

# Active Transport: A reflection for Aotearoa

April 2018

‘Imagine a future where our communities, towns and cities [are] designed to encourage more people to use active modes of transport to get to their destination. [A] country where family time [means] moving together and playing together because it [is] fun, accessible and affordable. A country with a thriving economy built on a culture where standing and activity ... [are] the norm, maximising productivity, efficiency and innovation. As a nation we would be happier, healthier, stronger and more connected.’

Excerpt from a vision created by Activity and Nutrition Aotearoa 2015<sup>(1)</sup>

This document discusses the findings from Activity and Nutrition Aotearoa’s (ANA) scan of the literature on active transport and health. This scan looked at the highest level of evidence from systematic reviews.

Active transport is the use of physical activity to travel from one place to another<sup>(3)</sup> and contributes to meeting our physical activity requirements. Active travel and active commuting are used interchangeably with active transport.

The New Zealand (NZ) Eating and Activity Guidelines for New Zealand Adults<sup>(3)</sup> reviewed the latest evidence<sup>(2)</sup> into physical activity and the risks of inactivity. They offer the following suggestions:

Sit less, move more!	
Break up long periods of sitting.	
Do at least 2 ½ hours of moderate or 1 ¼ hours of vigorous physical activity spread throughout the week.	
For extra health benefits, aim for 5 hours of moderate or 2 ½ hours of vigorous physical activity spread throughout the week.	
Do muscle strengthening activities on at least two days each week.	
Doing some physical activity is better than doing none.	



Active transport is one way to increase physical activity and provides a convenient way to include physical activity to daily routines.

## What do we know about active transport in Aotearoa?

The Ministry of Transport (MoT) regularly publishes the [New Zealand Household Travel Survey](#) (NZHTS).<sup>(6)</sup>

Recent surveys have found that:

- walking was the most common form of active travel (17%)
- cycling comprised only 1% of trips
- levels of active transport differed by city, for example respondents in Hamilton and Auckland engaged in less active transport than those in Wellington and Christchurch.
- cycling was more common amongst men (two thirds of cycling trips)
- walking was more common amongst women (55%)
- cycling and walking were more common in younger age groups.

Data from the [New Zealand Census](#) (2013)<sup>(8)</sup> examining individuals' main mode of travel to work on census day revealed that:

- 3% of commutes to work were by bicycle and 7% were by walking
- cycling to work was most common in Christchurch (7%) and least common in Auckland (1.2%), while walking to work was most common in Wellington (21%) and least common in Tauranga (4%)
- the number of people cycling to work increased by 16% between 2007 and 2013 (in Wellington, the number of people cycling during peak hours grew by 40% between 2007 and 2012, and in Auckland the number increased by 22%)
- walking to work was much more common in people who lived in lower income areas.

However over the longer term rates of walking and cycling have been declining.<sup>(9)</sup>



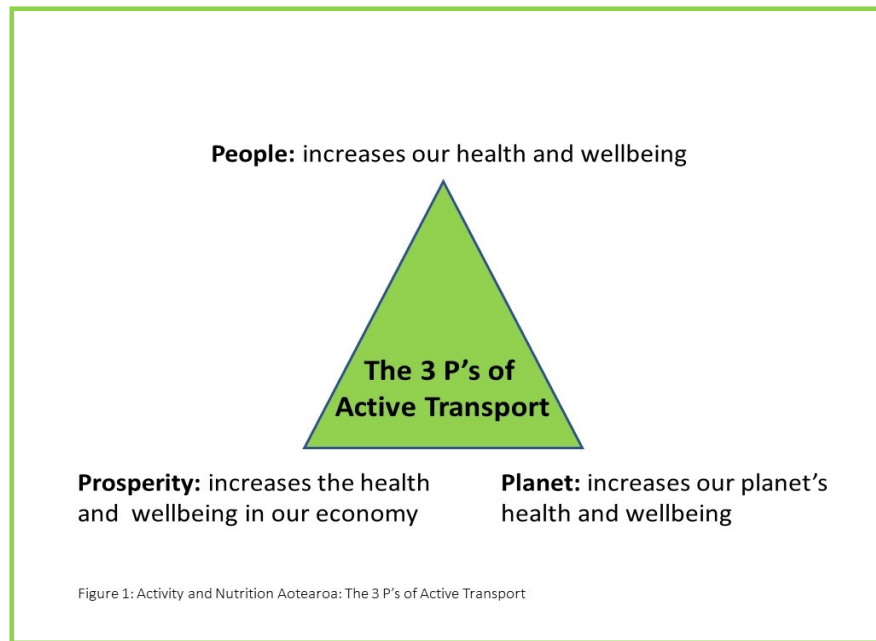
The Active Transport for Active Living Coalition is an alliance of over 100 health, engineering, environmental, architectural, planning and transport organisations in the UK. In their 2014 report, [The case for action by the Active Transport for Healthy Living Coalition](#),<sup>(10)</sup> they find strong evidence that active travel has benefits that include, but go well beyond improving population health.' These benefits include:

- improved user experience (often referred to as 'journey ambience')
- reduced public costs of providing transport infrastructure and services
- health benefits from a more physically active population
- reduced road collisions
- reduced congestion, fuel, noise and air pollution and carbon dioxide emissions
- greater accessibility to facilities and services
- increased social capital
- increased economic activity.<sup>(10)</sup>



## Why focus on active transport?

Focussing on active transport is important because it improves our health and wellbeing, and has positive impacts on the environment (Figure 1).



### Recommendations:

- A focus on the positive benefits of active transport may help increase investment into active transport approaches.
- All active transport interventions should include robust evaluation.
- Research into other forms of active transport such as skateboarding or scootering would provide more information about possible interventions.
- Inequities should be considered as part of future research and interventions to ensure minority and less privileged groups are reached.
- Encourage more females to cycle.
- Investigate what would work with your community. Ask yourself how you could you get greater buy-in from the local community who could advocate on your behalf.



## Active transport, economics and the environment

- Active transport is well known to have environmental and economic benefits.
- Cycling and walking provide substantial economic benefits for households.

Climate change is described as the biggest global health threat of the 21st century. <sup>(11)</sup> In contrast to vehicle transport, active transport has zero carbon emissions.

Increasing active transport also promises savings for the NZ health system and reduced air pollution. <sup>(12)</sup>

Active travel for short trips helps cut carbon emissions. <sup>(25)</sup>

Modelling of potential policy changes to increase cycle commuting in Auckland showed that transforming urban roads to be more cycle-friendly would have benefits that would outweigh the costs by up to 25%. <sup>(13)</sup> This is consistent with [UK estimates](#). <sup>(14)</sup>

[UK research](#) <sup>(15)</sup> has evaluated the population-wide impacts of new walking and cycling infrastructure. Results showed increases in walking, cycling and physical activity at both one- and two-year follow ups. However, carbon dioxide emissions declined only slightly. The authors noted this may have been due to people taking additional trips rather than moving from cars to non-motorised forms of transport.

Despite this, replacing short trips with active transport could reduce car trips by up to one half: almost 20% of household trips are less than 2 km, and almost half are under 6 km. <sup>(27)</sup> It is actually quicker to cycle for distances up to five kilometres than to drive on congested roads <sup>(26)</sup>



Currently transport costs represent the third largest expense for household weekly budgets in New Zealand (14% or \$158 per week), after housing and food. Walking and cycling provide relatively inexpensive alternatives. <sup>(9)</sup>

### Recommendations:

- Reframing health messages to align with environmental goals may increase engagement.
- Identifying common goals may enable collaboration across sectors.

## Active transport and health outcomes

- There is a strong body of evidence demonstrating physical activity **reduces the risk** of a range of health conditions such as cardiovascular disease, type 2 diabetes, stroke, certain cancers, depression and stress.
- There is limited evidence that active transport improves health outcomes, however ANA believes other aspects of active travel, including a reduction in pollution and in carbon footprint, are clear potential co-benefits.
- Social isolation is likely to be reduced when there is better infrastructure for active transport and this could be an area for further investigation given the importance and focus on mental health in NZ at present.
- The evidence that active commuting influences body mass index is not strong.
- A lack of evidence does not mean that interventions are ineffective; it simply means that better research and evaluation is needed to determine whether they are effective.

Overall the literature shows small positive health effects in groups who actively travelled longer distances, including reductions in the risk of hypertension and type 2 Diabetes, but not obesity.<sup>(16)</sup>

Associations between active commuting and body mass index show that cycling, but not walking, to work has benefits for both mental and physical wellbeing.<sup>(17,18)</sup>

[A New Zealand study](#)<sup>(9)</sup> found cities with higher levels of cycling and walking had reduced risk factors for diabetes and lower levels of obesity. However an unexpected finding also showed higher levels of depression, bipolar disorder and anxiety.



It has been estimated that moving 5% of kilometres travelled from vehicles to cycling would have significant health benefits. This includes avoiding 116 deaths from increased physical activity, six fewer deaths due to reduced air pollution from vehicle emissions and also five cyclist fatalities from road crashes annually.<sup>(21)</sup>

## What gets in the way of active transport?

- Current research focuses on more barriers to active transport and less on enablers.
- The main barrier to engagement in active transport is perceived lack of safety.

Safety concerns are reported as the biggest barrier to increasing active transport, yet there is limited research to support why this may be the case. This raises the question; is safety a real barrier or a perceived barrier?

A New Zealand Transport Agency (NZTA) report, [Urban New Zealanders Attitudes and perceptions of cycling](#), found that 75% of adults would cycle if the roads were safer.

New Zealand [research](#)<sup>(19)</sup> suggests that the risk of cycling is lower than DIY (do-it-yourself repairs), horse riding, skiing and rugby. (Figure 2).

Yet emotive media portrayals of cyclists' injuries and deaths still contribute to a perception of danger. For instance, in December 2017, a [New Zealand Herald](#)<sup>(20)</sup> headline proclaimed a 'Deadly year on the roads for cyclists, fatalities more than triple that of 2016.' The article went on to report that over 550 cyclists were injured on the roads in 2017.

Similarly, parents' concerns about safety can be a barrier to participation in [walking school bus interventions](#) (WSB).<sup>(23)</sup>

In Scotland, almost half of the parents responding to a [survey](#)<sup>(22)</sup> 'felt that unsafe walking and cycling routes, a lack of or inadequate pavements, ineffective or lack of crossings, unsafe school entrances and dangerous driving were all major factors which prevented their children from walking, cycling or scootering to school.'

Lack of time and volunteer recruitment have also been mentioned as barriers for active transport, as has unsuitable weather, yet climate doesn't appear to be a strong factor. Similarly, business owners often incorrectly believe that cycleways will have a negative impact on their businesses.<sup>(9)</sup>

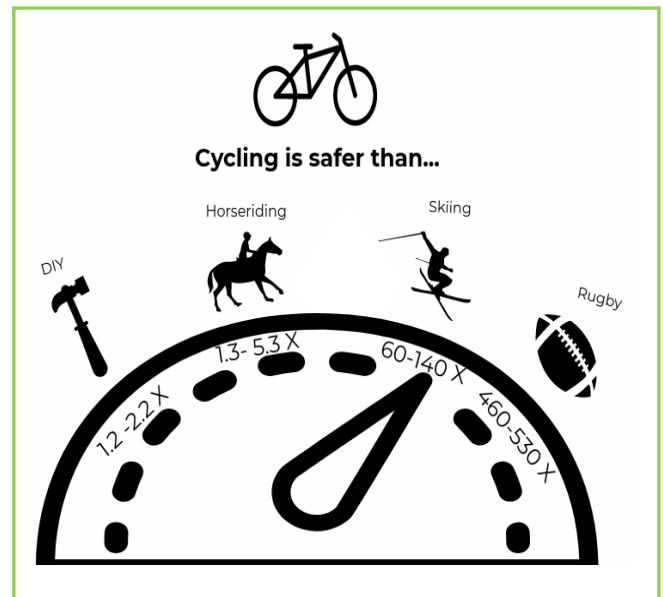


Figure 2

In its national [business case](#) for promoting cycling, the NZTA suggests that past promotion has had a narrow focus on the benefits for people who cycle. Councils are challenged to make the case for improved cycling infrastructure and to address opposition from other road users and local businesses who are concerned about issues like parking spaces.

### Recommendations:

- Challenge the perception that cycling is dangerous.
- Promote the enablers that encourage active transport.

## What enables active transport?

- Placing a greater emphasis on the benefits of active transport could transform public perception and create greater buy-in from the local community, and contribute to reduced road congestion and air pollution, and greater use of local shops by people cycling.
- There are potential economic benefits to the community through local employment, such as in bike shops and bike tourism and spending in local businesses such as cafes.
- New infrastructure that provides spaces for walking and cycling, may also increase house values and reduce the costs of maintaining roads and carparks. Increased house values will have public health implications which must be considered in the complex mix of issues raised.



### *A Case Study: Christchurch Business*

*One Christchurch business has received media coverage for its decision to provide incentives of up to \$10 for staff to bike to work.*

*One staff member quoted on Stuff on 6 March 2018 said 'It's been great so far, I get to ride through Hagley Park and see people feeding the ducks, reading books and stuff, which is quite different to just waiting for the lights to change while driving. ... The dedicated cycleways really help. I can ride from here to university, near where I live, on a cycleway for most of the way.'*

In a review of six city councils, all six (Auckland, Tauranga, Hamilton, Wellington, Christchurch, and Dunedin) had policies supporting cycling and walking, and most had advice on active travel from advisory committees.

All cities had plans for cycling and walking, however there were large variations between cities. Most policies favoured car use. Only some councils had requirements for new developments to create bicycle storage, while all had minimum requirements for car parks.<sup>(9)</sup>



## What can be done to increase active transport?

There are a range of interventions that could be used to promote active transport, and increase cycling and walking between destinations. These fall into five groups: regulation, policy, environmental, communication and a comprehensive approach. (Figure3)



- 1. Regulation:** May include requirements for city planners to include sufficient green spaces or cycleways, pedestrian-friendly streets or slower traffic speeds.
- 2. Policy:** May include taxes, subsidies and incentives; may be national, regional, or localised to a workplace.

Road user charges lead to decreases in the number of car journeys, and increases in pedestrian activity and distances cycled. A congestion road tax was trialed in Stockholm and this resulted in people spending more time doing physical activity and less time sitting.<sup>(29)</sup>

Financial incentives such as petrol taxes and employer-subsidised bicycles can be used to encourage behaviour change. Providing economic incentives, such as increased car parking charges, car-sharing financial incentives, and the option of cashing in workplace car parks, reduces car use and increases active transport.<sup>(30)</sup> The use of incentives has proven effective in other public health issues such as the consumption of alcohol and use of tobacco.

### Recommendations:

- Identify common goals across sectors. This may help to influence policy change.
- Build relationships with your local and regional council to establish and maintain a policy supporting active transport such as encouraging active transport neighbourhood design in new subdivisions.
- Mayor of Auckland City Phil Goff said in his vision for Auckland: 'We will expand our active transport modes including our walk and cycleways so people can easily and safely get around our city.' Ask how you can help make this a reality.

**3. Environmental:** May include providing workplace bicycles and showers, or investing in cycleways.

Environmental interventions tended to achieve modest changes in behaviour, however it is likely they have a larger population health benefit than individual or group-based interventions, as they are able to reach more people. <sup>(31)</sup>

Nearly all interventions designed to shift people from car to active travel showed a positive change. <sup>(32)</sup>

WSB studies in Australia, New Zealand and the United States found that WSB intervention schools had increased active commuting to school and general physical activity levels compared to control schools. <sup>(23)</sup>

To promote urban infrastructure that has a positive impact on active transport the NZ Ministry for the Environment's Urban Design Protocol, makes a voluntary commitment to specific urban design initiatives. <sup>(28)</sup>

**4. Communication:** May include behavioural programmes, skills training and written information.

Most research has focused on either workplace, school or personal travel plans. There is insufficient evidence to conclude that communication strategies are effective in changing the way people travel, or improving health. <sup>(33, 34)</sup>

One study suggests a combination of environmental and behavioural change techniques resulted in increases in cycling and decreases in driving to work. <sup>(39)</sup>

There is a European-wide initiative called '[In town, without my car](#)'.<sup>(35)</sup> This campaign aims to encourage people to use alternative forms of transport for a day. This is a one-off promotion to raise awareness of long term mobility and pollution.

Auckland Transport Cycling Research has suggested that messages be developed that resonate with the target group such as focussing on cycling being fun, easy and enjoyable. <sup>(24)</sup>

One of the challenges of reviewing interventions to encourage behaviour change is that intervention components vary. This makes it difficult to untangle which components of interventions have been successful.



**Recommendations:**

Tailor messages to the interests of the target audience.

For example, promoting active travel to schools has a few different target audiences:

- Children = fun
- Schools = reduced congestion around the school
- Parents = social interaction
- Local government = investment opportunities
- Central government = reduced costs

**5. Comprehensive:** May include a combination of regulation, policy, communication and environmental changes.

A comprehensive approach provides the best outcomes for promoting active transport and is an encouraging way forward for public health in NZ.

In Copenhagen, [Denmark](#)<sup>(36)</sup> comprehensive approaches have been in place for 40 years and cycling now plays a vital role in individuals' everyday lives.

In NZ while there is a focus on separating car and cycle traffic we still need to combine this with good connectivity and bicycle storage facilities.

The Model Communities Programmes in New Plymouth and Hastings was used to assess behaviour change as a result of a comprehensive approach. Research conducted in these cities found that the percentage of trips made by cycling or walking increased by about 30 percent. However while there was an increase in the number of trips, the overall level of physical activity did not change significantly.<sup>(37,38)</sup> It is important to have a control group in intervention studies and in this case walking and cycling declined in control groups highlighting the benefits of the intervention.

Other research has shown that changes to the environment, combined with advice and support for both individual and organisations, are necessary for achieving sustained behavioural change in a population. A range of interventions to promote cycling showed increased cycling at a population level. Successful interventions included intensive intervention with individuals, marketing to households, improving infrastructure for cycling, and wider population initiatives.<sup>(40)</sup>

Multi-level interventions have been found to be more effective and the best outcomes occur as a result of initiatives that combine a range of coordinated strategies making up a comprehensive approach.<sup>(41,43)</sup>

*A Case Study: Melbourne City<sup>(42)</sup>*

*After cycling infrastructure was built in Melbourne, peak-hour cycling increased from 9% in 2008, to 16% in 2017. The comprehensive approach included an overall plan, increased cycle routes, bike shares, bike parks and an annual cycle census. The census data shows cycles make up about 17% of all vehicle movements in the city's peak traffic.*

*The increased infrastructure has created opportunities for additional investment such as a privately-owned dock-less bike share company called oBike, whose bikes are unlocked with a smart phone app and can be left at any designated bike parking location.*



**Recommendations:**

- Advocate for comprehensive approaches that focus on regulation, policy, environment *and* communication.
- Work with other organisations that complement what you do and build on the strengths of your organisations. You don't need to be responsible for all parts of a comprehensive strategy by yourself. Working together on a combined strategy is likely to make a greater impact than working in isolation.
- Think outside of the traditional silos of health and link with organisations working in areas that have similar goals, such as organisations working on climate change, local business chamber of commerce, schools and cycling advocacy groups.
- There are opportunities for the health sector to forge advantageous relationships with other sectors interested in climate change and environmental sustainability rather than promoting active transport only as a health gain.

## Useful Resources: Organisations that promote active transport

The **Ministry of Health** website maintains a list of links to organisations and resources that might help with increasing physical activity and active transport.

<https://www.health.govt.nz/>

**Bikes Welcome** is a charitable trust whose vision is 'Great bike parking everywhere: encouraging more people to ride to more places'.

Bikes Welcome helps businesses recognise, value and support their bike-using customers. Bikes Welcome works with local councils and related organisations to help facilitate good bike parking in public places, as well as good policy.

<http://www.bikeswelcome.org/>

'**Cycling Action Network (CAN)** is New Zealand's national network of cycling advocates. We work with government, local authorities, businesses and the community on behalf of cyclists, for a better cycling environment.'

<https://can.org.nz/>

'**Living Streets Aotearoa** is the New Zealand organisation for people on foot, promoting walking-friendly communities. We are a nationwide organisation with local branches and affiliates throughout New Zealand.

We want more people walking and enjoying public spaces be they young or old, fast or slow, whether walking, sitting, commuting, shopping, between appointments, or out on the streets for exercise, for leisure or for pleasure.'

<http://www.livingstreets.org.nz/>

'The **Sustainable Business Network** is a membership-based social enterprise that helps business succeed through sustainability. We have a vision: to make NZ a model sustainable nation.'

There is an active SBN Smart Transport Forum which includes a focus on getting people active.

<https://sustainable.org.nz/>

**Bikes in Schools** is a complete biking package implemented within a school that enables all students to ride a bike on a regular basis. It provides bikes, storage, helmets and cycle skills.

<http://bikeon.org.nz/>

This is not an exhaustive list. We welcome suggestions of others organisations involved in promoting active transport.

## References

1. Activity and Nutrition Aotearoa (formerly Agencies for Nutrition Action). (2015). Promoting Physical Activity at the Local Government Level.
2. Brown, W., Bauman, A., Bull, F., & Burton, N. (2012). *Development of Evidence-based Physical Activity Recommendations for Adults (18-64 years)*. Report prepared for the Australian Government Department of Health.
3. Ministry of Health. (2015). *Eating and Activity Guidelines for New Zealand Adults*. Wellington: Ministry of Health.
4. World Health Organization (WHO). (2017). Physical Activity Fact Sheet. Retrieved from <http://www.who.int/mediacentre/factsheets/fs385/en/>
5. The New Zealand Labour Party and the Green Party of Aotearoa New Zealand. (2017). Confidence and Supply Agreement between the New Zealand Labour party & Green Party of New Zealand. Retrieved from <https://www.greens.org.nz/sites/default/files/NZLP%20%26%20GP%20C%26S%20Agreement%20FINAL.PDF>
6. Ministry of Transport. (2015). New Zealand Household Travel Survey 2009 - 2012: comparing travel modes, (April), 1–17. Retrieved from <http://www.transport.govt.nz/assets/Uploads/Research/Documents/Household-Travel-Survey-intro-Dec2017.pdf>
8. Statistics New Zealand. (2015). 2013 Census. Retrieved from [http://archive.stats.govt.nz/Census/2013-census.aspx?\\_ga=2.59335341.1041623696.1518140443-1804446463.1515719327](http://archive.stats.govt.nz/Census/2013-census.aspx?_ga=2.59335341.1041623696.1518140443-1804446463.1515719327)
9. Shaw, C., & Russell, M. (2017). Benchmarking Cycling and Walking in Six New Zealand Cities: Pilot Study 2015. *Journal of Transport & Health*, 5, S56-S57.
10. Active Transport for Healthy Living Coalition. (2014). The case for action by the Active Transport and Healthy Living Coalition. Retrieved from <http://www.adph.org.uk/wp-content/uploads/2014/07/20140617-Active-Transport-FINAL.pdf>
11. Costello, A., Abbas, M., Allen, A., Ball, S., Bell, S., Bellamy, R., ... & Lee, M. (2009). Managing the health effects of climate change: Lancet and University College London Institute for Global Health Commission. *The Lancet*, 373(9676), 1693-1733.
12. Genter, J. A., Donovan, S., Petrenas, B., & Badland, H. (2008). Valuing the health benefits of active transport modes. *New Zealand transport agency research report*, 359, 72.
13. Macmillan, A., Connor, J., Witten, K., Kearns, R., Rees, D., & Woodward, A. (2014). The societal costs and benefits of commuter bicycling: simulating the effects of specific policies using system dynamics modelling. *Environmental health perspectives*, 122(4), 335. <https://doi.org/10.1289/ehp.1307250>
14. Jarrett, J., Woodcock, J., Griffiths, U. K., Chalabi, Z., Edwards, P., Roberts, I., & Haines, A. (2012). Effect of increasing active travel in urban England and Wales on costs to the National Health Service. *Lancet*, 379 (9832), 2198–2205. [https://doi.org/10.1016/S0140-6736\(12\)60766-1](https://doi.org/10.1016/S0140-6736(12)60766-1)
15. Brand, C., Goodman, A., & Ogilvie, D. (2014). Evaluating the impacts of new walking and cycling infrastructure on carbon dioxide emissions from motorized travel: A controlled longitudinal study. *Applied Energy*, 128(0), 284–295. <https://doi.org/http://dx.doi.org/10.1016/j.apenergy.2014.04.072>

16. Saunders, L. E., Green, J. M., Petticrew, M. P., Steinbach, R., & Roberts, H. (2013). What are the health benefits of active travel? A systematic review of trials and cohort studies. *PLoS One*, 8(8), e69912. <https://doi.org/10.1371/journal.pone.0069912>
17. Mytton, O. T., Panter, J., & Ogilvie, D. (2016). Longitudinal associations of active commuting with wellbeing and sickness absence. *Preventive Medicine*, 84, 19–26. <https://doi.org/https://dx.doi.org/10.1016/j.ypmed.2015.12.010>
18. Hart, J., & Parkhurst, G. (2011). Driven to excess: Impacts of motor vehicles on the quality of life of residents of three streets in Bristol UK. *World Transport Policy & Practice*, 17(2), 12-30.
19. Chieng, M., Lai, H., & Woodward, A. (2017). How dangerous is cycling in New Zealand?. *Journal of Transport & Health*, 6, 23-28.
20. Peacock, A. (2017, December 12). Deadly year on the roads for cyclists, fatalities more than triple that of 2016. Retrieved from [http://www.nzherald.co.nz/nz/news/article.cfm?c\\_id=1&objectid=11957905](http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11957905)
21. Lindsay, G., Macmillan, A., & Woodward, A. (2011). Moving urban trips from cars to bicycles: impact on health and emissions. *Aust N Z J Public Health*, 35(1), 54–60. <https://doi.org/10.1111/j.1753-6405.2010.00621.x>.
22. Walker, E. (2017). School Travel survey for parents. UK. Sustrans and Scottish Parents Teacher Council. Retrieved from: [https://www.sustrans.org.uk/sites/default/files/file\\_content\\_type/scottish\\_parent\\_teacher\\_council\\_school\\_travel\\_survey\\_report\\_final\\_edited.pdf](https://www.sustrans.org.uk/sites/default/files/file_content_type/scottish_parent_teacher_council_school_travel_survey_report_final_edited.pdf)
23. Smith, L., Norgate, S. H., Cherrett, T., Davies, N., Winstanley, C., & Harding, M. (2015). Walking school buses as a form of active transportation for children—a review of the evidence. *Journal of school health*, 85(3), 197-210. <https://doi.org/10.1111/josh.12239>
24. Legge, N., & Landtroop, R. (2013). Auckland Transport Cycling Research. Auckland Transport.
25. Department of Transport. (2011). Creating Growth, Cutting Carbon Making Sustainable Local Transport happen. Retrieved from [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/3890/making-sustainable-local-transport-happenDepartment of transport. \(2011\). -whitepaper.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/3890/making-sustainable-local-transport-happenDepartment%20of%20transport.%20(2011).%20-whitepaper.pdf)
26. Austroads (2010). The Australian National Cycling Strategy 2011-2016. Retrieved from <http://www.bicyclecouncil.com.au/files/publication/National-Cycling-Strategy-2011-2016.pdf>
27. Burke, M., & Brown, A. L. (2007). Distances people walk for transport. *Road & Transport Research: A Journal of Australian and New Zealand Research and Practice*, 16(3), 16.
28. Ministry for the Environment. (2005). New Zealand Urban Design Protocol. Wellington.
29. Bergman, P., Grijbovski, A. M., Hagstromer, M., Patterson, E., & Sjostrom, M. (2010). Congestion road tax and physical activity. *Am J Prev Med*, 38(2), 171–177. <https://doi.org/10.1016/j.amepre.2009.09.042>
30. Martin, A., Suhrcke, M., & Ogilvie, D. (2012). Financial Incentives to Promote Active Travel. *American journal of preventive medicine*, 43(6), e45-e57.
31. Stewart, G., Anokye, N. K., & Pokhrel, S. (2015). What interventions increase commuter cycling? A systematic review. *BMJ Open*, 5(8), e007945. <https://doi.org/10.1136/bmjopen-2015-007945>
32. Scheepers, C. E., Wendel-Vos, G. C. W., den Broeder, J. M., van Kempen, E. E. M. M., van Wesemael, P. J. V., & Schuit, A. J. (2014). Shifting from car to active transport: A systematic review of the effectiveness of interventions. *Transportation Research Part a-Policy and Practice*, 70, 264–280. [https://doi.org/DOI 10.1016/j.tra.2014.10.015](https://doi.org/DOI%2010.1016/j.tra.2014.10.015)
33. Moser, G., & Bamberg, S. (2008). The effectiveness of soft transport policy measures: A critical assessment and meta-analysis of empirical evidence. *Journal of Environmental Psychology*, 28(1), 10–26. <https://doi.org/10.1016/j.jenvp.2007.09.001>

34. Bird, E. L., Baker, G., Mutrie, N., Ogilvie, D., Sahlqvist, S., & Powell, J. (2013). Behavior change techniques used to promote walking and cycling: a systematic review. *Health Psychol*, 32(8), 829–838. <https://doi.org/10.1037/a0032078>
35. Frering, C. (n.d.) ADEME - European day 'In town, without my car ?'. Retrieved from [http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n\\_proj\\_id=1317](http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=1317)
36. The City of Copenhagen. (n.d.). City of Cyclists. Retrieved from <https://international.kk.dk/artikel/city-cyclists>
37. Chapman, R., Howden-Chapman, P., Keall, M., Witten, K., Abrahamse, W., Woodward, A., ... Grams, M. (2014). Increasing active travel: aims, methods and baseline measures of a quasi-experimental study. *BMC Public Health*, 14, 935. <https://doi.org/10.1186/1471-2458-14-935>
38. Keall, M., Chapman, R., Howden-Chapman, P., Witten, K., Abrahamse, W., & Woodward, A. (2015). Increasing active travel: results of a quasi-experimental study of an intervention to encourage walking and cycling. *J Epidemiol Community Health*, 69(12), 1184–1190. <https://doi.org/10.1136/jech-2015-205466>
39. Goodman, A., Panter, J., Sharp, S. J., & Ogilvie, D. (2013). Effectiveness and equity impacts of town-wide cycling initiatives in England: a longitudinal, controlled natural experimental study. *Soc Sci Med*, 97, 228–237. <https://doi.org/10.1016/j.socscimed.2013.08.030>
40. Yang, L., Sahlqvist, S., McMinn, A., Griffin, S. J., & Ogilvie, D. (2010). Interventions to promote cycling: systematic review. *BMJ*, 341, c5293. <https://doi.org/10.1136/bmj.c5293>
41. Pucher, J., Dill, J., & Handy, S. (2010). Infrastructure, programs, and policies to increase bicycling: An international review. *Preventive Medicine*, 50, S106–S125. <https://doi.org/DOI 10.1016/j.ypmed.2009.07.028>
42. City of Melbourne. (n.d.). Cycling Data. Retrieved from <http://www.melbourne.vic.gov.au/parking-and-transport/cycling/Pages/cycling-data.aspx>
43. Larouche, R., Mammen, G., Rowe, D., & Faulkner, G. (2018). Effectiveness of active school transport interventions: A systematic review and update. *BMC Public Health*, 18:206. Retrieved from <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-017-5005-1>



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 Photos on page 1, 2, 3, 5, 6, 7, 9 & 10 kindly supplied by NZ Transport Agency