

# Emission Impossible? Reducing GHG Emissions with Land Transport Programmes

Amber Carran-Fletcher &  
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Road Engineering Association of Asia and Australasia Roadshow  
October 2022



BETTER TRANSPORT • BETTER PLACES • BETTER CHOICES



## Evaluating the greenhouse gas emission reduction benefits from land transport mode shift programmes and projects – a research note

March 2021

L Thorwaldson, F Thomas, A Carran-Fletcher  
MRCagney

Waka Kotahi, NZ Transport Agency, research note 004  
Contracted research organisation – MRCagney

# TOITŪ TE TAIAO OUR SUSTAINABILITY ACTION PLAN

OVERVIEW | APRIL 2020



# Approach

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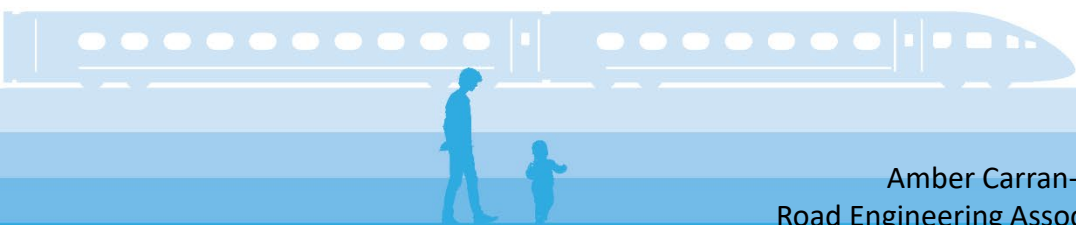
## Part 1: Are reductions being measured?

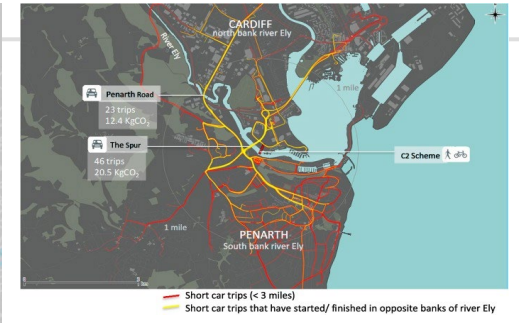
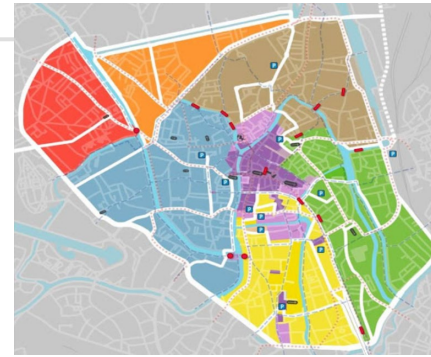
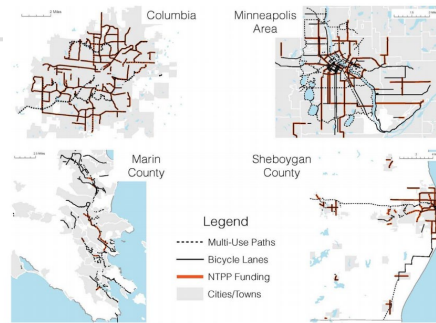




# Measurement Methodologies

- Vehicle cordon counts
- Household travel survey data
- Parking data
- Vehicle and active mode counts
- GPS travel diaries
- Public transport ridership data





# 16 Case Studies

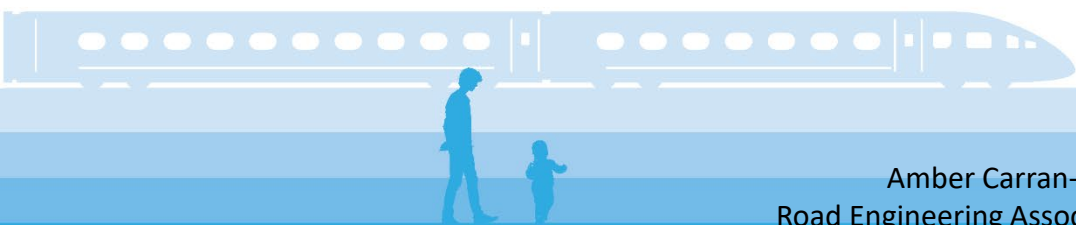
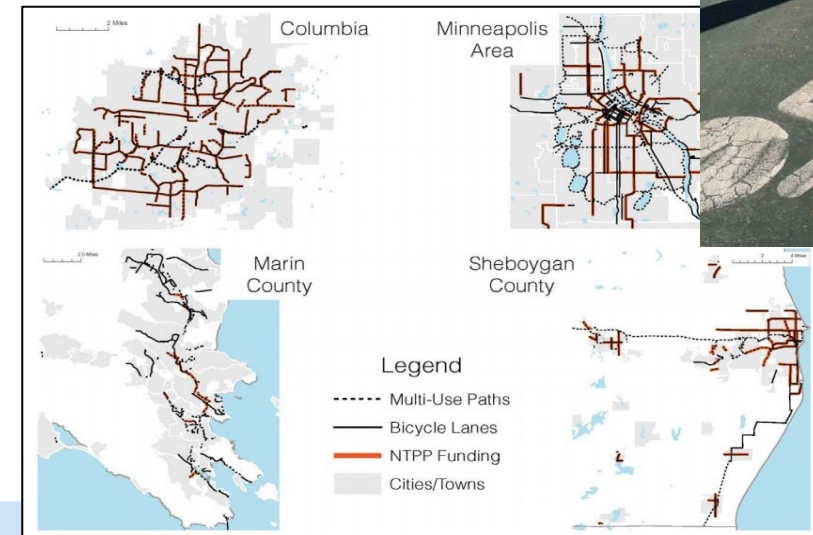


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# Investment Types:

- Bus rapid transit (BRT)
- Integrated transport & land use planning
- Transit oriented development (TOD)
- Congestion pricing
- Rapid cycle network rollout
- Demand responsive parking
- Parking cash out
- Urban logistics
- Walking and cycling programmes
- Commute trip reduction programmes



# Limitations

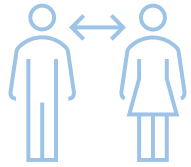
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Secondary research only



Interventions cannot be directly compared



Covid-19 effects



# Key findings

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- Varied measurement methods





# Key findings

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- Varied measurement methods



- Interrelated factors affecting outcomes – total may exceed sum of parts



# Key findings

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- Varied measurement methods



- Many of the case studies come from the United States



- Interrelated factors affecting outcomes – total may exceed sum of parts



# Key findings

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- Varied measurement methods



- Many of the case studies come from the United States



- Interrelated factors affecting outcomes – total may exceed sum of parts



- No New Zealand or Australian case studies





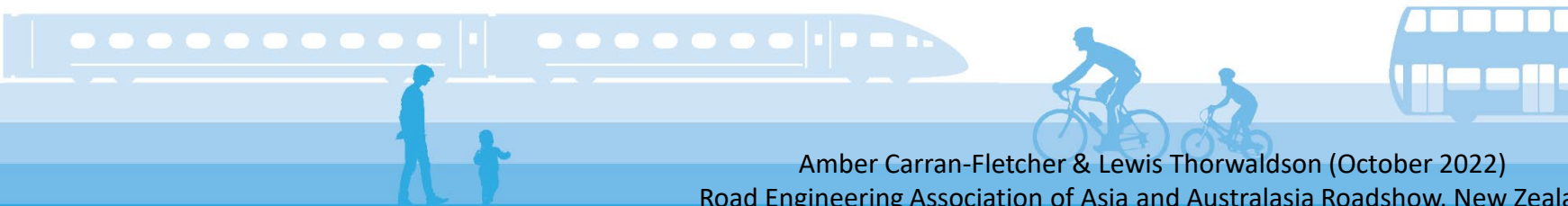
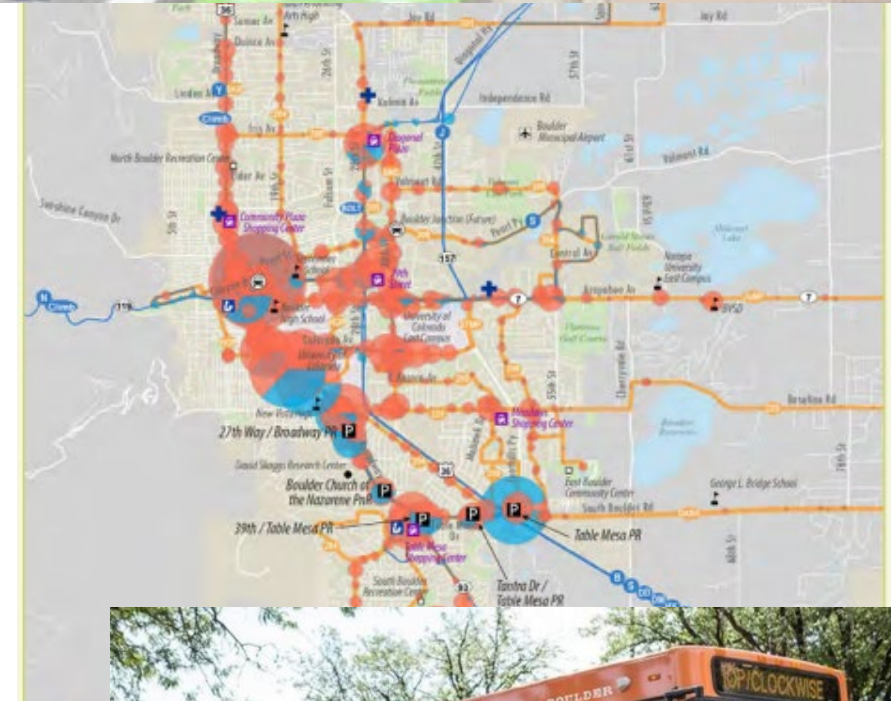
# Case Studies

- What was the project?
  - Integrated travel demand management
  - Urban cargo bicycle logistics
  - Low-traffic neighbourhoods
- How did they measure emissions reductions?
- How can this inform New Zealand's decarbonization efforts?

# Boulder, Colorado

1996: No long-term growth in vehicle travel over 1994 levels

- Public transport (bus)
  - Increased frequencies and services
- Active mode
  - Cycle facilities on 95% of arterial streets
- Parking management
  - Reducing drive alone rates




# Boulder, Colorado - EcoPass

- Annual transit pass – unlimited rides on local and regional services
- Bulk discount only available through:
  - Employers
  - University
  - Neighbourhoods



Eco Pass Central **PLANNING INFO** for BOULDER BUSINESSES



**A Partnership of:**  
**btc** BOULDER TRANSPORTATION CONNECTIONS  
**GO BOULDER** CITY OF BOULDER  
**RTD** WWW.RTD-DENVER.COM

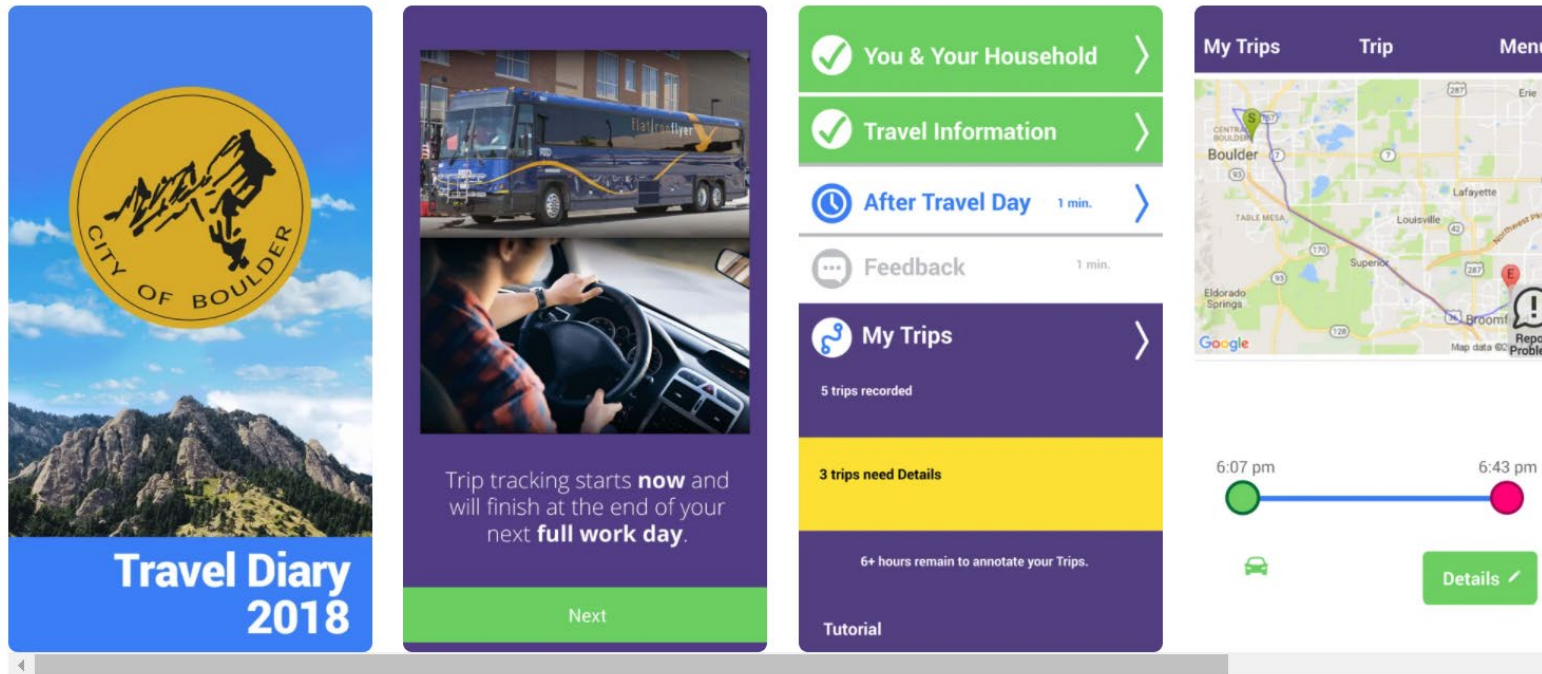
We make it easy to learn about, sign up for and take advantage of the many benefits of the EcoPass program.

Learn about the **Community Wide EcoPass and its Feasibility Study.**



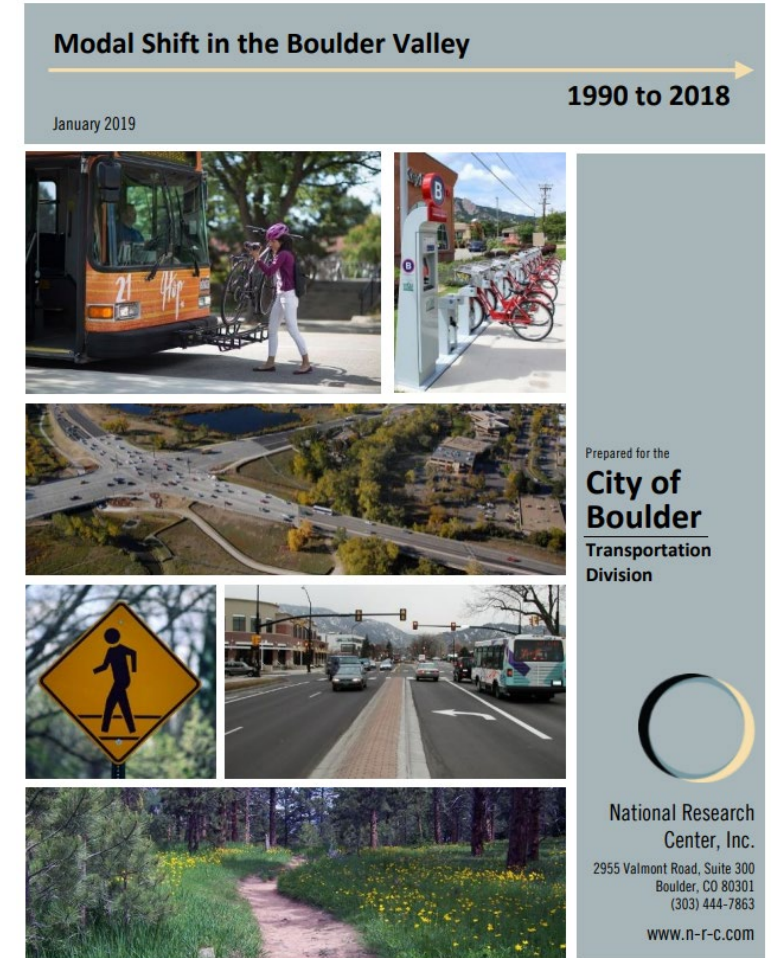


# Measurement Methodology



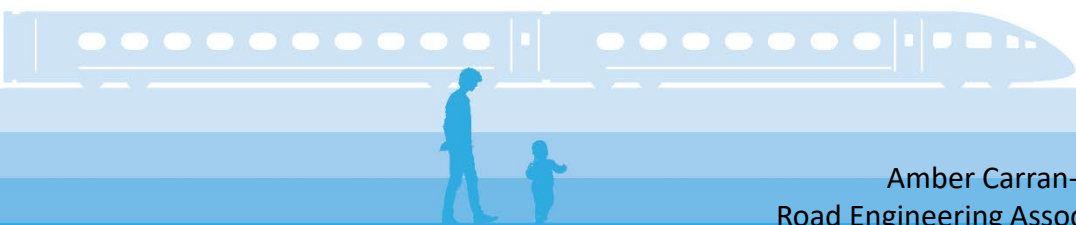
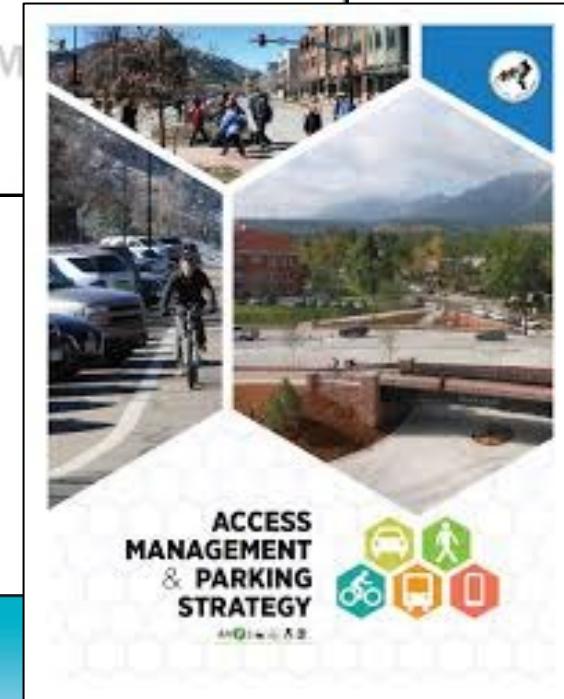
# Boulder, Colorado - outcomes

- VKT to 1994 levels by 2009
- 2016 GHG emissions estimated to be 30% lower than without
- 19% reduction in VKT per capita 1990-2018
- EcoPass holders 40-55% less driving



# Relevance to New Zealand

- Bulk public transport passes enabled by fringe-benefit tax exemption
  - Universities
  - Employers
  - Neighbourhoods
- Strong target setting and monitoring programmes
  - Measuring VKT
  - “If you don’t count it, it doesn’t count”





# Urban Cargo Bicycle Logistics

# Cargo bikes for urban logistics

Cambridge, UK



Nuremburg, Germany

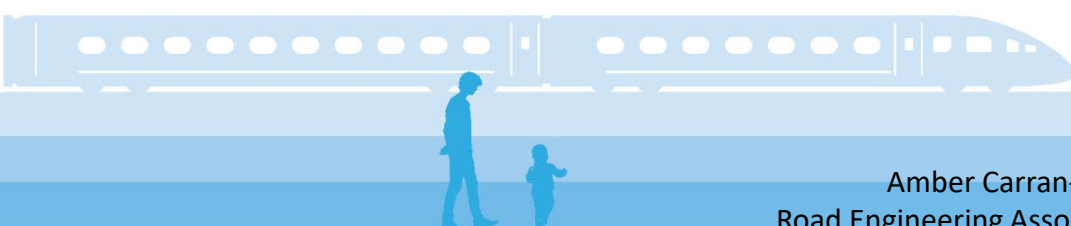


Brussels, Belgium



# Cambridge, UK

Saved an estimated 45 tonnes of CO<sub>2</sub>

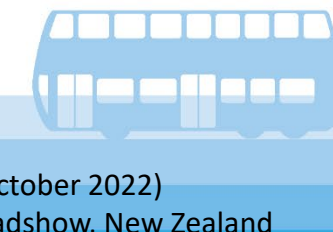
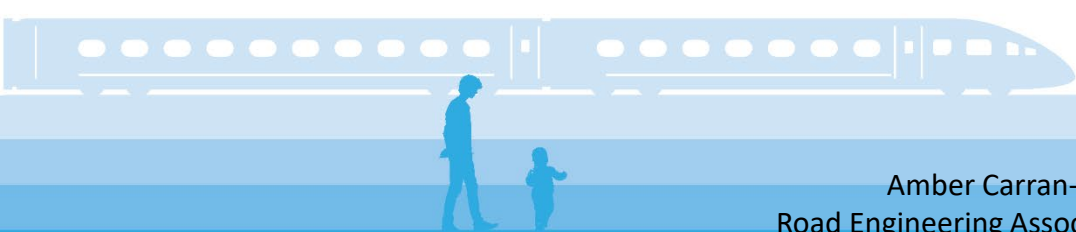
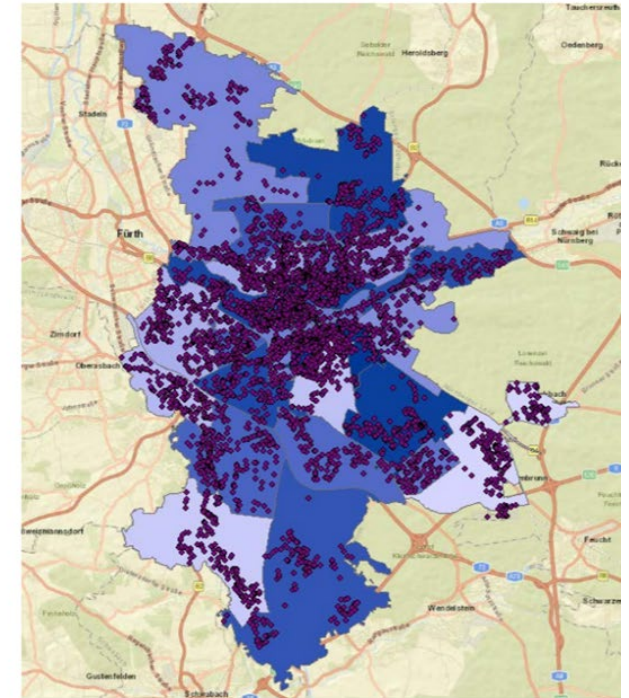
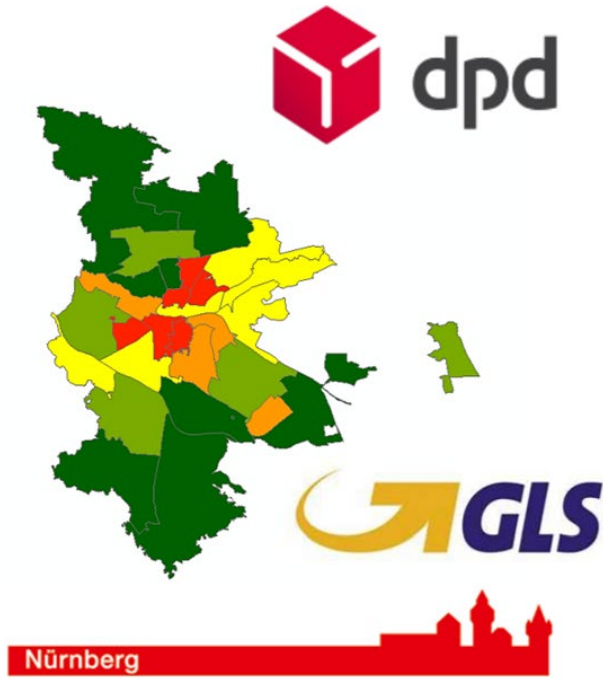


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# Nuremburg, Germany

Saved an estimated 56 tonnes of CO<sub>2</sub>





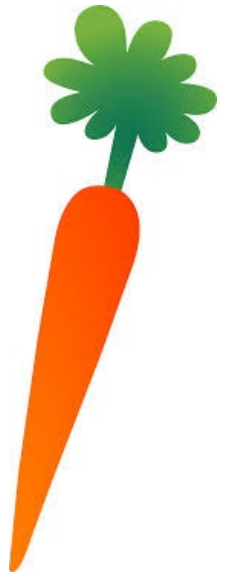
# Brussels, Belgium

24% reduction in CO<sub>2</sub> emissions



# Policy levers

- Low emissions zones
- Vehicle size and weight restrictions
- Congestion charges
- Parking restrictions
- Time restrictions
- Coordinated pro-cycling policies
- Cycling infrastructure
- Micro-consolidation centres
- Cycle logistics friendly tenders





# Relevance to New Zealand

- E-Bike power regulations
- Infrastructure needs
- Include in procurement specs
- CERF for freight emissions

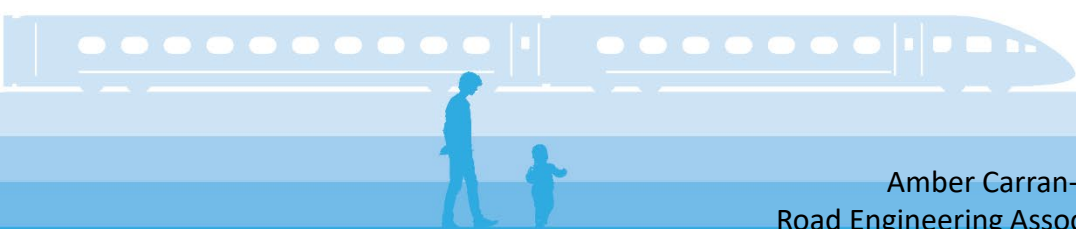


# Low traffic neighbourhoods (LTNs)



# What is an LTN?

An area closed to through car traffic so you can drive to it but not through it. Modal filters allow people to pass through on foot, bike and public transport but prevents cars from using residential streets as shortcuts.





# Low Traffic Neighbourhoods

Groningen, NL



Ghent, Belgium



London, UK

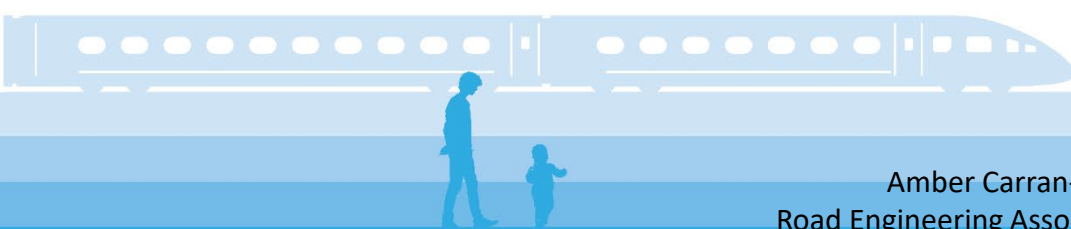




# Groningen

One year on:

- 47% drop in traffic volumes in the centre
- 12-17% increase in bus use



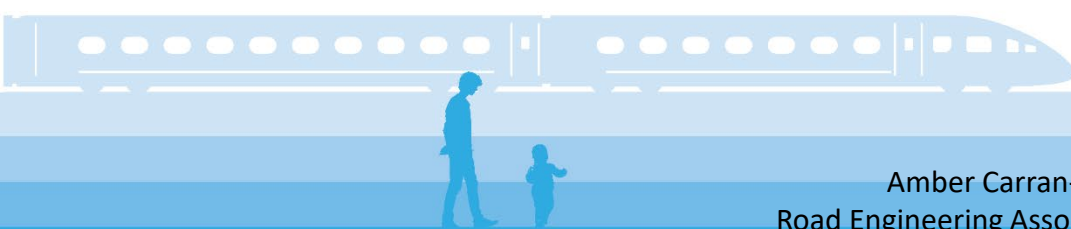


# Ghent

- 50% increase in cycling
- 2030 cycling target (35% mode share) reached in 2019
- Public transport mode share up from 9% in 2015 to 14% in 2018
- Car mode share drop from 55% to 27%

## Broader Mobility Plan included

- Parking plan
- Improvements to cycling infrastructure

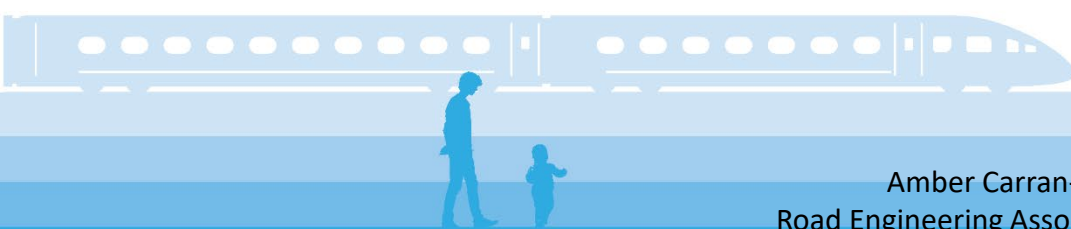
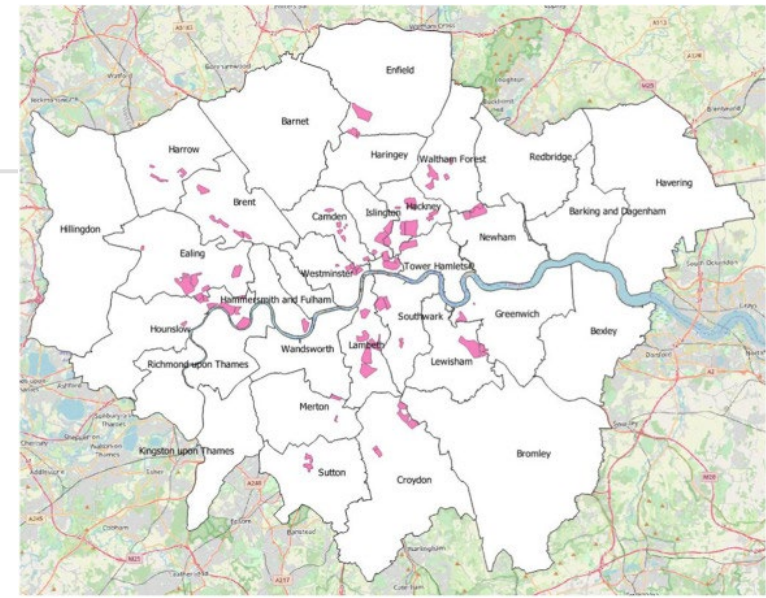




# London

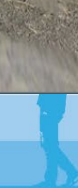
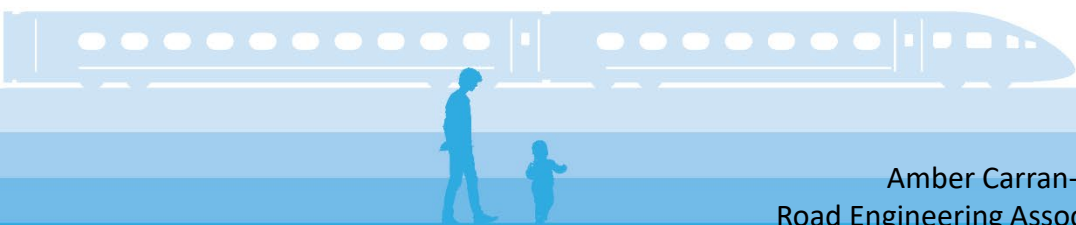
Residents of LTN neighbourhoods:

- Reduced time driving per week
- Drove less than residents of non-LTN neighbourhoods
- Reduced car ownership
- More active travel
- Lower road injury risk





# Relevance to New Zealand



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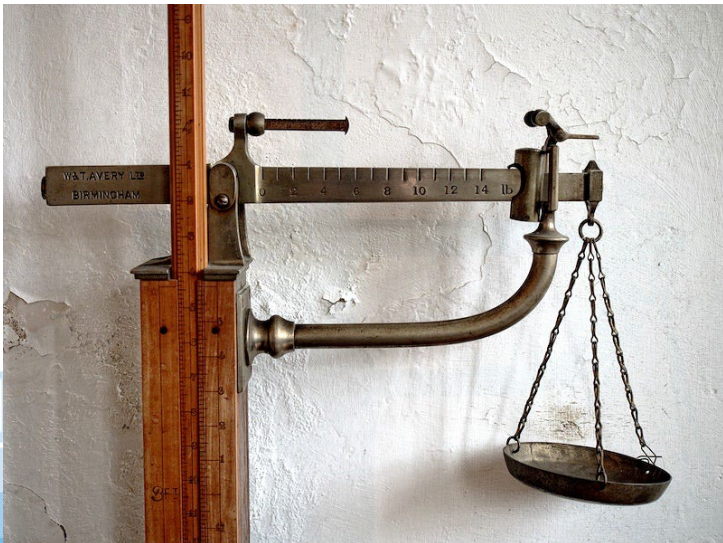
# Research conclusions



# In Conclusion...



- Most relevant metric: VKT
- VKT reduction is a stated policy goal
- Projects never stand alone - the whole is greater than the sum of the parts
- Tie funding to measurement



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# Current Progress

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- NPS-UD upzoning & removal of parking minimums.
- Removal of Fringe Benefit Tax delayed but expected soon – goes into Boulder case study – relevance to NZ
- MoT's Emissions Reduction Plan (ERP)
- Climate Emergency Response Fund (CERF)
- AC's Transport Emissions Reduction Pathway (TERP)
- WK's VKT Reduction Workstream



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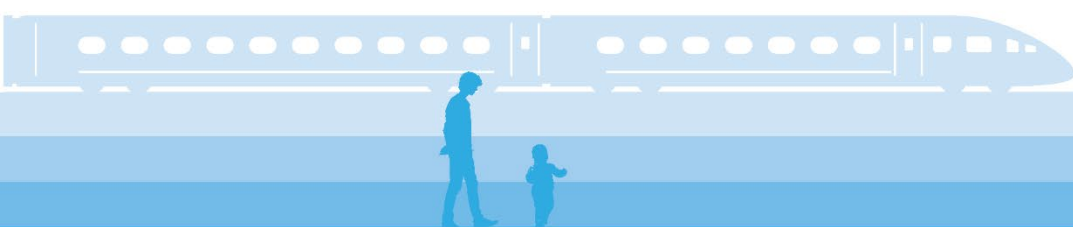
# Additional reference slides

# What about electric?

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[pixabay.com/users/mysticsartdesign-322497/](https://pixabay.com/users/mysticsartdesign-322497/)



# What about electric?

Community Goals	Cleaner Vehicles	Vehicle Travel Reductions
Total Vehicle Travel	Increased	Reduced
Congestion reduction	Worse	Better
Roadway cost savings	Worse	Better
Parking cost savings	Worse	Better
Consumer savings and affordability	Mixed	Better
Traffic safety	Worse	Better
Mobility options for non-drivers	Worse	Better
Energy conservation	Better	Better
Pollution reduction	Better	Better
Physical fitness and health	Worse	Better
More compact development	Worse	Better

Source: Litman (2020) <https://www.vtpi.org/wwclimate.pdf>