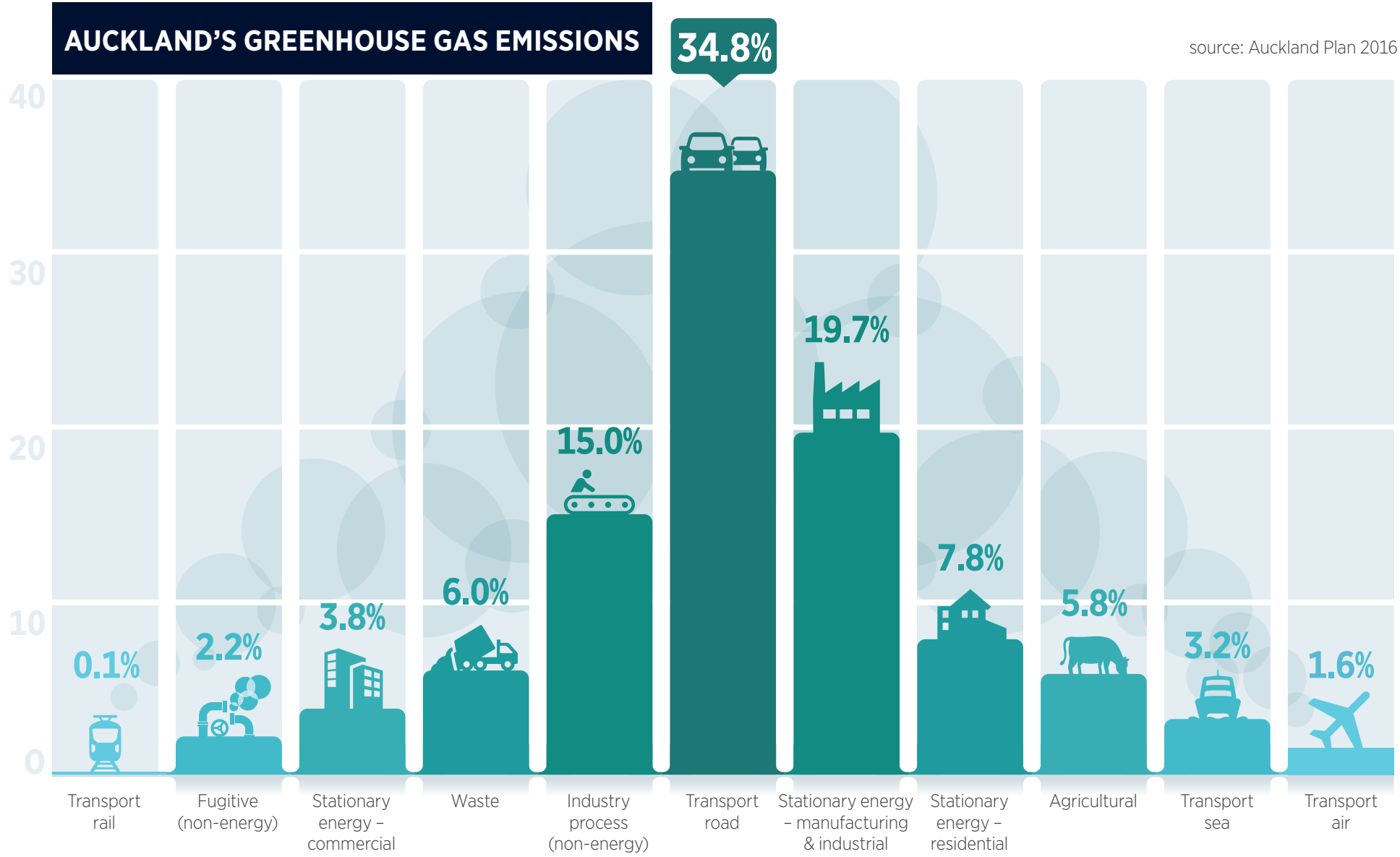
Auckland's road transport emissions...a new dialogue


AUCKLAND'S GREENHOUSE GAS EMISSIONS
source: Auckland Plan 2016
40
30
20
10
0
0.1%
2.2%
3.8%
6.0%
15.0%
34.8%
19.7%
7.8%
5.8%
3.2%
1.6%
Transport rail
Fugitive (non-energy)
Stationary energy – commercial
Waste
Industry process (non-energy)
Transport road
Stationary energy – manufacturing & industrial
Stationary energy – residential
Agricultural
Transport sea
Transport air

Introduction

Auckland Transport takes climate change seriously and we know that the largest greenhouse gas emitting sector in Auckland is road transportation, making up 35% of our region's emission profile. That is almost 6% of New Zealand's **entire** emission profile.

This document provides information on the three main factors that influence the quantity of greenhouse gases emitted from road transportation. These are: overall demand for vehicle travel (measured in vehicle kilometres travelled (VKT)); fuel type; and fuel efficiency (litres consumed per 100km). These factors are analysed in this document to understand key trends over the past ten years, and the projections over the next ten years.

This document opens a discussion on the future of Auckland's road transport emissions. It is intended as a starting point for a continuing process of engagement with stakeholders and industry to support a better understanding of the future opportunities, challenges and choices that Auckland will face delivering a zero-emission transport network.

Vehicle kilometres travelled (VKT) × Average CO_2 emissions per km = Total CO_2 emissions

Past (2007-2017)

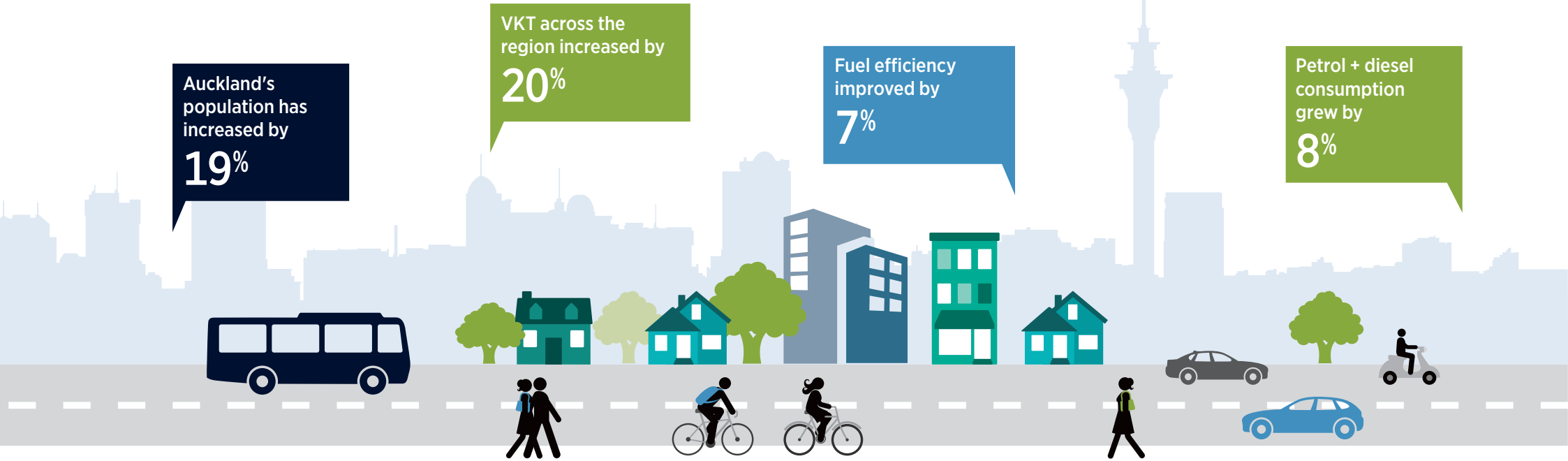
Vehicle Kilometres Travelled

VKT is one of the main factors influencing the quantity of greenhouse gas emissions produced. Total VKT itself depends on the distance individual Aucklanders travel by car, along with the size of Auckland's population.

Over the past decade, changing economic conditions have seen a drop and then recovery in the distance travelled per person. However, a 19% increase in population means that total VKT by Auckland's vehicle fleet increased by 20% over the same period. Growth in VKT has been particularly strong since 2014, driven by a combination of the recovery in per capita travel and the recent surge in population.

Fuel Efficiency and Consumption

Despite the 20% increase in VKT, total fuel consumption across the region has only increased by 8% over the past ten years. Improvements in fleet fuel efficiency and the modest shift towards alternative fuelled vehicles have meant that the increase in fuel consumption has been smaller than the increase in distance travelled by Auckland's fleet. Although we don't have Auckland-specific data, we do know that the fuel economy of New Zealand's light petrol fleet has improved by 7%. Trends also show a 9% decline in per capita fuel consumption over the past ten years.



Please note that the data used in this section is based on Quarter 2 figures

Emissions

So, what does this mean when it comes to emissions? Over the past ten years, we've seen a 9% increase in road transport emissions - almost in line with fuel consumption. The slight difference is accounted for when we dive deeper and look at the trends by fuel type.

Petrol consumption has remained steady (+2%) however, diesel consumption has grown significantly since 2007 (+22%). The surge in diesel consumption is concerning as diesel produces 15% more CO_2 than petrol. The increase in diesel consumption has accounted for 89% of the rise in road transport emissions since 2007.

Despite Aucklanders travelling more, we have seen petrol use per capita drop by

14%

and road transport emissions per capita have dropped by

9%

Auckland's petrol emissions have grown slightly by

2%

but diesel consumption has grown rapidly by

22%

Due to population growth, Auckland's total road transport emissions have increased by

9%

Diesel produces

15%

more

CO_2

emissions per litre compared to petrol

Future (to 2028)

To understand future trends, Auckland Transport models the future network by using NZTA's Vehicle Emissions Prediction Model and the Auckland Forecasting Centre's Macro Strategic Model. The model for 2028 assumes completion of the 2018 Regional Land Transport Plan (RLTP) projects, delivered by the planned $28 billion investment in Auckland's transport system. Model results for 2028 are compared against our 2016 baseline.

Vehicle Kilometres Travelled

Investment in Auckland's transport system delivers improved transport choices, with 8% of daily trips occuring on public transport. Combined with walking and cycling, daily mode share for non-car trips is predicted to grow to 22%. As a result, daily VKT per capita is predicted to decrease by 4%. However, similar to the last decade, the forecast 24% increase in population is enough to drive a 19% increase in total daily VKT across the region. Fortunately, we see some decoupling between growth in population and growth in VKT.

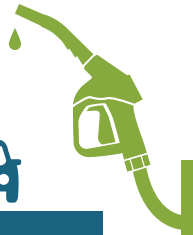
Fuel Efficiency and Consumption

NZTA's Vehicle Emissions Prediction Model predicts fuel efficiency will improve by 18% compared to 2016 levels. This improvement is expected due to the increased proportion of electric vehicles in the vehicle fleet and more fuel-efficient conventional vehicles. This forecast major improvement will largely offset the impact on fuel consumption from the increase in total vehicle travel. Consequently, total fuel consumption is expected to remain at similar levels to 2016 (+2%) even though total VKT has grown.

Although total daily fuel consumption remains fairly steady, the mix changes with consumption by heavy commercial vehicles forecast to increase by 23% while use by the light fleet drops by 3%. Overall, we see a significant decrease in daily fuel consumption per capita (-18%) as a result of fuel efficiency and more trips being taken using public transport and walking and cycling.

Population is forecast to grow by **24%**

Total daily VKT is projected to increase by **19%**



Fleet fuel efficiency is forecast to improve by **18%**

Light vehicle fleet fuel consumption is predicted to drop by **3%**

Fuel consumption from the heavy commercial fleet is forecast to increase by **23%**

Emissions

The strong growth in public transport and walking and cycling and a more efficient fleet are predicted to slow the increase in transport emissions over time. Up to 2028, emissions are projected to increase only by 5%, compared with 9% over the past decade.

The growth of 5% in emissions is higher than the growth in fuel consumption (2%) because of the demand from the heavy vehicle fleet, which is expected to account for 85% of the predicted increase in emissions.

Strong modal shift + better fuel efficiency contribute to

15% reduction in daily road transport emissions **per capita**

Total daily road transport emissions are expected to rise

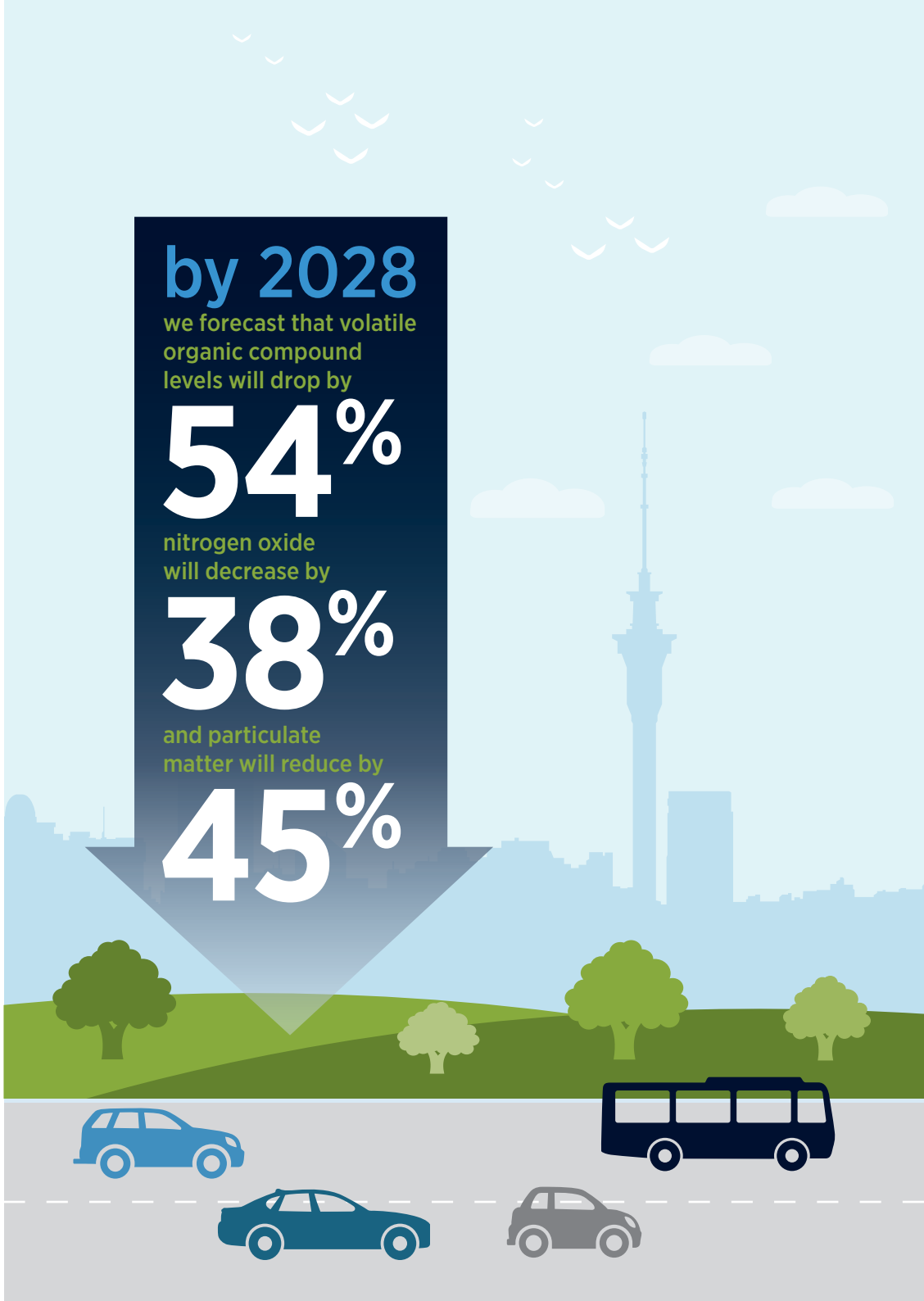
5% by 2028

Closing words... the beginning of a new dialogue

Despite emissions continuing to rise, there are some positives that come out of the modelling. We see a reduction in many harmful particulates due to the impact of improved emission standards on the fleet. By 2028, the modelling predicts that volatile organic compound levels will drop by 54%, nitrogen oxide will decrease by 38% and particulate matter will reduce by 45%.

In summary, the $28 billion of transport investment will lead to a major increase in sustainable transport options such as public transport and walking and cycling over the next ten years. Additionally, a faster take up of fuel-efficient technologies will contribute to a 15% reduction in road transport emissions per capita. Meanwhile, Auckland still faces the challenge of a growing population and increasing heavy vehicle use, driving total emissions up by 5%.

Beyond 2028, Auckland's success in reducing road transport emissions is going to depend on a combination of further public transport growth and more people walking and cycling to drive demand down, the adoption of cleaner technologies and addressing freight emissions. It will require collaboration from organisations across different sectors to bring expertise to the table. Auckland Transport is up for the challenge and will do everything we can to bring emissions down. We encourage you to contribute to the discussion on the future of our transport system to make our region, and our planet, a more sustainable place for everyone to enjoy.



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