“Making it Real for Making a Difference”

Results of Stage 1 of the Real-World Fuel Consumption Project

AA Research Foundation
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Gerda Kuschel*
and Jayne Metcalfe
Emission Impossible Ltd

What's the issue in a nutshell?

- New Zealand has signed up to reduce greenhouse gas emissions by 2030 to 11% below 1990 levels
- However, since 1990, road transport emissions have increased by 83% and the NZ light vehicle fleet is one of the oldest in the world at 14.1 years on average
- **Would replacing the aging fleet with newer vehicles make it easier for NZ to meet its GHG targets … ?**

What are the critical questions?

The research project aims to address the following critical questions:

1. What is the **actual on-road fuel efficiency** of New Zealand's older fleet?
2. All things being equal, **are NZers buying vehicles which will improve NZ's GHG emissions** or are they making it worse?

Kiwis want to make a difference

New Zealanders are becoming **increasingly concerned about climate change**:

- Consumer found 70% think it is a major concern
- MfE found 61% support tougher GHG targets
- **An AA member survey** (in 2017) found 85% strongly or generally support environmentalism with 79% considering it possible/better that NZ meets its Paris Accord targets

But how can motorists be sure their decisions will make a real difference?

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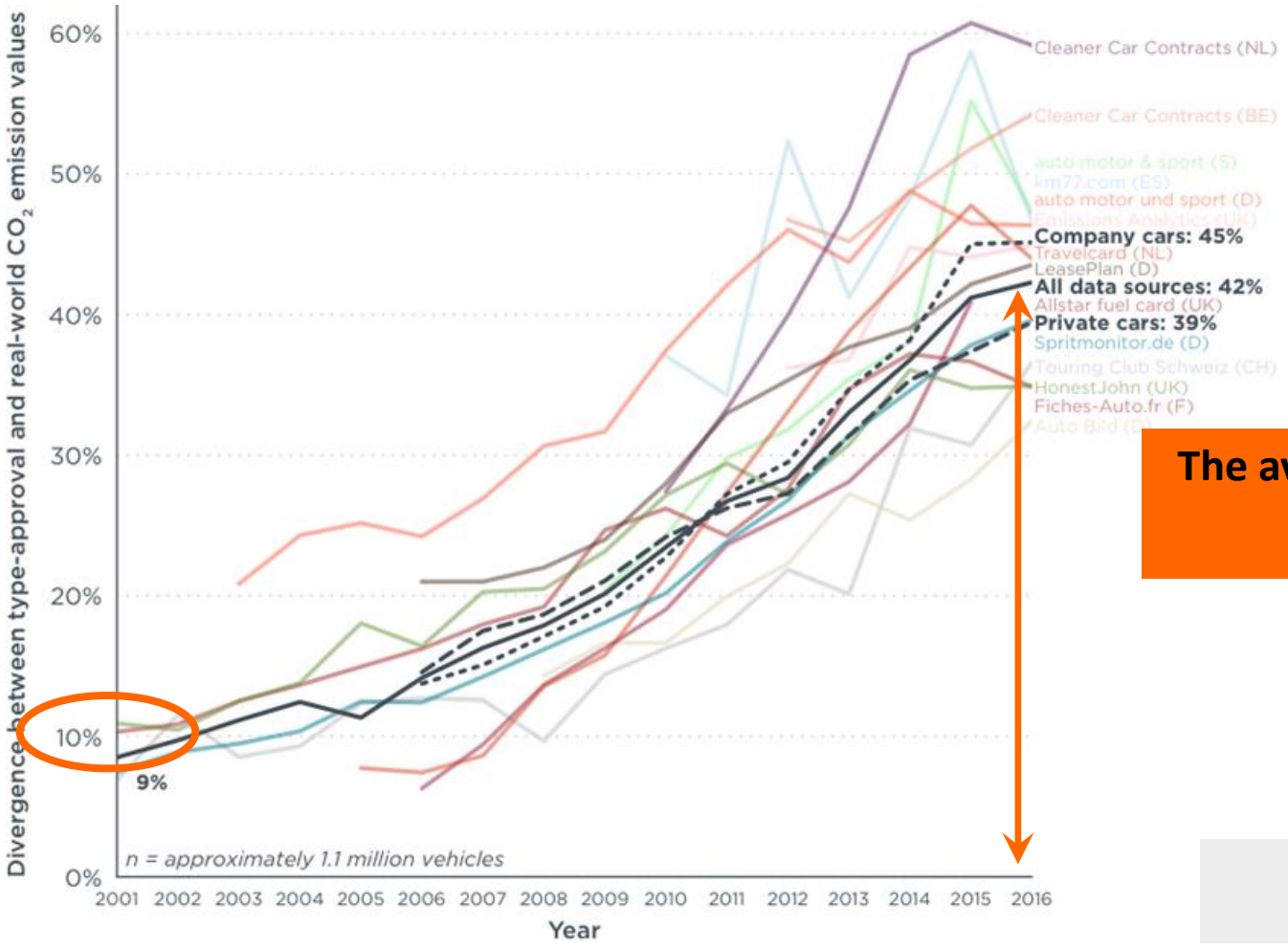
It's complicated … a.k.a. mind the gap!

The gap between real-world and type-approved fuel consumption is growing



The average gap is now 42%

(ICCT 2017)

Overall project concept

A multi-stage approach recommended as follows:

1. Review existing resources in NZ and overseas and scope options to gather better real-world information
2. Undertake a pilot survey and analyse key findings
3. Refine options and launch a comprehensive survey/education campaign

Enabling findings to be incorporated into the development of the next stage

Overall project concept

A multi-stage approach recommended as follows::

1. **Review existing resources in NZ and overseas and scope options to gather better real-world information – funded by AARF**
2. Undertake a pilot survey and analyse key findings
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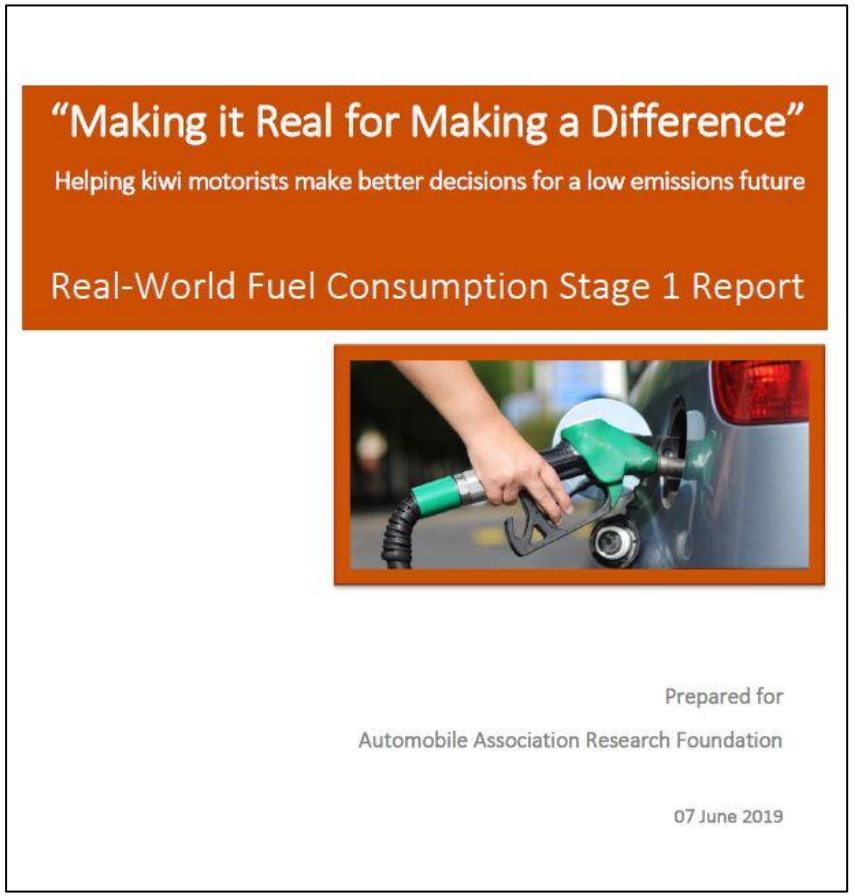
Enabling findings to be incorporated into the development of the next stage

What did we do in Stage 1?

- Identified priority vehicles
- Reviewed useful fuel consumption resources
- Identified key data gaps
- Estimated implications of real-world data
- Reported key findings
- Made recommendations for Stage 2



Priority vehicles

VIA & MTA identified the top 30 NZ new and used import makes/models in 2016, 2017 and 2018

Interesting findings: The rise of hybrids and EVS

- **Used imports**:
  - Prius at #14 in 2016 then #8 in 2017 and #6 in 2018
  - Leaf absent in 2016 then #23 and #9 in 2018

New Zealand websites

RightCar

- Can compare **multiple** cars
- Official FC only in either l/100km or ✯ ✯ ✯ (used)

TOYOTA VITZ
Hatchback IMPORT
Includes 44 model variants
1999-2005
Not rated
Fuel economy
$1,710 / year

TOYOTA VITZ
Hatchback IMPORT
Includes 3 model variants
2010-2013
UCSR safety
Marginal score
Fuel economy
No information available

TOYOTA VITZ
Hatchback IMPORT
Includes 13 model variants
2000-2015
UCSR safety
Poor score
Fuel economy
No information available
for best variant

CARJAM GERDS

2004 TOYOTA VITZ
BLUE Station Wagon
GERDS

Any issues with the vehicle?
CarJam Full Report runs over 50 checks and exposes any problems in one easy to read list of alerts, warnings and notices.
Get CarJam Report

Year: 2004 (2004-11)
Make: TOYOTA
Model: VITZ
Colour: BLUE
Body Style: Station Wagon (CBA-NCP13)
VIN: 7A8H63E0707079419
Plate: GERDS
Engine No: 1NZ-3411136 (1NZ-FE)
Chassis: NCP13-0079419

Photo of a similar vehicle or model
114,034 K on 13 Jul 2011
Upload Your Photo

CarJam

- Single car only but **more data**
- Official FC only in either l/100km or ✯ ✯ ✯ (used)

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New Zealand real-world data

Fleetcard datasets

- Corporate vehicle fuel use 2010-2017
- Real-world fuel consumption
- Broad approval to use data from CustomFleet

PEMS testing

- Real-world results but only for 26 light vehicles
- Used import and new vehicles (YoM 1996-2016)

International websites

HonestJohn.co.uk (UK)

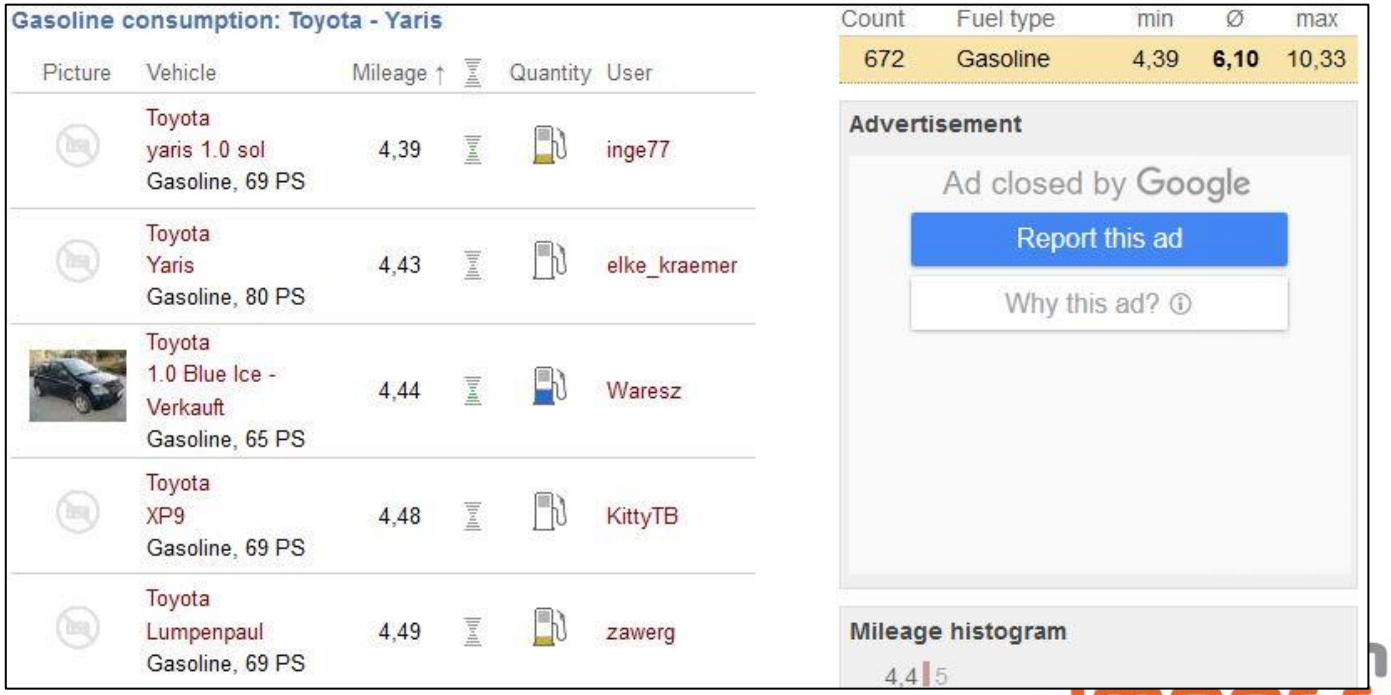
Data type	**On-road, user-submitted**
Data availability	2001–2017, approximately 9,000 vehicles per year
Data collection	Fuel consumption data, entered by vehicle drivers into a publicly available online database
Fleet structure, driving behavior	Mostly private cars; urban and extra-urban driving

52.5 MPG = 5.38 l/100km

International websites

Spritmonitor.de (Germany)

Data type	**On-road, user-submitted**
Data availability	2001–2017, on average 10,000 vehicles per build year
Data collection	Fuel consumption data entered by drivers into a publicly available online database
Fleet structure, driving behavior	Mostly private cars; urban and extra-urban driving; some information on driving style



Gasoline consumption: Toyota - Yaris

Picture	Vehicle	Mileage ↑	Quantity	User
	Toyota yaris 1.0 sol Gasoline, 69 PS	4,39		inge77
	Toyota Yaris Gasoline, 80 PS	4,43		elke_kraemer
	Toyota 1.0 Blue Ice - Verkauft Gasoline, 65 PS	4,44		Waresz
	Toyota XP9 Gasoline, 69 PS	4,48		KittyTB
	Toyota Lumpenpaul Gasoline, 69 PS	4,49		zawerg

Count	Fuel type	min	Ø	max
672	Gasoline	4,39	**6,10**	10,33

Mileage histogram

4,4 | 5

International websites

Emissions Analytics (UK)

Data type	**On-road, test route**
Data availability	2012–2017, on average 100 vehicles per year
Data collection	Portable emissions measurement system (PEMS) testing on urban and extra-urban roads
Fleet structure, driving behavior	Mixed vehicle fleet; professional drivers always using the same test route

Show 10 entries Search: yaris

Make	Model	Trim	Fuel Type	Model Year	Engine Size L	Power Bhp	Drive Train	Driven Wheels	Transmission	Body Style	Doors	Euro Stage	EQUA Mpg Rating	T/F
			Petrol	2015										T
Toyota	Yaris	Active	Petrol Hybrid	2015	1.5	100	FWD	2	Automatic	Hatchback	5	Euro 6	52.9	T
Toyota	Yaris	Excel	Petrol	2015	1.3	98	FWD	2	Manual	Hatchback	5	Euro 5	41.1	T
Toyota	Yaris	Excel	Petrol Hybrid	2015	1.5	100	FWD	2	Automatic	Hatchback	5	Euro 6	52.9	T

52.9 MPG = 5.34 l/100km

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International websites

E-Nenpi.com (Japan)

Data type	On-road, user-submitted
Data availability	Data from 2001 to 2014, approximately 3,000 vehicles per year
Data collection	Fuel economy data entered by vehicle drivers into a publicly available online database
Fleet structure, driving behavior	Unknown

No	Model name	Photo	Actual fuel consumption	WLTC mode fuel consumption JC08 mode fuel consumption 10.15 mode fuel consumption
1	Toyota Starlet 1300cc (EP82) MT FF 4th generation		19.94 km / L	- - 18.4 ～ 19.2Km / L
2	Toyota Pixis Joy 660cc (LA250A) CVT FF Turbo		19.83 km / L	- 24.8 ～ 27.0Km / L -
3	Toyota Vitz 1300cc (SCP13) CVT FF U idle stop others		18.10 km / L	- - 23.0 ～ 25.5Km / L

International websites

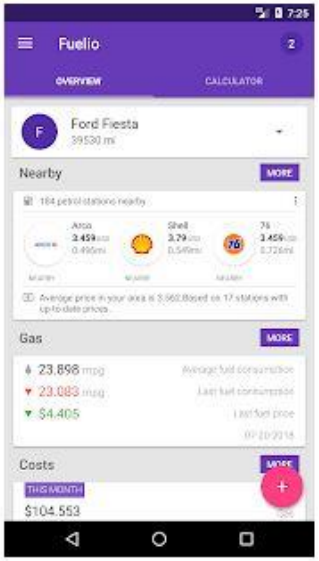
MyMPG (US)

Data type	On-road, user-submitted
Data availability	Model years 2001-2014, approximately 3,000 vehicles per model year
Data collection	Fuel economy data entered by vehicle drivers into a publicly available online database
Fleet structure, driving behavior	City and highway driving, some information on driving conditions and fuel costs

International apps

Top 10 as rated by Techigem

1. **Fuelio** - Gas Log & Costs Android
2. **Drivvo** – Car management, Fuel log Android
3. **Fuel Tracker** - Gas and mileage log iPhone
4. **Fuel Monitor**- Fuel Economy iPhone
5. **My Cars** (fuel logger++) Android
6. **Simply Auto**- Fuel log, Car Service, and Mileage Android
7. **Fuel Manager** - Consumption Android
8. **Fuel calculator** Android
9. **FillUp** – Fuel Log Android
10. **Mileage Calculator** by Atulpriya Androidev Android



But these largely personal use only

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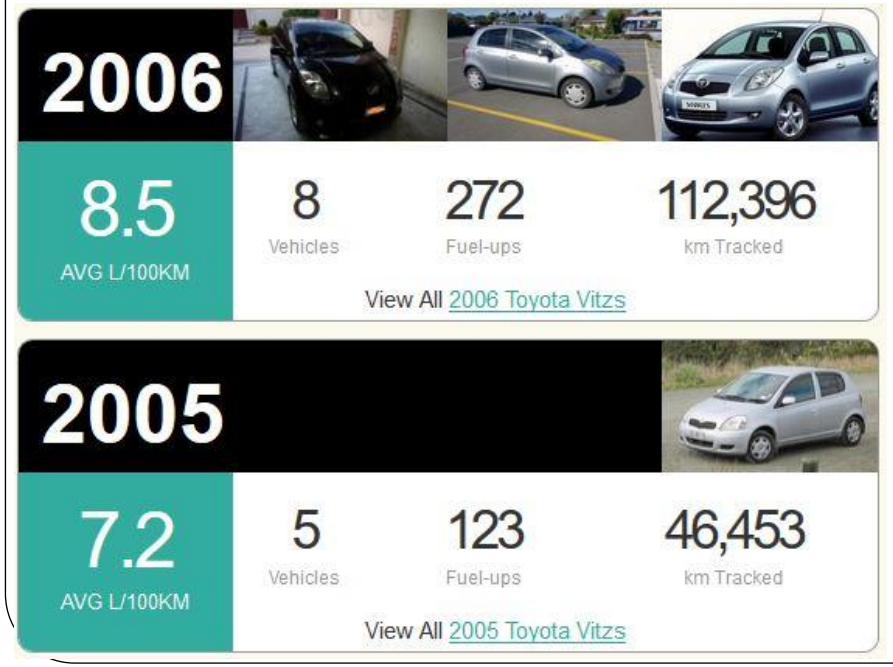
International apps

Fuelly - the “hybrid” app

- Primarily US data so less relevant to NZ?
- But good example of a user friendly app
- Data type: on road, user submitted
- Data availability: 800,000 cars



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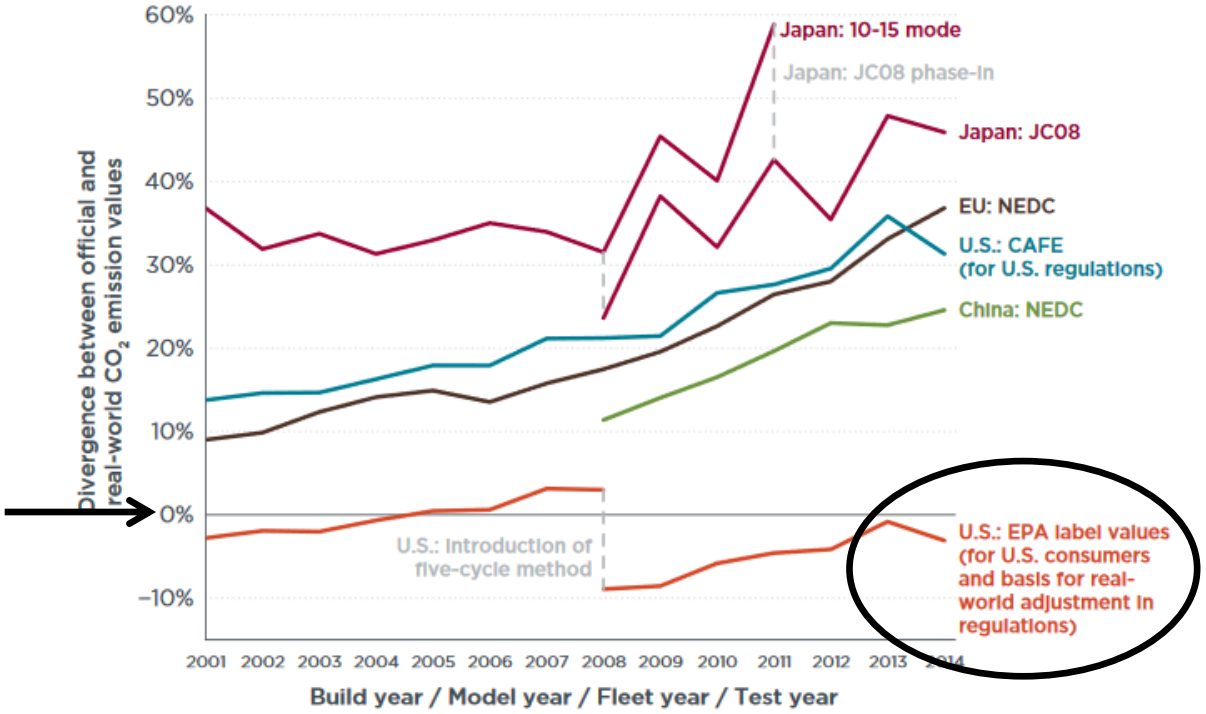
International real-world data

The ICCT is the “keeper” of the most comprehensive datasets on real-world emissions

2017 review of real-world fuel consumption data for more than 1.5 million passenger cars in the EU, US, China, and Japan



The divergence (gap) has increased over time in all regions

International real-world data

Implications of the “gap”

- For **customers** – translates into unexpected fuel expenses
- For **society** - undermines efforts to mitigate climate change and reduce fossil fuel dependence
- For **governments** – hampers incentive schemes for low-carbon vehicles
- For **car manufacturers** – erodes public confidence and creates an uneven playing field

International real-world data

Adopting WLTP a good step but not a silver bullet
Also need to:

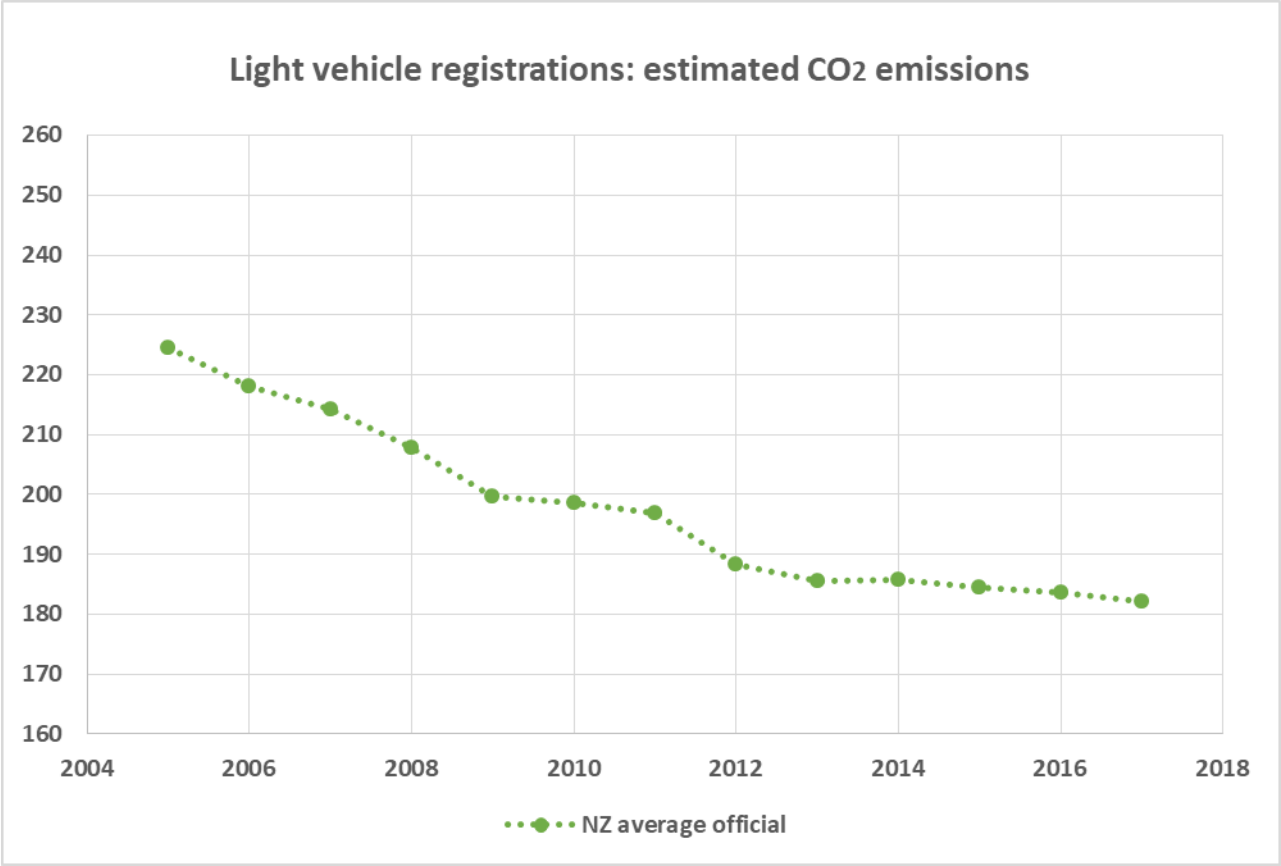
- Develop **official measurements** of real-world CO_2
- Provide **consumers with better access to realistic fuel consumption** data for improved purchasing
- Factor in the gap between official and real-world values in **road transportation policies** and research
- Conduct **more research** on real-world performance of light commercial, heavy duty and PHEVs

WLTP – Worldwide Harmonized Light Vehicle Test Procedure

So what are the implications?

Preliminary attempt made to estimate trends in real-world fuel consumption in NZ (based on the data found)

The improvement we *think* is happening …



So what are the implications?

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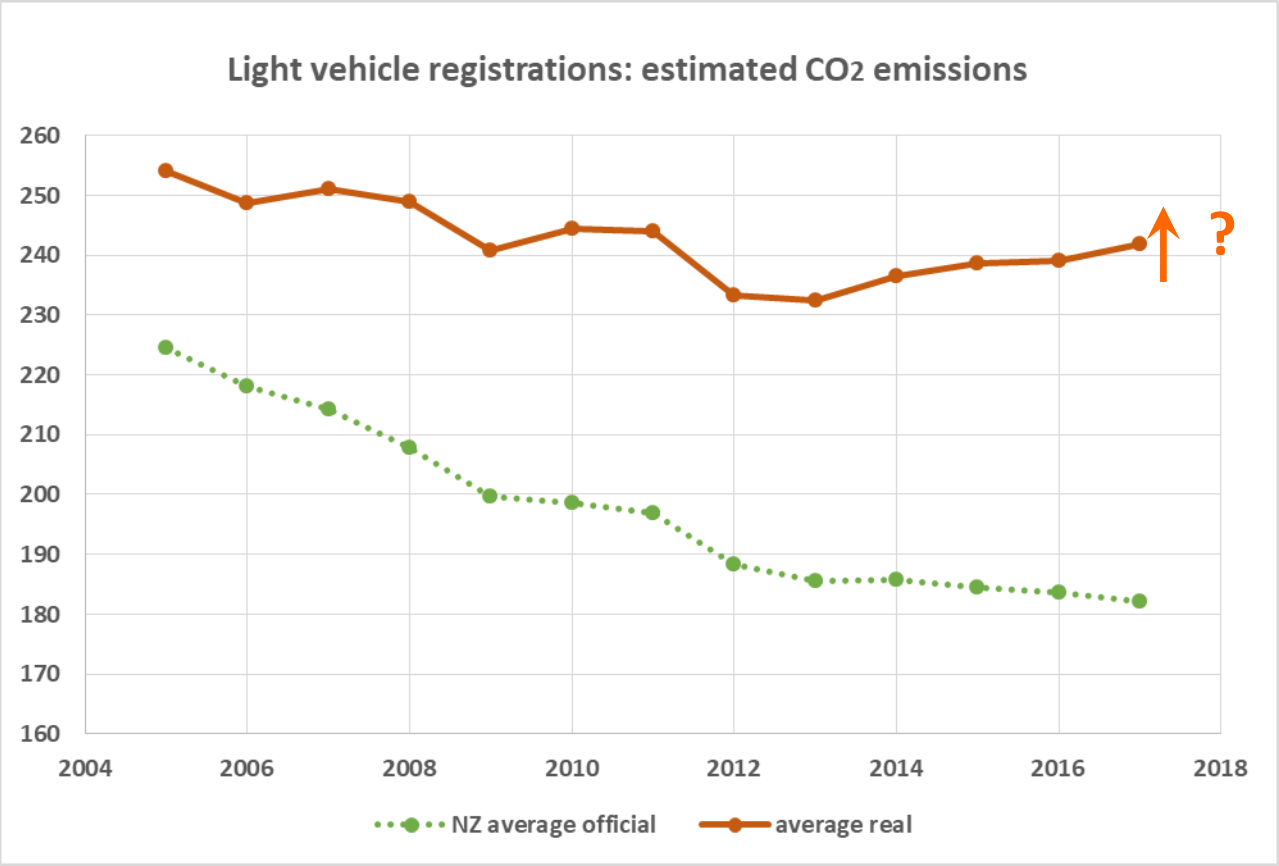
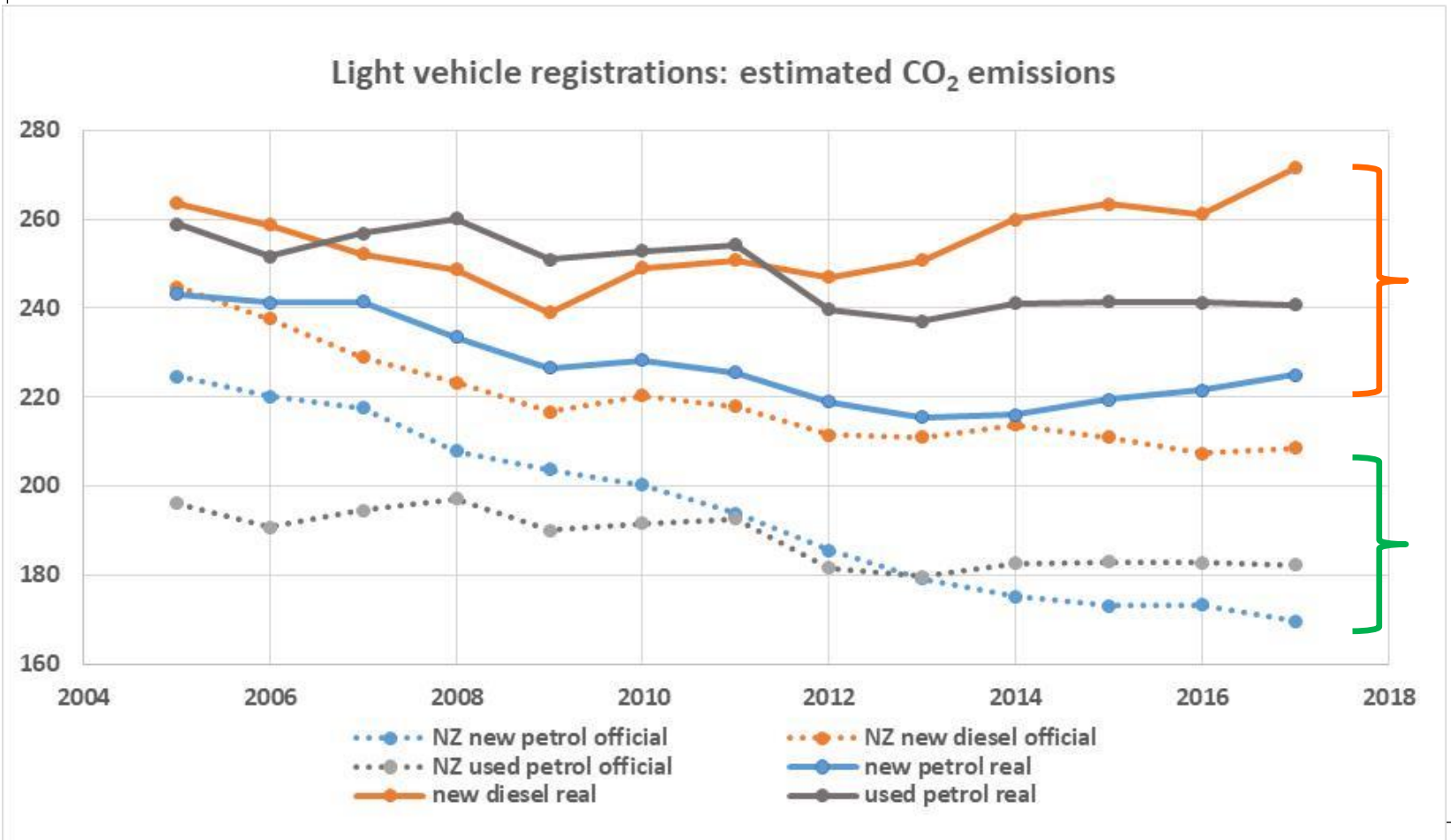
The reality we *are actually* getting …



So what are the implications?

Possible there has been **no improvement** in fuel efficiency in the past decade – **may actually have got worse!**



Conclusions

- NZ motorists want to make a positive difference
- But only fuel consumption data readily available is official and even then limited for used imports
- Official fuel consumption information is misleading with real-world consumption ~42% higher on average
- Possibly no improvement in the average real-world fuel efficiency of light vehicles entering NZ (worse?)

Currently no realistic information available for concerned NZers to ensure their vehicle choices will be better for the planet

Where to from here?

Recommend investigating the development of website similar to MyMPG (layout), with:

- Official figures
- International real-world data (via our ICCT links)
- User real-world data

Shared MPG Estimates

"My MPG" can help you calculate and track your MPG and, if you wish, share it with others. I want to track my MPG.

DISCLAIMER: Average user estimates are based on data from My MPG users rather than official sources. Since the source data cannot verified, neither DOE nor EPA guarantees the accuracy of these estimates.

Shared MPG Estimates: Toyota Yaris

Configuration		User MPG			EPA MPG		
		Average	Range	No. of Vehicles	Comb	City	Hwy
	2019 Toyota Yaris 4 cyl, 1.5 L, Automatic (S6), Regular Gasoline, SIDI	40.7	NA	1	35	32	40
		Show All					

The final word

Improved understanding of real-world fuel consumption will

help kiwi motorists to make better purchasing decisions and

give policy makers more accurate information to assist in developing future policy options

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Thanks for your attention!

Any questions?

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