TE MANATŪ WAKA
MINISTRY OF TRANSPORT

22 June 2022 OC220469

Hon Michael Wood
Minister of Transport

Action required by:
Friday, 1 July 2022

RELEASE OF HAPINZ 3.0

Purpose

Preparing you for the release of the upcoming Health and Air Pollution in New Zealand (HAPINZ 3.0) report. It details the health impacts that air pollution has on the health of New Zealanders and its implications for transport.

Key points

- On 6 July 2022, the Ministry for the Environment Manatū Mō Te Taiao will release HAPINZ 3.0. HAPINZ is a study on the health effects and social costs of air pollution in New Zealand. The research is an update to previous HAPINZ studies published in 2007 and 2012.
- The health effects and social costs associated with air pollution are increasing. Although concentrations of particulate matter (PM) have decreased over recent years in many places, nitrogen dioxide gas concentrations (NO_2) have increased, along with the number of people exposed to air pollution.
- Results from the 2022 HAPINZ 3.0 study show that based on data from 2016, air pollution in New Zealand contributes annually to:
    - the premature deaths of more than 3,300 adult New Zealanders, with over 2,400 of those premature deaths due to motor vehicle pollution
    - more than 13,100 hospital admissions for respiratory and cardiac illnesses
    - over 13,200 cases of childhood asthma, including 845 asthma hospitalisations for children
    - approximately 1.745 million restricted activity days (days on which people could not do the things they might otherwise have done if air pollution had not been present).
- Unlike previous reports, this study has found that motor vehicles are now the greatest contributor to air pollution health effects in New Zealand and domestic fires are the second largest contributor. The social costs from air pollution health impacts now total $15.6 billion per annum, with around two thirds due to motor vehicle emissions.

- These impacts are far more significant than expected and highlight that even exposure to low levels of vehicle pollution can be harmful. This is a new finding for New Zealand and one that is now being confirmed around the world.
- The increase in importance of vehicles as a source of pollution is because the effects of NO_2 were not considered in previous studies due to insufficient information about NO_2 levels in air and NO_2 specific health impacts.
- Due to the significance of the findings, an additional international peer review of the study was commissioned. The review recommended additional analysis, which once completed, confirmed and increased confidence in the original findings.
- The work underway to require Euro 6/VI has the potential to decrease the impact of motor vehicle pollution over the coming years. The implementation of the first emissions reduction plan will also contribute to lowering levels of motor vehicle pollution, through mode shift and cleaner energy sources (such as electricity, alternative fuels, and hydrogen) in the longer term.

Recommendations

We recommend you:

1	**note** Te Manatū Waka Ministry of Transport, Ministry for the Environment, Ministry of Health, and Waka Kotahi New Zealand Transport Agency will release the HAPINZ 3.0 report on 6 July 2022	
2	**note** the Ministers and Associate Ministers of the Health and Environment portfolios have been briefed on the release of the HAPINZ 3.0 report	
3	**agree** to discuss with the associate Minister of Health and the Minister for the Environment the release of a joint media statement, prepared by the agencies above.	Yes/No

Joanna Pohatu
Acting Manager, Environment, Emissions and Adaptation
22 / 6 / 2022

Hon Michael Wood
Minister of Transport
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Minister's office to complete: ☐ Approved ☐ Declined

☐ Seen by Minister ☐ Not seen by Minister

☐ Overtaken by events

Comments

Contacts

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RELEASE OF HAPINZ 3.0

HAPINZ 3.0 will be released on 6 July 2022

1 HAPINZ 3.0 was undertaken by New Zealand experts in air quality, health and economics and has been internationally peer reviewed. The research is an update to previous HAPINZ studies published in 2007 and 2012.

2 Results from the 2022 HAPINZ 3.0 study show that air pollution significantly harms many New Zealanders. Based on data for 2016, air pollution in New Zealand contributes annually to:

2.1 the premature deaths of more than 3,300 adult New Zealanders, with over 2,400 of those premature deaths due to motor vehicle pollution

2.2 more than 13,100 hospital admissions for respiratory and cardiac illnesses

2.3 over 13,200 cases of childhood asthma, including 845 asthma hospitalisations for children

2.4 approximately 1.745 million restricted activity days (days on which people could not do the things they might otherwise have done if air pollution had not been present).

3 The social costs from air pollution health impacts now total $15.6 billion per annum, an increase of over 10 percent from 2006. About 60 percent ($9.5 billion) is due to NO_2, which is solely attributed to motor vehicle emissions.

4 The social costs of $PM_{2.5}$ pollution from anthropogenic sources in New Zealand in 2016 was $6.1 billion. PM comes from a range of sources, including heating, industrial activity, and motor vehicle pollution. HAPINZ 3.0 found $PM_{2.5}$ pollution was attributed mainly to domestic fires (74 percent) and motor vehicle emissions (17 percent).[1]

5 Sources which contributed to the health burden caused by anthropogenic air pollution in New Zealand in 2016, at the national scale:

5.1 Motor vehicles were responsible for 67 percent of the total health burden ($10.5 billion)

5.2 Domestic fires contributed 29 percent ($4.6 billion)

5.3 Windblown dust from construction and other activities contributed 3 percent ($0.5 billion)

5.4 Industry contributed less than 0.05 percent but it is very location-dependent ($7.7 million).

[1] $PM_{2.5}$ are particulate pollutants that are 2.5 microns or smaller. Microns are 0.001mm in size.

Unlike previous HAPINZ reports, this study has found that motor vehicles were the greatest contributor to air pollution health effects in New Zealand

6 The growth in both the vehicle fleet size (especially diesel vehicles) and the number of people exposed to air pollution means the health effects and social costs associated with air pollution are increasing. This is despite a decrease in levels of particulate matter in New Zealand's air because actions have been taken to reduce emissions from wood burners used to heat homes in winter over the past twenty years. Vehicle fuel and emissions standards have also contributed to the decrease.

7 The increase in importance of vehicles as a source of pollution is because we now know much more about the harm caused by NO_2 that mostly comes from diesel vehicle tailpipe emissions in New Zealand. Of the more than 3,300 premature deaths associated with (anthropogenic) air pollution in New Zealand, more than 60 percent were associated with NO_2 pollution. The effects of NO_2 were not considered in previous studies because there was insufficient information about NO_2 levels in air and the specific health impacts from NO_2.

8 These impacts are far more significant than expected and provide evidence that even exposure to low levels of vehicle pollution can be harmful. This is a new finding for New Zealand and one that is now being confirmed around the world.[2]

9 Due to the significance of the findings, an additional international peer review of the study was commissioned. The review recommended additional analysis, which once completed, confirmed and increased confidence in the original findings.

10 The study does not account for changes to air pollutants or health risks due to the COVID-19 pandemic. The Ministry of Health (MoH) has commissioned a separate study using the HAPINZ 3.0 model to examine the effect that reduced air pollution levels from the COVID-19 lockdowns had on health impacts from air pollution.

There are measures underway to reduce harmful motor vehicle pollution

11 As you are aware, officials are working towards requiring more stringent emissions standards. Implementing stringent standards has the potential to avoid over $8 billion dollars in social harm costs out to 2050 and is the most significant action we can take to reduce the harm caused by motor vehicle pollution in the long term.

12 The release of the HAPINZ 3.0 report is an important tool to progress this work and provides impetus to combat harmful vehicle emissions through emission standards and other measures.

Elements of our current work programme that will reduce harmful air pollution

13 There are some initiatives underway or agreed in the Emissions Reduction Plan (ERP) which will have a positive impact on motor vehicle pollution. You will be familiar with this table from "OC220137 Release of HAPINZ 3.0 and options to reduce motor vehicle harmful emissions".

[2] https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health

Underway Initiatives	Details
Mode-shift	Work underway to reduce vehicle kilometres travelled (VkT) will help to reduce harmful emissions from motor vehicles.
The Clean Vehicles Programme	The Clean Vehicle Discount and Standard, which will continue to incentivise consumers towards low and zero-emission vehicles, is likely to result in reduced harmful emissions over the long term.
Freight decarbonisation	The work on the Green Freight project and current freight decarbonisation strategy is likely to reduce levels of harmful pollution from heavy vehicles. Shifting freight to coastal shipping and rail, promoting low carbon fuels, more efficient logistics, and re-rerouting heavy vehicles away from population-dense areas would all help to reduce harmful emissions in the long-term.
MARPOL Annex VI	Acceding to the Marine International Convention for the Prevention of Pollution from Ships (MARPOL) will reduce harmful emissions from shipping in and around New Zealand ports and harbours.
Public transport bus fleet decarbonisation	The public transport bus fleet is progressively being decarbonised. The Government requires all new public transport buses must be electric from 2025 and is targeting decarbonisation of the entire fleet by 2035. Based on existing diesel buses being operated until they reach a maximum of 20 years, we expect that most of our 900 very worst emission (Euro 3 and Euro 4) buses will exit the fleet between 2022 and 2032. From 2032, we would expect to see significant numbers of our existing 1000 Euro 5 buses exiting the fleet, but a full replacement of these vehicles would likely take until 2041. Accelerating the replacement of Euro 3, 4 and 5 buses with zero-emission buses sooner would be reliant on additional funding given the current cost premium for providing services with electric buses.

Additional measures

14 You will be familiar with the additional measures below as explored in OC220137, and you have indicated interest in updating the Government procurement rules and low-emission zones (LEZs). Officials are continuing to explore possibilities in these areas but are prioritising the Euro 6/VI implementation work initially.

15 Although some of the actions in the ERP will help to reduce harmful emissions, the HAPINZ 3.0 report makes it clear that further action will be required to drastically reduce the impact of motor vehicle pollution. This could include additional measures explored in the table below or using existing tools such as the Clean Vehicle Programme to further promote electric vehicles and petrol hybrids.

Potential initiatives	Details
Update the government procurement rules	So that where diesel vehicles are purchased or used in contracting arrangements, they should be Euro 6 or better. This will help to stimulate suppliers into providing Euro 6 vehicles ahead of it being a legal requirement. Officials are engaging with MBIE, who would undertake this work. This could also link in with the Carbon Neutral Government Programme, as agencies seek to decrease and electrify their vehicle fleets.

Public information campaigns	Government agencies could carry out consumer-facing public information communications on the harm caused by diesel engines, promote the use of Euro 6 and zero emission vehicles, and increase awareness of helpful behavioural changes, such as avoiding unnecessary engine idling outside schools and in populated areas.
Engage with organisations	Once the HAPINZ 3.0 report is public, we will look to engage with relevant agencies, asthma organisations, health organisations, including Māori health organisations, councils, and other relevant parties, to develop further advice and to invite them to be part of wider efforts to build awareness about harmful emissions.
Update Rightcar website	To accurately depict harmful emissions on vehicle models. For instance, currently a Euro 5 diesel ute receives five out of six stars for its air pollution rating, which we deem too generous given the high air pollution levels of Euro 5 diesel vehicles.
Investigate further initiatives with industry	Engage with the motor vehicle industry to investigate affordable and practical methods to reduce harmful emissions in our existing fleet of diesel utes, vans, and trucks. For example, there could be additional checks and fixes at warrant of fitness and certificate of fitness tests, or Clean Vehicle Retrofits. Overseas, Euro 6/VI technology is retrofitted to older heavy vehicles to help them comply with Low Emission Zones. Any additional checks at warrant and certificate of fitness checks, or vehicle retrofitting, is highly complex work and will
Low-Emission Zones (LEZs)	s 9(2)(f)(iv) [redacted]
Off-road diesel fuel use	Nearly 30 percent of New Zealand's diesel fuel is used in 'off road' applications such as agricultural machinery, construction, mining, portable generators, and recreational boating. There is currently no legislation that regulates emissions from off-road equipment. There is some precedent for this overseas and standards that can apply to these kinds of vehicles and machinery, but more work will need to be done as to the organisation appointed to have the legal mandate to regulate them. More work is needed to assess the appropriate ways to address this issue. The Energy Efficiency Conservation Authority (EECA) is researching use of off-road fuels and has funding mechanisms that may help address the issue partially, by supporting businesses to shift into electrification and more efficient equipment. There are also safety concerns around some of this equipment, regardless of how they are powered. We are in the process of discussing this topic further with EECA.
Increased roadside monitoring of NO_2	Central and local Governments should investigate greater roadside monitoring of NO_2 to use as input into air quality models. This will enable government to identify local areas of concern, so appropriate mitigations can be applied, and will increase the data and information available to better inform policy.

Consultation and collaboration

16 This study was funded jointly by MfE, MoH, Waka Kotahi New Zealand Transport Agency (Waka Kotahi) and Te Manatū Waka Ministry of Transport (the Ministry).

17 The steering committee was made up of representatives from these agencies plus Statistics New Zealand and Regional Councils. The study was undertaken by air quality, health, and economics experts from New Zealand businesses and universities. It was peer reviewed by three international subject matter experts.

18 A briefing on the report and its implications for the Health and Environment portfolios has been sent to the Ministers and Associate Ministers of Health, Environment, and Climate Change.

Next steps

19 The study, report, and data will be released publicly on 6 July 2022. The Ministry and Waka Kotahi will publish a webpage on HAPINZ 3.0 on our respective websites, linking to the report on MfE's website.

20 On agreement, the Ministers of Health, Environment and Transport will receive a joint communications plan with key messages.

21 Work with Waka Kotahi to update Rightcar so that it better reflects the significance of vehicle emissions in light of the HAPINZ findings.

22 The Ministry will send a copy of the report and accompanying data and information to vehicle industry stakeholders, including the Motor Industry Association, Imported Motor Vehicle Association, Automobile Association, Motor Trade Association, the Special Interest Vehicle Association of New Zealand, and the New Zealand Bus and Coach Association.

23 The Ministry will also engage with the Māori Health Authority and Asthma New Zealand on release of the report and affected road users such as active and public transport users.