

# **The Wellington City Councils' Cycleway programme**

**An analysis of the climate change  
rationale and other arguments**

**August 2022**

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Principal Ian Harrison (B.C.A. Hons. V.U.W., Master of Public Policy SAIS Johns Hopkins) has worked with the Reserve Bank of New Zealand, the World Bank, the International Monetary Fund and the Bank for International Settlements.

Contact: Ian Harrison – Principal Tailrisk Economics

[harrisonian52@gmail.com](mailto:harrisonian52@gmail.com)

Ph. 022 175 3669 04 384 857

# The Wellington City Councils' Cycleway programme

## Part one: Introduction

The Wellington City Council has affirmed a 10 year, \$226 million programme to install a network of cycleways across the city. In addition, the Lets Get Wellington Moving City Streets programme is expected to spend \$30 million on cycleways in the central city. There will also be opportunity costs to residents, businesses and shoppers as parking spaces are lost to cycleways.

The Council says that the key driver of the size of the cycleway programme, and the acceleration of the pace of implementation, is the need to respond to climate change.

*This Council has declared a climate emergency and we know we must act swiftly. Collectively, we must make changes to preserve and protect our homes, our city and planet and to give our children and generations to come some hope of a sustainable, healthy future.*

*Road transport accounts for a massive 34 percent of Wellington City's emissions so changing how we move around is the best way to make a difference by 2030, and to help us become a net zero carbon capital by 2050.*

The main focus of this paper is on the emissions impact of the cycleways project. Will it make the big difference to Wellington's road transport emissions that the Council is suggesting?

Our assessment is that the Council's claims are grossly misleading. Our analysis shows that even on the fairly optimistic assumption that the cycleways will increase

cycle commuting by sixty percent, this will only reduce road transport emissions by 0.4 percent over 2022-2050. The cost will be at least \$4800 per ton of emissions reduced. The Council could achieve the same result at a cost of around \$80 a ton by focusing on planting trees.

It is also important to understand that the Council's climate change measures will have no perceptible impact on New Zealand reaching its Paris commitments. The reason is that New Zealand has an emissions trading scheme. The Government sets quantity targets consistent with its Paris commitments, and the markets sets the price of the emissions. All the Council is doing in pursuing its own targets is shifting emissions reductions from low cost mechanisms elsewhere in New Zealand to its high cost cycleway programme.

However, the Council is focused just on Wellington's emissions reductions. But even here the cycleways will make little difference for two main reasons. First, the electric car revolution is coming and by 2050 there won't be many internal combustion engine cars left in Wellington. Obviously, when a commuter switches from an electric car to a bike there is no transport emission reduction. The transport emissions problem will take care of itself.

Second, all the evidence suggests that cycleways do not generate major changes in transport modes. The Council's optimistic assessment of the cycling uptake, of up to two to three times current levels, is based on modeling of how people will respond to cycleways that was conducted in 2014. The modeling actually showed that people would not change their behavior very much if cycleways were provided. However the results were manipulated to generate an increase in rider numbers of over one hundred percent.

There is also a large literature that shows that cycleways do not generate much additional traffic and the Wellington experience seems to bear that out. The Brooklyn cycleway increased weekday journeys by only 6 percent and the Council has been loath to produce data for the Island Bay cycleway.

As there is no real climate change justification for cycleways the Council needs to make its case in terms of the other claimed benefits: health; safety; reduced congestion and general 'wellbeing'. But the Council has conducted little real analysis to support its arguments on these points. For example, while there has been only one serious accident involving a car and a cycle on the Island Bay to City bike route in 21 years, the Council persists in talking up the safety risks the cycleway will address. On the commercial impact the Council's analysis is based on a single, rather inadequate, study of a San Francisco cycleway with little relevance to

Wellington. There is no evidence that the Council has seriously assessed the social and economic consequences of its plan.

What we do know is that the programme will create social disharmony.

There will be winners and losers. Many of the winners will be wealthier male cyclists. Amongst the losers will be businesses affected by the lack of parking, and homeowners and renters who won't be able to park outside their houses. They will find it particularly galling when a cyclist sails by on their \$9000 electric bike while they can't park their \$3000 car. The old and frail will be particularly at risk. Many rely on cars and parking for mobility. Cycling is not an option for them. Newtown, which services a wider immigrant community will be affected. Picking up food for an extended family will become more difficult and business will be lost as shopping moves to where there is parking. And of course ratepayers in general will have to foot a substantial bill.

This paper is structured as follows:

Part two briefly discusses the Council's Climate change implementation plan. This provides a basis for assessing the impact of the cycleways on that plan.

Part three presents elements of the Council's cycle network plan and assesses the Council's non-climate change arguments for cycleways.

Part four discusses the key document 'Cycle Demand Analysis' that underpins the Council's estimates of the impact of cycleways on cyclist numbers.

Part five discusses a recent Waka Kotahi report on transport mode preferences that the Council ignored. It suggests that cycleways will have only a limited impact on the level of cycling in Wellington.

Part six discusses the safety issue.

Part seven presents our assessment of the impact of the cycleway programme on the level of emissions over 2022-2050. Road transport emissions are reduced by 0.4 percent.

## Part two: The Councils Climate change programme Te Atakura - First to Zero

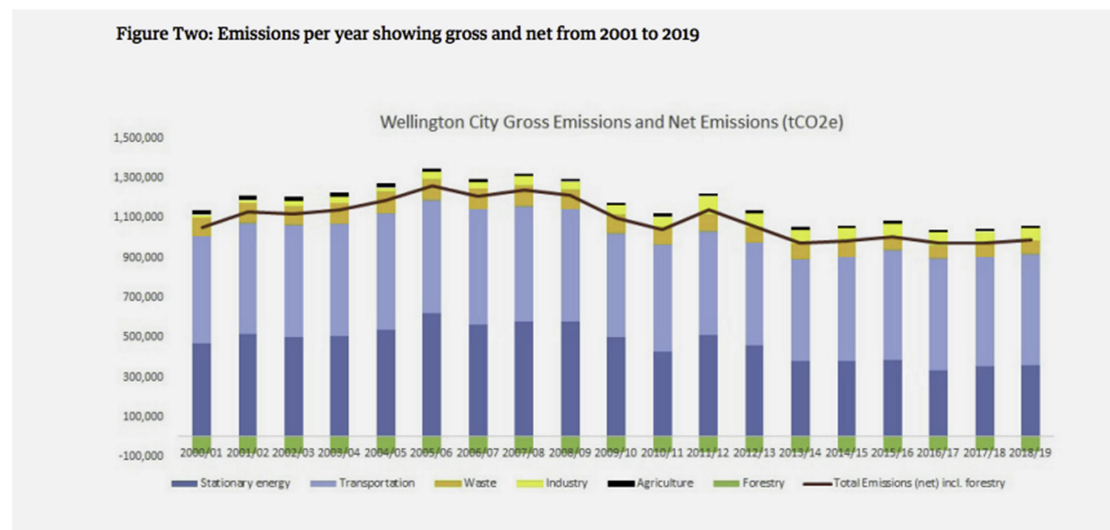
The Council says it measures Wellington City 's emissions using the Global Protocol for Community-scale Greenhouse Gas Emission Inventory (the Global Protocol). This is one of the frameworks used internationally to accounting for and report on city-wide greenhouse emissions. Zero emissions is defined in net terms in the framework. Forest sequesterations are deducted from gross emissions.

The distinctive feature about this accounting framework is that it includes emissions from: intercity road travel, domestic and international air travel by city residents and it accounts for emissions embeded in 'imported' electricity.

However, it is not clear whether the Council's approach is consistent with the Global Protocol. The Council's document talks, at some points, in terms transport emissions on Wellington's territory, not in terms of emissions by Wellingtonians. The territorial concept reduces Wellington's emissions because longer distance travel by Wellingtonians is assigned to non-Wellingtonians.

Figure one shows the aggregate Wellington emissions (on whatever basis) over 2000-2019, and their breakdown.

**Figure one: Wellington emissions per year**



The distinctive features about Wellington's net emissions are:

- They are only about half the New Zealand average on a per capita basis. This is because Wellington does not have significant agricultural and industrial sectors. It does not mean that Wellington residents are more virtuous or 'greener' than New Zealanders on average.
- Emissions fell by 41 percent over 2000-2019.
- Emissions are concentrated in two sectors: stationary energy and transport.
- Road transport emissions account for 34 percent of the total.
- 50 percent of the stationary energy emissions are imputed emissions attributed to electricity. These are expected to largely disappear by 2035 as the grid decarbonises.

We do not accept that Wellington's climate change targets serve a useful purpose in terms of meeting New Zealand's Paris targets. Wellington has neither the obligation or capacity to meet the targets. These sit with the government. The Wellington's Councils efforts are largely just expensive grandstanding that will have almost no impact on New Zealand's overall emissions.

However, even accepting that a local Wellington target should be achieved, this can be done at little cost. The electric car revolution is underway. By 2030-35 most new cars sales will be electric and by 2050 most of the Wellington cars stock will also be electric. Wellington is a high income area, and is leading the electric vehicle charge. The New Zealand Infrastructure Commission reports that Wellingtons electric car ownership rate is 2.3 times the national average.

So by 2050 Wellington could be down to gross emissions of 100,000 tons. These could be offset by additional forest plantings of around 5000 hectares, probably at a cost of \$80 to \$100 a ton. Wellington's total area is close to 442,000 hectares so there is plenty of room. Of course won't achieve anything other than the satisfaction, for some, of meeting the Wellington target. The planet doesn't care if the forestry sequesters are in Wellington or somewhere up country that might be more suitable.

All this will occur without the Wellington Council doing anything beyond responding to the price incentives in the ETS when making its own spending and investment decisions, and, if it insists, planting some trees.

### **Possible impact of cycleways on emissions**

Despite its claims that the cycleway is essential to reduce emissions the Council has not provided detailed information on the emissions impact of the policy. So we have had to make our own assessment. The Council provides the following information for 2018-19.

Total gross emissions were 1061,000 tons. The transport share is 53 percent and the road transportation share of this is 66 percent for a total of 371,000 tons. However, we need to exclude from this commercial transport emissions, because they, obviously, will not be impacted by the cycleways. We also need to exclude from the Wellington territorial emissions commuter trips originating out of Wellington (Hutt, Porirua and Kapiti). It is highly unlikely that many of these users will be induced to cycle into the city because there are more cycle lanes in the city. While this is something of a guess, our assessment of the amount of transport emissions that could be impacted by mode shifts to cycling is half the above number, or 185,000 tons.

## **Part three: Paneke Pōneke - Bike network plan 2021–2031**

This part discusses some of the data and arguments presented in the Council's Bike network document Paneke Pōneke.

### **Cycling in Wellington**

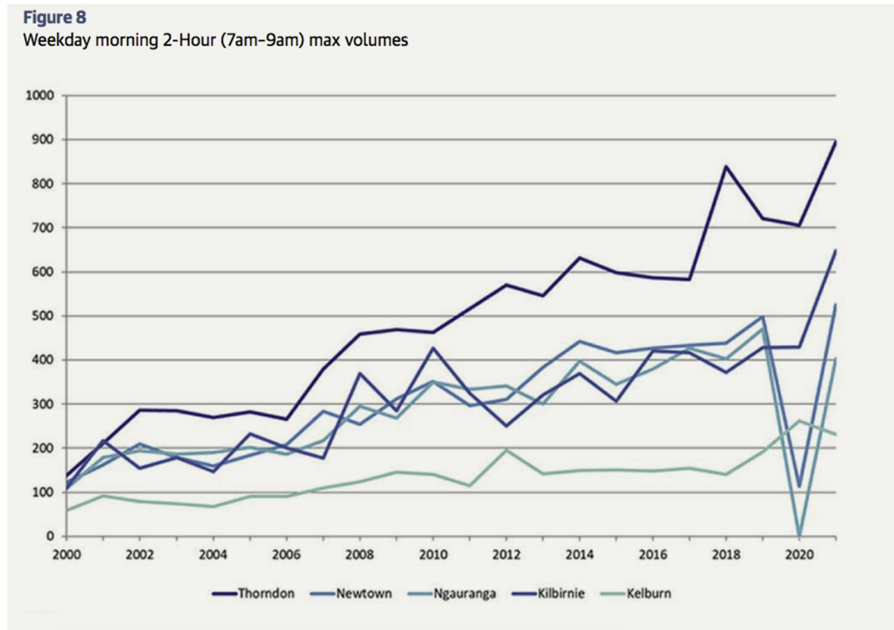
Census figures show that the number of people cycling as their main means of commuting to work increased from 3.54 percent in 2013 to 4.02 percent in 2018. According to the Council cycling increased by 41 percent over 2012-21. The Council does not explain why their data appears to differ from the census data. The Council also produced the data presented in figure two on cyclist volumes by major conduits into the city. Unfortunately the data refers to maximum volumes over each year, which exaggerates the numbers. Average and minimum volumes should also have been reported.

But the Council is not happy with the increases.

*However, this pace of change is not the big change required within the context of our climate emergency.*



**Figure two: Maximum numbers on main conduits**



### The Council's arguments for the cycleways

#### *Feelings of safety*

One of the Council's main argument for the cycleway network is that whatever the objective facts around cycling safety many prospective riders do not feel safe. This is putting them off riding. Thus there is a large latent demand for cycling that will be mobilised by the cycleway network. Two surveys were cited in support:

*A Transport Perceptions study carried out by Greater Wellington Regional Council in 2019 revealed that about 28 percent of the respondents reported feelings of safety while cycling, . This compares poorly to the 64 percent perception of safety for pedestrians.*

This description of the survey question was inaccurate. The question was:

*How safe or unsafe do you think people in the Wellington region generally are when they cycle to work or study?*

Repondents were asked to guess how safe everyone in the region is when they cycled or walked. They were not asked how safe they felt, as the Council claimed. Of course the respondents had no real idea how safe the entire regional population were so they guessed high. And they assumed that walking is safer than cycling, which is true, but hardly new information.

The second survey result was:

*Furthermore, a 2021 Residents Monitoring Survey revealed that only 23 percent of participants agreed that cycling in the city was safe for themselves, and even worse, just seven percent agreed that cycling in the city was safe for their children*

The 23 percent was higher than the 17 percent, in the same survey who thought that the Council makes decisions in the best interests of the city. While 23 percent of respondents thought cycling was safe, only 5 percent cycle regularly, suggesting that perceptions of safety is not the significant impediment to a material increase in cycling. 18 percent thought cycling was safe but still did not ride.

On cycling infrastructure the survey found that 45 percent were dissatisfied and 35 percent were satisfied. Only 20 percent were satisfied in the Southern ward, the community that has had an ineffective and unnecessary cycleway forced on them by the Council.

Some responses on the Council's decision making are also relevant here. Only one percent were very satisfied with its decision making and 15 percent quite satisfied. 19 percent were very dissatisfied and 30 percent quite dissatisfied. 11 percent cited cycle lanes as a reasons for their dissatisfaction; 22 percent cited an unwillingness to listen to residents; 19 percent cited focusing on the wrong areas/vanity projects not core city projects.

### **Improved sustainability and environment**

*More people choosing to ride bikes or scooters will result in fewer people using cars. This will reduce fuel consumption and harmful carbon emissions, and will improve air quality, creating a more pleasant and healthier environment for everyone.*

The impact on fuel consumption is discussed below. Wellington does not have an issue with air quality, except for a few downturn locations affected by diesel public transport. So there will not be a material air quality improvement.

### **Better-connected transport network**

*Cycling plays a central role in achieving a balanced transport network that effectively connects people and places.*

*Giving people more choice about how they travel will take more people out of vehicles and onto bikes, which could result in our streets working more efficiently for everyone.*

The Council has not conveyed any information of the impact of more cycling on congestion. To the extent that cyclists shift from buses there will be no impact. While cycling may well reduce the number of cars on the road at times this

improvement is vulnerable to swings in bike riding when the weather deteriorates. This could mean that congestion will become worse on bad weather days. The Council has not mentioned this obvious risk or made any attempt to assess the impact of bad weather. Cycle lanes could also exacerbate congestion in some cases as motorists are forced into single lanes.

### **Increased economic activity**

*As New Zealand's capital and third-largest city, Wellington has a strong business and commercial hub. A large portion of the number of people cycling in Wellington is made up of those who cycle to work. This shows there is a need to provide effective connections between residential areas where there is high demand and the central city where most workplaces are based.*

This is not logical. The fact that some people are currently biking to work does not demonstrate that spending to increase that number is necessary.

*A strong transport network is good for the region's economy. The positive effect of bike networks on retail sales has been documented. As a result of building bike lanes in San Francisco<sup>1</sup>, 60 percent of retailers observed more residents shopping locally and 40 percent observed an increase in sales.*

*Reallocating space from on-street parking to bus priority lanes and/or bike lanes increases the number of people able to use our streets and to stop and spend time and money.*

We have not seen any analysis that shows that cycling benefits retail sales in general. The San Francisco study cited did not have anything useful to say about the impact of cycleways on retail trade in Wellington. It covered just 27 merchants on a single street in a grid pattern urban environment. There would have been only a relatively small loss of carparks within the wider area. And as the worse affected business would have failed or moved in the four and a half years it took to conduct the survey these negative impacts would have been missed. We note that all of the respondents to the survey emphasised the importance of car parking to their businesses.

Citing an irrelevant San Francisco study is no substitute for a serious analysis of the economic impact on the affected commercial areas in Wellington.

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<sup>1</sup> E. Drennen, Mission District of San Francisco, Economic Effects of Traffic Calming on Urban Small Businesses, 2003

*Giving people more transport choice and being able to get around easily by bike makes Wellington a more attractive place to live, visit and work. It will also help to attract more people to the area as Wellington becomes known for being a cycle-friendly city.*

The claim that being cycle-friendly will attract more people is mostly just wishful thinking.

## **Part four: The Cycle Demand Analysis paper**

It is claimed that cycling could double with a network of bike-friendly lanes but with some more favorable assumptions there could be a threefold increase. The primary research underpinning the Council's analysis was a Council sponsored paper 'Cycle Demand Analysis' based on a survey conducted in 2014.

Some of the results from the survey were:

- 76 percent of the population would consider cycling in some circumstances, whether for recreation, errands or commuting if safe separated infrastructure was provided. However this doesn't mean very much in terms of emissions or congestions reductions. It just means that under ideal circumstances (good weather, separated cycle path for the whole journey; and a relatively flat and not too long a journey) that many Wellingtonians would be prepared to give cycling a go. They would cycle at least once a year.
- There is a perception that cycling is unsafe and that motorists are inconsiderate.
- Would be cyclists preferred short commutes. Anything over 15 minutes was typically viewed negatively or very negatively.
- There was a recognition that cycleways involve trade-offs. Respondents were not in favor of removing parking on both sides of the road.
- There was more detail on a possible the Island Bay to City cycleway. Specifically it was estimated that the share of cyclists would increase from about 5 percent to 11.5 percent with separate cycleways, an increase of 130 percent.

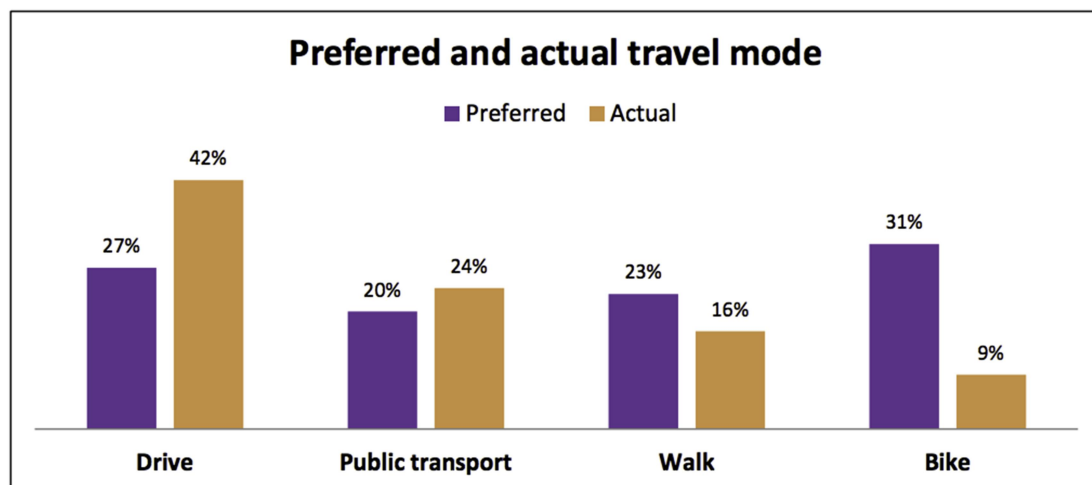
The Council focused on the data presented in figure three, which they claimed further demonstrated that there was a large latent demand for cycling that could

only be unleashed by providing separated cycle lanes. Forty two percent of respondents were using cars, but only 27 percent wanted to. And 9 percent were cycling when 31 percent wanted to. We will get to the robustness of these results below, but for now we just note that more people are taking buses than want to, which has implications for the impact of cycling lanes. If they are effective they will draw traffic away from buses. The other point to note is that the preference for walking is nearly 50 percent above the actual walking level. As there are no real infrastructural impediments to walking this suggests that the estimates are capturing factors that can't be changed by Council's actions. Some people would walk if they were closer to work or they didn't live up a hill. Similarly more people might cycle but for the hills and bad weather or their distance from work.

The wide gap between motorists' preferred and actual travel mode does not appear in the more recent Waka Kotahi survey discussed below. Their data suggests that drivers are more or less doing what they want to do.

So we should be cautious about taking the Council's survey data at face value.

**Figure three: Preferred and actual travel modes**



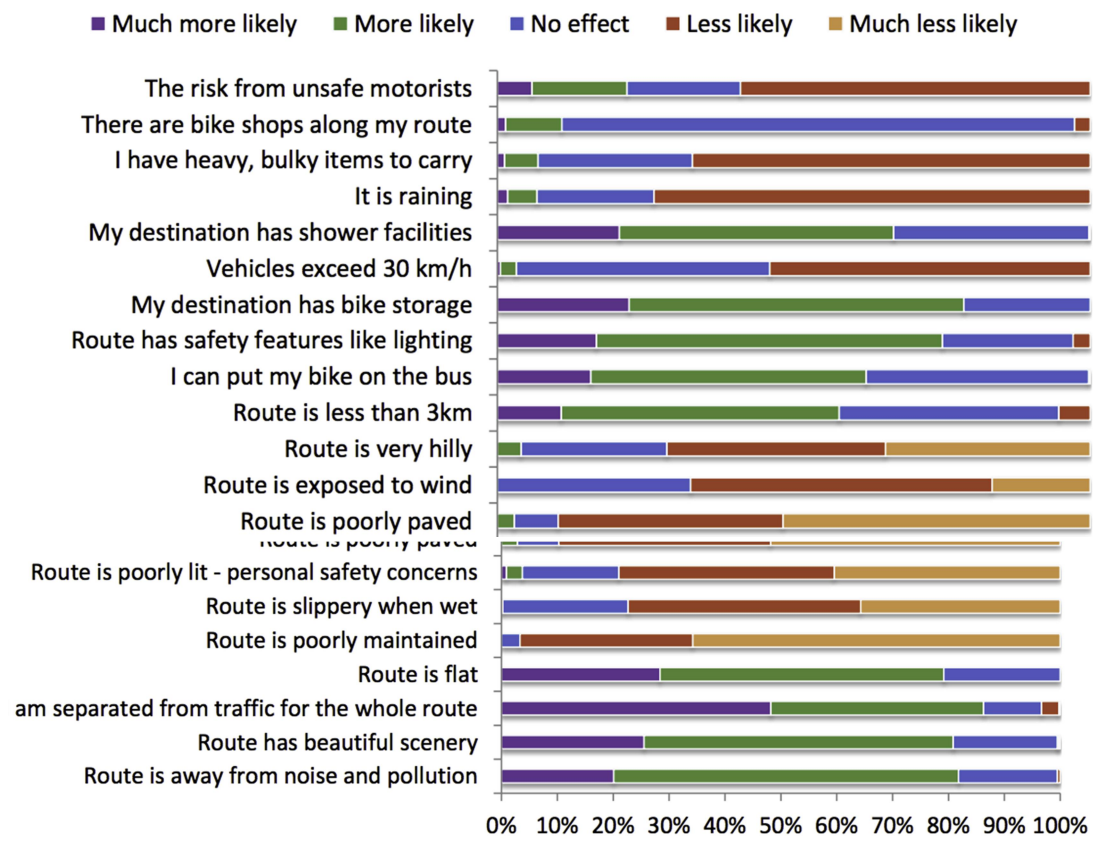
### **Barriers to cycling**

The main barriers to cycling were described as:

*poorly designed or maintained roads (debris or a poor surface). This is followed by the risk from motorists driving unsafely and an assortment of other barriers such as: poor lighting, a route that is slippery when wet, whether or not it is raining, and the need to transport bulky items.*

The lack of dedicated cycle lanes was not specifically mentioned, but the risk from unsafe motorists rated only ninth (see figure four) as a negative influence. On the positive side separation from traffic for the whole route was a strong driver, but few cyclists are likely to be in this situation even with the full cycle network in place.

**Figure four: Impacts on likelihood of cycling**



**Key issues with the cycle demand analysis**

The paper used the results of web-based survey on attitudes to cycling and a stated-choice experiment to model the response to a cycleway on the Island Bay to City route. A stated choice experiment consists of hypothetical choices, with varying attributes, that the respondent is asked to choose between.

There were two stages in the exercise. The first, which had a 40 percent response rate, tested attitudes and current cycling behaviour. The second tested responses to cycle infrastructure improvements after respondents had viewed pictures of possible improvements. This had only a 30 percent response rate. The low response rates could have biased the results. Respondents with a strong view on cycling could have been more likely to respond.

The initial results were that current claimed cycling rate exceeded rates reported in the census and the modelled rates **after** the infrastructure improvements. Taken at face value the results were showing that the cycle lane would have no impact on cycling rates.

The authors concluded that the minimal impact results could not be correct and that one of the pre and post improvement cycling rates must be wrong. They further concluded that the fault lay with the pre-improvement responses. The justification was:

*We speculate that because cycling may be seen as socially desirable, the interviewee wishes to appear pleasing to the interviewer. Over-reporting may occur prior to prompting due to the misconception that the survey may be a cursory gauge of support.*

Which is a reasonable supposition. However, it was then just assumed that the same bias **did not** apply to statements about future behaviour.

*We also speculate that after going through a rigorous analytical choice process, survey respondents are better prepared to effectively and accurately report their own cycling behaviour given varying levels of infrastructure provision.*

And:

*Finally, we speculate that given the high prominence of cycling in the media of late, it is possible that some respondents who support cycling initially thought it might be a good idea to overstate how much they actually cycle to help "support" the idea of cycling. However, as they progressed through the intensive survey, they realised that honest answers are more helpful.*

This was just making stuff up. Their data and modelling was telling them the cycle lanes would not increase cycle riding. So they simply reduced the estimate of current riding from the reported 9 percent to about four percent (based on the reported census results) and left the projected increase alone, on the assumption that respondents' claims about their future virtuous behaviours were reliable. This is a little like regarding New Years' weight loss resolutions as reliable indicators of future weight changes. The effect of this little twist was to securing a cycling increase of over 100 percent.

The reality is that the authors were in a sticky situation. They were heavily invested, both personally and professionally, in cycle paths, but if they admitted that the post

improvement responses were also overstated the whole exercise would collapse. So they resorted to the most implausible 'speculations' to talk their way out of it.

### **Empirical evidence**

A further obvious omission from the Council's analysis is a review of the literature on the effectiveness of cycling promotion investments. There is a substantial literature here, and we discuss some relevant papers. The first<sup>2</sup> is a review of 12 studies from 12 countries. Seven of the studies related to individual or group based interventions to encourage cycling. These were effective in only three of the interventions. The more relevant were the environment interventions (cycle lanes etc.), which showed only small improvements.

The English CCT (Cycling Cities and Towns) programme aimed to increase cycling through capital and revenue investments. Changes in cycle commuting between 2002 and 2011 were compared with changes in matched towns. The analysis indicated that cycling to work in the intervention towns increased by 0.69 percentage points.

In Ireland, the Department of Transport set a target of increasing cycling from 2 percent of journeys in 2009 to 10 percent by 2020. There were a range of interventions, including tax-free loans to purchase cycle; infrastructure change (traffic calming, cycle lanes including segregated lanes); promotions and events. By 2016 census data showed that the cycle modal share was 3 percent, well short of the desired 10 percent.

One US study assessed the effects of transport/cycle infrastructure on cycle commuting. Cycle commuter modal share increased in central Minnesota (from 2.8 percent to 3.3 percent. At the University of Minnesota and Minneapolis the share increased from 0.79 percent to 0.84 percent). In the suburbs the cycle commuting share fell from 0.33 percent to 0.27 percent.

Other studies show a similar pattern. A summary<sup>3</sup> of studies of Dutch and Danish experiences in encouraging modal changes towards cycling (figure five below) found the shifts from cars to cycling were mostly in the 2 to 3 percentage point range.

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<sup>2</sup> Glenn Stewart, Nana Kwame Anokye, Subhash Pokhrel 2015 What interventions increase commuter cycling? A systematic review BMJ vol 5 issue 8 2015

<sup>3</sup> Interventions in bicycle infrastructure, lessons from Dutch and Danish cases Kees van Goeverden Thomas Sick Nielsen b, Henrik Harder c, Rob van Nes Transportation Research Procedia 10 ( 2015 ) 403 – 412



Closer to home Chapman et al<sup>4</sup>. compared active transport outcomes over 2011-13 in two New Zealand cities (New Plymouth and Hastings) that had active transport interventions, with two that did not. They found that relative to the control cities, the odds of trips being by active modes (walking or cycling) increased by 37 percent. But there was no actual increase in active travel. The decline observed in preceding years was merely arrested.

### Figure five : Modal changes Denmark and Netherlands

Table 4. Modal shifts in share of all cyclists in trips in the after situation

Study	Shift from walking	Shift from car	Shift from PT	Shift from all motorized modes
Tilburg (Goudappel en Coffeng and Rijkswaterstaat, 1980)		2%	0%	
The Hague (DHV <i>et al</i> , 1980)		2%	0%	
Delft (Katteler <i>et al</i> , 1987)	3%	3% <sup>1</sup>	0%	3%
Bryggebroen (COWI, 2009a)		2%		11%
Åbuen		2%		
Albertslundruten		2.5%		9%
Farumruten		5%	6%	10%

1: 1% car driver, 2% car passenger

## Part six: Understanding attitudes and perceptions of cycling & walking WAKA KOTAHI

The Council neglected to mention the reasonably authoritative and useful survey of urban area travel produced by Waka Kotahi.<sup>5</sup> The information presented here is for 2020 but there were earlier versions that the Council could have referenced. Some relevant findings were:

- Overall, 56 percent of urban New Zealanders (who were physically able to ride) feel that they are or would be safe cycling. 23 percent did not feel safe; 15 percent were neutral; and 7 percent did not know. 84 percent of

<sup>4</sup> Chapman R, Howden-Chapman P, Keall M, et al. 2014 'Increasing active travel: aims, methods and baseline measures of a quasi-experimental study.' BMC Public Health;14:935.

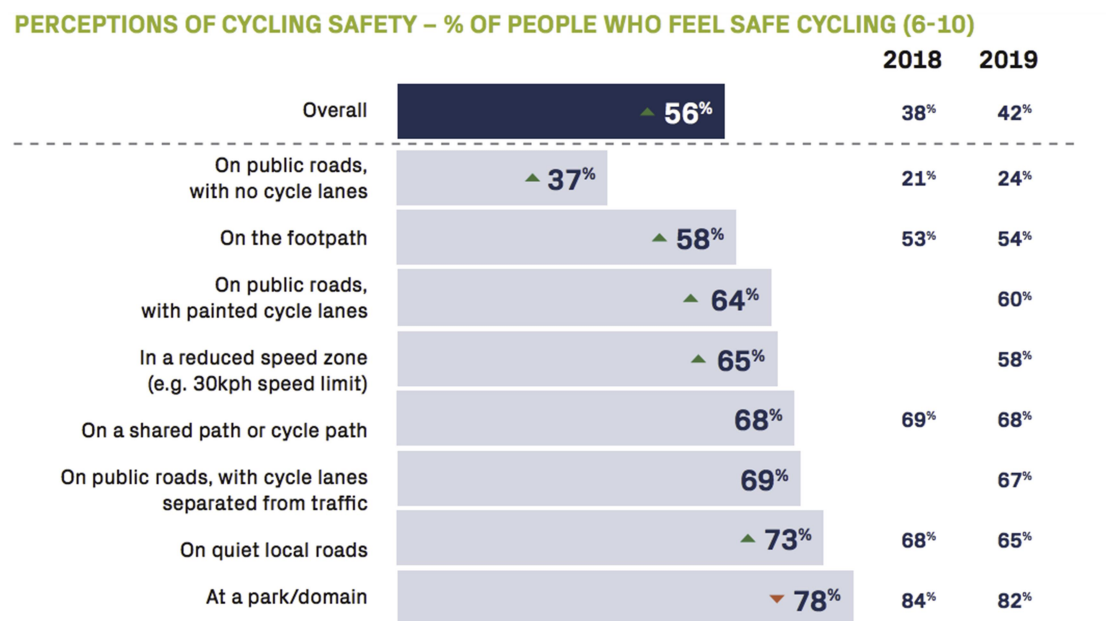
<sup>5</sup> Understanding attitudes and perceptions of cycling & walking WAKA KOTAHI 2021

committed riders; 73 percent of regular riders and 75 percent of occasional riders felt safe.

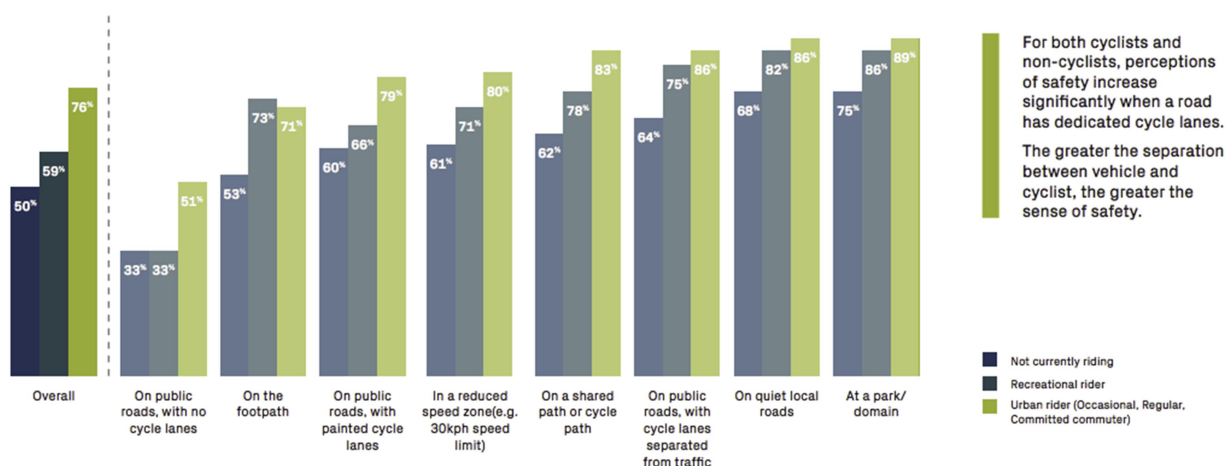
- Those who ride more frequently are more satisfied with the current cycling infrastructure, while recreational riders have lower satisfaction.
- There was support for investment in cycling lanes because it gives people more travel options (60 percent) and it gets people outside exercising (59 percent). However, these were leading questions and, importantly respondents were not told how much it would cost and how effective the intervention might be.
- Cycling accounts for 4 percent of the number of trips.

There was a useful breakdown of how safe people feel in different cycling environments. The most important finding (figure six) was that separate cycle lanes did not make a large difference to perceptions of safety. A reduced speed zone or a painted cycle lane was perceived to be almost as safe as a separate cycle lane (64/65 percent vs 69 percent).

**Figure six: Impact of cycling environment on perceptions of safety**



### PERCEPTIONS OF CYCLING SAFETY – % OF PEOPLE WHO FEEL SAFE CYCLING (6-10)



The survey also found that walkers are finding that cyclists are behaving badly on shared pathways. Only 23 percent frequently see cyclists slow down when approaching pedestrians or give a safe amount of space. Only 16 percent used bells to warn pedestrians when approaching from behind.

## Part eight: Improving injury risk

An improvement in injury risk is cited as an important project output. This is based on 2020 data that showed 10 people were seriously injured (spent at least a night in hospital) and 46 received minor injuries while cycling on Wellington streets. The historical data shows that the numbers have been constant despite the increase in cycling numbers, so the accident rates have been falling.

The problem with the Council's numbers is that they did not assess the number of accidents on the prospective cycleways, or exclude accidents that had nothing to do with cars. We examined accidents on the island Bay to city Route for 2000-2022 accessing Waka Kotahi's Crash Accident System. There were four serious accidents. Two were bike alone accidents, one involved a bus, and just **one** involved a car.

The only other evidence on the impact of cycleways on injury rates was a New York city study<sup>6</sup>.

<sup>6</sup> New York Department of Transport, Protected Bike Lane Analysis

The cycleway evidence was as follows:

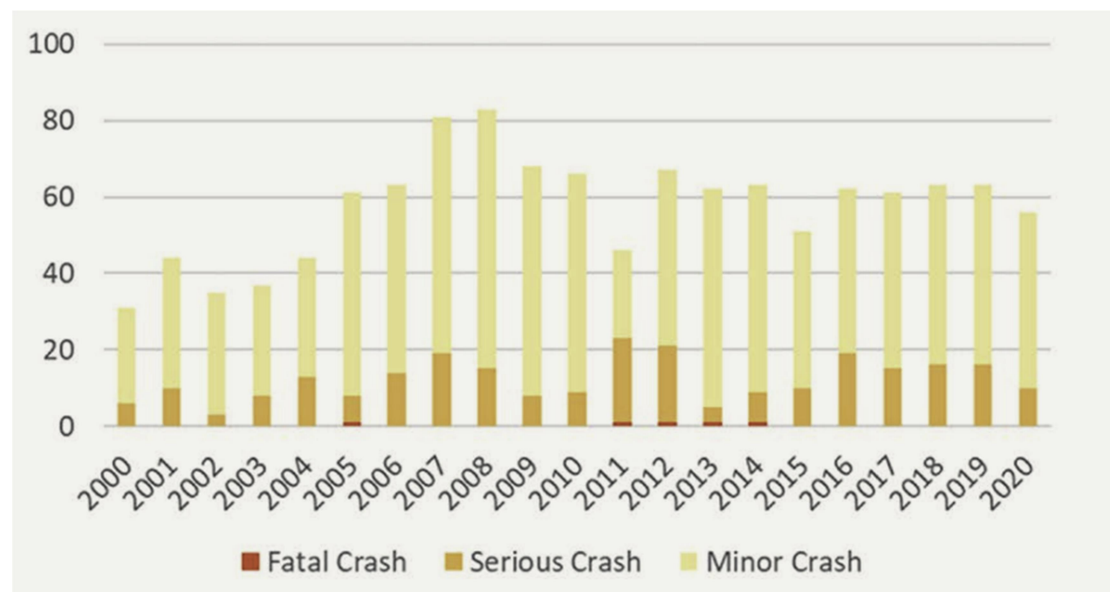
*A significantly lower risk of injury (40 percent) has been observed following the installation of bike lanes in New York.*

This study found that the decrease in the injury rate on the streets with bike lanes was almost exactly offset by the increase in cycling. Also the study did not account for increased injuries of riders transiting to and from the cycle lanes. So the overall effect was probably to increase the number of injuries.

Our expectation is that cycling deaths and serious injury numbers will increase overall because cycling is inherently less safe than riding in a car. There are more deaths on bicycles in the Netherlands, which has a huge cycleway network, than in cars.

But that is not a reason to discourage cycling. The risks are still low and sensible cyclists accept that alongside the many benefits they get from cycling there is a small accident risk. But it does mean the Council should rein in its claims that accidents will be reduced.

**Figure seven: Wellington City cycling accident numbers**



## Part seven: Calculating the impact on emissions

In this part we calculate the impact the cycleway programme will have on Wellington's transport emissions over 2022-50. We first calculate the expected transport emissions over that period and then adjust for the impact of the cycleways.

The following inputs were required:

1. The increase in the share of cycling in commuter travel

Forecasting the response of cycle trips to the cycleway role-out is problematic. The Council's policy paper suggested an increase of up to 10 percentage points from the current 5 percent, but as we have demonstrated the evidence for this is extremely thin. A skeptic might suggest that the likely increases will be so small that the impact on transport emissions will be immaterial. However, for illustrative purposes we have assumed a relatively optimistic increase from 5 percent of journeys to 8 percent, a 60 percent increase. The emissions impact results we present below can be scaled to reflect stronger and weaker impacts on the cycling mode share.

2. The diversion from public transport and from walking to cycling.

If commuters divert from walking and busing to cycling there will be no impact on emissions. We have assumed that one third of the increased cycling commuters are diverted.

3. The average commuter cycle distance

It is assumed that the average cycling commute is shorter than the average motorist commute. New cyclists will be drawn from motorists with shorter commutes, and so save less than the average level of emissions per journey. A 20 percent reduction in the emissions impact is made.

4. Population increase

Population and hence commuting is assumed to increase by one percent a year.

5. The change in the stock of electric vehicles.

It is assumed that all new vehicles will be electric by 2035. By 2035 25 percent of the light vehicle stock will be electric increasing to 90 percent by 2050 as the existing stock of internal combustion engine vehicles roll off.

6. Implementation of the cycleway programme.

The impact of the cycleways on emissions increases linearly from an assumed 20 percent in 2022 to 100 percent in 2030 when the system is completed.

Our key results are as follows:

- Cycleways have a maximum impact on emissions of 2600 tons in 2030 when the network is complete.
- The increase in the electric vehicle fleet see this savings fall to about 350 tons by 2050.
- Over 2022-50 the average impact is about 0.4 percent of the average current level of emissions (adjusted for the population increases).
- Given the capital cost of \$226 million the cost of the emissions savings is about \$4800 per ton. We have not attempted to assess the opportunity cost of lost car parks but this could make a significant addition to the total cost per ton.

The reasons why cycleways are a relatively ineffective and expensive way to reduce emissions are:

- Only a small proportion of journeys are diverted to cycling and these journeys will be relatively short;
- Cycleways will not reduce emissions from commercial traffic and long distance commuting;
- Some journeys will be diverted from buses and walking;
- Diversions will be increasingly from electric cars, and this will not affect emission levels.

The Council will probably disagree with our estimates of the impact of the cycleways on emissions. We would welcome that if the Council backs up its arguments with its own quantitative assessment.

But the evidence is conclusive. Emissions reductions are not a justification for the cycleway programme and the Council should stop pretending that it is. The debate on cycleways should turn on the non-climate arguments.

## **Addendum**

### **What about Seville?**

At a recent meeting on the proposed city to Island Bay City cycleway with affected businesses, the Council cited Seville, Spain as evidence that the cycleways could be a success. And in Spanish terms the Seville cycleways were a success. According to a

2015 Guardian article<sup>7</sup> celebrating the transformation, cycle riding had increased 11 fold. But that was from 0.5 percent of journeys to six percent, with a lower share for commuter journeys. This is a slightly lower share than Wellington has achieved without cycleways. There does not appear to have been any growth in cycling in Seville since 2015.

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<sup>7</sup> How Seville transformed itself into the cycling capital of southern Europe Guardian January 2015

## Further references

Allatt, TF, S Turner, and L Tarjomi (2013) Reallocation of road space. NZ Transport Agency research report 530. Auckland Transport

Beetham, J (2014) Re-cycling the streets: exploring the allocation of public space for transport. Wellington: Victoria University of Wellington.

Cycling Safety Panel (2014) Safer journeys for people who cycle. Cycling Safety Panel final report and recommendations. Wellington: NZ Transport Agency.

Glenn Stewart, Nana Kwame Anokye, Subhash Pokhrel 2015 What interventions increase commuter cycling? A systematic review BMJ vol 5 issue 8 2015

F Powell, C Bowie, L Halsted, J Beetham and L Baker Opus International Consultants, Wellington and Auckland 2015

The costs and benefits of inner city parking vis- à- vis network optimisation October NZTA research report 575

THE ENVIRONMENTAL AND WELFARE IMPLICATIONS OF PARKING POLICIES – ENVIRONMENT WORKING PAPER No. 145 by Antonio Russo (1), Jos van Ommeren (2) and Alexandros Dimitropoulos (3)