



Micromobility

Tuesday 13th July 2021



TODAY'S PRESENTERS



Joshua Chivers

*Urban Planner
RACV*



Julia Hunter

Senior Manager

*Strategic Partnerships & Growth
in Mobility for RACV*



Tom Cooper

*General Manager of Australia
and New Zealand*

At Beam



Hafez Alavi

Transport Lead

HA Consulting

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Web: www.ite.org.au



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Please remain on mute

No questions during presentation

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FIRST PRESENTATION



Joshua Chivers

Urban Planner
RACV

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ITE Micromobility webinar

By Joshua Chivers and Julia Hunter

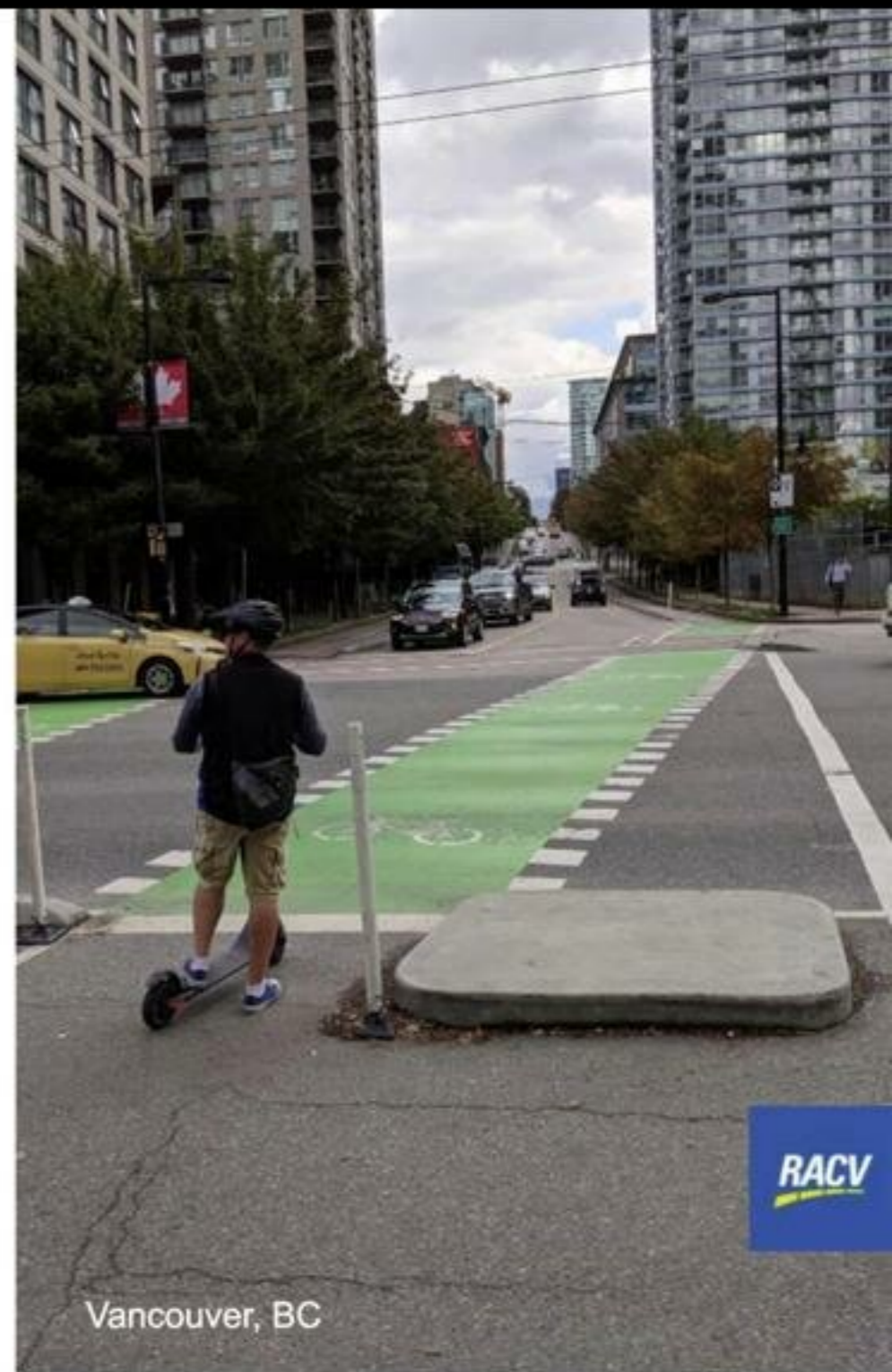


Introduction

RACV is committed to improving the mobility and wellbeing of Victorians. We believe in an integrated transport network that moves people safely, efficiently and equitably. Micromobility has the potential to address gaps in Victoria's transport network, by providing choice in areas where transport options are limited or non-existent.

What are e-scooters?

- E-scooters are a form of micro-mobility, they are typically two wheeled and propelled by an electric motor. See image on the right.
- These transport devices are emerging around the world, with a presence in Brisbane and Adelaide.
- E-scooters that are over 200 watts and go faster than 10km/h on level ground cannot be legally used on roads or footpaths in Victoria.
- In cities where higher powered e-scooters are legal, there is usually the presence of e-scooter rental companies such as Ride, Lime and Beam. These rental e-scooters can often be found on footpaths or docking locations and can be hired by downloading an application on a smartphone.



Vancouver, BC

RACV engagement.

E-scooter survey.

- In October 2019, RACV released a short online survey, aimed at tapping into people's perceptions and attitudes towards e-scooters.
- The survey received 1442 responses with a run-time of approximately 3 weeks.
- A Royal Auto article was developed to inform RACV members about what e-scooters are and the legality of them in Victoria.
- This Royal Auto article contained a link to the survey, which was posted on the Royal Auto website and was promoted through RACV's Digital Newsletter.
- Everyday Victorians and RACV members were further engaged by sponsored Facebook and Twitter posts.

Source: <https://www.racv.com.au/content/dam/racv/images/public-policy/reports/eScooter-survey-results---Dec-2019.pdf>



Portland, Oregon

RACV engagement.

E-scooter survey findings.

Headline results;

- 79% of survey respondents told us that they would use an e-scooter.
- Main factors that would make respondents consider using an e-scooter:
 1. Better for the environment than a car.
 2. Freedom to go where I want.
 3. Avoid congestion.
- Trips that respondents would like to use the e-scooters for:
 1. To get to public transport.
 2. For recreation / fun.
 3. To go to work.
- Locations where respondents would like to see e-scooters be used:
 1. Shared Path / Bicycle Path.
 2. Bicycle Lanes.
 3. On roads with speed limits under 50km/h or less.

Source: <https://www.racv.com.au/content/dam/racv/images/public-policy/reports/eScooter-survey-results---Dec-2019.pdf>



Portland, Oregon

RACV engagement.

E-scooter survey findings.

Headline results;

- 71% of respondents stated that rental e-scooters should be allowed in Victoria.
- Respondents living in outer metropolitan Melbourne saw e-scooters as a first and last mile solution.
- Why wouldn't respondents consider using an e-scooter?
 1. I don't trust other road users.
 2. Infrastructure is not safe enough.
 3. They don't suit my needs.

Source: <https://www.racv.com.au/content/dam/racv/images/public-policy/reports/eScooter-survey-results---Dec-2019.pdf>
Photo: Ivan Teece (2020), <https://unsplash.com/photos/3JmbJUac1PbM>



RACV engagement.

What we found out.

- The survey results revealed that there is strong support for e-scooters in Victoria.
- Non-road rule compliant e-scooters are here. Available to buy online and in Australian retail outlets.
- Globally, we are seeing public e-scooter hire/share schemes expand and become viable in their local contexts.
- Many benefits; micro-mobility is filling different gaps in the transport system for different people. This is a good thing.
- The issue; they are currently, for the most part, illegal to use in Victoria.
- There's a disconnect between innovation in the transport sector, policy and regulatory tools that govern their use.
- Not without concerns. Safety, the risk profile of riding them, and the impact parked e-scooters may have on the public realm are all relevant issues to explore.

Source: <https://www.racv.com.au/content/dam/racv/images/public-policy/reports/eScooter-survey-results---Dec-2019.pdf>



San Francisco, California

RACV engagement.

Engagement with Victorians and two submissions to the National Transport Commission.

National Transport Commission (2018-2020).

- The National Transport Commission released their regulatory impact statement on personal mobility devices in August last year.
- The work that they have undertaken aims to implement personal mobility devices (which includes e-scooters) into the Australian road rules.
- It will then be the responsibility of each individual state to legislate these road rules based on the rules set in the Australian road rules.
- RACV made two submissions to the National Transport Commission.

Source: <https://www.ntc.gov.au/files/default/files/essnts/files/NTC-Decision-RIS-PMDs.pdf>



RACV engagement.

E-Bike Trials (Bendigo)

- In partnership with LaTrobe University Bendigo, we lent 8 participants e-bikes and monitored their mode behaviour and usage.
- The participants primarily used the bikes for commuting and every participant in the Bendigo trial would consider riding an e-bike in the future.
- Participants expressed very high satisfaction with e-bikes averaging over 9/10 by the final week of the trial period.
- Participants preferred e-bikes over other modes for convenience and health/fitness but were unlikely to ride them when the weather was cold, wet or windy.

Source: <https://www.roadsafety.gov.au/nrs/safe-system>



The Safe System Principles.

Future legislation for micromobility must consider the safe system approach.

The safe system approach involves a holistic view to road safety.

The primary four areas are:

- Safe roads,
- Safe speeds,
- Safe vehicles and,
- Safe people.

These four areas influence our policy positioning on all matters relating to road safety, including micromobility.

We must continue to acknowledge that people make mistakes, we have a shared responsibility on our roads and that humans are vulnerable.



Public Policy and Advocacy

Positions

- We need nationally consistent road rules among the states and territories.
- We have called for a national framework for personal mobility devices to allow e-scooters to travel at 25km/h on most roads, bicycle lanes, bicycle paths, shared paths and 10km/h on footpaths.
- Personal mobility devices like e-scooters have the potential to ease congestion and provide a more sustainable transport option.
- Safe, separated bicycle infrastructure is an essential aspect for all micromobility options, including bicycles, e-bikes and e-scooters. A safe cycling network is still needed for Melbourne and we are urging the local and state governments to fund this necessary infrastructure as soon as possible.

Source: <https://www.racv.com.au/content/dam/racv/images/public-policy/reports/eScooter-survey-results---Dec-2019.pdf>



San Francisco, California

Micromobility & MaaS

Julia Hunter



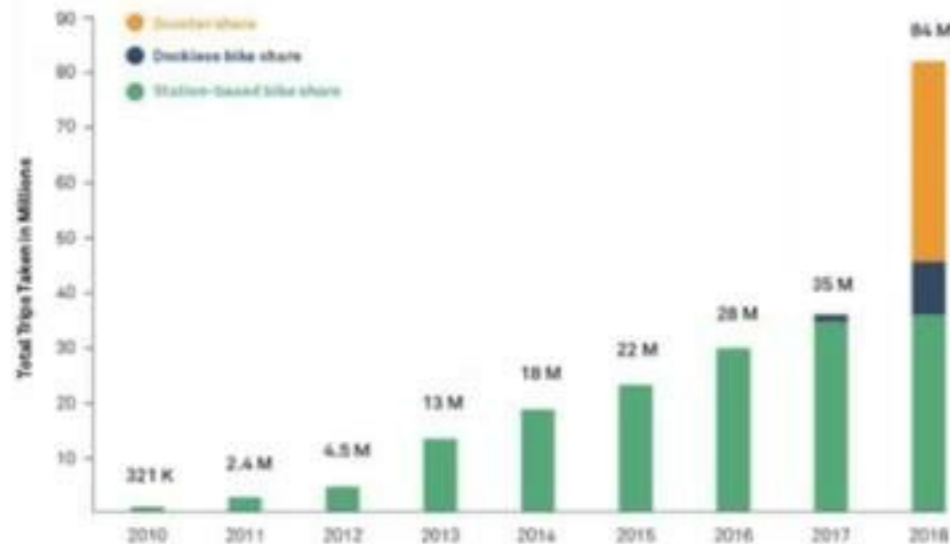
Congestion, Conflict & COVID



A transport revolution?



84 Million Trips on Shared Micromobility in 2018



Source: NACTO

Financial Times

Half of all bikes sold in Europe will be electric by 2025, predicts manufacturer

Bosch's division chief predicted annual growth rates in e-bike sales ... core markets include Germany, Netherlands, Belgium, Luxembourg, ...
3 days ago



Electrek

The affordable electric vehicles outselling electric cars around the world

Electric bike companies are generally left to figure it out on their own, with little or no outside assistance. And yet, e-bike sales in the US have ...
2 weeks ago



WHAT THE NUMBERS TELL US



EBIKE SALES

ebike sales have been growing at 50% per year for the past three years. That means sales are currently doubling in less than every two years.

Source: <https://micromobilityreport.com.au/what-is-micromobility/>



TRANSPORT SPEND

The average Australian metropolitan household spends 14.1% on household income on transport (pre-COVID)

Source: Australian Automobile Association's Transport Affordability Index



CYCLING PARTICIPATION

Cycling levels around Australia have increased by up to 69% compared to pre-COVID.

Source: <http://www.bicyclingaustralia.com.au/news/the-data-is-in-cycling-participation-numbers-are-way-up>

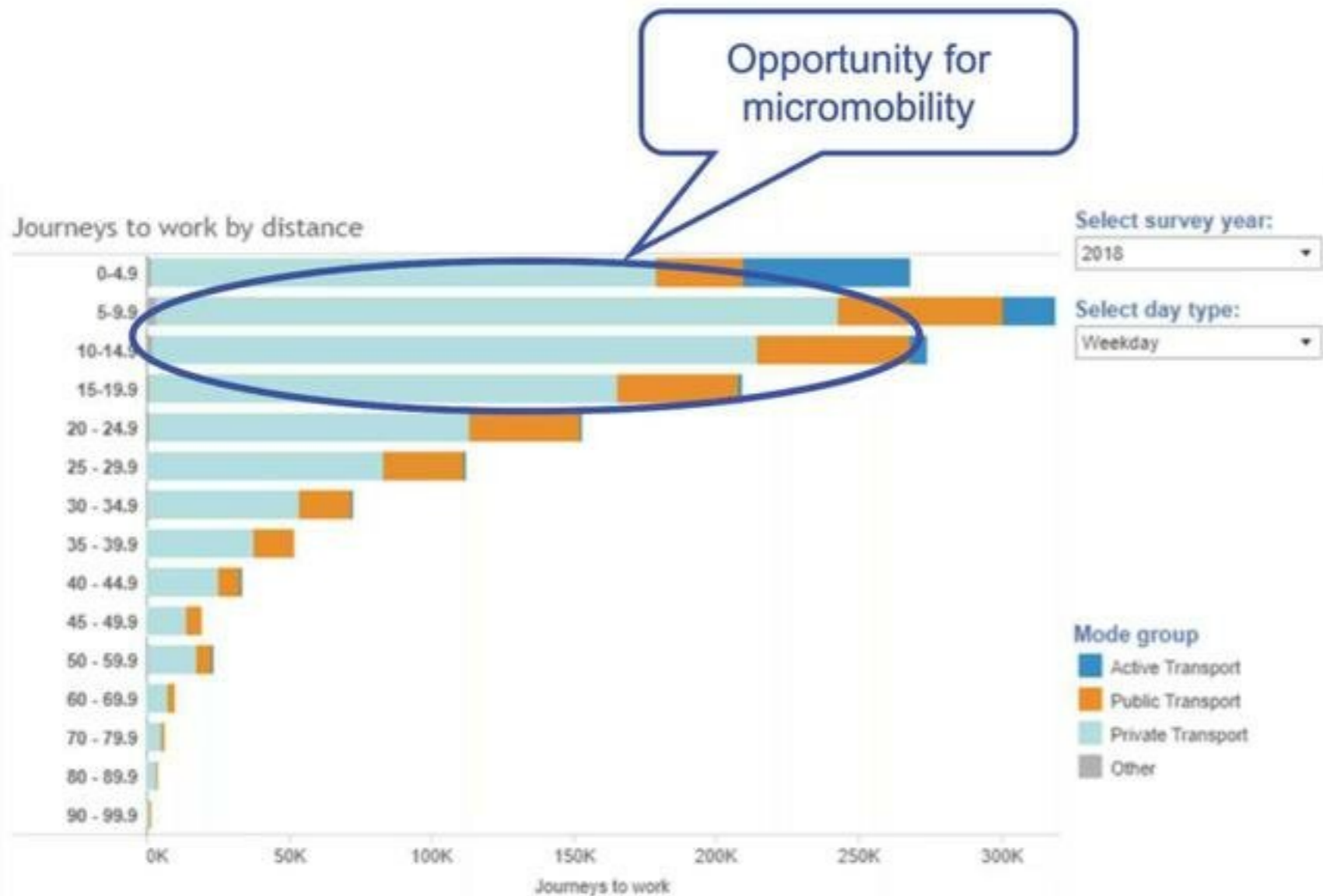


ACTIVE TRANSPORT

Victorian government objective of active transport reaching a 25 per cent share of all trips.

Source: <https://www.climatechange.vic.gov.au/victorian-government-action-on-climate-change/Transport-sector-pledge-accessible.pdf>

Mobility in Victoria



Private vehicle remains the predominant mode of transport for Victorians.

COVID-19 restrictions led to a dramatic decrease in journeys. As restrictions eased, we have seen relatively higher uplift in private vehicle journeys compared to other modes.

However, the trend over the medium-long term is expected to include increases in active modes and micromobility.

ebikes and scooters can increase the range for which people are willing to replace a private vehicle journey.

Improve the lives of Victorians by helping them get around conveniently, cost-effectively and sustainably



What is arevo?

arevo is a one-stop journey planning app that is focused on providing a user's complete mobility needs.



Multiple levers exist to promote micro-mobility

Promotions

Education & Training Programs
Promotional Events
Personalised Marketing
Information Resources

Laws

Road Rules
Liability Laws
Cycling Laws
Enforcement
Trials

Incentives

Payments
Tax Credits
Rewards
Driving Costs

Infrastructure

Land-use planning
Cycling Infrastructure
Network Connectivity
Congestion Management
Public Transport Interments

Rider confidence by environment



Midblock



Figure 12 Rider confidence by environment
Source: Based on CDM Research & ASDF Research (2017)

*Let's Ride,
Melbourne*

BICYCLE BEHAVIOUR CHANGE PROGRAM



Non-confident
riders now
confident

59%

agree the initiative
boosted their
confidence to ride

Feel
capable

84%

feel capable to ride
safely after interacting
with the program

Awareness

51%

were aware of the new
bike infrastructure

Riding more
for transport

46%

say they are riding more
since interacting with
the program

Motivated
to ride more

68%

agree the initiative was
a motivation to ride
more



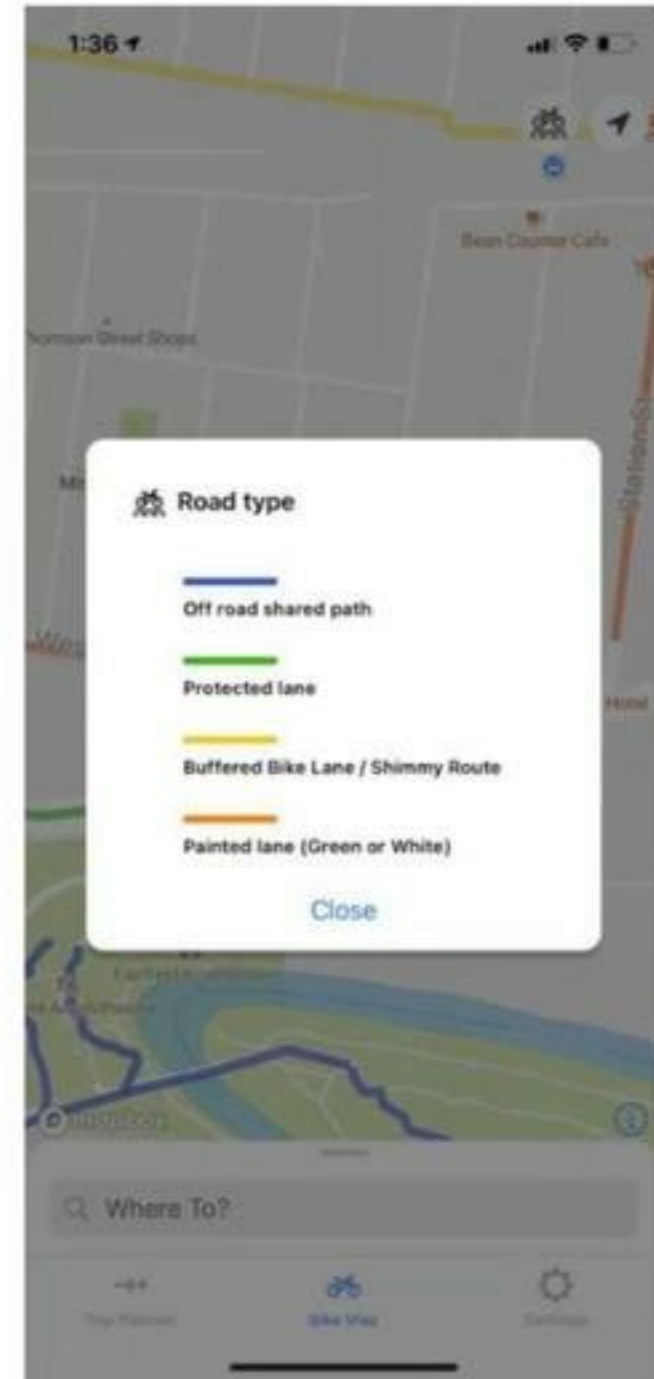
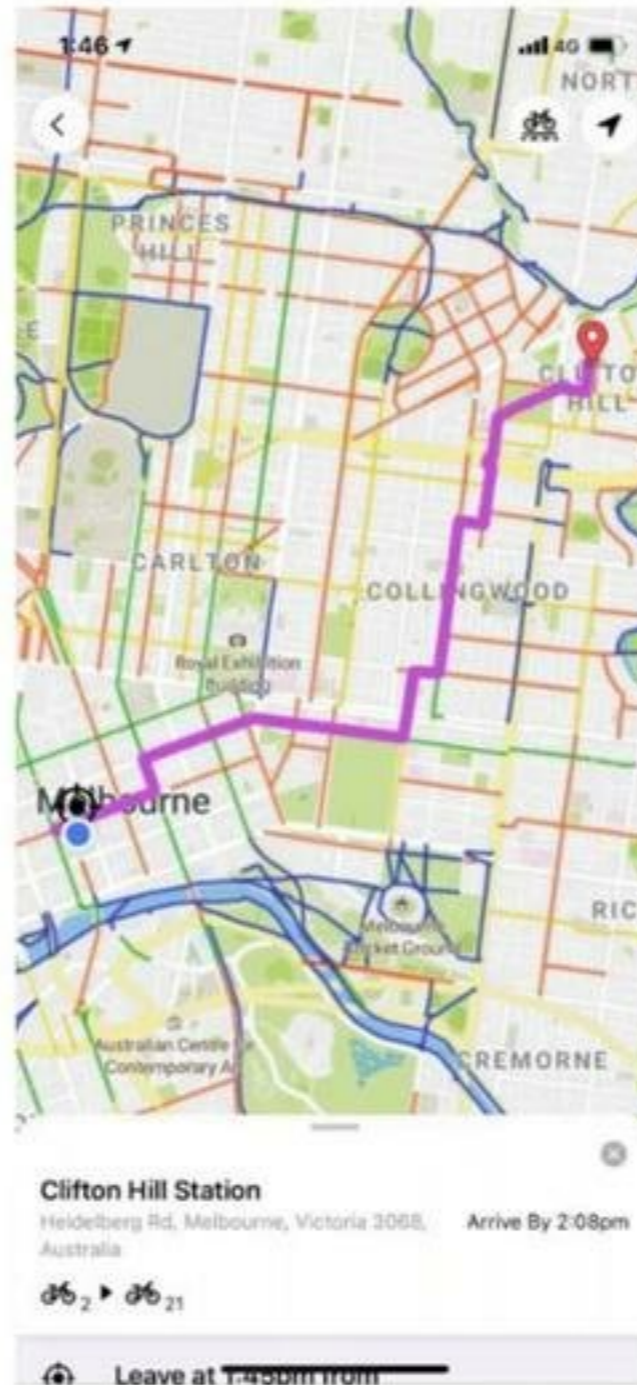
Bike Mapping

One barrier for new bike riders is working out a biking route.

Where are the bike paths?

What are the different types of bike paths?

How do I plan a safe journey?



Mobility Utopia

What if.....

- You could get to your destination in a way that was faster AND cheaper AND more sustainable
- Getting from A to B was more than a functional journey – it was an experience in itself
- Logistics and fleet needs were met by micromobility

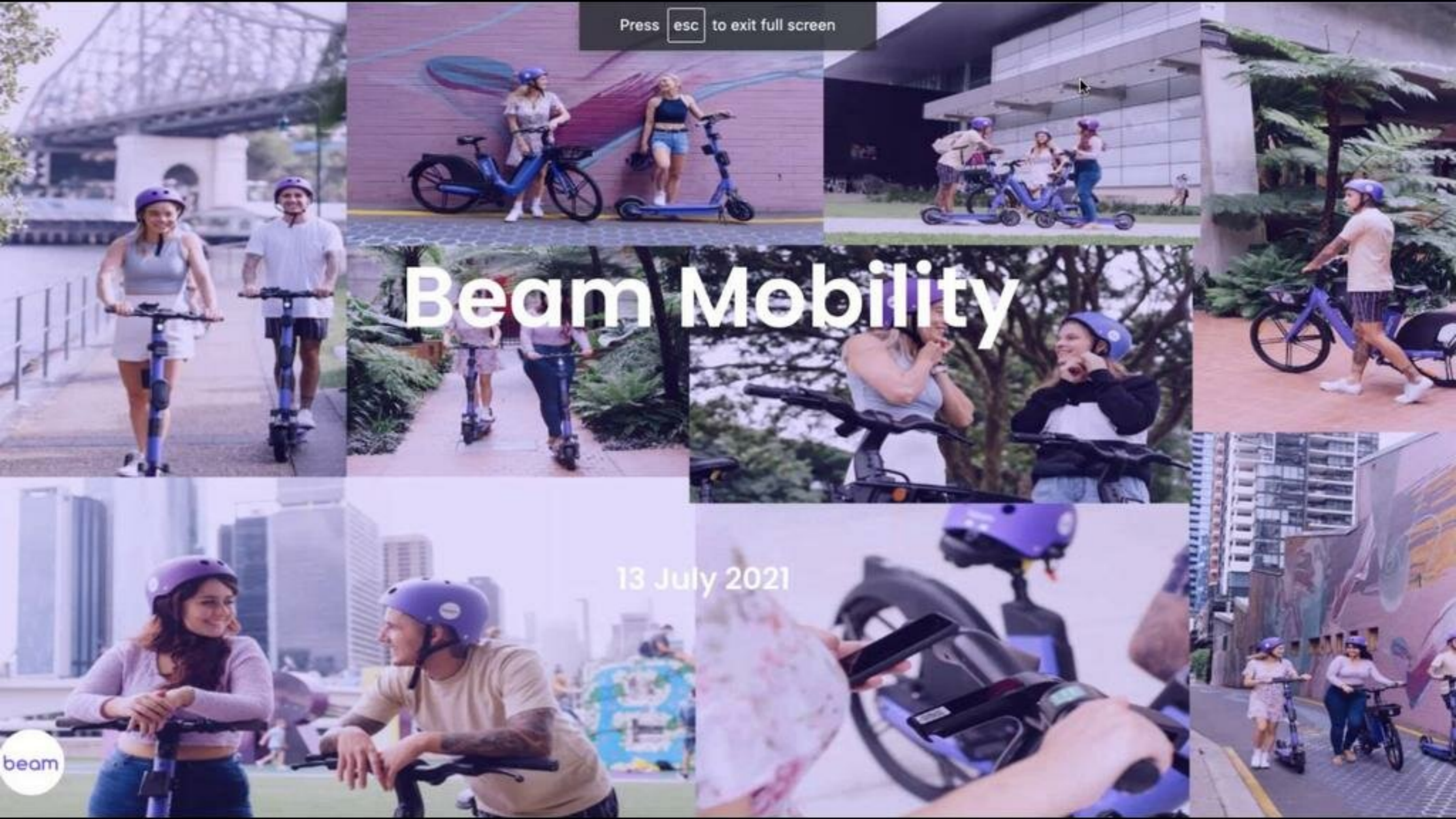


Press `esc` to exit full screen

Beam Mobility

13 July 2021

beam





Summary

- 1. Where Beam operates**
- 2. Vehicles**
- 3. Providing Accessibility**
- 4. How Micro Mobility is helping tourism and events**
- 5. Shared v owned**

Beam's APAC Footprint

Taiwan

Running Trials in
National Taiwan University

Malaysia

Launched in
Jan 2019

Thailand

Launched in
July 2021

South Korea

Launched in
June 2019

Australia

Launched in
January 2019

New Zealand

Launched in
January 2019



Beam's ANZ Footprint

Australia

Launched in
January 2019

Adelaide

Launched in
April 2019

Canberra

Launched in
October 2020

Bunbury

Launched in
March 2020

Adelaide Coast

Launched in
September 2020

Sydney

Launched in
October 2020

Townsville

Launched in
October 2020

Brisbane

Launched in
July 2021

New Zealand

Launched in
January 2019

Auckland

Launched in
January 2020

Wellington

Launched in
March 2021

Vehicle Timeline

Evolution of the shared E-Scooter

2018

Gen-1



2019

Gen-2

- +50% battery capacity to 540 watt hours
- LG battery Cells (same as Tesla)
- 25% bigger wheel
- larger frame and standing base
- lower center of gravity
- dual mechanical & electrical brake,
- significant durability improvements (bell, kickstand, vehicle water proofing)



Early 2020

Gen-3

- fully swappable batteries
- fully hidden cables
- modular design of components for repairability and vehicle lifetime



Late 2020

Gen-4

- 2.8x the battery capacity of gen 1 (1kwh) with 120km range
- hydraulic suspension for safer riding
- double sided anti-tipping kickstand
- triple brake: mechanical on each wheel + rear electric



SAFETY

Vehicles Built for Safety

Beam Saturn+

Beam Apollo

Shared Safety Features

Concealed wires and cables

Industry Leading Brakes System

Double-sided kickstand

Best-in-class swappable battery

Bluetooth enabled helmet lock

Smart safety lights

EXTRA SAFETY FEATURE ON THE E-SCOOTER

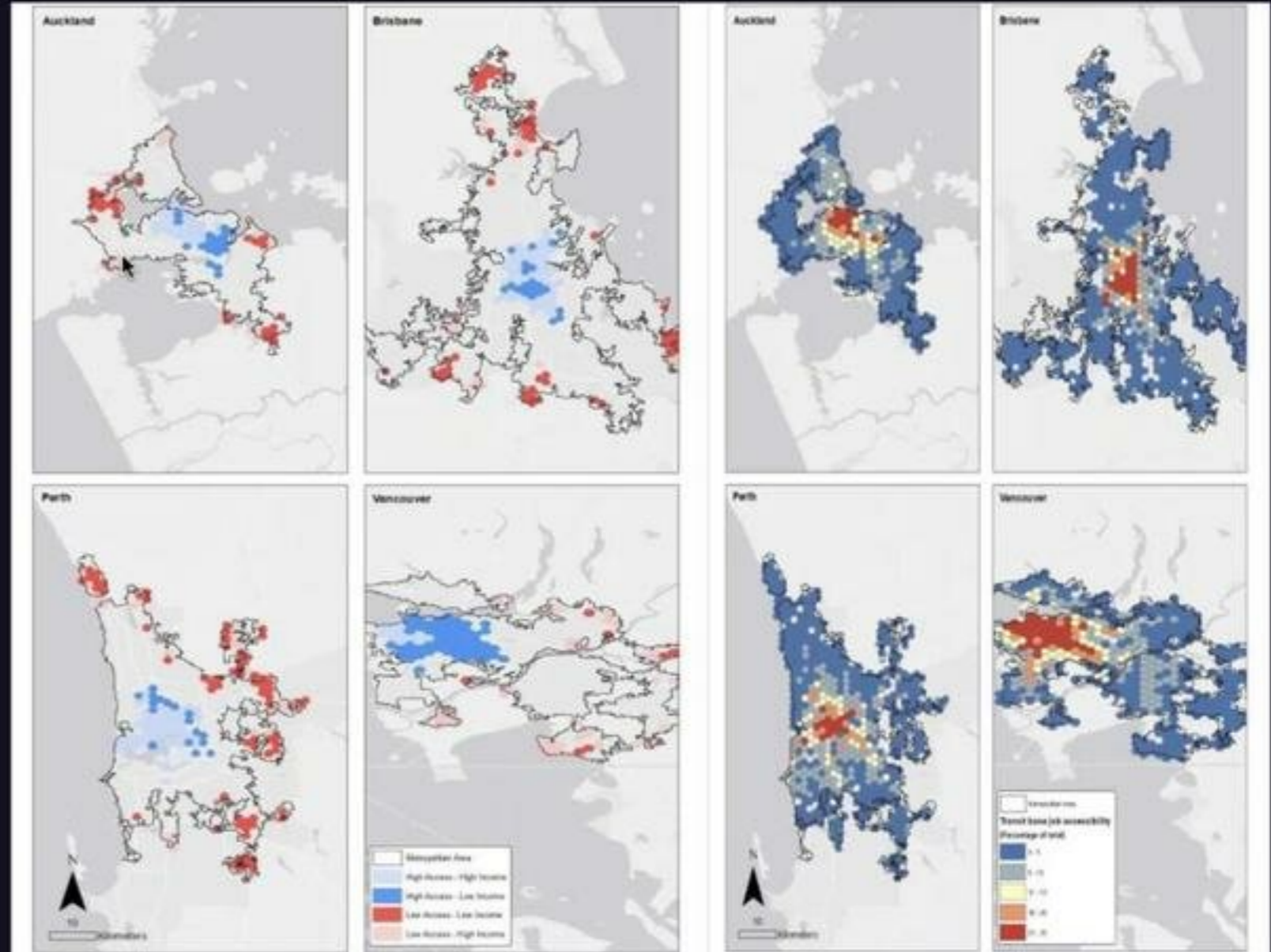
Hydraulic suspension system

Indicator lights



Accessibility

Making
transport
accessible for
everyone
creates
better cities!

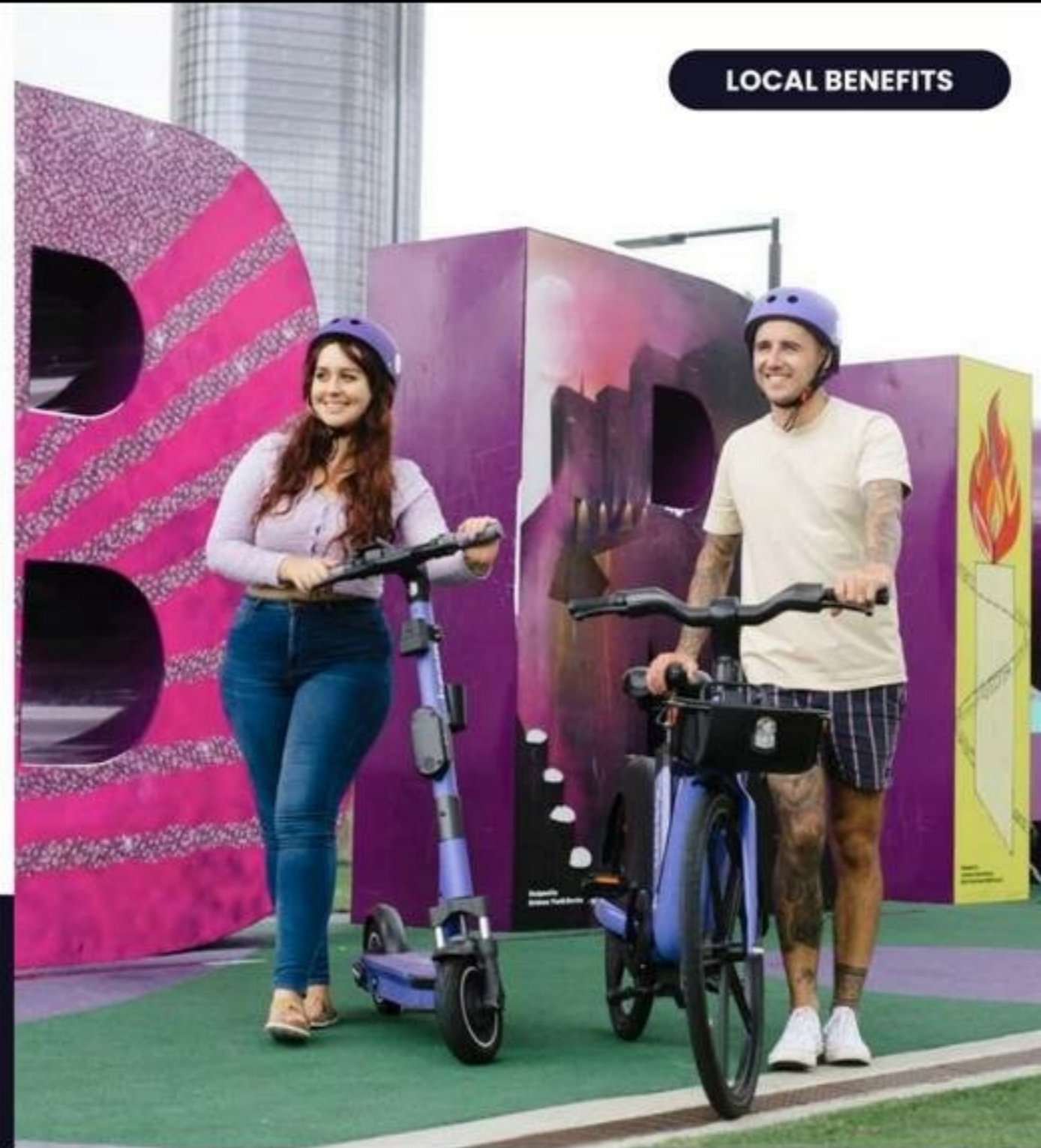


Driving Tourism Expenditure

E-mobility vehicles allow tourists and day trippers alike to move through a city and disperse further. This increases the opportunity for them to spend money at smaller businesses.

We believe that e-mobility opens up cities allowing people to see more and immerse themselves in the local atmosphere.

LOCAL BENEFITS



City
Experiences



Guided
Tours



Events
Promotion

Shared vs Owned

We are now seeing 3,000 – 5,000 trips per day across markets in ANZ.

"We started selling e-scooters about 2 years ago and since then sales have taken off. I now sell two e-scooters for every e-bike I sell."



*E-scooter sales boom in Queensland but confusion over rules, council uptake continue
ABC Far North / By Phil Brandel Posted Tue 25 May 2021 at 12:41pm*

Questions



Safety and Micromobility

A Focus on eScooter Riders

Tuesday, 13 July 2021

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LinkedIn: Hafez Alavi

**Acknowledging
ITE...**

**Appreciating your
participation...**



TODAY'S PRESENTATION

**WHY
SAFETY**

DATA

**WHAT
TO DO**

WHY SAFETY MATTERS

Why we're doing what we're doing...

ALEX'S STORY

32yo
Married

Two Young
Kids

Small Biz
Employer

Boating &
Fishing

Healthy
Rec Drugs

THE CRASH



Injured Body Regions

THE CRASH...

50%
Death

Air
Ambulance

40
Hosp Days

>1
\$Million
(Lifetime)

ALEX – 6 MONTHS

Slow
Recovery

Permanent
Scars

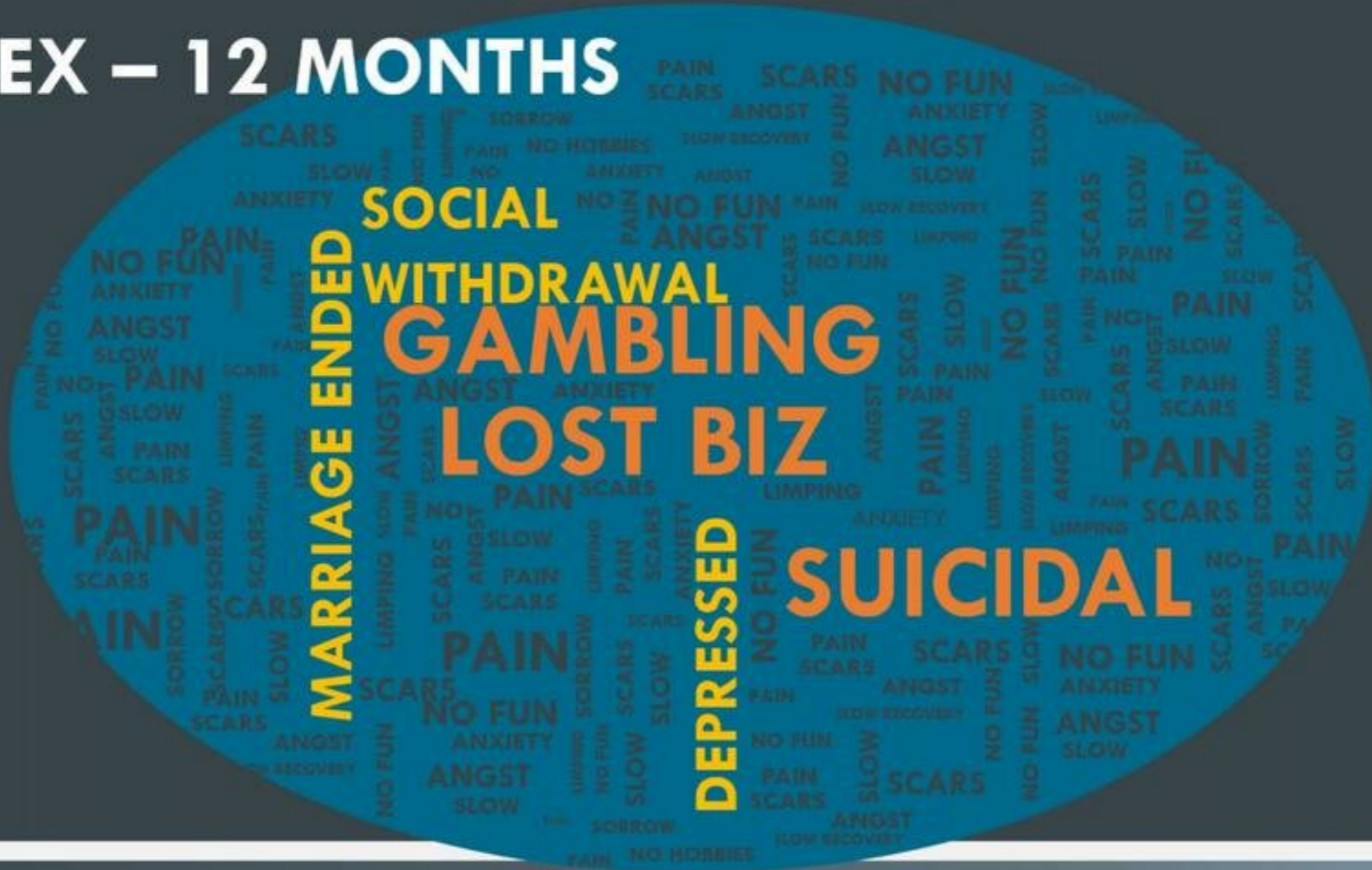
Continuous
Pain

Limping

Anxiety

Stopped
Hobbies

ALEX – 12 MONTHS



**Have you or a person you know
been involved in a crash?**

Post **1** in chatroom for **Yes**, and **0** for **No**.

4

SUSTAINABLE TRANSPORT PLANNING HELPS US FIGHT ROAD TRAUMA



**SUSTAINABLE TRANSPORT PLANNING
HELPS US FIGHT ROAD TRAUMA**

LET'S HAVE A LOOK AT THE DATA

A review of the existing evidence-base and surveys...

SYSTEMATIC REVIEW

E-SCOOTERS INJURY

28

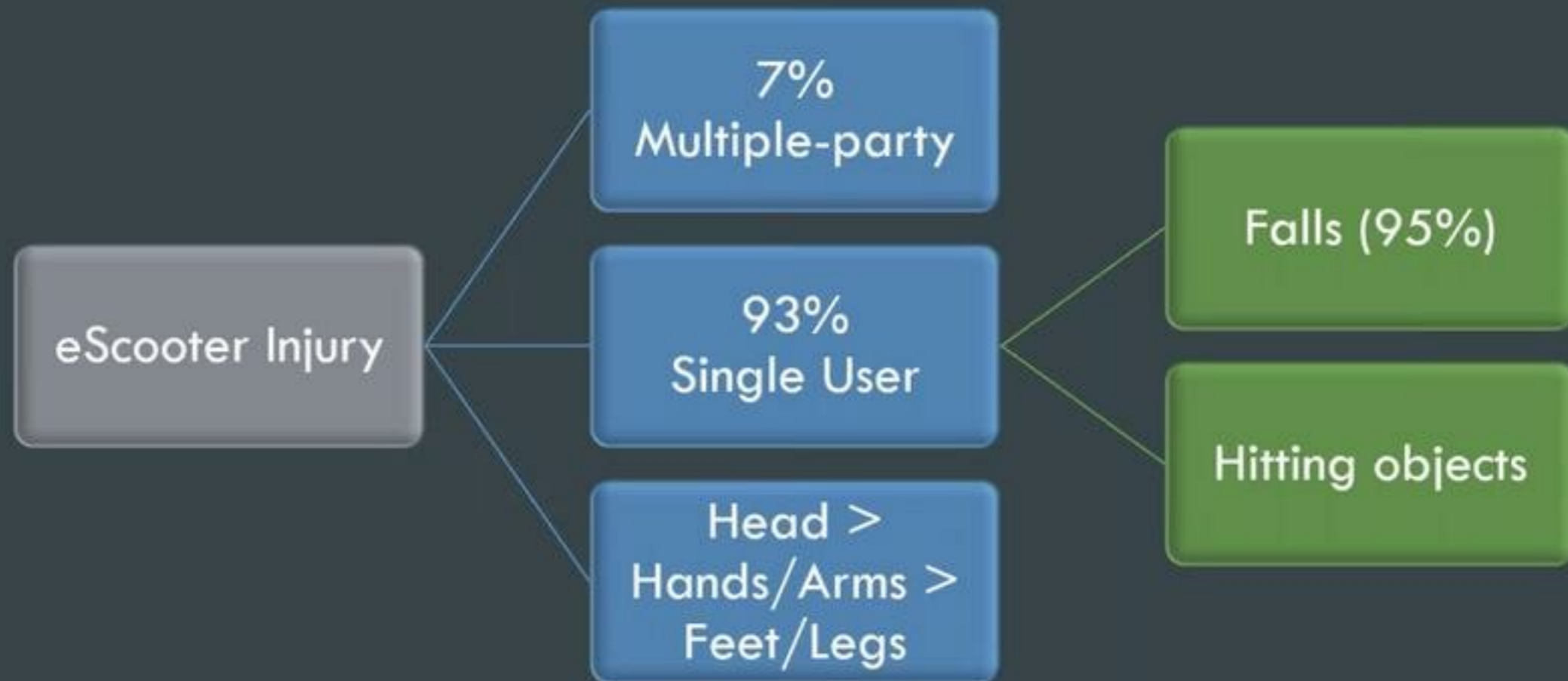
Peer-reviewed
Studies

2010 - 2020

4 (ANZ)
13 (U.S.)

Injury Data
ED or Health
Databases

INJURY MECHANISM



RIDER BEHAVIOUR



EU ROAD SAFETY RESEARCH INSTITUTES (2020) E-SCOOTER SURVEY

18
Countries across
EU

80%
eScooters are
legal

40%
Bicycle category
27%
Own category

40%
No age restriction
40%
> 12 – 18

70%
Max speed limit
of 20-25kph

FERSI SURVEY (2020)...

55%
Restriction on
maximum power

16%
Footpath/bike lane

11%
Bike lane only

38%
Bike/traffic lanes

11%
Need registration
or insurance

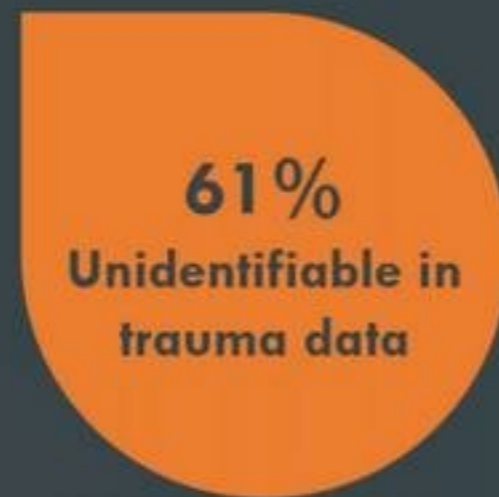
22%
Compulsory
helmets

FERSI SURVEY (2020)...

SAFETY

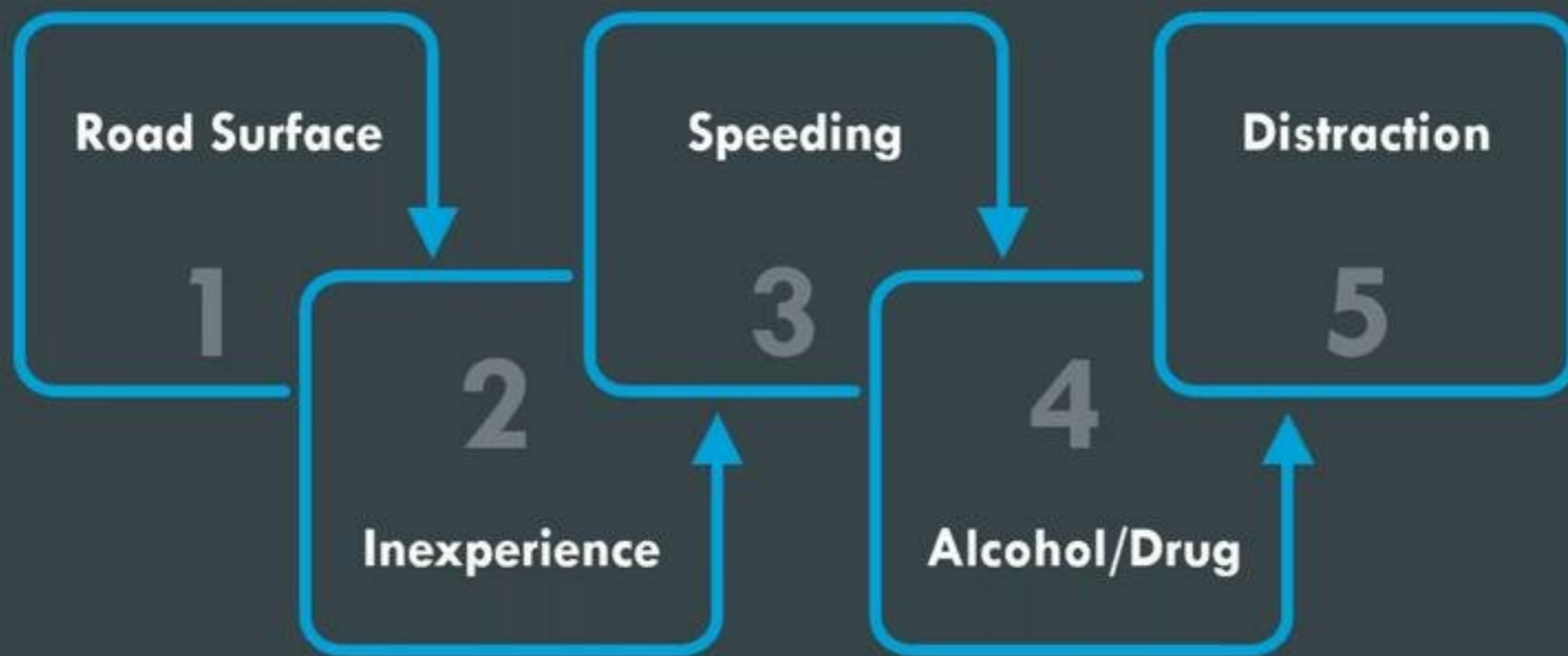
FERSI SURVEY (2020)...

SAFETY



FERSI SURVEY (2020)...

RISK FACTORS



Have you ever ridden an e-Scooter?

Post **1** in chatroom for **Yes**, and **0** for **No**.

**What safety risks have you
encountered?**

Really keen to know...

E-SCOOTERS

THROUGH THE SAFE SYSTEM LENS

How to prevent eScooter serious road trauma...

SAFE SYSTEM APPROACH

SOME KEY UNDERLYING PRICIPLES

**Human
Fallibility**

**Human
Vulnerability**

**All-System
Response**

**Shared
Responsibility**

WHAT DOES IT MEAN, PRACTICALLY?



3. Exposure
2. Crash Risk
1. Severity Risk

1. INJURY SEVERITY MANAGEMENT



2. CRASH RISK MANAGEMENT

- **Remove conflict points**
- **Minimise** the number of conflict points
- **Reduce the area** of a conflict
- **Reduce vehicle speed** at conflict points
- **Human Factor**

GIVE US AN EXAMPLE...
DUTCH ROUNDABOUT

GIVE US AN EXAMPLE...

DUTCH ROUNDABOUT

RAISED
PEDESTRIAN
CROSSINGS

SEPARATED
BICYCLE
LANES

HUMAN
FACTOR
DESIGN



FEWER
CONFLICT
POINTS

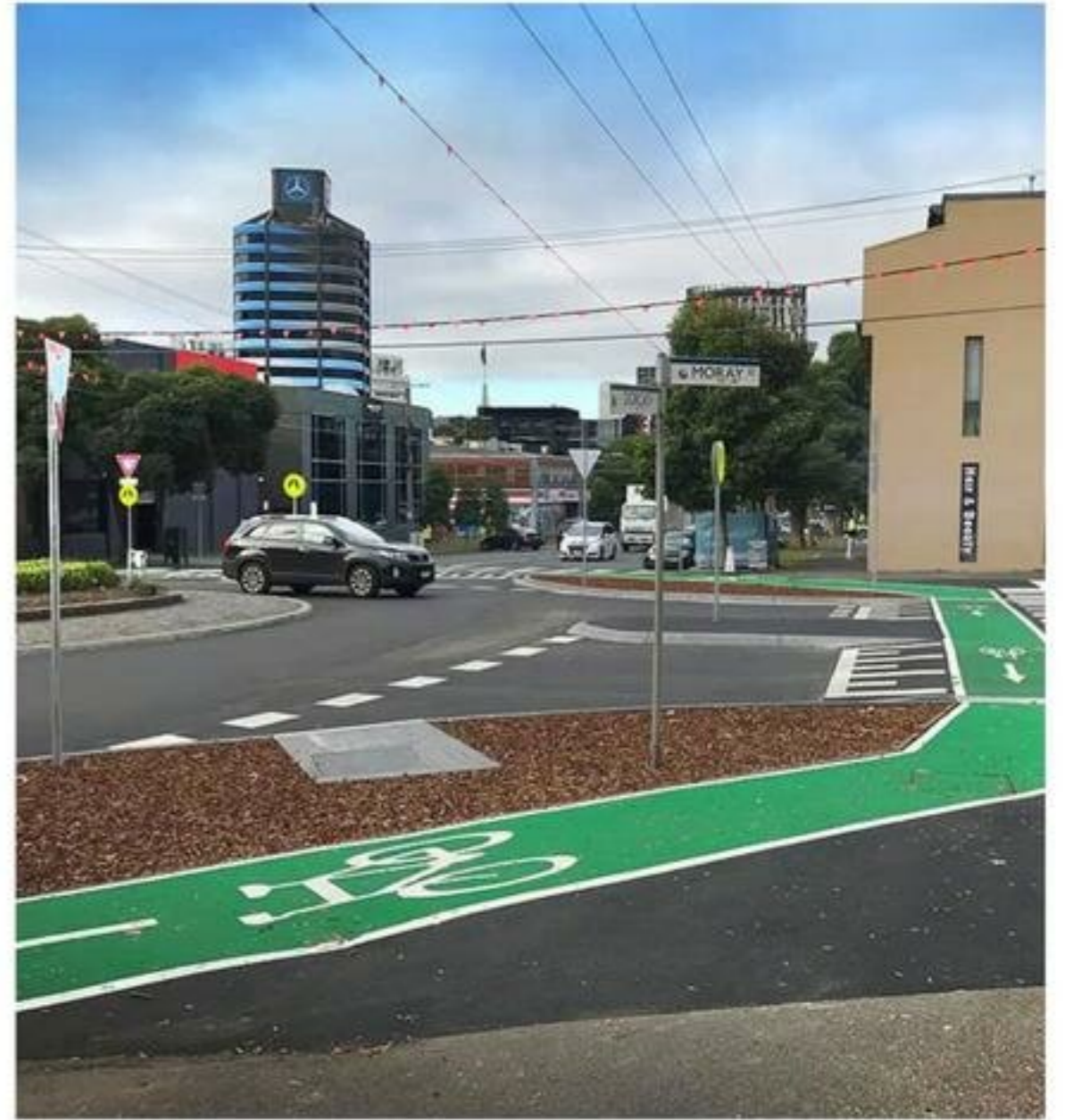
LOWER
SPEEDS

ONE-LANE
LEGS

3. EXPOSURE MANAGEMENT

- **Time-separate VRU** and **traffic** (cycling signal phases)
- **Space-separate** VRU and traffic (both **intersections** and **lengths**)
- **Move VRU to parallel, safer routes** (directness and other principles)
- **Reduce the number of vehicles** (mode shift from cars to active transport)

VRU: Vulnerable Road Users such as pedestrians, cyclists and eScooter riders



E-SCOOTER SAFETY

5-PILLAR RECOMMENDATIONS

E-SCOOTER SAFETY

5-PILLAR RECOMMENDATIONS

Safe Streets

Better Surface

Separation from Traffic & Peds**

Safe Speed

30kph Limit When Not Separated

Max Speed 15-20kph

Safe Riders

Compulsory Helmet Use

Drug & Alcohol Restrictions

Safe eScooters

Limited Power

More Stable Designs

Post-Crash Care

Trauma Data

Understand Injury Mechanisms

Thank y'all

Hope you're keeping well during these times...

Hafez Alavi

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ADVANCING
SUSTAINABLE
TRANSPORT SAFETY

HEA
CONSULTING