ROAD SAFETY AND SAFE SPEEDS PROGRAMME

Frequently asked questions

Terminology

Glossary of terms

2018-19

INTRODUCTION

VISION ZERO

Auckland has a serious problem on its road transport network.

In 2017, 64 people died and an additional 749 were seriously injured and now have to live with life-long consequences.

The increase in road trauma is both a transport and public health issue for the region with significant economic costs. More importantly, the after-effects of road trauma on victims' whānau, friends and community are devastating.

Auckland Transport is committed to improving road safety and embraces the Vision Zero goal of eliminating deaths and serious injuries in our road transport system. We do not accept that some people may die or be seriously injured as a price to pay for travelling on our roads.

FUNDING

We are fast-tracking implementation of a safety and speed management plan, and delivering an ambitious $700 million safety infrastructure acceleration programme, estimated to reduce death and serious injuries by up to 18% over an initial three-year period.

Our programme will deliver major, minor and mass-action safety engineering projects, including speed management at high-risk routes and locations across the network.

The safety programme is partly funded by the Regional Fuel Tax (RFT), which contributes $210 million of the total $700 million capital expenditure.

GUIDING PRINCIPLES

To support this programme, clear communications and easily understood language are paramount in building support and alliances with all our road safety partners and stakeholders.

Towards these goals, we have developed the first edition of AT's frequently asked questions, a terminology guide and a glossary of terms.

The guide's core principle is to provide quick and easily understood information on what is a complex and challenging programme. It is designed to have consistent information for AT's internal stakeholders as well as our road safety partners, external stakeholders, the media and members of the public.

The guide will be updated regularly as our safety and speed management programme progresses.

1 Why is road safety a priority?

The rates of death and serious injury on our roads are unacceptable – no one should lose their life or be seriously injured when travelling on our transport network.

In 2017, 64 people died and 749 were seriously injured on our road network. We have a Vision Zero goal with an interim target to reduce death and serious injuries on our roads by 60% in 10 years. Auckland Council and the Government have signalled that improving safety on our roads is a high priority through the 10 Year Budget, Auckland Transport Alignment Programme (ATAP) and the Government Policy Statement on transport. We have prioritised road safety in our Regional Long Term Plan.

AT safety engineering investment was approximately $13 million per annum and addressed only two to three of the high risk intersections and roads. It is clear from the last three years' death and serious injury numbers (DSI) show that the existing level of funding has not made an impact on reducing road trauma.

2 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 serious mental 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 activities.[1]
- A stay in hospital due to a crash.

3 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]

The total social cost of motor vehicle injury crashes in 2016 was $4.17 billion (up by 7.8% from $3.87 billion in 2015). This estimate covers all injuries recorded by the NZ Police, hospitals and ACC.

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.

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[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

Question 3 continued

This increase reflects a 2.5% increase in the total number of fatalities (from 319 in 2015 to 327 in 2016) and a 17% increase in the estimated number of serious injuries (from 3,775 in 2015 to 4,410 in 2016). In per-crash terms, the updated average social cost is estimated at $4,916,000 per fatal crash, $923,000 for every reported serious injury crash and $104,000 per reported minor injury crash.

4 What is Vision Zero and the Safe System?

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 speed management. Vision Zero speed limits must be determined by the core protective qualities of road infrastructure and the vehicles using it. It moves away from the tradition of blaming drivers. Vision Zero takes into account that potential crashes must be anticipated, planned for and accommodated.

The Safe System is an approach for realising Vision Zero aims for a more 'forgiving' road network, one that takes human imperfection and vulnerability into account through safe vehicles, safe speeds, safe roads and road users.

The Safe System proposes to set lower speed limits in busy environments such as Auckland city centre and town centres and higher limits in well protected, heavy traffic flow environments, like motorways. If speed management is systematically addressed, zero harm is an achievable goal for all road users.

5 Is AT a Vision Zero organisation?

AT has embraced Vision Zero in our commitment and emerging work programme across the business. We see our zero-harm goal as underpinning longer-term sustainability for our city and region.

As part of our Vision Zero goal, we have an interim target to reduce death and serious injuries on our roads by 60% in 10 years (with an initial three-year target of reducing it by 18%).

We are at the early stages of our road safety journey and have a lot of planning and delivery ahead of us in the coming years. Vision Zero is not just about road safety; it will assist our city's goal of becoming carbon neutral, reducing air pollution and improving public health.

By embracing Vision Zero, we will work with our partners, stakeholders, customers and wider communities to generate the action and innovation needed to achieve and sustain our goal.

Speed management initiatives are an important first step in the longer journey of delivering safer, accessible, cleaner and more affordable transport services, as called for in the new Government Policy Statement on Land Transport.

6 What is AT doing to improve road safety?

AT's Board, Chief Executive and Executive Leadership Team have endorsed the Speed Management Plan and Safe Roads Strategy. AT is developing its programme business case on safety which is in alignment with the Government's Policy Statement on transport, which focuses on safety as one of its four pillars.

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

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

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Question 6 continued

To complement our speed management 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 this financial year to improve infrastructure across our rural and urban areas.

Rural road delineation programme

- This financial year, $5 million (including funding from the Regional Fuel Tax) will be spent on improved 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.
- We are delivering over 600 campaigns, events, training and checkpoints to our key stakeholders to target high-risk groups and communities.
- Six more red light camera sites have been installed at high-risk intersections in Auckland to reduce dangerous driving and help save lives.

Pedestrian crossings

- We are upgrading 33 pedestrian crossings across the region this financial year.
- Our minor improvements programme addresses safety issues raised across the network by customers.

7 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. AT will deliver improvements on its network.

8 When is AT going to start work on improving road safety?

We have already started with our Rural Road Delineation and Signage Programme. Additionally, six new red light safety cameras have been installed at key high-risk intersections. Over the next ten years, we will bring the total number of red light cameras in Auckland to 42. We will also deliver a number of intersection and pedestrian crossing improvements in FY2018-19.

- In FY2017-18, 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 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.
- With the support of our board, we have been working with our central Government road safety partners and they are embracing the challenge we all face.

NZ Police have fully staffed their traffic safety team to bolster enforcement, the Ministry of Transport is exploring making speed management 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.

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Question 8 continued

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, areas where development is already happening, or areas where we are being proactive and preparing for future development, and around schools.

The technical analysis on these roads is complete and they are ready to be rolled out to improve safety for all road users. The wards effected by this accelerated programme are: Rodney, Albany, Ōrākei, Waitākere, Manukau, Manurewa-Papakura, Waitematā and Gulf and Franklin.

9 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.

10 What is AT doing about speed?

During AT's three-year speed management programme, we are identifying roads that will be affected by proposed speed limit reductions. These will be added to the Schedule of Speed Limits and drafted into a bylaw. The bylaw will then be consulted on Auckland-wide. Once the bylaw has been approved by AT's board, the new speed limits become legally enforceable.

The bylaw process involves 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 slower speeds.

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

11 Is AT consulting on speed limit changes?

AT's board makes and approves the bylaw. To do so, AT will consult with members of the public 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 allows any member of the public (whether an Auckland resident or not) to submit their views if they wish to.

12 What about NZ Police and enforcement?

NZ Police are 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 speed management programme and we look forward to our continued partnership with them.

13 How does AT prioritise routes and intersections for improvements?

Routes and intersections are ranked for improvement based on evidence from crash data and predictive analysis tools.

Road crashes, as reported by NZ Police, are recorded in the Crash Analysis System (CAS) managed by 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.

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Question 13 continued

Speed limit changes focus on 'high benefit' changes. These are:

- High-risk roads with high death and serious injury rates.
- '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.

TOWN CENTRES

Town centres (including Auckland city centre and high-risk residential areas) have more people walking and cycling. In such environments:

- AT's priorities are to reduce speed limits to survivable levels, recognising that many users share the same space.
- Existing operating (actual) speeds are normally lower than posted speeds during peak periods due to the high volume of traffic.
- We will create public spaces that promote people's health, happiness and wellbeing.
- As town centres become increasingly busy, we will provide more people focused streets where families feel safer.
- We will make area-wide changes rather than focus on individual streets, as they are part of a larger road network.

RURAL ROADS

In rural areas, our focus is on high crash risk routes. In such environments:

- We will introduce safe and appropriate speeds across areas, rather than individual roads.
- We will focus on making our key routes safer (for example, no speed limits greater than 80km/h on roads without a centre median separation).

14 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

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

Whatever causes a crash, the severity of the outcome depends on speed. Driving even a few kilometres slower can make a big difference to making our roads safer.

For roads in built-up areas, where there is a mix of vulnerable road users and motor vehicle traffic, the safe impact speed is internationally defined as 30 km/h.

16 Who is a vulnerable road user?

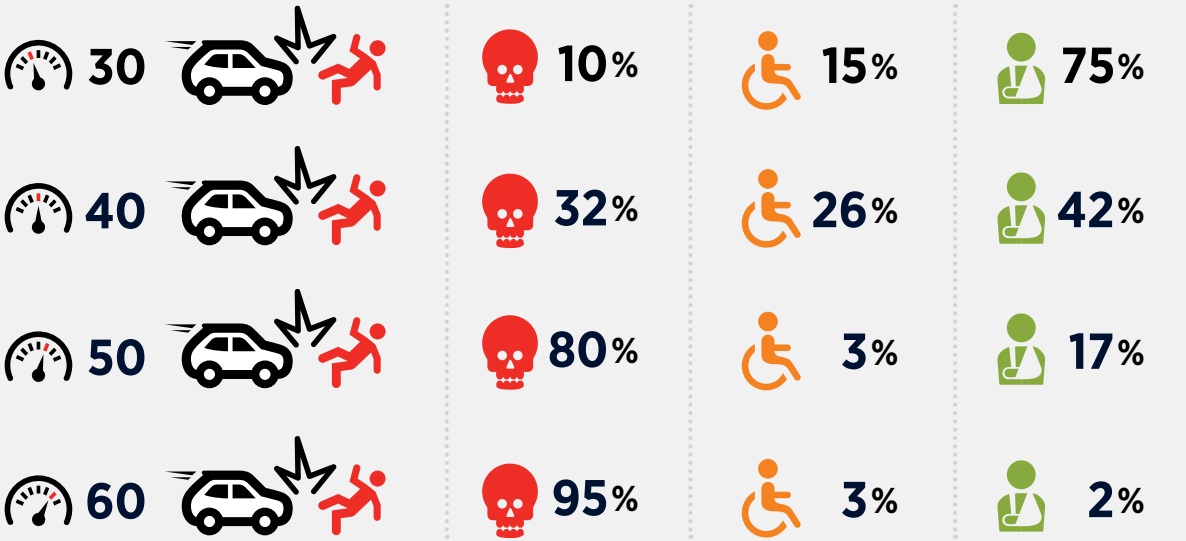
A vulnerable road user is anyone not in a vehicle. People walking, those on motorised two-wheelers (motorcycles, mopeds and light mopeds) and people cycling are referred to as vulnerable road users because of their 'unprotected' state.

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 10 km/h to 40 km/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.

Death and injury percentages



17 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 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.

18 What does vehicle stopping or braking distance and what role speed 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.

19 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.

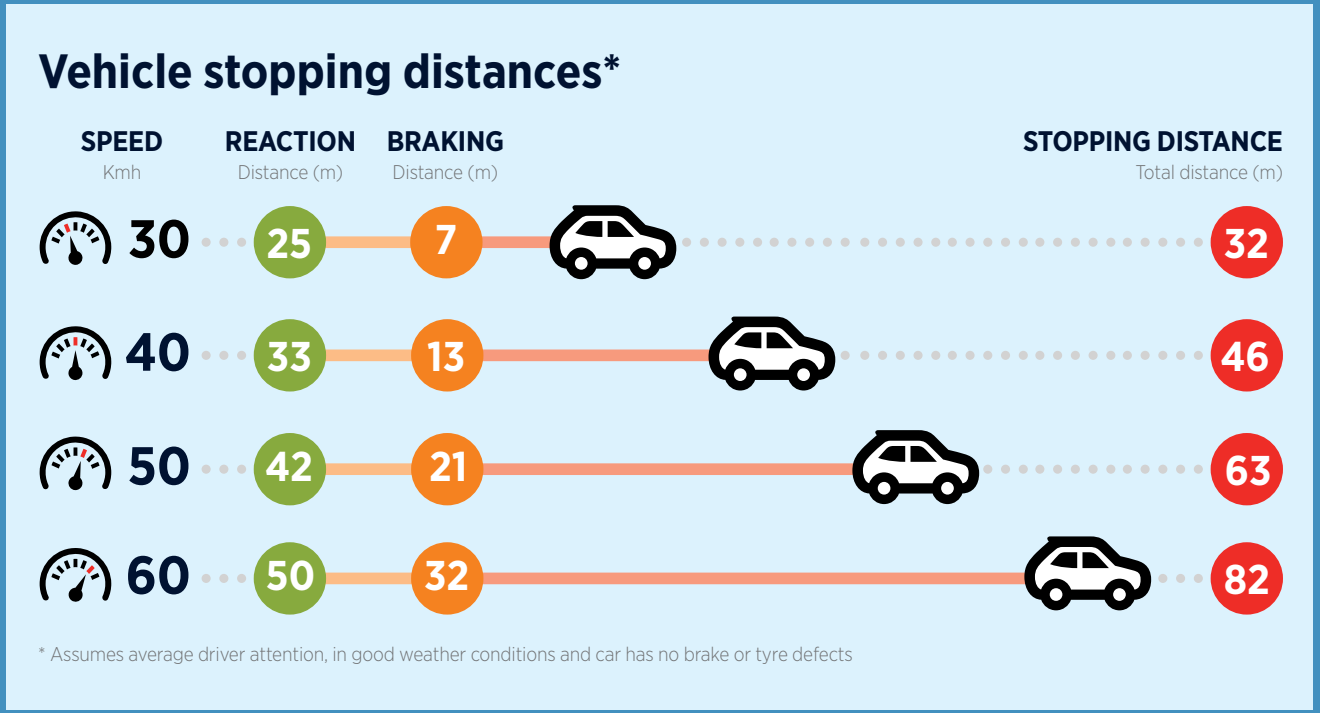
In an emergency, the quicker you react, the better the outcome is likely to be. Anything that stops you from reacting quickly will increase the time it takes for your vehicle to come to a stop. Being distracted by a mobile phone will slow you down for example. And it goes without saying that drugs and 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.

20 How long does it take your vehicle to stop?

The ‘Vehicle stopping distances’ infographic gives you a general idea of how your 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 30 km/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 21 metres for the car to come to a complete stop).



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

LOCATION	SPEED LIMIT CHANGE	CRASH/SPEED REDUCTION RESULTS
Queen Street, Auckland NZ	50km/h to 30km/h	Lowered in 2008. Crash rates down 39.8% and a 36% reduction in deaths and serious injuries (10 years before compared to 10 years after).
Wynyard Quarter, Auckland, NZ	50km/h to 30km/h	Zero deaths and serious injuries since implementation.
Auckland city centre temporary traffic management area, NZ	50km/h to 30km/h	All injury crashes reduced by 25% and deaths and serious injuries reduced by 27%.
Whitford Road, Auckland, NZ	80km/h to 60km/h (temporary)	• Between 2013–2017 44 injury crashes were recorded including 11 serious injuries. In the first 5 months of 2018 an additional 5 crashes were recorded – 1 fatal, 1 serious and 3 minor injury crashes. Since a temporary 60km/h was introduced in June 2018 there have been no reported crashes. • Public opinion has swung from being against the change to supporting the change. We received this email "A large number of people are very supportive of your changes as they have young kids driving which is a real concern for them. Once again thanks for everything you are doing in pushing for change and improvements."
Christchurch, NZ	From 50km/h to 30km/h in City Centre	Compared with crashes prior to the speed limit reduction, injuries have reduced by 25% in the 30km/h zone. The same type of crashes have increased by 13.5% in the parts of the City Centre that were still at 50km/h.
London, United Kingdom	32km/h City speed limit (2014)	• 1km/h average speed reduction in City of London after one year (2015) • 6% reduction in collision rates on urban main roads.
New York, USA	40km/h City wide speed limit (2014) (combined with other Vision Zero interventions)	• 28% reduction in road fatalities (2014 – 2018) • 45% in pedestrian fatalities (2014 – 2018)
Sweden	90km/h to 80km/h	On rural roads where the speed limit was reduced from 90km/h to 80km/h, the mean speed decreased by 3.1 km/h, and the number of fatalities decreased by 41%.
South Australia – urban	From 60km/h to 50km/h default urban speed limit (2003)	37% reduction in fatal crashes (compared to those that stayed at 60km/h was 19% reduction)
South Australia – rural	100km/h speed limit along 1,100km of rural roads (formally 110km/h), introduced July 2003	On the road sections where the speed limit was reduced from 110km/h to 100km/h, casualty crashes reduced by 32%. On the 110km/h roads that were not changed, casualty crashes reduced by 12%.
Bristol, United Kingdom	32km/h limits introduced 2014-2015	• 4km/h reduction in speeds since 2014 (2018) • Four lives a year saved • Approximately GBP15M saved per year due to lower casualty rates • 15 DSIs avoided each year (plus 160 minor injuries)
Israel	INCREASED speed limit from 90km/h to 100km/h in 1988	In the six years following, an average of 347 more people died than what would have been expected based on previous trends. The increases in death rates persisted six years after the speed limit change despite major countermeasures and increasing congestion throughout the period of follow-up.

London introduced a 20 mp/h (32km/h) speed limit on a third of its streets in 2014 and saw a 6% reduction in vulnerable road user trauma. New York City introduced a Vision Zero Plan in 2014, which has resulted in a 28% reduction in all road deaths and a 48% reduction in pedestrian deaths.

[3] **Source:** Friedman, L. S., Barach, P., & Richter, E. D. (2007). Raised speed limits, case fatality and road deaths: a six year follow-up using ARIMA models. Injury Prevention, 13(3), 156–161. http://doi.org/10.1136/ip.2006.014027

22 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 also 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.

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

In 2017, 64 people were killed on Auckland roads and 44% (28) were speed related deaths.

Refer to the 'Breakdown of the 28 speed related fatalities' infographic below.

24 What is the extent of the speed management programme?

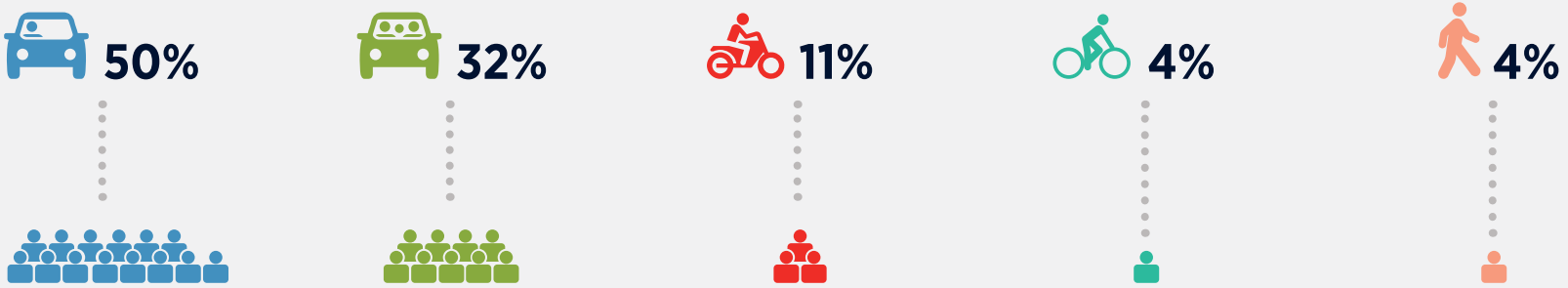
AT is investigating making changes to more than 900km of roads in the Auckland region or about 13% of the road network. A three-year programme to reduce deaths and serious injuries by 18% and by 60% in a 10-year period has begun.

25 How have these roads been prioritised?

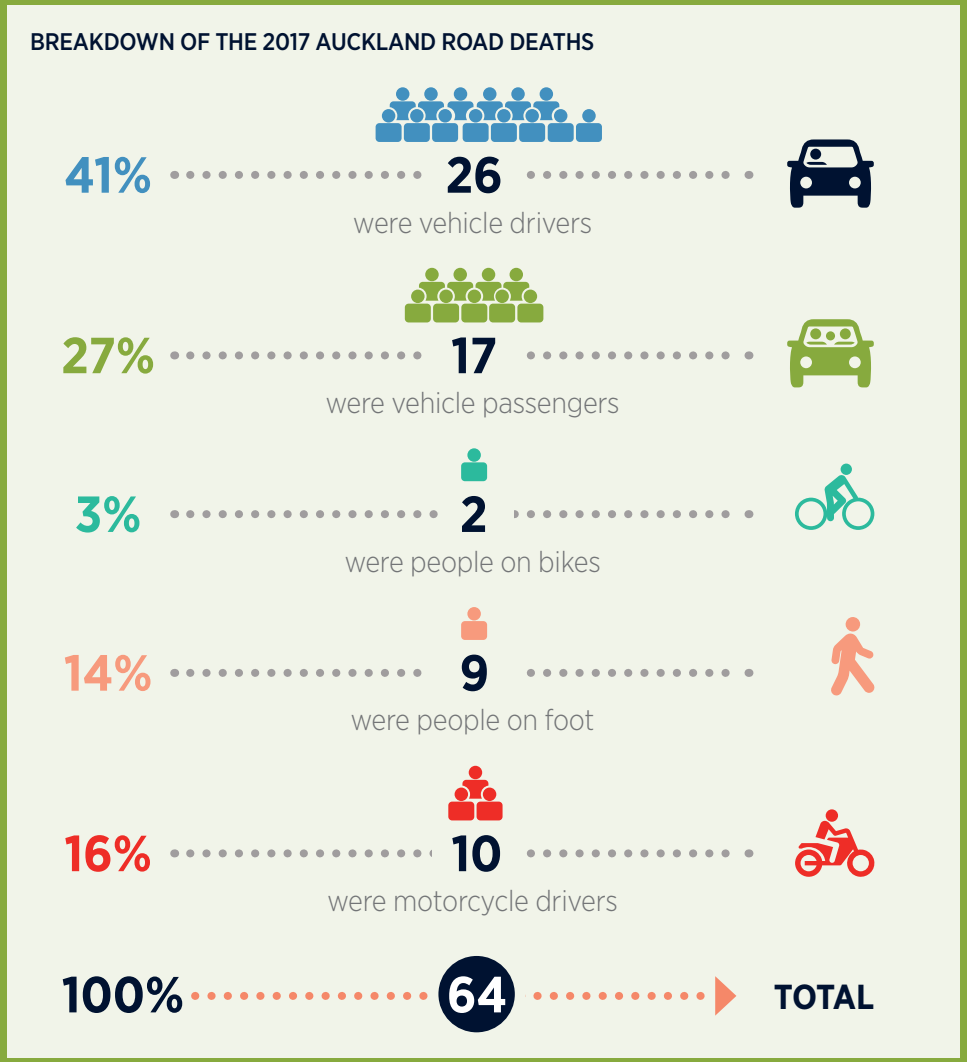
Roads have been identified based on a number of factors including:

	Safety concerns raised by local residents.		Vehicles exceeding speed limits.
	Local crash data and predictive analysis to identify high crash areas due to land use change etc.		Locations of schools, local shops, community facilities and parks, where people walk and cycle frequently.

BREAKDOWN OF THE 28 SPEED RELATED FATALITIES



26 What is the breakdown of the 2017 Auckland road deaths by road user type?



27 What is the impact on journey times if the speed limit is dropped to 30km/h?

It is important to understand that in dense urban environments (like the city centre or town centres), there is congestion and frequent stopping at traffic controls and intersections. A slower speed limit may not have any significant impact on journey time.

Using Nelson Street as an example of a relatively long street within the city centre, travelling at 30 km/h as opposed to 50 km/h (if even possible), would incur an additional 48 seconds in travel time over the 1 km distance.

In terms of modelling, current models during the AM peak remain unchanged whether or not we have 30kp/h or 50kp/h speed limit. Traffic patterns in inter-peak and off-peak hours are currently less understood than the AM peak, but it is expected that there will be some delay during these periods, as traffic is more readily able to reach 50km/h between intersections.

It should be highlighted that there are still significant numbers of pedestrians and cyclists even late at night, so the additional safety benefit of reduced speeds is still valuable compared to a slight delay (most measured in seconds rather than minutes) to the more limited number of motorists at these less busy times.

It is also worth highlighting a recent study by NZTA, which indicates that lower speed limits only marginally increase journey times. The study found that when driving at the maximum posted speed limit wherever possible, drivers arrived at their destination as little as 1.08 minutes faster than when they drove 10km/h slower.

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

Yes, Auckland Transport is currently investigating lower speeds of 30km/h in Auckland city centre which aligns with Auckland Council's City Centre Masterplan. We are also looking at introducing 30km/h in some town centres. This will be finalised for consultation as part of the speed management bylaw later this year. Generally, the city centre zone under consideration is within the motorway boundaries.

The investigation will determine the precise locations for the start of the lower speed limit and what physical changes we would need to implement. 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 account 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, the chance of dying is 10%. At 50km, the chance of dying is 80%. If the travel speed of the vehicle is 40 km/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.

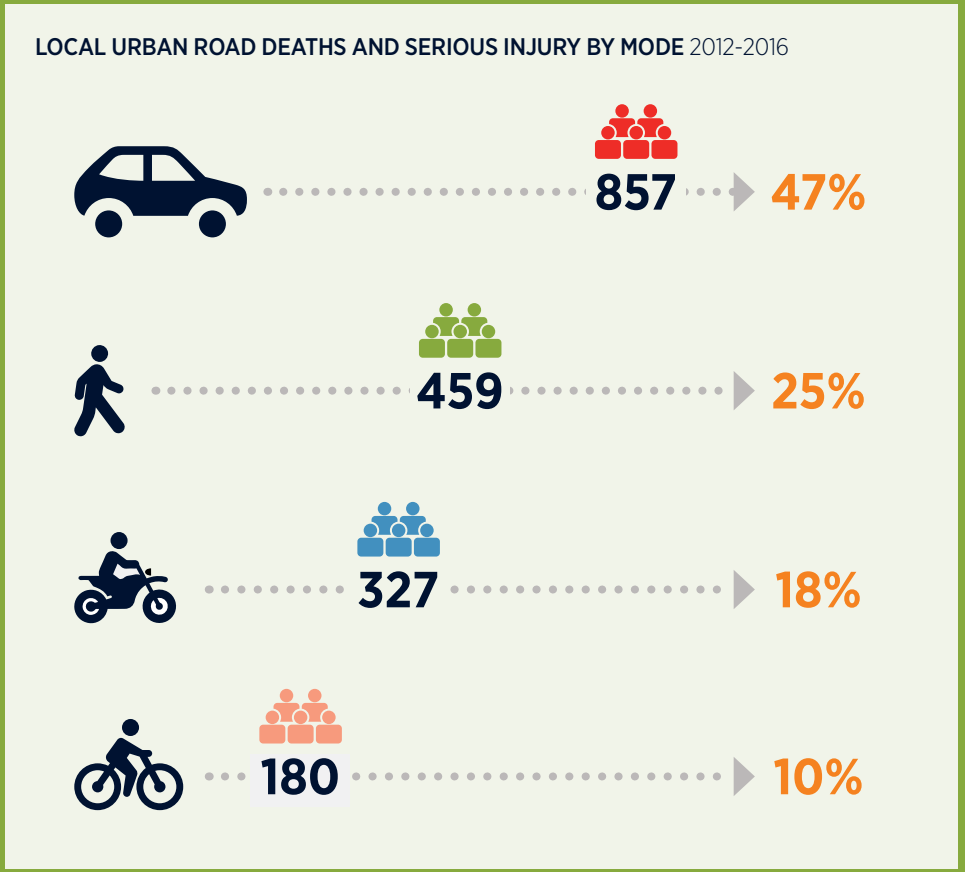
The existing average speeds along main roads are generally below 30km/h and journey times are unlikely to be impacted, however there are points within the city centre that have higher speeds.

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 speed management programmes to deliver road safety improvements across the region.

AT is also investigating 30 km/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.



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

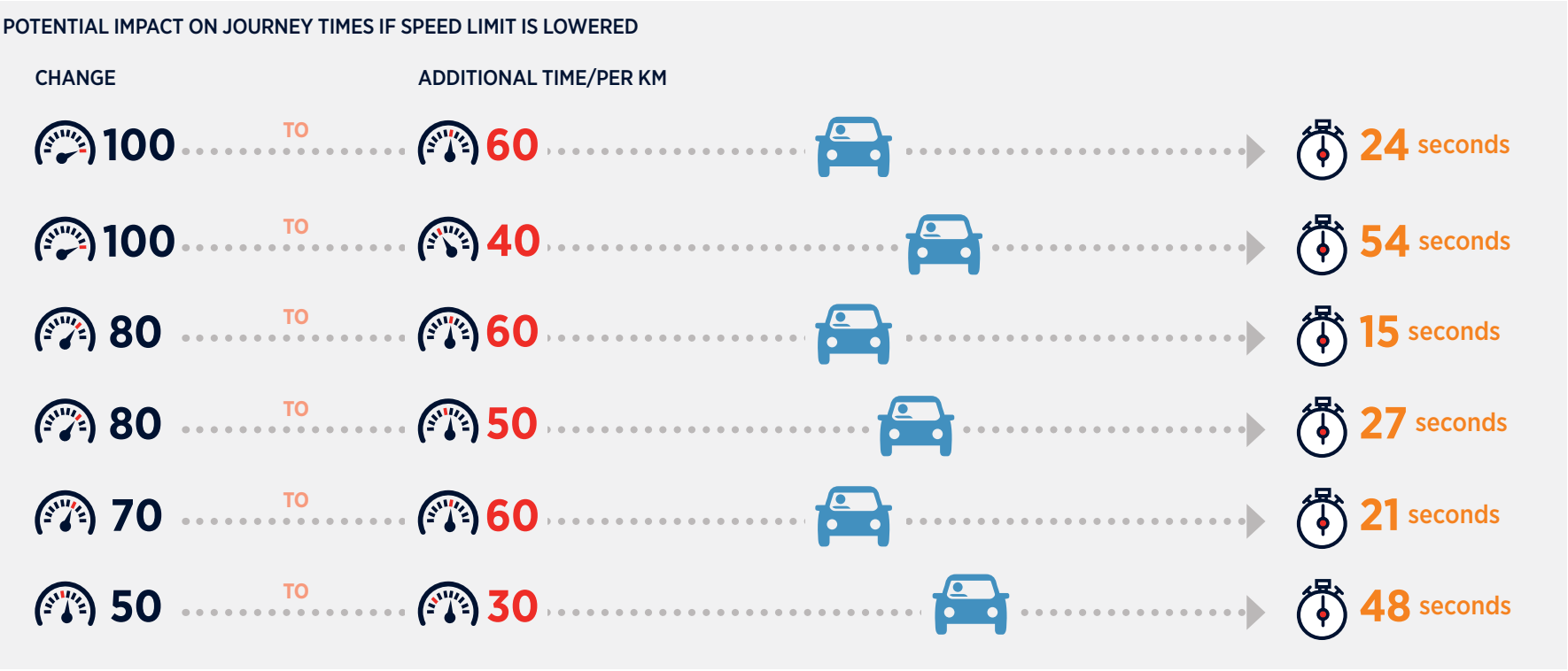
Given that people travel at a variety of speeds, the 'Potential impact on journey times if speed limit is lowered' infographic gives an indication of the additional time added to a journey per kilometre. Many of our roads operate at a range of speeds from 30 – 70km/h so it is complicated to calculate an average journey time increase for the road. However, the increase is likely to be minimal.

There is no linear correlation between speed limit and travel times in urban environments, as vehicle speed is only one of several factors that influence travel times.
For example, disruption from large projects and events (such as the CRL in Auckland) and traffic volumes (i.e. congestion) can have a much greater impact on travel times than the posted speed limit.

Most Vision Zero cities focus their monitoring into the impact of lower speeds, and focus on the safety benefits rather than 'travel time' outcomes. With regards to other locations such as Christchurch, they have only recently installed their lower zone and haven't published assessments into its impacts.

They also have issues in that much of their historic data isn't comparable, as it's either pre-quake or during construction when roads were closed and temporary traffic management due to infrastructure and building repairs.

Refer to the 'Potential impact on journey times if speed limit is lowered' infographic below.



30 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 speed management 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.

31 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.

32 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.

33 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.

34 Wouldn't it be easier to just get bad drivers off the road?

Most crashes in Auckland are not caused by extreme or illegal behaviour but rather by people who make mistakes.

We want to create a low speed and forgiving road environment, so that when mistakes are made, we don't have such bad outcomes.

35 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.

36 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 can ensure that we are always delivering a full programme.

37 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.

TERMINOLOGY

TERM	MEANING
Vision Zero/Safe System	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 vunerable creatures. We are not built to withstand high impact forces. In terms of road safety, this puts the spotlight on speed management. 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 speed management is 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.
Speed management	Speed limit setting is often the core of speed management, but also includes engineering to slow operating speeds or to create a safe environment for higher speeds ('see engineering up').
Engineering up	Modifying/rebuilding the road to improve or maintain safety.
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.
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	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.

GLOSSARY OF TERMS A-Z

ACCESSIBILITY
Ease of access/egress to any location by walking, cycling, transit and private vehicles, or for commercial vehicles. In terms of those with disabilities (including the elderly), the aim is to provide pedestrian citizens with greater accessibility to the outdoors throughout the year.

ACTIVE MODES
See Active Transport

ACTIVE TRANSPORT
Any mode of transport by which people use their own energy to power their motion, including walking, running, cycling, skateboarding, inline skating and use of a manual wheelchair.

ACTIVE STREETS
Streets where building edges/frontages are oriented toward, and are directly accessible from, the street by foot to promote pedestrian activity.

ARTERIAL ROADS
Intended to carry large volumes of traffic between areas ('through traffic') with fewer access opportunities to adjacent developments.

BARRIER-FREE
A design characteristic that maximises accessibility for persons with physical or cognitive difficulties.

CAPACITY (ROADWAY)
Maximum hourly rate at which vehicles can reasonably be expected to pass a given point given prevailing roadway, traffic, and control conditions.

CARRIAGEWAY
The (kerb-to-kerb) section of a street or road that currently is primarily used by motor vehicles, but may also be used by pedestrians and cyclists.

CHICANES
Chicanes are traffic calming measures used to reduce traffic speeds especially in residential and other areas with a lot of people walking and cycling.

COLLECTOR ROADS
Roads that provide neighbourhood travel between local and arterial roads and direct access to adjacent lands. Buses generally operate on collector roads within neighbourhoods.

COMPLETE COMMUNITY
A community that is fully developed and meets the needs of local residents through an entire lifetime. Complete Communities include a full range of housing, commerce, recreational, institutional and public spaces. They provide a physical and social environment where residents and visitors can live, learn, work and play.

COMPLETE STREET
A street that moves people, by foot, bike, bus and car; provides places where people can live, work, shop and play; supports the natural environment; facilitates movement of trucks and service vehicles, and supports our economy.

CONNECTIVITY
Connectivity entails how easily and directly users are able to move through street networks.

CORNER RADII
The measure of how broad or tight corners are at a junction, measured from the outside of a kerb or the outside of a cycle lane (where present).

CYCLE FRIENDLY
A street environment designed to allow cyclists to move about in safety and comfort.

DENSITY
The number of dwelling units, square metres of floor space, or people per acre or hectare of land.

DESIGN SPEED
Design speed is the speed selected as a basis to establish appropriate geometric design elements for a particular section of road. Essentially, it is the maximum speed at which it is envisaged/intended that the majority of vehicles will travel, under normal conditions.

DESIRE LINES
Normally the shortest route from one place to another, but can also be the most convenient, easy to use or comfortable route between to places.

ENCLOSURE (SENSE OF)
A condition created by providing a continuous line of buildings and/or street trees that has the effect of calming traffic and creating a greater perception of safety, especially for pedestrians and cyclists.

FOOTPATHS
The area within the road reserve that is generally reserved for pedestrian use.

FORMAL OR FORMALISED CROSSINGS
Crossings that require motorised traffic to stop to let pedestrians cross. These can include zebra crossing and signalised crossings

FREQUENCY (TRANSIT)
The number of transit units (buses or trains) on a given route or line, moving in the same direction, that pass a given point, within a specified interval of time, usually one hour.

FUNCTIONAL CLASSIFICATION
Functional classification is the process by which streets and highways are grouped into classes according to the land use, service function, traffic volume and speed, flow characteristics, vehicle type, and connections.

GREEN INFRASTRUCTURE
An interconnected network of natural green and engineered green elements applicable at multiple scales. Natural green elements include the conservation and integration of traditional green elements including trees, wetlands, riparian areas and parks. Engineered green elements include systems and technologies designed to mimic ecological functions, or to reduce impacts on ecological systems. GI examples include green alleys, green buildings and green roadways.

GREENWAYS
See Local Paths

GREENFIELD DEVELOPMENT
Urban development where there is no need to demolish or rebuild any existing structures. Typically, this development occurs on the periphery of the metropolitan area.

HIGH OCCUPANCY VEHICLE (HOV)
A vehicle occupied by multiple occupants, usually 2-3 or more occupants. Often HOVs are defined by a local regulation or sign, indicating how many occupants are required for the vehicle to be able to travel in a separate lane for HOVs. Buses are usually considered HOVs in this context.

HOME ZONE
A type of shared street in a residential area which may also include items of street furniture that would normally be used within areas of open spaces.

HORIZONTAL DEFLECTIONS
Changes that occur within the horizontal alignment of the carriageway, such as pinch points, which slow vehicles and require drivers to change direction.

HUMAN SCALE
A person's perception of the size, scale, height, bulk and/or massing of buildings and other features of the built environment.

INTEGRATED STREET NETWORKS
Highly connected street networks that support the integration of land use and transport.

IMPERVIOUS SURFACES
Mainly artificial structures, such as building roofs, roadway pavements, sidewalks, and parking lots, that cannot be easily penetrated by water, thereby resulting in runoff.

LEGIBILITY
The ease in which a user can navigate a street or street network using a series of environmental cues, such as buildings and landmarks.

LEVEL OF SERVICE (LOS)
An indicator of the quality of operating conditions for the transport system that may be applied to cycling or walking facilities (to reflect safety, connectivity, convenience, and comfort), transit service (to reflect speed, reliability, frequency, and passenger comfort) or roadways (to reflect the ratio of vehicle demand to roadway capacity, and resultant delay).

LINK
The role of the street in serving as a facility for the movement of people through the corridor.

LOCAL PATHS
A road or street designed to slow traffic, limit traffic volumes, facilitate cycling and walking, and to reduce environmental impacts and discharges to the storm sewer system. Local Paths provide amenity and are pleasant, slow-traffic roads and streets that are inviting routes for walking and cycling. Local Paths utilize storm water management strategies with features such as street trees, landscaped swales and special paving materials that allow infiltration and limit runoff. Increased vegetation may also improve air quality.

LOCAL ROADS
Roads that provide direct access to adjacent lands and serve neighbourhood travel.

MIXED USE
A development, street or broader area that contains a range of different land uses.

MODE (OR MODAL) SPLIT
The proportion of total person trips using each of the various modes of transportation. The proportion using any one mode is its modal share. Together, transit, cycling, and walking trips make up the non-auto modal share.

MODE SHARE
The percentage of person-trips made by one travel mode, relative to the total number of person-trips made by all modes

MODE SHIFT
The shift away from single occupant vehicle use and dependency to an increased variety of transport mode usage for various types of trips.

NODES
Major places of convergence and interchange between different forms of transport.

NEIGHBOURHOOD
A residential area with an appropriate mix of housing types with convenience-type commercial facilities and, where appropriate, schools or park facilities.

OPERATING SPEED
The prevailing speed of traffic on a transport facility. Typically quantified as the 85th percentile speed (i.e. the speed at which 85% of vehicles are traveling at or below).

PASSIVE SURVEILLANCE
Overlooking of streets and spaces from adjoining buildings.

PEDESTRIAN-FRIENDLY
See Walkable.

PERMEABILITY
The degree to which an area has a variety of pleasant, convenient and safe routes through it.

PLACE
The role of the street in serving as a destination for people to spend time.

PLACEMAKING
Placemaking is the process of creating spaces, such as squares, plazas, parks, and streets, that will attract people because they are pleasurable or interesting.

PUBLIC REALM
The region of a street right-of-way between buildings and the driving lanes used by pedestrians. It can include sidewalks, street furniture, street trees, signs, street lights, and patio space.

PUBLIC TRANSPORT
Public transport is a shared passenger transport service which is available for use by the general public, as distinct from modes such as taxicab, carpooling or hired buses which are not shared by strangers without private arrangement.

ROADWAY RESERVE
Publicly owned land containing roads and streets and/or utilities.

ROAD DIET
A technique to reduce the number of lanes on a roadway cross-section. One of the most common applications of a road diet is to improve space for other users (e.g. pedestrians, cyclists) in the context of two-way streets with two lanes in each direction.

SAFETY
Freedom from the occurrence or risk of injury, danger or loss.

SECURITY
The real or perceived sense of personal security including the condition of being protected from criminal activity such as assault, theft and vandalism.

SEGREGATION
Streets within which interactions between modes of transport are discouraged or prevented through the use of a series of barriers and other design measures.

SHARED USE PATH
A facility for active transport modes (including walking, wheel chair use, jogging, cycling, and in-line skating) which is generally constructed to a wider, asphalt standard, but may be concrete or granular.

SHARED STREETS
A street where pedestrians, cyclists and vehicles share the main carriageway and where pedestrians have priority of movement over other users.

SPEED LIMIT
The legally-defined maximum speed of vehicles on a transport facility. The speed limit is sometimes referred to as the Posted Speed, though not all speed limits are 'posted'.

SPEED MANAGEMENT
Processes and techniques to preserve neighbourhood liveability by mitigating excessive traffic speeds in neighbourhoods where traffic volume or 'short cutting' is not the concern.

STOPPING SIGHT DISTANCE
The distance ahead a driver needs to see in order to stop safely should an obstruction enter their path.

STREET
Roadways that are designed to accommodate all modes of transportation (to varying degrees depending on the specific street type). They also contribute to a sense of place, and typically provide more streetscape elements than roads.

STREET FURNITURE
Items placed within the street with the purpose of directing movement and/or enhancing its place value including public art, lighting, bollards, guardrails, seating and cycle parking.

STREET TYPE
Street type defines a street, taking into consideration the land use context, the relationship of the buildings to the street and the number of travel lanes, users, volume, type and speed of traffic.

STREETSCAPE
All elements that make up the physical environment of a street and define its character. This includes paving, trees, lighting, building type, setback style, pedestrian, cycle and transit amenities, street furniture, etc.

SUSTAINABLE MODES OF TRANSPORT
Transport which has a lower impact on the environment including walking, cycling and public transport.

TRAFFIC CALMING
The elements of a streetscape that are designed to slow the speed of traffic.

TRANSIT ORIENTED DEVELOPMENT (TOD)
A walkable, cycleable, mixed-use form of development typically focused within 600 m of a transit station (LRT or BRT). Its intent is to create mobility options for a higher density of transit riders and the local community.

TRAVEL MODE
The selected method of travel, such as automobile use (driver or passenger), public transport (bus, light rail, trains), or active transport (including walking, wheel chair use, jogging, cycling and in-line skating).

TYPOLOGY
Defines the key geographic areas within the urban boundary that share common characteristics. Typologies establish the framework within which more detailed land use designations and policies can be established. Integral to each typology and the city as a whole are the 'Road and Street Palette' and transit services, which are integrated with land use or typologies.

UNIVERSAL DESIGN
The design of products and environments to be usable by all people (of all abilities) to the greatest extent possible, without the need for adaptation or specialised design.

URBAN FOREST
All the trees and associated vegetative under-story in the city, including trees and shrubs intentionally planted, naturally occurring, or accidentally seeded within the city limits.

UTILITIES
Facilities for gas, electricity, telephone, cable television, water, storm and sanitary sewer.

VERTICAL DEFLECTIONS
Changes that occur within the vertical alignment of the carriageway, such as speed bumps, which require drivers to slow down.

VULNERABLE USERS
Road users who are most at risk—pedestrians and cyclists, specifically children, the elderly, and people with mobility impairments.

WALKABILITY
The extent to which the built environment allows people to walk to get to everyday destinations for work, shopping, education, and recreation. Walkability can be affected by street connectivity, mix of land uses, destinations and pedestrian infrastructure.

WALKABLE
An environment designed to make travel on foot convenient, attractive and comfortable for various ages and abilities. Considerations include directness of the route, interest along the route, safety, amount of street activity, separation of pedestrians and traffic, street furniture, surface material, sidewalk width, prevailing wind direction, intersection treatment, curb cuts, ramps and landscaping.

RURAL ROADS
Rural roads can be challenging. They are often unsealed, winding, hilly, have unsegregated lanes and even the most alert and experienced drivers can make mistakes. The consequences of small errors can be devastating.

It will take time and investment to upgrade or engineer the road network to a standard where the impact of a crash is minimised. This is why reducing speeds is a cost effective, efficient and immediate way we can improve the outcome for people involved in a crash.

SCHOOL ZONE SPEED LIMIT
At the start and end of the school day, traffic and pedestrian volumes are higher than normal around schools, increasing the risk of an accident.

Lowering the speed on roads surrounding schools will make it safer for schoolchildren and other pedestrians, allowing drivers more time to stop in case something goes wrong and creating a friendlier environment for people.

URBAN DEVELOPMENT
The building of new houses, shops or offices brings with it more cars and pedestrians. Bringing down the speed limit will help make the areas where development happens safer for all road users.

Generally, this means the speed limit will change to a speed more suited to an urban environment, like 50km/h or 60km/h.

URBAN EXTENSION
When new development takes place, you have to extend the area classified as ‘urban’. This has implications for the road network, too. More houses means more people, which have to be accommodated.

TOWN CENTRE ZONE
Town centres experience a higher concentration of pedestrians and other vulnerable road users, meaning there is a greater risk of an accident. By lowering the speed limit, we give pedestrians and drivers more time to react and reduce the chances of a death or serious injury occurring.

URBAN EDGE
The border between a city and the surrounding environment. Usually defined by lower levels of infrastructure, such as roads and sewerage systems. Extending the urban edge means more development is taking place.

Types of Roads

ARTERIAL ROADS

Arterials are major through roads that are expected to carry large volumes of traffic. Arterials are often divided into major and minor arterials, and rural and urban arterials.

COLLECTOR ROADS

Collector roads collect traffic from local roads, and distribute it to arterials. Traffic using a collector is usually going to or coming from somewhere nearby.

LOCAL ROADS

Local roads have the lowest speed limit, and carry relatively low volumes of traffic. Residential areas are mostly made up of local roads.

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