New Zealand Vehicle Emissions Screening Programme

DISCUSSION DOCUMENT

November 2004

Ministry of Transport
PO Box 3175 Wellington
New Zealand

ISBN: 0–478–10002–7

MINISTERIAL FOREWORD

Last year, in response to concerns about declining air quality associated with vehicle exhaust emissions, and the resulting severe health problems, the government, with the support of the Greens, announced a range of new fuel and emissions standards, including plans to introduce mandatory emissions screening from mid 2006.

Emissions screening will target the very worst polluters. These are the ten percent of vehicles that are currently responsible for between 40 to 50 percent of vehicle pollutants. Addressing this ten percent will bring about considerable reductions in emissions.

The new screening initiatives will also aim to reduce emissions by encouraging regular maintenance and identifying high emitting vehicles to ensure they are repaired or put off the road.

The screening programme will be monitored to ensure ongoing improvement in the emissions performance of the New Zealand vehicle fleet.

This discussion document outlines the framework for the emissions screening programme and explores issues such as the frequency of testing, the range of vehicles to be tested and the test methods to be used.

The document is an important part of the government's commitment to ensure the final programme is fair, equitable and does not unduly penalise the vast majority of responsible motorists. There are also real fuel efficiency gains possible from this work.

The discussion process will benefit from having the widest possible input from interested parties. I urge you to take the time to make a submission and contribute to this important work.

Hon. Judith Tizard
Associate Minister of Transport

MAKING A SUBMISSION

We welcome your comments on the specific questions set out in Sections Three and Four of this document. Any general comments about the proposed framework are also welcome.

Please include in your submission:

- the title of this document;
- your name (and title, if applicable);
- your organisation's name (if applicable); and
- your address (postal and email, if applicable).

Please note the deadline for submission is 24 January 2005.

Please send your comments to:

Advisor: Vehicle Emissions
Environment Group
Ministry of Transport
PO Box 3175
Wellington

If possible, email your submission to us at: emissions@transport.govt.nz

Please note that your submission is public information

Please clearly indicate if your comments are commercially sensitive or if, for some other reason, you consider they should not be disclosed.

An easy-to-read version of the document is available on the Ministry's website at: **www.transport.govt.nz**

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1. INTRODUCTION

Purpose of the discussion document

The purpose of this document is to outline the Ministry of Transport's preliminary proposal for the New Zealand vehicle emissions screening programme. It is planned to begin this programme in mid to late 2006. The programme is expected to apply to all vehicle classes (light and heavy) that are subject to the Vehicle Exhaust Emissions Rule and that are required to have entry and in-service certification, (that is, Warrant of Fitness (WoF) or Certificate of Fitness (CoF) inspections).

Feedback received on the proposals made in this document will contribute to the development and design of the screening programme. The feedback will supplement information collected and analysed during the Vehicle Emissions Pilot Testing Programme and information gained from the Social Impact Assessment (see Section Two).

The screening programme proposals will be introduced through a Land Transport Rule. Interested parties will get another formal opportunity to comment on the proposals when the public (yellow) consultation draft of the Land Transport Rule is released, which is scheduled for 2005.

Additional background information on the vehicle emissions policy and on measuring vehicle-exhaust emissions can be viewed in the *New Zealand Vehicle Emissions Screening Programme—Resource Document,* which can be downloaded from the Ministry of Transport website (www.transport.govt.nz).

Background to the Vehicle Emissions Policy

Air-quality monitoring has identified vehicle-exhaust emissions as a significant source of air pollution. Other sources of air pollution include domestic heating fires and industry. New Zealand air-quality guidelines and international standards are regularly exceeded in some urban areas.

Poor air quality can be a significant cause of health problems, including asthma, heart disease, and bronchitis. While any New Zealander might be affected, children and the elderly are most at risk. A report from National Institute of Water and Atmospheric Research Ltd (NIWA), commissioned by the Ministry of Transport and released in 2002, estimated that around 400 people die prematurely each year due to exposure to vehicle emissions.[1] This problem is worse in urban centres with high traffic rates and congestion, where a large segment of the population is exposed to air pollution.

In addition to health problems, air pollution causes problems that are less direct and quantifiable such as poor visibility (including smog and haze) and staining of building surfaces. Air pollution can also be damaging to New Zealand's international reputation for having a clean environment.

[1] National Institute of Water and Atmospheric Research Ltd, Health Effects Due to Motor Vehicle Air Pollution in New Zealand, Report to the Ministry Of Transport, January 2002.

The domestic transport sector is a significant contributor to greenhouse gas emissions, accounting for 45 percent of all carbon dioxide emissions in 2002.[2] Road transport is responsible for 89 percent of total transport emissions and has increased by an average of 4 percent per annum since 1990.[3] The number of registered vehicles in New Zealand has more than trebled since 1960, and transport continues to be one of the fastest growing contributors to New Zealand's greenhouse gas emissions.

The Government's response

The Government is committed to tackling the environmental and health issues associated with vehicle emissions in New Zealand. Until recently there were no specific legal requirements setting out vehicle emissions standards in New Zealand. This was addressed in 2003 when the Minister of Transport signed the *Land Transport Vehicle Exhaust Emissions Rule 2003 (33001)* (the Vehicle Exhaust Emissions Rule), which requires vehicles entering New Zealand to be manufactured to an approved emissions standard from the United States, Europe, Japan, or Australia.

In October 2003, the Vehicle Emissions Policy initiatives were announced. These initiatives aim to reduce the contribution of vehicle-exhaust emissions to local air pollution and greenhouse gas emissions. The Vehicle Emissions Policy package consists of:

- emissions screening of imported used vehicles to ensure minimum emissions performance before entry to the New Zealand fleet;
- emissions screening of in-service vehicles as part of the WoF or CoF inspections; and
- education of vehicle users on the need for, and benefits of, regular vehicle maintenance and repair.

These initiatives build on earlier measures that the Government has introduced to tackle vehicle pollution, which include:

- revised fuel specifications, including the progressive reduction of the maximum sulphur content in diesel fuels to 50 parts per million by 2006 *(the Petroleum Products Specifications Regulations 2002),* making New Zealand fuels cleaner, and bringing them into line with European standards;
- increasing transport funding to tackle severe traffic congestion in key areas (including Auckland) through roading developments, public transport initiatives, and promotion of walking and cycling;
- undertaking further research on the health impacts of vehicle emissions; and
- amending Regulation 28 of the *Traffic Regulations 1976* by making it an offence to emit excessive smoke for more than 10 seconds. This 10-second smoke regulation has been in place since 2001 and applies to petrol and diesel vehicles.

[2] Ministry of Economic Development, New Zealand Energy Greenhouse Gas Emissions 1990 –2002, June 2003.
[3] Ibid.

Additional measures being developed to reduce vehicle emissions include:

- a walking and cycling strategy *(Getting There—On Foot, By Cycle);*
- the removal of barriers to the introduction of renewable transport fuels (including ethanol petrol blends and bio-diesel);
- monitoring the fuel consumption of vehicles entering New Zealand and providing information to consumers on the fuel consumption of new vehicles to encourage the purchase of more fuel-efficient vehicles; and
- identifying opportunities for Government leadership in reducing vehicle emissions through purchasing and management practices within public-sector fleets.

The Vehicle Emissions Policy is consistent with the objectives of the New Zealand Transport Strategy, including protecting and promoting public health and ensuring environmental sustainability. It contributes to the National Energy Efficiency and Conservation Strategy and the Climate Change Programme.

The Vehicle Emissions Policy also complements the Government's broader air-quality work programme and the recently introduced National Environmental Standards for air quality.

The proposed vehicle emissions screening programme

Vehicles produce different types of emissions. These include noise, exhaust tailpipe emissions from the combustion of fuel in the engine, vapour emissions from the fuel and oil, and dust particles from wear on brakes, clutches, and tyres. The vehicle emissions screening programme is designed to address the issue of vehicle-exhaust emissions that affect air quality, such as carbon monoxide, hydrocarbons and particulate matter, and the greenhouse gas, carbon dioxide.

Vehicles depend on properly functioning emission-control equipment to keep exhaust emissions low. Over time, as the distance a vehicle travels increases, its emissions performance may deteriorate due to normal wear and tear or the failure of emission-control equipment. Regular maintenance can help to ensure that a vehicle's emission-control equipment continues to operate effectively.

Vehicles that are 'gross emitters' of exhaust emissions are significantly out of tune or have experienced component failure that cause emissions levels to greatly exceed the original design level. It is likely that a proportion of the New Zealand fleet will have faulty or malfunctioning emission-control equipment. It is rarely obvious when this happens because the emissions (such as carbon monoxide) may not be visible and emission-control malfunctions do not necessarily affect vehicle drivability. 'Gross emitters' will be identified by setting an appropriate emissions performance requirement. If a vehicle is tested and fails the performance requirement, that vehicle will be required to undergo repairs.

Although the Vehicle Exhaust Emissions Rule requires imported vehicles to have been manufactured to an approved emissions standard, there is no guarantee that all emission-control equipment on imported used vehicles or vehicles currently in the New Zealand fleet continues to operate effectively. The absence of a vehicle emissions screening programme in New Zealand means that there is no way to ensure that gross-emitting vehicles are identified. There is also little incentive for owners to maintain their vehicle's emission-control equipment if they are unaware that it is not operating effectively.

With the growing number of vehicles on New Zealand roads, there is significant scope to improve and maintain the emissions performance of vehicles in the fleet throughout their service life. The objective of the vehicle emissions screening programme is to identify the vehicles that are gross emitters before they can enter the New Zealand vehicle fleet as well as gross emitters currently in use on New Zealand roads. These vehicles may then be required to undergo repairs to improve their emissions performance or be retired from the fleet.

The effectiveness of the screening programme will be monitored to ensure the ongoing improvement of the New Zealand vehicle fleet.

2. DEVELOPING THE EMISSIONS SCREENING PROGRAMME

An important part of the policy development for the proposed vehicle emissions screening programme is to determine the current emissions performance of the New Zealand vehicle fleet and the likely impacts of emissions screening on vehicle owners, the vehicle industry, and the environment. The work-streams contributing to the development and implementation of the vehicle emissions screening programme are:

- the Vehicle Emissions Pilot Testing Programme;
- the Social Impact Assessment; and
- the development of a Land Transport Rule.

The Vehicle Emissions Pilot Testing Programme

A Vehicle Emissions Pilot Testing Programme is currently underway to address the current lack of data on the emissions performance of the New Zealand vehicle fleet. A representative sample of both petrol- and diesel-fuelled light (3500 kilograms and under) and heavy (over 3500 kilograms) vehicles throughout New Zealand will be tested. The results will be analysed to help refine the preliminary proposal for the screening programme outlined in this document.

The pilot programme will provide:

- an analysis of the emissions profile of the New Zealand fleet by vehicle type, weight, age, fuel type, and engine technology;
- an estimate of failure rates for the New Zealand fleet based on overseas performance limits;
- an estimate of the percentage of vehicles without emission-control equipment (such as catalytic converters);
- a comparison of the ability of emissions test methods to identify the worst emitting vehicles in the fleet;
- an assessment of emissions testing procedures and equipment;
- information on the likely causes of poor emissions performance;
- information on the cost and effectiveness of emissions-related maintenance and repairs; and
- an estimate of the likely emissions reductions from improved maintenance on a fleet-wide basis.

The information collected on the performance of the New Zealand vehicle fleet will be used to determine the 'entry' and 'in-service' emissions performance limits. There will be an opportunity to comment on the proposed limits during consultation on the public (yellow) draft of the Land Transport Rule in 2005.

Vehicle owners will be asked to volunteer to have their vehicles' emissions checked and will receive information about the types and levels of emissions produced by their vehicles. The Ministry of Transport has produced a brochure *(Clean up Your Vehicle's Emissions)* that gives information on how vehicle owners can reduce emissions from their vehicles.

Most testing will be carried out in vehicle testing stations, WoF and CoF garages, and repair workshops, using simple test methods. Some vehicles with high levels of emissions will undergo repairs and then have their emissions re-tested to assess the approximate cost and effectiveness of repairs.

Some testing will also be carried out in a laboratory setting, using loaded-test procedures (that is, using a dynamometer to replicate on-road driving conditions). The Vehicle Emissions Pilot Testing Programme will compare the results from both types of test to assess whether simple testing methods are the most appropriate for the screening programme. Loaded testing will also provide data to quantify the potential emissions reductions and fuel-consumption savings achieved through the emissions screening programme. Additional information on emissions screening methods is available in the *New Zealand Vehicle Emissions Screening Programme—Resource Document.*

Social Impact Assessment

Adverse social and economic impacts could occur where the proposed emissions screening programme imposes extra costs on vehicle owners (such as increased repair and maintenance, WoF, and CoF charges). A Social Impact Assessment is being undertaken in order to understand the extent and severity of any impacts and where in society they might lie. A two-stage assessment has been developed.

Stage one will consist of an international literature review evaluating any mitigation measures for emissions testing and developing a report that will explore a range of assumptions to describe who might be affected. A range of scenarios will then be developed to show how various sectors of society might be affected and suggest possible options for mitigation. Stage two will test the assumptions and scenarios using a range of impact assessment techniques, including data analysis, focus-group interviews, and employing the profiles of vehicle owners established by the Vehicle Emissions Pilot Testing Programme.

A final report will then be prepared, outlining proposals for the mitigation of social impacts and the means by which those measures may be funded.

Land Transport Rule

A Land Transport Rule will establish the legal basis for the proposed emissions screening programme. This rule will specify the:

- authorisation for conducting emissions screening;
- operation of the screening programme, including frequency, screening procedures, and the vehicles to be screened;
- entry and in-service emission limits for vehicles; and
- approval requirements for emissions screening equipment.

The rule may also incorporate the 10-second 'smoky vehicle rule' (currently set out in Regulation 28 of the *Traffic Regulations 1976).*

The rule development process will provide interested parties with a further formal opportunity to comment on the design and implementation of the vehicle emissions screening programme.

Associated changes to regulations

New offences and penalties associated with the screening programme would be introduced through an amendment to the *Land Transport (Offences and Penalties) Regulations 1999.*

3. THE PROPOSAL

Introduction

The vehicle emissions screening programme will be implemented through the existing WoF and CoF regimes for vehicles that are in service, and the entry certification regime for imported used vehicles[4]. In addition to the existing inspection requirements, vehicles would be required to meet a specified emissions performance limit appropriate to, for example, each vehicle's age, type, and technology.

The New Zealand vehicle emissions screening programme will be applied nationwide. Application of the programme on a national basis recognises the contribution of all motor-vehicle emissions to ambient air pollution and greenhouse gas concentrations. Motor vehicles are highly mobile and, as a result, application of the programme to targeted territories (such as certain cities or urban areas) or different regional emissions limits are likely to be impractical and difficult to implement. They could encourage avoidance behaviours, such as registering ownership of vehicles outside the programme areas.

The vehicle emission screening programme will identify the gross-emitting vehicles. In general, these are vehicles that have not been well maintained or have experienced serious emission-control equipment failure. The worst emitting vehicles would need to be repaired and re-tested. They would not be issued with a WoF or CoF or certified for entry to the fleet unless their emissions performance can be improved to meet the specified emissions performance limit. Any gross-emitting vehicle that is not repaired would not be allowed to enter the fleet, or, if it was already in service, it would be retired from the fleet.

Questions about the screening programme:

1. Do you have any comments about how emissions screening might affect vehicle owners?
2. Do you have any comments about how emissions screening might affect the vehicle inspection and repair industries?

Elements of the proposed screening programme

Performance limits

Studies on motor-vehicle emissions from overseas and within New Zealand typically show that a small percentage of vehicles account for a large percentage of the total emissions produced. A recent remote-sensing survey carried out by the Auckland Regional Council (ARC) collected emissions data for 34,000 vehicles in the Auckland area. The results showed that the worst 10 percent of vehicles surveyed produced 40 to 50 percent of the total vehicle emissions. This is likely to be typical of the distribution across the fleet.

The intention is to screen for gross-emitting vehicles—those that produce excessive emission levels for their design capability, due to component failure or because the vehicle is severely out of tune. When setting initial emissions performance limits, an appropriate level would be one that:

- is not too stringent at the beginning, as the aim of the screening programme is to progressively improve the emissions performance of the fleet; and
- is not too low, as this would fail to improve the emissions performance of the New Zealand fleet.

[4] Imported vehicles that have not been registered anywhere in the world (i.e. brand new vehicles) would not be required to have an emissions screening check at the border. However, proof of compliance with an approved emissions standard is a requirement of the Vehicle Exhaust Emissions Rule 2003.

Emissions limits for the New Zealand fleet have yet to be developed. The Vehicle Emissions Pilot Testing Programme (see Section Two) will provide data on the emissions performance of imported used vehicles and the New Zealand vehicle fleet. This data will then be used to set appropriate emissions performance limits. Data from the Vehicle Emissions Pilot Testing Programme will be used to identify the emissions profiles of different types of vehicles to develop appropriate 'vehicle bands'.

It is proposed that performance limits be set specific to each vehicle band, taking into account a range of vehicle characteristics, such as age, vehicle type, gross vehicle mass, engine and emission-control technology, and whether a vehicle was manufactured to an emission standard. It is unlikely that older vehicles or vehicles that were not manufactured with emission-control equipment would be required to meet the same performance limits as more modern vehicles with later emissions technology.

It is expected that the emissions performance of the New Zealand fleet will improve through revised fuel specifications (improvements in fuel quality) and the entry of new vehicles with the latest emissions control technologies. Ongoing monitoring of the vehicle emissions screening programme will allow performance limits to be revised over time, as required, to ensure they are appropriate to the changing profile of the fleet.

Limits for emissions of carbon monoxide, hydrocarbons, and particulate matter will be developed for petrol-fuelled vehicles. Limits for particulate matter emissions will be developed for diesel vehicles.

Overseas practice in emissions screening will be considered in the development of performance limits for the New Zealand fleet. However, it is unlikely that overseas limits will be adopted given the significant differences between the make-up of the New Zealand vehicle fleet and the vehicle fleets of other jurisdictions. Stakeholders will have a further opportunity to comment on the proposed limits as part of the Land Transport Rule development process.

Questions about performance limits:

3. What sorts of vehicle characteristics should be used to establish vehicle bands for emissions performance limits? (For example, vehicle age, engine technology, and weight.)
4. Do you think the selection of pollutants for which performance limits are being proposed is appropriate?
5. Should the performance limits for newly imported used vehicles be more stringent than the limits for vehicles that are in-service?
6. Do you see any practical difficulties in implementing different performance limits for vehicles in different bands? How could these be overcome?
7. What is the best approach to ensure continuing improvements in the performance of the New Zealand fleet?
8. What is the best longer-term approach for improving the performance of diesel engines, particularly with respect to particulate emissions?

Programme framework

There are three possible framework options for a vehicle emissions screening programme—centralised, decentralised, or a combination of both (a hybrid programme).

a) Centralised programme

This type of programme consists of a relatively small number (compared with that of a decentralised programme) of 'test-only' centres that carry out vehicle emissions screening checks. Vehicles that require repairs must be repaired elsewhere. This type of programme is typically operated by national or local governments or operated by contractors with government administration. Typically, centralised programme test centres perform a high volume of emissions screening checks at low operating costs. This also helps to justify the relatively high investment required for such centres in terms of equipment and inspector training.

A disadvantage of a centralised programme is the potential for public inconvenience, because there are a relatively small number of test centres and often long travel times to reach them. Another disadvantage is that a centralised programme does not provide for screening and repair services within the one organisation so repairs therefore have to be carried out at a separate organisation.

b) Decentralised programme

A decentralised programme typically consists of a larger number of test centres than are usually available in a centralised programme, carrying out both emissions screening and any required vehicle repairs. The main advantage of having a larger number of test centres is the convenience for the general public. In addition, the repairer can use the emissions screening equipment to verify the effectiveness of any repairs.

A major disadvantage of decentralised programmes is the need for significant capital expenditure against low inspection volumes. Programme management and quality control are also more difficult in a decentralised programme. In addition, there is risk inherent in test-and-repair centres being subject to different pressures: on the one hand, customer pressure could cause inspectors to pass vehicles that should otherwise fail; on the other hand, there could be incentives to fail vehicles to get repair business. These risks can be largely overcome by effective quality assurance systems.

c) Hybrid programme

A hybrid programme is a combination of the centralised and decentralised programmes (that is, both test-only centres and test-and-repair centres).

The current New Zealand entry certification regime is a centralised programme implemented by four test-only Transport Service Delivery Agents (TSDAs) appointed by the Land Transport Safety Authority (LTSA)[5]. The TSDAs are Vehicle Testing New Zealand, Vehicle Inspection New Zealand, OnRoad New Zealand, and the New Zealand Automobile Association.

The in-service certification regime incorporates a centralised programme (CoF inspections provided by TSDAs) and a hybrid programme (WoF inspections provided by both TSDAs and authorised test-and-repair WoF garages).

[5] The LTSA will become Land Transport New Zealand from December 2004.

The hybrid programme is the preferred option. It is proposed that the vehicle emissions screening programme will align with the existing entry and in-service certification regimes. The emissions screening programme would therefore consist of a centralised programme for vehicles entering the fleet and a hybrid programme for vehicles already in service.

Test-only centres would provide:

- screening of imported used vehicles as part of the entry certification process;
- screening of in-service vehicles requiring CoF inspections;
- screening of in-service vehicles requiring WoF inspections (if vehicle owners choose this option); and
- re-screening of vehicles that failed their initial emissions screening check and have under gone subsequent repairs.

Test-and-repair centres would provide:

- screening of in-service vehicles requiring WoF inspections (if vehicle owners choose this option);
- repairs for vehicles that fail the screening check; and
- re-screening of vehicles that failed their initial emissions screening check and have under gone subsequent repairs.

Some garages (such as those doing a low volume of WoF inspections) might decide not to participate in the vehicle emissions screening programme. Arrangements would need to be considered to allow these garages to continue to provide WoF services. This would have parallels to the alternative fuels inspection regime, where not all WoF garages provide alternative fuel safety inspections.

Suitable arrangements could include outsourcing vehicle emissions screening to other garages with the appropriate equipment and expertise, to specialist providers, or possibly to mobile test services (for remote areas). This would be similar to the existing mobile CoF inspections and mobile driver licensing services provided to remote areas in New Zealand.

Questions on the programme framework

9. Do you agree that the proposed hybrid framework is the most appropriate for the New Zealand situation?
10. What would be the main issues for testing stations and WoF garages around participating in the proposed in-service emissions screening programme?
11. What would be the main issues fort TSDAs around participating in the proposed entry emissions screening programme?
12. How much lead-in time would TSDAs and WoF or CoF garages require to be suitably equipped and trained to participate in the emissions screening programme?
13. What difficulties would you anticipate for smaller or geographically isolated garages?
14. What would you see as the major issues for garages wishing to outsource the emissions screening test in order to continue providing WoF services?

Test type

a) Petrol-fuelled vehicles
The available testing methods for measuring motor vehicle emissions vary in sophistication and cost. The more sophisticated tests are predominantly 'loaded' tests (such as the IM 240 or ASM test), where the engine of the vehicle is driven in gear against a simulated road load. Less sophisticated tests where the engine is not in gear are referred to as 'simple' tests.

Being more sophisticated, loaded tests are more accurate, but they are also a lot more expensive in terms of equipment required and ongoing operating costs. Loaded tests require a dynamometer (that is, a rolling road machine) to replicate on-road driving conditions and are used to assess carbon monoxide, hydrocarbon, and nitrous oxide emissions.

The IM 240 test is considered to be one of the most sophisticated tests used in vehicle emissions screening programmes. This test is used by vehicle manufacturers in the United States to measure emissions before vehicles can be approved for sale. The IM 240 is considered to provide the nearest simulation of standardised normal on-road driving whilst also measuring emission rates. The test reproduces vehicle inertia at varying speeds and conditions for 240 seconds. In the United States, the high costs of the IM 240 system restrict its application to centralised programmes.

Simple testing is less accurate than loaded testing but is considered suitable for identifying the gross emitters in a vehicle fleet. The main advantage of simple testing is that the equipment required is significantly less expensive. Simple test methods are widely used in emissions screening programmes overseas.

The idle/high-idle test is a simple emissions test carried out on stationary vehicles. A gas analyser is used to measure exhaust carbon monoxide and hydrocarbon emissions as well as the air to fuel ratio. This type of testing provides an approximate representation of overall engine operating condition. A car emitting too much at idle or increased idle speed would be a high emitter at almost any engine operating level.

b) Diesel-fuelled vehicles
Emissions tests for diesel-fuelled vehicles involve measuring exhaust smoke (particulate matter) densities using an opacimeter. The opacimeter measures the amount of light that can be transmitted through a plume of exhaust smoke.

Emissions from diesel-fuelled vehicles can be tested either while the vehicle is stationary or while the vehicle is in gear with the engine under load. As with petrol-fuelled vehicles, the more sophisticated loaded testing requires a dynamometer.

Simple tests carried out while vehicles are stationary cannot always give a reliable measure of smoke emissions in actual use but are considered suitable for identifying gross emitters of particulate matter.

Given that the New Zealand vehicle emissions screening programme aims to identify the very worst emitting vehicles in the New Zealand fleet, sophisticated testing is unlikely to be required. It is proposed to implement the following simple tests for screening imported used vehicles and vehicles already in the New Zealand fleet:

- the idle/high-idle test for petrol-fuelled vehicles; and
- the smoke opacity test for diesel-fuelled vehicles.

A visual inspection would also be undertaken as part of the vehicle emission screening procedure for both petrol- and diesel-fuelled vehicles. Further information on vehicle emissions testing procedures is available in the in the *New Zealand Vehicle Emissions Screening Programme—Resource Document.*

Questions to consider

15. Do you believe the simple tests proposed are the most suitable tests for the New Zealand situation?
16. Are there any other practical implications of implementing simple testing that should be considered (including implications for equipment and facilities)?

Vehicles to have emissions screening checks

It is proposed that the vehicle classes that are subject to the Vehicle Exhaust Emissions Rule and that are required to have entry and in-service certification (that is, WoF or CoF inspections) should be required to have vehicle emission screening checks.

The relevant vehicle classes are:

- passenger vehicles (cars)—classes MA, MB, and MC;
- buses and vans—classes MD1, MD2, MD3, MD4, and ME; and
- goods vehicles—classes NA, NB, and NC.

A table with definitions of these vehicle classes is in the appendix to this document.

It is possible that some vehicles might be exempt from the emission screening requirements. Proposals about which vehicles should be exempt will be developed when the information gathered during the Vehicle Emissions Pilot Testing Programme is analysed. Potential exemptions from screening could include new vehicles (vehicles not previously registered anywhere in the world) until they reach a certain age and vehicles over a specified age. If new vehicles were exempt, other options would need to be investigated to ensure they maintain their emissions performance.

Irrespective of any exemptions, vehicles used on New Zealand roads would continue to be subject to the 10-second smoky vehicle rule (under Regulation 28 of the *Traffic Regulations 1976)* which does not allow a vehicle to emit excessive visible exhaust smoke.

Questions to consider

17. Do you think new vehicles should be exempt from the screening programme? If yes, at what age should a new vehicle have its first emissions screening check?
18. If new vehicles are exempt from screening tests, what is the best way to ensure new vehicles maintain their emissions performance?
19. Do you think older vehicles should be exempt from the screening programme? If yes, from what age should older vehicles be exempt and why?
20. Should any other vehicle types be exempt from the emissions screening programme and, if so, why?

Frequency of in-service vehicle emission screening

The vehicle emissions screening programme will be incorporated into the existing in-service inspection regime (WoF and CoF), so the frequency of screening checks will need to align with that regime. However, there might be reason to require emissions screening checks for some vehicles less frequently than standard WoF and CoF inspections. Information gathered during the Vehicle Emissions Pilot Testing Programme will be used to develop proposals about the frequency of vehicle emission screening.

a) WoF vehicles

Current thinking is that vehicles requiring a WoF will be required to have an emission screening check every 12 months. For vehicles under 6 years old, this would mean a screening check at every WoF inspection (bearing in mind that new vehicles might be exempt from emission screening for a specified number of years). For vehicles over 6 years old, this would mean a screening check at every second WoF inspection.

WoF regime	**Existing inspection frequency**
Vehicle less than 6 years	Every 12 months
Vehicle more than 6 years	Every 6 months
Emissions screening within WoF regime	**Possible frequency**
Vehicle less than [x] years	Exempt from emission screening
Vehicle between [x] and 6 years	Every 12 months
Vehicle more than 6 years	Every 12 months

b) CoF vehicles

Current thinking is that vehicles requiring a CoF would be required to have an emission screening check every 6 months. This would mean an emission screening check at every CoF inspection. As with WoF vehicles, new vehicles might be exempt from emission screening for a specified number of years.

More frequent emission screening (relative to WoF vehicle screening) might be justified due to the high proportion of diesel-fuelled commercial and heavy vehicles in this group and the high mileages associated with these vehicles. The Vehicle Emissions Pilot Testing Programme will provide information with which to develop frequency proposals.

CoF regime	**Existing inspection frequency**
All vehicles	Every 6 months
Emissions screening within CoF regime	**Possible frequency**
All vehicles less than [x] years	Exempt from emissions screening
All vehicles more than [x] years	Every 6 months

Questions to consider

21. Do you think emissions screening should be required at every WoF?
22. Do you think emissions screening should be required at every CoF?
23. Do you agree that newer vehicles should have less frequent emissions screening checks than older vehicles? If yes, at what age should screening start and at what age should it become more frequent?

4. IMPLEMENTATION

Compliance

A high level of compliance with the proposed New Zealand vehicle emissions programme is essential to achieve the objectives of the Vehicle Emissions Policy and reduce vehicle emissions. As the screening programme will align with the entry and in-service certification regimes, the existing compliance mechanisms would be used to discourage non-compliance and ensure the effectiveness of the programme.

a) Entry certification
   Vehicles that are not entry-certified cannot be registered for use on New Zealand roads. There would be no way of registering a vehicle that did not pass the emissions screening check carried out as part of entry certification inspections.

   Instructions for inspectors would be included in the *Entry Vehicle Inspection Requirements Manual.*

b) In-service certification
   The current compliance mechanisms in place for the WoF and CoF inspection regimes would apply to the in-service emissions screening programme. As with any other inspection item, an in-service vehicle that fails the emissions screening check would not be issued with a WoF or CoF until appropriate repairs were carried out and the vehicle passed a subsequent test. A vehicle without a current WoF or CoF inspection label cannot legally be used on the road and vehicle owners who use such vehicles can be issued with infringement fines.

Instructions for WoF and CoF inspectors would be included in the *In-Service Vehicle Inspection Requirements Manual.*

Quality assurance

The LTSA Vehicle Certification Unit maintains a nationwide network of inspection reviewers. Reviewers implement a performance review system to assess the performance of entry and in-service certification inspectors and support them and the vehicle certification industry. Complaints about the issuing of a WoF, CoF, or any other vehicle certification can be referred to the Vehicle Certification Unit if the matter cannot be resolved between the parties concerned.

The existing performance review system could extend to cover the proposed vehicle emissions screening programme to ensure the consistent quality of emissions screening checks. The *Vehicle Inspection Requirements Manual* would outline the screening procedures to be followed for each screening check and the emission performance limits that vehicles had to comply with. The LTSA has powers to take remedial action where there is reason to believe a vehicle inspector or inspecting organisation has failed to comply with the conditions of their appointment or the requirements in the *Vehicle Inspection Requirements Manual.*

On-road enforcement

a) Current measures
The enforcement measures that exist for the WoF and CoF regime would continue to apply. Vehicle owners are issued with an infringement notice for not displaying a current WoF or CoF label. Vehicles without a current WoF or CoF because they did not pass the vehicle emissions screening check could be identified by local authority wardens or by the police during roadside vehicle checks.

Vehicles used on New Zealand roads will continue to be subject to the 10-second 'smoky vehicle rule' (currently Regulation 28 of the *Traffic Regulations 1976*), which does not allow a vehicle of any age to emit excessive exhaust smoke. This regulation might be transferred to the Land Transport Rule.

b) Supplementary on-road enforcement
The introduction of the vehicle emissions performance limits allows for the introduction of supplementary enforcement measures to identify gross-emitting vehicles. These could, for example, include vehicles that passed an emissions screening check when they received their last WoF or CoF but no longer met the applicable performance limits.

Random roadside vehicle inspections could be carried out using the same emissions screening procedures and equipment used by inspection organisations as part of the WoF and CoF inspection regime. This could be a useful tool to help local authorities monitor or improve compliance with the emissions performance limits in specific targeted areas (such as urban areas). In New Zealand, only uniformed police officers have the authority to stop vehicles at the roadside, so authorities wishing to carry out roadside emissions screening checks would need to work with the police.

Another possible enforcement tool is remote sensing, which uses a beam of infra-red light to measure a vehicle's exhaust emissions at the instant the vehicle passes the remote-sensing device (usually set up by the side of a road). This provides a snapshot of emission levels but is not always a reliable indicator of the vehicle's actual emissions performance. This is because even properly functioning vehicles can exhibit high emissions of carbon monoxide and hydrocarbons under certain driving conditions such as acceleration or 'cold-starting'. Difficulties are also encountered with diesel trucks, which have vertical exhaust systems outside the range of such remote sensors.

The main advantage of remote sensing is that a large number of vehicles can be screened quickly at low cost. Unlike roadside emissions screening, remote sensing does not require vehicles to be stopped, as registration numbers can be recorded for any subsequent follow-up. Follow-up could include the dissemination of information or advice on vehicle emissions. Any follow-up involving enforcement would require the co-operation of the police.

Questions to consider

24. Do you think any changes should be made to regulation 28 of the *Traffic Regulations 1976*, if this section is transferred into the Land Transport Rule?
25. What would you see as the main advantages and limitations of enforcing the emissions performance limits?
26 Do you have any views or opinions about the use of supplementary on-road enforcement options?

Industry training and equipment

It is essential that vehicle inspectors have appropriate equipment and adequate training to implement the proposed vehicle emissions screening programme. Before the introduction of the programme, inspecting organisations and vehicle repairers must have the necessary skills and equipment to:

- correctly carry out the appropriate emissions screening check;
- correctly diagnose any defects in emission-control equipment for vehicles that fail the screening check; and
- carry out any repairs required (if appropriate).

The Ministry of Transport will work closely with the Motor Trade Association and other key stakeholders during the development and implementation of the emissions screening programme to ensure that the necessary infrastructure is in place. It is anticipated that this process will commence once the results from the Vehicle Emissions Pilot Testing Programme have been analysed.

The Vehicle Emissions Pilot Testing Programme will also help identify the most appropriate equipment for carrying out vehicle emissions screening. Stakeholders will have a further opportunity to comment on the equipment and training required as part of the Land Transport Rule development process.

5. PUBLIC EDUCATION

The approach

The new vehicle emissions screening programme would be complemented by activity to raise awareness and understanding of the impact of vehicle emissions, the rationale for the screening programme, and the programme's benefits to motorists. The aim is to maximise the number of people who willingly comply with the new testing regime ahead of the programme implementation and to minimise any confusion. This will be achieved by disseminating information to vehicle owners about the steps they can take to reduce their vehicle's emissions and to ensure they know about the screening tests before the new requirements take effect. Public education and information activity will be backed up by research to identify what people know about vehicle emissions, compliance issues, and incentives. In general terms, the public education programme will centre around simple and clear information about:

- what vehicle emissions are, and why they are an issue;
- what the Government is doing about them and why;
- what vehicle owners and importers will have to do about high emitting vehicles, when, and why; and
- what everyone can do themselves and why.

Leading up to the start of the screening programme a range of resources, activities, and public education material will be developed to support motorists.

Core actions

The activity will focus on three core actions:

- Awareness will be built of vehicle emissions as a problem and the proposed measures to reduce emissions.
- People will be encouraged to think about the changes and the proposed solutions. This activity will deepen understanding of the reasons for change, the benefits to the consumer and vehicle owner, and what motorists can do to minimise vehicle emissions.
- Action and compliance will be encouraged. This phase would see the continued identification of the problem, presentation of solutions, and encouragement of people to take action. Information will be provided about the benefits of lower vehicle emissions, the new requirements, impact, start dates, what motorists can and should be doing to meet the new requirements, and the implications of not meeting the requirements.

Partnerships with industry and business will be developed to bolster the public education effort and to identify and implement additional innovative communications activities and opportunities. Advertising will be used where appropriate.The activity will link into and complement the New Zealand Climate Change Office "4 Million Careful Owners" public education programme. It will also link into the Energy Efficiency Conservation Authority's activity around vehicle fuel economy and renewable transport fuels. Additional information to help inform the activity will become available through the Social Impact Assessment work being carried out.

Questions about public education:

27. Do you have any further suggestions on how the introduction of the emissions screening programme could be managed to ensure vehicle owners are prepared for the introduction of emissions performance requirements?

APPENDIX: MOTOR VEHICLE CLASSES

Class	Definition
Passenger vehicle	A motor vehicle that: (a) is constructed primarily for the carriage of passengers; and (b) either (i) has at least four wheels, or (ii) has three wheels and a gross vehicle mass exceeding one tonne.
MA (Passenger car)	A passenger vehicle (other than a Class MB or Class MC vehicle) that has not more than nine seating positions (including the driver's seating position).
MB (Forward control passenger vehicle)	A passenger vehicle (other than a Class MC vehicle): (a) that has not more than nine seating positions (including the driver's position); and (b) in which the centre of the steering wheel is in the forward quarter of the vehicle's total length.
MC (Off-road passenger vehicle)	A passenger vehicle, designed with special features for off-road operation, that has not more than nine seating positions (including the driver's position), and that: (a) has a four-wheel drive; and (b) has at least four of the following characteristics when the vehicle is unladen on a level surface and the front wheels are parallel to the vehicle's longitudinal centre-line and the tyres are inflated to the vehicle manufacturer's recommended pressure (i) an approach angle of not less than 28 degrees, (ii) a breakover angle of not less than 14 degrees, (iii) a departure angle of not less than 20 degrees, (iv) a running clearance of not less than 200 millimetres, and (v) a front-axle clearance, rear axle clearance, or suspension clearance of not less than 175 millimetres.
Omnibus	A passenger vehicle that has more than nine seating positions (including the driver's position). An omnibus compromising two or more non-separable but articulated units shall be considered as a single vehicle.
MD1	An omnibus that has a gross vehicle mass not exceeding 3.5 tonnes and not more than 12 seats.
MD2	An omnibus that has a gross vehicle mass not exceeding 3.5 tonnes and more than 12 seats.
MD3	An omnibus that has a gross vehicle mass exceeding 3.5 tonnes but not exceeding 4.5 tonnes.

Class	Definition
MD4	An omnibus that has a gross vehicle mass exceeding 4.5 tonnes but not exceeding 5 tonnes.
ME (Heavy omnibus)	An omnibus that has a gross vehicle mass exceeding 5 tonnes.
Goods vehicle	A motor vehicle that: (a) is constructed primarily for the carriage of goods; and (b) either (i) has at least four wheels, or (ii) has three wheels and a gross wheel mass exceeding one tonne. For the purpose of this description (a) a vehicle that is constructed for both the carriage of goods and passengers shall be considered primarily for the carriage of goods if the number of seating positions multiplied by 68 kg is less than 50% of the difference between gross vehicle mass and the unladen mass, (b) the equipment and installations carried on special purpose vehicles not designed for the carriage of passengers shall be considered to be goods, (c) a goods vehicle that has two or more non-separable but articulated units shall be considered to be a single vehicle.
NA (Light goods vehicle)	A goods vehicle that has a gross vehicle mass not exceeding 3.5 tonnes.
NB (Medium goods vehicle)	A goods vehicle that has a gross vehicle mass exceeding 3.5 tonnes but not exceeding 12 tonnes.
NC (Heavy goods vehicle)	A goods vehicle that has a gross vehicle mass exceeding 12 tonnes.