FUTURE OF MOBILITY SEMINAR SERIES

THURSDAY 13 JULY 2023

12:00PM – 2:30PM

137 St Georges Terrace, Perth WA 6000

HATCH | RobertsDay

WESTCYCLE

Curtin University

Smart active transportation infrastructure (SmATI) to achieve sustainable mobility

Negar Nili

Doctor of Philosophy - Architecture and Interior Architecture

Content

- Research Topic
- Literature review
- Problem Statement
- Research design and methodology
- Data collection
- Analysis methods
- Findings
- Thesis contribution
- Publication

Research topic

Title

Sustainable method for urban mobility in smart cities

Research question

How can smart active transport infrastructure (SmATI) facilitate active transport?

Background

- Urban transportation
- Car Dependency → ✓ Air pollution ✓ Greenhouse gases ✓ Climate change

Active Transportation (AT) → ✓ Health ✓ Economic ✓ Environment

Technology → ✓ New ways to increase sustainable transport

Figure 1. Transportation pollution

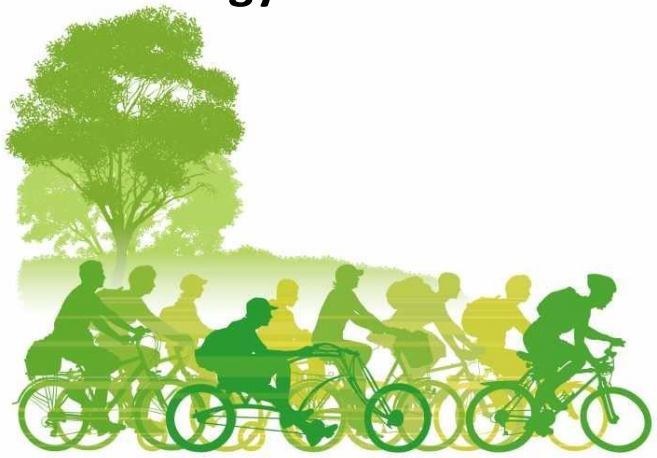


Figure 2. Active transportation

Figure 3. Technology to support AT

Problem Statement

Little attention has been devoted to the applications' end-users

Aim

Explore people's attitudes toward using technology to reduce AT barriers and encourage them to use AT for their daily trips.

Research approach

Active Transportation Infrastructure (ATI)

- Pathway network of AT, such as roads, bike lanes, footpaths
- Other objects related to AT, such as cars, traffic lights, and end-of-trip facilities
- People

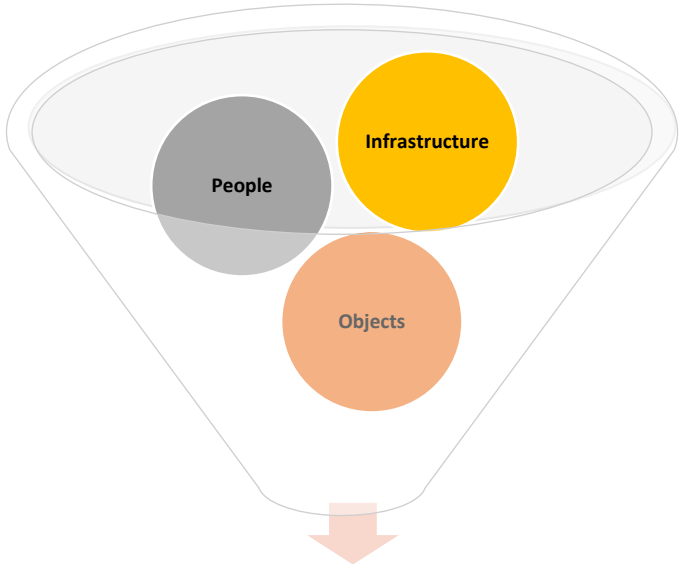


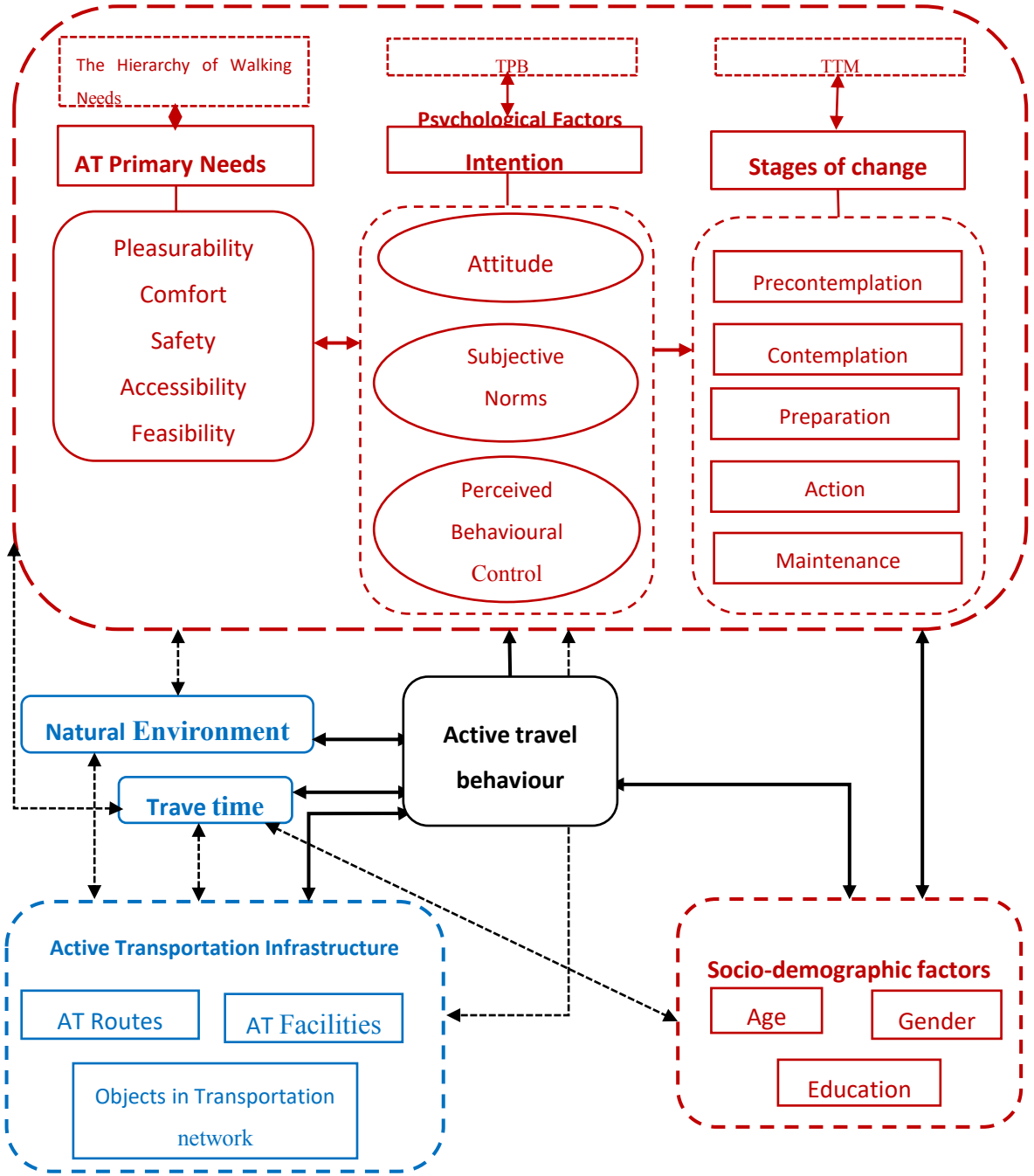
Figure4. **Active Transport Infrastructure (ATI)**

Smart **A**ctive **T**ransportation **I**nfrastructure (SmATI)

Factors influence travel behaviour

- **Internal Factors**
  - Attitudes
  - Perceptions
  - Sociodemographic characteristics
- **External factors**
  - Built environment
  - Natural environment
- **Travel behaviour theory**
  - Theory of planned behaviour (TPB) (Ajzen, 1991)
  - Trans Theoretical Model (TTM) (Prochaska & Velicer, 1997)
  - The Hierarchy of walking needs (Alfonzo, 2005)

The PhD study conceptual diagram of factors influencing AT behaviour, derived from the analytical literature review



Use of technologies for Active Transportation

Developed Typology

- Physical infrastructure technology
- App technology
- Vehicle technology.

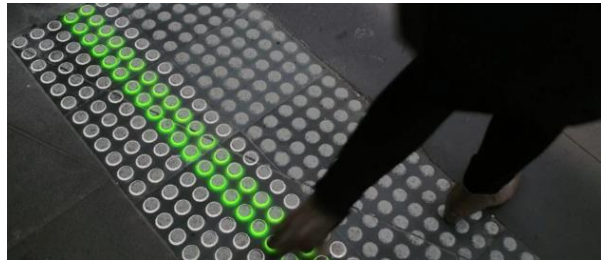


Figure 5. Smart Tactile Paving system

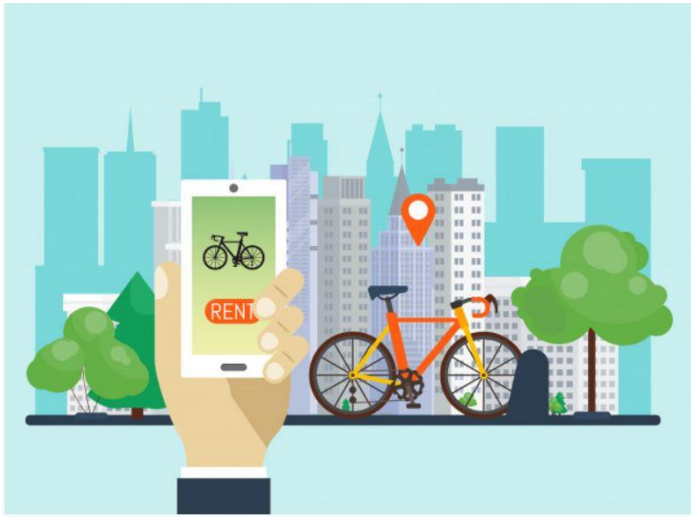


Figure 6. AT App technology

Figure 7. Vehicle technology related to AT

Aim and objectives

The overarching aim of this study was to contribute to research on active travel behaviour and offer a new framework for applying technology to increase use of AT based on satisfying general public requirements.

This study addressed the research problem from two perspectives.

- **Transport experts'** viewpoints regarding applying technology to facilitate AT.
- **General public** attitudes towards using technology to facilitate AT were sought.

Objectives:

- Establish the ATI concept
- Explore expert and general public views to establish principles that should be considered when adopting technologies to increase use of AT
- Provide a framework to inform practice, policymakers and authorities regarding facilitating AT through technology.

Research design

A **mixed-methods** approach was adopted to address the research question and objectives.

- A qualitative method (interview) was used to identify the applicability of using technology to increase use of AT and identify strategies and policies required to facilitate AT using technology. → National and international transport experts

- A general public survey → Perth metropolitan region in Western Australia.

- The principles of three travel behaviour theories—

✓ Theory of Planned Behaviour (TPB; Ajzen, 1991),

✓ Transtheoretical Model (TTM; Prochaska & Velicer, 1997)

✓ Hierarchy of Walking Needs (Alfonzo, 2005)

Data Collection

- Experts

✓ Analysing experts' viewpoints regarding the most important factors that should be considered when applying technology to ATI.

✓ Exploring AT barriers from a practitioner's and authority's perspective. Eliciting expert opinions provided insights into the factors influencing people's AT behaviour.

✓ The expert interviews provided qualitative information on expected factors that should be considered when developing AT by applying technology.

✓ Results from the expert interview analysis also informed the general public questionnaire design.

Type of organisation	Number of participants
Academia	6
Private company	6
Government	9

Finding: Analysis of interviews with experts

- Contributed to clarifying the typology of AT technology → Physical infrastructure technology
  App technology
  Vehicle technology.

- The analysis of expert interviews revealed essential criteria to consider when applying technology to minimise AT barriers and encourage people to select this mode of transport for their trips.

The SmATI concept should employ **five criteria** to be met to influence people to take AT:

- Safety and security
- Simplicity
- Connection and integration
- Awareness
- Prioritisation.

+

✓ Policies contribute to improving AT.
✓ Policies should support the criteria to achieve a successful outcome, which is encouraging people to use AT

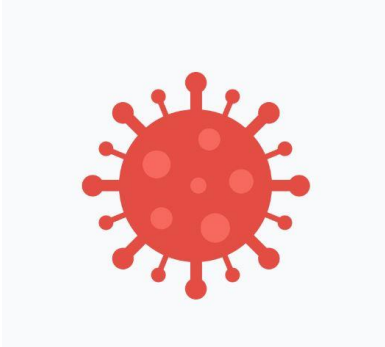
Data Collection

- General Public

- To discover people's attitudes and preferences toward AT
- The barriers that impede them to take AT
- Inquiry if adding technology to reduce AT barriers can encourage them to select the mode of transportation.

A general public survey

✓ Intercept (n=74)



COVID 19 Pandemic

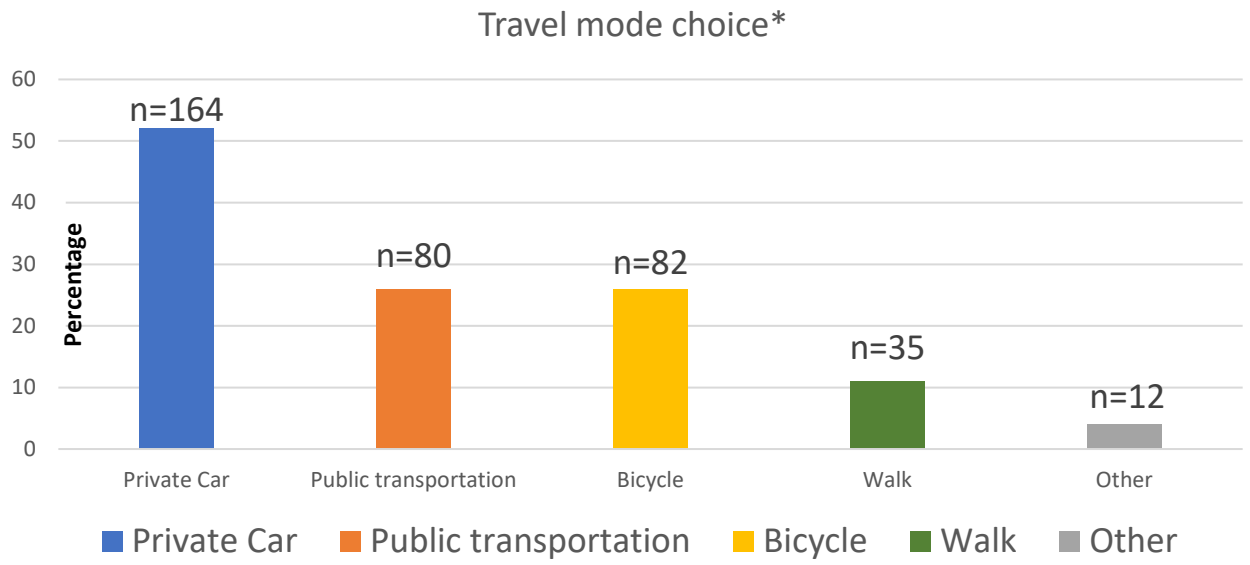
✓ Online (n=293)

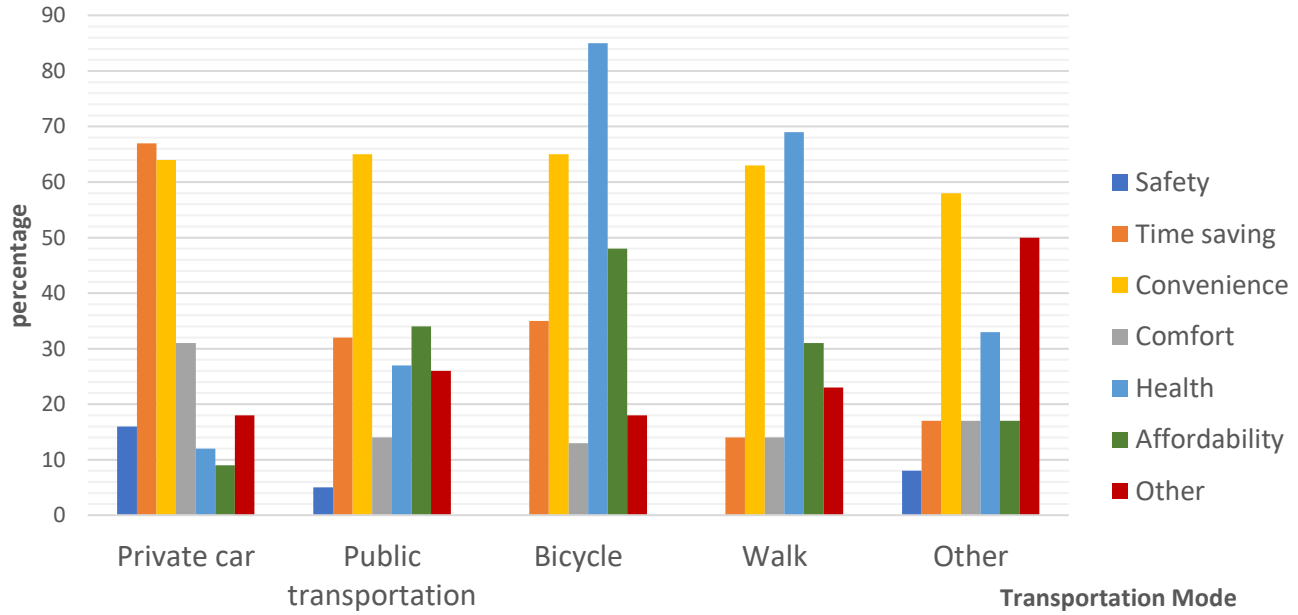
Finding: Analysis of general public survey

Participants' characteristics

- The scope of AT in the questionnaire was limited to cycling and walking.

Socio-demographic Characteristics	N	Percent (%)
Gender		
Female	178	57.1
Male	133	42.6
Other	1	.3
Age		
Under 18	10	3.2
18-30	52	16.7
31-40	89	28.5
41-50	77	24.7
51-60	55	17.6
61 or older	29	9.3
Level of Education		
High School	46	14.7
Undergraduate	59	18.9
Graduate certificate	52	16.7
Higher Education	155	49.7
Parental status		
No children under 12 years old	225	72.1
One child under 12 years old	39	12.5
More than one child under 12 years old	48	15.4
Usual activity		
Work/Study	273	87.5
Retired	21	6.7
Other	18	5.8


Travel mode choice*
60
50
40
30
20
10
0
Percentage
n=164
n=80
n=82
n=35
n=12
Private Car
Public transportation
Bicycle
Walk
Other
Private Car
Public transportation
Bicycle
Walk
Other


90
80
70
60
50
40
30
20
10
0
percentage
Private car
Public transportation
Bicycle
Walk
Other
Transportation Mode
Safety
Time saving
Convenience
Comfort
Health
Affordability
Other

People's attitude towards active transportation barrier

What are the main barriers that impede people to use AT

- Safety
- Feasibility
- Environment attractiveness
- Expense
- Facilities
- Responsibility

This research study's findings indicate that **lack of feasibility** and **safety** are the most important barriers that impact people's AT behaviour.

Most important barrier for **<u>Pedestrians</u>:**

1. Feasibility

2. Safety

Most important barrier for **<u>Cyclists</u>:**

1. Safety

2. Feasibility

People's attitude toward adding technology to ATI to decrease its barriers

- Individuals have **positive** attitudes toward certain technologies suggesting areas worth focusing on.

The most encouraging **technology** that facilitates AT for both Groups, **Cyclists** and **pedestrians**:

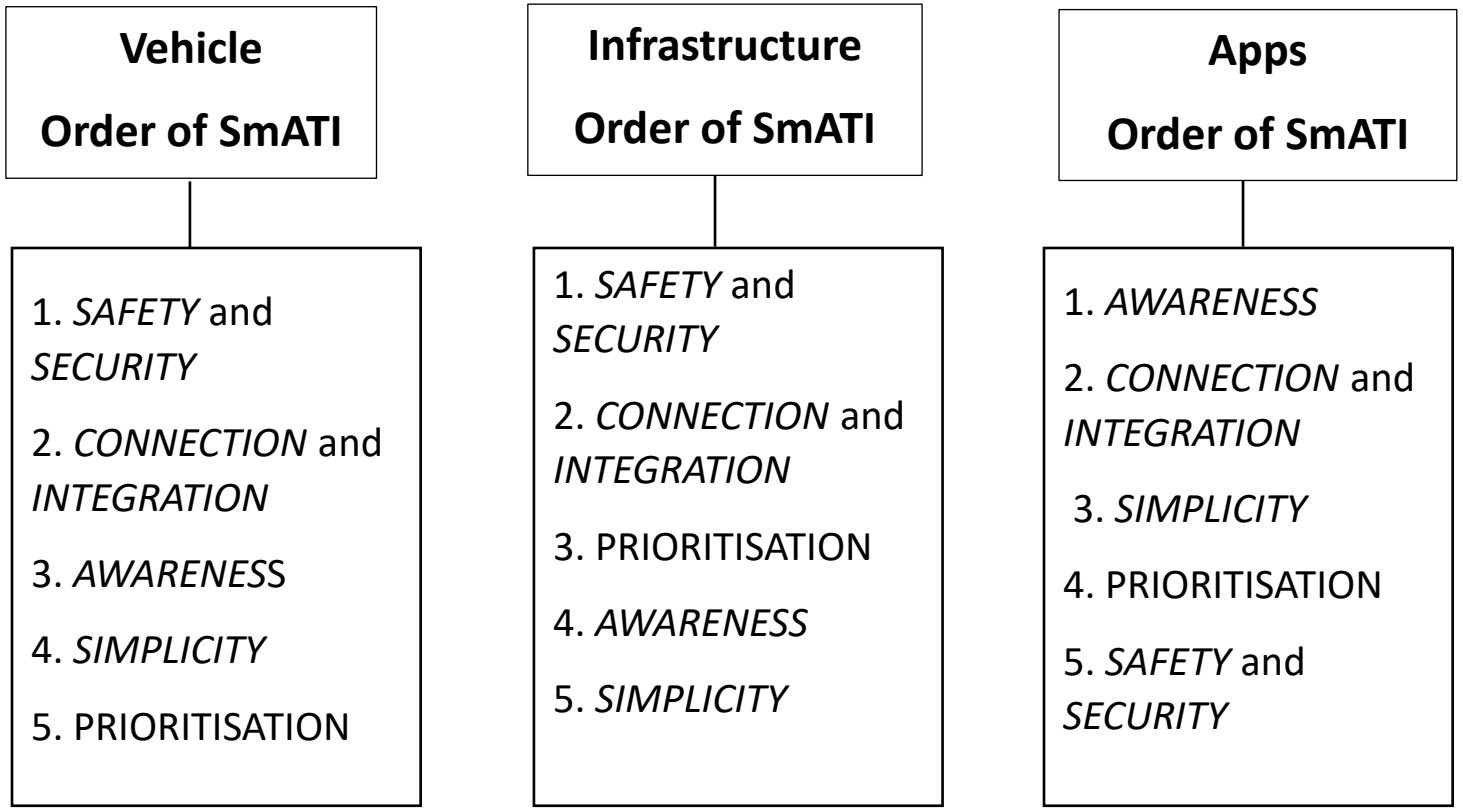
1. Safety

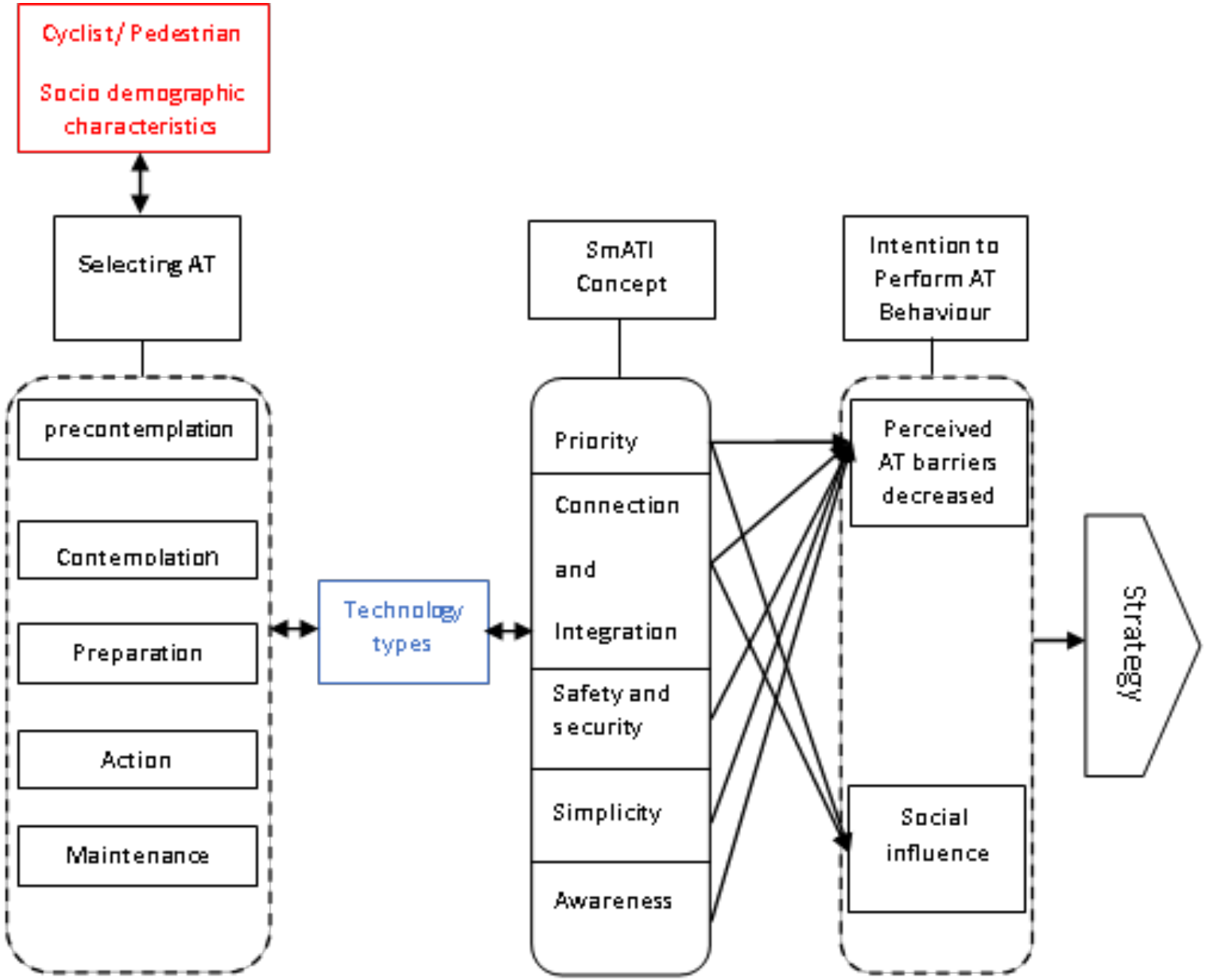
2. Simplicity

Interview findings on Preliminary Criteria for SmATI:

- Safety and security
- Simplicity
- Connection and integration
- Awareness
- Prioritisation.

Order of SmATI criteria for each technology type




Cyclist/ Pedestrian
Socio demographic characteristics
Selecting AT
precontemplation
Contemplation
Preparation
Action
Maintenance
Technology types
SmATI Concept
Priority
Connection and Integration
Safety and security
Simplicity
Awareness
Intention to Perform AT Behaviour
Perceived AT barriers decreased
Social influence
Strategy

Thesis contributions

- Offers a new typology for technologies used for AT.
- The SmATI conceptual framework incorporates views from **experts** and the **general public**
- Various strategies and approaches are required for applying technology to increase AT

The framework that was informed by expert interviews, a general public survey, and three theories related to AT can assist designers, urban planners, and policymakers when developing strategies to use technology to facilitate AT.

How the study framework can assist

- To align sustainable transportation **strategies**, **infrastructure**, and **technologies** with user requirements.
- To develop holistic **sustainable transportation strategies**.
- To make **real-time** decisions and deliver **highly customized products**.
- To become more **cognisant** of how programs may need to be **adjusted** for specific groups of population.
- To assist with **identifying** user groups to better align technologies with different population subsets.
- To better understand how AT technology can **further support** more walking and cycling

Limitations and recommendations

- First, many technological improvements were concepts unfamiliar to most respondents who therefore could only imagine their uses and potential benefits.

- Use of real technological tools may also demonstrate how technology influences people in different stages of behaviour change and assist in designing strategies accordingly.

- The urban context (general city size, existing infrastructure) limits the generalisability of this study's outcomes.

- It is also important to note that this study examined people's attitudes from an urban planning point of view and not from a sociological perspective.

- Technology encompasses a broad range of human-made devices. To narrow the study scope, only digital and electrical technologies such as sensors and actuators that can be embedded or applied to ATI were included.

Final statement

The SmATI conceptual framework suggests that to apply technology to ATI, the following factors should be considered:

- ✓ Users of the technologies: people in different stages of behaviour change and with different characteristics have different reactions towards the development of technology
- ✓ Technology type: infrastructure, vehicle, app
- ✓ Five SmATI criteria
  - ***SAFETY* and *SECURITY***
  - ***SIMPLICITY***
  - ***CONNECTIONS* and *INTEGRATION***
  - ***AWARENESS***
  - ***PRIORITISATION***

- The framework reflects that both **internal** and **external** factors influence individuals AT behaviour.

Publications resulting from the work presented in this PhD thesis

- Smart infrastructure for active transportation- Conference paper

  CITIES IN A CHANGING WORLD: QUESTIONS OF CULTURE, CLIMATE AND DESIGN- June 2021. Selected for a book chapter. Nili, Negar; Babb, Courtney; Izadpanahi, Parisa

- Smart Active Transport Infrastructure contributing to sustainable development goals- Conference paper. Second GSN International Conference 2022- November 2022 Nili, Negar; Babb, Courtney; Izadpanahi, Parisa

- Active transportation in future urban environments - Conference paper

  ASA Conference-Architectural Science and User Experience. How Can Design Enhance the Quality of Life?- December 2022

  Nili, Negar; Izadpanahi, Parisa; Babb, Courtney

Acknowledgement

Dr Parisa Izadpanahi Dr Courtney Babb

List of figures

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Thank you

FUTURE OF MOBILITY SEMINAR SERIES

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137 St Georges Terrace, Perth WA 6000

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Curtin University

Embedding micromobility into greenfield developments

James Pearse, Principal Transport Planner

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What is micromobility?

Small personal mobility devices which are…

- Human or electrically powered
- Privately owned or shared
- Capable of low to moderate speeds (typically < 30km/h)

Image courtesy of TfNSW

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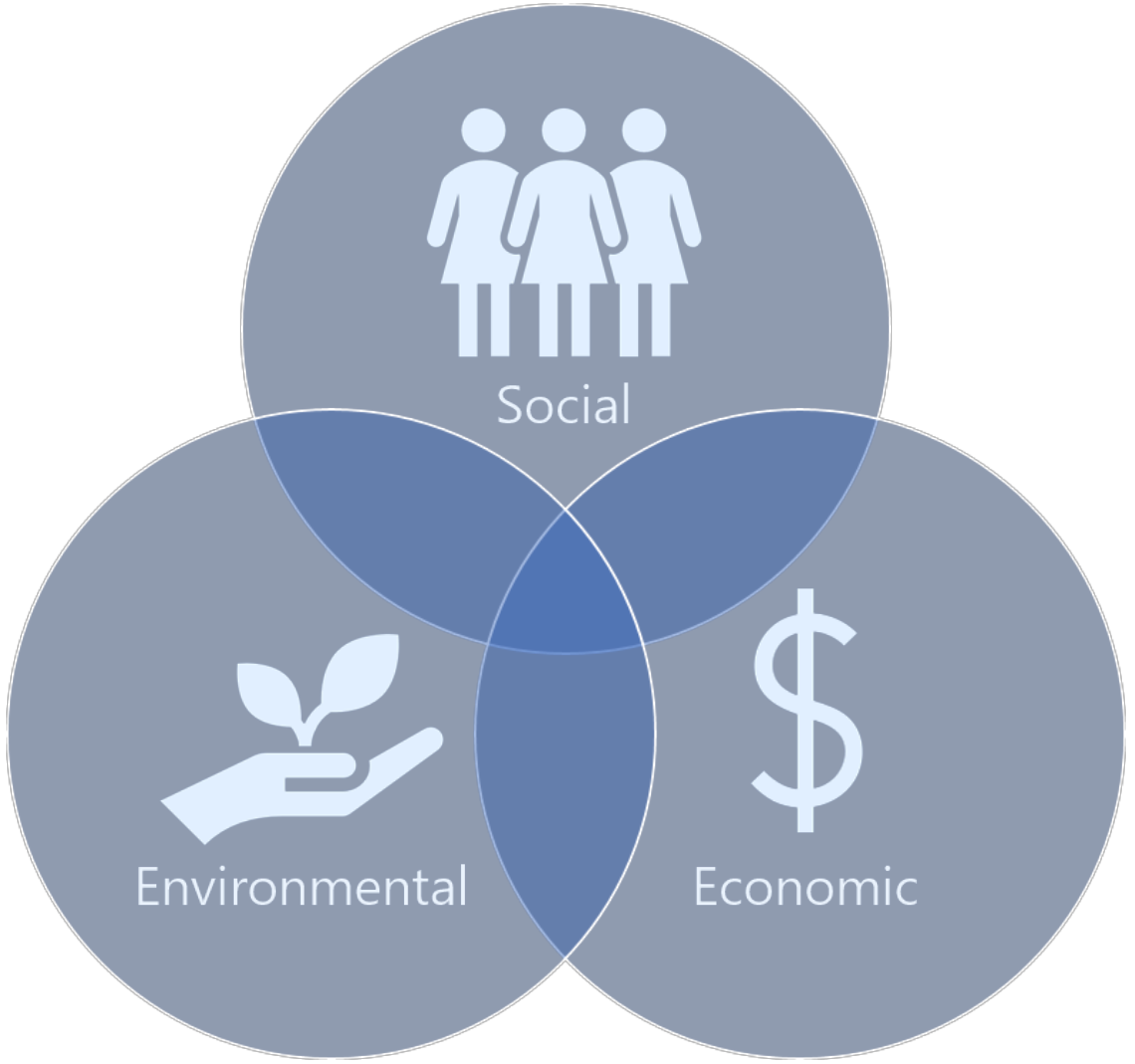
Who benefits from more people choosing micromobility?

- A healthier and happier population
- A greener and cleaner environment
- More vibrant, friendlier and safer communities
- A fairer and more equitable society



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*The way we cater for micromobility in greenfields developments is *generally* inconsistent with international best practice.*

Designing for All Ages & Abilities

"If a city is functional for an 8-year-old and 80-year-old, it should work for nearly everyone"

AAA infrastructure needs to be:

- Safe
- Comfortable
- Connected.

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Image courtesy of Hub Cycling

Rethinking local street design

Integrate where possible, separate where necessary

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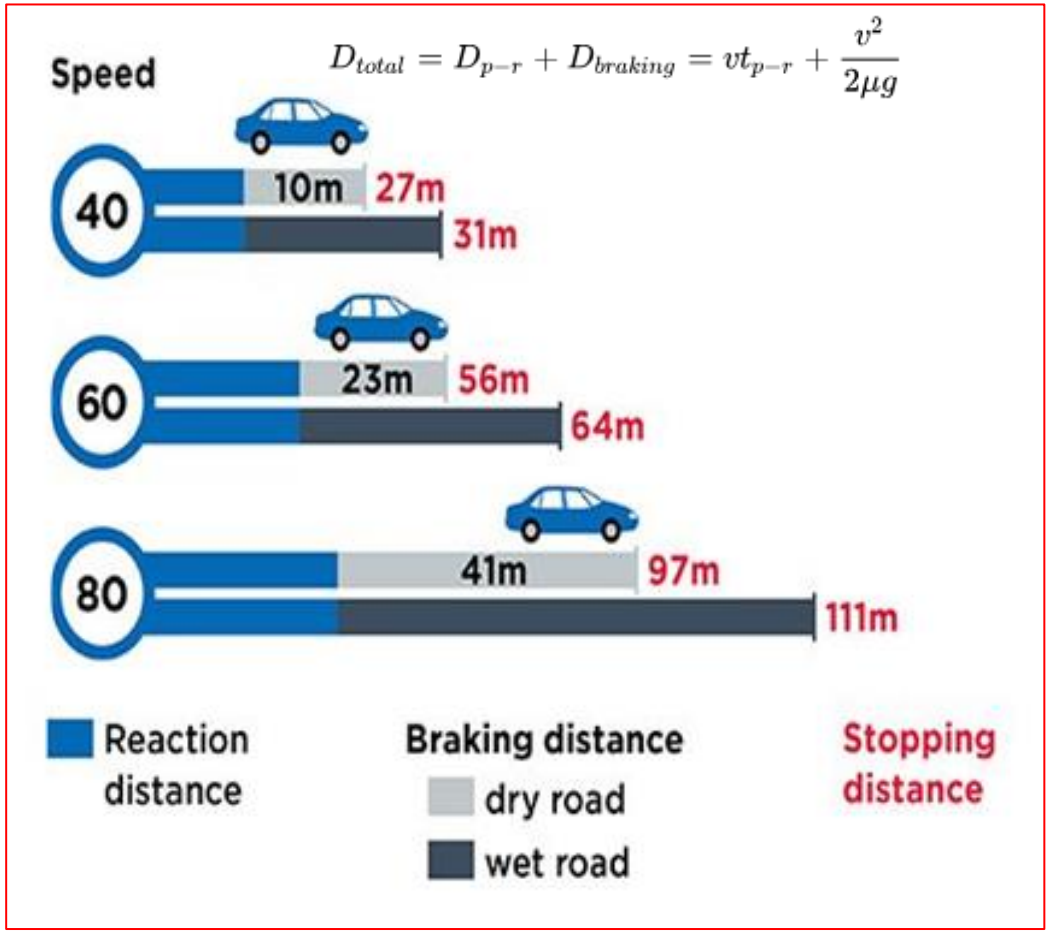
An increase in speed increases the **severity** of crashes

Graphic courtesy of Government of NSW

An increase in speed increases the **likelihood** of crashes



Graphic courtesy of Government of NSW

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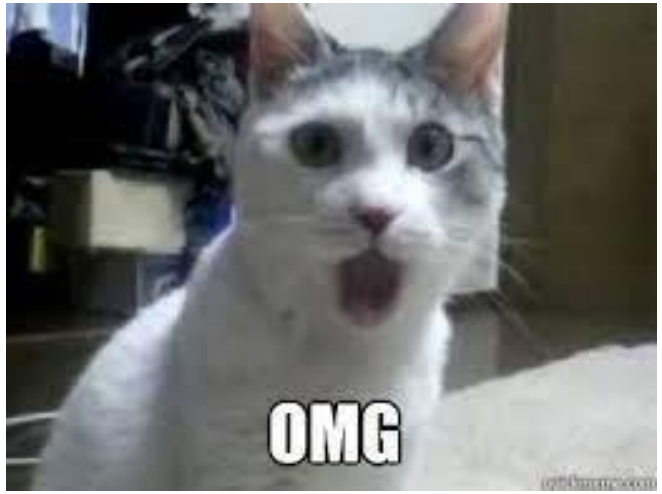
Low Traffic Neighbourhoods

- Use of **traffic calming** to facilitate **benign traffic conditions**

- Use of **self-explaining street principles** so that it is intuitive to drive at low speeds, rather than relying on speed cameras or police enforcement; and

- Use of **modal filtering** to strategically restricts some movements to just pedestrians and micromobility users.

Phasing out unprotected bike lanes

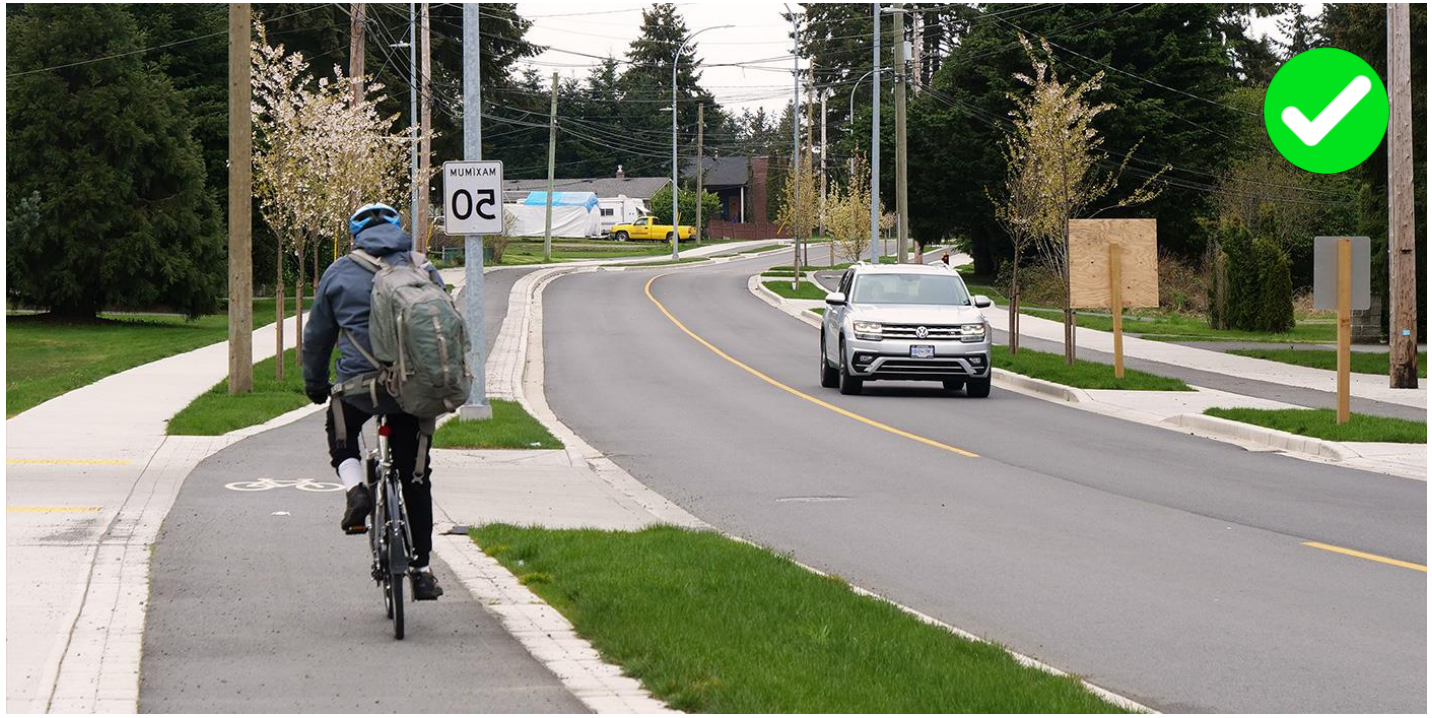


Paint ≠ infrastructure

Image courtesy of Tim Burns


JINDALEE BLVD
KINGSBRIDGE BLVD
JINDALEE BLVD
KINGSBRIDGE BLVD


imgflip.com
vevo


MUMIXAM
05

Challenging the (over) use of shared paths

Micromobility users ≠ pedestrians with wheels

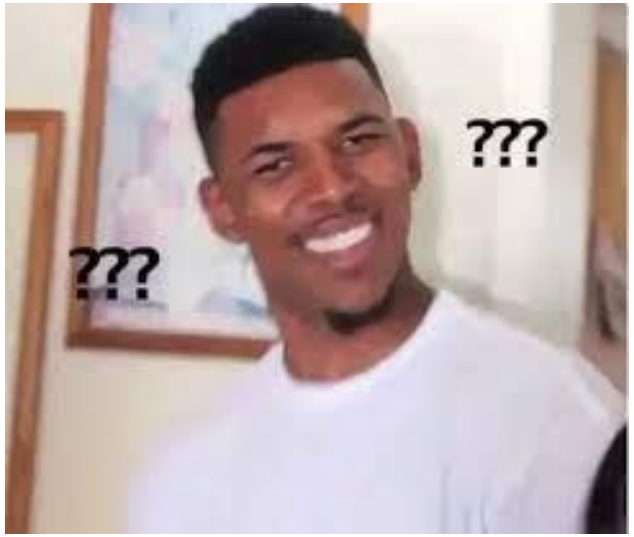
SHARED PATHS

SEPARATED PATHS

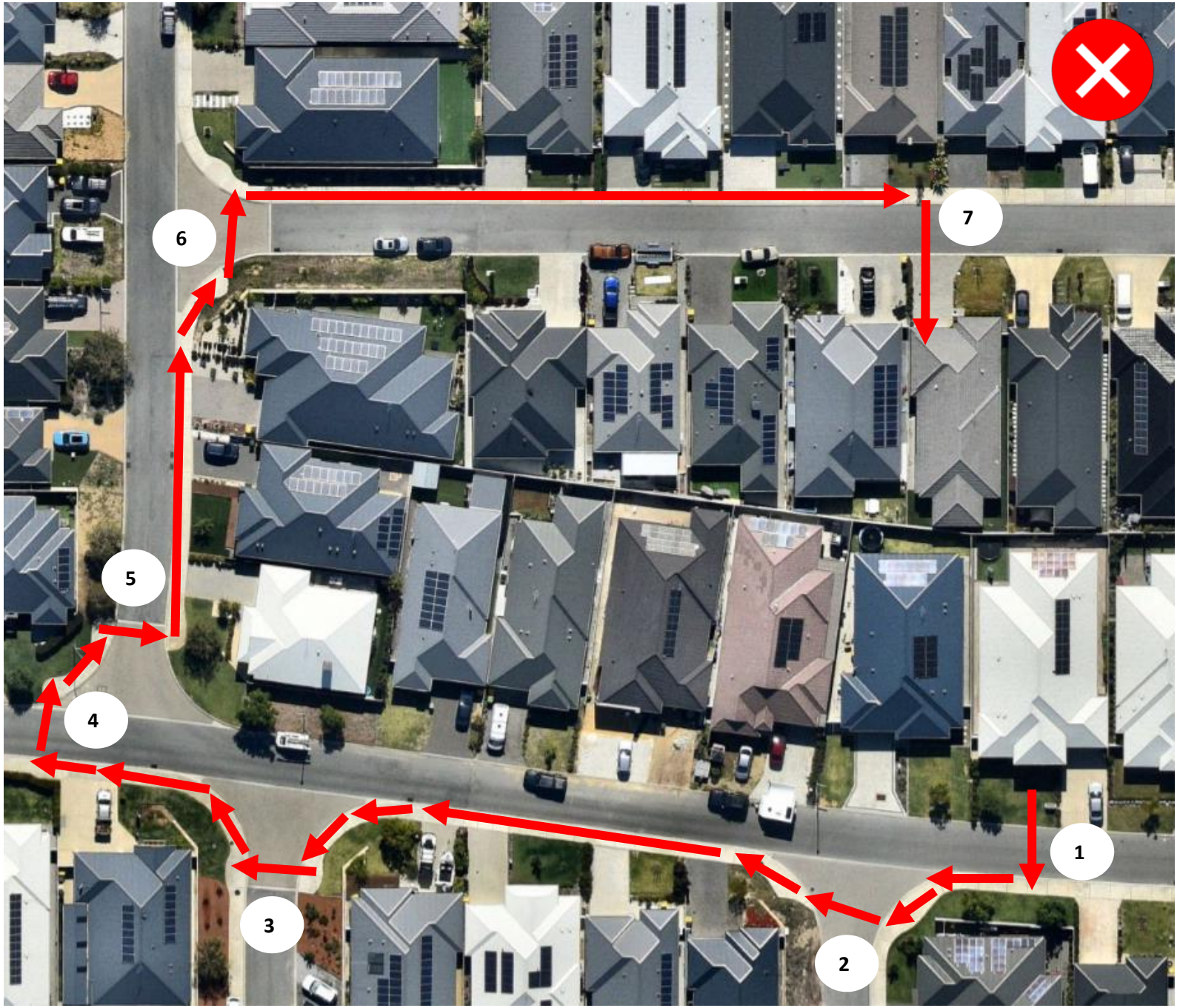
THREE NETWORKS FOR THREE USER GROUPS

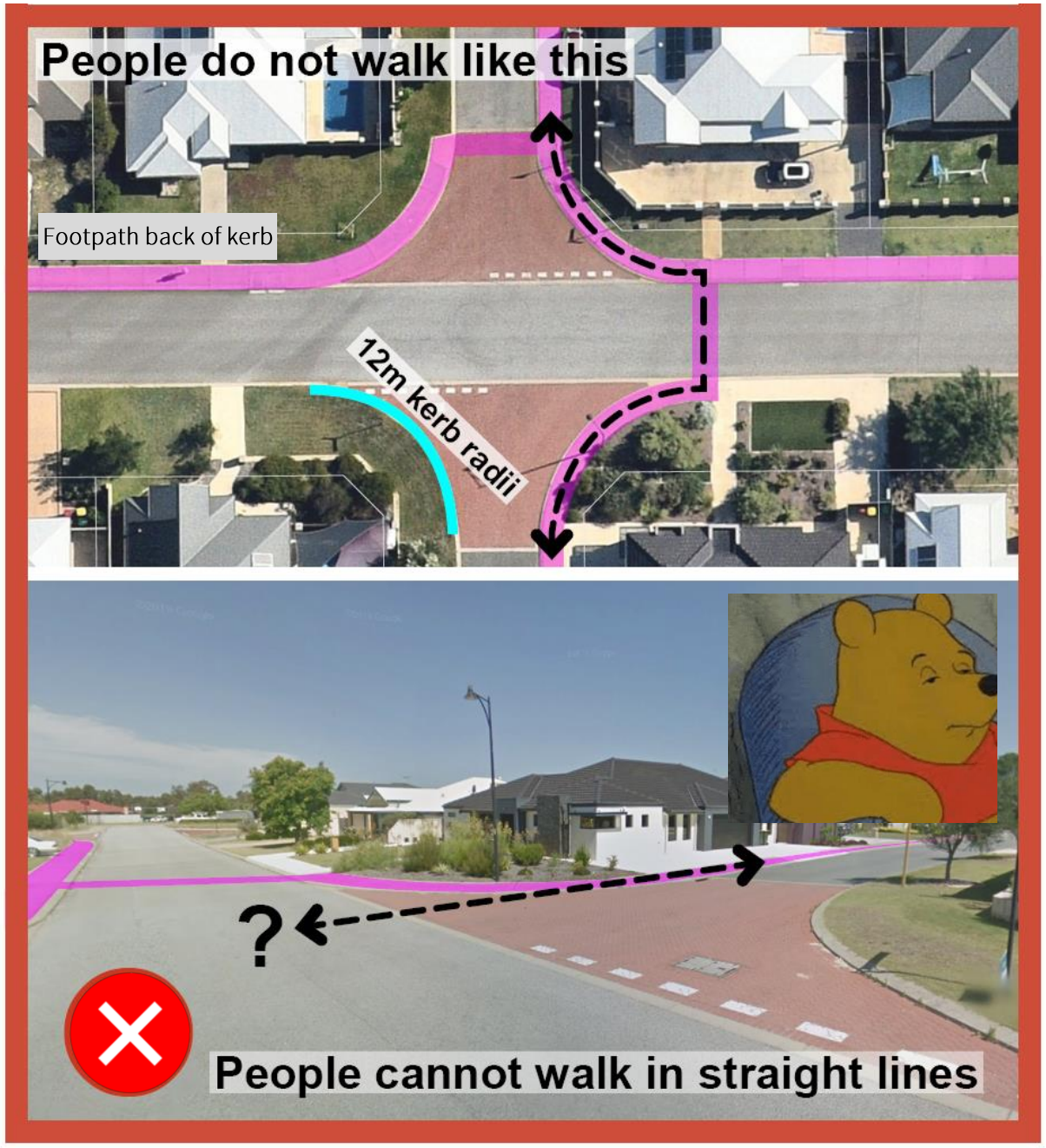
Apsley Estate, Mandogalup (WA)

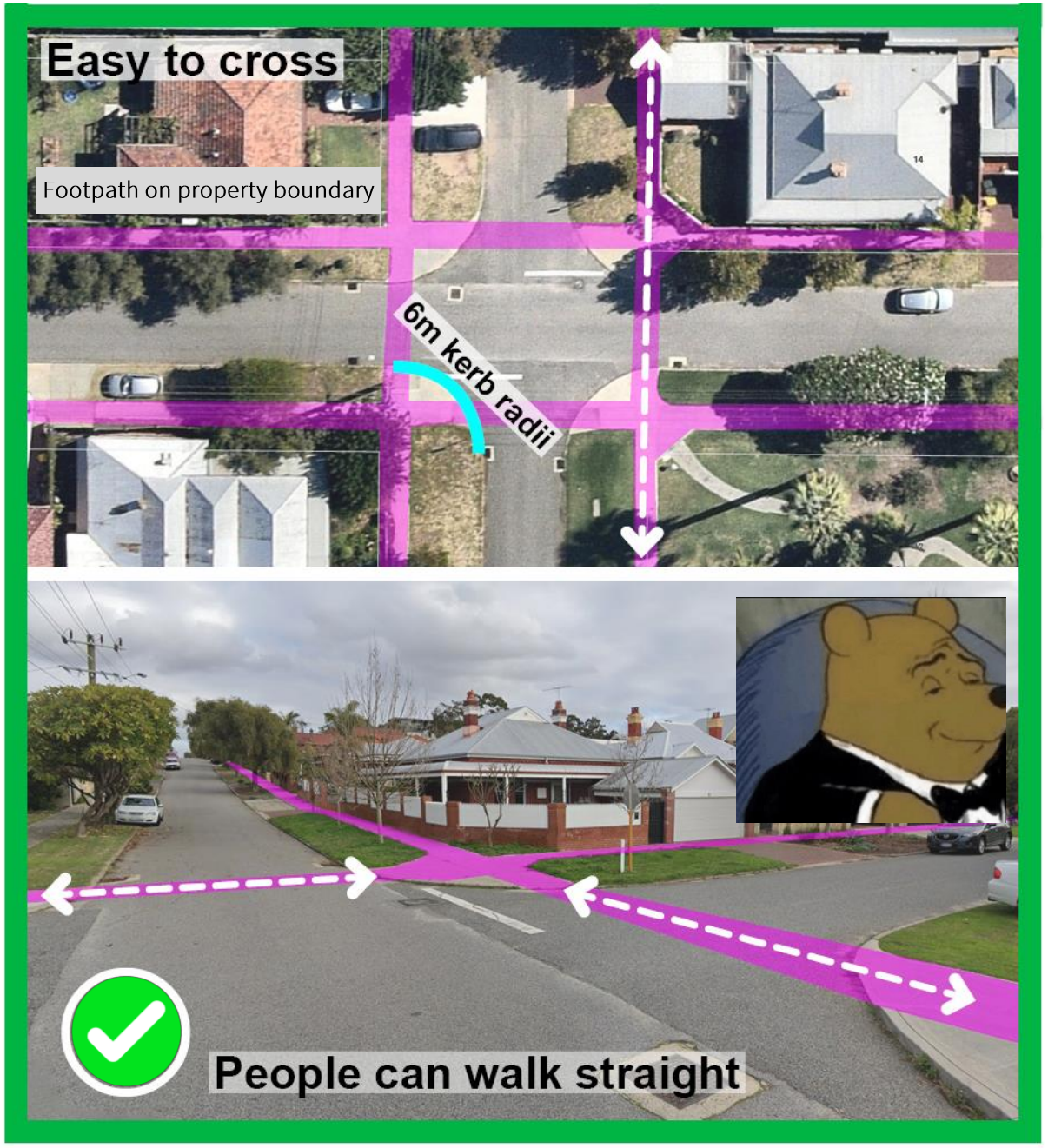
Rectifying terrible footpath design



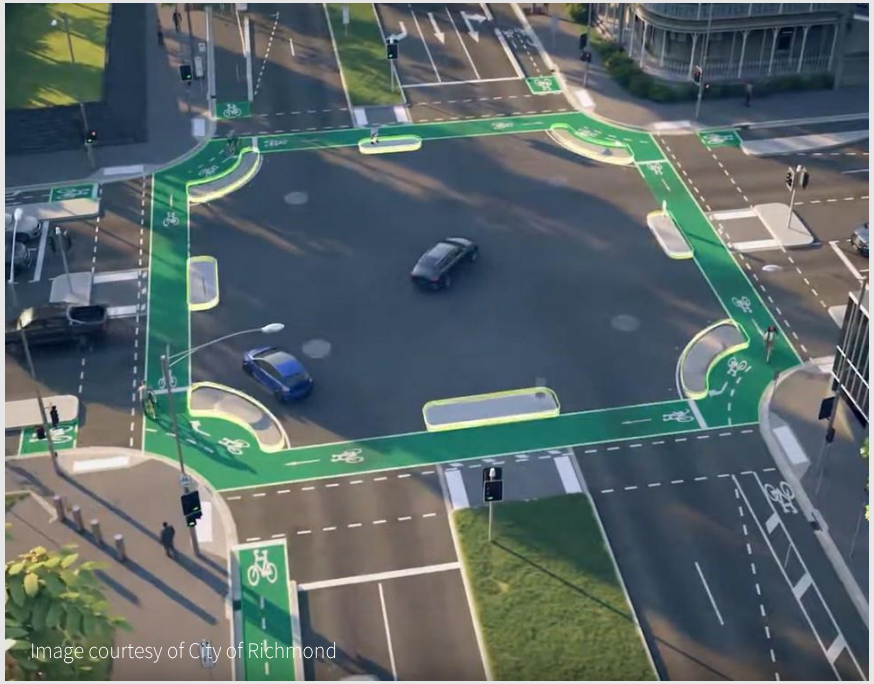
Walking shouldn't be a chore




People do not walk like this
Footpath back of kerb
12m kerb radii
?
People cannot walk in straight lines


Easy to cross
Footpath on property boundary
6m kerb radii
People can walk straight

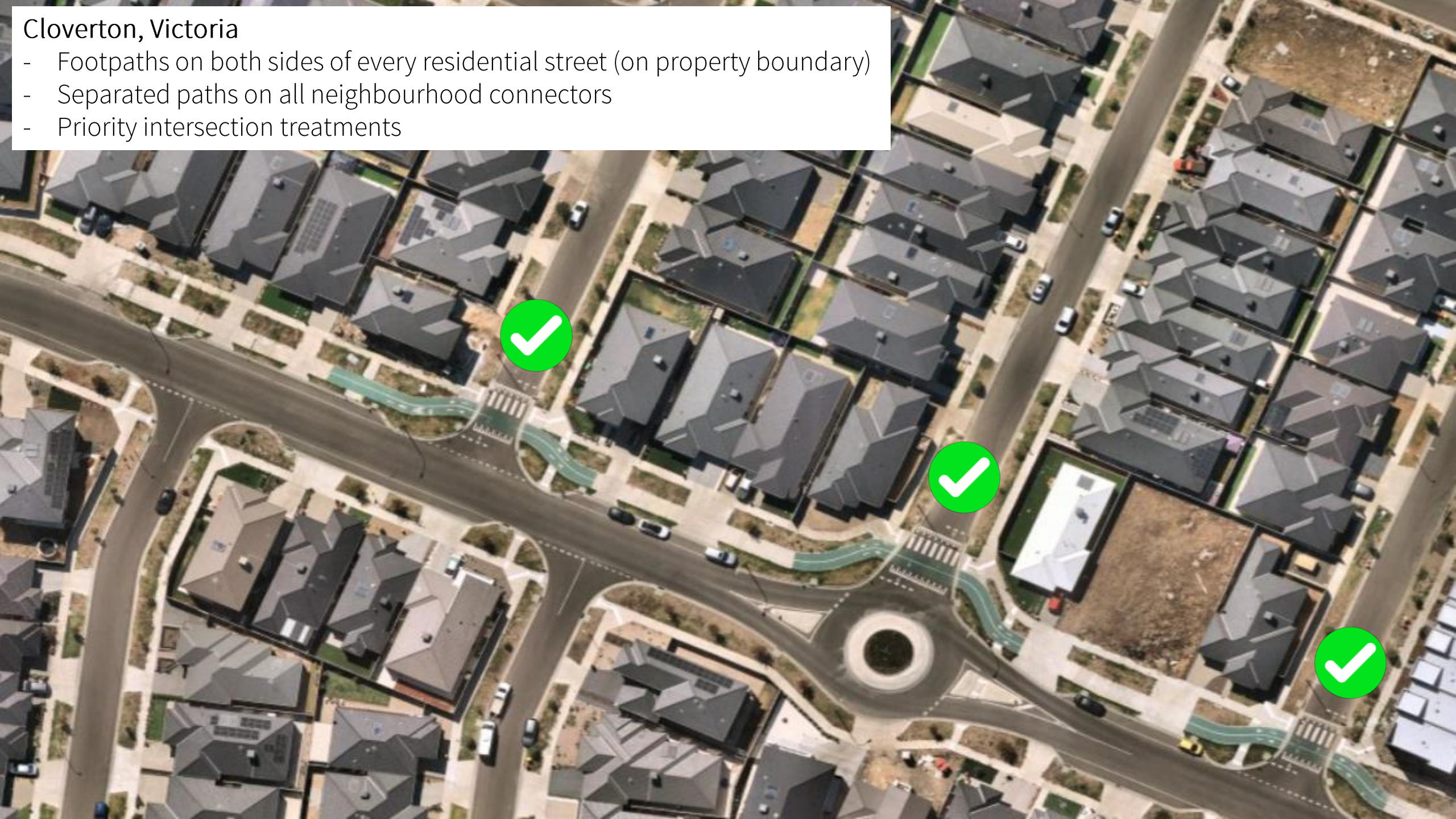
Don’t give up at the intersection!

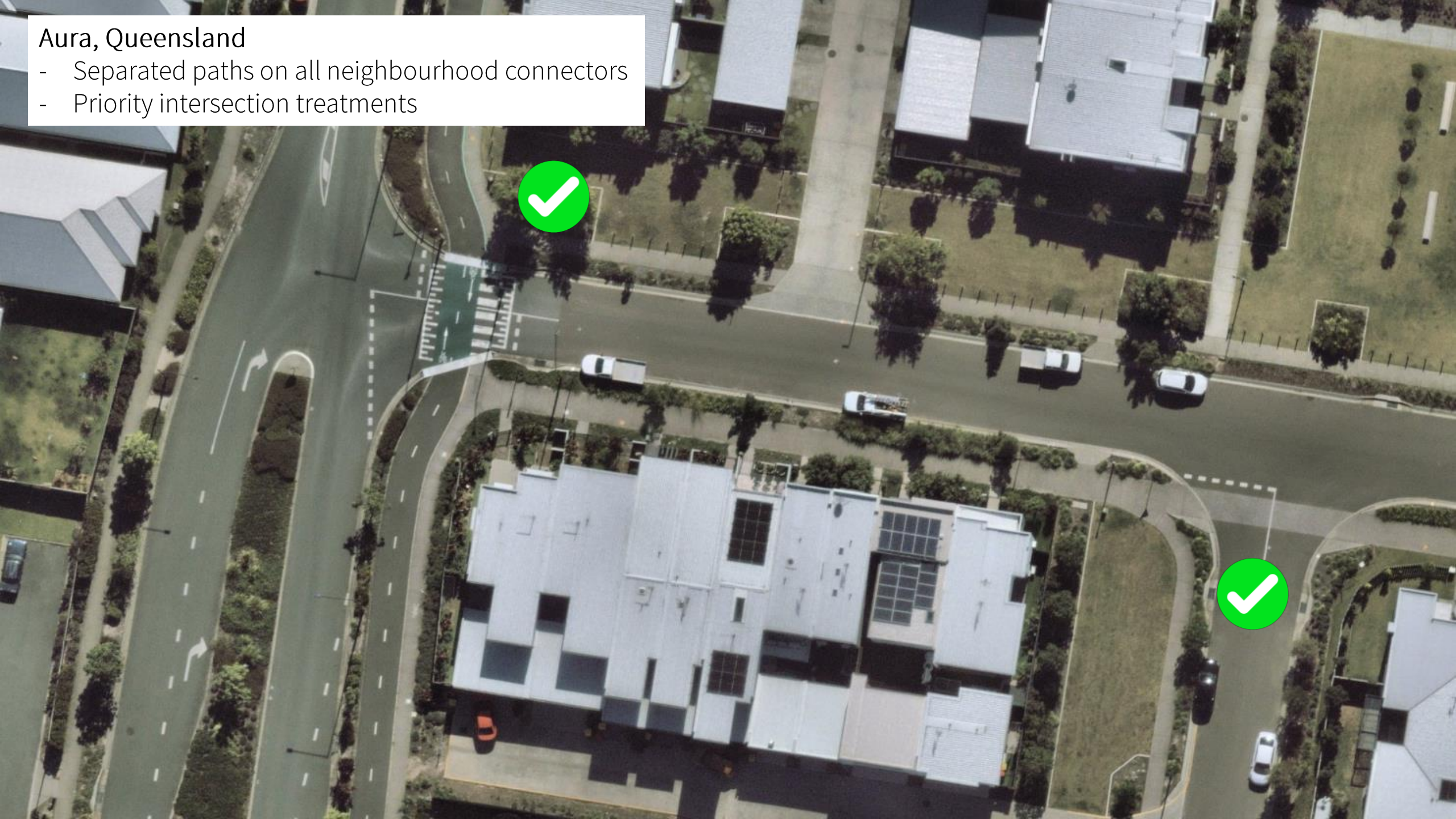


Protected signalised intersections ✓

Protected roundabouts ✓

Priority side road entry treatments ✓


Cloverton, Victoria
- Footpaths on both sides of every residential street (on property boundary)
- Separated paths on all neighbourhood connectors
- Priority intersection treatments


Aura, Queensland
- Separated paths on all neighbourhood connectors
- Priority intersection treatments

Bringing it all together – a network where every street is configured to support micromobility

Street typology	Movement function	Place function	Posted speed limit	Property access	Micromobility facility
Highways and urban arterials	High	Low	60km/h or higher	None (or very limited)	High quality off-street separated paths
Neighbour hood connectors	Moderate	Moderate	40 - 60km/h	Some	Protected on-street bike lanes
Local access streets	Low	High	30km/h or lower	Lots	Integrated cycling on-street (shared with cars)


Image courtesy of Bicycle Dutch


Image courtesy of Bicycle Dutch


Image courtesy of Bicycle Dutch

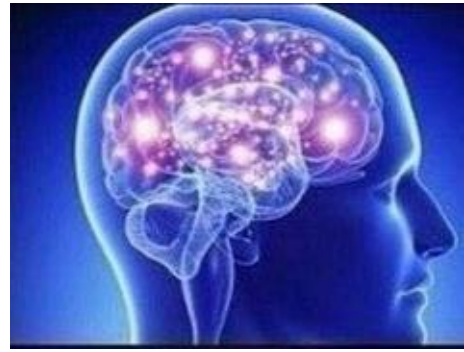
Quick recap.

Ensure infrastructure caters for people of all ages and abilities

“Think in threes” on higher order streets

Reduce speeds and volumes on lower order streets

Don’t give up at the intersection



Why is this important?

HATCH

Retrofitting micromobility infrastructure hard!

GemmaTognini
@GemmaTognini · Follow

Pitt St bike lane.
Peak hour. Meanwhile, traffic is ...problematic.
LOL
#sydney

5:12 AM · Mar 9, 2023

Cambridge council backflips on Wembley intersection changes following public pushback

[illegible] | PerthNow - Western Suburbs

ern Suburbs | Central | Local News

ge has backflipped on plans to restrict right turns at Wembley after "overwhelming" opposition from

s last week revoked a decision from May 2021 to out intersection treatments" at Ruislip and Jersey l Ruislip streets, and Northwood and Cambridge street.

the original intersections, the council approved a plan ands to be built at the intersection of Ruislip Street with rborne Street, which would only allow left turns in and

Bike path plan 'idiotic'

I write in support of the letter from Tanya Bowman in the 11 December edition of the Upper Yarra Mail regarding this ill-thought-out proposal (Waburton Mountain Bike Destination).

Not only is there the impact on the nearby residents, but also the poor toilet facilities, parking etcetera in the town.

A recent cycle event not only proved to be an imposition on the residents of Dammans Road due to the road closure, but proved have little or no effect on the busi[illegible] cal traders.

One business owner sta[illegible] nd other shops were very qu[illegible]

I think this is an indicatio[illegible] rth that this idiotic proposa[illegible]

Emails have been forwarde[illegible] ncil and local member with o[illegible] nses.

off McDonald,
burton

POST Newspapers
27 May 2023

Cycle path and the OBH

To Cottesloe council:

Obviously, "the consultants" on the new cycle/walking path were not told (or failed to take into account) that the redevelopment of the Ocean Beach Hotel is imminent. Or maybe they were.

That means that the carpark will be turned into a building site, making the walking path useless.

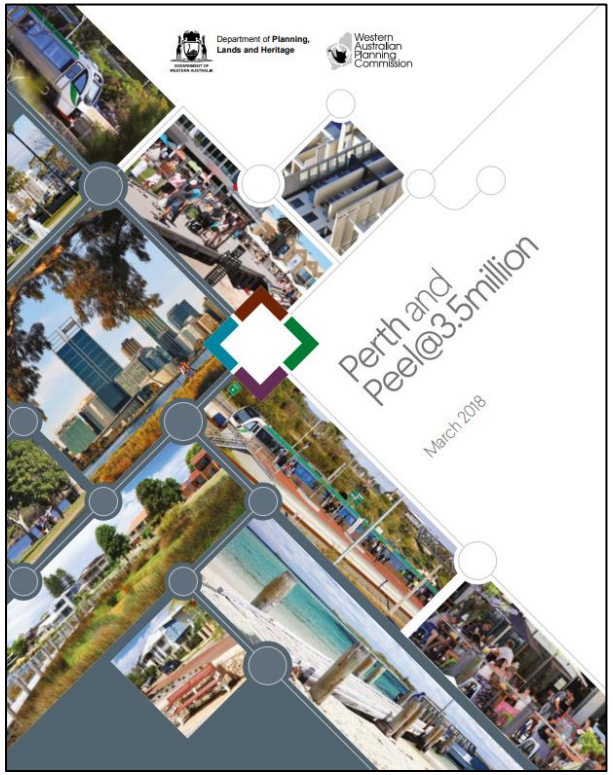
Will you seek a refund of the amount paid for this design?

And did the administrative staff who approved this design do the appropriate research?

Cary Dry
Cliff Way, Claremont

Greenfields development is not going away anytime soon.

*"Some **800,000 new homes** are required to accommodate the projected population growth of **3.5 million by 2050** and this will be delivered through a mix of infill and greenfield development with targets of 47 per cent and **53 percent** respectively"*



Liveable neighbourhoods

Guidance: Liveable Neighbourhoods is a Western Australian Planning Commission (WAPC) operational policy that guides the structure planning and subdivision for greenfield and large brownfield (urban infill) sites.

Last updated: 30 September 2022

In general, Liveable Neighbourhoods replaces the current WAPC development control policies. Where such policies conflict with Liveable Neighbourhoods, Liveable Neighbourhoods will prevail unless an applicant can demonstrate why it cannot or should not apply.

Liveable Neighbourhoods review

The next stage of **Design WA** is Neighbourhood Design.

It will update and revise Liveable Neighbourhoods to provide a State Planning Policy to guide the structure planning and subdivision of greenfield and large infill sites – complementing Precinct Design. Given the predictions of **Perth and Peel @ 3.5 million**, neighbourhood design for liveable and sustainable communities is integral to the future of our cities and towns. The Neighbourhood Design policy will be the next evolution of the pioneering and award winning Liveable Neighbourhoods policy.

Neighbourhood Design will apply the 10 Principles of Good Design outlined in ***State Planning Policy 7.0 Design of the Built Environment***.

The policy will require a tailored, performance-based approach to neighbourhood design, supported by design review and a high level of community and stakeholder participation.

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Contact

Address:
140 William Street
PERTH WA 6000
Locked Bag 2506
Perth WA 6001

Telephone:
61 8 6551 8002

Email:
info@dplh.wa.gov.au

For more information

James Pearse

Transport Advisory Lead – Western Region

james.pearse@hatch.com

+61 427 663 641

Level 2, 442 Murray Street

Perth WA 6000

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FUTURE OF MOBILITY SEMINAR SERIES

THURSDAY 13 JULY 2023

12:00PM – 2:30PM

137 St Georges Terrace, Perth WA 6000

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WESTCYCLE

Curtin University

Can Shared Autonomous Vehicles (SAVs) transition cities beyond car-reliance?

https://www.abc.net.au/news/2016-10-07/perth-traffic-hotspots-that-need-fixing/7914496

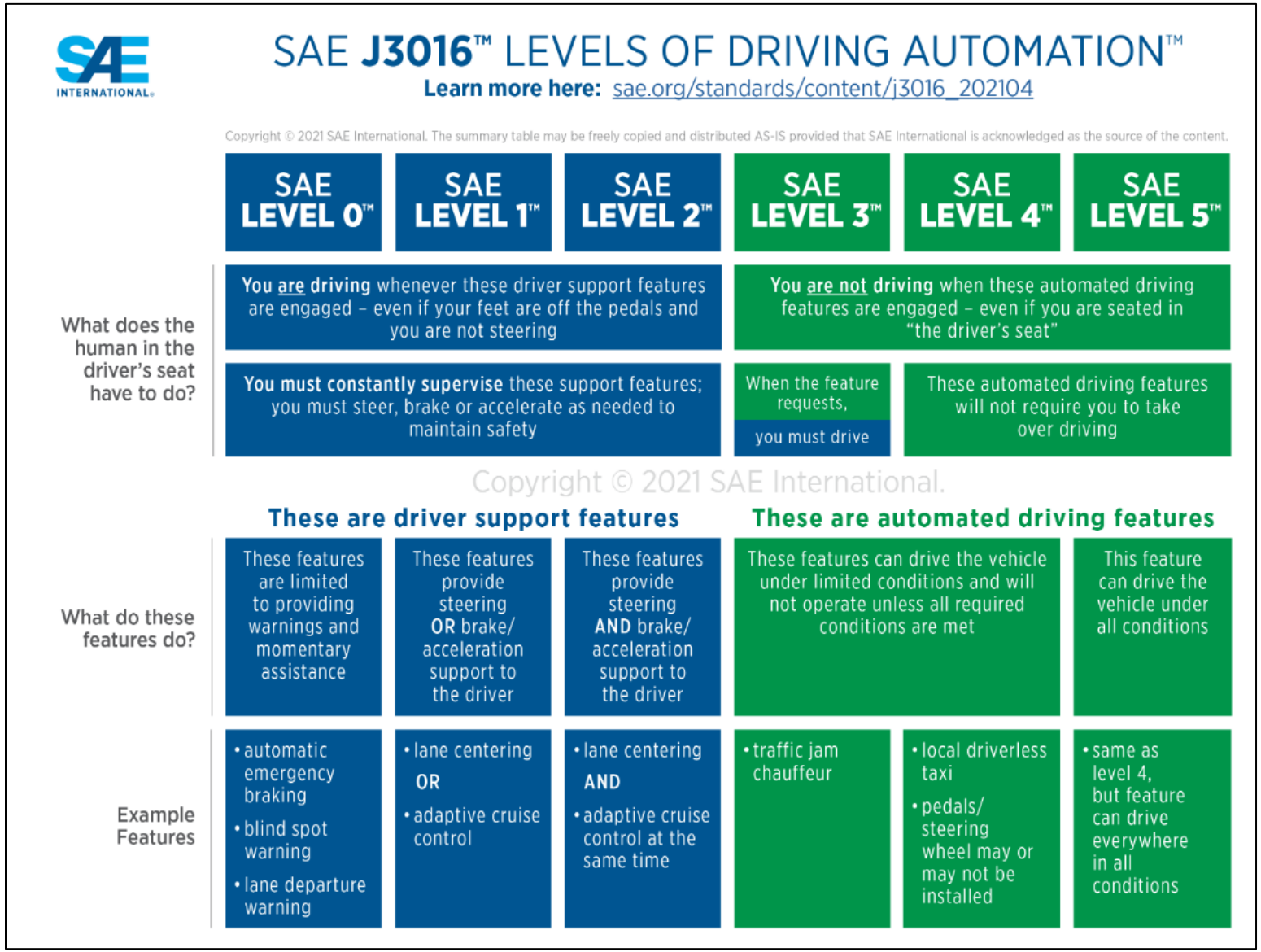
?

https://www.infrastructurevictoria.com.au/project/automated-and-zero-emission-vehicle-infrastructure/

Ferenc Stephen Kovacs – PhD candidate, Curtin University

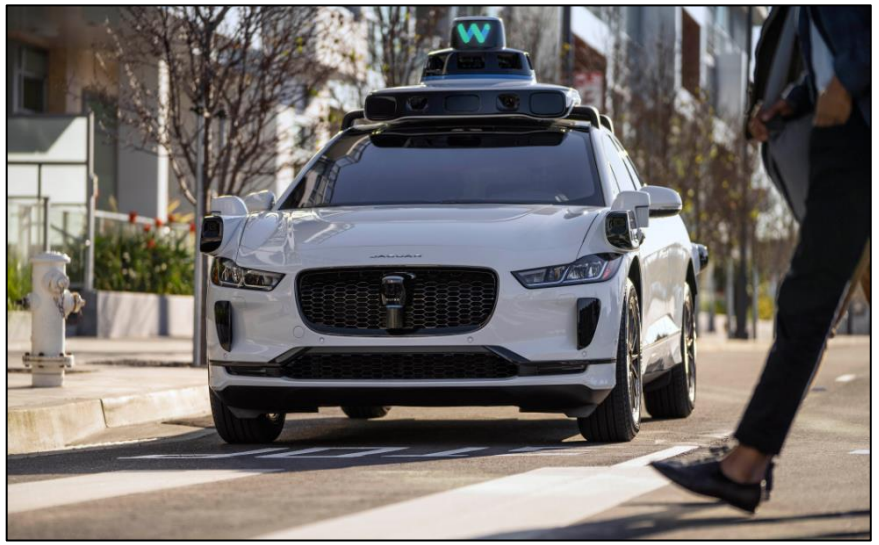
Contents

Autonomous Vehicles



Shared Autonomous Vehicles

- Shared fleet
- On-demand, hailed from smartphone app
- Flexible routes
- Dynamic ridesharing



https://waymo.com/blog/2023/03/paving-way-toward-fully-electric-ride.html

Examples

- Waymo One (Google subsidiary)
- Cruise Automation (GM subsidiary)
- Zoox (Amazon)

https://zoox.com/press/

Research Questions and Methods

Research Question	Sub Questions	Methods
Will the diffusion of shared and autonomous mobility reduce car reliance?	How do households in car-reliant communities travel now, including their use of ridesharing, an observable proxy for SAVs?	Intercept survey n=213
	How do households in car-reliant communities envisage travelling in the AV future?	Intercept Survey n=213
	"Are planners facilitating shared mobility and AVs to reduce car-reliance?	Semi-structured interviews n=26 Content analysis n=25
	How aligned are households and public sector planners?	Synthesis of above research methods
	Does the convergence of these factors suggest shared mobility and AVs are likely to create a shared mobility future in car-reliant communities?	As above

Supervisors:
Dr Courtney Babb
Prof Carey Curtis
Dr Parisa Izadpanahi

Methodology

- Methodology combined Stern's attitude-behaviour-context (ABC) theory of behaviour with the Multi-level Perspective of change (MLP).
- ABC views behaviour as a function of attitudinal and contextual variables, augmented by personal capability and habit.
- The MLP holds socio-technical systems like automobility are locked-in by inertial forces.
- Periodically experience profound change, or *socio-technical transition*. Actors can help process by fostering niche innovations after defecting from the incumbent regime.

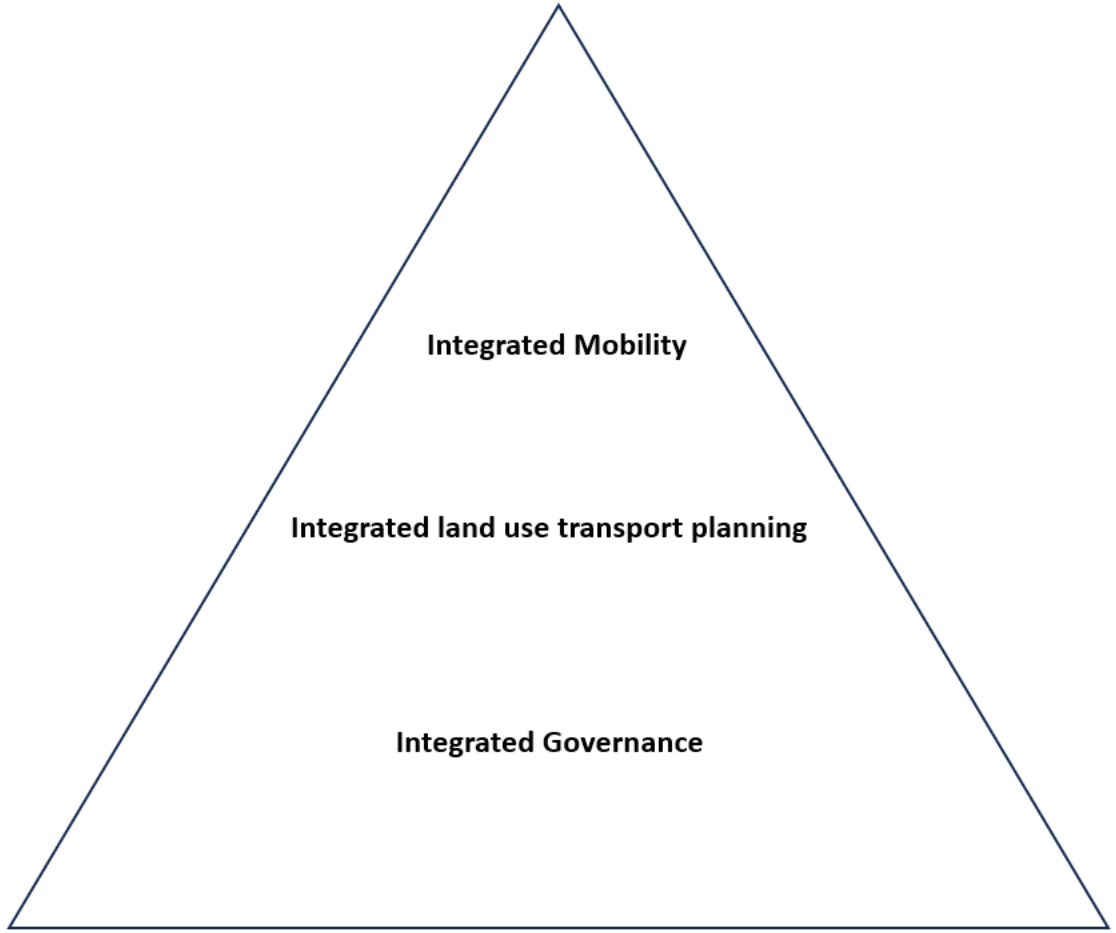
Easter morning 1900: 5th Ave, New York City. Spot the automobile.

Source: US National Archives.

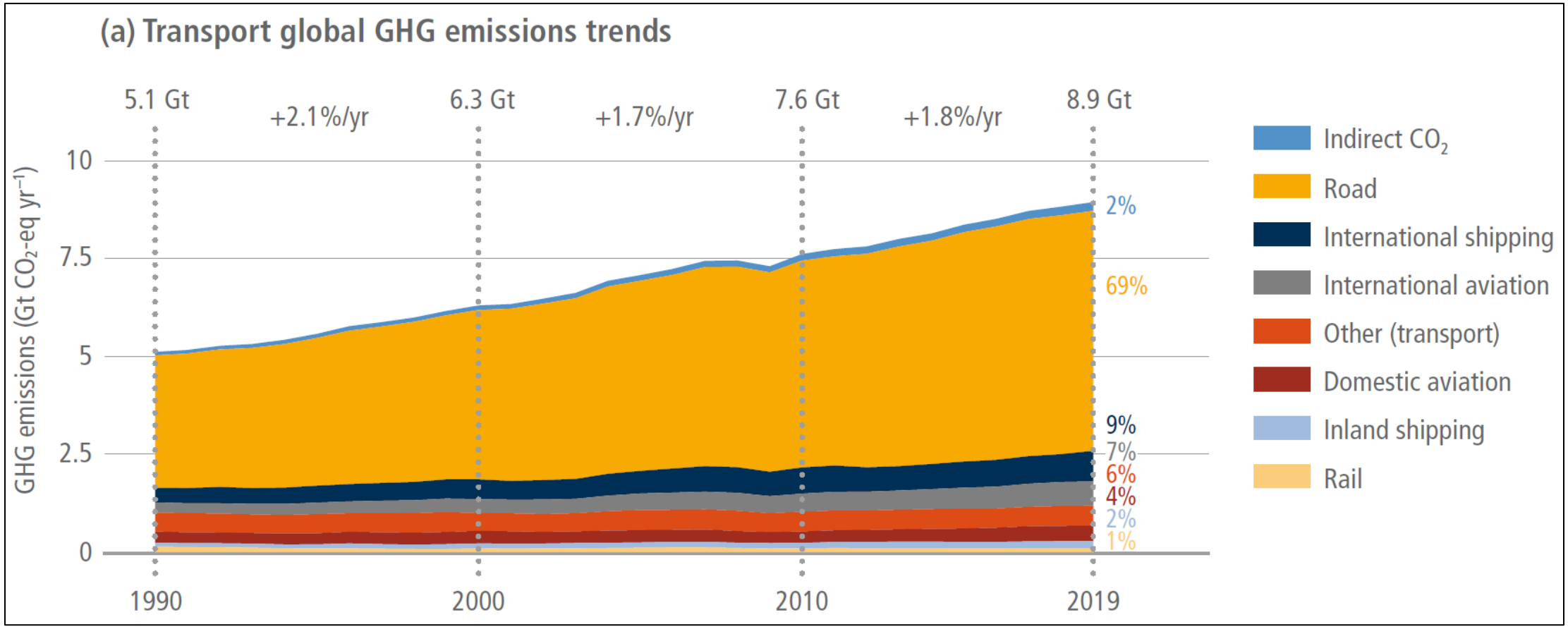
Easter morning 1913: 5th Ave, New York City. Spot the horse.

Source: George Grantham Bain Collection.

The Three ‘Eyes’



The context



https://www.ipcc.ch/report/ar6/wg3/ (accessed 31/01/23)

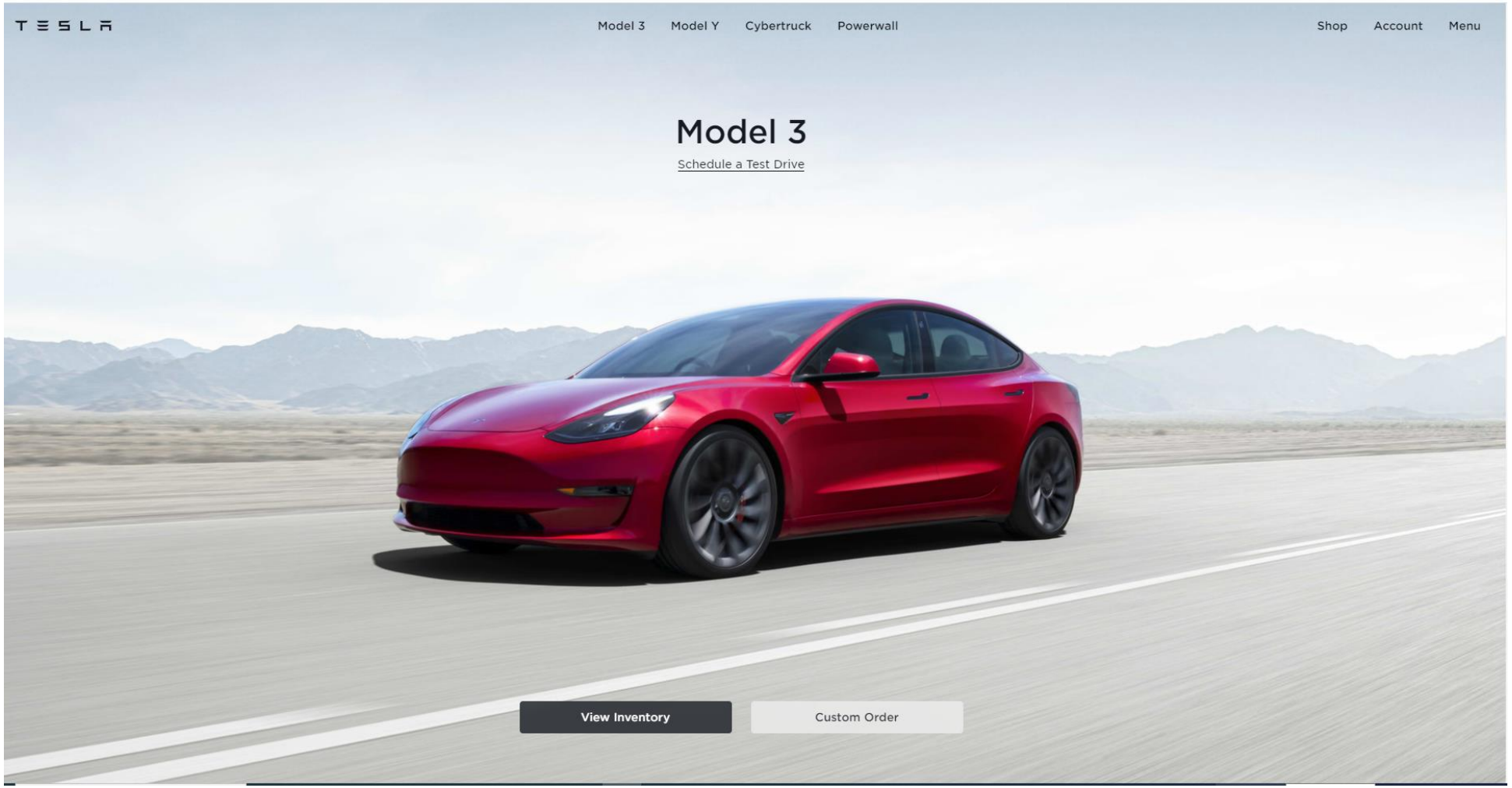
John Maynard Keynes

“When the facts change, I change my mind. What do you do, sir?”

Contradicts sustainability ‘storylines’

- Global car population rising, including most European countries.
- Transit patronage declined after COVID but was already falling in countries like USA since about 2014
- Although some integrated suburban transit systems perform well, many jurisdictions challenged by low patronage/high deficits.
- Densification supports public and active travel but slow process, overwhelmed by global urbanisation rates.

What about Electric vehicles?



https://www.tesla.com/en_au

Geological Survey of Finland
Unit
Place of business

1.3.2021 Report number: 16/2021

The Mining of Minerals and the Limits to Growth

Simon P. Michaux

Material scarcity

Global reserves are not large enough to supply enough metals to build the renewable non-fossil fuels industrial system...

The grade of processed ore for many of the industrial metals has been decreasing …This has the implication of the increase in mining energy consumption per unit of metal.

The global fleet of vehicles was estimated to be 1.416 billion vehicles… just 0.51% of the global fleet is currently EV technology, and…99.49% of the global fleet has yet to be replaced.

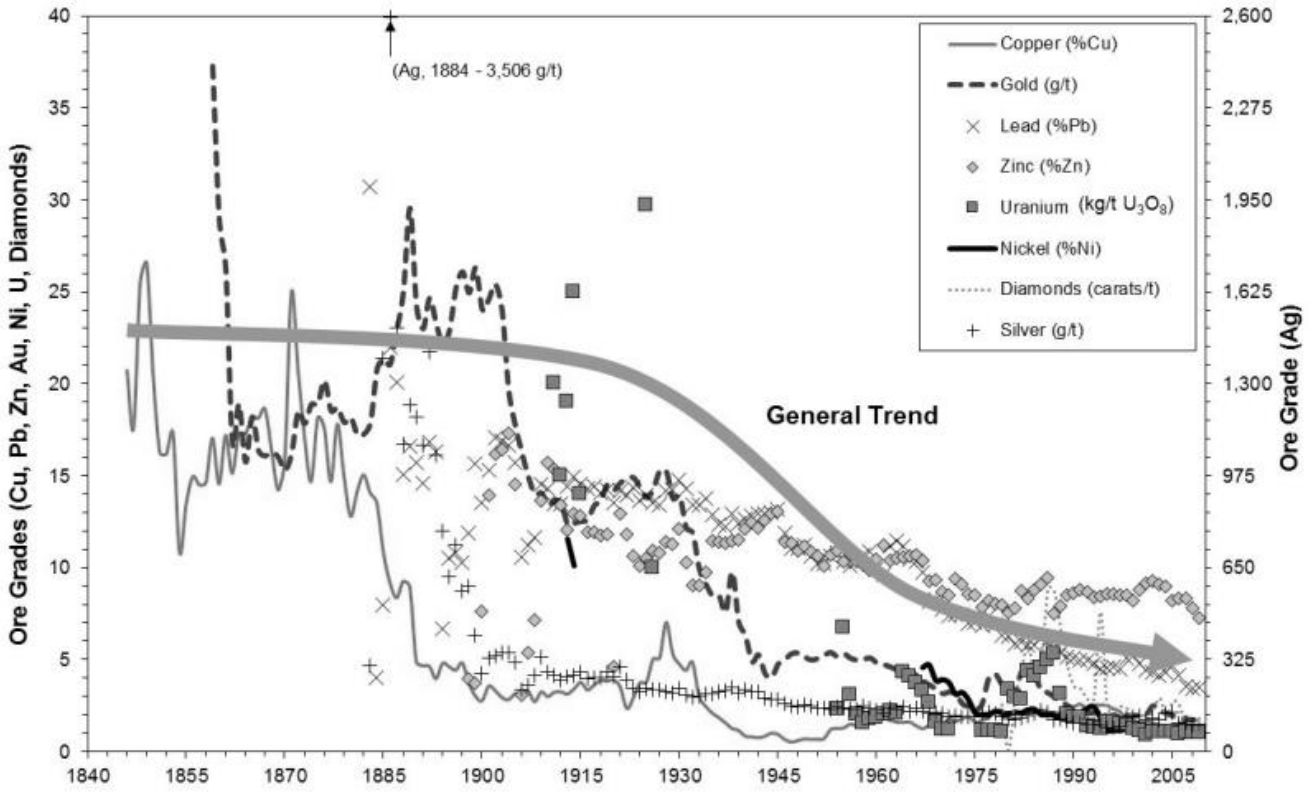
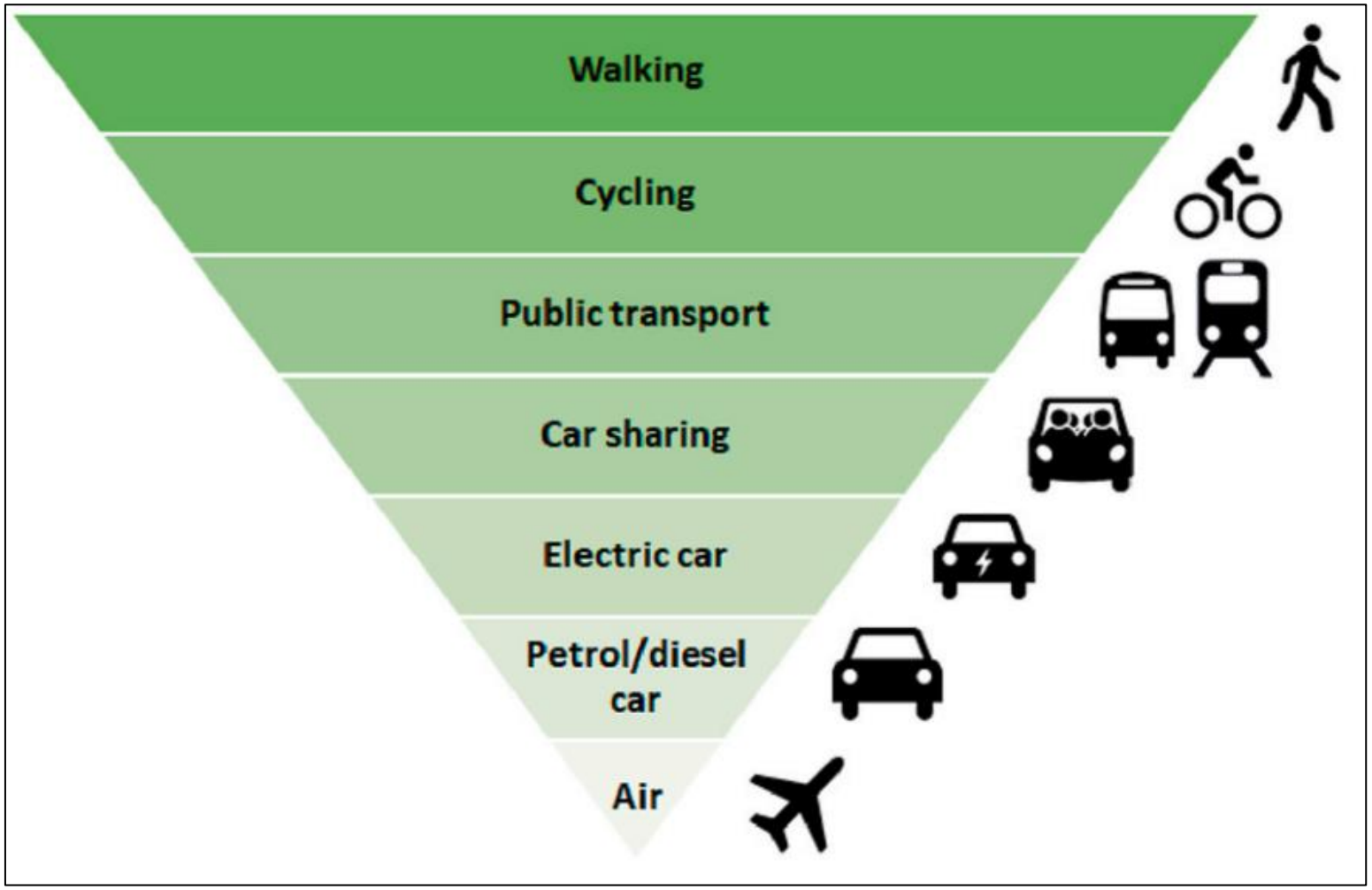


Figure 16. Grade of mined minerals has been decreasing (Source: Mudd 2009- updated 2012, Analyst- Gavin Mudd)

Sustainable Transport Hierarchy



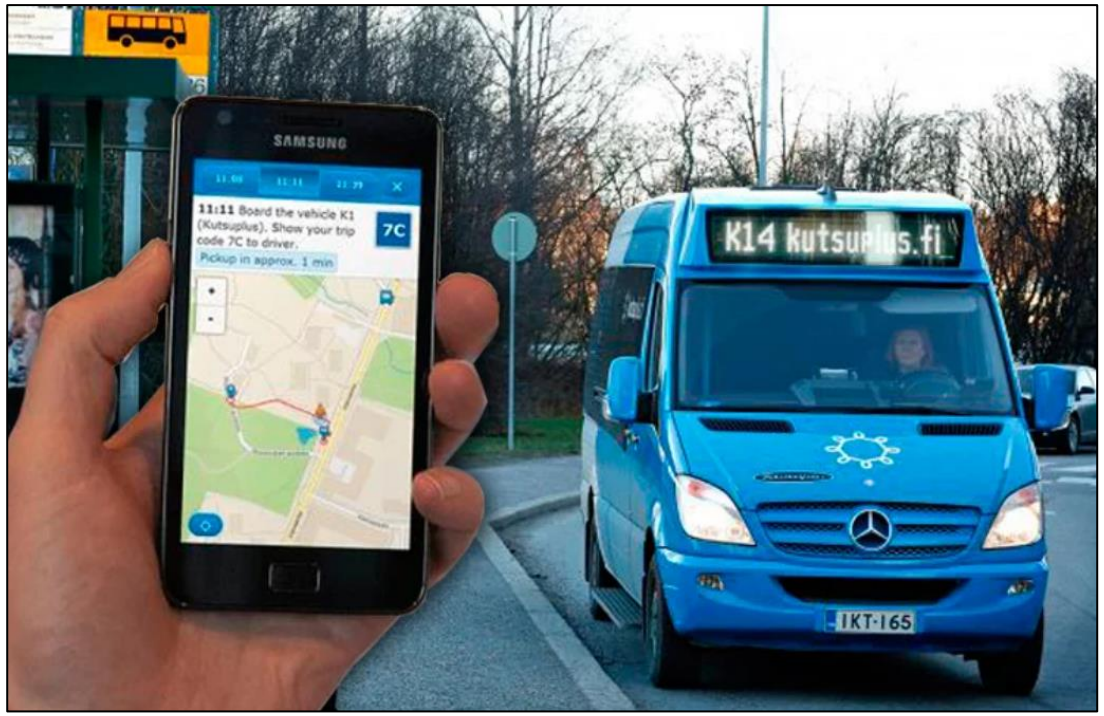
Mundaca, Román-Collado, and Cansino (2022)

Criteria for a technologically-enabled sustainability transition

- Shared access
- Shared Use
- Integration of collective transport modes
- Mitigation of land use dispersal

Rationale for a mobility transition

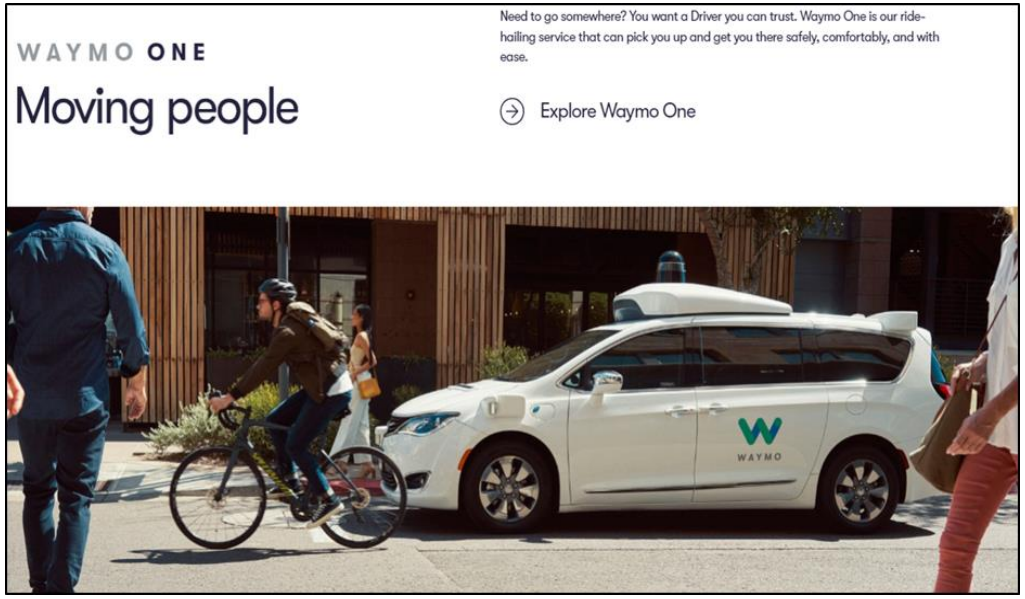
- Shared mobility can reduce car ownership, enabling less parking demanding, complementing redevelopment.
- Shared mobility can improve transit access in suburbia.
- Pragmatic integration of ‘development-oriented transit’ and ‘transit-oriented development’ (Cervero, 2020)
- Automation may be ‘game changer’ by reducing marginal cost of ridesharing and transit.



https://www.revistacolectibondi.com.ar/2016/04/18/finlandia-asi-es-el-transporte-publico-segun-demanda-de-helsinki/

Autonomous Vehicles

- **Car ownership will decline** if people prefer accessing SAVs. 1 SAV could replace 11 cars.
- SAVs could reduce parking demand and improve suburban transit access. Opportunity for **land use transport integration.**
- VKT growth could be mitigated if many share SAV rides and **integrate SAVs with transit.**
- Uncertainty regarding how many will access SAVs, share rides on SAVs and use SAVs to access transit.
- If most prefer Private Autonomous Vehicles (PAVs), ability to use travel time could **expand travel time budgets**. Risk of more VKT/sprawl.
- AV impacts determined by interplay of household preferences and planning responses, including degree to which **governance is integrated**.



Waymo.com (accessed 15/01/23)

"The future is already here, it's just not evenly distributed yet" (William Gibson, 1992)

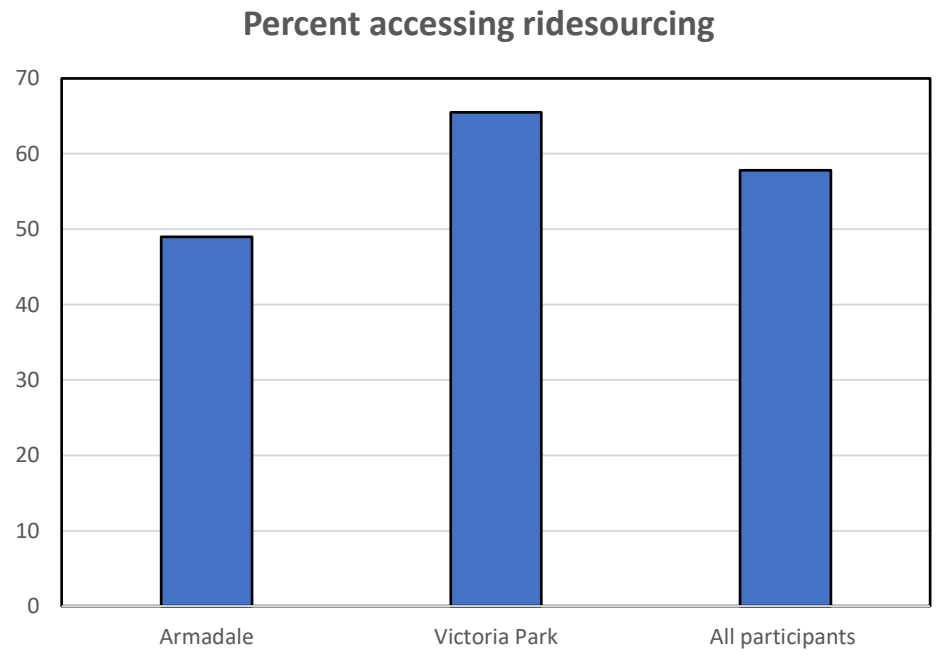
Case study areas

- Household travel data collected from metro Perth, example of a car-reliant city (*McLeod and Curtis 2019*)
- Victoria Park and Armadale LGA's selected as sites with differing accessibility, important contextual variable *Stevens (2017)*.

- Institutional data sourced from Perth, site of household analysis and;
- Australia's Eastern States (NSW, Vic, Qld)
- Results compared against data from Finland and Sweden.
- Selected as examples of places with a history of mobility innovation *Miörner and Trippl 2019; Mladenović et al. 2020*).

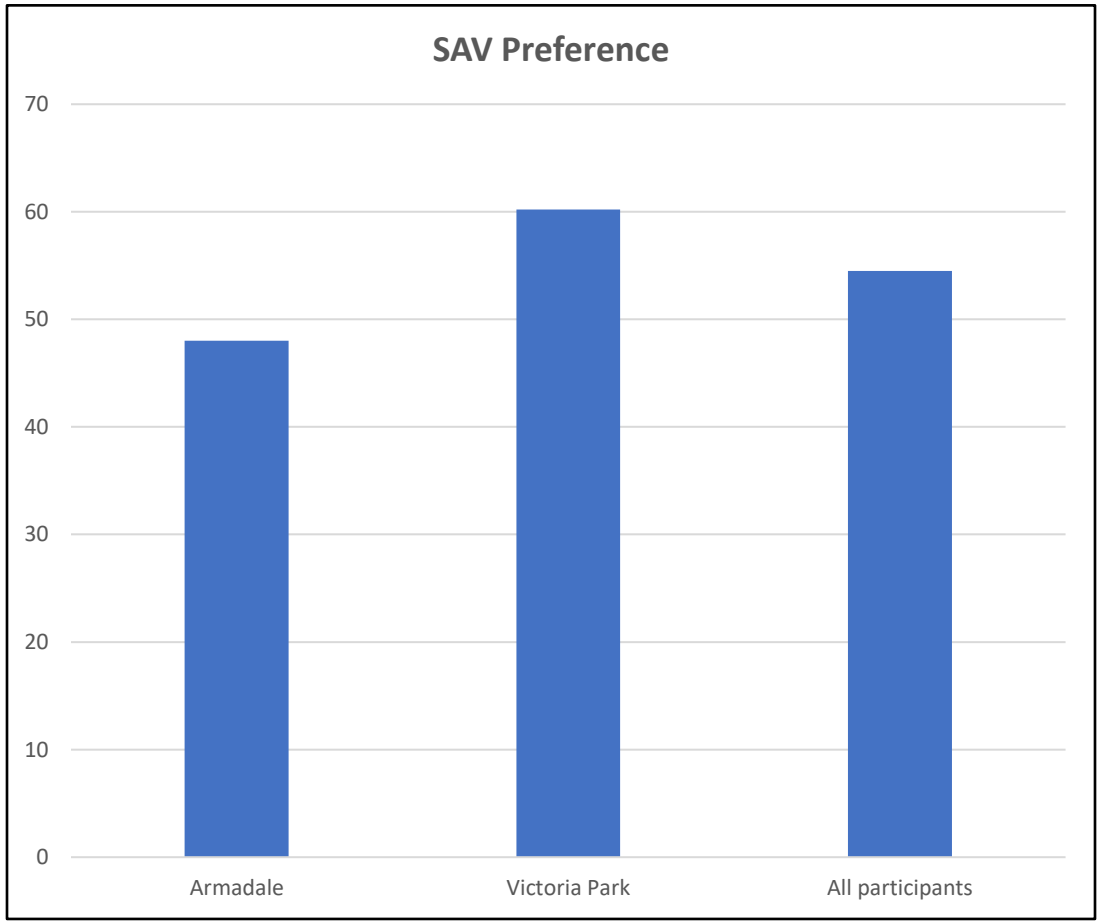
Geographical differences ridesourcing use

- 57.8% of all participants (n=213) had accessed ridesourcing.
- 49% of Armadale participants (n=100) had accessed ridesourcing.
- 65.5% of Victoria Park participants (n=113) had accessed ridesourcing.
- Where available, 24.3% had shared rides.



Geographical differences in SAV preferences

- 54.5% of all participants (n=213) had a SAV preference.
- 48% of Armadale participants (n=100) had a SAV preference.
- 60.2% of Victoria Park participants (n=113) had a SAV preference.

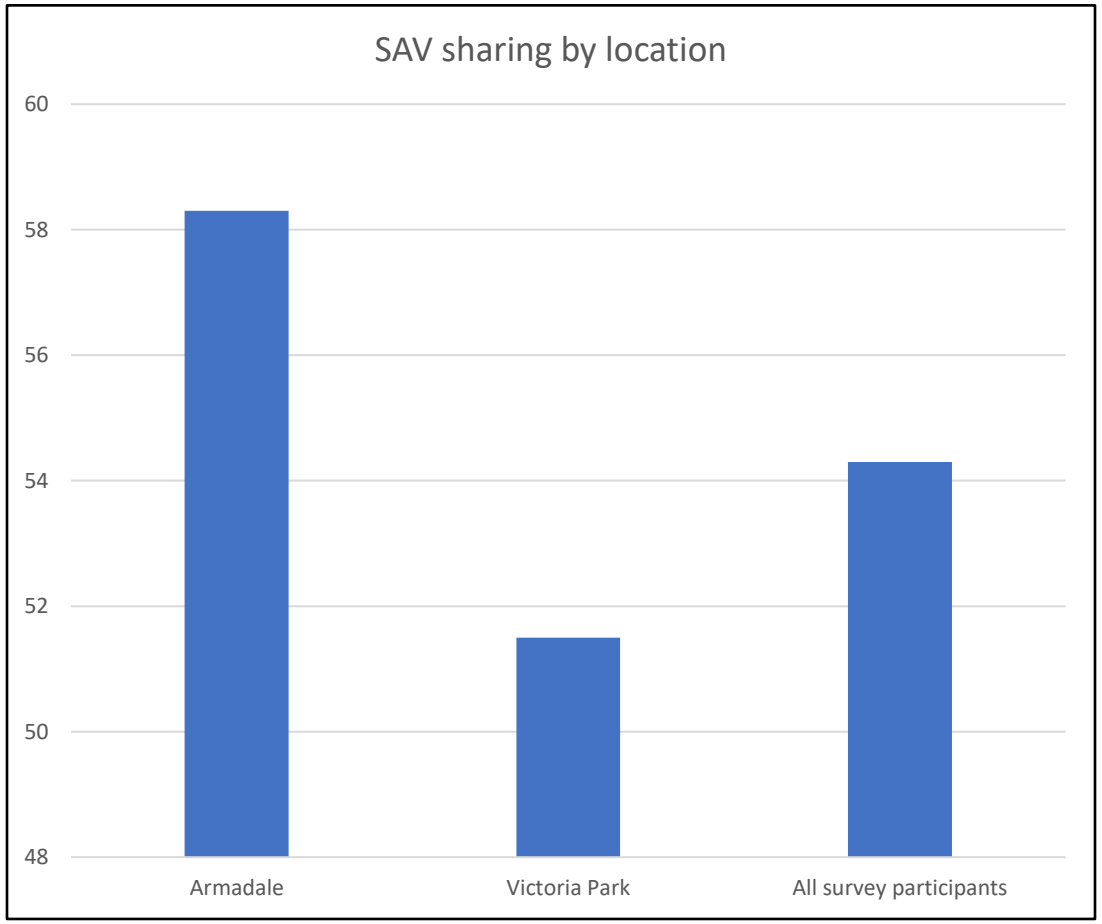


Reasons for AV preference

SAV preference rationale	Frequency	PAV preference rationale	Frequency
Cost savings – only have to pay for use, not ownership	69% n=80	Convenience – always available when needed	83.5% n=76
Environmental impact would be reduced	50% n=58	Personal security	46.2% n=42
Convenience – no need to clean or maintain vehicle	44% n=51	Cleanliness	26.4% n=24
Garage/driveway could be re-purposed to other uses	19% n=22	Children in care	25.3% n=23
Other	15.5% n=18	Pet ownership	23.1% n=21
		Luggage space	19.8% n=18
		Other	13.2% n=12

Geographical differences in SAV ridesharing preferences

- 54.3% of participants with a SAV preference (n=116) thought they would rideshare on SAVs.
- 58.3% of Armadale participants with a SAV preference (n=48) thought they would rideshare on SAVs.
- 51.5% of Victoria Park participants with a SAV preference (n=68) thought they would rideshare on SAVs.



Barriers to ridesharing on SAVs

Impediment to sharing rides	Number	Percent
Feel unsafe sharing rides with strangers	27	52.9%
Dislike sharing rides with strangers	22	43.2%
Prefer collection from trip origin	18	35.3%
Prefer direct trip to destination	18	35.3%
Trip would take longer	9	17.7%
Need more workspace than available if sharing	1	2%
Other	0	0%

SAV/transit integration

Factor	Would integrate SAVs with transit	Would not integrate SAVs with transit
Armadale	58.3% n=28	41.7% n=20
Victoria Park	27.9% n=19	72.1% n=49
All survey participants	40.5% n=47	59.5% n=69

Lessons learned

- Perth households increasingly habituated to shared mobility.
- May be re-negotiating relationship with transport. Pragmatic use of option best suited to trip.
- Many sharing rides and using ridesourcing to access transit.
- Over half preferred accessing SAVs, primarily due to avoiding costs of private car ownership.
- Important to ensure short, reliable SAV wait times
- Provide SAV ridesharing options perceived as safe, with minimal travel time penalties (short detours, high-frequency transit spines).

https://unsplash.com/s/photos/lessons-learned

Australia

- Perth's planners impeded by fragmented governance/Neoliberal institutional landscape (*Legacy et al, 2019*). Limited 'defection' (Roberts and Geels, 2019) from status quo.
- While influenced by Neoliberalism, planners in other Australian states facilitating shared mobility and automation to reduce car reliance.

Finland and Sweden

- Transport sector embracing shared and autonomous mobility to improve transit access and coverage.
- Town planners leveraging shared mobility innovations to reduce parking supply, facilitate compact urbanism.
- Articulated visions of accessible urbanism, with supportive measures. Suggests negative technology impacts can be minimised/benefits maximised.

Impacts may have a variable spatial expression

- SAVs will probably experience faster uptake in urban and inner-suburban environments
- Jurisdictions with collaborative governance structures may achieve greater integrated mobility and more land use transport integration.
- Cities with integrated transit systems and road pricing well-positioned to capture potential SAV benefits
- Places with a neoliberal governance tradition will see impacts shaped by market investors.

https://www.freepik.com/premium-photo/selective-focus-image-old-signboard-blue-sky-background_23260264.htm#page=52&query=signs%20street&position=13&from_view=keyword&track=ais

Thoughts for practitioners

- Work across ‘silos’ and with community developing mobility systems addressing needs and values.
- Don’t wait for SAVs to be widely distributed. Focus on:
  - integrated transit systems, with mobility ‘backbones’
  - Partnerships between shared mobility and transit providers lessening parking demand at transit hubs.
  - Subsidise ridesharing accessing suburban transit to improve suburban transit accessibility
  - Levy single-occupant urban ridesourcing trips
  - Variable road pricing systems discouraging lengthy, low occupancy trips.
- Foster technology trials and maintain support long enough to ‘breakthrough’ into mainstream.

https://www.transport.nsw.gov.au/data-and-research/research-hub/research-hub/research-projects/driverless-shuttle-bus-trial

Conclusion

- Conventional approaches reducing car reliance failed to reduce carbon emissions.
- Transport electrification necessary, but resource constraints dictate more reliance on active and collective transport.
- Sustainability transition contingent on integration of mobility services, integration of land use and transport, both enabled by integrated governance.
- People becoming habituated to shared mobility and many receptive to SAVs. Key will be short wait times and perceived safety and privacy.

https://pixabay.com/illustrations/earth-space-sunlight-sun-rays-1756274/

FUTURE OF MOBILITY SEMINAR SERIES

SPECIAL EDITION

Thursday 26 July 2023

10:00–11:30am

Curtin HIVE

WESTCYCLE

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