrol, Diesel, Hybrid)	Total
Total New Vehicle Sales (Victoria)	11,514	142,200	153,714
EV Market Share (Victoria)	7.5%	92.5%	100%
EV Sales (Australia-wide)	43,151	538,608	581,759
Australian EV Market Share	7.4%	92.6%	100%

Source: Electric Vehicle Council's 2023 Report

In Melbourne, electric vehicle (EV) adoption is growing steadily, with EVs accounting for 7.5% of new vehicle sales in Victoria in 2023. However, challenges remain, particularly in the availability of charging infrastructure. Currently, there are over 2,392 public EV charging points across the state, but the EV-to-charger ratio is approximately 16.5 vehicles per charging point, which indicates a gap between the growing number of EVs and the available charging infrastructure. This gap is even more pronounced in suburban areas, where charging stations are sparse (Electric Vehicle Council, 2023; Fitch Solutions, 2023).

C. Green Corridors and Active Mobility

Melbourne can enhance mobility and reduce emissions by expanding its green corridors. These green spaces encourage active transport–walking and cycling–while reducing the reliance on fossil-fuel-powered vehicles. Expanding green corridors by 15-20% will promote low-emission transport and healthier lifestyle, especially in undeserved suburban areas.

- Melbourne has over **480 hectares of green spaces**, but many are concentrated in the inner city, leaving outer suburbs underserved (City of Melbourne, 2023).
- **Urban sprawl** in Melbourne has increased private car usage by **10% over the past decade**, leading to more emissions (INRIX, 2023).
- Expanding **green corridors** could increase cycling and walking by **15-20%**, reducing vehicle emissions and promoting healthier lifestyles (Sustainability Victoria, 2023).
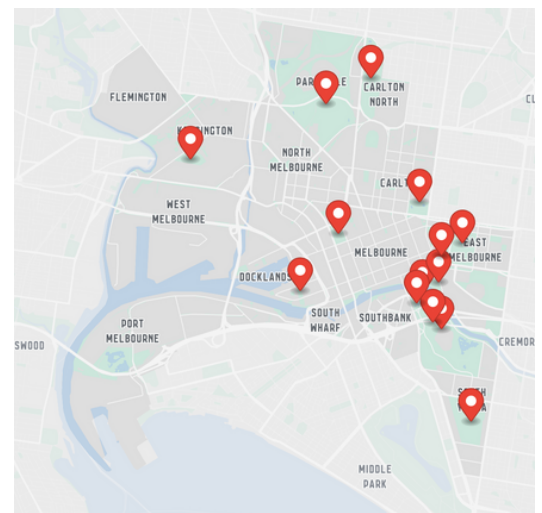
KEY CHALLENGES AND OPPORTUNITIES

S

Strengths

- **Established Public Transport:** Serves as a foundation for expanding on-demand EV shuttles and MaaS integration.
- **Green Spaces:** 480+ hectares offer opportunities for green corridors, supporting active transport and reducing emissions.
- **Digital Infrastructure:** The PTV app provides a base for expanding into a full MaaS platform with EV charging and shuttle services.

W

Weaknesses

- **Fossil-Fuel Dependency:** Private transportation trips rely heavily on fossil-fuel vehicles, delaying the transition to EVs.
- **Limited EV Charging:** 16.5 EVs per charger, limiting infrastructure in suburban areas, slows the adoption of on-demand electric shuttles.

O

Opportunities

- **MaaS Implementation:** Expanding the existing PTV app into an integrated MaaS Platform.
- **On-Demand EV Shuttles:** Expand access to clean transport in underserved areas, reducing fossil-fuel reliance.
- **Green Corridor Expansion:** Potential to increase cycling and walking by 15-20% through new green corridors linking.

T

Threats

- **Urban Sprawl:** Increases travel distances, challenging the implementation of low-emission transport solutions.
- **Funding Gaps:** Delays in infrastructure investment—especially for EV charging and MaaS—could slow the transition to sustainable mobility.

STRATEGIC SOLUTION

Phase 1

Pilot MaaS Integration

- Launch a pilot Mobility-as-a-Service (MaaS) platform in inner Melbourne, integrating public transport, bike-sharing, and ride-sharing into one app.

Phase 2

Expand MaaS to Suburbs

- Extend MaaS to suburban areas, adding real-time EV charging, on-demand electric shuttles, and cycling options to reduce fossil fuel reliance.

Phase 3

Compact City Implementation & Green Corridors

- Develop green corridors that connect suburbs to transport hubs.
- Use the MaaS platform to optimise routes and electric shuttle services.

Phase 5

Full MaaS Rollout

- Fully integrate MaaS city-wide, enabling seamless transitions between public transport, EV shuttles, and cycling, creating a clean, connected city.

Phase 4

EV Infrastructure Expansion

- Partner with BMW to scale EV charging and on-demand shuttles, building a sustainable transport system with a strong EV foundation.

This phased approach to implementing MaaS and the Compact City concept is essential for tackling Melbourne's urban mobility challenges. Successful examples in cities like Helsinki and Stockholm have shown that MaaS can reduce car usage by 10%.

By 2027, Melbourne's existing PTV app can be expanded into a fully-fledged MaaS platform, integrating on-demand transport solutions like electric shuttles and bike-sharing.

Additionally, expanding green corridors will encourage active transport, reducing congestion and emissions. By 2030, Melbourne will have transformed into a city where residents can access essential services within 15 minutes, supported by sustainable mobility and clean energy. The full rollout of MaaS combined with expanded EV infrastructure, will position Melbourne for sustainable growth.

MOBILITY-AS-A-SERVICE

PTV App Limitations

- **Limited Multi-Modal Integration:** Lacks integration with ride-sharing, bike-sharing, and EV charging.
- **No Payment Integration:** Does not support unified payment for multi-modal journeys.
- **Lacks Alternative Route Suggestions:** Only provides real-time disruption alerts, not eco-friendly route options.

Specific Improvements

### Integrate All Public Transport & On-Demand Electric Shuttle

Integrate **bike-sharing, scooter,** and **EV shuttles** to enable **seamless multi-modal travel,** reducing dependence on fossil-fuel vehicle.

Payment Gateway

The app needs a **unified payment system** where users can pay for multiple transport modes in on transaction. Payment models could include **pay-as-you-go** and **monthly subscriptions.**

Incentives for Eco-Friendly Choices

Make the platform able to track carbon footprints and offer rewards for selecting low-emission transport options.
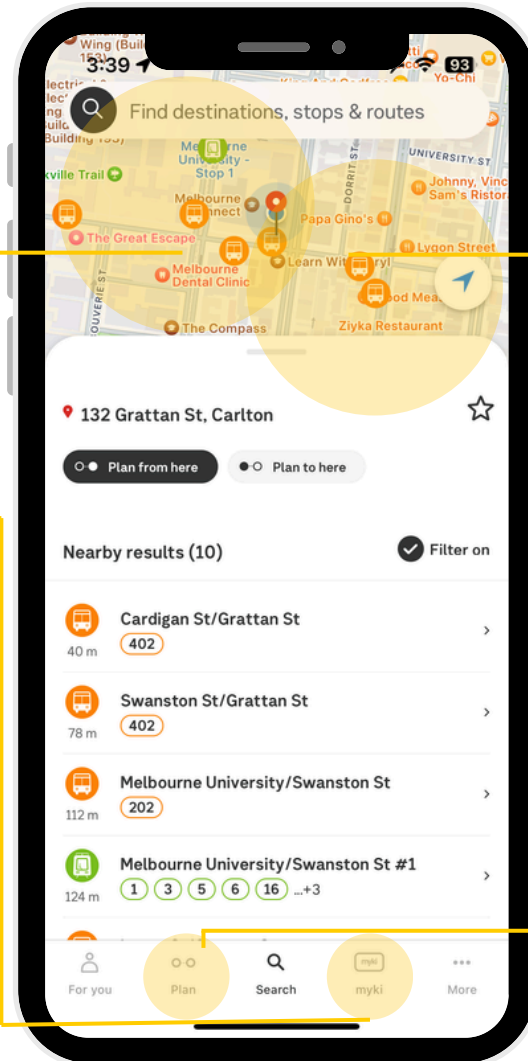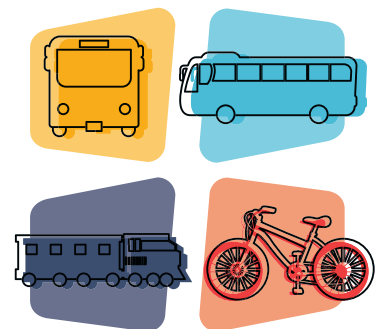
New Features to Add

EV Charging Integration

Working together with **BMW's ConnectedDrive** technology to incorporate **real-time EV charging station availability** to support the growing demand for EVs.

Route Optimisation with AI

Use **AI-based algorithms** to provide users with the most efficient and eco friendly travel routes, combining multiple transport modes.
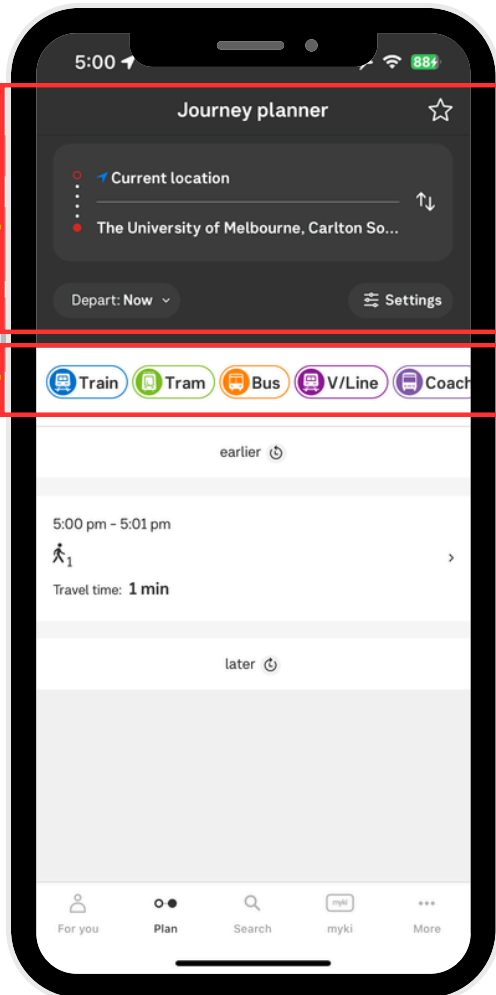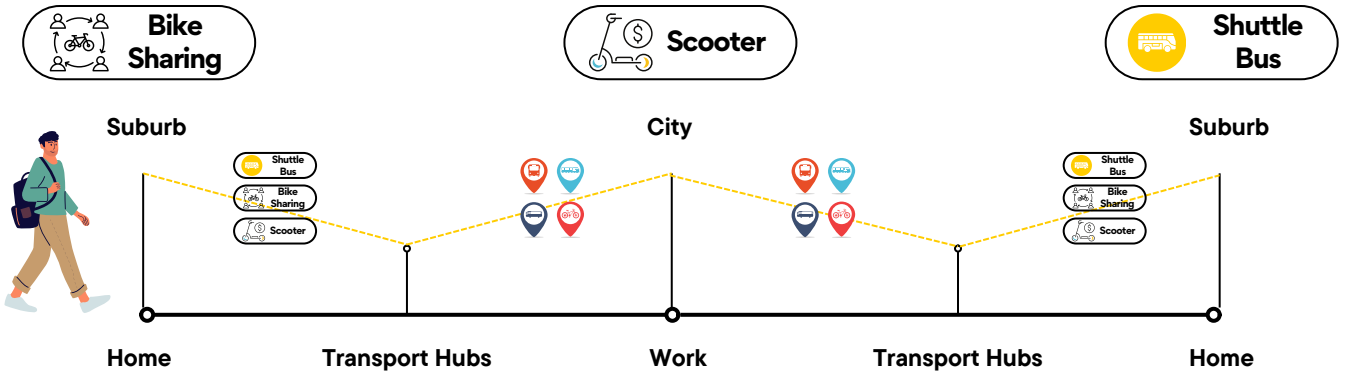

Precedent from a Success Story: Helsinki, Finland

Helsinki's Whim app was one of the first fully operational MaaS platforms. It integrates public transport, ride-hailing, car-sharing, and bike-sharing into a single service.

Metric	Before MaaS (%)	After MaaS (%)
Car Ownership	45	33
Multi-Modal Trip Use	25	50
Public Transport Use Increase	—	12

MOBILITY-AS-A-SERVICE

Integrate All Public Transport & On-Demand Electric Shuttle

Residents can combine walking, cycling, ride-sharing, and shuttle services in one cohesive journey, making urban areas more connected and accessible without the need for personal vehicles.
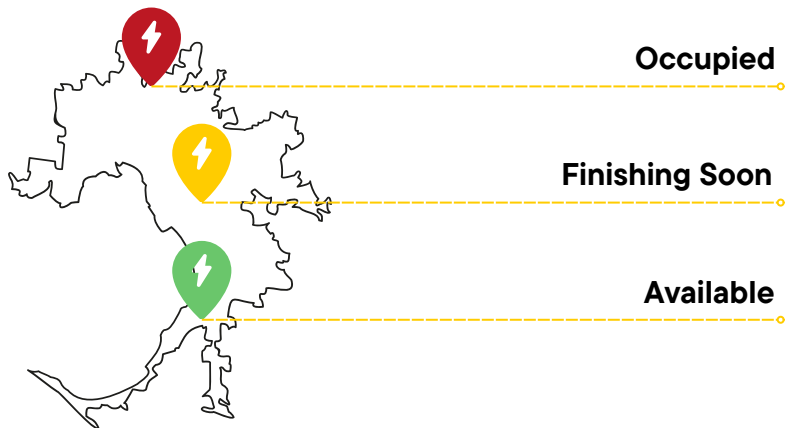
Bike Sharing

Scooter

Shuttle Bus

Suburb — City — Suburb

Home — Transport Hubs — Work — Transport Hubs — Home

Shuttle Bus / Bike Sharing / Scooter

EV Charging Integration

EV Charging

Integration will allow users to view **real-time availability** of charging stations. Users will be able to **locate nearby chargers**, **check if they are in use**, and even **reserve a spot** in advance, reducing waiting times and optimising charging efficiency.

EV Charging Indicators

Occupied

**Finishing Soon**

Available

Route Optimisation with AI

Use **AI-based algorithms** to provide users with the most efficient and eco-friendly travel routes, incorporating multiple transport modes such as public transport, on-demand shuttles, ride-sharing, cycling, and walking. By leveraging real-time data, this feature will optimize journeys to minimize time, cost, and environmental impact.

MOBILITY-AS-A-SERVICE

Payment Gateway

Implement a unified payment system within the MaaS platform that allows users to seamlessly pay for multiple transport modes—such as ride-sharing, bike-sharing, EV shuttles, and public transport—in a single transaction. The system will also expand Myki Mobile, currently only available on Android, to support iPhones and other devices, ensuring accessibility for all users.
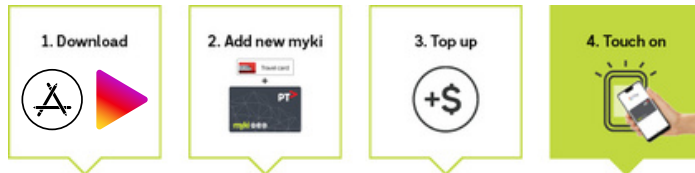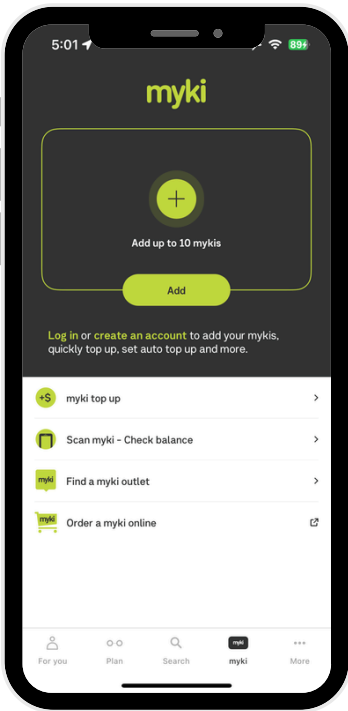
Flexible Payment Options:
- Pay-as-you-go for occasional users.
- Monthly subscriptions for regular commuters, offering cost-effective access to bundled services.
- Prepaid Wallet: Users can top up credits in advance and use them across all transport modes.
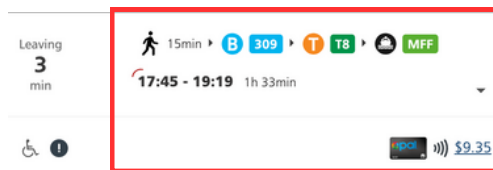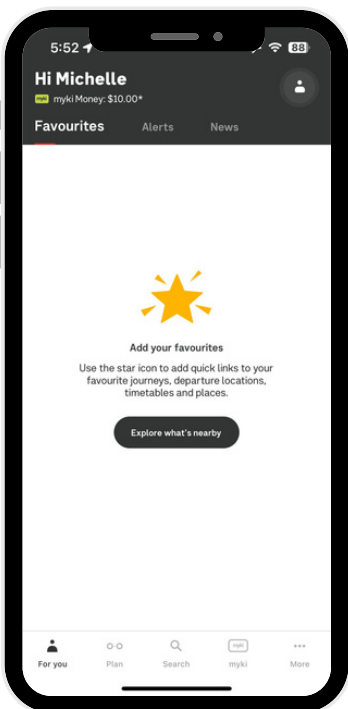

Image source: example from Sydney's Transport Trip Planner.

Real-Time Fare Calculation:
- Automatically calculates the total fare for a journey across multiple transport modes, showing users a clear breakdown of costs.

Incentives for Eco-Friendly Choices

Motivate users to choose low-emission transport options by offering rewards and tracking their carbon footprints. This initiative promotes sustainable mobility while helping Melbourne meet its climate action targets.

Melbourne University

Bike Sharing

Tram

BMW Australia

CO_2 Emissions estimate: 17 kg CO2e
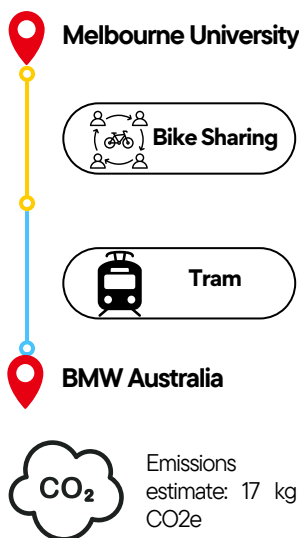
Carbon Footprint Tracking:
- The MaaS platform will include a feature that tracks users' carbon emissions based on their transport choices, whether it's public transport, electric vehicles, or bike-sharing.

Reward System for Green Choices:
- These rewards can take the form of discounts on future travel, cashback, or even loyalty points that can be redeemed for free rides or public transport credits.
- Potential partnerships with businesses could also offer discounts at local eco-conscious retailers or community services (e.g., gyms, cafes) as part of the reward system.

COMPACT CITY

✳ WHAT IS IT?

The Compact City is an urban planning concept where all essential services—such as work, education, healthcare, shopping, and recreation—are accessible within a 15-minute walk or bike ride from people's homes.

REDUCE TRAFFIC CONGESTION

LOWER CARBON EMISSIONS

IMPROVE PUBLIC HEALTH

INCREASE SOCIAL EQUITY

IMPLEMENTATION PLAN

Create Mixed-Use Zoning Policies
- Rezoning suburban areas to allow for the construction of multi-use buildings.
- Providing tax incentives to developers that build mixed-use properties in targeted neighbourhoods.

Enhance Active Transport Infrastructure
- Build dedicated cycling lanes & walking paths that connect residential neighbourhoods to local amenities.
- Introduce bike-sharing and EV charging stations in key locations.
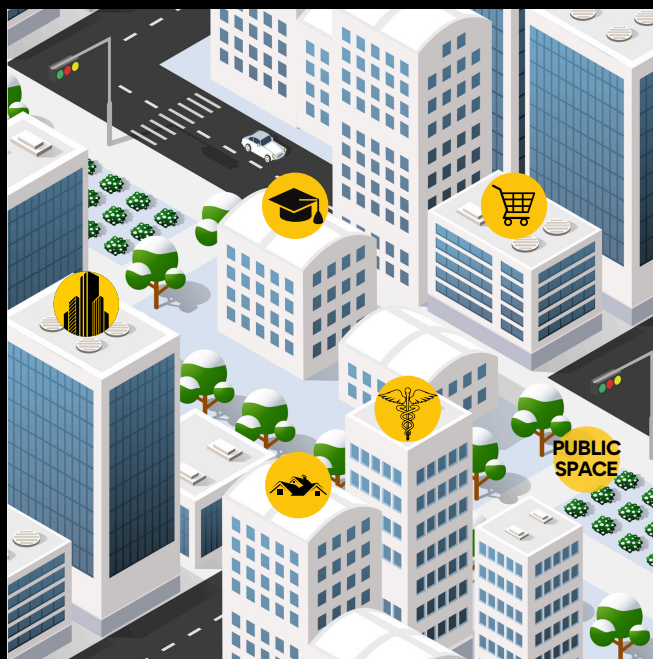
PILOT PROJECT

To test the feasibility of the Compact City concept, start with pilot neighbourhoods that offer both opportunities for success and the ability to scale the concept over time.

The criteria for selecting pilot neighbourhoods :
- **Existing Public Transport:**
- **Density and Growth Potential**
- **Accessibility Gaps**

BRUNSWICK   PRESTON

FOOTSCRAY

PUBLIC SPACE

Expand Public Transport Access
- Extend bus and tram lines to undeserved areas.
- Introducing on-demand electric shuttles to connect low-density neighbourhoods to major transport hubs.

Build Community Hubs
- Convert under-utilised spaces into community service hubs.
- Ensure that each hub includes healthcare facilities, recreational spaces (gyms, parks), educational services, and co-working areas.

Foster Community Engagement
- Hosting community workshops to gather input and ideas from residents on how they would like their neighbourhoods to evolve.
- Conducting surveys to assess local needs.

ON DEMAND SHUTTLE & GREEN CORRIDORS

The combination of **Green Corridors** and **On-Demand Electric Shuttles** offers a comprehensive, sustainable transport solution for Melbourne. **Green corridors** provide safe, scenic routes for walking and cycling, while **on-demand electric shuttles** ensure flexible, accessible transport for those needing quick and clean travel options. Together, they promote <u>active transport</u>, <u>reduce car dependency</u>, and <u>improve public health</u>, aligning with the Compact City concept.

Green Corridors

- <u>Dedicated lanes</u> for pedestrians and cyclists to ensure safe, eco-friendly travel.
- <u>Tree-lined pathways</u> that create pleasant, shaded routes and enhance urban biodiversity.
- <u>Rest stops</u> and <u>bike-sharing stations</u> to encourage active transport.

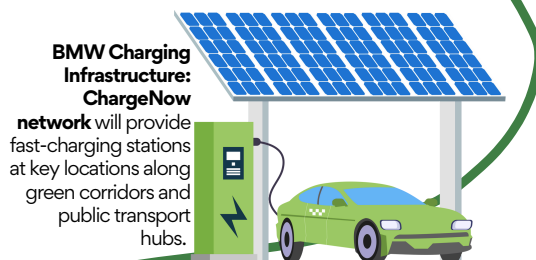## On-Demand Electric Shuttles

These shuttles will run alongside green corridors, connecting neighbourhoods to public transport hubs. Residents can request shuttles via the PTV app, choosing this service if they:

- Need to travel longer distances or carry heavy items.
- Live farther from the green corridors but want to access public transport hub.
- Prefer a low-emission alternative to driving.

These shuttle service will dynamically adjust its routes based on real-time demand and traffic data to provide efficient, real-time connections between neighbourhoods and transport hubs.

Shuttle service to nearest public transport.

BMW Charging Infrastructure: ChargeNow network will provide fast-charging stations at key locations along green corridors and public transport hubs.

These stations will serve both on-demand electric shuttles and private EV users.

POLICY INTEGRATION

Melbourne's urban policy development focuses on achieving **sustainable mobility** and **climate resilience** by expanding **green corridors**, incentivising **EV adoption**, and developing **public-private partnerships** for advanced infrastructure. The following reforms aim to align existing policies with Melbourne's **Compact City vision**, integrating sustainable transport, green infrastructure, and community access.

Policy Area	Current Policies in Melbourne	Suggested Improvements
Zoning and Urban Planning	**Plan Melbourne 2017-2050** prioritises activity centres and urban infill in growth areas (Victorian Government, 2017).	Implement **mixed-use zoning** in suburban areas, creating walkable neighbourhoods with integrated **green corridors** and housing developments near public transport.
Transport and Mobility	Focus on **public transport investment** and **cycling lanes** (Victorian Department of Transport, 2022).	Expand **on-demand electric shuttles** to underserved suburban areas and connect to green corridors, integrating **MaaS** (Mobility as a Service) for efficient travel.
Active Transport Incentives	Victorian Cycling **Strategy 2018-2028** supports cycling infrastructure in the city (VicRoads, 2018).	Introduce **tax incentives** for businesses to install **bike-sharing stations** and EV charging points in strategic suburban areas.
Electric Vehicle (EV) Adoption	The **Zero Emission Vehicle Roadmap** aims for 50% EVs by 2030 (Victorian Government, 2021).	Expand the roadmap by focusing on **suburban EV infrastructure**, increasing **fast-charging stations** along green corridors, using partnerships like BMW's ChargeNow network.
Environmental Policies	The **Climate Change Act 2017** mandates emissions reduction and heat mitigation (Victorian Government, 2017).	Mandate **zero-emission public transport** by 2030 and create **biodiversity-enhanced green corridors** to connect communities and reduce urban heat.
Public-Private Partnerships (PPP)	Limited use of **PPPs** for infrastructure projects in **Infrastructure Victoria's Strategy** (Infrastructure Victoria, 2021).	Expand PPPs to fund **EV charging infrastructure**, **on-demand shuttles**, and **green corridors**, establishing partnerships with companies like BMW for EV charging stations.

REFERENCES

Abduljabbar, R., Dia, H., Liyanage, S., & Bagloee, S. A. (2019). Applications of Artificial Intelligence in Transport: An Overview. Sustainability, 11(1), 189. https://doi.org/10.3390/su11010189

Australian Bureau of Statistics. (2021). Australia's journey to work. Australian Bureau of Statistics; Australian Bureau of Statistics. https://www.abs.gov.au/articles/australias-journey-work#cite-window2

Beshears, J., & Gino, F. (2015, May). Leaders as Decision Architects. Harvard Business Review. https://hbr.org/2015/05/leaders-as-decision-architects

Electric Vehicle Council. (2023a). Australian Electric Vehicle Industry Recap 2023. https://electricvehiclecouncil.com.au/wp-content/uploads/2024/03/EVC-Australian-EV-Industry-Recap-2023.pdf

Electric Vehicle Council. (2023b). State of Electric Vehicles. https://electricvehiclecouncil.com.au/wp-content/uploads/2023/07/State-of-EVs_July-2023_.pdf

Energy. (2024, May 7). Electric vehicle charging locations. Energy. https://www.energy.vic.gov.au/renewable-energy/zero-emission-vehicles/electric-vehicle-charging-locations

Infrastructure Victoria. (2021). Victoria's 30-year infrastructure strategy. Infrastructure Victoria.

Miroslav Katsarov. (2024, August 12). Council Post: How Artificial Intelligence Is Shaping Public Transit. Forbes. https://www.forbes.com/councils/forbestechcouncil/2024/02/01/how-artificial-intelligence-is-shaping-public-transit/

Monthly public transport patronage by mode - Victorian Government Data Directory. (2024, August 21). Vic.gov.au. https://discover.data.vic.gov.au/dataset/monthly-public-transport-patronage-by-mode

Planet Ark Recycling Near You - Car Battery Recycling in the City of Melbourne area. (2023). Recycling near You. https://recyclingnearyou.com.au/car-batteries/MelbourneVIC

Plugshare. (2019). EV Charging Station Location. Plugshare.com. https://www.plugshare.com/

Reed, T. (2023). INRIX Global Traffic Scorecard.

Ushakov, D., Dudukalov, E., Shmatko, L., & Shatila, K. (2022). Artificial Intelligence as a factor of public transportations system development. Transportation Research Procedia, 63, 2401–2408. https://doi.org/10.1016/j.trpro.2022.06.276

Victorian Government. (2017). Plan Melbourne 2017-2050: Metropolitan planning strategy. Department of Environment, Land, Water and Planning.

Victorian Department of Transport. (2022). Transport investment and cycling infrastructure report.

VicRoads. (2018). Victorian Cycling Strategy 2018-2028: Increasing cycling for transport. Victorian Government.

Victorian Government. (2021). Zero Emission Vehicle Roadmap: Action plan for the future of transport. Department of Environment, Land, Water and Planning.

Victorian Government. (2017). Climate Change Act 2017: Legislative framework for emissions reduction and climate resilience.