Ministry of Transport
TE MANATŪ WAKA

BRIEFING

10 December 2020 OC200968

Hon Michael Wood
Minister of Transport

Action required by:
Monday, 18 January 2021

WHY ADJUST THE CLEAN CAR STANDARD'S TARGET BY VEHICLE WEIGHT?

Purpose

To respond to your request for more advice on why we have proposed a weight-adjusted target for the Clean Car Standard (the Standard).

Key points

- A flat target puts too little pressure on small vehicles to reduce emissions, and too much pressure on large SUVs, utes, and vans. A weight-adjusted target ensures all vehicles, from micro-cars to large utes, face the same amount of pressure to reduce emissions.
- By ensuring all vehicle types face equal pressure to reduce emissions, a weight-adjusted target avoids supply constraints and price increases that could occur if some vehicle segments were restricted.
- A flat target would create equity issues and be counterproductive, by limiting the supply of larger vehicles, even when some of these vehicles have decarbonisation value, such as hybrid people-movers and hybrid SUVs. It could also limit the supply of utes and vans needed for a commercial purpose before they are affordable or available in low or zero emission format.
- A weight-adjusted standard will not influence the mix of vehicle types, for example, cars versus SUVs or utes. What it will do, is increase the supply of vehicles with lower CO_2 emissions across the spectrum of light vehicles. To make gains in emission reductions by encouraging consumers to move away from larger vehicles to smaller vehicles, a complementary demand side initiative, like a Clean Car Discount, is needed. A Discount would do this because its fees and rebates would be based purely on the level of a vehicle's CO_2 emissions and would not be weight-adjusted.
- A weight-adjusted target minimises cost increases to a degree, however there will still be price increases to consumers. A discount or feebate mechanism remains our recommendation to reduce the issue of affordability as we decarbonise our light vehicle fleet.

Recommendations

We recommend you:

1 **note** we can finalise the Clean Car Standard proposal rapidly for Cabinet consideration following your feedback on this briefing and any other design considerations such as the target date and review mechanism

2 **note** it will take up to 18 months for the vehicle industry and Waka Kotahi to prepare for and implement the Standard, so finalising its initial design now will enable implementation from first half of 2022

3 **note** the ways in which a weight-adjusted target puts equal pressure on the different vehicle segments to reduce emissions

4 **confirm** whether officials can continue to finalise the Clean Car Standard Cabinet paper with a weight-adjusted target. Yes / No

Ewan Delany **Manager, Environment, Emissions and Adaptation** 10/12/20	Hon Michael Wood **Minister of Transport** ..... / ..... / .....

Minister's office to complete: ☐ Approved ☐ Declined

☐ Seen by Minister ☐ Not seen by Minister

☐ Overtaken by events

Comments

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WHY ADJUST THE CLEAN CAR STANDARD'S TARGET BY VEHICLE WEIGHT?

In 2008 a vehicle CO_2 standard was progressed with a flat target that applied to all light vehicles irrespective of their weight

1 The fifth Labour Government progressed work on a vehicle CO_2 standard. Its proposal was to regulate a standard with a target of 170 grams CO_2 per kilometre in 2015. This target was "flat". It would have applied to all light vehicles coming into New Zealand irrespective of their weight.

2 A flat target differs from the weight-adjusted one in the Standard. With a weight-adjusted target, vehicles that are heavier than the average vehicle by weight[1] would attract a higher target than 105 grams in 2025.[2] Vehicles that are lighter than the average one, attract a lower target. Weight-adjustment recognises that the heavier a vehicle, the more fuel it takes to move it and the higher the CO_2 emissions.

With a flat target the vehicle market may be less able to respond to the vehicle needs of the economy and society

3 Given that the objective is to reduce vehicle emissions, it may seem counter-productive to allow heavier vehicles with higher emissions to have numerically higher targets. However, weight-adjustment is desirable because of the multiple objectives a CO_2 standard has to achieve.

4 Not only do we want the CO_2 standard to reduce vehicle CO_2 emissions, we want it to do so in a way that:

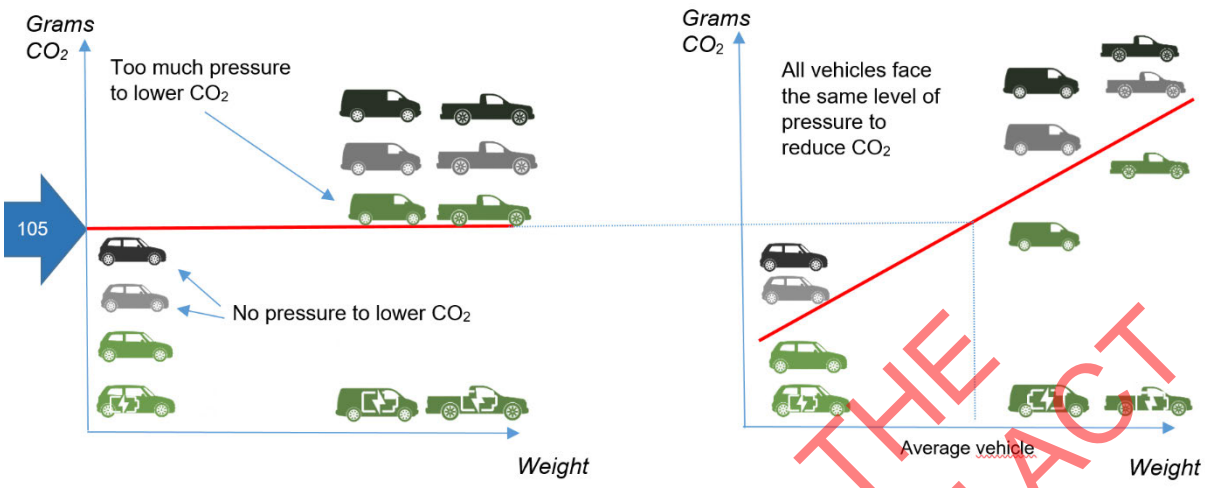
4.1 maintains an in-flow of vehicles that meets the vehicle needs of the economy and society

4.2 has low compliance costs for the vehicle industry and minimises cost increases for consumers.

5 A weight-adjusted target is preferable because it gives full effect to our expectations of a CO_2 standard. A flat target only gives effect to the first part – it reduces vehicle CO_2 emissions. The diagram below illustrates the effects of the two types of target.

[1] In the current fleet of light vehicles coming in, the average vehicle has a weight of around 1.6 tonnes.
[2] We have used 2025 as the end-year for the headline target, acknowledging that final decisions have yet to be taken.

Flat target **Weight-adjusted target**



6 Both targets work through fleet averaging. Suppliers have to ensure that across the vehicles they are bringing in, the average CO_2 emissions are equal to, or less than, the target. This allows vehicle suppliers to sell vehicles with CO_2 emissions over the target, so long as they are offset by sufficient sales of vehicles that are under the target.

7 A flat target has the advantage of lowering CO_2 emissions predominantly through vehicle down-sizing. Small vehicles emit less CO_2 so the greater number a supplier has in its fleet, the easier it is to meet the 105 grams target.

8 However, a flat target places little, or no, pressure on small vehicles to improve their efficiency. At the same time it places relatively more pressure on larger, heavy vehicles. This difference in improvement expectation has the potential to markedly disrupt the market. Specifically it risks:

- larger vehicles being de-selected for our market even though they may have superior CO_2 reducing technology eg petrol hybrids
- encouraging the supply of smaller vehicles that have relatively poor CO_2 reducing technology compared to others of their size
- restricting the supply of vehicles needed to respond to legitimate vehicle need. For example, tradespeople requiring vans and utes, and large families wanting people-movers.
- disadvantaging vehicle suppliers who offer a greater proportion of large vehicles and favouring suppliers who supply a greater proportion of small vehicles.

9 Overall with a flat target the vehicle market may not be able respond to the vehicle needs of the economy and society unless suppliers opt to not comply with Standard.

The 2008 proposal tried to address the downsides of a flat target with a CO_2 credit trading scheme but the cost of the scheme was too great

10 To limit the market disruption the 2008 proposal provided for a CO_2 credit trading scheme. This scheme would have allowed suppliers who imported vehicles under the

flat target to sell credits. Suppliers who imported vehicles over the flat target would have to buy credits. Conceptually this is similar to the Standard's grouping mechanism, however, a much higher amount of trading was anticipated.

11 The cost of the credit trading mechanism led to the proposal not progressing.[3] An independent cost-benefit analysis found that trading costs would have outweighed the benefits of the CO_2 standard.

In contrast a weight-adjusted target reduces vehicle emissions with lower costs

12 A weight adjusted target places equal pressures on all vehicles to improve by:

12.1 allowing the wide range of vehicles in the light fleet, from micro-cars to light trucks, to attract appropriate CO_2 targets. In this way it preserves the diversity of vehicles in the fleet in terms of their size, shape and functionality. In particular, it avoids the risk of removing large vehicles from the market, even though they may be relatively efficient for their size due to superior technology

12.2 ensuring all vehicles suppliers are treated equally. For example, a supplier with a high proportion of large hybrid SUVs is not disadvantaged in favour of a supplier with a high proportion of inefficient small conventional cars

12.3 more readily enabling the adoption of safety and emissions control technologies that tend to add weight to vehicles. For example, recognising that more efficient hybrid vehicles and other alternative technologies can be heavier than conventional vehicles

12.4 lowering the compliance costs to industry of complying with the Standard.

13 Our proposal is consistent with how CO_2 standards operate internationally. All countries with CO_2 standards adjust the targets by either vehicle weight or size (footprint dimensions). No country applies a flat target.[4]

14 We opted for weight over size as the attribute to adjust targets because this is what the Japanese, European and Korean vehicle CO_2 standards use. The vehicles coming into New Zealand are predominantly from manufacturers from these jurisdictions.

A weight-adjusted target is vehicle agnostic and needs to be accompanied by a measure to disincentivise the purchase of large conventional SUVs and utes

15 In proposing a weight-adjusted standard, we acknowledge that smaller vehicles tend to have lower CO_2 emissions than larger ones. We also recognise that a weight-adjusted standard will not increase the supply of smaller vehicles per se as it does not influence the mix of vehicle types, for example, cars versus SUVs or utes. What it will do, is increase the supply of vehicles with lower CO_2 emissions across the spectrum of light vehicles. Internationally, this is viewed as the best way to reduce emissions.

[3] Cabinet Paper (esmap.org)
[4] Light Vehicle Emissions Standards for Australia, Research Report, Australian Government, June 2014

16 If the vehicles entering our fleet are EVs then the issue of vehicle size is not a concern for CO_2 emissions. However, for conventional vehicles, greater gains in CO_2 emission reductions would occur if people opt to buy smaller fuel efficient vehicles. This is why a complementary demand side initiative, like a Clean Car Discount, is important. Intervention is needed to help create the demand for smaller vehicles. A Discount would do this because its fees and rebates would be based purely on the level of a vehicle's CO_2 emissions and would not be weight-adjusted.

17 The Discount would also address the equity issue that arises with EVs and hybrids. These vehicles still cost several thousand dollars more than equivalent conventional vehicles. The Discount address the equity concern by making these vehicles more affordable for more New Zealanders.

The industry supports weight-adjusted targets but not for small vehicles

18 The vehicle industry supports a weight-adjusted target with a modification made for small vehicles. As previously advised, a flat target for all small vehicles up to 1.2 tonnes is desirable because a strict weight-adjusted target results in small vehicles being given very low (i.e. stricter) targets relative to the average vehicle. This happens because our average vehicle is relatively heavy with less people buying small vehicles.

A weight-adjusted target will put significant pressure to improve on current popular light vehicles across all vehicle segments

19 The following section details the implications of weight-adjusted and flat targets for the most popular vehicle segments and models in New Zealand. Annex 1 is a table showing how top ranking new and used vehicles fare with a flat target of 105 grams versus with their weight-adjusted targets.

For utes – new hybrid models will be needed to meet the weight-adjusted target

20 The top selling vehicle in New Zealand is the Ford Ranger ute (227 grams CO_2/km), followed by the Toyota Hilux ute (207 grams CO_2/km). The top 10 highest selling new vehicles also includes Mitsubishi, Mazda and Holden utes. The most efficient one is the Nissan Navara (188 grams CO_2/km).[5] The large engine size and sheer quantity of utes contribute significantly to pushing New Zealand's average vehicle emissions well above the OECD average.

21 A flat target of 105 grams CO_2/km will be unreachable through fuel efficiency alone. Utes usually run on diesel, which while efficient in terms of CO_2 produces more noxious gases and harmful particulates than petrol. Petrol equivalents of these vehicles would produce around 250 grams CO_2/km, although if diesel utes were to be replaced with petrol hybrids (or electric utes), local air quality would be improved.

22 Weight adjusted targets for the six ute models above are 130-137 grams CO_2/km. We consider that when a hybrid ute is available, it will fit under that threshold. For instance, the Toyota Highlander large SUV all-wheel-drive petrol hybrid is a comparable vehicle and has emissions of 117 grams CO_2/km.

23 We expect the first hybrid and electric ute models to be available in New Zealand by 2022. However, it is not clear what price premium will apply and how that might of changed by 2025. It is also not clear whether they will be available in sufficient supply

[5] 2-wheel-drive diesel single-cab utes have slightly lower emissions.

to meet today's high sales volumes. A weight adjusted target still relies on a large number of hybrid and electric utes being sold, but not as many as a flat target would necessitate.

24 Toyota considers about half of their ute sales are for urban private/commercial use. The other half are for demanding 'work horse' use including on farms and use by tradespeople. The former consumers can and may shift to more efficient SUVs. Hybrid and EV SUVs are already available. A weight adjusted target ensures utes needed for 'work horse' use remain available while the segment transitions from diesel to zero-emission.

For SUVs – hybrids are also needed to meet the target; some are available now at a significant price premium

25 After utes, SUVs have replaced cars in terms of what most New Zealanders are purchasing new. Sales of hybrid and electric SUVs are uncommon, although there are some notable exceptions on a per-model basis.

26 The Toyota RAV4 Hybrid is the third best selling new vehicle in New Zealand., and is the best-selling new hybrid vehicle. The non-hybrid version emits 140 grams CO_2/km and this improves to 110 grams CO_2/km in hybrid form. The Mitsubishi Outlander SUV, is also in the top 10 most purchased vehicles and improves from 167 grams CO_2/km to 44 grams CO_2/km from non-hybrid to plug-in hybrid.

27 The size and weight of an SUV means achieving 105 grams CO_2/km through fuel efficiency alone is not do-able.

28 A weight-adjusted target for the RAV4 Hybrid is 126 grams CO_2/km. This means it and other hybrid SUVs achieves its weight adjusted target. It could not meet the flat target. With a weight-adjusted target suppliers will be motivated to sell hybrid SUVs at scale.

29 A RAV4 Hybrid costs $7,000 more than a conventional petrol vehicle. The Outlander plug-in hybrid costs approximately $17,000 more than its conventional variant. Several pure electric SUVs are available in the New Zealand market, at a premium of several tens of thousands of dollars compared to their conventional equivalents. Not all new vehicle buyers can absorb such increases. Therefore there is still considerable risk to the New Zealand market around affordability of new vehicles without the Clean Car Discount.

For vans and people movers hybrids and pure EVs will also be needed as only a few are available now but at a significant price premium

30 Vans share a problem with utes in that their large engine sizes produce high CO_2 emissions. Unlike utes, vans generally are purchased for commercial purposes. It is often less practical to switch to other vehicle types while remaining fit for purpose.

31 The Toyota Hiace is New Zealand's top selling van. It sits in both the top 10 new and used sales rankings. This van would have a weight adjusted target of approximately 140 grams CO_2/km, compared to current actual emissions of 214 grams CO_2/km (new, diesel) and 278 grams CO_2/km (used import, petrol).

32 New Zealand's cheapest fully electric van is sold by LDV for $57,500, or twice the price of its equivalent conventional variant. Ford has recently announced plug-in hybrid vans for sale next year. The price premium is unknown, although their SUV plug-in hybrids cost $18,000 more than its equivalent conventional variant.

33 A flat rate of 105 grams CO_2/km is unreachable through fuel efficiency alone for vans. The weight adjustment should, as for utes, encourage the supply of hybrids, plug in hybrids, and electric vans. As a van weighs more than the average light vehicle, it will create a greater credit reward for zero emission vans than if a flat target were used.

34 People movers, which tend to be large cars or small vans with seven or eight seats, are a popular used import, and produce high emissions relative to other vehicles. The most popular hybrid people mover is the Toyota Estima. An eight year old imported Estima hybrid with 136 grams CO_2/km of CO_2 emissions sits below its weight adjusted target. This means suppliers will be encouraged to increase its supply. However, this vehicle would sit above a flat target. This could create a potential equity issue from limiting the availability of affordable people movers.

For cars and small vehicles in the used market – the weight-adjusted target is still challenging but more options are available at a moderate cost

35 While cars are less popular than utes and SUVs in terms of new sales, cars remain very popular in the used import market. Given their weight is generally below the New Zealand average vehicle weight, the rationale for a weight adjusted target on cars is for the opposite reason to utes and SUVs. That is a flat target places too little, or no pressure on small vehicles to improve.

36 A weight-adjusted target produces a figure as low as 80 grams CO_2/km on the lightest vehicles. This encourages suppliers to sell hybrid and electric versions where possible.

37 Hybrids and EVs feature prominently as the top-selling used vehicles. For example, the Toyota Aqua (a compact version of the Prius) and Toyota Prius are the second and fifth most imported used vehicles in New Zealand. The Nissan Leaf ranks 12th. Hybrids currently account for 17 percent of used imports.

38 There is significant availability of hybrid models from Japan though they are bought in New Zealand in smaller numbers than their conventional counterparts. For example, the top-selling used import is the Mazda Axela, with over 5,000 imports for the year to date. A hybrid version has been manufactured since 2013, yet less than 300 of these have been imported this year. The hybrid would meet its strong weight-adjusted target though the conventional variant substantially misses its target.

Annex 1: Top selling vehicles in New Zealand and their performance against a flat or a weight-adjusted target

	Make	Model	Body	Fuel	Quantity registered 2020 YTD	Weight (kg)	Vehicle Emissions (CO_2 g/km)	Flat Target (CO_2 g/km)	Vehicle Emissions relative to Flat Target (CO_2 g/km)	Weight Adjusted Target for Vehicle (CO_2 g/km)	Vehicle Emissions relative to Weight Adjusted Target (CO_2 g/km)
Top selling new vehicles grouped by make/model/fuel type.											
1	FORD	RANGER	UTILITY	DIESEL	7311	2078	229	105	**124.0**	135 2	**93.8**
2	TOYOTA	HILUX	UTILITY	DIESEL	5035	2110	207	105	**102.0**	136 5	**70.5**
3	TOYOTA	RAV4	SUV	PETROL HYBRID	3509	1705	112	105	**7.0**	126.0	**-14.0**
4	MITSUBISHI	TRITON	UTILITY	DIESEL	3472	1940	224	105	**119.0**	129.7	**94.3**
5	KIA	SELTOS	SUV	PETROL	2560	1312	157	105	**52.0**	90.7	**66.3**
6	HOLDEN	COLORADO	UTILITY	DIESEL	2483	2010	224	105	**119.0**	132 5	**91.5**
7	KIA	SPORTAGE	STATION WAGON	PETROL	2389	1571	182	105	**77.0**	114.0	**68.0**
8	SUZUKI	SWIFT	SMALL HATCHBACK	PETROL	2226	1200	110	105	**5.0**	80.6	**29.4**
9	MITSUBISHI	ASX	SUV	PETROL	2124	1380	176	105	**71.0**	96 8	**79.2**
10	NISSAN	NAVARA	UTILITY	DIESEL	2119	1942	186	105	**81.0**	129 8	**56.2**
11	MAZDA	CX-5	STATION WAGON	PETROL	1940	1555	154	105	**49.0**	112 5	**41.5**
12	TOYOTA	HIACE	VAN	DIESEL	1760	2270	214	105	**109.0**	142 9	**71.1**
13	MAZDA	BT-50	UTILITY	DIESEL	1716	2020	261	105	**156.0**	132 9	**128.1**
14	MITSUBISHI	OUTLANDER	SUV	PETROL	1620	1475	167	105	**62.0**	105 3	**61.7**
15	NISSAN	QASHQAI	SUV	PETROL	1582	1375	159	105	**54.0**	96 3	**62.7**
Top selling used imports grouped by make/model/fuel type								105			
1	MAZDA	AXELA	SALOON	PETROL	5186	1295	140	105	**35.0**	89.1	**50.9**
2	TOYOTA	AQUA	HATCHBACK	PETROL HYBRID	4356	1200	90	105	**-15.0**	80.6	**9.4**
3	MAZDA	DEMIO	HATCHBACK	PETROL	3415	1200	117	105	**12.0**	80.6	**36.4**
4	SUZUKI	SWIFT	HATCHBACK	PETROL	3262	1200	142	105	**37.0**	80.6	**61.4**
5	TOYOTA	PRIUS	CAR	PETROL HYBRID	3340	1354	90	105	**-15.0**	94 5	**-4.5**
6	SUBARU	IMPREZA	HATCHBACK	PETROL	2501	1320	239	105	**134.0**	91 3	**147.7**
7	SUBARU	LEGACY	SALOON	PETROL	2430	1490	193	105	**88.0**	106.7	**86.3**
8	NISSAN	TIIDA	HATCHBACK	PETROL	2428	1145	122	105	**17.0**	75.6	**46.4**
9	HONDA	FIT	CAR	PETROL	2316	1200	124	105	**19.0**	80.6	**43.4**
10	VOLKSWAGEN	GOLF	HATCHBACK	PETROL	2255	1361	147	105	**42.0**	95.0	**52.0**
11	MITSUBISHI	OUTLANDER	SUV	PETROL	2211	1622	163	105	**58.0**	118 5	**44.5**
12	NISSAN	LEAF	HATCHBACK	ELECTRIC	2081	1481	0	105	**-105.0**	105 9	**-105.9**
13	NISSAN	X-TRAIL	SUV	PETROL	1955	1505	193	105	**88.0**	108.0	**85.0**
14	MAZDA	ATENZA	SALOON	PETROL	1832	1454	145	105	**40.0**	103.4	**41.6**
15	TOYOTA	HIACE	VAN	PETROL	1706	1877	278	105	**173.0**	127 2	**150.8**
Other vehicles and notes:											
Mitsubishi Outlander (best selling petrol plugin hybrid, new and used)					790	1880	44	105	**-61.0**	141 8	**-97.8**
Toyota Estima Hybrid (best selling used hybrid peoplemover).					312	2011	136	105	**31.0**	153.6	**-17.6**

Emissions on used models based on being eight or more years old.

Vehicles under 1200kg are shown as 1200kg to enable calculation of weight adjusted targets.

Holden has exited the vehicle market and their top-selling Colorado ute will no longer be sold from 2021.

Calculations performed December 2020. Vehicle registrations are for the period 1 Jan to 30 Nov 2020.