





Introduction

In 2020, 526 people in Auckland were either killed or seriously injured on our roads. These included people not in vehicles - in particular, pedestrians.

Safety is a key strategic priority nationally and regionally as outlined in the Government Policy Statement on Land Transport (GPS), Auckland Transport Alignment Plan (ATAP), the Regional Land Transport Plan (RLTP) and the Road to Zero 2020–2030 strategy which set a target to reduce Deaths and Serious Injuries (DSI) by 40%, equivalent to approximately 750 fewer deaths and 5,600 fewer serious injuries, over the next decade and “...requires Auckland Transport to establish safe and appropriate travelling speeds across Auckland’s road network”.

In 2019 the Auckland Transport board approved both the Vision Zero for Tāmaki Makaurau, a Transport Safety Strategy and Action Plan to 2030 and the Road Safety Programme Business Case which provided for a broad suite of interventions to tackle road trauma. This included investment in the four pillars of the safe system approach - safe roads, safe drivers, safe vehicles and safe speeds. This investment is consistent with Central Government and Auckland Council strategy and priorities.

The Vision Zero programme was adopted to reduce deaths and serious injuries on our road transport system. Auckland, is not alone, many liveable cities around the world have also adopted Vision Zero. One death on the road is one too many and Auckland Transport does not accept that some people may die or be seriously injured as a result of travelling on Auckland’s road network.

AT is a Road Controlling Authority (RCA). As such, under the Land Transport Act 1998, AT is legally required to review speed limits on individual roads to ensure they are ‘safe and appropriate’ and, where such review demonstrates speed limits are not ‘safe and appropriate’, take action to ensure that speed limits are ‘safe and appropriate’. As part of determining whether speed limits are ‘safe and appropriate’ AT is legally required to consult with a wide range of specified groups under the Land Transport Rule: Setting of Speed Limits 2017.

Vision Zero

As an RCA, Auckland Transport is the custodian of our region's transport system and we take this responsibility seriously, playing a vital role in shaping the future of our region.

Whether you're walking, cycling, driving, motorcycling or taking public transport, you should feel safe and free to wherever you go. How we design our transport infrastructure plays a direct role in strengthening the connection between people and the places we share.

Auckland is a Vision Zero region, which is based on the principal that even one death on Auckland roads is one too many. People's lives and wellbeing should never be traded for faster journey times.

Vision Zero is a Swedish ethics-based approach that focuses on a core principle that human life and health can never be exchanged for other benefits within society. It represents a paradigm shift away from the conventional 'cost versus benefit' measures used to decide how much money to spend on our road network, towards valuing the benefit of decreasing risk. We do not believe that some deaths and serious injuries are acceptable; that it is a price to be paid for our mobility.

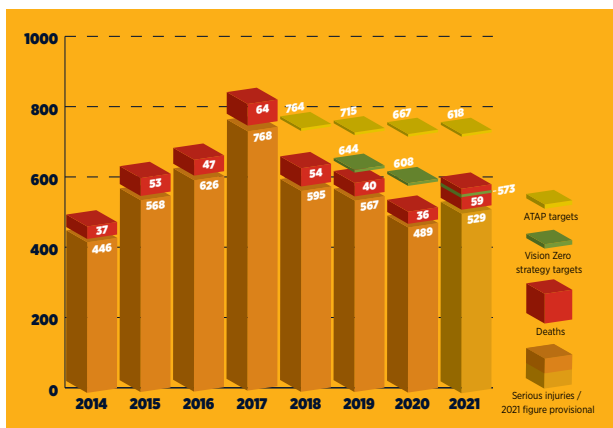
We acknowledge that as people we all make mistakes, however, a mistake should not mean someone dies or is seriously injured on our roads. That's why Auckland Transport is committed to delivering an ambitious 700 million safety programme that includes implementing safe and appropriate speed limits on a number of priority roads across Auckland.

Our Vision Zero programme envisions a time (target 2050) where parents are secure in the knowledge that when they let their kids walk or cycle in their neighbourhood, they will return home safely without the threat of being killed or seriously injured. Simply put, Vision Zero puts people at the heart of our road transport safety programme.

Funding

AT is delivering an ambitious \$700 million safety infrastructure programme over 10 years (2018-2028). It will deliver major, minor and mass-action safety engineering projects, including safe speeds on high- risk routes and locations across the network.

The safety programme is partly funded by the Regional Fuel Tax (RFT), which contributes \$552 million of the total \$700 million capital expenditure.



Why is road safety a priority?

During 2020, there were 37 deaths on Auckland’s roads, a decrease of three deaths from 2019. Road safety performance in 2020, likely to be aided by COVID-19 pandemic lockdowns, continued a downward trend established since 2017 as illustrated by Figure 1.

Disturbingly, DSI has dramatically increased again in the last few months of the 2020 calendar year and in early 2021. There have been 53 road fatalities over the period January and September 2021, more than double the 25 fatalities during the same period in calendar 2020.

Vulnerable road users represented 57% of deaths in 2020. This is consistent with national and international trends where improved vehicle technologies and infrastructure improvements have been more successful in protecting those inside vehicles than out. The high percentage of vulnerable road user fatalities reinforces the importance of progressing with the Safe Speeds Programme especially in town centres and residential areas.

Between 2014-17, deaths on Auckland roads increased at more than three times the rate of the rest of NZ and more than five times the growth of travel. Serious injury rates have more than doubled, while also increasing by more than four times the total kilometers travelled nationally.

The social cost of road trauma in Auckland was \$1.6 billion in 2018. People walking, cycling and on motorbikes make up around 47% of DSI.

The Road Safety Business Improvement Review November 2017 to January 2018 says “Auckland is experiencing what could legitimately be described as a crisis in road safety performance.”

The rate of deaths and serious injuries on our roads is unacceptable – no one should lose their life or be seriously injured when travelling on our transport network. Hence, road safety is a priority for Auckland.

What is a serious injury?

A serious injury is one with life-long consequences for the people involved. The consequence of a serious injury can lead to mental, physical and emotional issues and can affect the person's family and friends.

A serious injury is broadly defined as a personal injury which can lead to:

- Death
- Dismemberment
- Significant disfigurement
- Fractures
- Loss of a foetus
- Permanent loss of use of a body organ, body part, function or system.
- Permanent consequential limitation of use of a body organ or body part
- Significant limitation of use of a body function or system
- A medically determined injury or impairment of a non-permanent nature, which prevents the injured person from performing substantially all of the material acts which constitute such person's usual and customary daily activities¹
- An over-night or prolonged stay in hospital due to a crash.

What is the social cost of road crashes and injuries?

The social cost of a road crash and the associated injuries includes a number of elements:

- Loss of life or life quality
- Loss of output due to temporary incapacitation
- Medical costs Legal costs
- Property damage costs.
- Injury costs are classified into fatal, serious and minor injuries as reported by crash investigators.²

In New Zealand, the total social cost of motor vehicle injury crashes in 2017 is \$4.8 billion (up by 15 percent from \$4.2 billion in 2016) at June 2018 prices.

This estimate covers all injuries recorded by NZ Police, hospitals and ACC.

This increase reflects a 16% increase in the total number of fatalities (from 327 in 2016 to 378 in 2017) and an 11% increase in the estimated total number of serious and minor injuries (from 38,218 in 2016 to 42,398 in 2017).

It is impossible to put a value on the loss of a loved one. On top of leaving a huge hole in the lives of families, friends, workplaces and communities, road crashes have a huge impact on our society.

¹ Source: <https://definitions.uslegal.com/s/serious-injury> Hyacinthe v. United States, 2009 U.S. Dist. LEXIS 108192 (E.D.N.Y. Nov. 19, 2009)

² Source: <https://www.transport.govt.nz/resources/road-safety-resources/roadcrashstatistics/social-cost-of-road-crashes-and-injuries>

What is Vision Zero?

Vision Zero is an ethics-based transport safety approach developed in Sweden in the late 1990s. It places responsibility on people who design and operate the transport system to provide a safe system.

We want a transport system that prioritises safety, not a system that puts other measures ahead of human life and limb. We will get you there safely, as efficiently as we can. This is a shift from thinking we will get you there quickly, as safely as we can.

Vision Zero Principles

Ethics

People shouldn't die or be seriously injured in transport journeys.

Responsibility

System designers are ultimately responsible for the safety level in the entire system – systems, design, maintenance and use. Everyone needs to show respect, good judgement and follow the rules. If injury still occurs because of lack of knowledge, acceptance or ability, then system designers must take further action to prevent people being killed or seriously injured.

People centered

System designers must accept that people make mistakes and people are **vulnerable**.³

System response

We need to look at the whole system and develop combinations of solutions and all work together to ensure safe **outcomes**.⁴

“ Human life should not be traded for other benefits in society” Claes Tingvall, Vision Zero founder

Is Auckland a Vision Zero region?

Yes. As the guardian of our region's transport system, AT plays a vital role in shaping the future of our city. We want to create a region that allows our children to grow up curious and experience the freedom of being active, so they can grow up to be healthy adults. How we design our transport infrastructure plays a direct role in strengthening the connection between people and the places they share.

Moving towards this idea of maximising our shared values in our public spaces, Auckland has declared itself a Vision Zero region. Vision Zero is a Swedish ethics- based approach that focuses on a core principle that human life and health can never be exchanged for other benefits within society. It takes the zero-harm workplace health and safety approach onto the road network where we spend a large part of our time in one of the riskiest everyday activities. It represents a paradigm shift away from the conventional 'cost versus benefit' measures used to decide how much money to spend on our road network, towards valuing the benefit of decreasing risk.

³ Source: Europe and its road safety vision - how far is zero? Claes Tingvall at the 7th European Transport Safety Lecture (2005)

⁴ Source: Vision Zero 20 Years On, Hanna Lindberg (April 2017)

What is AT doing to improve road safety?

The Board of Auckland Transport (AT) commissioned an independent review of Auckland's road safety performance in late 2017 and the resulting report, Auckland Transport: Road Safety Business Improvement Review November 2017 to January 2018, was the first step taken towards AT becoming a Vision Zero organisation and region.

The Auckland Council Planning Committee (September 2018) unanimously passed a resolution to "request Auckland Transport to accelerate the road safety and speed management programmes and seek input from partners to make Auckland a Vision Zero region."

AT's Board, Chief Executive and Executive Leadership Team have endorsed the Safe Speeds programme and Vision Zero strategy. AT's Road Safety Programme Business Case aligns with the Government's Policy Statement on transport. (The GPS mentions safety as one of its four priorities.) It also aligns with the Regional Land Transport Plan (RLTP), the Auckland Plan 2050 and the Auckland Transport Alignment Project (ATAP)

At an operational level we have a number of programmes including:

- Road safety engineering programme targeting urban and rural high risk roads and intersections.
- Setting safe speeds Improvements to make walking, cycling and motorcycling safe
- Walking school buses and road safety community education.
- Red light camera programme with NZ Police.

To complement our Safe Speeds programme, we are also looking at making the entire transport system safe for all road users. With our road safety and community partners, we are working on the following:

- Safer communities programme
- Using a localised approach to make roads safer and create more opportunities for active transport (walking and cycling). For our 2018-21 programme, we are working with three communities: Māngere Bridge, Mt Roskill and Papakura.

Safe roads and roadsides (urban and rural) programme

- We are investing \$35 million in the 2019/2020 financial year to improve infrastructure across our rural and urban areas.

Rural road delineation programme

- In the 2018/2019 financial year, we invested \$5 million (including funding from the Regional Fuel Tax) to improve road markings and better signage on more than 400km of rural roads across Auckland.

Safe road use – red light running programme

- We are partnering with NZ Police to change dangerous driver behaviour at intersections through red light running enforcement.
- Six more red light camera sites have been installed at high-risk intersections in Auckland to reduce dangerous driving and help save lives. Over the next five years, we will bring the total number of red light cameras in Auckland to 42.
- We are delivering over 600 campaigns, events, training and checkpoints to our key stakeholders to target high-risk groups and communities.

Pedestrian crossings

- Made possible by the Regional Fuel Tax, AT is doing improvement work on 30 level crossings as part of its road safety programme. There will be improved signage, lighting, kerb build-outs and refuge islands. All crossings will be turned into raised tables to encourage people driving to slow down when approaching a crossing. AT has carefully assessed zebra crossings all over Auckland and has prioritised these locations based on a combination of crash data, vicinity to schools, road speed, the volume of cars, traffic conditions, and community requests.

Other safety projects

- Work has been completed to make the Dairy Flat Highway safe. One of the major improvements is a round about to replace the Coatesville- Riverhead/Dairy Flat Highway intersection.
- Other improvements include new right turn bays, centre median safety barriers, side barriers and intersection upgrades. AT also plans to reduce speeds at different sections of the highway, creating more consistent and safer speeds.
- This includes speeds being reduced from 100km/h to 80km/h along the highway, and from 100km/h to 60km/h around the Dairy Flat Village.
- There are safety projects at the residential level with Te Atatū South and Papakura's Rosehill areas getting safety improvements in response to concerns raised by the local community. Other safety improvement projects will also take place in residential areas of Manurewa, Henderson-Massey and other local board areas across the region.
- In the financial year 2017-2018, we invested \$3.4 million to address high-risk rural intersections, correct road shapes and install barriers.
- An additional \$700,000 was invested in improving risky rural routes, improving signs, lining and road surfaces. We've also started work on our Rural Delineation Programme. We signalised Auckland's worst intersections at Bullock Track – Great North Road and Tuarangi Road (Western Springs) and Tāmaki Drive – Ngapipi Road (Mission Bay) to improve road safety for everyone.
- NZ Police have fully staffed their traffic safety team to bolster enforcement, the Ministry of Transport is exploring making safe speed measures more streamlined, and the NZTA is working with us to implement trials such as point to point speed cameras. One of our most visible activities in collaboration with partners was the Compulsory Breath Testing initiative with the Vodafone Warriors and NZ Police in South Auckland.
- However, this is just a start, and looking ahead our \$700 million Road Safety 2018-28 programme is designed to deliver major, minor and mass action safety engineering projects at high-risk locations across the network. The Government, Auckland Council and proceeds from the Regional Fuel Tax will fund the road safety programme.
- As part of our commitment to improving road safety, we are accelerating the delivery of safe and appropriate speed limits on roads in a number of areas. These include rural roads, newly built roads, and areas where development is already happening.
- We are being proactive and preparing for future development, especially in areas around schools.

Who else is delivering road safety improvements?

AT is working in partnership with a number of agencies, including NZTA, ACC and NZ Police to improve road safety.

How much is it costing?

There is \$700 million in the RLTP for road safety improvements, which includes \$210 million in funding from the Regional Fuel Tax.

What is AT doing about safe speed?

During AT's initial three-year Safe Speeds programme, we are identifying roads that will be affected by proposed speed limit reductions. These were added to the Schedule of Speed Limits and drafted into a bylaw and consulted on with the Auckland public (March 2019). AT's Board has approved the bylaw and new speed limits will come into force from June 2020.

The bylaw process involved setting the urban boundary, listing exceptions to the urban boundary and listing all roads under each category where a change to the existing speed limit is being proposed.

To support the speed limit bylaw change, engineering measures will also be implemented. These include installing speed calming measures like speed tables, humps and narrowing roads to encourage driving at safe speeds.

Setting safe speeds is the fastest way to increase safety on the network, due to its ability to improve safety and reduce the severity of injury in the event of a crash.

Is AT consulting on speed limit changes?

AT's board makes and approves the bylaw. To do so, AT has consulted with members of the public in March 2019 on the bylaw in accordance with the special consultative procedure under the Local Government Act 2002 (and also in accordance with the Land Transport Rule: Setting of Speed Limits 2017 with regard to the new speed limits themselves).

The public consultation on the bylaw allowed any member of the public (whether an Auckland resident or not) to submit their views.

For any future rounds of proposed speed limit changes, AT will once again engage and consult with Aucklanders as per the Special Consultative Procedure, Section 83 of the Local Government Act and the Land Transport Rule: Setting of Speed Limits 2017. AT focuses on the top 10% of high-risk roads and intersections. That's because doing so is likely to return the highest benefits in reducing DSIs. This approach follows guidance provided by Waka Kotahi NZ Transport Agency's Speed Management Guide. The public consultation on the bylaw allowed any member of the public (whether an Auckland resident or not) to submit their views.

What about NZ Police and enforcement?

NZ Police is responsible for the delivery of road policing services in the Auckland region, targeted to reduce unsafe road user behaviours resulting in deaths and serious injuries. AT partners with NZ Police on a number of road safety interventions, including assisting their roadside operations. NZ Police will play an important role in the successful delivery of our Safe Speeds programme and we look forward to our continued partnership with them.

Why is my road selected / not selected for speed management? How does AT prioritise routes and intersections for improvements?

- AT is currently focusing on the top 10% of high risk areas. That's because doing so is likely to return the best benefits, which is to immediately reduce the high rates of deaths and serious injuries on our roads. This approach is in keeping with the Speed Management Guide (NZTA, 2016).
- When setting safe and appropriate speeds, AT examines and analyses data from 7,300 km of roads in the Auckland region. That's the same distance as a one-way trip from Auckland to Bali or Honolulu. We also receive over a thousand requests every year from our customers asking us to improve the safety of their local roads.

Given the number of roads and the volume of requests we receive, AT has to prioritise areas that are most in need of safety measures.

- Routes and intersections are ranked for improvement based on evidence from crash and predictive data.
- Road crashes, as reported by NZ Police, are recorded in the Crash Analysis System (CAS) managed by the NZTA.
- Our first priority is to treat intersections and corridors where we have evidence of recurring issues.
- AT regularly checks that current speeds are safe and appropriate for the road. We also look at our predictive analysis and modelling to identify high crash areas to factor in changes in land use, etc.

When setting safe speeds, AT makes area-wide changes rather than focusing on individual streets on the following criteria:

- High-risk roads/intersections with high death and serious injury rates based on crash data from the NZTA's Crash Analysis System
- The likelihood of a crash occurring is determined by a number of factors, including type of road, crash history, road length and width, volume of traffic and average speeds.
- Crash risk is measured as a collective crash risk related to DSI crashes over a length of street or as a personal crash related to DSI crashes over a length of street carrying a specific volume of traffic.
- 'Self-explaining roads' such as winding rural roads and traffic-calmed urban areas where most drivers are already travelling slow. A self-explaining road is where the road design encourages a driver to instinctively adopt a safe speed.

What are self-explaining roads and why have they been included?

A self-explaining road is a road where the road conditions help people choose a safer speed to drive at – such as winding rural roads and traffic-calmed urban areas.

Therefore, reducing the speed limit will make it easier for people who don't know the roads as well to know what the appropriate speed is.

AT has included self-explaining roads as the operating speeds on them are much lower than the currently posted speed limit. As we set safe and appropriate speeds in areas close to or adjoining self-explaining roads, including them helps to make the entire road network far more consistent and intuitive. An area- based approach (rather than treating individual roads) has proven to be more effective in helping drivers drive to the conditions.

Is AT's criteria for reducing speed limits dependent on the type of road?

Yes. The roads have been selected based on a number of criteria, namely their risk of causing death or serious injury as well as those with large numbers of vulnerable road users like pedestrians. 90% of the roads we plan to reduce the speeds of are rural roads. The remaining are made up of the city centre, town centres and residential roads.

The criteria for speed reductions is dependent on the road type:

Type of road: Reason for speed reductions

Rural roads: Approximately 90% of the total area we want to reduce speeds of are rural roads. They have been selected because they: Are either high-risk roads or close to high-risk roads Have high crash rates, or are close to roads with high crash rates Have speed limits which are unsuitable – they could be winding, hilly or have unsegregated lanes Don't have a centre median strip

Residential and urban roads: These roads have been selected because:

- They have large numbers of vulnerable road users (people walking and cycling)
- They're often near schools, kindergartens and other community facilities AT research into speeds and risk factors
- Concerns raised by the community

Town centres and Auckland city centre:

These areas have been selected because:

- This is where the highest number of vulnerable road users are – that being people walking and cycling
- Population increases mean more people are walking and cycling in these areas
- Reducing speeds in these areas has the greatest potential to reduce the chance of serious injuries and deaths occurring

Network- wide safe speeds: We will introduce safe and appropriate speeds across areas rather than individual roads.

What is the Crash Analysis System (CAS) and how is data captured in CAS?

The Crash Analysis System (CAS) is New Zealand's primary tool for capturing information about where, when and how road crashes occur. As they are reported, road crashes are recorded by NZ Police in the CAS managed by NZTA.

The CAS system provides tools to analyse and map crashes and enables users to identify high-risk locations and monitor trends and crash sites. This information helps inform transport policy, design and prioritise road safety improvements and monitor their effectiveness. Police reported crashes are recorded in CAS.

- AT analyses this data:
 - To look for trends, location, crash factors, weather conditions, condition of vehicles involved in the crash (individual crash analysis)
 - Over a large geographic area to look for trends over a long period.
- AT uses this information to create algorithms which help identify and predict any future crash hotspots. This allows AT to build mitigation measures to prevent crashes.

CAS data that cannot be identified is used at NZTA's Save One More Life hackathon, which brings together local and international road safety technology professionals to reimagine how technology can be used to reduce and eliminate deaths and serious injuries in New Zealand.

More information on CAS is available on the NZTA website: nzta.govt.nz/safety/safety-resources/crash-analysis-system

What is the difference between 30km/h and 40km/h in terms of safety and survivability?

Research from various road safety organisations like Austroads and the International Traffic Safety Data and Analysis Group (IRTAD) shows that a direct impact speed of 30km/h is the maximum a healthy human body can withstand without sustaining serious life- changing injuries. Research has also indicated that the death risk is about 4-5 times higher in collisions between a car and a pedestrian on foot at 50km/h compared to the same type of collisions at 30km/h.

The 2018 IRTAD Speed & Crash Risk report also mentions "If impact speed increases from 30km/h to 40km/h the risk of fatal injury is about doubled." Additional road safety research from experts like Höskuldur R.G.Kröyer of the Department of Technology and Society, Lund University, Sweden shows that children or the elderly may not survive direct impact speeds of 30km/h.

Who is a vulnerable road user?

A vulnerable road user is anyone not in a vehicle. People walking, those in wheelchairs, motorcycles, mopeds and light mopeds and people cycling, are referred to as vulnerable road users because of their 'unprotected' state.

There is a 10% chance of death for a person walking who is directly hit by a typical two tonne vehicle travelling at 30km/h and a 15% chance of serious injury.

If the travel speed of the vehicle is increased by 10km/h to 40km/h, a person walking who is directly hit would typically have a 32% chance of death and a 26% chance of serious injury.

Refer to 'Death and injury percentages' infographic below.

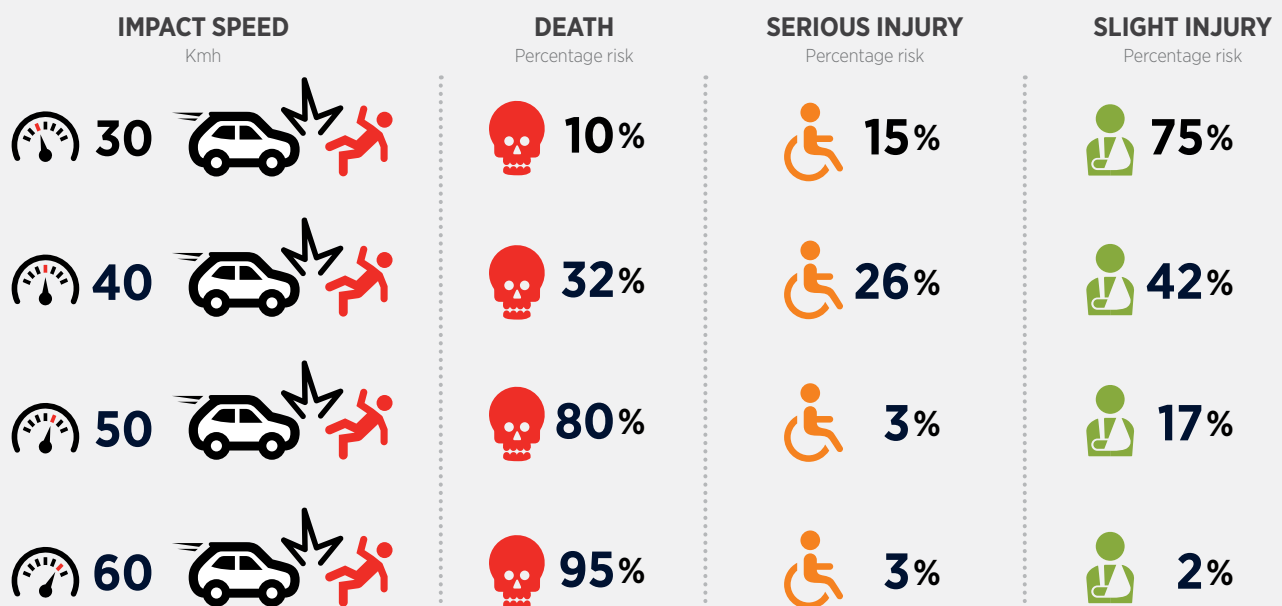
What is the average driver reaction time?

Driver reaction times vary greatly from situation to situation, and from person to person (between about 0.7 to 3 seconds or more). Some accident reconstruction specialists use 1.5 seconds as the average.

In some controlled studies, the average driver's reaction brake time was 2.3 seconds. In a busy urban situation, there may be several things happening for a driver to look at and assess (not counting distractions).

It takes about 0.5 seconds to change your direction of sight. While these may seem like relatively short amounts of time, they have exponential effects on your reaction and actual braking time.

Death and injury percentages



Survivability rates vary significantly based on a number of factors and scenarios. AT takes a preventative approach with respect to the survivability of our most vulnerable road users. Data taken from Research Report AP-R560-18 published in March 2018 by Austroads - the Association of Australian and New Zealand Road Transport and Traffic Authorities.

What is braking or stopping distance and what role does it play?

Braking distance refers to the distance a vehicle travels from the point when its brakes are fully applied, to when it comes to a complete stop. If the conditions are wet or damp, there will be less grip and the stopping distance will increase. If the tyres are under or over-inflated this will also affect the stopping distance, as will the quality of the brake pads and the brake balance.

An important component of the overall stopping distance is the driver's reaction time.

While a professional race driver who expects to have to brake might react in half a second or less, drivers in real life are not as quick. Reaction time followed by actual braking time can be different for different types of drivers, vehicles and driving conditions.

What are the factors that determine vehicle stopping distances?

There are a number of factors that determine vehicle stopping distances. Some of the key ones are:

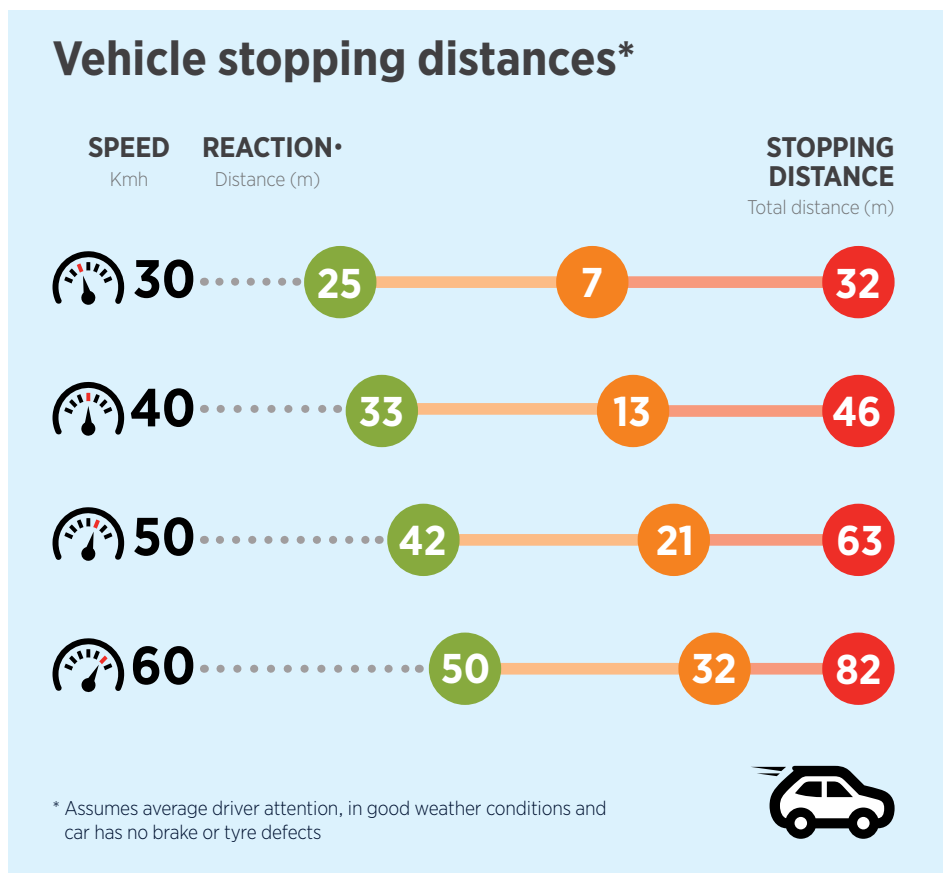
- **Tyres:** Car tyres are the only part of a vehicle that touch the road, so they're a big part of determining how quickly a vehicle can stop. Bald tyres will not perform as well as new ones that have a much deeper tread.
- **Weight of vehicle:** If you have four rugby players in your car, that's a fair amount of weight and it's going to take a lot to stop, as opposed to driving on your own.
- **The same is true if you are towing a trailer or caravan** – the extra weight means it will take you longer to slow down. In these cases you need to watch your speed, maintain a longer stopping distance and start braking earlier than normal to compensate for the extra time it will take to stop.
- **Weather and conditions of the road you're travelling on:** Weather can greatly influence stopping distance, most noticeably in ice, snow or rain. These elements get between your vehicle's tyres and the road, reducing traction. Chains are essential for ice and snow, but make sure you know how to fit and use them properly. Always be aware of the conditions and adapt your driving to suit them.
- **Speed:** The ultimate determining factor when it comes to stopping distance is your speed. Not driving to conditions or going just a little over the speed limit can make a big difference in how your car responds, especially during an emergency.

In an emergency, the quicker you react, the better the outcome is likely to be. Anything that stops you from reacting quickly will increase the time it takes for your vehicle to come to a stop. Being distracted by a mobile phone will delay your reaction times. And it goes without saying that drugs and alcohol definitely don't mix with driving. Tiredness can also have a very negative impact on your driving in general, and specifically your reaction speed. So if you're feeling drowsy, make sure you pull over and get some rest.

How long does it take your vehicle to stop?

The 'vehicle stopping distances' infographic (as seen below) gives you a rough idea of how our ability to react quickly contributes to stopping your car in an emergency. Information in the infographic assumes average driver attention, good weather conditions, with an average two-tonne car having no issues with its brakes or tyres.

Travelling at 30km/h, taking into account the time it takes for an average driver to react in an emergency situation, the car will have travelled 25 metres and then another seven metres for it to come to a complete stop. Total stopping distances get longer at higher speeds. Travelling at 50km/h, the total stopping distance is approximately 63 metres (the time it takes for an average driver to react in an emergency situation, the car will have travelled 42 metres, and then another metres for the car to come to a complete stop).



What are the outcomes of the impact of lower speeds from other places?

SWEDEN

1997 VISION ZERO IMPLEMENTED

2000 Deaths have halved

2008 **440** Died in crashes

2017 **254** Died in crashes

SYDNEY, AUSTRALIA

40% of crashes in the city centre take place 6am-6pm

2014 **40** km/h in city centre

2014 **46%** serious injuries

2016-17 State government extends zone

NEW YORK CITY, UNITED STATES

2013 **299** Died in crashes

2014 VISION ZERO IMPLEMENTED

2017 **222** Died in crashes

2018 **200** Died in crashes
(lowest level since the city began tracking such deaths in 1910)

BRISTOL, UNITED KINGDOM

2016-17 (32km/h)

Since then, more than **four lives a year were saved** and about **170 injuries were prevented**.

FRANCE

The speed limit on two-way roads outside urban areas (without a central barrier) was reduced to 80km/h from 90km/h in July 2018.

on rural roads

A 12-month evaluation reports shows that: 206 fewer road deaths took place over the 12-month period compared with the five-year average 2013-2017.

206

LONDON, UNITED KINGDOM

A before and after study evaluated the effects of 20mph (32km/h) traffic speed reduction zones (speed humps and mini roundabouts) in 200 small residential areas.

61% Total injuries

70% child pedestrian injuries

48% child cyclist injuries

6.2% for each 1 m/h reduction mean vehicle speed

QUEEN STREET, AUCKLAND **CHRISTCHURCH**

THE COUNTRY'S BUSIEST PEDESTRIAN STREET, SPEED LIMITS WERE CHANGED FROM

crash rates down **39.8%**

death and serious injuries down **36%**

VEHICLE AND FOOT TRAFFIC HAS BEEN GROWING WITH BUSINESSES RETURNING TO CITY.

injuries injuries crashes

36% vs previous 2 yrs 2016-18

25%

(10 years before compared to 10 years after).

What is the difference between speed related deaths and road deaths?

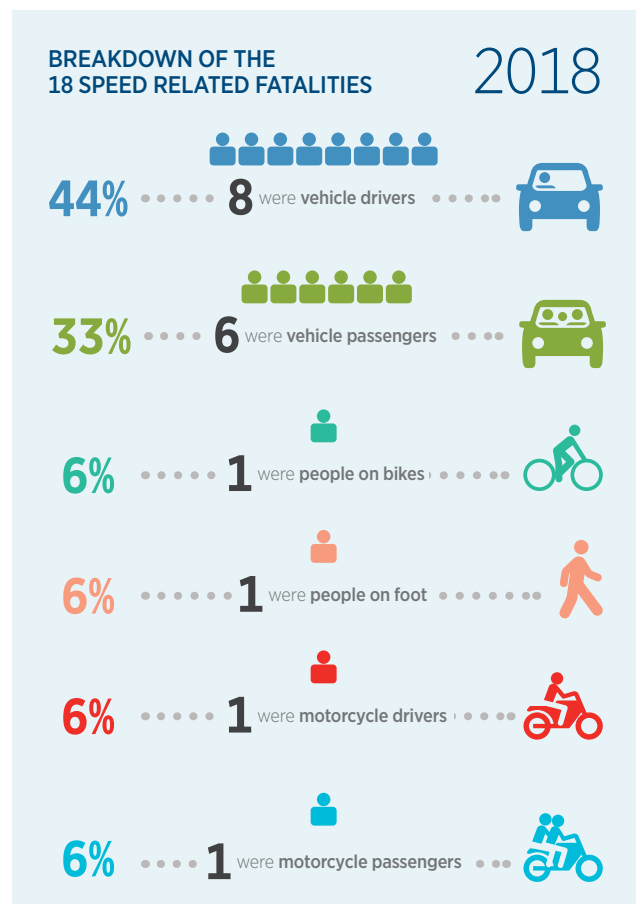
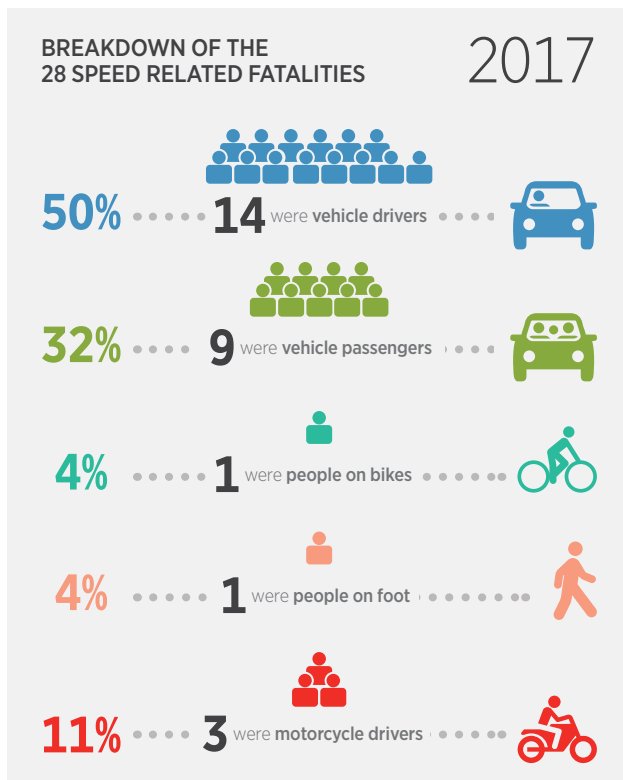
Road deaths refer to deaths on the road network regardless of what factors contributed to the fatal crash.

Speed contributes to all road deaths and injuries. It does this by adding to the level of injury and trauma in the crash, and by contributing to the likelihood of a crash occurring in the first place. Speed will determine whether you are able to stop quickly enough in an emergency, or whether you lose control of a vehicle.

Hence, speed determines both the likelihood of a crash occurring and the severity of the outcome. Regardless of what causes a crash, whether someone walks away will depend on the speed vehicles are travelling.

Does AT have a record of deaths and serious injuries in Auckland for the last two years related to speed?

In 2017, 64 people were killed on Auckland roads and 44% (28) were speed related deaths. In 2018, 54 people died and 595 were seriously injured on Auckland's roads. Refer to the 'Breakdown of the 28 speed related fatalities in 2017 and 2018' infographic below.



What is the extent of the Safe Speeds programme?

A three-year programme to reduce deaths and serious injuries by 60% in a 10-year period has begun.

How have these roads been prioritised?

Roads have been prioritised based on a number of factors including:

- SYDNEY, AUSTRALIA 40% of crashes in the city centre take place 6am-6pm 2014
- 2014 40% 46% km/h serious in city centre injuries 4km0/h
2016-17 State government extends zone
Safety concerns raised by local residents
Vehicles exceeding speed limits

Local crash data and Locations of schools, local predictive analysis to shops, community facilities identify high crash areas and parks, where people due to land use change etc walk and cycle frequently

Is AT considering a 30km/h speed limit in Auckland city centre and other town centres?

Yes. After considering close to 12,000 public submissions and reviewing technical reports, Auckland Transport's Board approved a bylaw on 22 October 2019. From June 2020, most of Auckland's city centre will have a speed limit of 30km/h (the current 10km/h combined pedestrian and vehicle zones will remain), however, the decision has been made to reduce Hobson, Fanshawe and Nelson streets to 40km/h instead of 30km/h. In addition, AT will implement engineering treatments on these arterials to protect vulnerable road users like people walking and cycling.

While the city centre accounts for 2.2% of Auckland's death and serious injuries, it has a significant number of people walking and cycling. 84% of all crashes involve vulnerable road users.



In other words, while Auckland city centre accounts for 0.6% of the total network, in 2017 it accounted for 4% of the total deaths and injuries (serious and minor).

People walking make up one quarter of the deaths and serious injuries on urban roads (excluding motorways), and people cycling or on motorbikes make up more than another quarter. Together, walking, cycling and motorcycling accounts for more than half the deaths and serious injuries on our urban streets.

If a person walking is hit by a vehicle travelling at 30km/h, the chance of dying is 10%. At 50km/h, the chance of dying is 80%. If the travel speed of the vehicle is 40km/h, a person walking when directly hit would typically have a 30% chance of death and a 70% chance of serious injury.

Additionally, given the city centre is approximately a four km square area, 2.2% is a significant amount for an area of this size.

The existing average speeds along main roads are generally below 30km/h and journey times are unlikely to be impacted, however there are points within the city centre that have higher speeds.

These are not appropriate when we have a high number of people walking and cycling. We are working closely with our partners including Auckland Council, NZ Police, NZTA and other organisations, on our road safety and Safe Speeds programmes to deliver road safety improvements across the region.

AT is also investigating 30km/h zones in other town centres in Auckland, which have a significant number of people walking and cycling. [Refer to the 'Local urban road deaths and serious injury by mode' infographic below.](#)

What is the potential impact on journey times if the speed limit is lowered?

Given that people travel at a variety of speeds, the 'Potential impact on journey times if speed limit is lowered' infographic gives an indication of the additional time added to a journey per kilometre. Many of our roads operate at a range of speeds from 30 – 80km/h and it is complicated to calculate an average journey time increase for the road as journey speeds are typically more significantly influenced by the road environment, prevailing traffic patterns and route intersection traffic controls. Consequently, the increase in average journey time tends to be minimal if affected at all.

Within the city centre, all average journey speeds are well below 30km/h during both the peak periods and during the day (interpeak). Speeds may well exceed 30km/h between signalised intersections, however the effect of closely spaced signalised intersections and the need to accommodate general traffic movements, buses and people walking, cycling and e-scooter results in average journey speeds well below the posted speed limit.

There are currently only two sections that have an average travel speed above 20km/h, but still below 30km/h within the city centre. These are on Bowen Avenue and Queen Street (between Karangahape Rd and Mayoral Drive), both being relatively simple streets with one or no intersections along their length.

In a nutshell, reducing the speed limit within the city centre will have little impact on general travel speeds and therefore travel times, as the posted speed limits are not the main contributory factor to travel speeds and times. The desired effect of reduced posted speed limits will therefore be to reduce speeding up

between signals and intersections. Additional effects include improved safety for people who walk, e-scooter and cycle, reduced crash impact severity and a more calmed street environment. [Refer to the 'Potential impact on journey times if speed limit is lowered' infographic below](#)

Why are there different speed limits proposed for roads that once had similar speed limits?

Historically speed limits were set based mainly on the land use. Urban areas defaulted to 50km/h, rural areas defaulted to 100km/h, and there was some scope to apply 80km/h and 70km/h to urban fringe areas.

Central Government have updated the legislation for setting of speed limits and under the new safe speeds approach, while 50km/h and 100km/h are still the default values, there are options to set speed limits based on the nature of the road rather than just surrounding land use.

In the case of rural roads this allows the adoption of speed limits of 80km/h or 60km/h where the roads are not designed to operate safely at 100km/h. In extreme cases such as narrow, winding, unsealed roads, 40km/h may also be considered as a rural speed limit.

The roll out of lower speed limits will occur gradually across the network. Key criteria for selecting which roads to treat first include:

- Routes with high crash rates (where speed reduction could be expected to give the best crash reductions)
- Routes where the road conditions/ geometry already encourage most drivers

to drive at a lower speed, and aligning the limit with lower speeds will help to make speed limits more credible

- In simple terms, the focus of AT's Safe Speeds programme is to introduce safe and appropriate speeds across the network with an initial focus on the highest risk roads. Safe and appropriate speeds are directly related to survivable speeds i.e the likelihood of people being killed with specific crash types relating to the type of road – for example on a rural road with higher speeds the type of crashes are likely to be run off road or head on crash, (safe and appropriate $\leq 80\text{km/h}$) whereas urban centres are more likely to involve people walking, cycling or e-scooter (safe and appropriate = 30km/h).

How will slower speeds impact emergency services?

When required, police and fire emergency vehicles will travel over speed humps as they do so now, at speed. Ambulances may have to slow down when transporting patients, as they do so now.

Can large vehicles like ambulances, fire engines and rescue vehicles go through speed calming measures like humps?

Yes, they already are going over speed calming measures like humps. Humps and tables are designed to accommodate the movement of large vehicles. In contrast, chicanes are not as effective as speed humps or tables.

How has AT ensured the safety of bus passengers (especially those standing) as buses go over speed tables and humps?

AT has conducted many tests with our Metro and bus services teams to develop the most effective speed tables that do not cause significant discomfort to passengers.

Why are you penalising the “good drivers”?

Vision Zero isn't about penalising anyone. Most of us are confident and good drivers, who observe road rules. However, we're also human and we make mistakes or get distracted. These mistakes or distractions shouldn't automatically lead to devastating consequences.

What does Vision Zero look like to the everyday motorist? Do I have to leave for work earlier?

- Vision Zero is already in action and no it doesn't mean you will have to leave earlier for work or have longer travel times
- Vision Zero means as partners we'll work together to each play our role. Here are examples of Vision Zero in action To make higher speed rural roads safer, we'll introduce median and side barriers. These prevent cars from running into oncoming traffic and losing control. Flexible barriers absorb much of the force in a collision, reducing the impact to the human body and allowing the vehicle to come to a gradual standstill. In other parts of New

Zealand, median barriers have reduced head-on collisions by 92% and deaths and serious injuries by 67% (Draft Standard Safety Intervention Toolkit, NZTA, February 2019). We're currently building flexible median and side barriers as part of the Dome Valley safety improvements

- Our urban transport system will be built and operated for people. You will be able to easily access public transport that's convenient and frequent and already the safest mode of urban travel. Since January 2018 we have installed 19 automatic pedestrian crossing gates at rail level crossings
- We've also trialled real time driver fatigue and distraction detection on our buses that monitor driver wellness and can alert drivers and the depot To make ferry boarding safer, since 2017 we've made it easier for passengers to wait on the stationary part of ferry wharves and put slip resistant marine flooring on gangways and pontoons
- You'll be able to enjoy more spaces designed for walking and cycling. Parents can feel more confident about their children walking or cycling to school. Research in 2015 demonstrated a 37% reduction in school aged walking/cycling deaths and serious injuries for 20 schools with electronic school speed zones and Travelwise programmes, compared to 20 control schools (Road Safety Promotions Evaluation Report, Auckland Transport (2015-16)
- Around the region, raised pedestrian crossings will protect you as you cross the road, like the one now on Sandringham Road near Ethel Street. When riding your bike, you'll enjoy protected cycle lanes

that have curbs or physical barriers, like the one along Quay Street. We'll conduct motorcycle safety trials such as electronic warning signs for turning

- Speed management is central to achieving Vision Zero. This means infrastructure and speed limits need to reflect the true risk of the road.
- We'll work closely with Police on enforcement and use more automated technology to help reduce the risks for everyone. 30km/h speed limits have been successful in our city centre. In Wynyard Quarter, between 2012-2017, there was an average of one death or serious injury a year – this has been zero since the 30km/h speed zone was introduced. On Queen Street, there's been a 36% reduction in deaths and serious injuries since 30km/h speeds were adopted in 2008 (Road Safety and Safe Speed Programme, Auckland Transport 2018-19) We'll continue to grow and share best practice knowledge about staying safe for everyone using our network; whether it's by motor vehicle, bike or public transport. We'll run education programmes to emphasise safe behaviour like wearing seatbelts, complying with give way rules, driving sober and alert, and reducing distractions. Where safe behaviours need enforcing to save lives across the wider system, we'll work together on safety campaigns. As an example, working with Police on red light running campaigns, including safety cameras, has helped with the significant drop in injuries from this type of crash from 2017 to 2018. We will make more use of safety management tools to identify where we have the highest risk, like the Urban Kiwi Road Assessment Programme (Urban KiwiRAP) mapping tool for safety at a planning level, and the Safe System

Assessment Framework for selecting the right engineering treatments. We will also work to influence safety legislation and policy as appropriate

- Many urban arterials are indicated as high risk for a range of vehicle and active mode users, so there will be a range of new approaches in these locations.
- Many rural roads are high risk and have a different range of solutions. Not all communities are equal, so extra effort will be made to provide high-risk communities and age groups with safe transport.

These engineers don't know my area.

Yes, that is correct. We don't know every detail of Auckland's transport system because:

- Auckland has 7,300 kilometres of legal road, of which approximately 868km (12%) is unsealed. 678km (78%) of the unsealed road network is in Rodney and the remaining 190km is located mainly in Franklin, Hauraki Gulf Islands, and Waitakere
- So, we will work with the community at a local level to gather intel, share information and collaborate with the locals to ensure that local concerns are addressed
- We intend to work in a collaborative way with engineers, planners, technicians, partnering with Police and politicians to provide a safe transport system for locals and for those who travel through local roads.

Vision Zero works in Europe. It won't work here. Why not just fix the roads?

- Vision Zero works in New Zealand, just as it works in Europe or anywhere in the world
- In Christchurch, the 30km/h speed zone in the city centre has seen a dramatic fall in deaths and serious injuries between 2016-18
- In Auckland:
 - The 30km/h speed zone along sections of Queen Street has seen crash rates down 39.8% and death and serious injuries down 36% (10 years before compared to 10 years after)
 - In 2017 a 30km/h zone was introduced in Wynyard Quarter and crashes have reduced by 25% with no reported deaths or serious injuries
- We will be fixing and upgrading the quality of our roads
- However, with large infrastructure projects, there is a long-lead time and more people could die or be seriously injured.
- Upgrading roads to European standards is expensive:
 - We are a small country in the South Pacific with a limited tax-base
 - Many people consider German roads as the gold-standard
 - However, Germany is the third largest economy in the world and also has European Union funds that it can use for its roading infrastructure With our limited resources, we will be targeting high-risk projects to get the maximum benefit of reducing DSIs as quickly as possible and getting them down to zero by 2050.

Why should we care about people who don't drive well?

- Data from New Zealand and overseas shows that rash driving or extreme behaviour is not the primary cause of crashes on our roads.
- We're human and we make mistakes Data shows that most crashes were caused by mistakes everyone of us could potentially make every day.
- So, this isn't about not caring about people who don't drive well; it's making sure that one of the characteristics that makes us human; our ability to make mistakes or sometimes make poor choices on the road, shouldn't lead to devastating consequences It is about protecting our most vulnerable, our children and seniors, so that none of us must mourn the death of a friend or a family member or have to live with life-changing consequences because we made a mistake.

What is an “appropriate” speed limit? How does it differ from Vision Zero speed limits?

An appropriate speed limit refers to travel speeds that are appropriate for the road function, its design and use

- It recognises that speed is one element among many in the network
- It assumes that while the safety is of high concern for the public, they also expect journeys to take a reasonable time and actual travel speeds need to reflect both expectations without sacrificing one for the other
- It further assumes that speed and journey time efficiency are more important on some journeys than others.
- Setting a safe speed limit is one way to reduce deaths and serious injuries
- Vision Zero speeds limits are survivable speed limits Survivable speed limits refers to the maximum amount of force the human body can withstand without dying or being seriously injured
- The death and serious injuries infographic below shows the maximum impact force our bodies can withstand without dying or being seriously injured

Is there a programme timeline for Vision Zero? What is the DSI reduction target in relation to this timeline?

- We plan to achieve an interim target of no more than 250 DSIs by 2030
 - Our goal is to prevent more than 3,000 DSIs happening over the next 11 years This target is approximately a 65% reduction from a 2016-2018 annual average baseline of 716 DSIs This extends the ATAP target of reducing DSIs by 60% by 2027, from a 2017 baseline
- Our target in the first action plan (2019-21) is no more than 575 DSIs by 2021 This target is approximately a 20% reduction from the 2016-18 annual average baseline Our goal of zero DSIs by 2050, is line with the Auckland Plan
 - This reflects a conservative judgment, based on similar timeframes considered by the Australian states of Victoria (2050) and adopted by New South Wales (2056)
 - We may be able to achieve faster results and will work with our partners to learn and develop as we go.

Modern cars are safer and better, so why are speeds being lowered?

While modern cars have better safety equipment, New Zealand's fleet is relatively old. Half the cars on the road lack even basic safety features like stability control or side airbags.

New Zealand roads are often unforgiving and leave no room for error. Even the best technology won't stop another car crashing into you. We all make mistakes. Speed is the one risk that all drivers can minimise.

Why does AT have more projects in the programme than available funding?

All AT priorities are laid out in the Regional Long Term Plan (RLTP) and, at the beginning of each financial year, this plan is turned into a list of projects, which are matched with the available funding.

Not all projects are able to be delivered as quickly as we would like and this is for many different reasons as outlined below. Those projects that are delayed will be taken as far as possible, through design and consultation for example, to ensure they are ready to go when possible.

We ensure that we have more projects in the pipeline than we have available funding, so we are always delivering a full programme.

Why do some projects get delayed?

As projects are developed we can uncover new problems that we didn't know existed at the beginning. Sometimes these are technical challenges, like discovering services are in different locations than we expected, or that existing structures are of different qualities than anticipated. Sometimes we can get feedback from elected members, local residents or the wider community about their needs that we have to take into account.

Responding to these situations appropriately can mean that project costs end up being higher than the initial estimates. These higher costs mean that more funding is required and that the project may be put on hold while we work out where that extra funding is going to come from.

To help, we have more projects in the pipeline so that when one project gets delayed, another can be brought forward to ensure we always have a full programme of works.



Term	Meaning
Engineering up	Modifying/rebuilding the road to improve or maintain safety.
Forgiving road environment	A road environment that allows drivers space to recover from mistakes and/or bring their vehicle safely to a stop without encountering hazards that would potentially result in death or serious injury. A forgiving road environment also automatically encourages slow speeds where there are more people walking and cycling.
Personal risk vs Collective risk	<ul style="list-style-type: none"> • How dangerous a road or intersection is can be described in two ways: • Personal Risk or Exposure (likelihood of a person being killed or seriously injured) is the estimated number of deaths or serious injuries per 100 million kilometres travelled. • Collective Risk or Crash Density is the total number of fatal and serious crashes or the estimated number of deaths or serious injuries over a crash period (usually five years), per kilometre of road.
Safe speeds	Speed limit setting is often the core of safe speeds, but also includes engineering to slow operating speeds or to create a safe environment for higher speeds (see 'engineering up').
Self-explaining road	A self-explaining road is where the road design encourages a driver to instinctively adopt a safe speed e.g. narrow road width, traffic calming etc.
Survivable speeds	Survivable speeds refer to the forces that we as human beings can tolerate and still survive when directly hit at speed. Internationally, a 30km/h direct impact speed is recognised as the maximum direct impact speed a healthy adult human body can tolerate without sustaining serious injuries or dying. There is a 10% chance of death for a healthy adult walking who is directly hit by a typical two tonne vehicle when travelling at 30km/h and a 15% chance of serious injury. If the same healthy adult is hit at a direct impact speed of 40km/h, the chance of death rises to 32% with a 26% chance of serious injury.
Vision Zero/ Safe System	<ul style="list-style-type: none"> • Vision Zero states that no loss of life in road crashes is acceptable. It places a greater responsibility on road corridor managers (AT and NZTA) to create a safe system and typically involves low speed environments. • Vision Zero, a Swedish ethics-based strategy focuses on a core principle that 'human life and health can never be exchanged for other benefits within society.' Vision Zero recognises that people make mistakes and that us humans are vulnerable creatures. We are not built to withstand high impact forces. In terms of road safety, this puts the spotlight on safe speeds. Vision Zero speed limits must be determined by the fundamental protective qualities of road infrastructure and the vehicles using it. It moves away from the traditional approach of blaming drivers. Vision Zero takes into account that potential crashes must be anticipated, planned for, and accommodated. Vision Zero proposes to set lower speed limits in busy environments such as Auckland city centre and town centres and higher speeds in well- protected, heavy traffic flow environments, like motorways. If safe speeds are systematically addressed, zero harm is an achievable goal for all road users. • The Safe System approach aims for a more 'forgiving' road network, one that takes human imperfection and vulnerability into account.



