

Cycling Infrastructure: If you build it, will they come? (and will they be safe?)

*Dr Glen Koorey
Director, ViaStrada Ltd*



Presentation Outline

- A Hypothesis
- The NZ Story
- The Christchurch Story
 - Before/after quakes
 - What was built
(video interlude)
 - Did they come?
 - Are they safe?
- Take-away Thoughts



Christchurch, NZ

A Hypothesis

(Based on my observations in Europe vs NZ/Aust/US)

1. If you focus on **safety for cycling**, you may not get more cycling
2. If you focus on **getting more cycling**, you are likely to get cycling safety too



Brisbane, Australia

Follow-up Hypothesis:

Cycling is a NORMAL Activity



Copenhagen, Denmark

The great New Zealand Image...



VIA

What's that about the weather?



West Coast Wilderness Trail

The great New Zealand Reality...



Christchurch, NZ c.2009

New Zealand

- 4.8 million people
 - Low population density
 - Very urbanised
- Typical Anglo-centric Development
 - Automobiles...
- ~1.5% of Trips by Bike
 - ~3% commuting



Genesis: Cycling Safety in NZ 2010

Cyclist killed in crash training

2 comments | [Post Comment](#)

MON, 15 NOV 2010 12:15P.M.

The cyclist killed near Palmerston North was the mother-of-four who was out training for a triathlon.

Patricia Anne Veronica Fraser, 42, of Palmerston North, was training for a triathlon with her best friend. The pair were riding near Mount Stewart when Mrs Fraser was killed in the same direction.

They were training for the 160km triathlon which will be held on November 21.

Mrs Fraser was married and had three children, aged from five to 13.

"Her family are devastated by the loss of space and privacy to grieve," says a spokeswoman for communications manager Kim Fraser.

The cause of the crash is under investigation.

Third Morrinsville cyclist dies

November 18, 2010, 7:43 am

Friends grieve for 'wonderful' nurse

By Vaimeena...

Schoolgirl hit amid cycle death spate

Last updated 10:50 18/11/2010

549 comments

[Text Size](#)

[Print](#)

[Share](#)



DEREK FLYNN

INJURY: A school girl was seriously injured after falling under the rear wheels of a truck and trailer unit south of Blenheim on State Highway 1.

A Blenheim schoolgirl was **seriously injured when she was run over by a truck** while cycling this morning, as the cycling death toll in the past five days rose to five.

The cycling deaths have seen the Cycling Advocates Network renewing calls for drivers to undergo testing every 10 years.

The 12-year-old girl was riding with another girl when she was hit by the truck and trailer, which was carrying a tractor, on State Highway 1 just outside Blenheim about 8.20am.

Blenheim St John Ambulance operations team leader Pete Davidson said the girl suffered serious head, chest and abdomen injuries and was taken to Wairau Hospital.

FIFTH CYCLE DEATH SINCE SUNDAY

Kay Wolfe, the third cyclist hit by a car near Morrinsville on Sunday has died in Waikato Hospital.

Wolfe, 45, of Gordonton, had been one of 10 cyclists from the Morrinsville Wheelers Cycling Club travelling in a group along the Morrinsville-Walton Rd when a car driven by a 23-year-old woman crossed the centreline on a corner and crashed into the group.

[Share](#)

17

[Tweet](#)

1

[Email](#)

[Print](#)



VIDEO John Key on cycling deaths (1:28)

- Waterfront cyclist killed in crash named
- Driver forces cyclist off road - lectures him
- Auckland cyclist killed trying to avoid opening door - police
- Spontaneous photo stop ends in tragedy

th family yesterday but

ld.

e March, when she is Zealand.

indow, saying: "Please s fatally injured in an

nzh your views

What needs to be done to make cycling safer?

[Share your view »](#)

[Read what others think](#)

NZ Coroner's Inquest Into Cycle Deaths (2011-13)

Inquest into death of eight cyclists begins

MICHAEL FORBES

Last updated 14:43 21/07/2011



Supplied

SAFETY INQUEST: Patricia Fraser was killed while out training for the Lake Taupo Cycle Challenge.

*"Would it not be in the interests of the 1.3 million [New Zealanders] who do cycle, to have clothing that would increase the likelihood of them being seen? ...If you get the **irresponsible ones** off the road, wouldn't that be a good thing?"*

Coroner Gordon Matenga, 21/07/2011

Today's hearing focused on the deaths of Patricia Fraser, 34, who was hit by a careless driver, near Bulls, on November 13 and Rex Dalzell, 75, who collided with a car north of Palmerston North on January 7.

Mr Morgan told Coroner Gordon Matenga that making high-visibility clothing mandatory for cyclists could discourage people from cycling altogether, which could lead to an increase in widespread health problems from inactivity.

If would also send a message

Not the Only Coroner...

Hi-vis clothes a must for cyclists - Coroner

Last updated 16:11 14/02/2013

232

Like 823

Tweet 46

g+1



Share

A coroner is calling for high-visibility clothing to be compulsory for cyclists after a top road safety cop was struck while cycling in Petone.

Superinte
five years

was killed in the Lower Hutt suburb while cycling home from work in Wellington

The truck driver who hit him, Desmond Wilson, was found guilty of careless driving, fined \$2000 reparations, and disqualified for nine months.

Now, Wellington Regional Coroner Ian Smith is calling for high-visibility clothing for cyclists, enhanced cyclist education, a one-metre gap between motorist and cyclist lanes, and clear rules about when a cyclist must use designated lanes only.

After investigating the 57-year-old's death, Smith also found that despite court orders for a redesign of the site at the Hutt Road and Petone Esplanade intersection, they "still fall short of what is needed."

"The intersection is in my view a most dangerous area for cyclists to use, no matter how well it is designed."

"Cyclists using this cycle/traffic lane area are literally taking their lives in their hands and a complete rethink and redesign of this area is required."

*"Turning to the issue of high-vis clothing, it is in my view a **no-brainer**. It should be compulsory for cyclists to wear at all times when riding in public."*

Coroner Ian Smith, 14/02/2013

"It's Just Obvious!"

Should it be compulsory for cyclists to wear high-visibility clothing?



More Headlines, More Surveys...

Cyclist death prompts high-vis warning

NICOLE MATHEWSON

Last updated 10:56 29/05/2014

20

Like 1

Tweet 0

g+1



Share

opinion poll

Should cyclists be forced to wear high-visibility clothing?

A coroner has renewed calls for cyclists to wear high-visibility clothing after releasing findings into the death of a Christchurch woman.

Yes, safety is paramount.

186 votes, 67.6%

No, it makes cyclists look silly. Instead m learn to share the road.

80 votes, 29.1%

I'm not sure.

9 votes, 3.3%

Total 275 votes

VIASTRADA

"I recommend that all cyclists when using public roads take all appropriate steps to make themselves more obvious to other road users... including the use of auxiliary lighting and the wearing of high-visibility clothing."

Coroner David Crerar, 29/05/2014

today

Crerar said he was satisfied the cause and effect of the death was clear and that the coroner's district court judge.

So What's the Evidence on the Effect of Hi-Vis?

- Study of NZ fatalities 2006-14 (~100 people)
 - >Half have no data available on rider clothing

	Seen by Driver	Not Seen / Too Late
Hi-Vis Worn	10	16
No Hi-Vis Worn	5	11

- **No statistically significant effect** of hi-vis on likelihood of being seen beforehand

(O/R = 0.194–2.722, Chi-Sq $p=0.636$)



Koorey G. (2014), "Investigating Common Patterns In New Zealand Cycling Fatalities", IPENZ Transportation Group Conference, Wellington, 23-26 Mar 2014

Other Studies

Thornley <i>et al</i> (2008)	Cyclists who "always" wore fluoro had 8x reduction in crash risk than those who "never"	
Kwan & Mapstone (2009)	No studies on visibility aids vs ped'n/bike crash risk	
Wood <i>et al</i> (2009)	Fluorescent vests were not a significant improvement on black clothing at night	
" "	Retro-reflective strips more effective when attached to knees/ankles than a jacket	
Wood <i>et al</i> (2010)	Not clear whether cyclists wearing hi-vis would reduce "look but did not see" crashes	
Washington <i>et al</i> (2011)	Never wearing bright coloured clothing" correlated with increase in crash risk	
" "	Use of fluoro/reflective clothing had no effect	
Miller (2012)	A non-significant increase in the odds of a crash for users of conspicuity aids compared to non-users whilst cycling	
TinTin <i>et al</i> (2013)	No significant difference in hazard ratio when wearing reflective clothing in dark or fluoro colours	
Hagel <i>et al</i> (2014)	During dark conditions, reflective clothing were estimated to increase the odds of a MV collision	

• No evidence worldwide with regards to the efficacy of a mandatory hi-vis clothing law

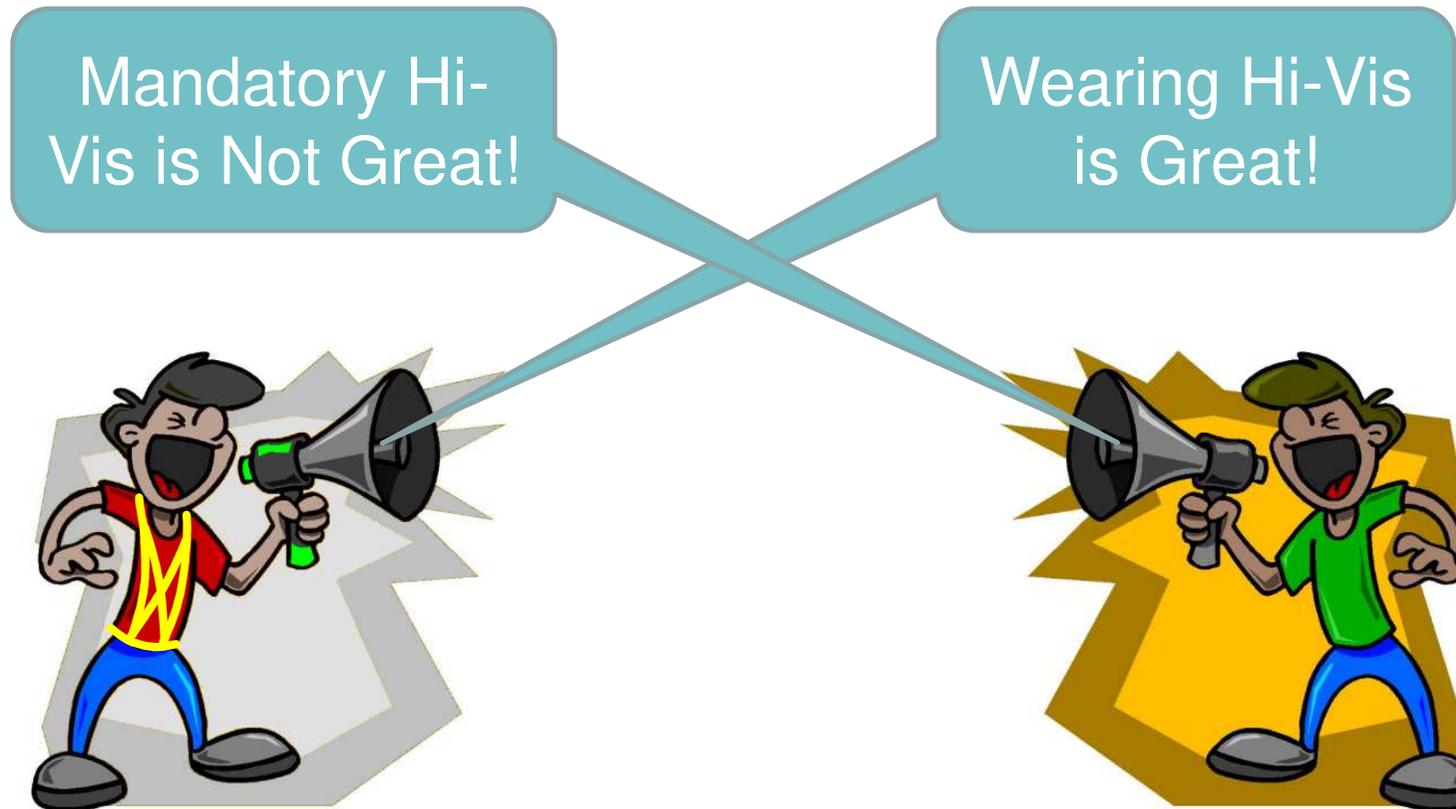
"Sorry Mate, I Didn't Look for See You"



NZ Cycle Fatality Data:

- 25 motorists saw cyclist beforehand (37%)
- 9 saw them too late (13%)
- 33 never saw them (49%)

Talking Past Each Other...



Koorey G. (2014), "High Visibility and Cycling - Balancing Safety and Culture". Velo-City Global 2014 Cycling Conference, Adelaide, Australia, 27-30 May 2014

National Cycle Safety Panel

- 2014 Expert group convened by NZTA/MoT
 - 35 Recommendations made (incl. 15 high priority recc's)
 - Many of them now implemented (or partly)



Urban Cycleways Fund (NZ\$100m)

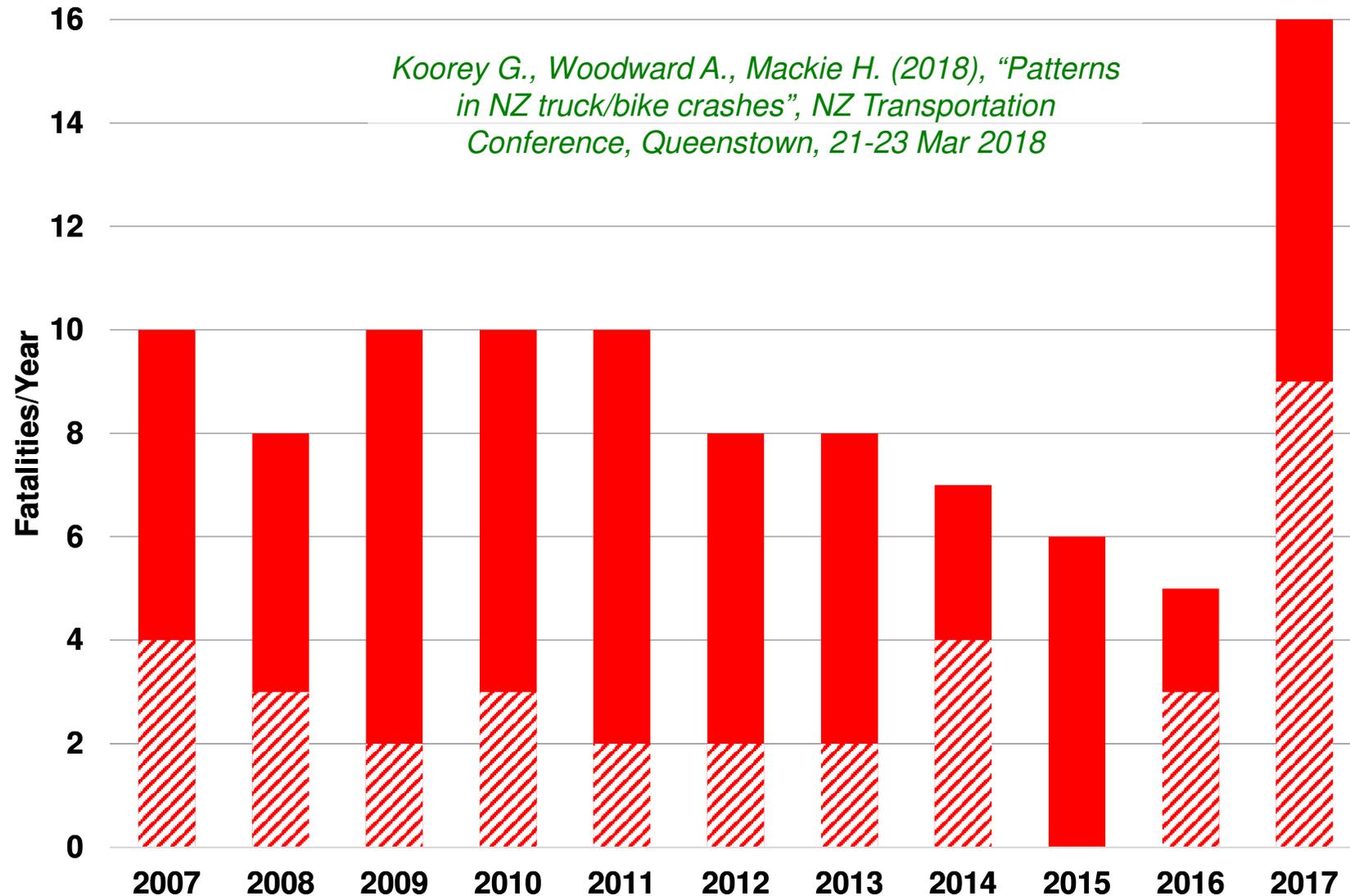
- Now spending ~NZ\$350m on cycling over 2018-21



Trucks vs Bikes: The problem...

- Cyclist vs motor veh: Fatalities over time

— Trucks:  becoming more prevalent



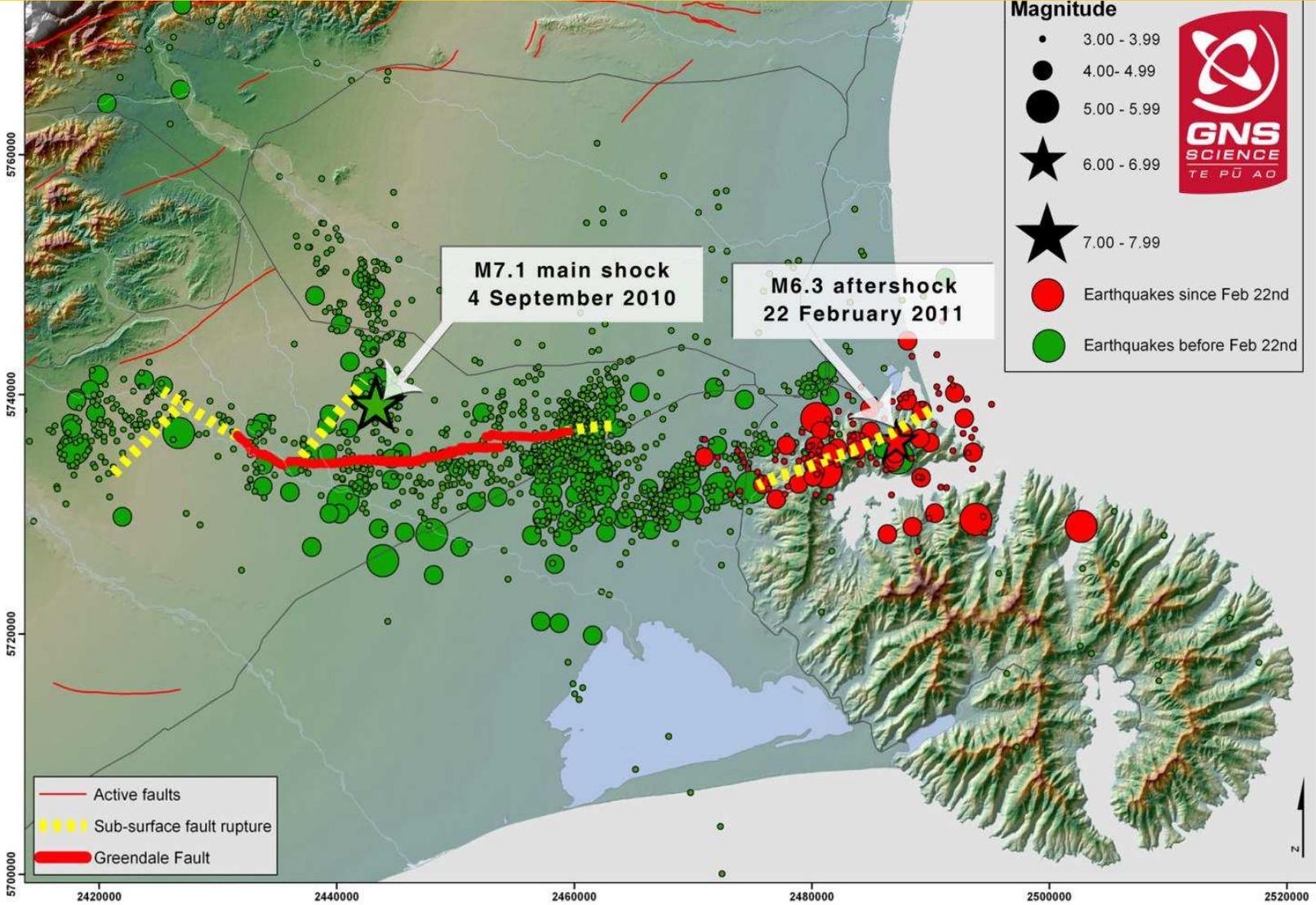
High priority recc's

Truck-related:

- **Separate cyclists** from high freight density traffic
- Trial minimum **mandatory passing distances**
- Increase/incentivise **training for truck drivers**
- Raise **cyclist awareness** of risks near heavy vehicles
- Investigate truck **side under-run** & other safety features

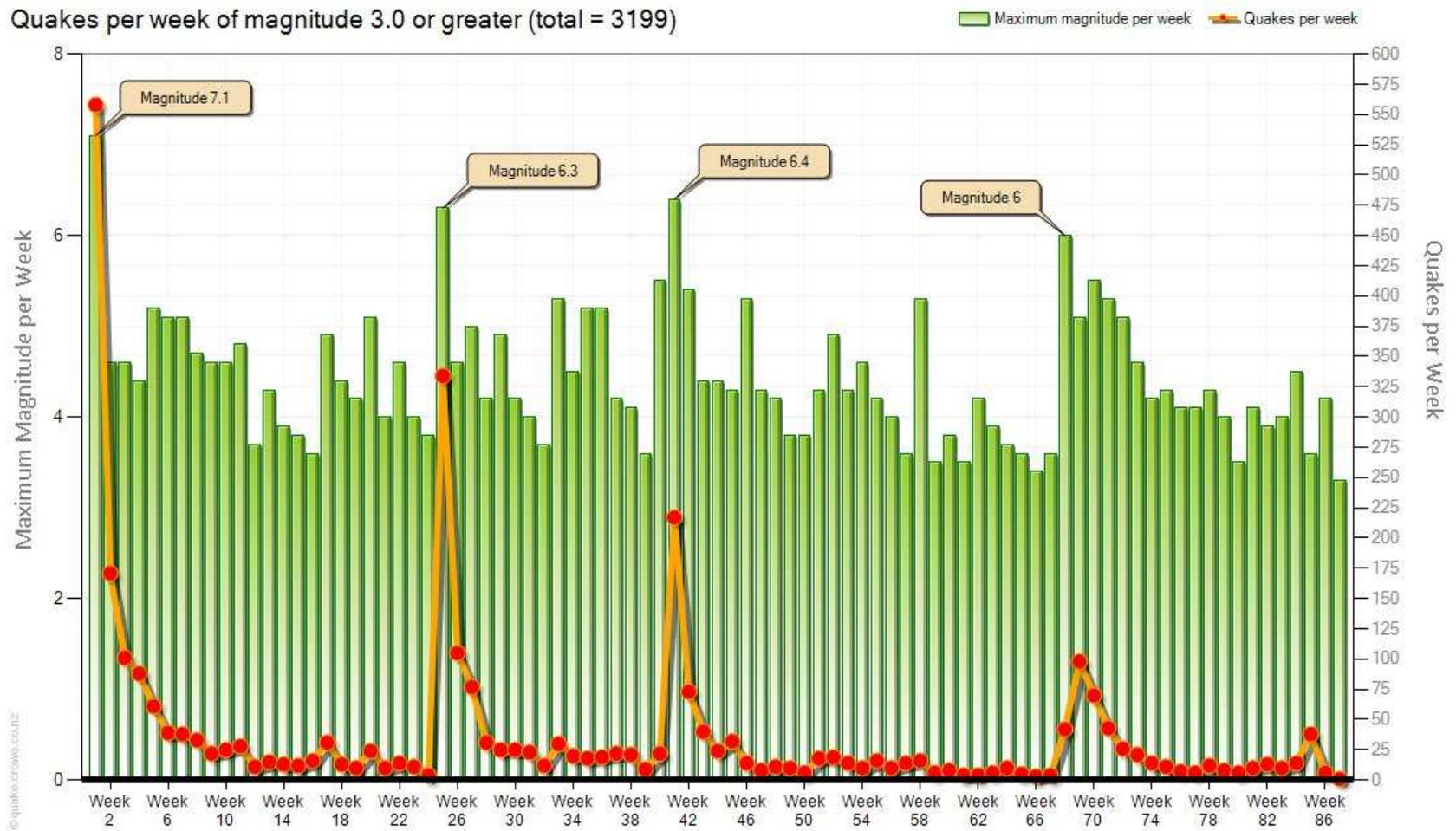
SAFE SYSTEM ENABLERS	
✓ 1.	Give greater priority to active transport needs (cycling and walking) in all land transport planning and investment decisions. This needs to be reflected in the Government Policy Statement on Land Transport Funding (GPS), the National Land Transport Programme (NLTP), the Transport Agency's Investment Assessment Framework, the Economic Evaluation Manual (EEM) and councils' long-term community plans.
✓ 2.	Establish and resource dedicated teams in the Transport Agency and Ministry of Transport with staff and funding to plan, implement and evaluate investments in cycling. Local government is encouraged to do the same.
✓ 3.	Improve the quantity and quality of data collection , especially for non-motor vehicle crashes.
SAFE SPEEDS	
✗ 4.	Ensure the needs of cycling are considered in the implementation of the Safer Speeds Programme.
SAFE ROADS AND ROADSIDES	
? 5.	Accelerate the provision of completed, fit-for-purpose, connected cycle networks .
? 6.	Design intersections so they are safe for cyclists. Trial European design guidelines for roundabouts and other innovative treatments.
? 7.	Separate cyclists from high-speed and high-volume or high freight density traffic.
? 8.	Progressively remove parking from arterial roads where it is a safety risk.
✓ 9.	Develop and promote nationally applicable design guidelines for cycling infrastructure.
SAFE ROAD USE	
✗ 10.	Trial mandatory minimum passing distances for motor vehicles overtaking cyclists in conjunction with an information campaign explaining the rule change to all road users.
✗ 11.	a. Increase and incentivise training for commercial drivers about driving safely near cyclists b. Raise cyclist awareness of the risks of riding near heavy vehicles.
✓ 12.	Increase the safety of cycling to school through a package of Safe System measures.
? 13.	Improve all road user attitudes and behaviours towards sharing the road safely.
SAFE VEHICLES	
? 14.	Investigate the costs and benefits of introducing mandatory truck side-under-run protection and other vehicle safety features .
✓ 15.	Adopt improved standards for bicycle lights .

Meanwhile in Christchurch...



Aftershock Sequence

Quakes per week of magnitude 3.0 or greater (total = 3199)



Source: www.canterburyquakelive.co.nz

Christchurch: A Bit Tricky Driving...



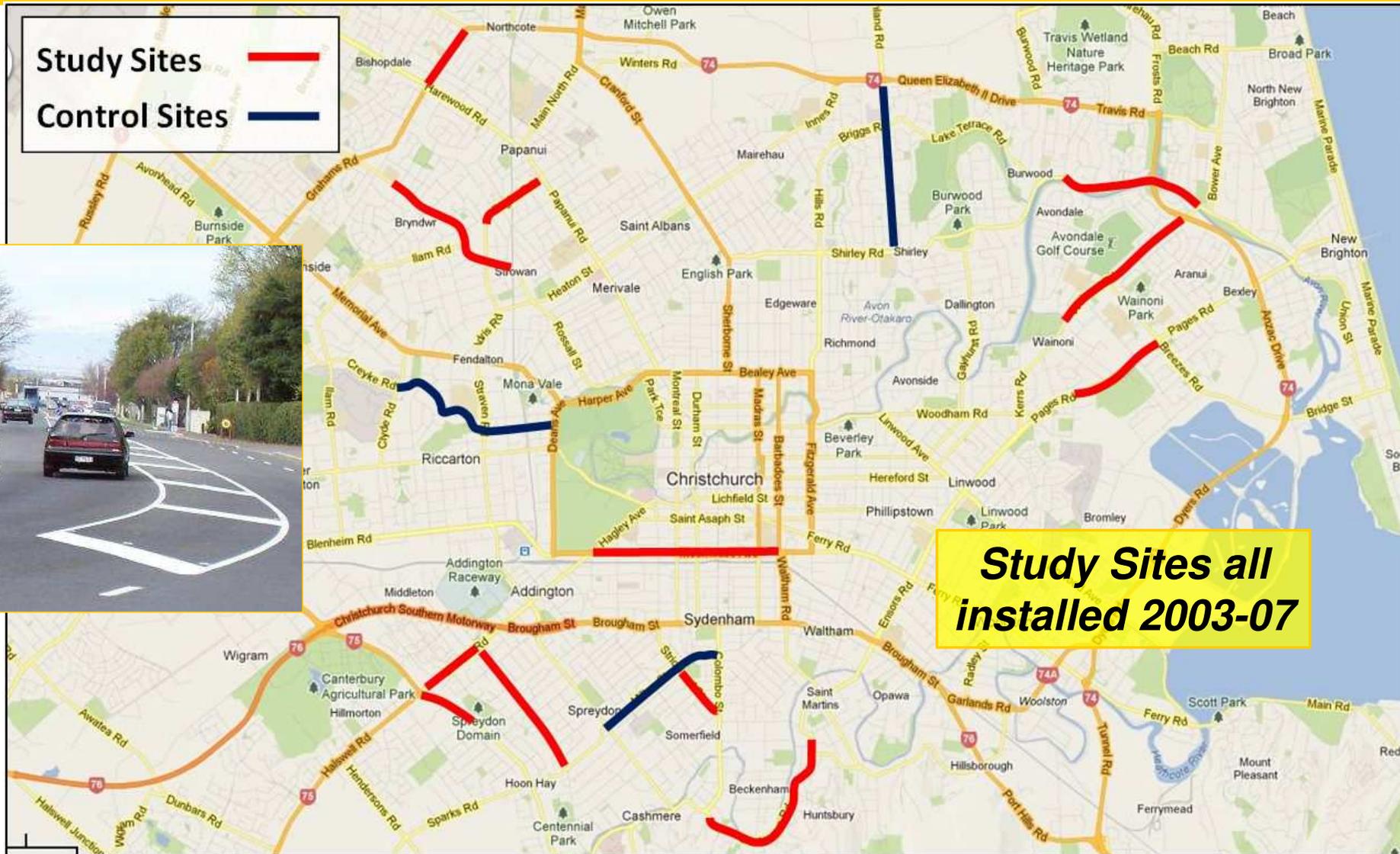
Christchurch Earthquakes: **Aftermath**

- 185 deaths
- Major damage (est. \$40 billion rebuild)
 - 70% of city centre demolished/rebuilt
 - 15,000-20,000 residential properties rebuilt
 - Over 120,000 properties repaired or bought out
 - 45% of Christchurch's roads rebuilt – 895 km

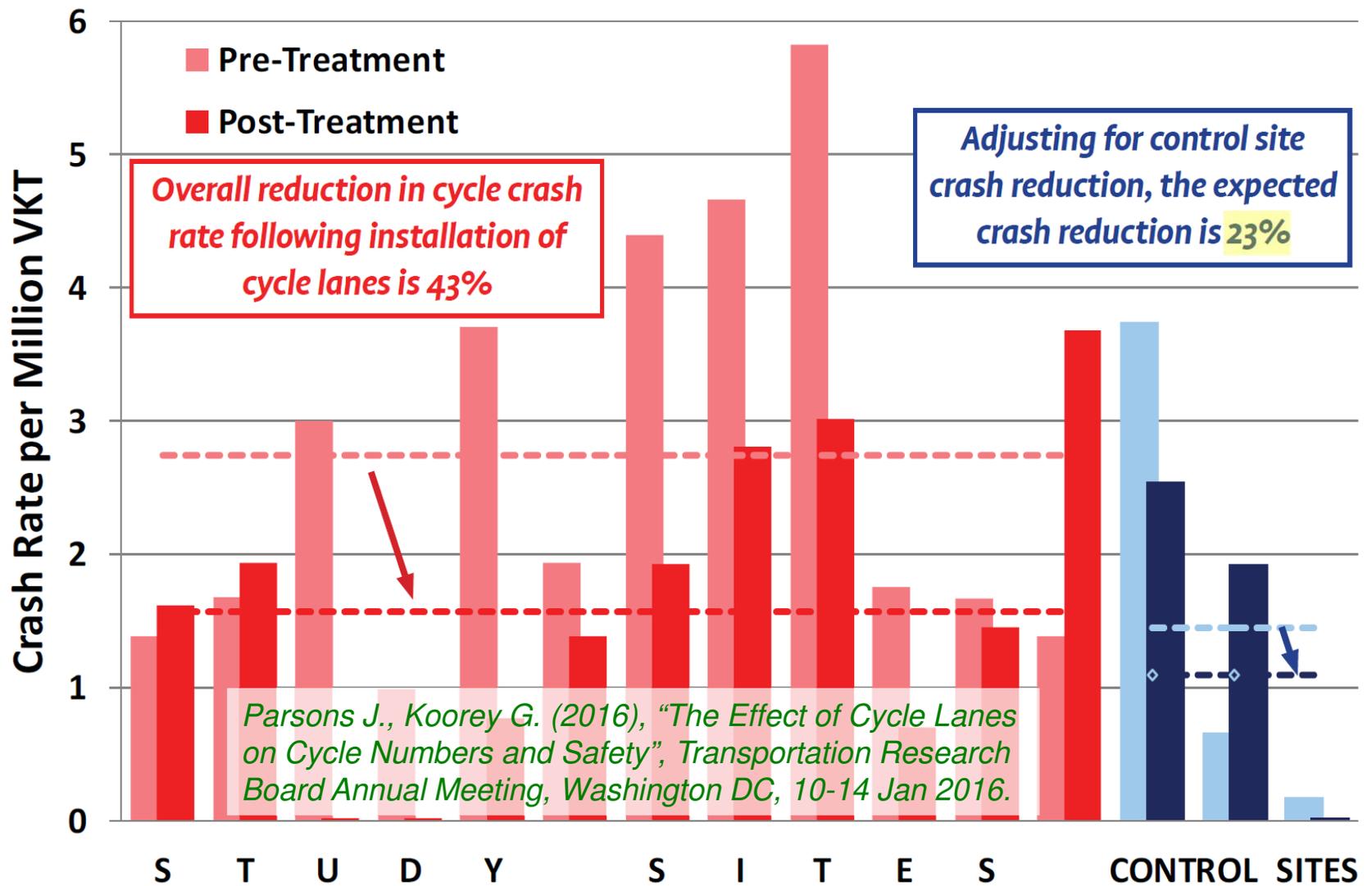
Opportunity?



Before the Quakes: On-road Cycle Lanes



Safety Benefits of Ordinary Cycle Lanes

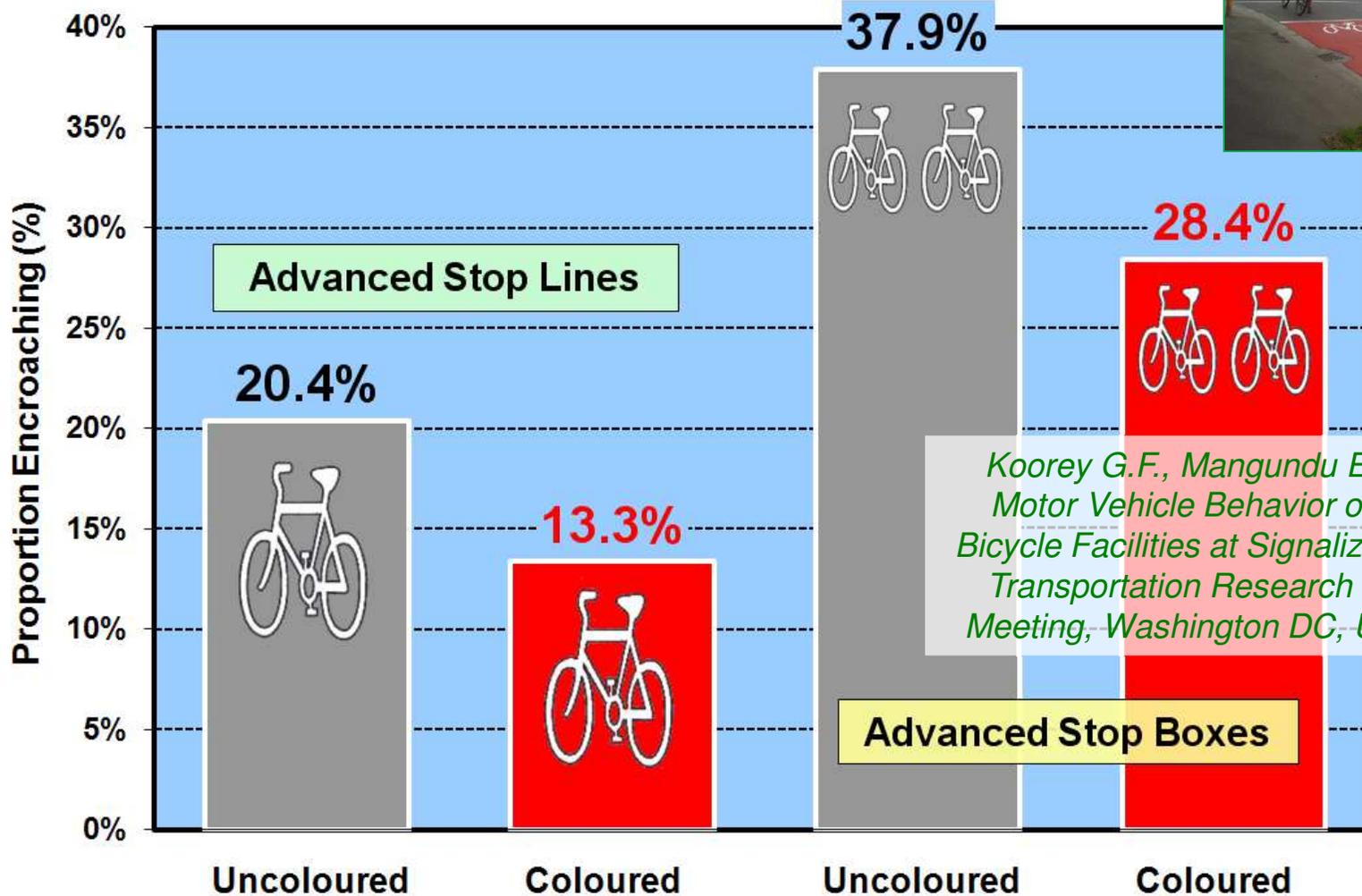


The Problem, however with Cycle Lanes...

- Motorist encroachment of Cycle Lanes
 - Safety concerns by existing/would-be cyclists

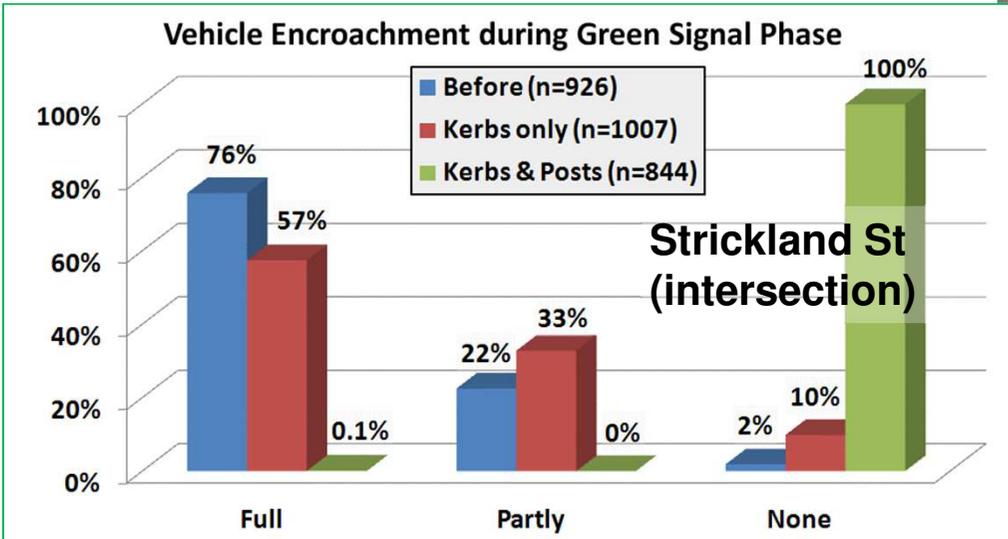


Cycle Facility Colour can help a bit...

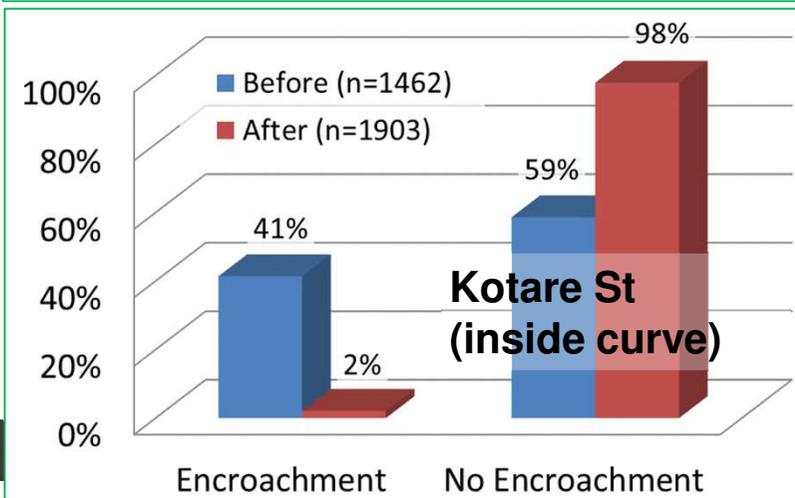


Koorey G.F., Mangundu E. (2010), "Effects on Motor Vehicle Behavior of Color and Width of Bicycle Facilities at Signalized Intersections", 89th Transportation Research Board (TRB) Annual Meeting, Washington DC, USA, 10-14 Jan 2010.

...as can Cycle Lane Separators



Koorey G., Wilke A., Aussendorf J. (2013), "Assessment of the Effectiveness of Narrow Separators on Cycle Lanes", IPENZ Transportation Group Conference, Dunedin, 14-16 Apr 2013



“An Accessible City”

CERA
Canterbury Earthquake
Recovery Authority

30



VIASTRADA



Cycling



Car travel



Walking



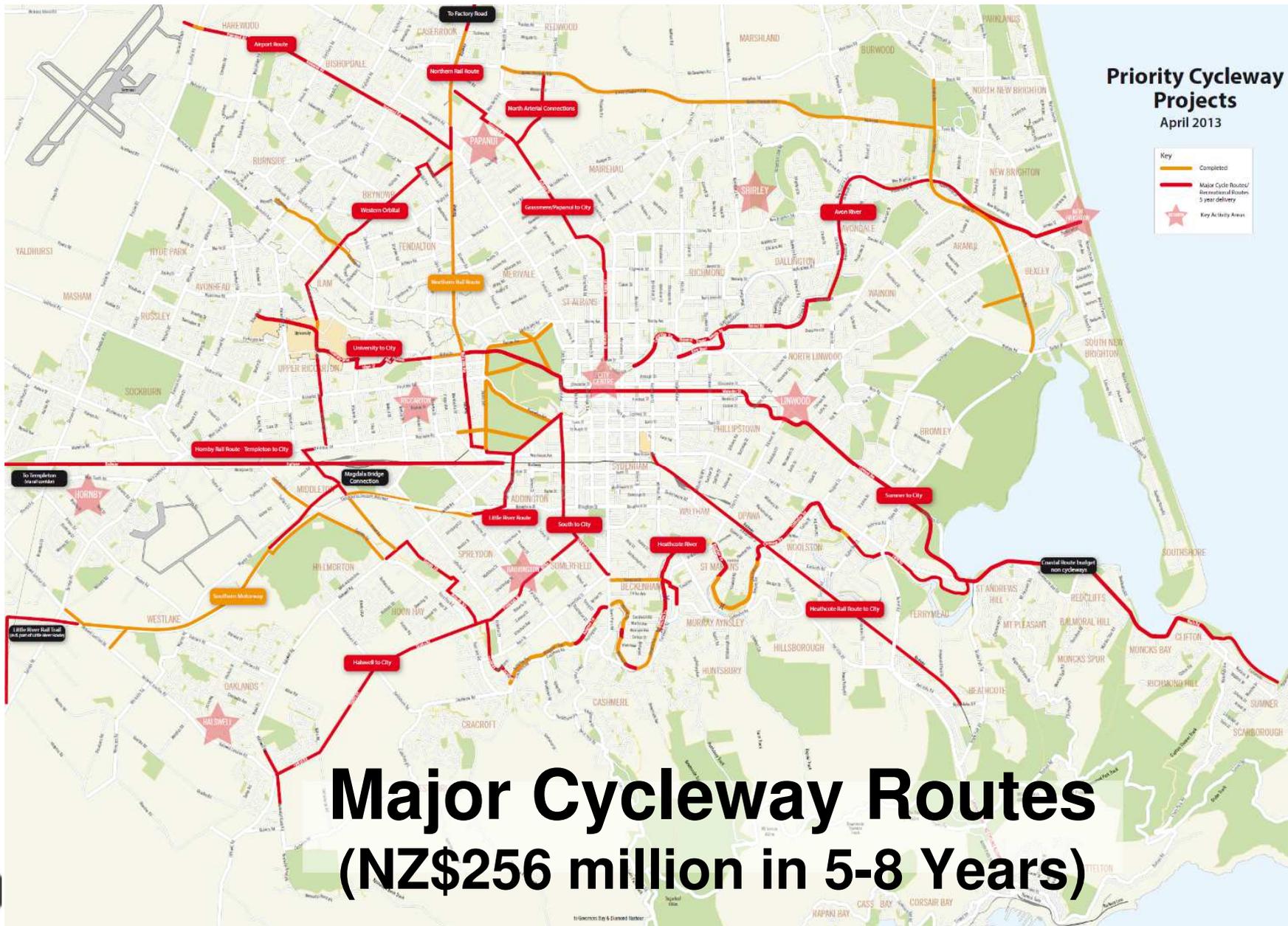
Public transport



Bus interchange

Priority Cycleway Projects April 2013

Key	
	Completed
	Major Cycle Routed/ Revised Routes 5 year delivery
	Key Activity Areas



Major Cycleway Routes (NZ\$256 million in 5-8 Years)



Separated Cycleways



Neighbourhood Greenways

A Variety of Treatments...



Shared Pathways



Roadway Crossings

Getting Dutch Advice...

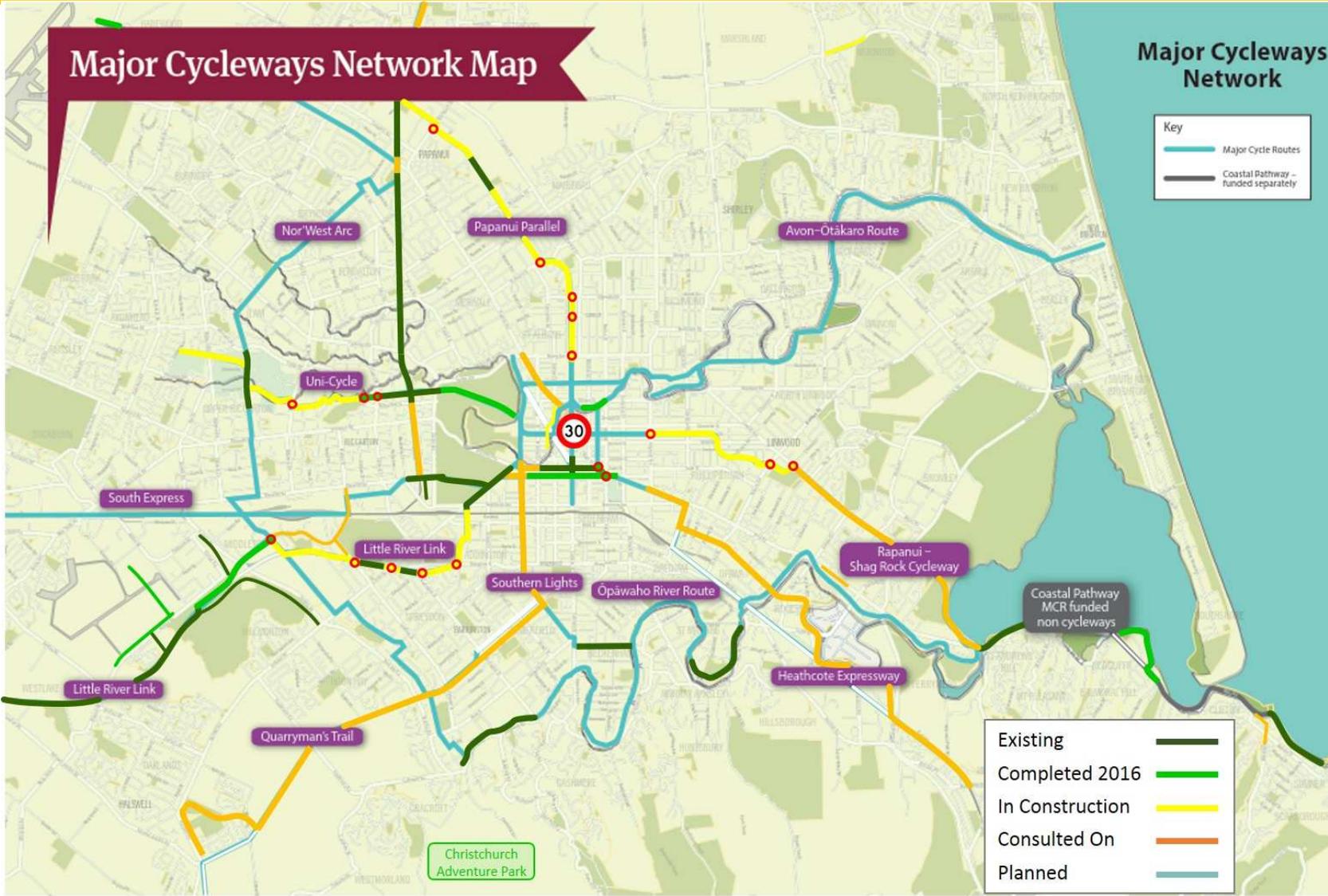


Here's what was built...

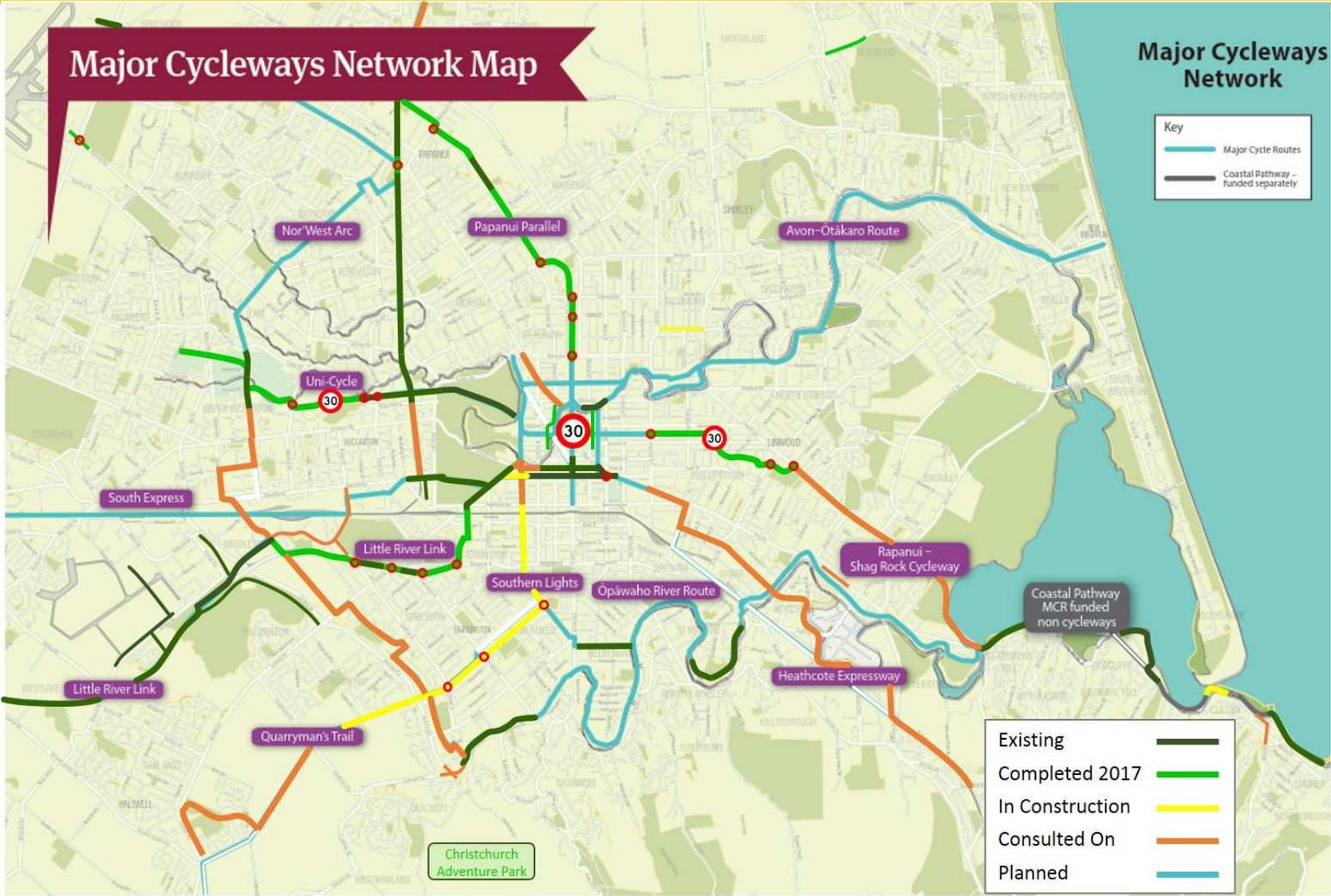


*And yes, projects
were safety audited...*

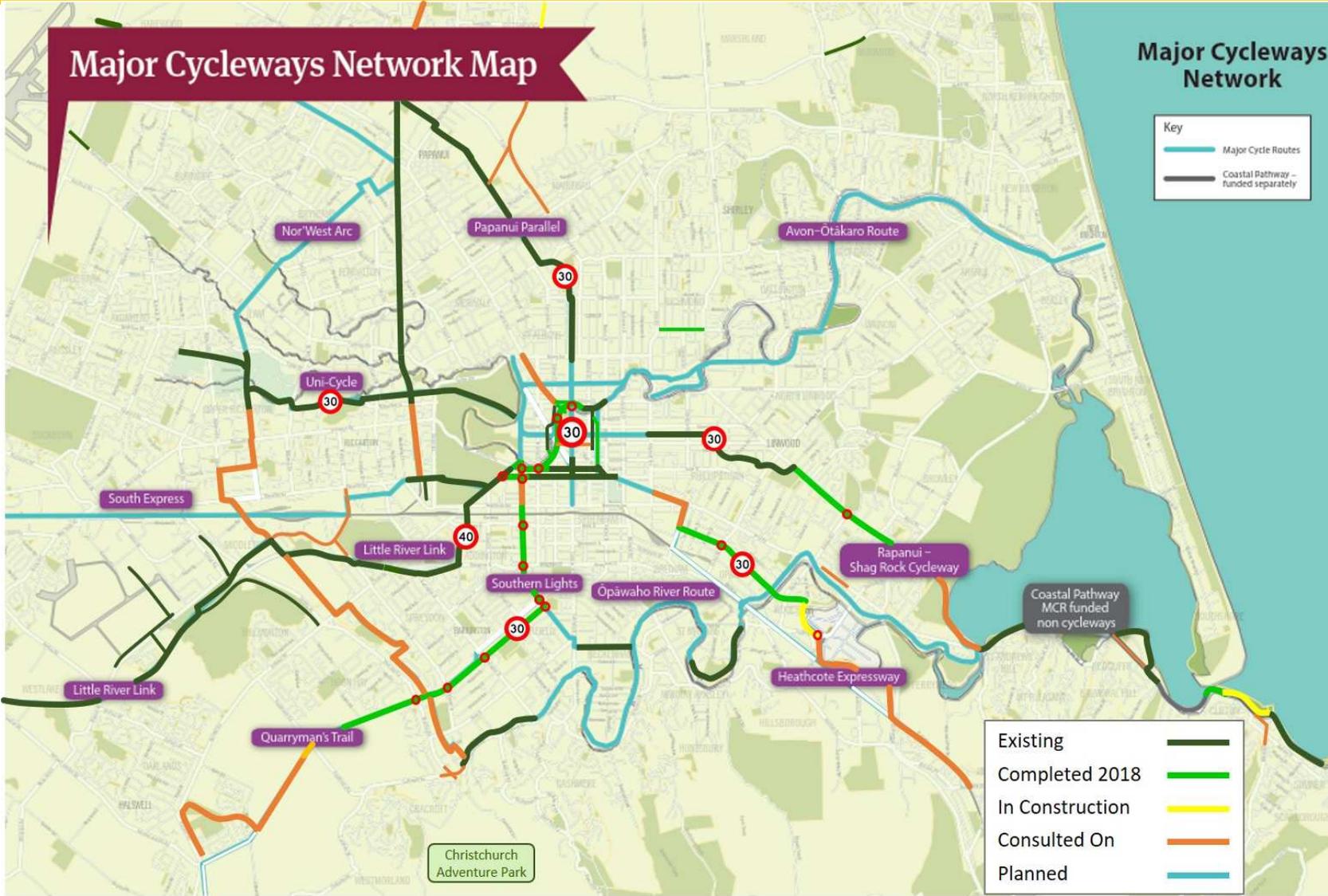
Christchurch MCR Growth - 2016



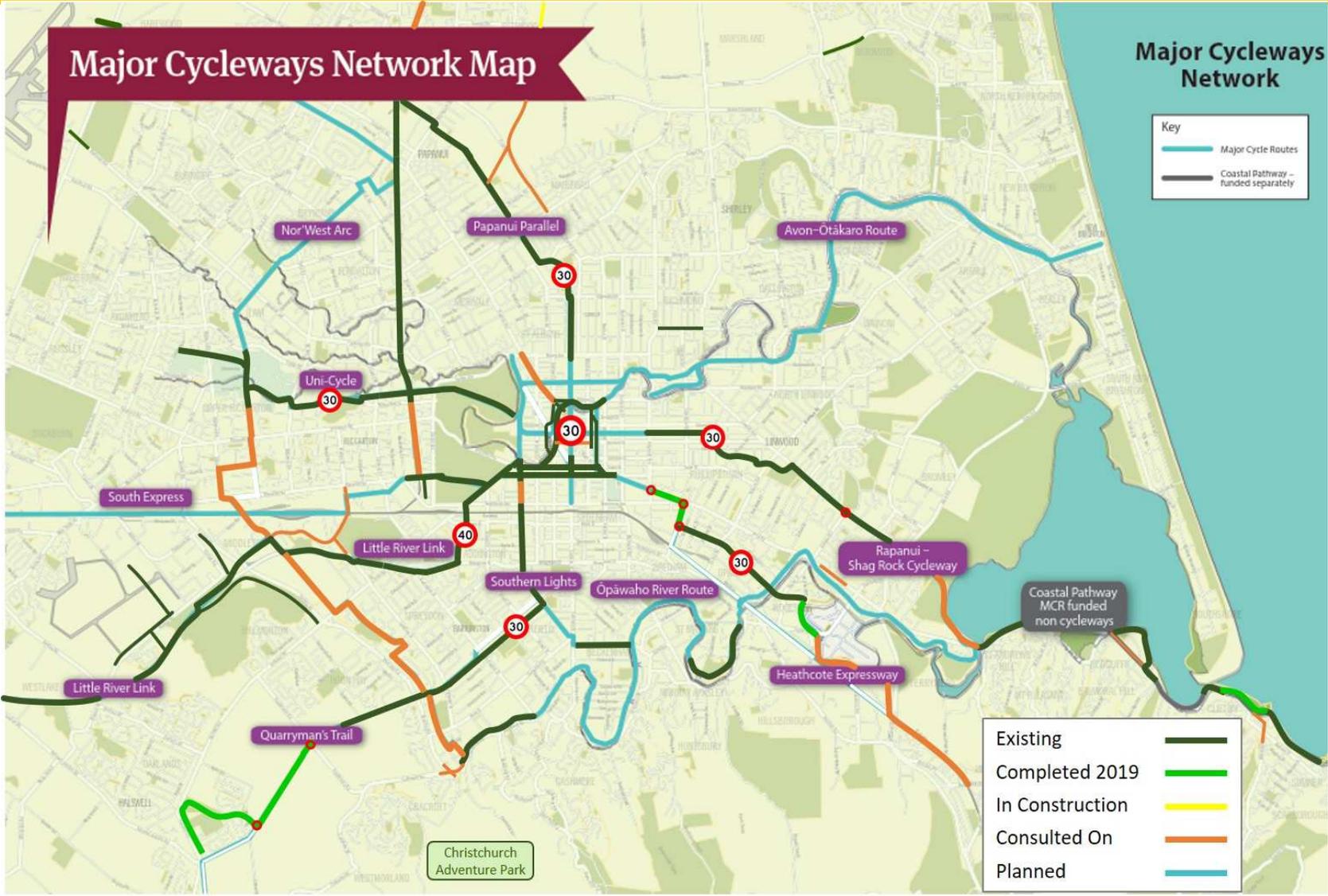
Christchurch MCR Growth - 2017



Christchurch MCR Growth - 2018



Christchurch MCR Growth – Nov 2019



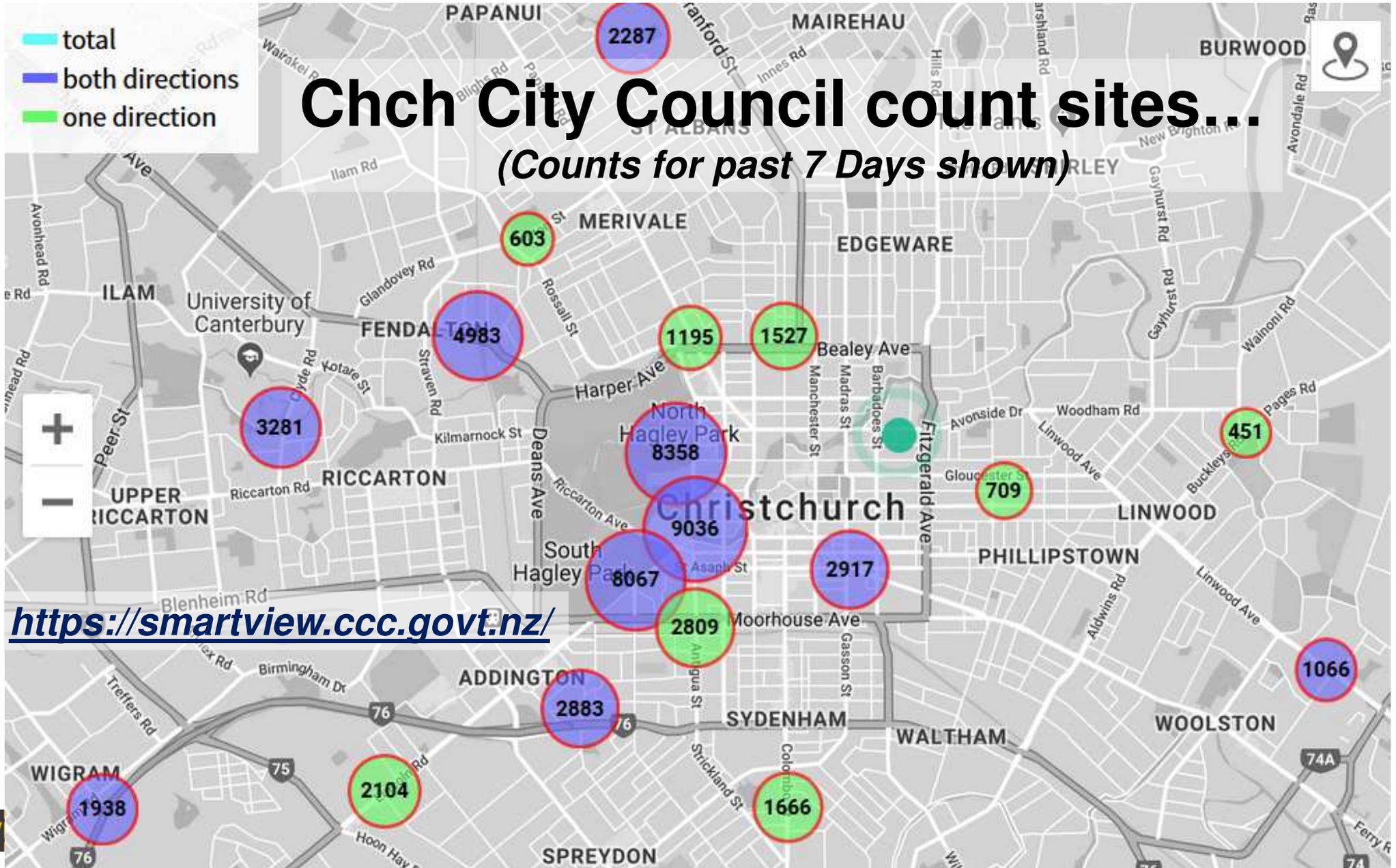
Counting people cycling



- total
- both directions
- one direction

Chch City Council count sites...

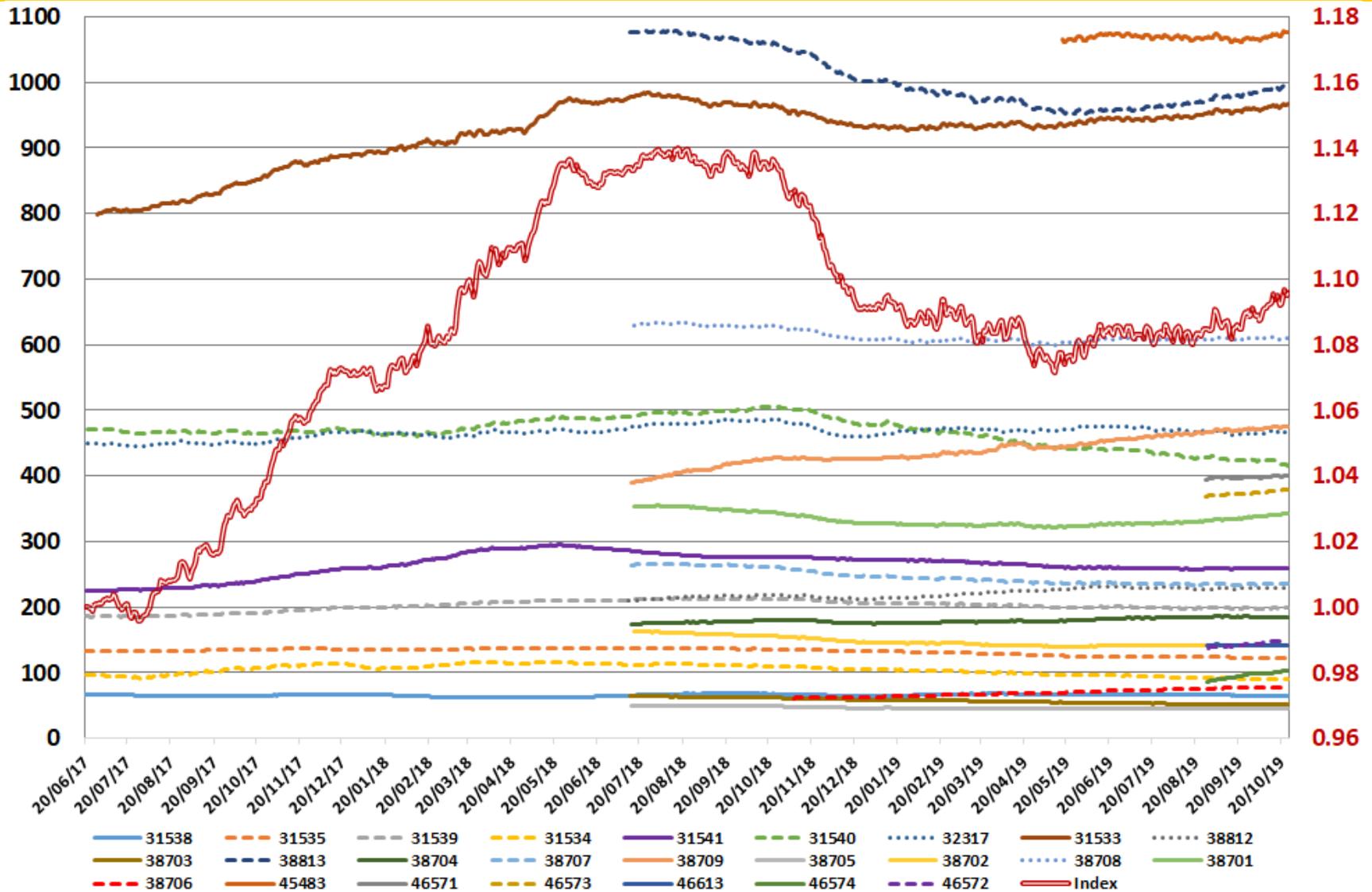
(Counts for past 7 Days shown)



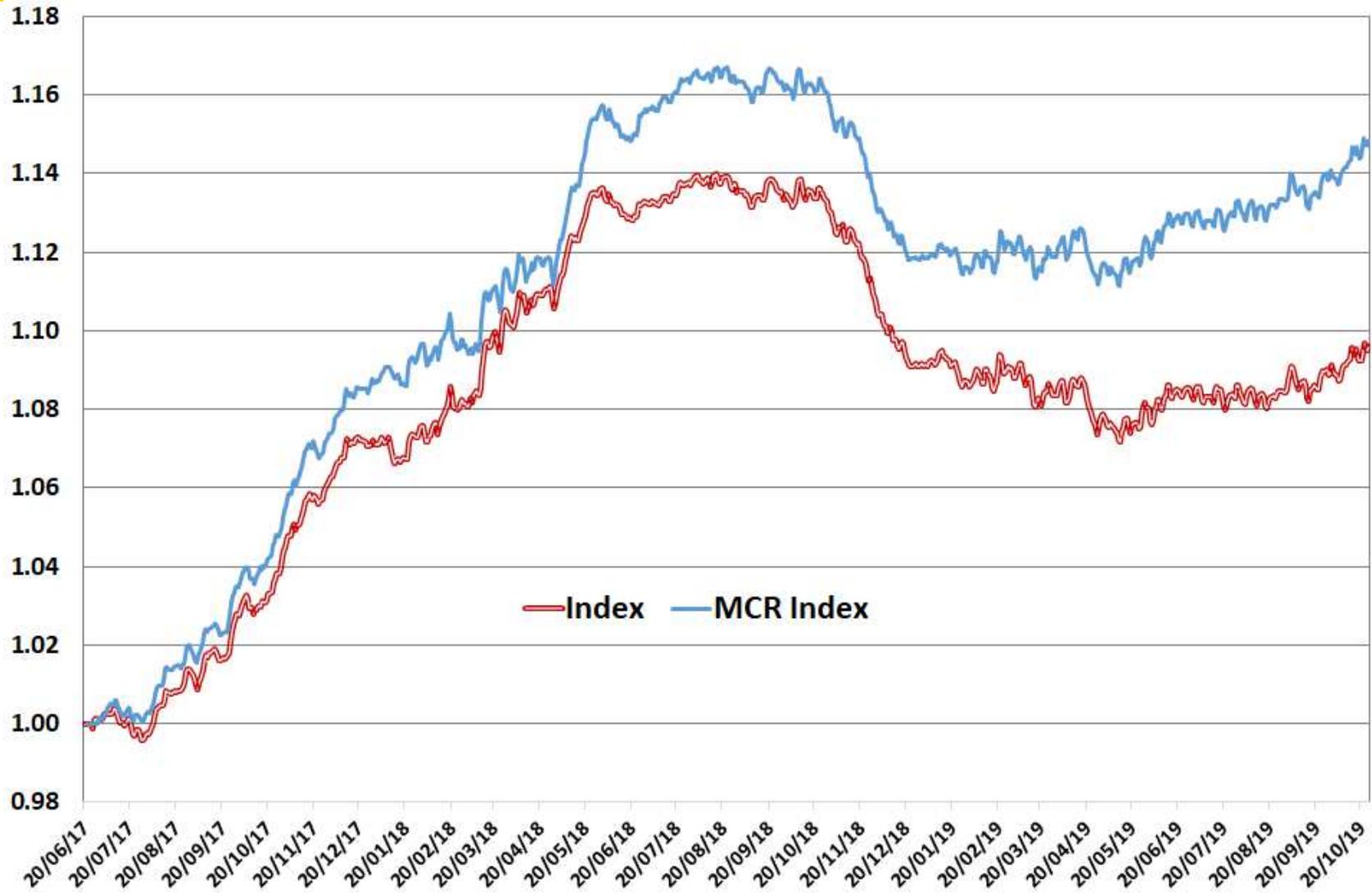
<https://smartview.ccc.govt.nz/>



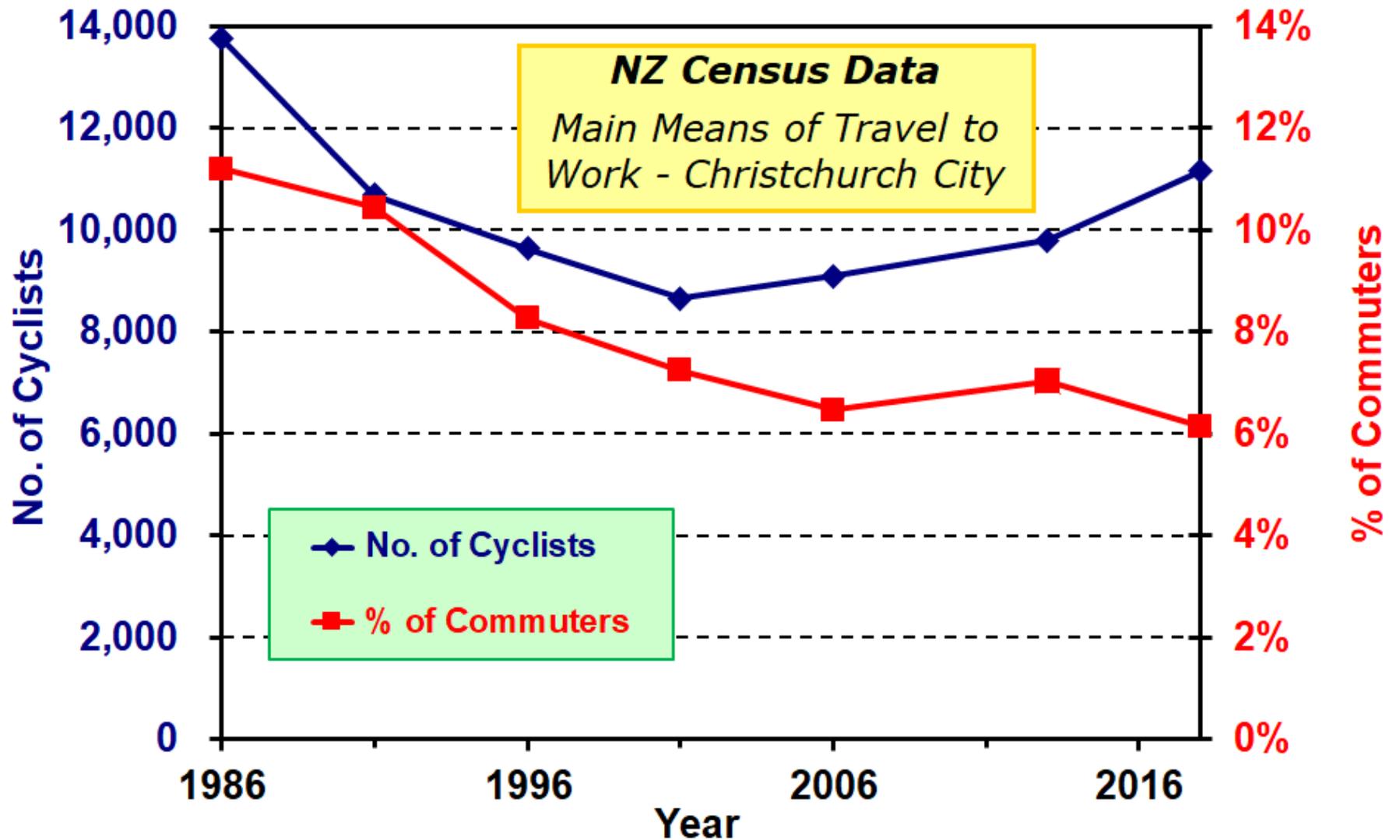
Christchurch Cycle Counts



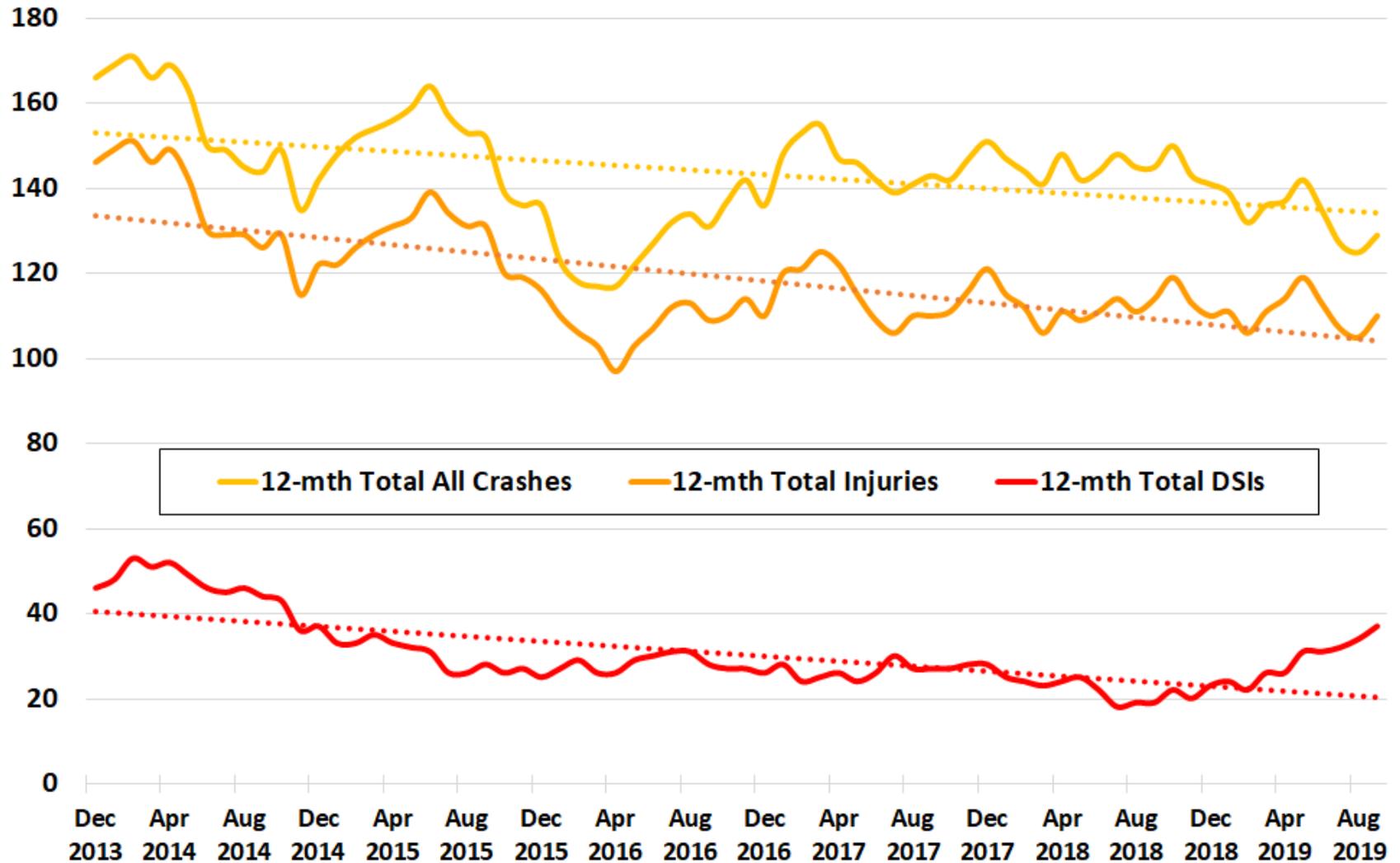
Christchurch Cycle Count Indices



Travel to Work: Cycling Census Data



Christchurch Cycling Safety Outcomes



Take-Away Thoughts

- Christchurch is building it (cycleways)
 - And people are coming!
 - And cycling appears to be getting safer...
- A focus on what can “solve” cycle safety problems can lead to unintended consequences
 - Less cycling → Fewer health & other benefits
- You still need to safety audit (or similar) new cycle projects
 - But innovation shouldn't be stifled because of “safety concerns”

Thank you!

- Any questions?



www.cyclingchristchurch.co.nz



Nijmegen, The Netherlands

glen@viastrada.nz

 [@GKoorey](https://twitter.com/GKoorey)

VIASTRADA