

Chair
Cabinet Economic Development Committee

REDUCING HARMFUL EMISSIONS FROM VEHICLES ENTERING THE NEW ZEALAND FLEET

Proposal

1. In order to improve the quality of vehicles entering the New Zealand vehicle fleet, this paper seeks agreement to introduce restrictions on used vehicles built before 1 January 2004 and update the existing controls on new vehicles. For used vehicles, preference is given to a requirement that vehicles meet specific minimum exhaust emission standards before first certification in New Zealand (ie before they can enter the fleet for the first time). The alternative is use of a rolling age ban. In support of any restriction, agreement is sought for emission testing of used vehicles before first certification in New Zealand.
2. For new vehicles, this paper seeks agreement to start the process of updating the current exhaust emission standards applying (Land Transport Rule: Vehicle Exhaust Emissions 2006).
3. Other considerations are amending the current Rule to clarify that vehicles must be fitted with On Board Diagnostic (OBD) equipment, and agreement to enable the New Zealand Defence Force, and potentially others, to import specialised vehicles that are not able to comply with recent emission standards.

Executive summary

4. Vehicle emissions contribute to poor air quality in New Zealand. Government action, in recent years, has included: requiring vehicles entering the fleet, whether new or used manufactured on or after 1 January 2004 to be built to recognised (harmful) exhaust emission standards; the reduction of sulphur in diesel from January 2006 to reduce particulate emissions; and the introduction of the visible smoke check at warrant and certificate of fitness in October 2006, with the publicity campaign: Choke the Smoke.

Controls applying to imported used vehicle

5. The objective is to reduce the impact that imported used vehicles have on air quality by restricting the entry of vehicles of older technology types. At present there are no minimum standards for exhaust emissions that apply to used vehicles manufactured before 1 January 2004¹, which is when the 2006 Rule originally came into effect. As the average age, of all types of used vehicles entering the fleet increases, New Zealand is not benefiting from improvements in manufacturing standards.

¹ Vehicles built on or after 1 January 2004 must have been built to the same exhaust emission standards set out in the 2006 rule as new vehicles. In 2006 only 3% of used imports were built in 2004 or after.

6. The paper outlines two approaches: a standards based approach, where vehicles entering the fleet must meet specified standards, and an age based restriction, where imported vehicles older than a certain age are not able to enter the fleet.
7. Regardless of the mechanism used, research indicates that there would be some adverse effects. Controls would effectively impose restrictions on the maximum age of vehicles entering the fleet and this could affect the price of imported vehicles and the relative value of vehicles already in the fleet. The effect of a restriction, if implemented on its own, is estimated to range from a 0.5% reduction in emissions to an increase in emissions of 2.5%, depending upon the response of vehicle purchasers, current users and importers. It is emphasised that supporting policies will be required in order to reduce emissions from the existing in-service fleet.
8. Comparing the two options, a standards based approach is preferred as it can require the introduction of specific technologies. Also, all controls on motor vehicles that currently apply at the time of first certification, such as safety requirements, are standards based. A rolling age ban has an advantage in that it does not need to be updated over time. But, departments do not support its use because age is a blunt and possibly arbitrary measure and a rolling age ban is potentially more difficult to apply in practice than standards. Difficulties include determining which date the age should be counted from and variation in the quality of vehicles of the same age from Singapore and Japan. If, however, a rolling age ban is supported, the paper recommends a minimum age of eight years, with the limit being the subject of consultation.
9. For a standards-based approach a table of emission standards is proposed. Japanese standards are used for ease of understanding, although equivalent standards from other countries would also be utilised. The paper sets out the dates for applying the Japanese standards as a minimum in New Zealand. For example, it is proposed that the government consult on a requirement for petrol vehicles entering the fleet to be built to the Japan 00/02 standard (ie introduced for different vehicle types between 2000 and 2002) from 2008. Improving the quality of used diesel vehicles entering the fleet is seen as a particular priority and this is reflected in more stringent emission standards proposed for diesel vehicles compared to petrol vehicles. For both petrol and diesel vehicles (light and heavy), the next stage would be the preparation of a Land Transport Rule or amendment Rule, and an associated consultation process.
10. Regardless of the approach to limit the technology age of vehicles entering the fleet, it is proposed that historic vehicles be exempted and continue to be allowed to enter the fleet.
11. Increasing the emissions standards of used vehicles entering the New Zealand fleet will not automatically see improvements in greenhouse gas emissions. Carbon dioxide emissions are more related to the size and weight of the vehicle than emission control technologies for harmful emissions. However, as a general rule, newer vehicles are safer and more fuel efficient than earlier models and some benefits should result from the proposed controls although this can't be quantified. Also, the use of light diesel vehicles has a fuel economy advantage, so there is a climate change benefit in being able to actively promote the use of clean diesel vehicles.
12. When a used vehicle of any age enters the fleet there is no physical inspection to ensure that the vehicle still meets the standard appropriate to its make and model, only a requirement of evidence that it was built to a recognised standard. It is proposed that all

used vehicles need to pass an approved emissions test before they enter the New Zealand fleet. Because of the dominance of imported used vehicles from Japan, the adoption of the Japanese in-service emissions test for New Zealand's approved test is recommended.

Controls applying to new vehicle imports

13. This paper proposes updating the current Land Transport Rule (Vehicle Exhaust Emissions 2006) to match the increased stringency of standards in the countries from which New Zealand sources vehicles. The updated standards, which are now available, are set out for petrol and diesel vehicles, light and heavy. As with the used vehicle proposals, consultation would occur on the proposed amendment to the Rule.
14. It is also proposed that the government consult on allowing some specialised vehicles to be exempt from having to meet emissions control standards. The New Zealand Defence Forces needs to be able to import vehicles that can bypass aspects of the emissions control technology when operating in hostile conditions and on poor fuel. Other services, e.g. ambulance and fire service, may also have this need.
15. This paper also seeks to clarify the application of the current Exhaust Emissions Rule to On Board Diagnostic (OBD) technology. It is proposed that the government confirm that this technology must be fitted to vehicles when it is part of the emissions standard that the vehicle is certified as complying with.

Background

16. Vehicle emissions are a contributing factor to low air quality in New Zealand, particularly in urban areas. Emissions affecting air quality, and therefore public health, include: carbon monoxide, oxides of nitrogen, sulphur dioxide, hydrocarbons, ozone, benzene and particulate matter. Studies in New Zealand show the impacts are serious.²
17. There have been significant improvements in emission standards in the jurisdictions that New Zealand receives vehicles from over the past two decades. These standards have required manufacturers to develop new technologies to achieve the necessary reductions. Over the longer term, New Zealand's fleet-wide emissions will not be reduced unless vehicles with these newer technologies are introduced. Government intervention is required to ensure that New Zealand obtains the benefit from improved emission technologies (and from other advances in safety or fuel economy introduced in recent years). Because the imported used car industry is largely driven by price, there is currently little incentive to voluntarily import models with improved technologies over older options.
18. In some areas of New Zealand, air quality improvements will be needed to meet the National Environmental Standard for Air Quality. While regional councils can set controls

² "The National Institute of Water and Atmospheric Research (NIWA) 2002 study estimated 399 people aged 30 and over die prematurely each year from exposure to microscopic particles from vehicle emissions. The Surface Transport Costs and Charges Study (2005) put the cost in 2001/02 of vehicle emissions at \$442m.

on domestic and industrial discharges to air, they are reliant on government to reduce emissions from vehicles. These proposed actions will contribute to reduced harmful emissions over the longer term.

19. Reducing harmful vehicle emissions contributes to a number of wider government objectives, including:
 - a requirement for all regions to meet National Environmental Standards for Air Quality set under the Resource Management Act (1991);
 - the New Zealand Transport Strategy's goals of protecting and promoting public health and ensuring environmental sustainability; and
 - National Energy Efficiency and Conservation Strategy, Sustainable Development Programme of Action and the Climate Change Programme objectives. Vehicle technologies that achieve low harmful emissions can also have co-benefits of reduced fuel use, and hence reduced greenhouse gas emissions.
20. The Ministry of Transport was directed to report back in November 2006 on the economic and social effects of introducing minimum emissions standards [CBC Min (05) 20/11 and EDC Min (06) 20/1 refers]. A subsequent decision also requested consideration of an age restriction along with assessment of the climate change implications of the current regulation targeting harmful emissions [EDC Min (06) 13/9 refers].
21. This paper focuses on vehicles entering the fleet. Any policy to set tighter controls on the emission standards must necessarily be viewed as part of a package of measures to reduce vehicle emissions; whether they be harmful or greenhouse.
22. Existing strategies to reduce harmful emissions include the reduction in levels of sulphur in diesel to 50 parts per million (ppm) in January 2006, which is expected to reduce harmful emissions from diesel vehicles by up to one third. A further reduction in sulphur levels to 10 ppm was recently announced by the government for 2009. This further reduction is important as it will allow the introduction of the very low emitting diesel vehicles built to the so called Euro 5 exhaust emission standard in which the sulphur affects the emission equipment. The recently introduced visible smoke check at warrant of fitness and its accompanying publicity campaign "choke the smoke" have also been successful in getting vehicle owners to take actions to reduce emissions. Work on other policies to reduce emissions from the existing fleet is underway and will be reported separately as required.

Assessment of effect of restrictions on used vehicles entering the fleet

23. Regardless of the mechanism used to restrict the entry³ of vehicles of older technology, research indicates⁴ that there would be some adverse effects. Any controls (including using a prescribed age or an emission standard) would effectively impose restrictions on the maximum age of vehicles entering the fleet, resulting in the potential for:

³ Although reference is often made to restricting imports and import controls, controls are enforced at time of first certification for use on the New Zealand roads. A vehicle not meeting a standard may continue to be imported, but may only be used on private roads, repaired or otherwise brought up to standard, or it may be broken up for parts.

⁴ [Appendix 1](#) details the key findings from the consultant's report

- a higher average price of imported vehicles;
- reduced numbers of vehicles entering the fleet;
- increased value of vehicles already in the fleet; and
- longer lives for existing vehicles to offset reductions in number of vehicles entering the fleet.

24. Cabinet specifically requested that the Ministry investigate the economic and social and environmental impacts of the introduction of minimum emission standards. The consultants have identified there would be few direct social consequences from the policy because it does not result in any sudden loss of vehicle, which can lead to social exclusion, and it does not cause any unexpected (and unavoidable) spikes in the cost of living. This is largely due to the very large fleet of second hand vehicles that people may purchase from instead of purchasing a used import.
25. The likelihood and magnitude of any economic effects would depend on the specific minimum standards adopted in New Zealand, the scope of their application and the public's response to the standards. The consultants considered there would be limited economic impacts from any restriction as importers were likely to import lower cost vehicles, (lower quality or lower standard of trim) rather than raise prices significantly.
26. The consultants estimated the environmental effects of a restriction if implemented on its own would range from a 0.5% reduction in emissions to a possible increase in emissions of 2.5% depending upon the response of consumers and importers to any control.
27. Although there may be some short term issues, it is appropriate for the government to restrict the entry of older technologies because:
- Without some form of regulatory controls, vehicles will continue to enter New Zealand with older and possibly poorer emission control technology;
 - Vehicles with older technology will continue to affect New Zealand's air quality by adding additional harmful pollutants into the atmosphere until they are removed from the fleet;
 - Non-regulatory means are unlikely to have certainty of outcome because there is little incentive for any one part of the industry to subject itself to tougher standards than the industry as a whole;
 - Studies of consumer preferences show that issues such as the price and power of a vehicle continue to dominate purchase behaviour and technical understanding of the different international emission standards is low.
28. The findings of the research show that while there can reasonably be expected to be long term reductions in emissions, restrictions on vehicles that can enter the fleet will not, on their own, lead to significant reductions in vehicle emissions over the short to medium term. Nor will restrictions lead to a reduction in the average age of the New Zealand vehicle fleet. As noted above, further policies will be required in order to reduce emissions from the existing fleet. These are being developed and will be reported separately.

Methods to limit the technology age of vehicles entering the New Zealand fleet

29. There are two basic methods to limit the technology age⁵ of vehicles entering the fleet:

- a standards based approach, where a vehicle must meet a certain minimum standard, such as an emission standard introduced from a certain date; and
- a “rolling age ban” whereby a vehicle must be less than a specific number of years old before it can enter the fleet.

Standards based approach

30. A standards based approach to restricting the entry of vehicles into the fleet is the preferred option. Standards allow the use of tools to address specific issues and can require the introduction of specific technologies that are appropriate to address those concerns. This approach is important when different jurisdictions have introduced similar standards, but at different times. For example the emission standards for Japanese built diesel vehicles were significantly less stringent than those required in Europe or Australia up until 2005. There are strong reasons, discussed below, to ensure that diesel vehicles meet the highest possible standards and for New Zealand to require the 2005 standard as soon as practical. A standards based approach would allow this, while not unnecessarily restricting the import of petrol vehicles.

31. Currently, all controls on motor vehicles that apply at the time of first certification, such as those for safety requirements, are standards based. Agencies have considerable experience in developing and implementing such controls based on existing international standards. A requirement for vehicles imported from Japan to be built to minimum emission standards would be relatively straightforward to implement in practice because the first two characters of the Japanese vehicle registration codes (on the relevant paperwork) are written in English script and indicate the vehicles emission standard. Representatives of the New Zealand used-car importers have indicated that European made vehicles imported into Japan by dealers also have emission codes that can be identified reasonably easily. However, there are a very small number of vehicles privately imported into Japan, generally luxury vehicles, that may not have clear documentation. These will need to be addressed in development of any Rule. For the small number of vehicles imported from other jurisdictions not built to Japanese standards, the emissions standard is generally available from the local manufacturer, their agent or from existing Government records.

Updating standards

32. Experience with the Land Transport Rule: Frontal Impact 2001 (the frontal impact rule) shows that if a Land Transport Rule effectively prevents vehicles built before a certain age from being imported (1996 in that case) this initially has an impact on the age of vehicles being imported. If the standard is not updated, importers tend to continue to

⁵ Technology age refers to the standard of the technology on the vehicle. Although standards are usually introduced from a particular date, manufacturers will make models that meet standards in advance of that date. Thus two vehicles made at the same time to different standards will have different technology ages, but the same age of manufacture.

purchase vehicles that only just exceed the minimum standard, resulting in the average age of the vehicles being imported getting older each successive year. This effect can clearly be seen in Figure 2 on page 10 below with a dip in the age of imports of petrol vehicles in 2003, the year the Rule was introduced. Accordingly it is necessary to ensure that any standards are continually updated.

33. If the Committee agrees to introduce a standards based approach as proposed, we consider it would be appropriate for the regulation to set out not only a minimum standard, but also to include a table showing the date when later standards will apply, for example when the Japan 05 emission standard for petrol vehicles and possibly the planned Japan 09 standard would be introduced. This would give the used-vehicle market certainty on coming standards.

Rolling age ban

34. An alternative approach to improving the technology age is the use of a rolling age ban. The primary advantage of the rolling age ban is its simplicity as it does not need to be updated over time. The approach avoids some of the historic concerns over the use of standards in that it would (presumably) apply to all classes of vehicles. The recent frontal impact rule, for example, did not apply to heavy vehicles (those weighing more than 3.5 tonnes) or to some four wheel drives. As a result there have been no incentives for importers to import newer vehicles with better technologies for these classes of vehicles. Providing universal coverage would ensure that unintentional “back doors” are not created that would allow the ongoing entry of older vehicles. On average, a rolling age ban would be expected to raise the standard of vehicles entering the fleet over time.
35. If an age ban was to be introduced it would be necessary to determine what an appropriate age for a restriction would be. There has been considerable media discussion about a seven year age ban. The date is proposed because many vehicles are sold in Japan (including export to New Zealand) before their seventh year in order to avoid paying a two yearly relatively large tax⁶. The seven year age is not relevant to imports from other jurisdictions and does not relate to any specific vehicle property that changes at that age. Officials recommend that if the Committee does wish to proceed with a rolling age ban, then the year of restriction should be determined after consultation. The Committee could, however, indicate a preferred range of six - nine years for the purposes of a draft Rule.
36. Departments do not support a rolling age ban and consider there are significant disadvantages with such an approach. Age is a blunt and possibly arbitrary tool. An age ban assumes that all vehicles of the same age were built to exactly the same standards in every market that New Zealand purchases, or may wish to purchase vehicles from in the future. This is not the case. In practice, different jurisdictions introduce standards on different dates and different manufacturers introduce different technologies sometimes many years in advance of being legally required. Even if vehicles are built to the same emission standards, research discussed further below clearly shows that maintenance is

⁶ Vehicles in Japan must pay taxes at the time of their periodic safety inspection. The inspection and taxes are after the third year and then every two years. The tax of about NZ\$2,500 (depending on vehicle type etc) is the same each year, but by the vehicle's seventh year the vehicle may be worth less than the tax. For this reason many Japanese choose to sell their vehicles rather than pay the tax. A similar peak in sales occurs again at nine years for this reason.

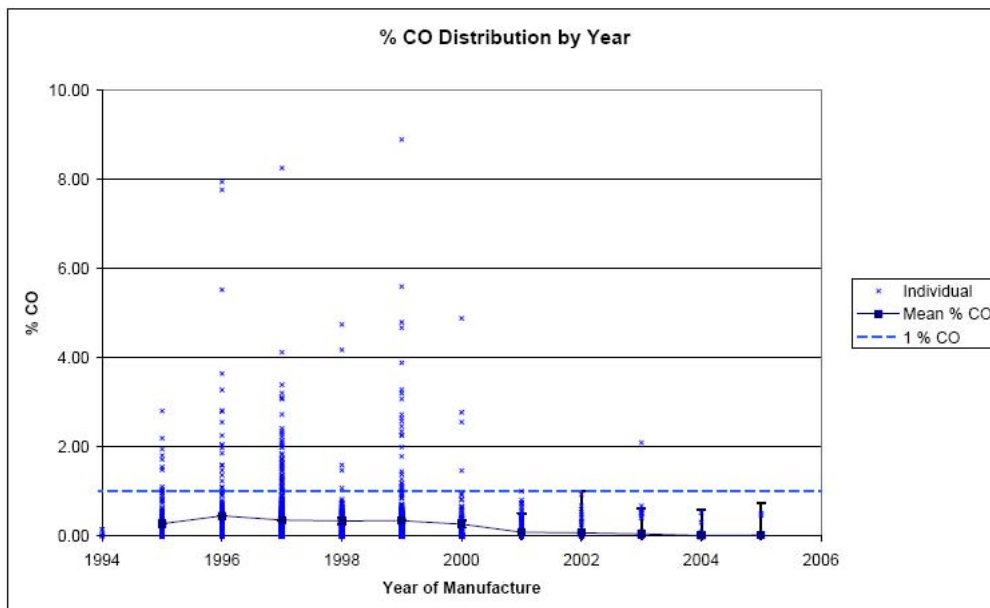
the most important consideration as to whether the vehicle continues to perform as intended. Age is therefore only a loose proxy for emissions performance, or for other standards such as safety standards.

37. Land Transport New Zealand has already had experience with ascertaining the age of vehicles during the introduction of the frontal impact rule in 2002. It reports that there were practical issues with the implementation of that control that would also need to be resolved for a rolling age ban. These include whether the age ban would refer to the vehicle's date of manufacture, year of registration in country of origin, or its model year. These can vary by periods of up to several years.
38. It is assumed that the vehicle age "cut off" would need to apply at time of border inspection (by the Ministry of Agriculture and Fisheries and Land Transport New Zealand). At present the border inspection process may take place either in Japan or New Zealand depending on the importer's preference. If the time of the border inspection was used it would place those exporters who were not able to carry out inspections in Japan at a disadvantage. Conceivably the ban could apply at time of certification in New Zealand, which may be clearer, but exemption processes would need to be developed to deal with vehicles that were delayed by shipping or other transport difficulties, and possibly for vehicles that failed some other aspect of the border entry or certification process and required repairs before they could be certified.
39. Emissions and safety have not improved equally quickly in all of the markets New Zealand currently imports used vehicles from. A small but growing number of vehicles are imported from Singapore. Singapore currently has lower minimum emission standards than Japan and also has lower minimum safety standards for some items. Singapore is reported to have no immediate plans to increase its emission or safety standards. Vehicle age would therefore not by itself, be a good indicator of the emission (or safety) standard of a vehicle imported from Singapore, or potentially from other countries.
40. If a rolling age ban was to be adopted it is likely that requirements to comply with other rules (e.g. vehicle safety) or those dealing with future issues (e.g. fuel consumption or compatibility with biofuels) would remain or continue to be developed. An age ban may therefore add complexity to the current importing requirements, rather than reduce it.
41. Rolling age bans have also not been supported by the Ministry of Foreign Affairs and Trade (MFAT) because the arbitrary nature of the ban may see it challenged under international trade law. This is because a rolling age ban could raise potential World Trade Organization (WTO) issues under the General Agreement on Tariffs and Trade (GATT). If Ministers choose to adopt an age-based control, MFAT advises the likelihood of a successful defence of the measure would be increased if the measure were made as least trade restrictive as possible (e.g. by being similar to equivalent vehicle import restrictions imposed by other countries) and made in conjunction with restrictions on domestic consumption (e.g. by placing limits on the age at which any used vehicles in New Zealand could be sold)

Proposed emission standards to restrict used petrol vehicles entering the fleet

42. If standards are used to determine the “cut offs” for vehicle technology, in-service studies indicate that petrol vehicles built to standards introduced in Japan since 2000 have lower average emissions than vehicles built in earlier years.⁷ The results of a survey carried out for the Ministry, shown in figure 1, illustrates the step-change in carbon monoxide (CO) emissions from vehicles built after the year 2000 with very few showing high emissions. Similar trends are shown for hydrocarbon (HC) emissions, which is the other gas tested. This result is also consistent with the findings of earlier work on the emission profiles of the current New Zealand fleet. Officials consider that the results from Japan give strong support for a restriction on petrol vehicles not built to the Japan 00/02 standard (ie introduced for different vehicle types between 2000 and 2002. (It should be noted that vehicles began being built to this standard from 1998.)

Figure 1. Carbon monoxide (CO) emissions from used petrol vehicles tested in Japan prior to import to New Zealand



43. Table 1 sets out proposed minimum emission standards for used petrol vehicles. We propose that consultation on the actual year(s) for introduction of particular minimum standards be part of consultation on the Rule. This paper, seeks agreement that if a standards approach is used, the Japanese 00/02 standard (or equivalent from other jurisdictions) should be the minimum emissions standard to apply for entry into service for petrol vehicles. Given the Rule making process the earliest this could be implemented is January 2008 and this is used as a starting point in the table below. The

⁷ The Ministry of Transport commissioned testing of used Japanese vehicles prior to export, according to the domestic Japanese emissions test, which is part of their Shaken test (broadly equivalent to the New Zealand Warrant of Fitness test). The emission tests is a simple tail pipe test and only for carbon monoxide and hydrocarbons at natural idle. The test limits are 1% carbon monoxide, 300ppm hydrocarbons.

final recommendations for implementation dates for the standards would be reported back as part of the normal process of developing a Land Transport Rule.

44. As with existing practices, exemptions to allow the import of historic vehicles and others that would normally be exempt from the vehicle standards regime would continue to be allowed for this and all other proposed restrictions.

Table 1: Suggested year to adopt standard minimum petrol vehicle emissions standard for imported second hand vehicles

Japanese petrol vehicle standard	Year to adopt as minimum standard in New Zealand	Number of years lag from implementation in Japan
Japan 00/02	2008	6-8
Japan 05	2011	6
Japan 09	2015	6

Note: Any Rule would identify equivalent emission standards from other recognised jurisdictions

Proposed emission standards to restrict used diesel vehicles entering the fleet

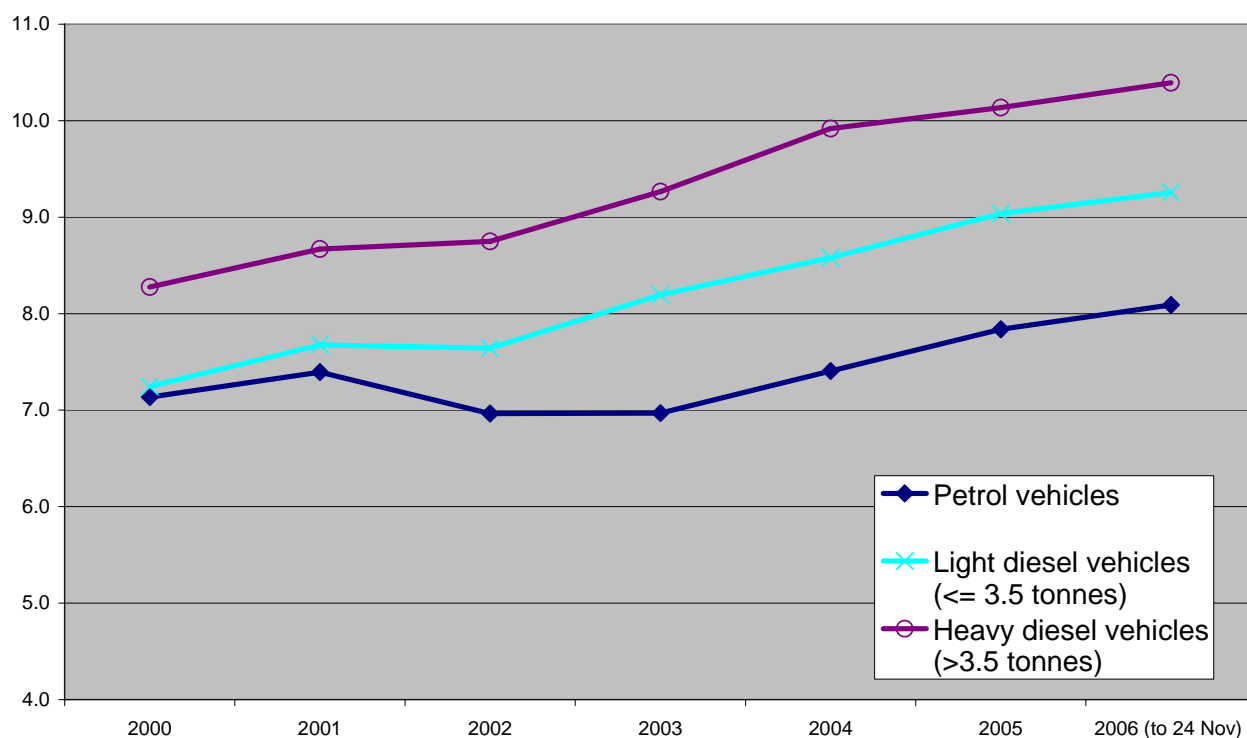
45. This paper proposes addressing the emissions from diesel vehicles is a priority. This is reflected in proposed higher levels of stringency for emission standards for importation of used diesel vehicles, compared to petrol vehicles.
46. Diesel vehicles make up 20% of the existing New Zealand fleet, but consume nearly 40% of the fuel⁸ indicating they are driven further than petrol counterparts. Research by the Ministry shows that diesel vehicles of all ages travel greater kilometres per year than equivalent petrol vehicles. Thus even older diesel vehicles are driven relatively large distances and cause disproportionately more harmful emissions.
47. Combustion of diesel produces fine particulates (known as PM₁₀ as they are smaller than 10 microns) which are generally considered the most harmful pollutant in terms of human health in New Zealand. In the Auckland area around 91% of the PM₁₀ from vehicles comes from diesel vehicles⁹. Other pollutants, especially oxides of nitrogen (NOx) are also emitted by diesel vehicles and reducing NOx emissions has been the focus of recent adjustments to international emissions standards, such as Euro 4 introduced in Europe and in New Zealand recently and Euro 5 scheduled for introduction in Europe in 2010. The Japanese diesel emission standards introduced in 2005 allow only 10% of the particulate emissions (PM₁₀) of the 97/99 standard and reduced NOx emission by 56%. The planned 2009 Japanese standards will reduce both the allowable limits of PM₁₀ and NOx to barely detectable limits.
48. As noted, the average age of diesel vehicles, especially diesel powered heavy vehicles (ie trucks), being brought into New Zealand is getting older and getting older faster than for petrol vehicles. Diesel powered heavy vehicles are now on average more than ten years old (10.4 years in 2006) at the time of import compared to slightly over eight years for petrol powered vehicles. This is shown in Figure 2. This increasing age means that

⁸ New Zealand's Energy Outlook to 2030. Ministry of Economic Development, 2006

⁹ Pers Com Gerda Kuschel Auckland Regional Council Technical Publication 292 Auckland Air Emissions Inventory:2004 released February 2006 available www.arc.govt.nz,

New Zealand is not importing vehicles built to more recent and stringent emission standards.

Figure 2. Average age of imported vehicles 2000- 2006



49. Table 2 sets out proposed dates for the introduction of minimum emission standards to be included in a draft Rule for consultation. As with petrol vehicles, it is proposed that the Ministry consult on the actual dates for implementing different minimum emission standards, but show a preference for the level of stringency outlined in table 2.

Table 2: Suggested year to adopt standard minimum diesel vehicle emissions standard for imported second hand vehicles

Japanese diesel vehicle standards	Year to adopt as minimum standard in NZ	Number of years lag from implementation in Japan
Japan 97/99	2008	9-11
Japan 02/04	2009	5-7
Japan 05	2010	5

Note: Any Rule would identify equivalent emission standards from other jurisdictions

50. As discussed in the December 2005 Cabinet paper [CBC Min (05) 20/11 refers], in 2003 the Tokyo Metropolitan Government introduced extremely high in-service emission requirements on vehicles in the greater Tokyo area. This measure was also copied in other cities. As a result most owners of diesel vehicles chose to sell them, including export to New Zealand, but also to other jurisdictions including Russia and the United Arab Emirates. As a consequence there are now almost no diesel powered light

vehicles in Tokyo (numbers have fallen from 6% of the fleet in 2000 to less than 1% in 2005) and those heavy vehicles present tend to have been built to very recent standards. Diesel vehicles are still available for export to New Zealand from other areas. In the first half of 2006 the volume of diesel vehicles older than 1997 being imported dropped to less than a third of the peak import volumes seen in 2003, which was when the emissions control was introduced in Tokyo. Accordingly there is unlikely to be a significant impact on the numbers of vehicles entering New Zealand as a result of introduction of the proposed minimum emission standards for diesel vehicles.

Climate change and safety benefits of restrictions on vehicle imports

51. In August 2006 [EDC Min (06) 13/9 refers] Cabinet directed the Ministry of Transport to report back on climate change implications of the Land Transport Rule: Vehicle Exhaust Emissions 2006 (the 2006 Rule). Increasing the emissions standards of vehicles entering the New Zealand fleet will not automatically see improvements in greenhouse gas emissions. Carbon dioxide (CO₂) emissions are directly related to the size and weight of the vehicle. Although an engine that uses more fuel will generally produce more harmful emissions, these are treated in the exhaust management system – particularly in the exhaust catalyst in the petrol vehicle. CO₂ emissions are not affected by an exhaust catalyst so continue to be emitted. Two vehicles can therefore have vastly different fuel economies (and therefore different CO₂ emissions), but both meet the same very stringent standards for harmful emissions simply by having a suitable exhaust catalyst.
52. If controls are introduced that limit vehicles entering the fleet there will be other co-benefits. As a general rule, newer vehicles are safer and more fuel efficient than earlier models because there have been improvements in engine technologies, materials and aerodynamics. It is reasonable to expect that if importing patterns remain constant (ie there is not a shift to larger engined vehicles or vehicles with less safety features) that there would be fuel economy and safety benefits from such a restriction. This is particularly true of imported used Japanese vehicles because industry fuel economy targets have lead to measurable improvements across the Japanese fleet¹⁰. (Note: this is not necessarily the case for vehicles imported from Australia in particular as consumer preferences have lead to newer cars having more power and accessories, so the available technical fuel economy benefits are overshadowed.)
53. Quantifying the benefits is difficult because CO₂ savings from a latest technology vehicle entering the fleet are expected to be clouded by the decision of the purchaser. The benefits depend on the type of vehicle that is purchased and how its fuel economy compares to the vehicle that would have purchased had a restriction for air quality reasons not been in place. Also, fuel economy benefits do not occur consistently with emissions technology changes, so there is no clear relationship with age. To illustrate, at a single vehicle level, if a 2003 Toyota Corolla was purchased over a 2000 model, a 14% fuel economy saving would be achieved. But, between 1991 and 2000 there was no change in relative fuel economy in that model.¹¹ Over a range of models the average improvement in fuel economy over recent years seems to be in the order of 1% per year.

¹⁰ By 2004 seventy percent of all vehicles sold in Japan either met or exceeded the Japanese Government's 2010 fuel consumption target of 6.5 l/100km.

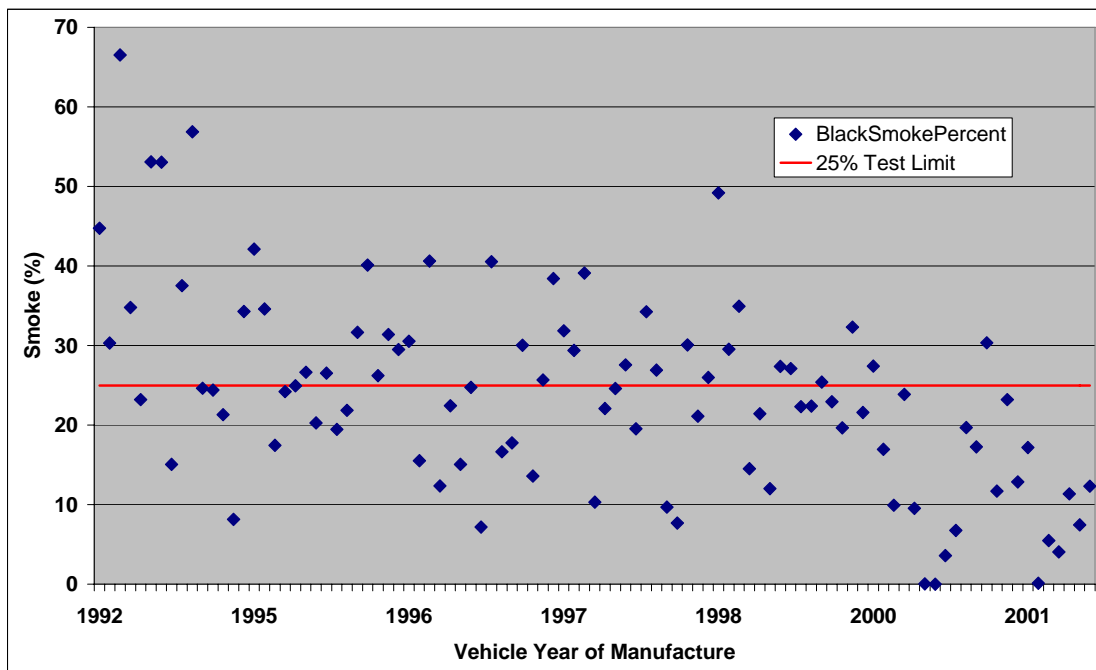
¹¹ Data from Australian Fuel Economy web site.

54. There can be expected to be minor gains in fuel efficiency if vehicles entering the fleet are emissions tested, as is proposed. Emissions, especially in diesel vehicles, generally lead to increased fuel consumption – smoke is unburned fuel. If vehicles are repaired there can be expected to be fuel consumption gains for those vehicles.
55. An important reason to want to reduce the harmful emissions from the New Zealand diesel fleet is that diesel engines are inherently more fuel efficient than petrol engines. If we can be confident that the diesel fleet meets higher harmful emission standards then New Zealand can follow Europe and actively promote the use of clean diesel vehicles as a way to reduce greenhouse gas emissions.

Emission testing for used vehicles before first certification

56. The 2006 Exhaust Emissions Rule only requires that imported used vehicles have been built to a recognised standard. Vehicles are not physically inspected that they continue to meet the emissions standards they were built to. In order to ensure that emissions from the New Zealand vehicle fleet are reduced over time, vehicles entering the fleet should not only have been built to a standard, but should be tested to ensure they continue to meet the standard at the time they enter the fleet. This is the current practice for safety standards. The emission tests could be carried out by certified agents in Japan before shipping, or in New Zealand after arrival as happens with safety and quarantine inspections.

Figure 3 Diesel Smoke by year of manufacture



all age fail the test. This implies that maintenance is a key factor and age alone is not a useful indicator of emissions. The failure rate of petrol vehicles in the study was lower than for diesel vehicles in this study (14% for petrol vs. 44% for diesel), but as with diesel vehicles, petrol vehicles of all ages failed the test. This indicates that testing the emissions of all vehicles before they enter the fleet would be justified. It is therefore proposed that all used vehicles, both petrol and diesel, be tested before they can be certified for use in New Zealand to ensure that the emissions equipment is working.

58. A strategy of setting minimum emission standards which are raised over time and then testing vehicles to ensure that their emission control equipment continues to function will ensure that harmful emissions from the fleet decline over the longer term.
59. New Zealand does not have an in-service emissions test or test limits that could be applied to imported vehicles. In-service tests are intended to indicate whether the emission control equipment is working. Different countries use slightly different tests and test limits, but most follow the same general procedures. As more than 95% of vehicles being imported are from Japan it is recommended that the Japanese in-service emission tests and test limits be used. These tests would also be appropriate for those vehicles coming from other jurisdictions built to other emission standards. If New Zealand chose to develop its own tests or test limits these could be adopted at a later point. If the current Japanese in-service tests are used, the costs have been estimated to be \$25-\$30 per vehicle.
60. As with controls on minimum emission standards, it is proposed that historic vehicles would not be required to be tested using a metered testing device, suitable for a modern catalyst-equipped petrol vehicle or equivalent metered test for modern diesel vehicles. Historic vehicles would continue to be required to pass the recently introduced visible smoke check.
61. It is proposed that the Committee direct the Ministry to prepare a draft Rule or suitable amendment Rule under the Land Transport Act to require emissions testing of all used vehicles to the relevant Japanese in-service tests and standards before they are certified for use in New Zealand.

Emission testing using On Board Diagnostic (OBD)

62. In the December 2005 Cabinet paper the Ministry indicated that it would investigate the use of on board diagnostic equipment (which uses the vehicles own electronics to monitor vehicle emissions) [CBC Min (05) 20/11 refers] as an emissions test. The Ministry has since established that Japanese Government does not consider the current standard of on board diagnostic, know as on board diagnostic 1, to be sufficiently reliable to be used for a stand alone emissions test. It is intended to inform a responsible owner that there may be a vehicle fault effecting emissions before a metered test is undertaken. However, the Japanese Government has announced plans to introduce the on board diagnostic 2 standard in 2008. On board diagnostic 2 is currently used in the United States for in-service emission testing and was also introduced on light vehicles recently in Europe. The Japanese Government is reported to be considering using this on board diagnostic technology as part of their in-service emissions test. The Ministry will review the possibility of using an on board diagnostic test at a later date once the on board diagnostic 2 standard is introduced.

Updating the emission standards affecting new vehicle imports

63. In 2005 approximately 80,000 new light petrol vehicles (ie weighing less than 3.5 tonnes) were registered in New Zealand. A further 20,000 new light diesel and 4,000 new heavy diesel vehicles (ie weighing more than 3.5 tonnes) were also registered. The Land Transport Rule: Vehicle Exhaust Emissions 2006 requires that any vehicle entering the country must meet an approved emissions standard appropriate to the vehicle's year of manufacture, weight and fuel¹². Virtually all new vehicles, including those manufactured in Japan are certified to meet European (Euro) standards¹³ or Australian standards (Australian Design Rules (ADR) which are identical to the European standards). Only a small number of vehicles (around 2-3%) are certified to the Japanese or US equivalent standards. Virtually all used vehicles are certified to meet Japanese standards.
64. The 2006 Rule currently sets out a table of standards that were known at the time of its original drafting in 2002. Since then many of these standards have been updated. An amendment is therefore required to adopt more stringent future requirements for new vehicles. The standards set out in the 2006 Rule for new petrol vehicles currently require implementation of standards for new vehicles around five years behind that of Japan and three years behind Europe. They are approximately two years behind Europe and Japan for diesel vehicles.
65. The European emission standard, Euro 4 and the Japanese standard Japan 05 came into force in the respective jurisdictions in 2005. The proposed updated standards for the 2006 Rule are set out below. If adopted the new standards would require new imports to meet either of these standards prior to 2009. This will reduce the current lag period behind Japanese standards to three years. This will be equivalent to the current lag behind European standards. It is proposed that New Zealand will gradually reduce the lag period for the introduction of new vehicle standards over the next six years.
66. Virtually all suppliers of new vehicles for the New Zealand market also make vehicles for other markets that require these high emission standards. There are therefore not likely to be any significant cost implications from the introduction of the proposed standards for new vehicles, over the costs the new vehicle manufacturer would otherwise face.
67. There are arguments for further reducing the lag between the adoption of international emissions standards in New Zealand for new vehicles. However, while imports of used vehicles built to lower standards continue this is not likely to be acceptable to the new vehicle importers. The proposed standards for new petrol and diesel imports (respectively) are set out in Tables 3 and 4 below as a basis for consultation as part of the Rule development process. Note the proposed changes add additional standards in future years. They do not change the dates from which standards are currently required.

¹² The approved standards are from: Australia (Australian Design Rules - ADRs), Europe (United Nations/Economic Commission for Europe – UN/ECE and European Economic Community – EEC), USA (General Motor Vehicle Safety Standards – FMVSS) and the Japan Safety Standards for Road Vehicles. The terms used in the table are for common terms. Full legal references will be included in any draft Rule.

¹³ The European Commission has developed emission standards for European vehicles. The first standard, Euro 1, was introduced from 1992. The actual implementation dates vary with vehicle weight and fuel. Euro 2 was required from the mid-late 1990s and Euro 3 from around 2000.

Table 3: Proposed vehicle exhaust emissions requirements for motor vehicles operated on petrol and presented for inspection in New Zealand for the first time

Date of manufacture	Approved vehicle emissions standard	
	Vehicles that operate on petrol	
	Light	Heavy
	New model	New model
On or after 1 January 2006 and before 1 January 2007	<i>Euro 3; US 2001; or Japan 00/02 ADR 79/01</i>	<i>US 98P; or Japan 00/02 ADR 80/01</i>
On or after 1 January 2007 and Before 1 January 2008	<i>Euro 3; US 2001; or Japan 00/02 ADR 79/01</i>	<i>US 98P; or Japan 00/02 ADR 80/01</i>
On or after 1 January 2008 and Before 1 January 2009	Euro 4; US 2004; or Japan 05 ADR 79/01	Euro 4; US 2004; or Japan 05 ADR 80/01
On or after 1 January 2009 and Before 1 January 2010	Euro 4; US 2004; or Japan 05; ADR 79/02	Euro 4; US 2004; or Japan 05 ADR 80/01
On or after 1 January 2010 and Before 1 January 2011	Euro 4; US 2004; or Japan 05 ADR 79/02	Euro 4; US 2004; or Japan 05 ADR 80/01
On or after 1 January 2011 and Before 1 January 2012	Euro 5 US 2007; or Japan 09 ADR 79/02	Euro 4; US 2004; or Japan 05 ADR 80/02

Notes:

Shaded cells indicate existing Rule

US adopted 'Tier 2' standards on December 21, 1999, with a phase-in implementation schedule from 2004 to 2009 (known as US 2004 or Tier 2). Light vehicles will need to be fully compliant in the US by 2007 and heavy vehicles by 2009. US 2004 and Euro 4 are equivalent standards.

The Euro 5 standard has been published and is expected to be introduced in 2010 but this is still to be confirmed.

The Japan 09 standard has been published and is expected to be introduced in 2009, but has not yet been implemented in regulation in Japan.

Table 4: Vehicle exhaust emissions requirements for motor vehicles operated on diesel and presented for inspection in New Zealand for the first time

Date of manufacture	Approved vehicle emissions standard	
	Vehicles that operate on diesel	
	Light	Heavy
	New model	New model
On or after 1 January 2006 and before 1 January 2007	<i>ADR 79/00 and ADR 30/01; Euro 2; US 2001; or Japan 02/04</i>	<i>ADR 80/00 and ADR 30/01; Euro 3; US 98D; or Japan 02/04</i>
On or after 1 January 2007 and before 1 January 2008	<i>ADR 79/01 and ADR 30/01; Euro 4; US 2004; or Japan 02/04</i>	<i>ADR 80/00 and ADR 30/01; Euro 4; US 2004; or Japan 02/04</i>
On or after 1 January 2008 and before 1 January 2009	ADR 79/01 and ADR 30/01; Euro 4; US 2004; or Japan 05	ADR 80/01 and ADR 30/01; Euro 4; US 2004; or Japan 05
On or after 1 January 2009 and before 1 January 2010	ADR 79/01 and ADR 30/02; Euro 4; US 2004; or Japan 05	ADR 80/01 and ADR 30/02; Euro 4; US 2007; or Japan 05
On or after 1 January 2010 and before 1 January 2011	ADR 79/01 and ADR 30/02; Euro 4; US 2004; or Japan 09	ADR 80/01 and ADR 30/02; Euro 5; US 2007; or Japan 05

Notes:

Shaded cells indicate existing Rule.

The Euro 5 standard has been published and is expected to be introduced in 2010 but this is still to be confirmed.

The Japan 09 standard has been published and is expected to be introduced in 2009, but has not yet been implemented in regulation in Japan.

68. The 2006 Rule contains separate implementation dates for new models and for so called “existing models”. New-model vehicles are defined as vehicles that have a date of manufacture occurring in the same calendar year as that in which the particular model of the vehicle was first manufactured. Existing models are those models that were already in production when the Rule came into effect. In general existing model vehicles are required to meet the same standards as new vehicles, but in some instances, such as the for diesel-powered heavy vehicles, industry consultation showed that it was appropriate to delay implementation of the standard for existing models for a year after new models. It is proposed that the Ministry of Transport consult with relevant stakeholders on whether it will be appropriate to delay introduction of any of the proposed standards for existing models. The outcome of the consultation on this will be reported to back to Cabinet as a part of the normal Rule making process.

69. In preparing these tables the Ministry of Transport has taken into account the recent amendments to fuel quality standards agreed in the Petroleum Products Specifications Regulations agreed to by the government. These changes were necessary so that New Zealand could import vehicles built to current and future emission standards being introduced in other jurisdictions. Fuel quality is now especially important for diesel vehicles as sulphur in fuel can damage the pollution control devices.

Other matters – possible exemption to emission standards for New Zealand Defence Force

70. During consultation on the 2006 draft Vehicle Exhaust Emissions Rule the New Zealand Defence Force identified that they may face difficulty complying with some elements of the new emission standards such as Euro 4. While most specialised defence equipment does not need to comply with the current emissions Rules, the Defence Force operates a fleet of heavy trucks that are required to comply with standard import and operating requirements. The Defence Force has reported that vehicles compliant with the recently introduced Euro 4 emissions standard (and other planned emission standards) may require the vehicle's engine to shut down or operate at a lower power when using non-standard fuels or when the emission control equipment is not operating as intended. The Defence Force pointed out that it needed to be able to operate its vehicles in remote areas, especially overseas and in battlefield conditions where a loss of power would not be acceptable.

71. The Defence Force would like to be able to import a limited number of diesel-powered heavy vehicles that have the ability to operate on a range of fuel types and which will be able to override any emission controls that would reduce a vehicle's power. They advise this would only be utilised if conditions meant this was necessary and they would otherwise seek to comply with the emissions standards during normal operating conditions. At present it is not legal to import a new vehicle that bypasses the emission controls. The Defence Force reports that they plan to import several hundred new vehicles in coming years that could be affected. The Ministry accepts there are reasonable grounds to consider an exemption for the Defence Force. As there are possibly other sections of the New Zealand community, such as the emergency services, where it may be appropriate to consider such an exemption, the Ministry would like to consult on this issue as part of this current package of measures.

72. Cabinet is requested to direct officials to commence development of an appropriate amendment to the Land Transport Rule: Vehicle Exhaust Emissions 2006 (the 2006 Rule), or other suitable Land Transport Rule to allow an exemption from emission standards for specially designated vehicles that would be adversely affected by requirements for reduced power if emissions control equipment did not function properly.

Other matters – need to clarify that emissions rules require on board diagnostics

73. The Ministry has been approached by a car company wishing to confirm whether vehicles complying with the Euro 3 petrol vehicle emission standard needed to be fitted

with on board diagnostic (OBD)¹⁴ equipment in order to comply with the New Zealand Rule.

74. The query was raised because the 2006 Rule, and the earlier 2003 version, contain a clause that states: *Despite 1.5 of this Rule and 1.4(1) of Land Transport Rule: Vehicle Standards Compliance 2002, a motor vehicle must be manufactured in accordance with [an approved vehicle emissions standard] that is relevant to the class of the vehicle and the vehicle's fuel type, to the extent that the standard applies to exhaust emissions.* [emphasis added]
75. Some overseas emission standards that New Zealand recognises require agencies to inspect premises of certified manufacturers. The clause in the Rule was intended to exclude such elements of the standards that did not relate directly to the exhaust emissions, due to the impracticability of New Zealand agencies inspecting premises in the jurisdiction in which the emissions standard originates. The Ministry's objective was that the clause, as drafted, does require on board diagnostic to be fitted as the on board diagnostic technology is essential to demonstrate that exhaust emissions remain within stated limits over time. The Ministry's legal advisers accept that, if challenged judicially, the clause, as worded might not be interpreted that way. For the avoidance of doubt, Cabinet's agreement is requested to amend the rule to clarify that on board diagnostic must be fitted, where required by the relevant emission standard. This is a minor change and will not impose any additional costs on the industry as the technology is standard requirement in all of the emission standards New Zealand recognises for new vehicles.

Consultation

76. The Ministry has not undertaken formal consultation on the proposals contained in this paper. Consultation will be undertaken as part of the Rule making process. The Ministry has met with many stakeholders in a wide range of forums since the December 2005 Cabinet decision. The Ministry considers that while there may remain some disagreement over specific elements of the policies outlined in this document, there is a general level of support from all sectors for the proposals. In particular the Ministry notes that the used car importers, who are represented by the Independent Motor Vehicle dealers Association (IMVDA), and who have historically strongly opposed policies that restrict entry of used vehicles, appear to have moderated their position and are willing to consider restrictions on imports. It is now considered unlikely that the proposals in the paper will be as controversial as was considered when Cabinet considered the issues in late 2005.

¹⁴ On board diagnostic technology is required to monitor that a vehicle's emissions control equipment is functioning. It is required by most recent emission standards for petrol and diesel vehicles including Euro 3 for petrol vehicles and Euro 4 for diesel powered heavy vehicles. It is possible to use an electronic scan tool to check that the equipment is functioning as part of an emissions test.

77. The following departments and agencies have been consulted and agree with the recommendations: New Zealand Customs Service, Ministry of Economic Development, Energy Efficiency and Conservation Authority, Ministry for the Environment, Ministry of Foreign Affairs and Trade, Ministry of Health, Land Transport New Zealand, New Zealand Defence Force, New Zealand Police, Transit New Zealand, Ministry of Social Development and the Treasury. The Department of Prime Minister and Cabinet and Local Government New Zealand have been informed of its contents.

Financial implications

78. There are no financial implications from these recommendations.

Human rights implications

79. There are no human rights implications from these recommendations.

Legislative implications

80. The proposals in this Cabinet paper will require amendments to Land Transport Rules under the Land Transport Act 1998. Rule amendments were included in the Transport Rules Programme for 2006/07 that was provided to Cabinet in July 2006 [CAB Min (06) 24/8 refers]. The Minister for Transport Safety would refer amended rules to Cabinet for noting of the content before confirming [CAB (01) 20/6 refers].

Regulatory impact and business compliance cost statement

81. These RIS/BCCSs are works in progress. Final, more detailed statements will be prepared as a result of consultation on the draft Rules or amendment Rules and will be submitted to Cabinet.

82. For the proposal relating to the import of used vehicles, a Regulatory Impact Statement and Business Compliance Cost Statement are attached that comply with the requirements for Regulatory Impacts Statements and Business Compliance Cost Statements as set out in Cabinet Office Circular CO (04) 4.

83. For the proposal relating to the import of new vehicles, a Regulatory Impact Statement is attached that complies with the requirements for Regulatory Impact Statements as set out in Cabinet Office Circular CO (04) 4. No compliance costs to business arise from the proposal.

84. There will be additional compliance costs around the provision of information for the certification of imported vehicles, which are expected to be relatively minor as the emissions code which identifies the emission standard a vehicle was built to is included on the standard deregistration papers. If an emission test is required, appropriate testing standards and procedures would need to be developed and formally adopted. The introduction of minimum emission standards and testing would also involve some one-off compliance costs around redesigning and printing appropriate forms.

Gender implications

85. There are no gender implications from these recommendations.

Disability perspective

86. There are no disability implications from these recommendations.

Publicity

87. I plan to make an announcement to the press about these decisions. A draft press release has been prepared and is attached.

Appendix 1

Executive Summary from consultant's report on social, economic and environmental impacts of proposed emissions standards on used imported vehicles

This Covec report¹ examines the social, economic and environmental impacts of proposed emissions standards on used imported vehicles. If implemented, these standards would effectively limit the age of used imports and would have a number of effects. These include:

- reductions in the total number of imports
- increases in average import prices
- increases in the value of vehicles already in the fleet, and
- longer lives for existing vehicles to offset reductions in import numbers.

Previous Study on Socio-Economic Impacts of Emissions Policies

This report represents the second phase of a wider study on vehicle emissions. The first phase, which was completed in 2005, examined the social and economic impacts of a then-proposed in-service vehicle emissions screening programme: a requirement for the emissions of vehicles to be tested as part of the Warrant of Fitness (WoF) or Certificate of Fitness (CoF) test.

The earlier study examined the effects of the vehicle testing regime in terms of costs and the possible social exclusion impact of losing a vehicle. The analysis suggested that the communities at greatest risk are young and old people, particularly those of Maori and Pacific descent. Solo parents were also identified as high risk, especially solo Maori or Pacific Island mothers. They have lower-than-average household incomes and relatively high daily living costs.

There are also risks for large families, related to the lower levels of disposable income and the number of people affected by a loss of vehicle. Disabled people are also vulnerable because of lower incomes and difficulties in accessing other transport means.

The impacts of having to pay a significant bill for low income households include reductions in spending on other items or descending further into a spiral of debt. Studies on poverty in New Zealand have identified a range of implications for low income households including increased probability of eating poorly, not going to the doctor or dentist, reducing participation in recreational activities, reduced educational opportunities for children and living in unsuitable accommodation.

¹ Covec (2005) Vehicle Fleet Emission Screening Programme Social and Economic Impact Assessment Phase I. Final Report to the Ministry of Transport

Loss of a car can exclude households from many activities, including health visits, work, shopping, visiting friends and recreation. These difficulties relate particularly to situations where facilities are some distance away.

In June 2005, subsequent to the release of the phase 1 report, the Minister of Transport announced the introduction of emissions control policies to be put in place by the end of 2006, comprising a visual smoke test as part of the WoF/CoF test that would target the worst emitters, and prohibition of removal of (or tampering with) a vehicle's emissions control technology.

Earlier this year, the Ministry of Transport asked us to examine the effects of an alternative emissions policy – this time focused on restricting the entry of used imported vehicles at the border. This report presents the results of our analysis on the social, economic and environmental impacts of that policy.

Proposed Standards underlying the Revised Policy

The emissions standards underlying the revised emissions policy are Japanese manufacturing standards introduced in the late 1990s and early 2000s. Specifically, for petrol vehicles, they are the standards introduced between 2000 and 2002, while for diesel vehicles there are either the standards introduced:

- between 1997 and 1999 (the 97/99 standard), or
- between 2002 and 2004 (the 02/04 standard).

Petrol standards limit emissions of CO, HC, and NO, while diesel standards limit emissions of CO, HC, NO and PM. All standards are expressed as grams per kilometre.

Likely Degree of Impact

The likely success of the policy depends, amongst other things, on the restrictiveness of the underlying standards. Thus, if few prospective imports fail, the policy will be relatively ineffective, and vice versa.

To gauge the restrictiveness of the proposed emissions standards, we compared the 'effective age limits' imposed by them with the age distribution of historic imports. This helped identify the number of imports that *would have* failed if similar standards were in place at the time.

Now, unless emissions standards are updated periodically, these effective age limits will shift over time. For example, for petrol cars, the effective age limit will be 8-years in the second year of the policy, and 9-years in the third year if no updates are made.²

Because only used imported vehicles will potentially fail (and not new imports), the overall restrictiveness of the standards has been expressed as

² At the time of writing, the likelihood and/or frequency of any updates was uncertain. For the purposes of modelling, however, we have assumed annual updating of standards. The consequences of this assumption are discussed on page 45.

the percentage of used imports that would potentially fail (not the percentage of total imports). These figures are summarised in the table below.

Table 1: Proportion of Used Imports Affected in Year 1

Vehicle Type	Standard	% Affected
Petrol Cars	00/02	45%
Petrol Commercial	00/02	71%
Diesel Cars	97/99	28%
Diesel Cars	02/04	95%
Diesel Commercial	97/99	18%
Diesel Commercial	02/04	86%

While the percentages for commercial vehicles are relatively high (particularly for diesel under the 02/04 standard), commercial vehicles comprise only 5% of annual imports. This small share has led us to focus only on passenger vehicles in this report.

Characteristics of At-Risk Parties

Although the policy will have far-reaching effects, consumers prevented from buying their preferred import as a result will be most 'at-risk'. This naturally led us to consider what the geographic, demographic and socio-economic characteristics of 'at-risk' consumers might be. This was done by analysing the motor vehicle register.

The motor vehicle register lists every passenger (and goods) vehicle registered in New Zealand at any given point in time. A snapshot of this (as at 1/1/2005) was obtained during stage one of this project and "geo-coded", so that the precise geographic location of each vehicle (and its owner) was known. These geographic identifiers were then used to link the register to census information, so that socioeconomic and demographic information could be added to the analysis.

Using this data, we identified the characteristics of people that bought used Japanese imports in 2004 that *would have* been banned if similar restrictions were in place at the time. These were taken to represent 'at-risk' consumers.

It is important to recognise that the degree of risk is not uniform across 'at-risk' consumers. Rather, it depends on each consumer's ability to overcome import restrictions by upgrading to a vehicle that meets the standards. This, in turn, depends on the age gap between their preferred import and the oldest import permitted by the standards.

Extending this logic, we segmented at-risk consumers into three groups:

- Group A: people that bought cars one or two years older than the maximum
- Group B: people that bought cars three or four years older than the maximum
- Group C: people that bought cars five years (or more) older than the maximum

Thus, group A consumers are lower risk than group B, who are lower risk than group C. These groupings were used throughout our analysis.

Overall, 'at-risk' consumers were found to be:

- predominantly middle-aged males (30-49 years)
- from all across New Zealand, and especially Auckland and the South Island
- with below-average incomes, and
- larger-than-average household sizes.

In addition, we found that average incomes fall as the focus moves from group A to group B to group C. At the same time, average household sizes increase. This suggests that consumers in groups B and C will have limited capacity to upgrade their intended import to one that meets the standard and therefore truly are most 'at risk.'

Consumer Response Scenarios

The social, economic and environmental effects of the policy depend critically on the response of consumers. For example, if most 'at-risk' consumers end up purchasing a newer import than they would have otherwise, the overall effects will be positive. However, if most end up holding on to their existing vehicle, the overall effects will be negative.

This report considers the social, economic and environmental effects of five consumer response scenarios, in which the probability of upgrading varies across 'at-risk' groups. Two of these scenarios are fairly extreme and have been included only to establish limits on potential outcomes. The remaining three scenarios fall somewhere in the middle and are more representative of likely consumer reactions.

Effects on Vehicle Markets, Prices & Ages

This report considers the potential impacts of the two extreme scenarios on vehicle markets and vehicle prices. It also models the potential effects of these scenarios on average fleet age using the vehicle fleet emissions model (VFEM). Our overall findings were:

Scenario 1: All at-risk consumers upgrade to newer import

- No change in the overall level of imports
- Relatively static import prices
- No significant changes to import industry concentration
- Little effect on the domestic vehicle market
- Static scrappage rates
- No change to the overall size of the fleet
- Average fleet age decreases

Scenario 2: All at-risk consumers exit import market and retain existing vehicle

- Dramatic falls in the overall level of imports
- Higher import prices (and higher import costs)

- Greater import industry concentration
- More activity in the domestic vehicle market (and higher prices)
- Reduced scrappage rates
- Overall size of the fleet will fall (depending on scrappage rates).
- Average fleet age increases

Fuel and Emissions Impacts

This report also considers the potential impacts of the policy on fuel and emissions to 2030. This is done by comparing fuel use and emissions with and without the policy under the five response scenarios, and interpreting any differences as policy impacts.

Under response scenario 1, where all at-risk consumers upgrade to a newer import, potential fuel and emissions savings peak at around 0.5% of annual totals. Under response scenario 2, where all at-risk consumers exit the market and retain their existing vehicle, fuel and emissions *increases* peak at around 2.5% of annual totals. The fuel and emissions effects of the remaining scenarios lie between these extremes, but are skewed more toward scenario 2 than scenario 1.

These results suggest that the potential benefits of the policy pale in comparison to potential downside risks. This is due to the dynamic nature of vehicle market transactions. That is to say, if an affected consumer reacts to restrictions by purchasing a slightly newer import than intended, the incremental fuel and emissions benefits are limited to only that consumer. However, if an affected consumer exits the market and retains their existing vehicle, that decision can halt a series of downstream sales and purchase transactions, and thus have much greater overall effects.³

Social Impacts

This report has also considered the social impacts of the revised emissions policy. Overall, these are expected to be minor compared to the previous policy because it:

- does not result in any sudden loss of vehicle, which can lead to social exclusion, and
- does not cause any unexpected (and unavoidable) spikes in the cost of living.

At most, the policy may cause slight increases in the prices of vehicles. However, any such price effects are likely to go unnoticed in context of recent market trends, where the prices of imported vehicles have recently begun to fall.

³ Another way to look at this is as follows: the size of the fleet in any one year equals last years fleet plus imports less scrappage. If, for any reason, the rate of imports falls, so too must the rate of scrappage otherwise the fleet will be smaller than it would have been otherwise. Now, because vehicles about to be scrapped are typically older, they are typically also high emitters. Thus, any policy that prolongs the life of vehicles about to be scrapped will have adverse effects. This is precisely the finding of this report.

Policy Options

A number of studies in New Zealand have demonstrated the impacts of local air pollutants from transport. The impacts are serious and have been the motivation for a policy response. Policy options to tackle these effects include those that:

- remove the worst polluters from the fleet;
- ensure optimum performance of the existing fleet;
- change the fleet over time to less emitting vehicles by changing the characteristics of imports;
- change travel behaviour to reduce aggregate activity or change its location and thus exposure of people.

This study has analysed the expected effects of an emissions standard that would change the structure of the fleet over time by changing the age composition of imports. The analysis suggests that the policy will have limited positive environmental effects, and that adverse environmental effects are conceivable. It has also been shown to have limited positive (and possibly negative) social and economic impacts.

There are no simple solutions that will be effective environmentally and have low costs or low social impacts. Measures that will have a significant impact on the emissions of local pollutants from the fleet, such as more accurate vehicle testing methods, will have adverse social impacts on lower income households. In contrast, measures that seek to avoid these impacts, including the approach analysed here, are likely to have limited positive emissions effects.

Alternative policy avenues include those that focus on direct health effects, for example through tackling the location of emissions in urban centres, and those that focus on measures that target vehicle dependency via changes in urban form that reduce the need to travel, plus improvements in public transport availability, accessibility and utilisation.

The government is left with difficult choices. The broad options appear to be to:

- introduce more stringent testing methods and accept the socio-economic consequences or introduce mitigating policies;
- introduce import standards as examined in this study, although it is not clear that this is a worthwhile policy intervention;
- work with local government more closely to design policies that more directly target problem locations.

Consultation on Cabinet and Cabinet Committee Submissions

Certification by Department

Guidance on the consultation requirements for Cabinet and Cabinet committee papers is provided in chapter 11 of the Step by Step Guide: Cabinet and Cabinet Committee Processes, available at <http://www.dpmc.govt.nz/cabinet/guide/11.html>.

Departments/agencies consulted: The attached submission has implications for the following departments/agencies whose views have been sought and are accurately reflected in the submission:

New Zealand Customs Service, Ministry of Economic Development, Energy Efficiency and Conservation Authority, Ministry for the Environment, Ministry of Foreign Affairs and Trade, Ministry of Health, Land Transport New Zealand, New Zealand Defence Force, New Zealand Police, Transit New Zealand, Ministry of Social Development and the Treasury

Departments/agencies informed: In addition, the following departments/agencies have an interest in the submission and have been informed:

Department of Prime Minister and Cabinet and Local Government New Zealand

Others consulted: Other interested groups have been consulted as follows:

Signature	Name, Title, Department	Date / /
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Certification by Minister

Ministers should be prepared to update and amplify the advice below when the submission is discussed at Cabinet/Cabinet committee. The attached submission/proposal:

Consultation at Ministerial level	<input type="checkbox"/> did not need consultation with other Ministers <input type="checkbox"/> has been consulted with the Minister of Finance <i>[required for all submissions seeking new funding]</i> <input type="checkbox"/> has been consulted with the following Minister(s)	
Consultation with Labour/ Progressive caucuses	<input type="checkbox"/> does not need consultation with the government caucuses <input type="checkbox"/> has been or <input type="checkbox"/> will be consulted with the government caucuses	
Consultation with other parties	<input type="checkbox"/> does not need consultation at parliamentary level <input type="checkbox"/> has been consulted with the following other parties represented in Parliament: <input type="checkbox"/> New Zealand First <input type="checkbox"/> United Future <input type="checkbox"/> Green Party <input type="checkbox"/> Other [specify]..... <input type="checkbox"/> will be consulted with the following other parties represented in Parliament: <input type="checkbox"/> New Zealand First <input type="checkbox"/> United Future <input type="checkbox"/> Green Party <input type="checkbox"/> Other [specify].....	
Signature	Portfolio	Date / /