

SAFE MOBILITY STRATEGY

2021-2025



VISION
ZERO

Edmonton

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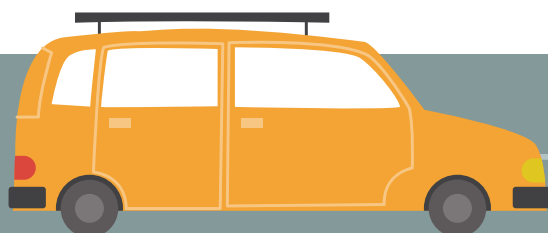
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Introduction

As Edmontonians, we move around the city in many ways. We go to the park, run errands, get exercise, pick up takeout, and head to work and school. We come from all corners of Edmonton and bring life to our community. We leave our homes, get behind steering wheels, hop on bikes and buses, walk or wheel down sidewalks, and climb into the cars of friends.

Many of us have experienced near crashes or minor crashes, but the impact of a mistake on our streets can be much more severe. In 2019, 268 people were seriously injured, and 14 people died due to crashes on our streets. As of November 2020, twelve people have tragically been killed in traffic crashes in Edmonton this year.

The *Safe Mobility Strategy*'s purpose is to achieve Vision Zero through safe and livable streets in amiskwacyi-waskahikan (ᐱᓄᓄᓕᓄᓂᓄᓂᓄᓂᓄᓂᓄᓂ) (Edmonton's traditional name).

Established in Sweden in 1997, Vision Zero is the internationally endorsed long-term goal of zero traffic-related fatalities and serious injuries. The City of Edmonton adopted Vision Zero in 2015, and the way forward to achieving this critical goal by 2032 is the *Safe Mobility Strategy 2021-2025* (*Safe Mobility Strategy*).

Amiskywciy-waskahikan

The lands on which Edmonton sits and the North Saskatchewan River that runs through it have been the sites of natural abundance, ceremony and culture, travel and rest, relationship building, making and trading for Indigenous Peoples since time immemorial. Edmonton is located within Treaty 6 Territory and within the Métis homelands and Métis Nation of Alberta Region 4. We acknowledge this land as the traditional territories of many First Nations such as the Nehiyaw (Cree), Dene, Nakota Sioux (Stoney), Anishinaabe (Saulteaux) and Niitsitapi (Blackfoot).

The city of Edmonton owes its strength and vibrancy to these lands and the diverse Indigenous Peoples whose ancestors' footsteps have marked this territory as well as settlers from around the world who continue to be welcomed here and call Edmonton home. Together we call upon all our collective honoured traditions and spirits to work in building a great city for today and future generations.

Toward Vision Zero

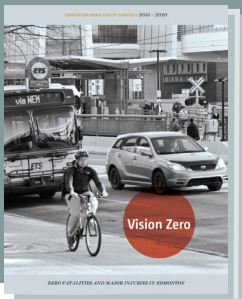
Significant progress has been made toward Vision Zero, and the *Safe Mobility Strategy* will continue this momentum.

To continue to grow into a city built for people, a combination of location-based and system-wide approaches is necessary to support safe and livable streets for all. With this approach, we can tackle widespread issues that contribute to crashes, including street design and the deep-rooted cultural norms around traffic and mobility. While doing this, we can also generate broader societal benefits that advance the vision, guiding principle and four strategic goals set out in *ConnectEdmonton*, Edmonton's strategic plan 2019–2028.



Toward Vision Zero: Progress to Date

The *Road Safety Strategy 2016–2020* has saved and improved lives.



Many of the most dangerous intersections and streets have been identified and treated with appropriate countermeasures to eliminate or reduce the contributing causes of crashes.

Since 2015:
Fatalities have decreased
Serious injuries have decreased



Learn more about progress to date at edmonton.ca/VisionZero



The *Safe Mobility Strategy* changes the conversation in two critical ways.

- 1 **Explicitly tying traffic safety to the vision and goals of *ConnectEdmonton* and the *City Plan*.** There is a growing realization that issues affecting transportation safety are interdependent with broader policy areas such as land use, climate resilience, and health, along with more traditional transportation policies, such as promoting transit and active transportation.
- 2 **Building upon the traditional disciplines of engineering, education, enforcement, engagement, and evaluation** to facilitate the decisions necessary to achieve a more livable and equitable Edmonton where everyone can move safely. These decisions will influence how the mobility system is planned, designed, built, activated, and maintained.



Safe Mobility Strategy Purpose and Principles

Purpose

Achieve Vision Zero through safe and livable streets in Edmonton.

Principles

We all move.

Edmonton's streets are for everyone no matter how they are moving, and the most vulnerable users need to be protected. A Gender-Based Analysis Plus (GBA+) lens and in-depth equity analysis is used to identify the groups and modes for which Edmonton's transportation network is less safe, and actions will be identified and implemented to address underlying inequities and enable everyone to thrive.

We all deserve to move safely.

It's simple: no loss of life is acceptable, and no one should have to travel in fear. This is the basis of the Vision Zero goal and inspires the actions and outcomes in the *Safe Mobility Strategy*.

We are connected.

The *Safe Mobility Strategy* puts forward a plan that lives out safety and livability as envisioned in *ConnectEdmonton* and set out in the *City Plan*. How people move impacts and is impacted by the rich complexity of Edmonton as a connected community; a human-centered approach to this work helps to advance Council's priorities around health, urban places, climate resilience, and economic prosperity.

We are successful when we work together.

We are collectively and individually responsible for enabling safety on our streets. Achieving Vision Zero goes far beyond the City of Edmonton's Traffic Safety section; it requires an integrated approach throughout the City of Edmonton and with partners in the community. The *Safe Mobility Strategy* leverages the experience, insight, and support of groups such as post-secondary institutions, Alberta Health Services, school boards, community leagues, business improvement areas, private industry, and other orders of government in its planning and execution.

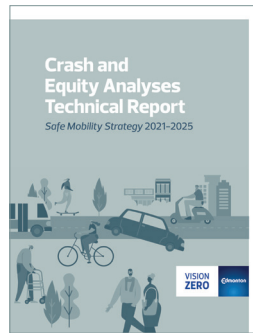
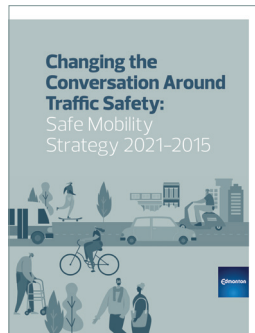
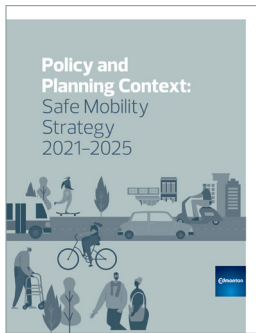
We are informed by analytics, lived experience, and research.

The City of Edmonton works closely with the Edmonton Police Service and the University of Alberta to collect and analyze quantitative data to inform traffic safety actions. This work brings insight into the realities of how Edmontonians are moving through the transportation network, but it doesn't integrate the community's experience and wisdom. Systems for gathering and using qualitative data are built to round out the information needed to proactively achieve safety and livability goals in addition to being responsive to where conflicts are occurring.

Technical Analysis and Discussion Papers

The *Safe Mobility Strategy* has been informed through a variety of technical studies and discussion papers, including:

- + The *Policy and Planning Context Discussion Paper*, which summarizes current traffic safety strategies and policies from the international scale to the local Edmonton context.
- + The *Changing the Conversation Around Traffic Safety Discussion Paper*, which outlines how *ConnectEdmonton*, the *City Plan*, and the *Safe Mobility Strategy* are connected.
- + The *Crash and Equity Analyses: Technical Report*, which documents the analysis of current crash patterns and the communities who are most impacted by traffic safety issues, incorporating a GBA+ lens.



Addressing Inequality and Discrimination

GBA+ PILOT PROJECT The City of Edmonton has adopted a Gender-Based Analysis Plus (GBA+) process to identify inequality and discrimination. The *Safe Mobility Strategy* is a GBA+ pilot project for the City, and just as we are leaders in adopting Vision Zero, we are the first municipality to adopt widespread GBA+ analysis. This will help us address inequality, reduce discrimination and ensure equality of outcomes for all of the communities we serve. The "plus" in GBA+ is critical, as it emphasizes the many identity factors which combine and layer to make up diversity.

While progress has been made, some Edmontonians have a disproportionate risk of being impacted by serious injury and fatal crashes. We know that seeking and understanding different perspectives is a continual process so that we can work to better understand the lived experience of all Edmontonians. We commit to making authentic connections on an ongoing basis throughout the *Safe Mobility Strategy*.



ConnectEdmonton: The Broad Societal Benefits of Safe Mobility



Safe mobility is essential to a connected, thriving city. Safe and livable streets benefit public health, local economy and the environment through creating urban places built for people.

A mobility system with safer transportation options can equitably address the needs of all demographic groups, including women, lower income people, elderly people, the very young, and people with limited mobility.

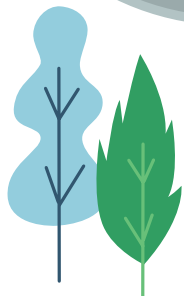


Urban Places

The average cost of car ownership in Canada is \$9,500 per year – twice what the average Canadian spends on groceries¹, and can be a large burden for those with a low income.



Safe access to non-driving options makes mobility more equitable.



Mode shift makes our roads safer.² When the number of people walking and cycling doubles, their risk of being in a crash decreases by 66%³



Dense urban cores help people and businesses thrive and allow for more housing and mobility options.

- <https://amainsider.com/caa-driving-costs-calculator/>
- <https://www.planetizen.com/blogs/108401-vision-zero-meet-vmt-reductions>
- Jacobsen, Peter L. "Safety in numbers: more walkers and bicyclists, safer walking and bicycling." *Injury prevention* 21.4 (2015): 271-275.
- Garrett-Peltier, Heidi. *Pedestrian and bicycle infrastructure: A national study of employment impacts*. Amherst: Political Economy Research Institute, University of Massachusetts, Amherst, 2011.





Investing in innovation and connectivity allows local and global businesses to grow and thrive.

Regional Prosperity



People traveling by foot and bike spend more money in the local economy than people in cars, and active transportation projects generate more jobs per dollar spent than road building projects⁴

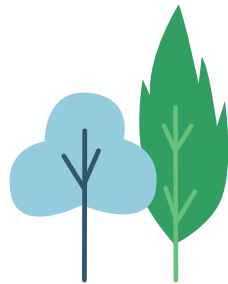


The average crash in Alberta leads to **a delay in travel** ranging from 20 minutes to over an hour⁵.

Crashes during peak travel times cause delays that can impact thousands of people each day who are trying to reach their destination.



The cost attributed to a single fatal crash in Alberta is approximately \$2.5 to \$7 million due to direct healthcare and emergency response costs, as well as the societal costs of the loss of a human life.⁶



5 https://drivetolive.ca/wp-content/uploads/2020/07/CollisionCostStudyUpdate_FinalReport.pdf
6 de Leur, Paul. 2018. Collision Cost Study Update: FINAL Report. Capital Region Intersection Safety Partnership

A recent report by the US Centers for Disease Control and Prevention (CDC) confirmed that, compared with taking 4,000 steps per day,

Taking 8,000 steps per day was associated with a 51% lower risk of death, and taking 12,000 steps per day was associated with a 65% lower risk.⁷

Healthy City

Edmonton's community and personal wellness embodies and promotes health and equity for all of us.

Improving active transportation routes enhances the safety, connectivity, and quality of life in a neighborhood.

Only 1 in 5 children in Canada walk or wheel to and from school, and most children aren't achieving the recommended physical activity levels each day.⁸

Dedicated cycling infrastructure prevents injuries and encourages more people to bike.⁹

7 <https://ontarioactiveschooltravel.ca/wp-content/uploads/2019/12/Making-the-Case-Dec-2018-En.pdf>

8 Reynolds, C. C., Harris, M. A., Teschke, K., Cipton, P. A., & Winters, M. (2009). The impact of transportation infrastructure on bicycling injuries and crashes: A review of the literature. *Environmental Health*, 8, 47.

9 <https://www.cdc.gov/media/releases/2020/p0324-daily-step-count.html>

Climate Resilience

Reducing the number of personal vehicles on the road mitigates climate change and **improves air quality by reducing vehicle emissions.**

Transportation causes **23% of Canada's greenhouse gas emissions.**¹⁰

Edmonton is transitioning to a low carbon future with clean air and water. We are adapting to a changing climate.

Air pollution from vehicles causes **184,000 deaths a year globally** from heart disease, stroke, lower respiratory infections, chronic obstructive pulmonary disease, and lung cancer.¹¹

The United States could **prevent the release of 79 million tonnes of CO₂ per year by 2030** by adopting denser development patterns.¹²

ConnectEdmonton and *The City Plan* are structured to build on and leverage these mutually supportive objectives and benefits. More information on these connections can be found in the **Changing the Conversation Around Traffic Safety** and the **Policy and Planning Context** discussion papers.

>> edmonton.ca/visionzero <<

10 <https://www.canada.ca/en/services/environment/weather/climatechange/climate-action/federal-actions-clean-growth-economy/clean-transportation.html>
11 Global Road Safety Facility and Institute for Health Metrics and Evaluation. 2014. Transport for Health: The Global Burden of Disease from Motorized Road Transport. Washington, DC, and Seattle, WA: World Bank and IHME
12 Ewing et al. 2008. Growing Cooler: The Evidence on Urban Development and Climate Change. Washington, DC: Urban Land Institute.

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Global Transportation Safety

The *Safe Mobility Strategy's* approach to transportation safety is informed by global best practices. Our challenges are not unique, and there is much to be learned from experts and experiences across Canada and around the globe.

A persistent global problem

Traffic-related deaths claim more than 1.35 million lives a year, and traffic crashes are the leading cause of death for children and youth aged 5 to 29 years old around the world.¹³ These numbers have remained stubbornly high despite dramatic improvements in vehicle technology and trauma care in recent years.

What has contributed to persistent traffic-related deaths?

- + Responsibility for traffic safety has often been sidelined to departments far removed from core planning and engineering groups.
- + The focus of road safety strategies has rarely challenged the convenience of driving.
- + The pervasive global and local assumption was that serious injuries and the loss of life on our streets are the unfortunate – but inevitable – consequences of living in a modern society.

Evolution of transportation safety practices

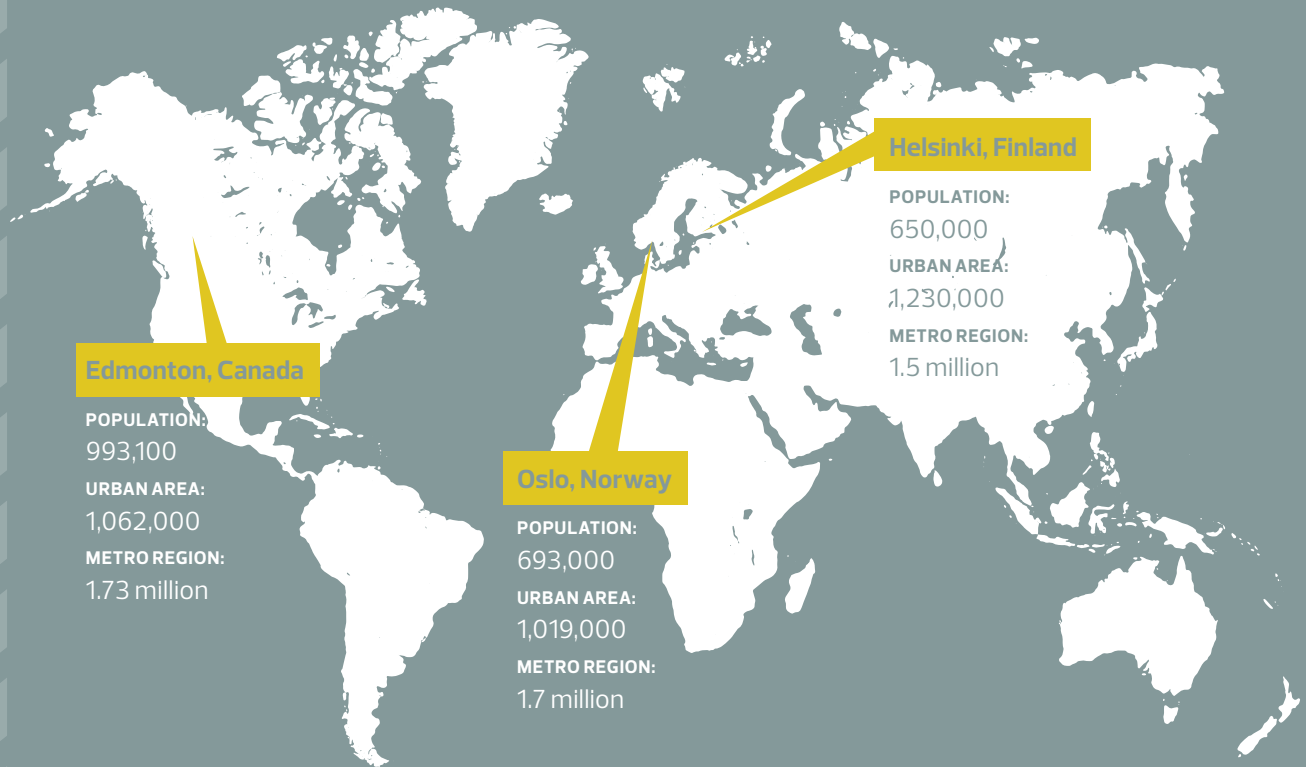
- + Transportation safety is finally being taken seriously with the loss of life on our roads now considered unacceptable and preventable.
- + Government agencies and the media are starting to refer to “crashes” rather than “accidents” to acknowledge that traffic-related deaths and injuries can be avoided.
- + Cities such as Oslo and Helsinki, which are similar in size to Edmonton, are proving that it is possible to achieve the goal of zero transportation fatalities.

New International Road Safety Recommendations

In planning for new transportation safety strategies at the *Third Global Ministerial Conference on Road Safety* in Stockholm, Sweden in February 2020, nine “Road Safety Recommendations” were published by a panel of academic experts who examined the previous decade and formalized what additional steps must be taken to achieve greater success in the coming decade.¹⁴ The holistic recommendations include areas such as transportation mode shift, child and youth health, infrastructure, vehicles, technologies, speeds, monitoring and reporting, and procurement.

¹³ World Health Organization, [Global Status Report on Road Safety](#), 2018.

¹⁴ Third Global Ministerial Conference on Road Safety, Stockholm, Sweden, February 19–20, 2020. [Saving Lives Beyond 2020: The Next Steps](#).



International Winter Cities Proving Vision Zero is Possible

Oslo recorded one transportation-related death in 2019. The victim was a car driver who crashed into a railing at a train station. Oslo's mayor credits large investments in public transport, bicycle lanes, and facilities for people walking for part of its success. It has also reduced the speed limit for cars, removed 1000 parking spots, installed more traffic calming, and created car-free zones, including "heart zones" where children play. Figures from the Norwegian Public Roads Administration show the number of deaths on Oslo's roads has fallen sharply, down from 41 deaths in 1975. On average, 3.6 people have died per year in traffic in Oslo in the last five years.¹⁵

Helsinki recorded no deaths for people walking for the first time since records began in 1960, down from an average of 20–30 per year in the 1990s. Speed limits have been tightening for decades and were reduced again last year. Now the speed limit is 30 km/h on most residential streets and the city centre, 50 km/h on main streets in suburban areas, and 40 km/h on main streets in the inner city.

"Of course, it's not only a question of speed limits, although I think all our specialists do say that is the most important single thing affecting traffic safety," said Anni Sinnemäki, the deputy mayor of urban environment in Helsinki.

"In the last few years, we have also focused on how we build the street environment. Streets are being better divided between pedestrians, cycle lanes and cars – the car lane is not the widest possible."

Along with narrower driving lanes, Helsinki has also built dozens of roundabouts and installed speed bumps since the 1990s to reduce speed.

The goal hasn't been achieved yet, however. Although both cities recorded zero fatalities for people walking in 2019, in Helsinki three people driving died in traffic crashes last year, while one person driving died in Oslo.¹⁶

¹⁵ <https://www.independent.co.uk/news/world/europe/oslo-traffic-road-deaths-accidents-norway-a9269441.html>

¹⁶ <https://www.theguardian.com/world/2020/mar/16/how-helsinki-and-oslo-cut-pedestrian-deaths-to-zero>



Creating a Safe System



Safe System Philosophy and Approach

The Safe System Approach is people-centered and views human life and health as paramount to all else. A Safe System is one that accommodates and compensates for the inevitability that we, as humans, will make mistakes while navigating our streets. It focuses on the primary known causes of traffic-related crashes to reduce serious injuries and fatalities by:

- + Making the transportation system more accommodating and “forgiving” of errors we make as humans
- + Managing the forces that injure people in a crash to the level that our bodies can tolerate without serious injury
- + Minimizing the level of unsafe user behaviour¹⁷

Designing with Mistakes in Mind

Driving a vehicle is a demanding task that requires frequent decision-making based on the road design and use, while many other factors, including other people, vehicles, traffic controls, and weather are changing around us. Due to the amount of information we are processing when we drive (called driver workload), we make mistakes when we don't see something, misinterpret what we should do, or fail to take action quickly enough. The transportation system should be designed to only require simple decisions; and if a mistake is made, it should not lead to a serious injury or fatality.

When designed appropriately, streets, pathways, and intersections provide clear cues to us when we drive, walk, or roll on what to expect and how to act. This differs from past approaches that relied more heavily on education and complicated designs that require individual interpretations, which often lead to mistakes.¹⁸

¹⁷ Peden M et al. [World report on road safety injury prevention](#), Geneva, World Health Organization, 2004.

¹⁸ Wegman F et al. [Advancing Sustainable Safety: National Road Safety Outlook for 2005-2020](#). The Hague, SWOV, 2006.

Humans and Road Safety

A Safe System is organized to manage the human characteristics that cause crashes and support our instincts to prevent injuries.

Human characteristics that can contribute to the **OCCURRENCE** of crashes and injuries¹⁹

- + People are physically vulnerable: their tolerance to rapid acceleration and deceleration forces are limited, and impact with solid objects is a source of injuries for road users.
- + People occasionally make errors, even if they are well trained, informed or educated.
- + People's concentration span is limited and they are not always conscious of their behaviour and choices and of their consequences, in particular when they are inexperienced or impaired.
- + People can only process certain amounts of information simultaneously and will get tired after a while.
- + People easily create connections between their daily experiences, so that they may develop a different perception of reality and risks than what objective information reveals.
- + People regularly behave based on motives that are not necessarily ideal for the safety of themselves or those around them.



Human characteristics that can contribute to the **PREVENTION** of crashes and injuries¹⁹

- + People have the ability to learn and to adapt. They adjust relatively easily to new circumstances.
- + People are creative and inventive, including when they encounter unfamiliar problems.
- + People easily recognize new patterns, which helps them to develop expectations and more efficient methods (faster ones and with fewer errors).
- + The natural behaviour of people is directed at self-preservation.
- + People are empathetic, which gives them a reason to look out not only for their own well-being, but also for that of others.



¹⁹ SWOV Institute for Road Safety Research. Sustainable Safety 3rd edition – The advanced vision for 2018–2030. The Hague, SWOV, 2018.

Managing Forces

Several factors affect the severity of any given crash:

VEHICLE SPEED Speed plays a significant role in both our decision making and the probability of a crash occurring. At higher speeds, our cone of vision narrows, we cover more distance while we identify a potential conflict and decide what action to take, and our stopping distance increases once we decide to apply the brakes. All of this increases both the likelihood of a crash and the crash severity.

VEHICLE SIZE When a crash occurs, the amount of kinetic energy that is transferred between the objects is related to the speed and mass of the objects. Larger vehicles accumulate more embodied energy and therefore have more energy to transfer in the event of a crash.

VEHICLE DESIGN Vehicles are designed to absorb this energy up to a point. Transport Canada²⁰ has safety standards for motor vehicles for frontal and side impacts. Unlike vehicles, human bodies can only absorb a limited amount of kinetic energy.

HUMAN FACTORS Older people and children are typically more vulnerable. Research shows that a 70-year-old person struck by a person driving a vehicle at any given speed has a similar risk of death as that of a 30-year-old person struck at a speed of about 20 km/h faster.²¹

20 <https://www.tc.gc.ca/en/services/road/safety-standards-vehicles-tires-child-car-seats/safety-standards-vehicles.html>

21 Tefft, B C. Impact speed and a pedestrian's risk of severe injury or death. *Accident Analysis and Prevention*, 2013, 50:871–878.

FIGURE 2 The figure illustrates the probability of a fatal or serious injury collision for different types of crashes at different speeds.²² The probability of a fatality or serious injury for all crash types increases as the speed increases.

- Pedestrian
- Person in vehicle:
 - Head on (frontal)
 - Adjacent direction (near side)
 - Opposing-turning (far side)
 - Rear end (frontal)

22 Jurewicz C et al. Exploration of vehicle impact speed – injury severity relationships for application in safer road design. *Transportation Research Procedia*, 2016, 14:4247–4256.

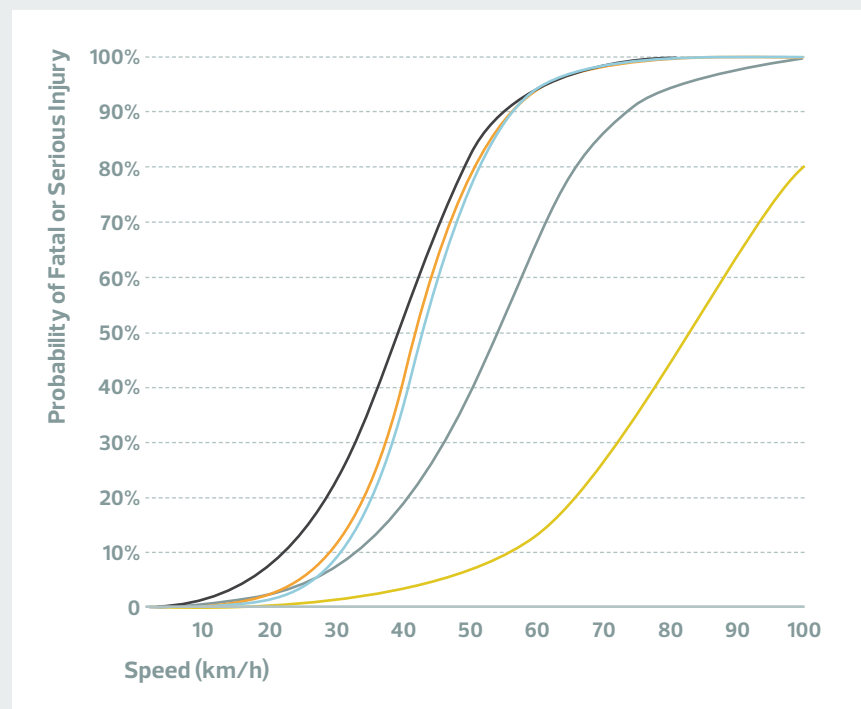
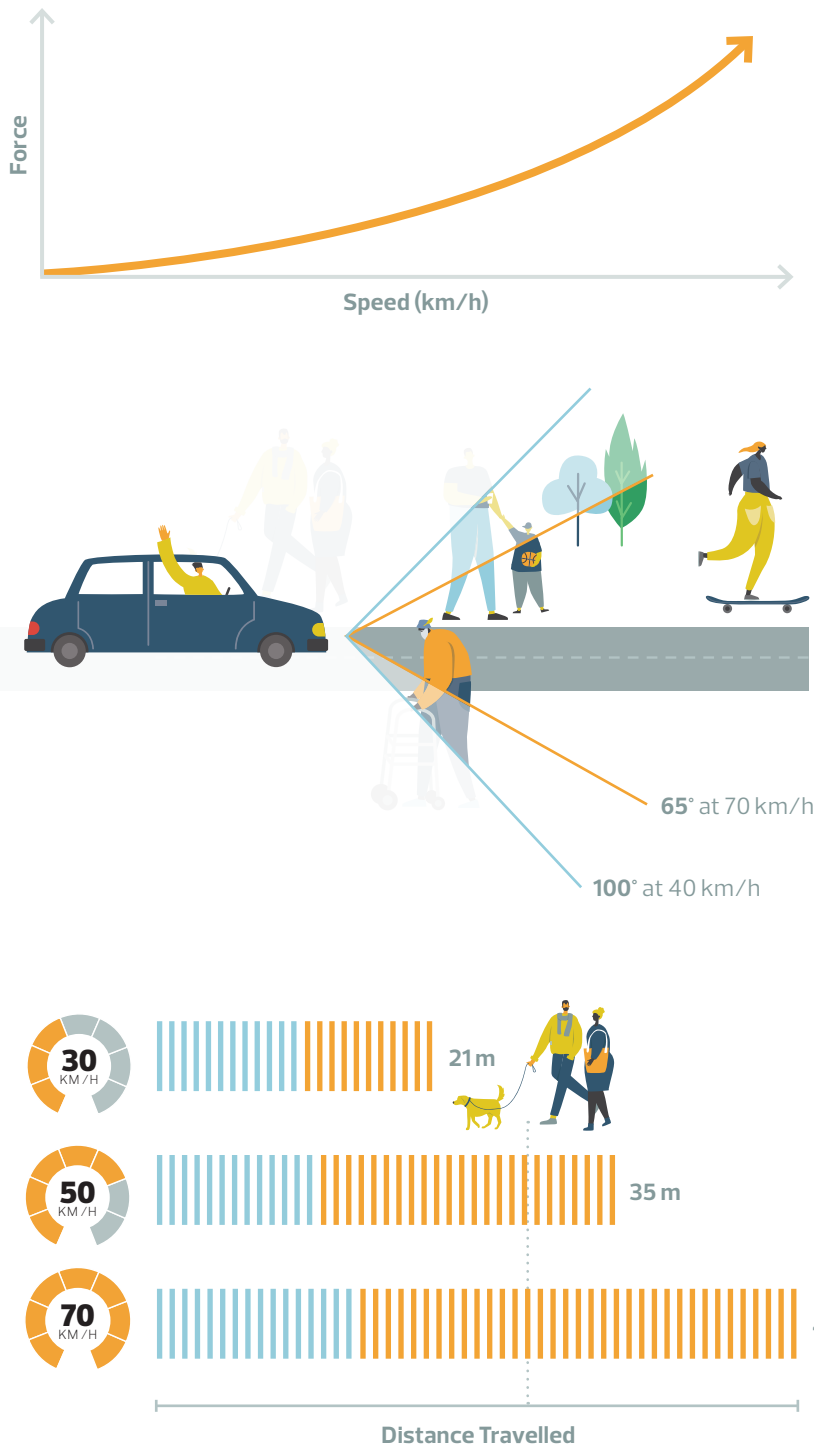


FIGURE 3 Speed has an impact on the likelihood and severity of crashes in multiple ways.²³



1

Crashes at higher speeds are more **forceful** and thus more likely to be fatal.

2

Drivers traveling at higher speeds have a **narrower field of vision**.

3

Drivers traveling at higher speeds **travel further** before they can react.

Thinking distance

4

Vehicles traveling at higher speeds have **longer braking distances**.

Braking distance

²³ Figure derived from NACTO, City Limits: Setting Safe Speed Limits on Urban Streets, September 2020. Data from the Transportation Association of Canada, Geometric Design Guide for Canadian Roads, 2017.

Analyzing Safety, Equity, and Lived Experiences in Edmonton

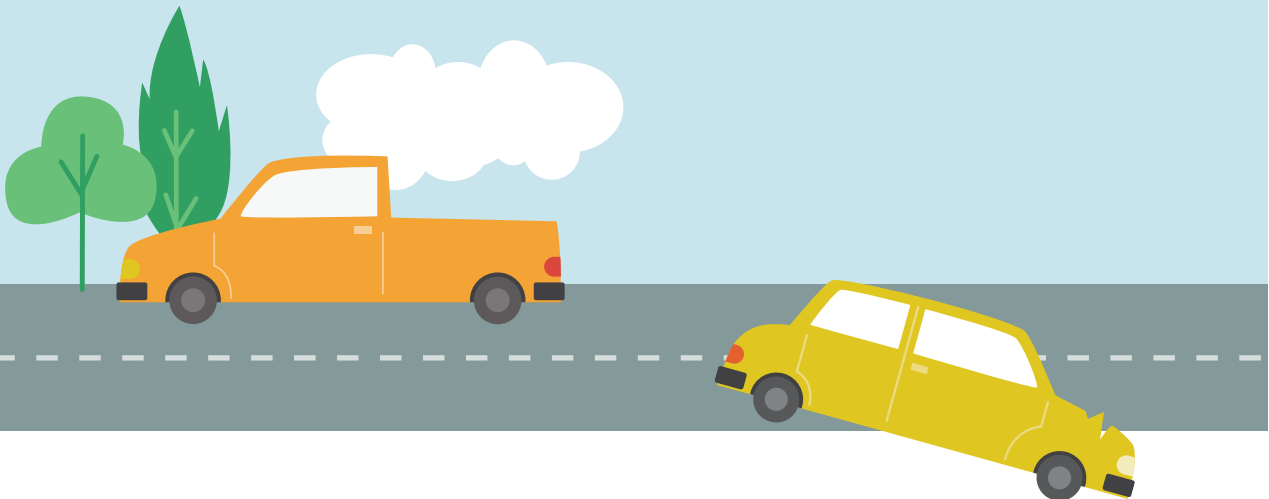


Learning from Crash Data

We analyzed five years of crash data on Edmonton's streets (2015 to 2019) to provide insight into crashes and the current level of safety that Edmonton's transportation network offers. The analysis showed us what types of crashes are happening and why, where they are happening, and who is involved. The findings help us to identify traffic safety problems, tailor solutions for safer, more livable streets in Edmonton, and prioritize the implementation of the *Safe Mobility Strategy* and its actions.

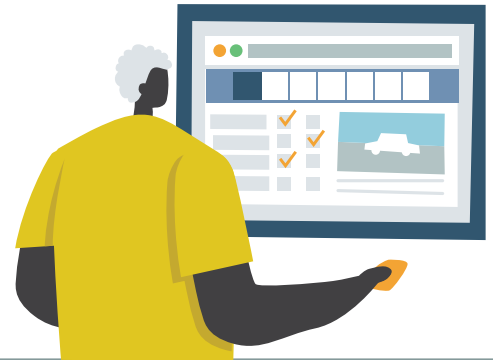
Specifically, the following analyses were completed:

- + *The Crash Analysis* allows us to better understand crashes and what we need to do to eliminate them on our streets.
 - One output of the Crash Analysis was identifying a High Injury Network for each mode of transportation.
- + *The Equity Analysis* helps us to understand how different populations may experience transportation safety across Edmonton.



Public Engagement: Learning from Lived Experience

Crash numbers only tell part of the story. Crash data are derived from police reports. While these provide important information, they do not provide information about crashes that do not involve a motor vehicle or about locations where near crashes are happening. Engaging with the community allows us to learn about Edmontonians' lived experiences with transportation safety and safe mobility. To create a strategy that proactively addresses safety for all Edmontonians, we need to understand where people feel safe and unsafe when walking, biking, driving, and using mobility aids, and how our streets contribute to those feelings.



There were two phases of engagement for the *Safe Mobility Strategy*:

PUBLIC ENGAGEMENT PHASE 1

The focus of Phase 1 engagement was learning about peoples' lived experiences with traffic safety in Edmonton. We learned that peoples' sense of safety varies based on factors like mode of transportation, gender, or use of a mobility aid and by location across the city. The results of this engagement are available in the *Phase 1 What We Heard Report*.



PUBLIC ENGAGEMENT PHASE 2

Phase 2 engagement focused on asking Edmontonians to provide comments on draft themes and draft key actions (for 2021-2022) for the *Safe Mobility Strategy*. We learned about peoples' level of support for the draft ideas and potential ideas that could be added. The results of this engagement are available in the *Phase 2 What We Heard Report*.



Applying an Equity Lens

An equity lens was applied to both the crash analysis and public engagement.

An equity analysis supported the crash analysis and helped us to understand how different populations may experience transportation safety differently across Edmonton. We know that the needs of communities and individuals differ and the challenges for any given community cannot be captured or understood comprehensively using only quantitative data. While the quantitative analysis tells us what is happening on our roads and who is impacted by it, public engagement is needed to understand what people are experiencing beyond these statistics.

The engagement plan for the *Safe Mobility Strategy* was built to be an inclusive process based on a Gender-Based Analysis Plus (GBA+). It included a broad engagement process for the community as a whole and a targeted engagement process for people whose voices are typically missed or go unheard. Unfortunately, with the onset of the COVID-19 pandemic, the engagement plan for the project had to change and engagement tools were shifted to be predominately online. We recognize that this process has created exclusions for those who do not have ready internet or computer access, and we are striving to mitigate that by working with outreach organizations to collect perspectives from those who aren't able to participate online.

As part of GBA+, we wanted to understand who we were and weren't hearing from. Compared to Edmonton's population, older adults and university graduates are over-represented, while people with a lower income, members of Indigenous communities, and visible minorities are under-represented. To engage under-represented Edmontonians, we contacted organizations who provide support to these communities to determine the best approach to learn more about the diverse experiences on Edmonton's streets. During the project engagement time period, these organizations were focused on high priority needs as a result of the COVID-19 pandemic and more extensive engagement was not possible.

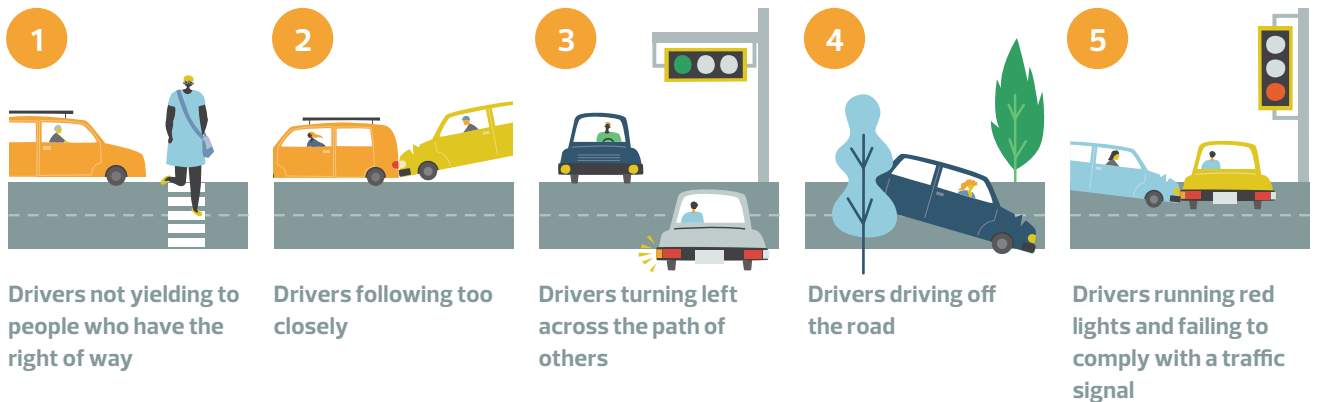
Engaging with these organizations and communities, addressing underlying inequities, and enabling everyone to thrive does not end here. Ensuring that safety is equitable throughout Edmonton is a significant focus for the *Safe Mobility Strategy*.



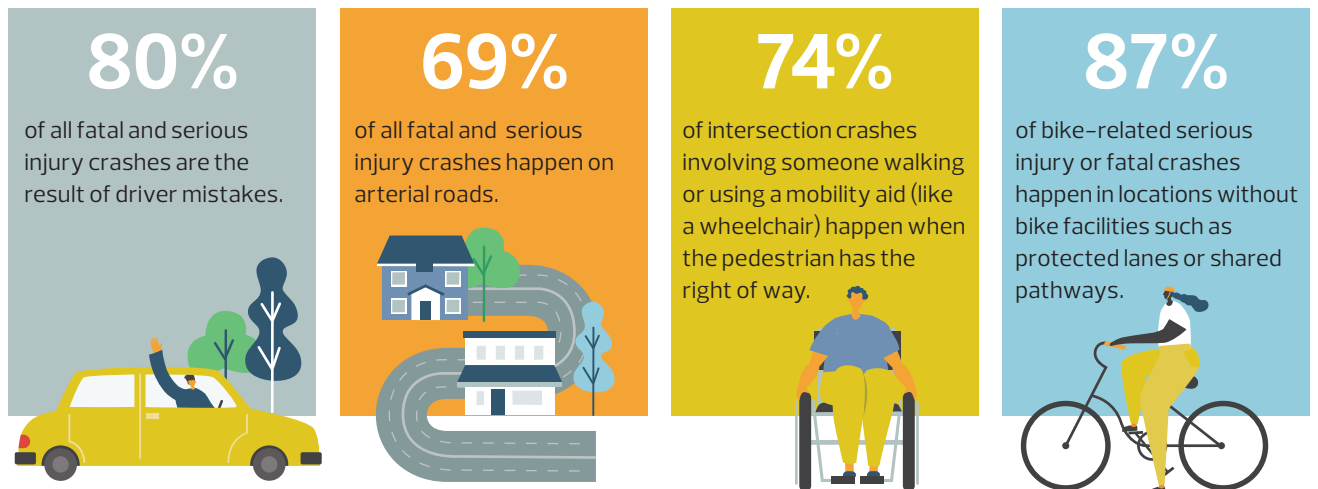
What We Learned

Why are crashes happening?

The top 5 causes of the most severe crashes on Edmonton streets are:



In looking at the major patterns of fatal and serious injury crashes, the following were key findings:



What about speed and distraction?

Crash data provides information on when and where a crash happens and the direction and movement of people involved in the crash, but does not always provide information that would be determined from a police investigation such as speed or distraction. Many crashes are self reported, and most people are unlikely to admit if they had been speeding, distracted or impaired. Despite this, we know that these issues are important contributors to crashes. Research has shown that in Canada distraction is a factor in 1 out of 4 fatal crashes.²⁴ Speed is a factor in every collision as it increases the likelihood of a serious injury or fatality.

²⁴ <https://diad.tirf.ca/2019/11/08/distracted-driving-puts-all-canadians-at-risk/>

Where are crashes happening?

A High Injury Network was identified by plotting crash locations on a map for each mode of transportation – walking, cycling, driving, and motorcycling. This helps us find specific corridors where serious and fatal injury crashes are occurring overall and by mode.

Central areas of Edmonton show up as High Injury Corridors for walking and cycling. Major arterials and freeways show up on the motorcycling and driving High Injury Network. We can also see there are corridors that overlap for the different modes of transportation such as 97 Street, Whyte Avenue, 109 Street, 170 Street, and Fort Road.

FIGURE 4 High Injury Network for Walking, Cycling, Motorcycling and Driving

- People Driving
- People Motorcycling
- People Cycling
- People Walking



In addition to the High Injury Network Analysis, we also analyzed which neighbourhoods had the highest number of fatal and serious injury crashes. These neighbourhoods are Alberta Avenue, Boyle Street, Central McDougall, Downtown, Eastwood, Glenwood, Killarney, McCauley, Oliver, Parkdale, Queen Mary Park, Spruce Avenue, Strathcona, West Jasper Place, and Westmount.



FIGURE 5 High Crash Neighbourhoods



We took a closer look at the High Injury Networks and the High Crash Neighbourhoods to identify what underlying factors may be contributing to their crash history. Many of these neighbourhoods have higher numbers of residents and workplaces, or have a higher distribution of arterial streets that run through or adjacent to the neighbourhoods and provide access to major destinations. These characteristics increase exposure to traffic and the risk of crashes for residents and people who are working in or visiting the areas.



When we look at the arterial streets themselves, the design of the streets are wide with multiple lanes and may or may not include left turn lanes. While they tend to have 50 or 60 km/h posted speed limits, the street width and low traffic volumes outside of rush hours result in operating speeds that are above the posted speeds. People crossing these streets walking (with or without mobility aids), cycling, and rolling face higher risks due to the vehicle speeds and crossing distances without having design features that require traffic to stop. Left turns for people driving can also be dangerous because of multiple lanes of oncoming traffic and left turning vehicles which obscure sightlines. If a crash occurs for these people, serious injuries or fatalities are likely due to the operating speeds and resulting crash forces.

At the same time, people making left turns are often focused on the risk of oncoming traffic instead of the people who are using the crosswalk to their left. This scenario can result in people walking and biking being hit by drivers turning left, causing serious injuries and fatalities.

Some of these corridors also have buildings that are set back from the property lines, creating a driving-oriented context that is difficult to change. The traffic safety changes required in this scenario will need to be different than those used for streets that are Main Streets or arterial streets that have a walking-oriented context.

These conditions need to be changed to achieve Vision Zero. Since we know where crashes are happening and the underlying design and operational issues that exist, we can prioritize these neighbourhoods and streets for safety improvements through the programs that support the *Safe Mobility Strategy*.

Who is most exposed to safety issues?

The High Injury Network and High Crash Neighbourhood analysis findings are critical in helping us understand where to prioritize our efforts over the next 5 years.

Everyone should have fair access to safe and comfortable infrastructure that allows them to walk, bike, take transit, or drive to their destination. Understanding the existing differences is what the equity analysis is about. The equity analysis allows us to understand how our transportation system impacts populations who experience disadvantages or marginalization.

When we analyze the demographic data at a neighbourhood level, the findings indicate **that Indigenous Peoples, households with lower incomes, older adults, and linguistic minorities are more exposed to failures in the transportation system that result in serious injury and fatal crashes.** When we pair the equity analysis with the crash analysis, we also see that people walking and cycling are more vulnerable. Improvement to safety for people walking and biking has not progressed at the same rate as for those driving or operating a motorcycle. The results from the crash and equity analyses have shown us that tragedies are happening disproportionately across Edmonton.

We know we don't have all the answers. **We have much more to learn from people who are the most exposed to risk in their neighbourhoods.** A first step in improving the safety of these communities is to engage with them to learn from their experiences, the safety issues and barriers they face, and the specific needs they may have.



EXAMPLE OF EQUITY CONSIDERATIONS:

High Crash Neighbourhoods vs. 311 Traffic Inquiries



An interesting example of how equity intersects with safety appears when we look at where the High Crash Neighbourhoods are in Edmonton and compare that to the neighbourhoods where there are the highest number of 311 traffic-related inquiries. Comparing these two maps shows very little overlap. While in depth conversation is needed to pinpoint the reasons for this disconnect, some community organizations have suggested that this could be impacted by:







- + **Neighbourhoods with higher numbers of 311 traffic inquiries tend to be wealthier.** As household income increases, there is typically an increase in power and ability to influence change by having more free time to advocate for change, having more direct connections and relationships with decision makers, and having better access to tools to make people aware of issues.
- + **High Crash Neighbourhoods tend to be home to more residents that are lower income and may not speak English or French as their primary language.** In contrast to people with high incomes, having a lower income may result in having less time to participate or limited access to technology and devices required to participate. If all communications can only be done in English, people that do not speak English may not be able to participate or be confident in communicating with officials.
- + **Indigenous Peoples and People of Colour may have very different levels of opportunity and comfort with engaging with government agencies.** There can be hesitation to interact and there may also be limited opportunity to participate if in-person engagement is not hosted in neighbourhoods where Indigenous Peoples and People of Colour live in higher numbers. The approach to engagement may also not be designed to reflect the ways in which people of different cultures communicate and share experiences.

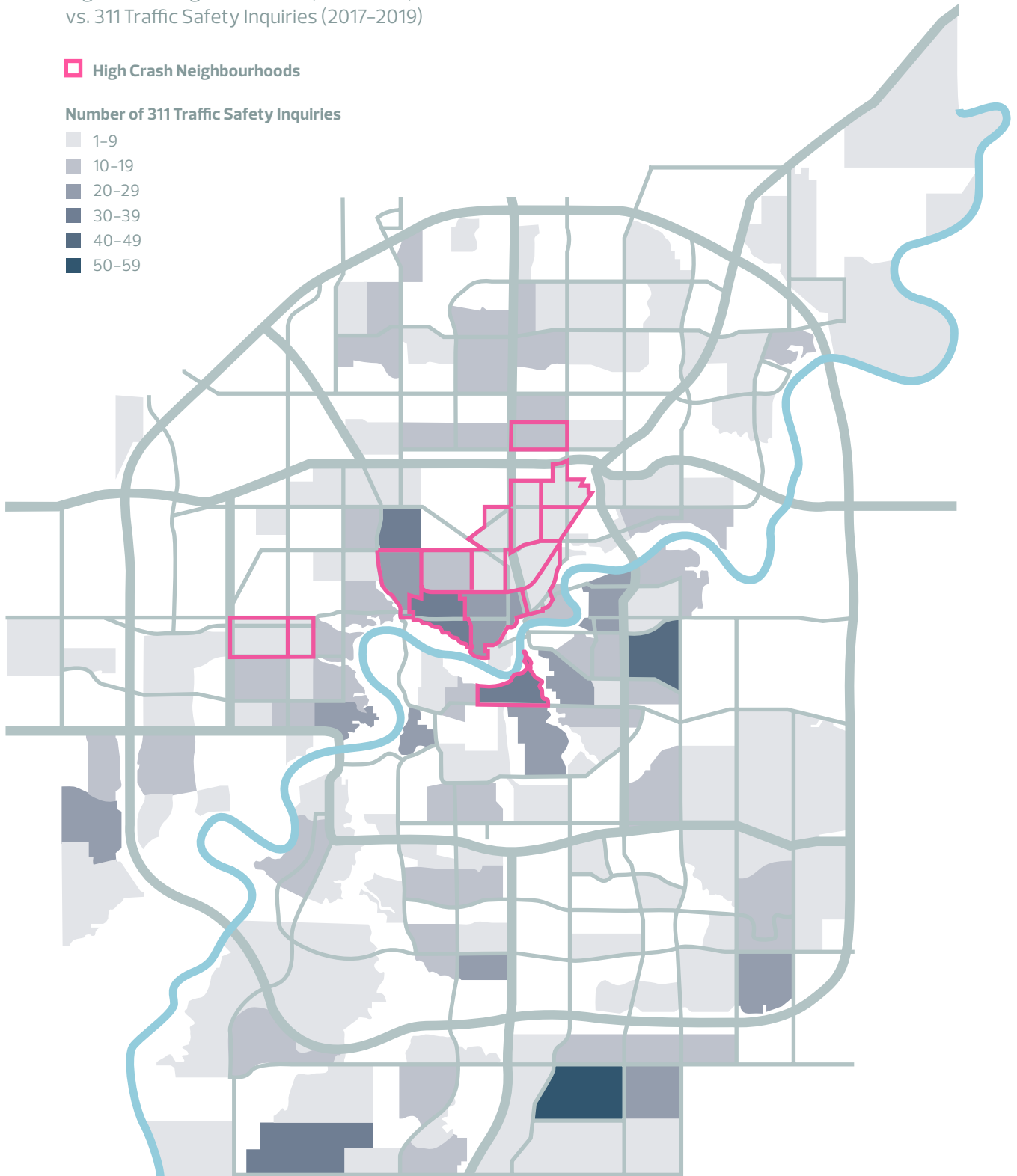
FIGURE 6

High Crash Neighbourhoods (2015–2019)
vs. 311 Traffic Safety Inquiries (2017–2019)

 High Crash Neighbourhoods

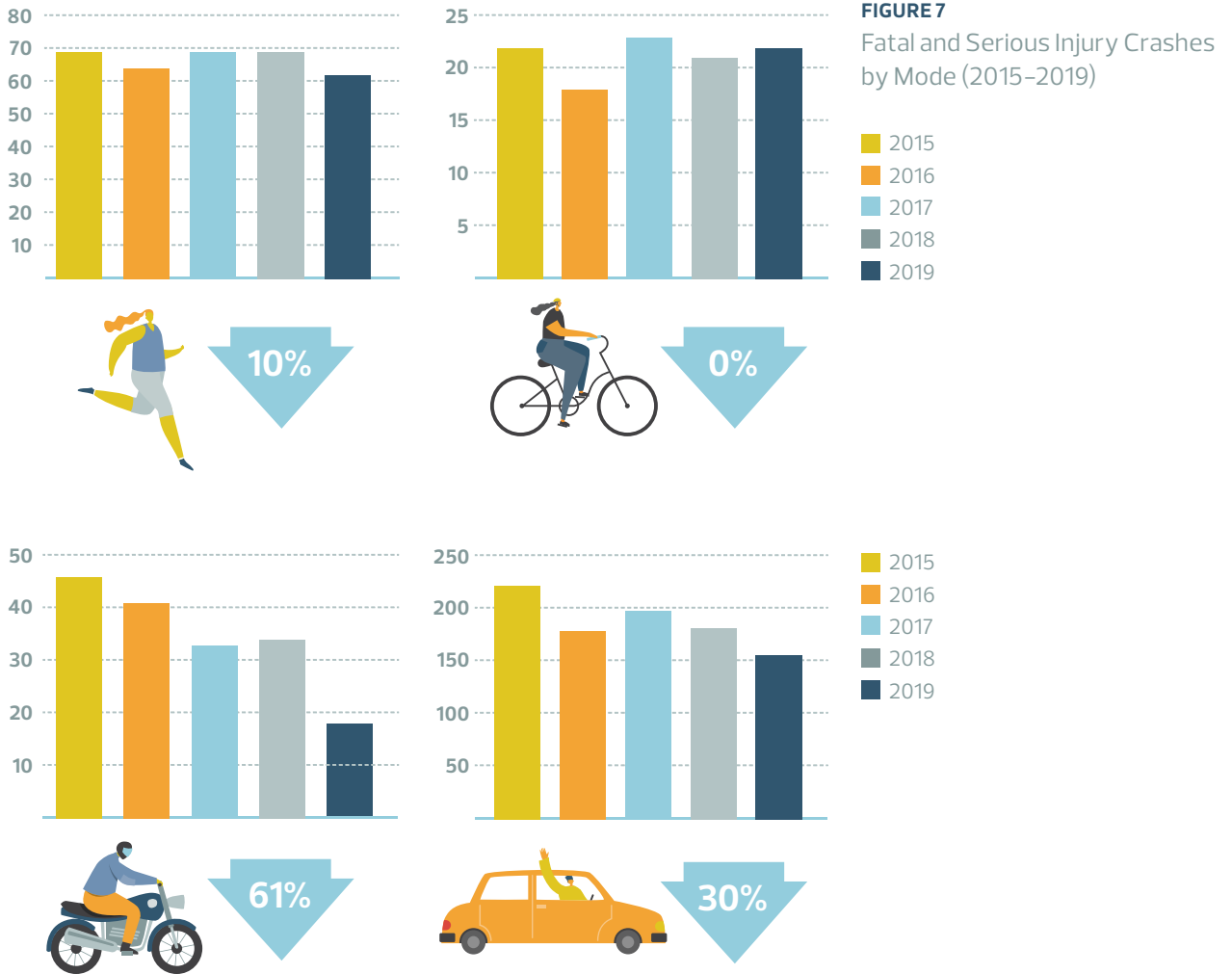
Number of 311 Traffic Safety Inquiries

-  1–9
-  10–19
-  20–29
-  30–39
-  40–49
-  50–59



Is the transportation system getting safer for us?

The way we travel changes our risk of being in a crash. Since 2015, we have seen a reduction in the numbers of fatal and serious injury crashes for people in vehicles and on motorcycles. However, the number of fatal and serious injury crashes for people walking and biking are relatively unchanged. We do not have the same level of information about walking and cycling travel patterns as we do for driving, so it's important to keep this in mind when considering changes to safety for people walking and biking. If the number of crashes remains stable even as the number of people who use these modes of travel increases, that is still a positive outcome. It does not, however, reduce the urgency needed to continue improving safety for vulnerable road users, as they face the highest safety risks on our streets.



How safe do people feel on our streets and around our neighbourhoods?

The Edmontonians who provided feedback during engagement told us that their feeling of safety varies depending on their identity factors and the mode of travel they are using. Identity factors can include sex and gender, race, ethnicity, religion, age, and mental and physical ability.

Identity Factors



- + 63% said their mobility or feeling of safety is influenced by their identity
- + The identity factor most frequently related to feeling unsafe is being a woman
- + For all modes of transportation, women reported feeling less safe than men
- + People most often mention walking or taking transit when they talk about how their mobility is impacted by their identity
- + Those who use mobility aids reported feeling less safe when travelling than those who do not use mobility aids

Mode of Travel



- + Driving was the mode where the most people reported feeling safe
- + For all road users, unsafe speed was among the top 3 concerns
- + Unsafe speeds were the biggest concern for people motorcycling or using mobility aids
- + Dangerous or confusing intersections were the most important categories for people driving and cycling
- + 60% of the pins submitted for the online map were for locations where people felt unsafe walking
- + Unsafe or missing crossings was the most frequent pin category for people walking

Public Engagement Themes

The ideas that we received from Edmontonians and community organizations during public engagement fell into four main categories:

1

Increasing safety for all modes and all people

The mobility system needs to be safe for people using all modes of transportation, including walking, cycling, riding transit, and driving. Achieving this requires our system to include an equity lens because barriers and issues differ for people of different identities.

2

Improving and expanding infrastructure

Transportation infrastructure changes are needed to improve safety through signal upgrades, more visible crossings, and more extensive sidewalk and cycling networks. Some comments specifically mentioned designing streets for lower speeds either through traffic calming devices or other roadway modifications.

3

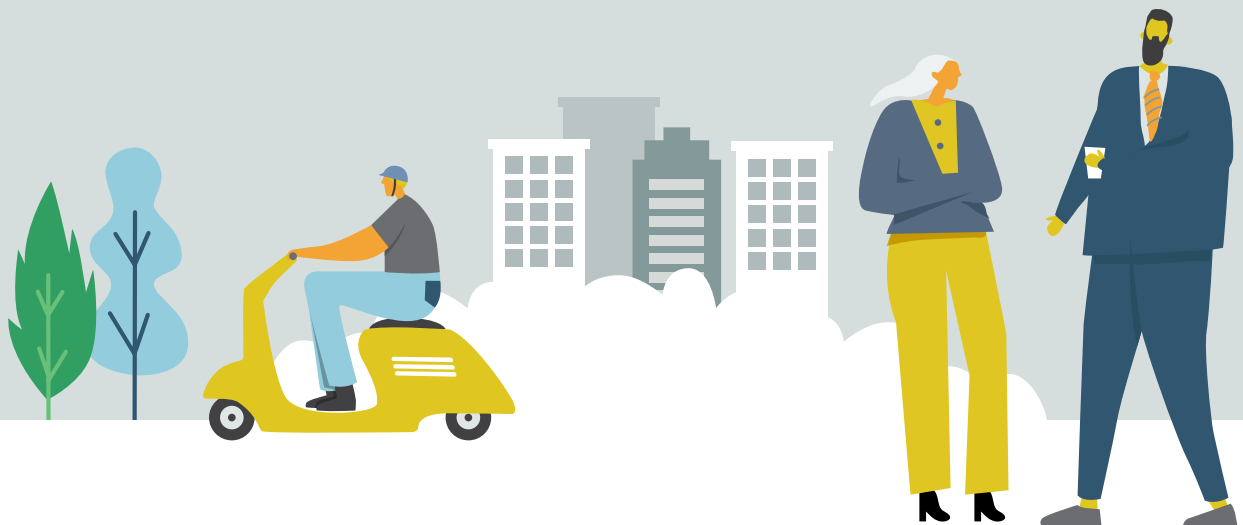
Increasing knowledge and improving behaviour

Improved education programs to increase knowledge of the rules of the road and etiquette are suggested. It's also important to consider making driver licensing tests more rigorous or frequent and increasing the consequences or fines for violations. Creating a broad culture of safety is an essential component for a successful strategy.

4

Creating partnerships to support continuous safety improvement

There are many organizations in Edmonton that provide services, offer programs, and complete research on transportation safety. These organizations can offer valuable insights, and their expertise should be integrated with the City of Edmonton's efforts to achieve broader and more significant increases in the safety of our transportation system.



The Path to Vision Zero

Drawing from global transportation safety, the lived experiences of Edmontonians, and technical analysis, the *Safe Mobility Strategy* incorporates the following learnings:

- + Injury from crashes is largely preventable and predictable – it is a human-made problem amenable to rational analysis and countermeasure, which requires holistic data and proactive interventions.
- + Common driving, walking, cycling, and motorcycling errors and behaviours should not lead to death and serious injury. The transportation system should help us to cope with increasingly demanding conditions.
- + The vulnerability of the human body should be a limiting design parameter for the transportation system. Speed management is central to this.
- + Transportation safety is a multi-disciplinary issue and a public health issue. All sectors, including health, need to be fully engaged in responsibility, activity, and advocacy for injury prevention.
- + Transportation safety needs to focus on all modes of travel. Equal protection is needed for all travellers, and we must recognize that when we travel in a vehicle, we bear more responsibility for the safety of others because we are protected by a metal frame. People moving outside of vehicles are not as protected and are at much higher risk.
- + Transportation safety and injuries are social equity issues. Local knowledge needs to inform the implementation of local solutions. Our concerns and needs vary based on our identity.



COVID-19: Reimagining Edmonton's Streets

The COVID-19 pandemic has brought unimaginable loss, strain and challenges worldwide; lives and livelihoods alike have been lost and forever changed. And yet, cities and communities have banded together to ensure their values and priorities are not lost through the chaos. These goals bear a striking resemblance to each other from place to place: collective focus on public health and wellness, authentic social connection, commitment to climate resilience, and enabling places and spaces that nurture the community. Edmontonians have navigated rapid change and embraced cultural and behavioural shifts in response to COVID-19 that give insight into the future of our city through *ConnectEdmonton* and the *City Plan* – among the best of examples are changes to the way we move and how we approach our streets.

Since March 2020, Edmonton has seen significant reductions in traffic volume on our streets – at one point, almost 50% less than is typical. And while numbers have returned to near normal as people began to return to work, school and other daily activities along with Alberta's relaunch phase, overall traffic volumes continue to remain roughly 15% lower than in previous years.

Rather than extensive travel through the city by vehicle, Edmontonians *stayed home* to contribute to flattening the COVID-19 curve. Finding ways to stay active and healthy have been of prime importance, and parks, trails, paths, and neighbourhoods saw new and renewed life through active modes (walking, cycling, rolling and more). This mode shift is substantial; for example, bicycle volumes on 76 Avenue increased more than 10% between April and August, and on the High Level bridge, pedestrian volumes increased roughly 25%. Local businesses that sell active modes goods and provide associated services reported much higher than usual sales as a result – in some cases, businesses were in need of *additional staff* to manage the influx. *One shop reported* online sales growing by 10 times in April, only to see that number further double in May. The importance of this change on our streets and paths cannot be understated – even a 10% change in travel patterns can significantly improve *air quality* and traffic safety.

Edmonton acted quickly to implement 28 kilometres of *Shared Streets*, which created space for people to move around while maintaining safe physical distance in dense and busy locations. In some locations, a vehicle travel lane was closed to expand the shared use path area, and in others, streets were opened to be used by all modes simultaneously as shared spaces. By using tactical, temporary methods (including reduced speed limits) to change the use and design of our streets, vehicle speeds decreased while compliance to 2 metre physical distance guidelines increased as did the number of people walking, cycling and rolling.

Perhaps one of the most critical improvements seen from the reduced number of vehicles on our streets has been the crash reductions. Largely mirroring the traffic volume trends (see below graph), April 2020 saw the most significant decline in crashes when compared to the previous year:

Injury (minor and serious):

75%

Property damage:

60%

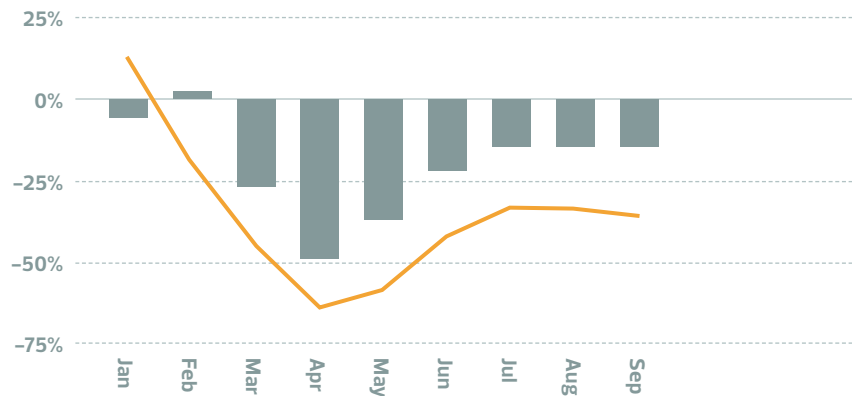
While traffic volume overall has mostly normalized, some areas continue to see significantly less vehicle travel. Downtown, one of Edmonton's highest crash neighbourhoods, continues to influence overall crash numbers with approximately 60% fewer crashes as compared to the previous 3 years.



FIGURE 8 Volume Change and Total Crashes

— Total Crashes Change
 ■ Volume Change

Based on data available on November 10, 2020.



Sadly, excessive speeding throughout the COVID-19 pandemic increased even as traffic volumes plummeted. Despite the presence of speed enforcement (automated and in-person) and the obvious need to avoid motor vehicle crashes to prevent additional strain on hospitals, there was a 30% increase in drivers speeding more than 20 km/h over the speed limit and more than 200% increase in drivers speeding more than 50 km/h over the speed limit in March and April 2020. As traffic volumes returned closer to normal, so have the number of speeding violations. Notably, fatality crashes have not seen similar reductions to injury and property damage crashes, and extreme speed plays a role in many of these tragedies.

These are monumental shifts that show us the beauty of a city built for people through changing our travel patterns. We are discovering the limited carrying capacity of our sidewalks, bike lanes, and trails just when we need them most. We are learning what travel is truly essential, how safety can be improved with even small decreases in vehicle volumes, and just how important daily physical activity is to our physical and emotional well-being. The experiences and learnings from our reimagined streets during COVID-19 are embedded in the work envisioned through the *Safe Mobility Strategy*. The benefits of evolving how we move are limitless and will help us to realize Vision Zero while creating a healthy, urban, climate resilient and prosperous Edmonton.

Themes and 2021–2022 Key Actions

The *Safe Mobility Strategy* will create a Safe System for Edmonton by organizing implementation into four Themes and associated Key Actions, all of which outline the critical efforts that must be taken to achieve the purpose and principles of the *Safe Mobility Strategy*.



KEY ACTIONS:

Community of Safe Communities

- Traffic Safety Community Activation
- Vision Zero Development Initiative
- Positive Enforcement Campaigns
- Speed Limit Reduction

Safety at Every Step

- Safe Crossings
- School Safety
- Project Integration
- Vision Zero and City Policy

Listen, Learn, Lead

- Strategic Collaboration with the Edmonton Police Service
- Safe Mobility Academic Working Group
- Expanded Monitoring Technology
- Partnering to Advance Safety Priorities

Equitable Safety

- Proactive Safety Reviews
- Prioritization Criteria
- Focused Relationship Building To Address Inequity
- Project Transparency and Communication



Community of Safe Communities

We make decisions every day that impact other people's lives and experiences while moving around our streets. Being part of this community means we each have an opportunity to contribute to, embrace, and support a culture of safe mobility in Edmonton. Vision Zero can be achieved when everyone – from City staff to citizens to community groups, businesses and organizations – works together, learns from each other, and makes bold choices that prioritize safety and livability for all and build a healthy, vibrant city.

2021–2022 Key Actions:

Traffic Safety Community Activation

Develop programming, tools and support to empower Edmontonians so they can influence and participate in safe and livable streets in their community, including:

- **Vision Zero Street Labs:** Combine Edmontonians' lived experience and City staff technical expertise to collaboratively identify and implement customized, creative and flexible solutions that address traffic safety concerns outside of Neighbourhood Renewal.
- **Safe Speeds Toolkit:** Support the implementation of Speed Limit Reductions and address ongoing speeding concerns in neighbourhoods. Enable communities to access tools such as portable driver feedback signs, creative signage and visual awareness options, and location specific data and information to educate and communicate about speeding issues.

Vision Zero Development Initiative

Create a toolkit and certification process for developers and the City to work collaboratively to establish Vision Zero developments.

Positive Enforcement Campaigns

Action new and creative opportunities to use enforcement data and presence to recognize and reward safe driving behaviours.

Speed Limit Reduction

Implement default residential speed limit reduction to 40 km/h, including on Main Street sections of Whyte and Jasper avenues and areas with high numbers of people walking to make our streets calmer, quieter, and safer for people walking, biking, driving, and enjoying their neighbourhood.

Safety at Every Step

People of all ages and abilities, using all modes of transportation, and in all seasons, deserve to be able to travel safely along Edmonton's streets and pathways. During planning, design, activation, and maintenance, we will proactively reduce exposure to risk and harm. This presents an opportunity for creative and dynamic solutions to new and existing roads in order to integrate safe infrastructure for walking, rolling, biking, driving, and riding transit. By working together – and acting quickly – we can support the evolution of a city of 1 million built for cars to a city of 2 million built for people.

2021–2022 Key Actions:

Safe Crossings

Enable people walking, biking, and rolling to safely cross streets through engineering measures. The Safe Crossings program will expand the measures available through the current Crosswalks program to include options ranging from temporary curb extensions to new signalization options (i.e., scramble crosswalks and lead pedestrian intervals) to rapid flashing beacons and pedestrian and full signals. By considering a wide variety of tools and controls, the Safe Crossings program will improve safety for all through protecting vulnerable road users.

School Safety

Reduce incidents and curb unsafe traffic-related behaviours at schools with elementary students through the addition of engineering countermeasures, such as marked crosswalks, signage and pavement marking upgrades, and rapid flashing beacons.

Project Integration

Partner with areas across the City to provide integrated, consistent safety support to transportation projects and programs, including:

- Consider crash and equity analyses data as a criteria for the Bike Plan location prioritization and future Arterial and Neighbourhood Renewal projects
- Conduct safety reviews for new and existing transit stop locations on collector and arterial roads
- Leverage crash and equity analyses data to support route and scheduling planning for Snow and Ice Control in supporting a safe and livable winter mobility network

Vision Zero and City Policy

Review and update City of Edmonton transportation and related city-building policy to ensure alignment to Vision Zero safety principles, standards and applications, including the development of internal resources and training for colleagues across the City to tangibly live out Vision Zero.

Listen, Learn, Lead

The *Safe Mobility Strategy* is data-driven and evidence-based, and yet, we don't have the breadth and depth of information needed to best understand traffic risks on our roads and their impact on quality of life. In collaborating with the public, colleagues, community partners and organizations, and other levels of government, we can collect, understand, and analyze data to inform the *Safe Mobility Strategy* and achieve Vision Zero. This starts with collecting better safety and health data, listening to people's lived experience, and sharing and collaborating with others.

2021–2022 Key Actions:

Strategic Collaboration with the Edmonton Police Service

- Provide data and analytics and partner on programs to:
 - Support strategic location selection and scheduling of in-person traffic enforcement and City-led mobile automated enforcement
 - Escalate repeat and serious offenders identified through automated enforcement for Edmonton Police Service action
- Support projects to improve consistency, quality and content of crash data reporting
- Address unsafe driver behaviours by using crash data and lived experience to identify intersection locations with automated enforcement equipment that could be utilized to enforce illegal left and right turns.
- Be present in and with the community to educate on the importance of traffic safety

Safe Mobility Academic Working Group

Develop a multidisciplinary research program (including academics specializing in urban planning, public health, psychology and human behaviour, equity and inclusion, and engineering) to enable holistic and integrated research and tangible safety and livability outcomes.

Expanded Monitoring Technology

Test and implement new road monitoring equipment that expands and diversifies information needed to better understand what's happening on Edmonton's streets, including near-crashes, when and how people are travelling, and road user actions and behaviours in order to implement the right actions and measures to increase safety and livability.

Partnering to Advance Safety Priorities

Work closely with federal and provincial governments and other groups and organizations that contribute to traffic safety to explore new sources of data, data sharing opportunities, and collaboration opportunities that advance *Safe Mobility Strategy* priorities and areas of concern that are not directly managed by the City of Edmonton (i.e., vehicle safety regulation, driver licensing and education, automated enforcement legislation for distracted driving).

Equitable Safety

Based on crash and equity analyses, we know that some parts of our community need extra focus and attention over the next five years. The transportation system is one of the many mechanisms through which society marginalizes certain communities. Working to address systemic inequity and build inclusion forms the basis for all actions of the *Safe Mobility Strategy*. Removing transportation-related barriers will require confronting uncomfortable topics, learning about experiences others have had that may not align with our own, and acting as allies to those that are disproportionately affected by the way the current system is planned, designed, activated, and maintained.

2021–2022 Key Actions:

Proactive Safety Reviews

Address systemic inequities by conducting proactive safety reviews in the highest crash neighbourhoods that are not accessing traditional channels to initiate change, such as 311. This work will build understanding as to why crashes are happening more frequently in some neighborhoods than others and how it impacts people's lives.

Prioritization Criteria

Include streets from the High Injury Network and High Crash Neighbourhoods that are disproportionately impacted by safety issues as project prioritization criteria evaluated to determine implementation priorities.

Focused Relationship Building To Address Inequity

Strengthen and establish relationships with organizations and people from equity-seeking communities to continually work towards removing barriers and creating solutions to safety issues.

Project Transparency and Communication

Create public access to assessment criteria, prioritization decisions, implementation status, and post-implementation evaluations for all safe mobility projects. Communicating this information will create a shared understanding of the diversity of considerations taken when selecting and prioritizing projects that ensure equity in determining where, when, and how the *Safe Mobility Strategy* will be realized on Edmonton's streets.

Measurement



The purpose of a monitoring and evaluation program is to determine if the changes made are having the intended outcomes on the community conditions and gauge effectiveness of how the program is being delivered. As such, three areas must be measured: **Vision Zero Targets, Community Outcomes, and Project Indicators.** Measuring our progress will result in more effective, deliberate, and impactful interventions and modifications to the implementation of the *Safe Mobility Strategy*.

Vision Zero Targets

Reducing the number of people killed or seriously injured is the fundamental measure of our success in achieving Vision Zero. Progress can be monitored through the following measures:

Fatal and Serious Injuries (All Road Users)

Tracking the number of fatal and serious injury crashes helps us ensure that we are continually making progress towards that goal.

+ **Target:** Zero serious injury and fatality crashes by 2032

Fatal and Serious Injuries (People Walking, Biking, and Rolling)

As a subset of the target above, it is important to track the change in crashes for these road users separately. People walking, biking, and rolling are more likely to be killed or seriously injured in a crash. Some of the Key Actions, such as crossing improvements, specifically target increased safety for these road users.



Crash Distribution

The crash and equity analyses showed us that some communities are more impacted by crashes than others. As we work toward our overall goal of Vision Zero, a less disproportionate crash distribution helps indicate that resources are being directed to the areas with highest need.

Community Outcomes

These are measures that are related to traffic safety culture change – the performance, behaviour and perceptions of Edmontonians – influenced by *Safe Mobility Strategy* programs. Measured through quantitative and qualitative data, these measures are useful indicators for both specific location projects and city-wide progress in implementing the *Safe Mobility Strategy*.

Speed and Speed Limit Compliance

Speed data can be used to evaluate the safety risk at a given location. The change in driver behaviour can also be evaluated by tracking speed compliance before and after a project is completed.

Automated Enforcement Violations

City-wide behaviour change can be measured by evaluating the total number of speed and red light running violations captured by automated enforcement, as well as the number of repeat offenses within specific periods of time. Progress can be identified through continuous decreases in these measures.

Mode Shift

Edmontonians' perceptions and feelings of safety are connected to their choice of transportation mode, and currently many Edmontonians feel less safe when traveling by modes other than driving a personal vehicle. As we improve safety for all modes, progress in this area will be measured by the increase in daily trips made by active transportation.

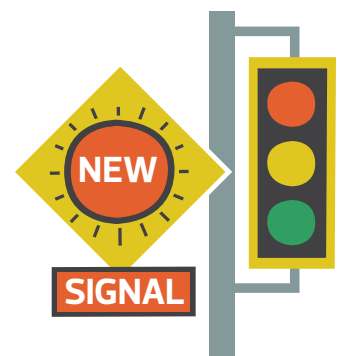
Perception of Safety

Hearing directly from Edmontonians about how their feelings of safety were impacted by changes in their community provides important lived experience data and demonstrates connections to livability.

Project Indicators

These measures are associated with the program outputs that result from the Key Actions in the *Safe Mobility Strategy*. Implementation plans for each Key Action will be developed and will include specific program outputs. Included below are some examples of outputs that will be tracked:

- Number of Safe Crossings projects completed
- Number of School Safety projects completed
- Number of engineering improvements on the High Injury Network
- Number of Traffic Safety Community Activation projects
- Number of hours of enforcement in High Crash Neighbourhoods



**VISION
ZERO**

Edmonton