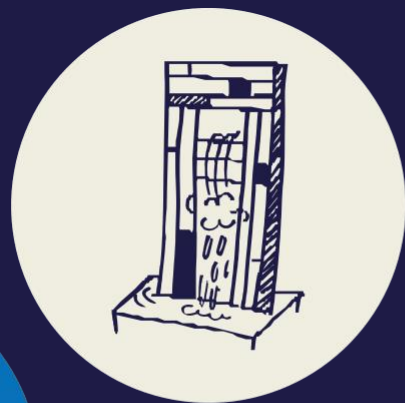


HAMILTON CITY COUNCIL SUBMISSION

Proposed Amendments to the Land Transport Rule: Vehicle Exhaust Emissions 2007 (May 2023 Consultation Document)

Ministry of Transport



20 June 2023



**Hamilton
City Council**
Te kaunihera o Kirikiriroa

Improving the Wellbeing of Hamiltonians

Hamilton City Council is focused on improving the wellbeing of Hamiltonians through delivering to our five priorities of shaping:

- **A city that's easy to live in**
- **A city where our people thrive**
- **A central city where our people love to be**
- **A fun city with lots to do**
- **A green city**

The topic of this submission is aligned to the priority '**A green city**'.

Council Approval and Reference

This submission was approved by the Chair of Hamilton City Council's Infrastructure and Transport Committee on 20 June 2023.

Hamilton City Council Reference D-4738186 - Submission # 738.

Key Messages

1. Hamilton City Council is supportive of the Ministry of Transport's **Proposed Amendments to the Land Transport Rule: Vehicle Exhaust Emissions 2007 (May 2023 Consultation Document)**.
2. We have recently made various submissions that are strongly aligned to this space. These include submissions to the **Land Transport (Clean Vehicles) Amendment Bill** ([refer here](#)) and the Ministry of Transport's **Transport Emissions - Pathways to Net Zero by 2050 - Green Paper (May 2021)** ([refer here](#)).
3. We acknowledge the significant role that the Proposed Amendments support in improving air quality in Hamilton, and the role it plays in delivering our Transport Strategy Access Hamilton - Ara Kootuitui Kirikiriroa.
4. The **Air Quality in Hamilton** section (and Appendix 1) of this submission provides an air quality indicator update for the Hamilton Airshed for the 10-year period 2013 to 2022. While exceedances have been recorded for PM10, PM 2.5 and NO2, the long term 10-year trend for these variables is either indeterminate or there is not sufficient data to determine a long-term trend. Implementation of the Proposed Amendments is seen as another key step in ensuring the ongoing improvement to Hamilton's air quality.
5. We recognise that the proposals focus on emissions that are harmful to human health (such as nitrogen oxides and carbon monoxide), and do not focus on carbon dioxide (CO₂) emissions that are harmful to the climate.
6. However, we would like to see recognition of the fact that there is overlap between the emissions that are harmful to human health and emissions that are harmful to the climate. For example, the Euro 6 emission standard sets a legal requirement for a car manufacturer to average CO₂ emissions below 98g/km (compared to 136g/km for the Euro 5 emission standard).
7. We are strongly committed to the [Emissions Reduction Plan](#) and our role in achieving the targets set out in this document, particularly those related to transport as transport emissions make up 64% of Hamilton's emissions profile (2018/19), and Hamilton City currently has high car dependency.
8. Therefore, we would like to see greater consideration of how the impacts of the Proposed Amendments will affect emissions that are harmful to the climate, and how far the Proposed Amendments will go towards achieving emissions reductions and targets set out in the Emissions Reduction Plan.
9. The Proposed Amendments outlined in the May 2023 Consultation Document do not make it clear if the timeframes for the changes are sufficient to effectively deliver on the Emissions Reduction Plan and emissions targets.
10. A better understanding of the implications of the Proposed Amendments on the Emissions Reduction Plan and its targets is required before we can comment on the pace of the proposed changes (as proposed, sped up, or are reduced).
11. Our response to the pace of the changes would be dependent on their impact on contributing to the Emissions Reduction Plan and targets. However, we also recognise that the timelines must be realistic and achievable for businesses and individuals to implement the changes, and to ensure that we achieve a just transition to a low-carbon future.
12. With this in mind, we support the introduction of higher emissions standards for light vehicle fleet; the introduction of formal emissions standards into the motorcycle and moped industry; and support both the retained and proposed exemptions.
13. However, we encourage the Ministry of Transport to consider the impacts of the Proposed Amendments on transport greenhouse gas emissions as outlined above, to recognise that these changes can and should lead to climate change benefits in addition to reducing impacts on human health.

14. We support the timeline extension for 'Disability Vehicles' to ensure we have a just, fair, and inclusive transition to the new standards of vehicles, and to minimise the potential supply constraints with obtaining a modified vehicle and seeking exemptions from the Director of Land Transport.

Introduction

15. Hamilton City Council welcomes the opportunity to make a submission to the Ministry of Transport's **Proposed Amendments to the Land Transport Rule: Vehicle Exhaust Emissions 2007 (May 2023 Consultation Document)** - referred to as the **Proposed Amendments**.
16. Hamilton City Council has recently made various submissions that are strongly aligned to this space, including:
- The 4 November 2021 submission by Hamilton City Council staff ([refer here](#)), which supported the overall intent of the **Land Transport (Clean Vehicles) Amendment Bill** i.e., *To achieve a rapid reduction in carbon dioxide emissions from light vehicles imported into New Zealand by increasing the supply and variety of zero and low-emissions vehicles, increasing the demand for zero and low-emissions vehicles, and informing New Zealanders about vehicle emissions levels and rebates receivable or charges payable in relation to light vehicles.*
 - Hamilton City Council's 25 June 2021 submission to the Ministry of Transport's **Transport Emissions - Pathways to Net Zero by 2050 - Green Paper (May 2021)** ([refer here](#)), noting that this submission was generally supportive of the Green Paper, with the key messages being:
 - *Support the Avoid, Shift, Improve Framework underpinning the approach to the Green Paper and emissions reduction in the transport sector. As well as reducing the need to travel, we see increasing mode shift as being the priority for Hamilton.*
 - *Investment needs to align with the Avoid, Shift, Improve Framework - the current Government Policy Statement on Land Transport 2021/22 - 2030/31 does not provide the necessary signals and investment to achieve the emissions reductions required.*
 - *The Green Paper is a good start in outlining an approach to reducing transport emissions. We are supportive of Pathways One and Four as outlined in Chapter 10 of the Green Paper, as they have the strongest focus on Theme 1: Changing the way we travel.*
17. There is an evidential link between the emissions released from internal combustion engine (ICE) vehicles and the surrounding air quality.
18. Implementation of the Proposed Amendments is another key step in ensuring the ongoing improvement to Hamilton's air quality, particularly as Hamilton City has the highest rate of car dependency in New Zealand with 86% of all trips being made in a private vehicle (car).
19. Overall, we are supportive of the Proposed Amendments to reduce emissions from motor vehicles that cause significant harm to our health.
20. We understand that the proposals are focused on emissions that are harmful to health (e.g., nitrogen oxides) and that these are different to greenhouse gas emissions (e.g., carbon dioxide, CO₂). We also recognise that greenhouse gas emissions for light fleet are regulated separately i.e., through the Land Transport (Clean Vehicles) Amendment Act 2022.
21. However, we encourage the Ministry of Transport to recognise that there is an overlap between the two. For example, nitrogen oxides impact health in the ways outlined on page 10 of the Consultation Document, but also lead to the formation of ozone, which is a greenhouse gas.

22. We also note that the Euro 6 emission standard sets a legal requirement for a car manufacturer to average CO₂ emissions below 98g/km (compared to 136g/km for the Euro 5 emission standard).
23. As such, we would like to see greater consideration and explanation of how the Proposed Amendments can have positive impacts on greenhouse gas emissions from transport, and how they align with the Emissions Reduction Plan and transport targets set in the Consultation Document.
24. We are strongly committed to the Emissions Reduction Plan and our role in achieving the targets. However, the Consultation Document does not address if the Proposed Amendments and their timeframes contribute to delivering the Emissions Reduction Plan and associated targets. Our response to the pace of the changes would be dependent on the contribution to the Emissions Reduction Plan and targets, and whether they support a just transition to a low-carbon future by enabling businesses and individuals to comply with the new measures in a realistic timeframe that also delivers to our climate change goals.
25. In summary, we are supportive of the proposals outlined, but would like to understand their role in greenhouse gas emission reductions. Whether the pace of the changes remain the same, sped up, or are reduced, is dependent on their contribution to the Emissions Reduction Plan and impact to achieving the associated targets.

Consultation Questions on Euro 6/VI Vehicle Emissions Standard

26. Hamilton City Council has provided feedback only to the questions in the Consultation Document that are of most relevance to our role as both local authority and a Road Controlling Authority.

Proposal One - Requiring a Stronger Standard for Harmful Emissions from Light Vehicles

27. **Q2: Do you consider the proposed timeframes to require stronger standards for harmful emissions from light vehicles should:**
 - a. Be pushed back
 - b. Be bought forward
 - c. Proceed as proposed
 - d. Not be implemented at all
28. We support Proposal One to require a stronger standard for harmful emission from light vehicles as it will enable better health outcomes from Aotearoa. However, a better understanding of the implications of the proposal for the Emissions Reduction Plan and its targets is required before we can comment on the pace of the proposed changes. Our response would be dependent on the impact of the stronger emissions standards for light vehicles on the Emissions Reduction Plan and targets, and whether the proposal timeframes are realistic for business and individuals to comply in a way that ensures a just transition to a low-carbon future.
29. **Q3: Please explain your answer for question for question two:**
30. This proposal aims to reduce the emissions associated with light vehicles that are harmful to human health, and we acknowledge the significant emissions reductions and health benefits that the proposal brings.
31. However, we encourage the Ministry of Transport to recognise that emissions that are harmful to human health can also be greenhouse gas emissions that are harmful to the climate. As such Proposal One will likely have some impact on greenhouse gas emissions from transport, so we would like to see greater consideration of this and how the Proposed Amendments align with the Emissions Reduction Plan and the transport targets set in the Plan.

32. A better understanding of the implications of the proposal on the Emissions Reduction Plan and its targets is required before we can comment on the pace of the proposed changes. However, we would support the introduction of these standards into the industry, which should proceed within appropriate and realistic timeline for implementing the changes.
33. This is especially important for cities like Hamilton where there is a high rate of car dependency. Whilst we acknowledge there is an urgent need to reduce our vehicle kilometers traveled (VKT) as we work towards our greenhouse gas emissions targets and the Emissions Reduction Plan, and we are working hard to provide genuine transport choice and encourage modal shift, the car will still play a role as a 'mode' in our transport network.
34. While greenhouse gas emissions reductions can be achieved by purchasing hybrid or electric vehicles, many people will still depend on ICE light vehicles due to ICE alternatives being financially out of reach. This proposal provides an opportunity to reduce harmful emissions and greenhouse gas emissions associated with ICE light vehicles, without further exacerbating socioeconomic class inequities around the cost of a private vehicle and the potential financial burden. We must ensure a just transition to a low-carbon future by enabling businesses and individuals to comply with the new measures in a realistic timeframe and would support the scale and pace of the change required to deliver this.
35. We also recognise the role this proposal brings in helping us to achieve our Transport Strategy, [Access Hamilton – Ara Kootuitui Kirikiriroa](#), specifically two of our outcome areas of 'Climate change' (page 30) and 'Environmental responsibility' (page 40). These two outcomes also have 'focus areas' that specifically addresses this proposal stating: "*discourage high polluting vehicles on our roads to improve air quality, environment and reduce noise.*" This proposal will help us achieve our Strategy sooner.
36. **Q4: Do you agree with the grouping on international standards for each implementation date? Are the requirements and limitations of each international standard appropriately aligned?**
37. Yes.

Proposal Two: Requiring a Stronger Standard for Harmful Emissions from Heavy Vehicles

38. **Q11: Do you consider the proposed timeframes to require stronger standards for harmful emissions from heavy vehicles should:**
 - a. Be pushed back
 - b. Be bought forward
 - c. Proceed as proposed
 - d. Not be implemented at all
39. We support Proposal Two to require a stronger standard for harmful emissions from heavy vehicles as it will enable better health outcomes for Aotearoa. However, a better understanding of the implications of the proposal for the Emissions Reduction Plan and its targets is required before we can comment on the pace of the proposed changes. Our response would be dependent on the impact of the stronger emissions standards for heavy vehicles on the Emissions Reduction Plan and targets, and whether the proposed timeframes are realistic for business and individuals to comply in a way that ensures a just transition to a low-carbon future.
40. **Q12: Please explain your answer for question for question two:**
41. As Hamilton is a part of the 'Golden Triangle', the city experiences a large number of heavy vehicle movements at its boundary, due to both normal freight movement and the development of the inland ports.

42. Proposal Two aims to reduce the emissions associated with heavy vehicles that are harmful to human health, and we acknowledge the significant emissions reductions and health benefits that the proposal brings. This is especially important as heavy vehicle movements are projected to increase e.g., due to online shopping trends.
43. However, we encourage the Ministry of Transport to recognise that emissions that are harmful to human health can also be greenhouse gas emissions that are harmful to the climate. As such Proposal Two will likely have some impact on greenhouse gas emissions from transport, so we would like to see greater consideration of this and how the proposal and timeframes align with the Emissions Reduction Plan and transport targets set in the Plan.
44. In particular, we would like to understand how the proposal helps in achieving the Emissions Reduction Target of “*reduce emission from freight in transport by 35% by 2035*”.
45. A better understanding of the implications of the proposal on the Emissions Reduction Plan and its targets is required before we can comment on the pace of the proposed changes. However, we would support that the introduction of these standards into the industry should proceed within appropriate and realistic timeline for implementing the changes.
46. We must ensure a just transition to a low-carbon future by enabling businesses and individuals in this area to comply with new measures in a realistic timeframe. We support the scale and pace of the change required to deliver this.

Proposal Three: Requiring Motorcycles and Mopeds to Meet Minimum Exhaust Emissions Standard

47. **Q17: Do you consider the proposed timeframes to require stronger standards for harmful emissions from motorcycles and/or mopeds should:**
 - a. Be pushed back
 - b. Be bought forward
 - c. Process as proposed
 - d. Not be implemented at all
48. We support Proposal Three to require stronger standards for harmful emissions from motorcycles and mopeds as this will enable better health outcomes for Aotearoa. However, a better understanding of the implications of the proposal for the Emissions Reduction Plan and its targets is required before we can comment on the pace of the proposed changes. Our response would be dependent on the impact of the stronger emissions standards for motorcycles and mopeds on the Emissions Reduction Plan and targets, and whether the proposal timeframes are realistic for business and individuals to comply in a way that ensures a just transition to a low-carbon future.
49. **Q18: Please explain your answer for question for question two:**
50. This proposal aims to reduce the emissions associated with motorcycles and mopeds that are harmful to human health, and we acknowledge the significant emissions reductions and health benefits that the proposal brings. The introduction of these standards into the industry should proceed within appropriate and realistic timeline for implementing the changes.
51. However, we encourage the Ministry of Transport to recognise that emissions that are harmful to human health can also be greenhouse gas emissions that are harmful to the climate. As such, Proposal Three will likely have some impact on greenhouse gas emissions from transport, so we would like to see greater consideration of this and how the proposal aligns with the Emissions Reduction Plan and transport targets set in the Plan.
52. A better understanding of the implications of the proposal on the Emissions Reduction Plan and its targets is required before we can comment on the pace of the proposed changes. However, we

would support that the introduction of these standards into the industry should proceed within appropriate and realistic timeline for implementing the changes.

53. We must ensure a just transition to a low-carbon future by enabling businesses and individuals in this area to comply with new measures in a realistic timeframe. We support the scale and pace of the change is required to would deliver this.

Proposal Four: Provisions for Disability Vehicles

54. **Q22: Do you consider the proposed timeframes to require stronger standards for harmful emissions from disability vehicles should:**

- a. Be pushed back
- b. Be bought forward
- c. Proceed as proposed
- d. Not be implemented at all

55. We support Proposal Four to allow extra time for used light disability vehicles to meet a stronger emissions standard. However, a better understanding of the implications of the proposal for the Emissions Reduction Plan and its targets is required before we can comment on the pace of the proposed changes. Our response would be dependent on the impact of the stronger emissions standards for disability vehicles on the Emissions Reduction Plan and targets, and whether the proposed timeframes are realistic for business and individuals to comply in a way that ensures a just transition to a low-carbon future.

56. **Q23: Please explain your answer for question for question two:**

57. We recognise that those who depend on a modified vehicle will be limited in their ability to reduce their emissions by modal change, and therefore support this proposal as it helps to ensure that these modified vehicles are at a standard that reduces emissions.
58. The proposal must ensure that the user is receiving their vehicle in an appropriate timeframe and does not provide further barriers to these user groups. We support the timeline extension to reduce the need to apply for case-by-case exemptions from the Director of Land Transport, to reduce potential supply constraints with obtaining a modified vehicle.
59. However, we encourage the Ministry of Transport to recognise that emissions that are harmful to human health can also be greenhouse gas emissions that are harmful to the climate. As such Proposal Four will likely have some impact on greenhouse gas emissions from transport, so we would like to see greater consideration of this and how the proposal aligns with the Emissions Reduction Plan and transport targets set in the Plan.

Air Quality in Hamilton

60. There is an evidential link between the emissions released from internal combustion engine (ICE) vehicles and the surrounding air quality.
61. As noted on the Ministry of Transport's website: *"The Health and Air Pollution in New Zealand 2016 report (HAPINZ 3.0), published in 2022, found that air pollution (primarily NO₂, PM₁₀ and PM_{2.5}) from the transport sector contributed \$10.5 billion in social costs per year, which is roughly two thirds of the total of all air pollution costs (\$15.6 billion). By way of comparison the total social cost of road crashes that result in deaths and serious injuries is \$8 billion. The calculated social costs come from the below list of health impacts:*
- 13,000 cases of asthma prevalence in our tamariki.
 - 900 childhood hospitalisations per year due to asthma/wheeze.
 - 2,200 premature deaths, which accounts for about one in 14 deaths annually.

- 9,000 cardiovascular and respiratory hospital admissions.
 - 300,000 restricted activity days (when air pollution causes symptoms which prevent people being able to go to work, school or undertake their usual activities).
62. Social costs measure the total cost of air pollution to the country, including loss of life, loss of productivity and income, and the costs of medical treatment, including hospital admissions”.
63. As required by the Resource Management Act, the Waikato Regional Council is responsible for monitoring air quality in the Waikato Region. Particulate matter (PM10 and PM 2.5) and nitrogen dioxide (NO2) are measured at various sites in Hamilton on a regular basis to monitor the city’s air quality over time.
64. **Appendix 1**, which was developed by the Waikato Regional Council, provides an air quality indicator update for the Hamilton Airshed for the 10-year period 2013 to 2022.
65. In summary, the PM10 national environmental standard continues to be complied with in Hamilton at both the Claudelands and Ohaupo Rd stations. The PM2.5 World Health Organisation (WHO) daily guideline is being exceeded each year ranging between 8 to 21 exceedances (3 allowable exceedances per year) at the Claudelands station.
66. The annual average WHO guideline is also being exceeded for PM2.5 at Claudelands. The long term 10-year trend for Claudelands for PM10 is indeterminate (neither improving nor worsening). As yet, there is not sufficient data to determine a long-term trend for PM2.5.
67. For NO2, the daily average WHO guideline is being exceeded at the Ohaupo Rd station about 20 to 30 times per year (3 allowable exceedances per year). The annual average WHO guideline is also being exceeded). As yet, there is not sufficient data to determine a long-term trend at the Ohaupo Rd station for NO2.
68. Waka Kotahi NZ Transport Agency’s nine passive NO2 traffic monitoring sites in Hamilton all exceed the annual average NO2 WHO guideline, **noting that these sites are mostly all located on the roadside at high traffic areas**. An improving trend has been identified at eight of these sites with an indeterminate trend identified at the Te Rapa Rd/Ann Michele St site.
69. Implementation of the Proposed Amendments to the Land Transport Rule: Vehicle Exhaust Emissions 2007 is seen as another key step in ensuring the ongoing improvement to Hamilton’s air quality.

Further Information and Opportunity to Discuss our Submission

70. Should the Ministry of Transport require clarification of the submission from Hamilton City Council, or additional information, please contact **Glenn Bunting** (Urban Transport Policy and Planning Manager - City Transportation) on **021 962 829**, email glenn.bunting@hcc.govt.nz in the first instance.
71. **Hamilton City Council representatives would welcome the opportunity to discuss the content of this submission in more detail with the Ministry of Transport.**

Yours faithfully



Lance Vervoort
CHIEF EXECUTIVE

APPENDIX 1

Air Quality Indicator Update for Hamilton Airshed

Dr Jonathan Caldwell, Senior Scientist, Science Section, Waikato Regional Council
22/05/2023

Air quality indicator update for the 10-year period 2013 to 2022. Air quality indicators include fine particulate matter, PM₁₀ and PM_{2.5} as well as nitrogen dioxide (NO₂).

- PM₁₀ 24-hour averages compared to the National Environmental Standard of 50 ug/m³ averaged over 24 hours (1 allowable exceedance).
- PM₁₀ annual averages compared to the World Health Organisation guideline of 15 ug/m³ average over a calendar year.
- PM_{2.5} 24-hour averages compared to the World Health Organisation guideline of 15 ug/m³ averaged over 24 hours (3 allowable exceedances).
- PM_{2.5} annual averages compared to the World Health Organisation guideline of 5 ug/m³ averaged over a calendar year.
- NO₂ hourly averages compared to the National Environmental Standard of 200 ug/m³ averaged over 1 hour (9 allowable exceedances).
- NO₂ 24-hour averages compared to the World Health Organisation guideline of 25 ug/m³ averaged over 24 hours (3 allowable exceedances).
- NO₂ annual averages compared to the World Health Organisation guideline of 10 ug/m³ averaged over a calendar year.

Table 1 Summary of NES & WHO compliance (2013 to 2022) for PM₁₀ and PM_{2.5} at Waikato Regional Council air quality monitoring stations in Hamilton airshed (Green tick = complying; red cross = exceeds).

Station	24-hr PM ₁₀	24-hr PM _{2.5}	Annual PM ₁₀	Annual PM _{2.5}
Claudlands	✓	✗	✓	✗
Ohaupo Rd	✓	NA	✓	NA

NA – not applicable, no PM_{2.5} monitoring.

Table 1 Summary of PM10 trend analyses (2013 to 2022) for Waikato Regional Council air quality monitoring stations in Hamilton airshed (green = improving; grey = indeterminate).

Station	Trend
Claudlands	
Ohaupo Rd	

Note: insufficient data yet available to determine trends for PM_{2.5}.

Table 3 Summary of NES & WHO compliance (2013 to 2022) for NO₂ at Waikato Regional Council's Ohaupo Road air quality monitoring station in Hamilton airshed (Green tick = complying; red cross = exceeds).

Station	1-hr NO ₂	24-hr NO ₂	Annual NO ₂
Ohaupo Rd	✓	✗	✗

Table 4 Summary of WHO compliance (2013 to 2022) for NO₂ at Waka Kotahi’s passive NO₂ traffic monitoring sites (red cross = exceeds the annual average).

Airshed	Location	Annual NO ₂
Hamilton	Cambridge Rd/Morrinsville Rd	X
Hamilton	Bridge St/Cobham Dr	X
Hamilton	Brooklyn Rd/Peachgrove Rd	X
Hamilton	Victoria St/Ulster St	X
Hamilton	Greenwood St/Killarney Rd	X
Hamilton	Lorne St/Ohaupo Rd	X
Hamilton	Avalon Dr/Grandview Rd	X
Hamilton	Seamer Place	X
Hamilton	Te Rapa Rd/Ann Michele St	X

Table 5 Summary of NO₂ trend analyses (2013 to 2022) for Waka Kotahi’s passive NO₂ traffic monitoring sites (green = improving; grey = indeterminate).

Airshed	Location	Trend
Hamilton	Cambridge Rd/Morrinsville Rd	
Hamilton	Bridge St/Cobham Dr	
Hamilton	Brooklyn Rd/Peachgrove Rd	
Hamilton	Victoria St/Ulster St	
Hamilton	Greenwood St/Killarney Rd	
Hamilton	Lorne St/Ohaupo Rd	
Hamilton	Avalon Dr/Grandview Rd	
Hamilton	Seamer Place	
Hamilton	Te Rapa Rd/Ann Michele St	

In summary, the PM₁₀ national environmental standard continues to be complied with in Hamilton at both the Claudelands and Ohaupo Rd stations. The PM_{2.5} world health organisation daily guideline is being exceeded each year ranging between 8 to 21 exceedances (3 allowable exceedances per year) at the Claudelands station. The annual average WHO guideline is also being exceeded for PM_{2.5} at Claudelands. The long term 10-year trend for Claudelands for PM₁₀ is indeterminate (neither improving nor worsening). As yet we do not have sufficient data to determine a long-term trend for PM_{2.5}. For NO₂, the daily average WHO guideline is being exceeded at the Ohaupo Rd station about 20 to 30 times per year (3 allowable exceedances per year). The annual average WHO guideline is also being exceeded). As yet we do not have sufficient data to determine a long-term trend at the Ohaupo Rd station for NO₂. Waka Kotahi’s nine passive NO₂ traffic monitoring sites¹ in Hamilton all exceed the annual average NO₂ WHO guideline, noting that these sites are mostly all located on the roadside at high traffic areas. An improving trend has been identified at eight of these sites with an indeterminate trend identified at the Te Rapa Rd/ Ann Michele St site.

¹ Waikato Regional Council provides contributory funding for operation of some of these Waka Kotahi sites. Many of these sites have been operating since 2007.

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