



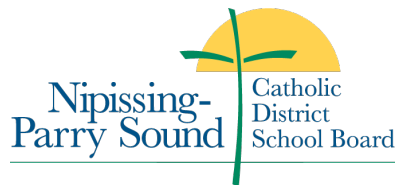
City of North Bay Road Safety Strategy

2025 – 2029

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Road Safety Strategy Partner Framework Partners



- ▶ North Bay Accessibility Committee
- ▶ North Bay Road Safety Committee



Introduction

North Bay is a vibrant community in Northeastern Ontario, Canada, nestled on the shores of Lake Nipissing and Trout Lake. Known for its scenic beauty and outdoor recreational opportunities, the City offers a unique blend of urban amenities and scenic landscapes. With deep historical roots in the railway and timber industries, North Bay has since transformed into a modern hub for education, healthcare, and tourism. Home to Nipissing University and Canadore College, the City also serves as a gateway to Northern Ontario's pristine wilderness, drawing nature lovers, hikers, and adventurers throughout the year. Spanning over 320 square kilometres, North Bay has an estimated population of 52,700, according to the 2021 census.

Road safety is an issue of great importance both locally and globally. Motor vehicle collisions remain a leading cause of death and disability in many areas, including North Bay, imposing heavy economic burdens and life-changing consequences. In 2022 alone, North Bay experienced 717 motor vehicle collisions, of which 107 resulted in injuries, underscoring the need for a holistic approach to improve road safety.

In response, North Bay has developed a comprehensive Road Safety Strategy. The Strategy reflects the latest advancements in traffic safety, focusing on identifying factors contributing to collisions and determining and implementing targeted interventions. Its primary goal is to save lives and reduce injuries resulting from motor vehicle collisions, with an emphasis on fatal and serious collisions. By fostering collaboration among key stakeholders in engineering, enforcement, education, and public engagement, the Strategy aims to create safer roads and cultivate a positive safety culture for travellers in North Bay.

This document provides an overview of North Bay's Road Safety Strategy. It outlines the City's Vision Zero approach to road safety, highlights the current state and emerging trends within the road network, and details key aspects of the Strategy. This includes a comprehensive examination of the six emphasis areas, the process undertaken in developing the Plan, and information on available resources, monitoring, and reporting mechanisms. The appendices offer a complete list of countermeasures for each emphasis area.

Vision Zero Principles and Safe Systems Approach

Vision Zero is a data-driven strategy supported by policies to eliminate traffic fatalities and serious injuries. It originated in Sweden in 1997 and has since been adopted by multiple communities worldwide, including here in North Bay. Vision Zero can be summed up in one powerful statement:

The loss of life from a motor vehicle collision is never acceptable.

Achieving the Vision Zero goal requires adopting a Safe System approach based on the understanding that people make mistakes, and our bodies can only handle so much force in a collision. Figure 1 below, adopted from the Transportation Association of Canada, illustrates the Safe System approach, highlighting the elements, principles, and key action areas which together form a comprehensive strategy with multiple layers of protection for road users. This system works in two ways: by preventing collisions from happening in the first place and by designing the road network to reduce collisions' severity when they occur.

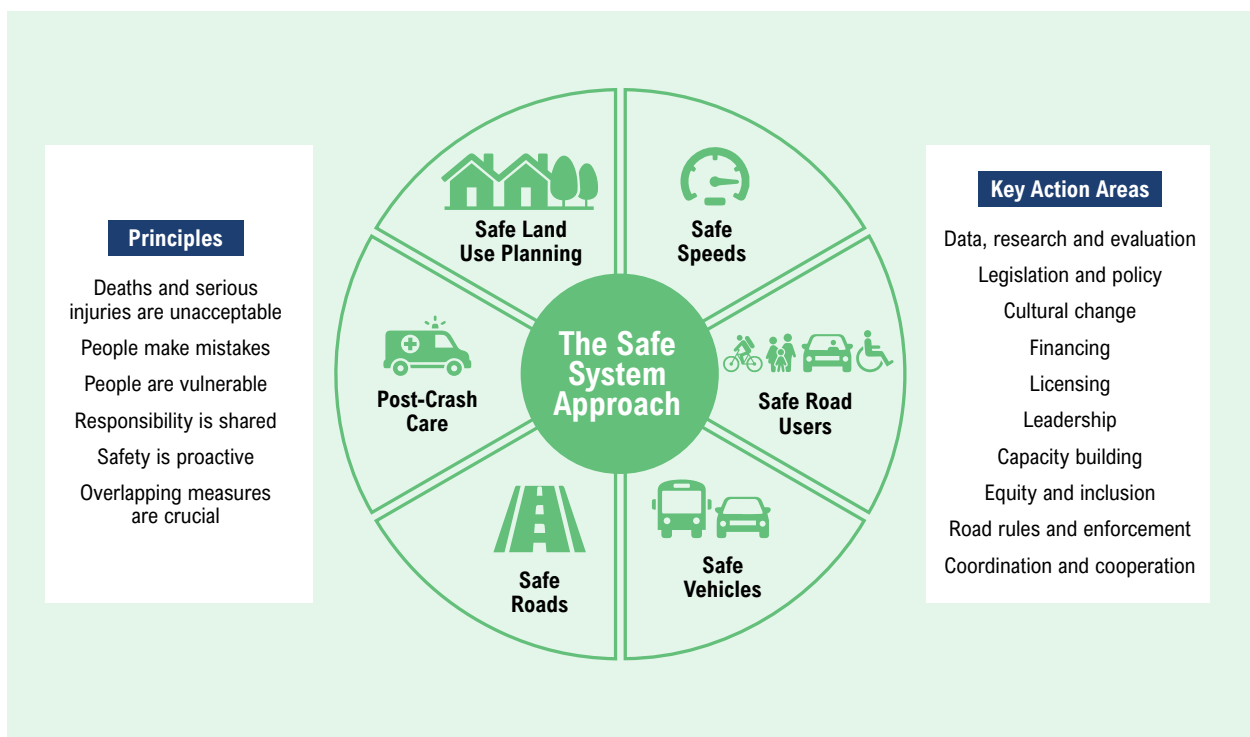


Figure 1: Safe System Approach Diagram

Quick Facts

A six-year (2015 to 2019, and 2022) comprehensive analysis of traffic collisions was conducted to review the current state of road safety in North Bay and inform the development of the Road Safety Strategy. The COVID-19 pandemic altered traffic volumes and patterns between 2020 and 2021. Therefore, collision data from this period was excluded from the analysis. The following sections provide further details on the collision analysis findings.



Intersection collisions are the most common type of collision in North Bay, contributing to 69% of fatal and injury collisions.



100% of the fatal collisions occurring in North Bay involved pedestrians.



17% of fatal and injury collisions occurring in North Bay involved pedestrians or cyclists.



33% of the fatal and injury collisions occurring in North Bay are a result of aggressive driving.



40% of the fatal and injury collisions occurring in North Bay were defined as distracted driving.



PM rush hour (3 PM – 6 PM) is the most common time for fatal and injury collisions.

Trends in the City of North Bay's Road Safety

Within the six-year study period, more than 4,900 collisions were reported on City roads. Of those collisions, more than 800 collisions resulted in an injury or fatality. The number of annual collisions and the proportion of collision type (property damage only collisions and injury or fatal collisions) is shown in Figure 2 below.

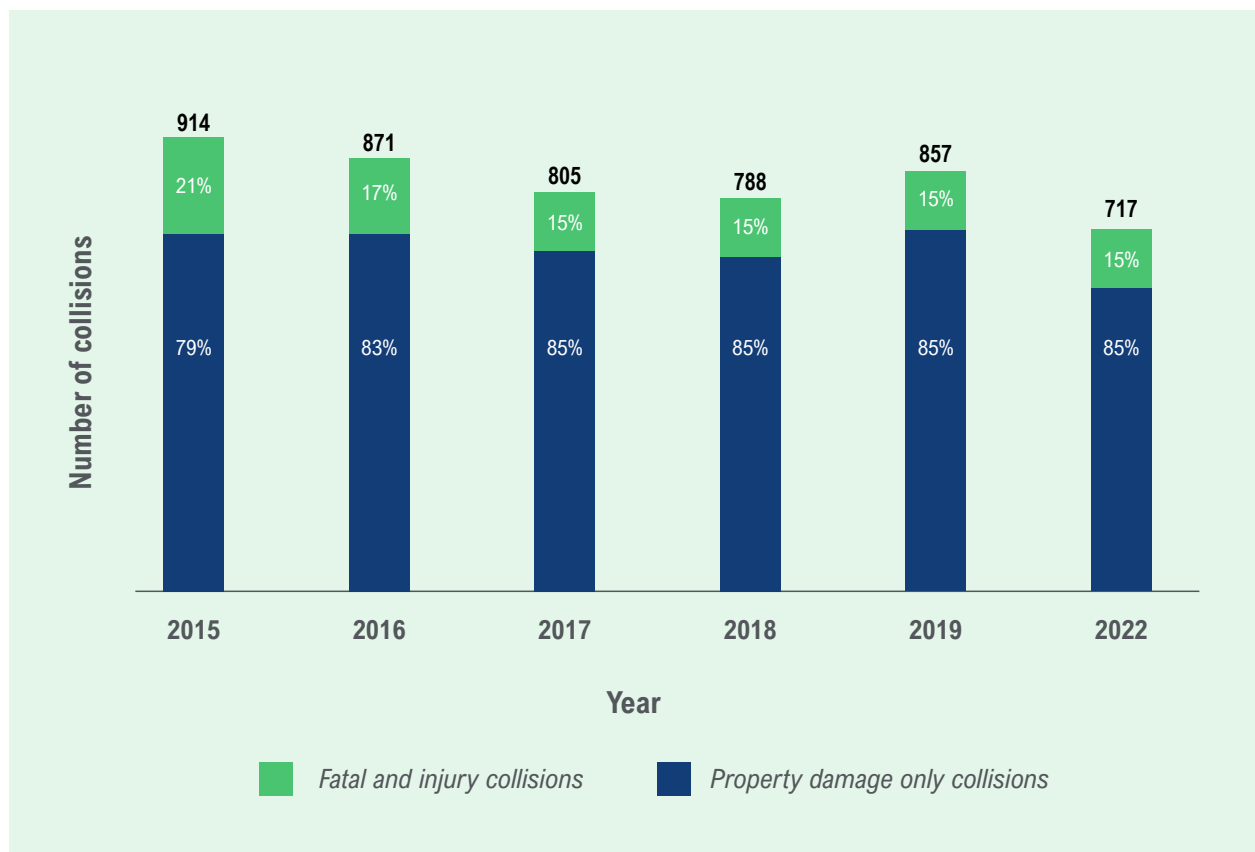


Figure 2: Annual Collisions in North Bay

In recent years, the City and its partners have made progress in slightly reducing the overall frequency and severity of collisions. However, injury and fatal collisions continue to account for 15% of all incidents. Aligned with the Vision Zero philosophy, the Road Safety Strategy will prioritize efforts to reduce these serious collisions on City roads. Figure 3 highlights this focus by illustrating the number of fatal or injury collisions across the most common collision types in the City.

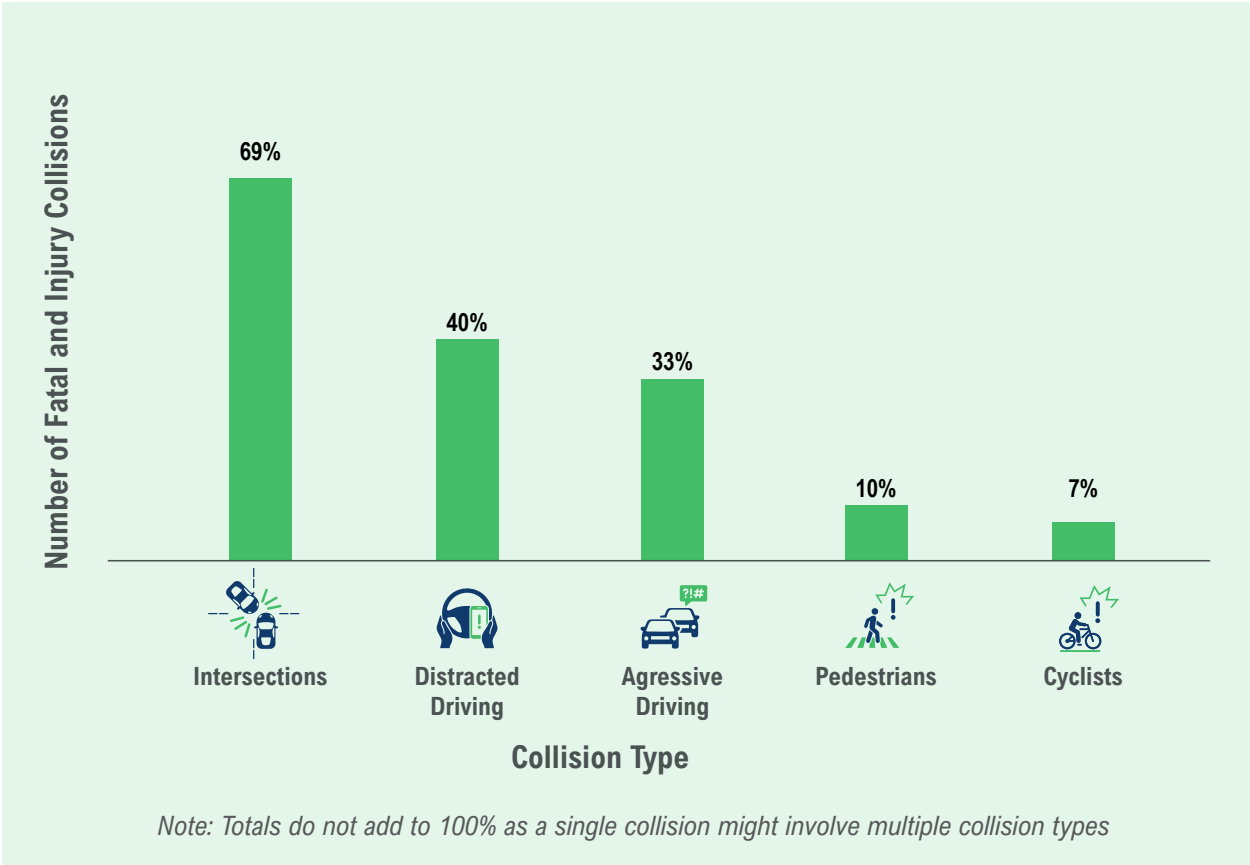


Figure 3: Number of Collisions by Collision Type

A single collision might involve multiple collision types. For example, if an impaired driver hits a cyclist at an intersection, it is classified as an intersection, cyclist, and impaired driving collision.

The findings from the six-year collision analysis played a crucial role in shaping the Road Safety Strategy. By identifying patterns, high-risk areas, and common factors contributing to collisions.

North Bay Road Safety Strategy

Everyone deserves the right to travel safely, regardless of their mode of transportation or their destination. Ensuring safety for all road users reduces collisions and fosters an inclusive and accessible environment, allowing people to move confidently and effortlessly throughout their community.

The City of North Bay has already launched several important road safety projects and programs. However, further efforts are needed to enhance safety for everyone. To address this, the City has developed a comprehensive five-year Road Safety Strategy (2025 to 2029) that builds on the current initiatives to reduce fatal and injury collisions and improve road safety for all users.

How Was the North Bay Road Safety Strategy Developed?

The development of the Road Safety Strategy was a collaborative process, with feedback from key stakeholders. The process began with a review of the City's current road safety programs and industry best practices. This was followed by a thorough data analysis, including historical collision data. Using this information and input from the public, the City and its road safety partners defined the vision, mission, goals, and key safety concerns (also known as emphasis areas) of the Strategy. From there, specific safety initiatives or countermeasures, were created to address these areas and reduce fatal and injury collisions over the next five years, in line with the City's multi-modal transportation goals. The City will implement these initiatives through an Action Plan and will regularly evaluate their effectiveness.

Figure 4 below illustrates the steps involved in the development and implementation of the Road Safety Strategy.

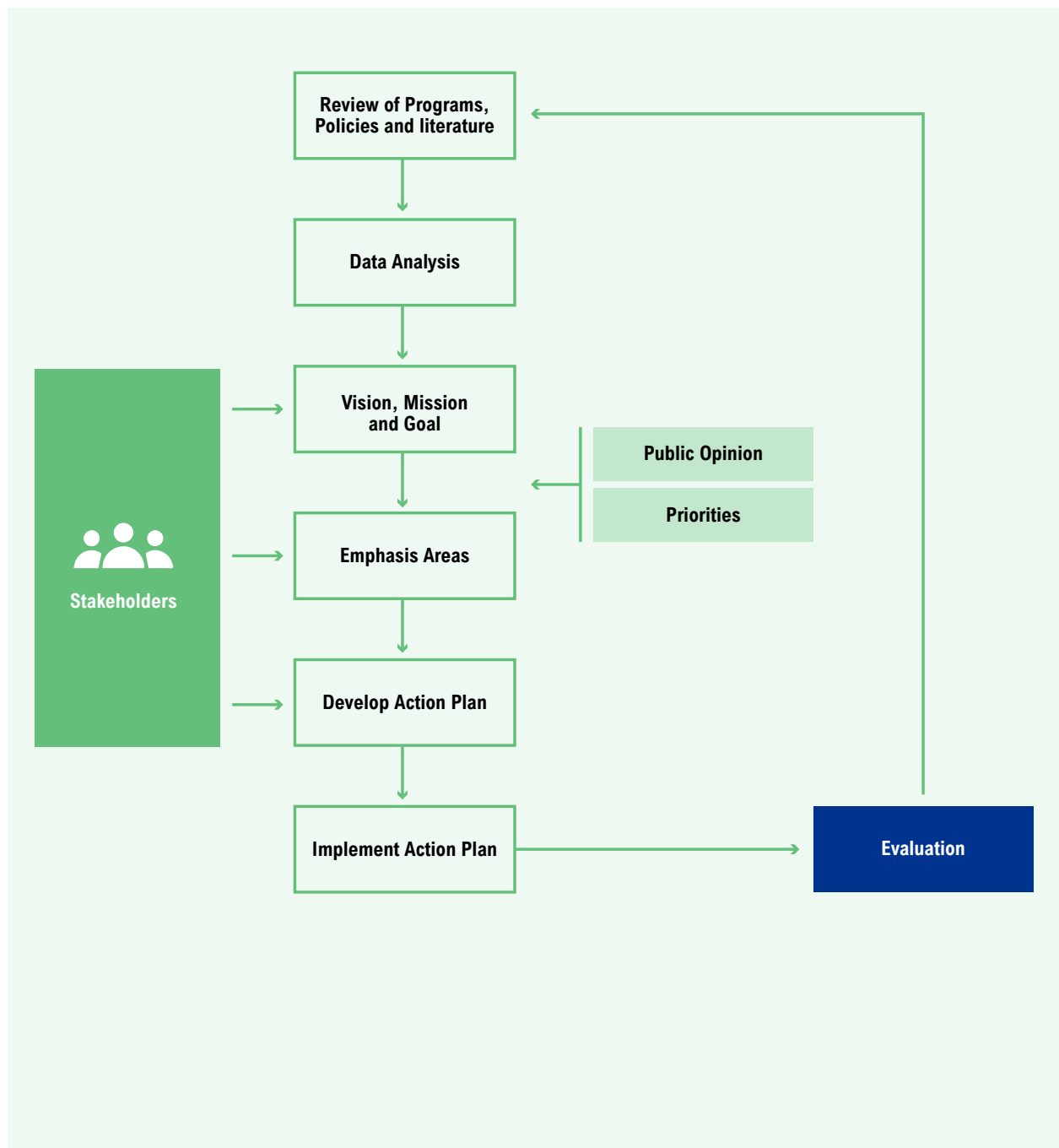


Figure 4: Road Safety Strategy Development and Implementation Process

The effectiveness of the Road Safety Strategy will be evaluated after the five-year implementation period. Based on the evaluation results, the City will make recommendations and adjustments to the Strategy to continue progressing toward the vision of eliminating fatal and serious injury collisions on City roads.

What Is the Vision, Mission, and Goal?

To create a detailed strategy for reducing motor vehicle fatalities and injuries in North Bay, a vision, mission, and goal were established for the Road Safety Strategy. The vision represents a high-level, long-term ideal that guides the overall Strategy. The mission statement provides specific direction on how to achieve the vision. The goal outlines what the Strategy aims to accomplish within a set timeframe, serving as a crucial step toward realizing the broader vision.

The vision, mission and goal were shaped by a detailed analysis of collision data and feedback from project stakeholders, ensuring they address the City's most pressing road safety concerns.



Vision

Zero fatal and serious injury collisions on our roads.



Mission

A data-driven and collaborative approach to prevent fatal and serious injury collisions and create a safe and efficient transportation system for all road users through community partnership, culture change, education, enforcement, and innovative design.



Goal

Reduce fatal and serious injury collisions by a minimum of 15% within five years.

What Are Emphasis Areas?

An Emphasis Area is a type or group of collisions that is a priority safety concern. The City will allocate human and financial resources, along with strategic initiatives, to take action and reduce these groups of collisions.

The six Emphasis Areas for the Road Safety Strategy are shown in **Figure 5** (speeding is included under aggressive driving):



Figure 5: North Bay Road Safety Strategy – Selected Emphasis Areas

What Is the Action Plan?

The Strategy consists of a comprehensive set of countermeasures known as the Road Safety Strategy Action Plan. A countermeasure is an action taken to reduce the frequency or severity of one or more specific types of collisions. There are three types of countermeasures included in the Action Plan:

- **Engineering countermeasures** involve modifying the road's physical format, such as adding traffic calming measures, adjusting traffic signals, installing signs or pavement markings, updating policies or practices such as traffic flow or parking, or using technology like variable message signs.
- **Enforcement countermeasures** include both police-staffed and automated enforcement. These countermeasures attempt to gain better compliance with existing rules of the road, with the secondary aim of educating drivers about the consequences of their actions.
- **Education & Engagement countermeasures** aim to change road user behaviour so that road users are more aware of the rules of the road, road safety, and forthcoming changes to roads and neighbourhoods.

The Action Plan outlines the steps needed to achieve the City's goal of reducing fatal and serious injury collisions by a minimum of 15% within five years. It includes a total of 74 countermeasures, 20 road safety management initiatives and 54 emphasis area-specific countermeasures.

Table 1 summarizes the number of countermeasures included in the Action Plan.

Emphasis Area	Countermeasure			Total
	Engineering	Education & Engagement	Enforcement	
 Road Safety Management	19	1	-	20
 Intersections	13	-	-	13
 Aggressive Driving	7	1	1	9
 Distracted Driving	3	1	1	5
 Pedestrians	13	1	1	15
 Cyclists	5	1	1	7
 Scool Zones	4	1	-	5
Total	64	6	4	74

Table 1: Summary of Action Plan by Emphasis Area and Type of Countermeasures



Road Safety Management Initiatives

Road safety management initiatives refer to a broad range of tasks and functions that contribute to the effective functioning and success of the Road Safety Strategy. Some examples of general countermeasures include:



Speed Data Collection Program



Vision Zero Dashboard



Annual Road Safety Report



Identification of Collision Hot Spots (Network Screening)

The complete list of road safety management initiatives can be found in the Road Safety Strategy Action Plan in **Appendix A**.

Intersections

Collisions involving vehicles passing through, approaching, or waiting to enter an intersection are defined as intersection collisions. Within the six-year study period (2015 to 2019, and 2022), a total of 568 fatal and injury collisions occurred at intersections, accounting for approximately 69% of fatal and injury collisions within the City. Out of all fatal and injury collisions at intersections, approximately 51% occurred at signalized intersections, and 49% occurred at unsignalized intersections. Most collisions occurring at intersections were classified as rear end, turning movement and angle collisions. **Figure 6** shows the history of intersection collisions in the City.

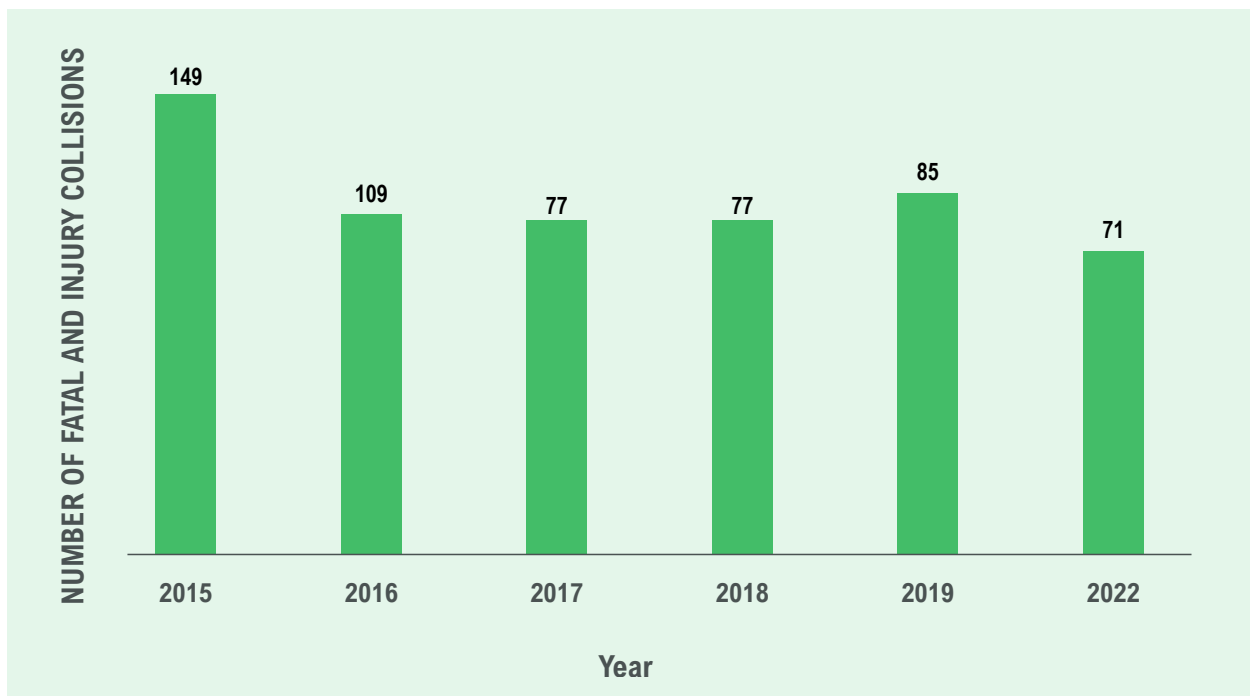


Figure 6: Annual Fatal and Injury Intersection Collisions

Countermeasures for intersections are generally engineering-related, such as adding left-turn lanes, implementing traffic signals, and improving sight lines. However, enforcement-related countermeasures such as red light cameras and automated speed enforcement may also be introduced. Intersections vary in design, traffic volume, and capacity. Therefore, countermeasures will vary from location to location. Some countermeasures are best suited for future road projects, while low-cost options could be implemented systemically across North Bay to improve safety.

In total, the intersections emphasis area has 13 countermeasures included in the Road Safety Strategy Action Plan. Examples of countermeasures to address intersection collisions in North Bay are shown below:



Red Light Cameras



**Left-turn Signal Phases
(Protected and Protected-Permissive)**



All-Way Stop Signs



Automated Speed Enforcement



Intersection Lighting

The complete list of intersection countermeasures can be found in the Road Safety Strategy Action Plan in **Appendix A**.



Aggressive Driving

Aggressive driving is defined as speeding, careless driving, stunt driving, failing to yield the right-of-way, or disregarding traffic control devices. These behaviours can harm the driver, passengers, and other road users. Within the six-year study period, there was a total of 276 fatal and injury collisions defined as aggressive driving. These collisions accounted for 33% of the total fatal and injury collisions occurring in North Bay. Most aggressive driving-related fatal and injury collisions were caused by failure to yield right-of-way, losing control, and disregarding traffic control devices. The history of collisions from aggressive driving in the City is shown in the **Figure 7**.

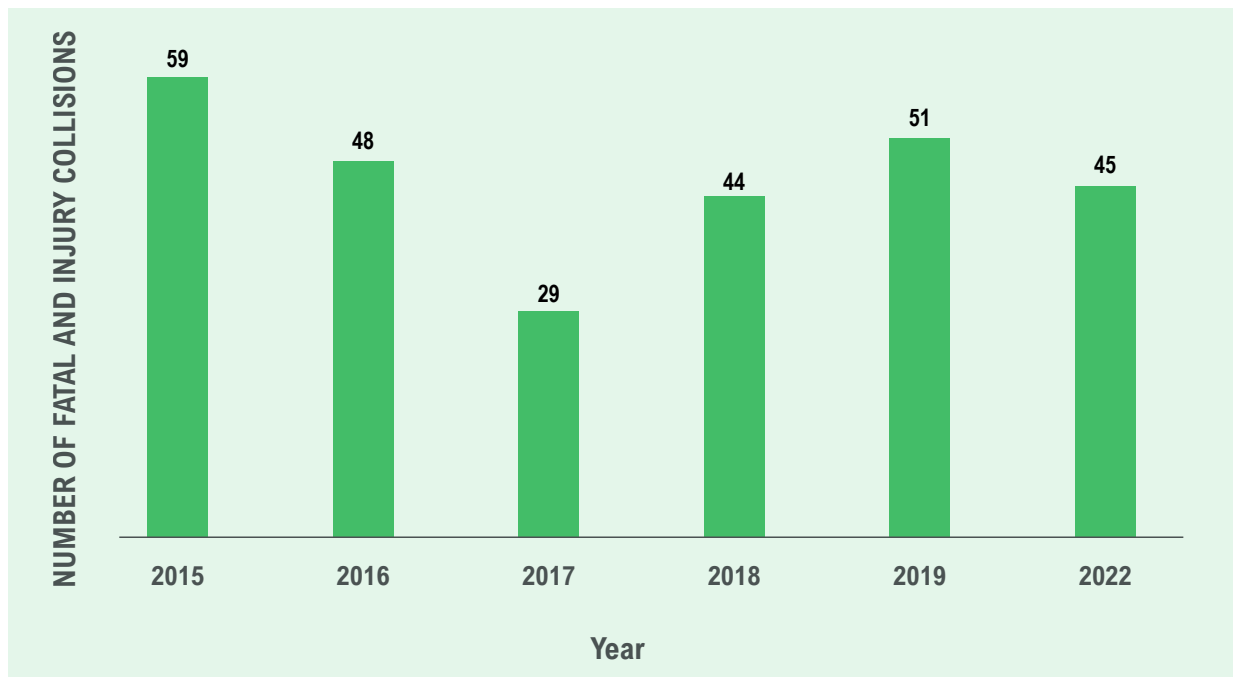


Figure 7: Annual Fatal and Injury Aggressive Driving Collisions

In total, there are 9 countermeasures included in the Road Safety Strategy Action Plan to address aggressive driving. The countermeasures aim to change the behaviour of drivers, but behavioural change is not immediate. To achieve timely results, engineering-related measures such as speed feedback signs, speed humps/ cushions, or community safety zones can effectively deter aggressive driving.

Examples of road safety countermeasures to reduce aggressive driving collisions in North Bay are shown below:

	Community Safety Zones
	Speed Humps / Cushions
	Centre Medians
	Police Enforcement Focused on Aggressive Driving
	Speed Feedback Signs Program

The complete list of aggressive driving countermeasures can be found in the Road Safety Strategy Action Plan in **Appendix A**.



Distracted Driving

Distracted driving refers to the act of operating a vehicle while engaging in activities that divert the driver's attention away from the primary task of driving. These distractions can significantly increase the risk of collisions, injuries, and fatalities on the road. Examples of distracted driving activities include:

- Using a mobile phone to text or talk
- Eating or drinking
- Grooming
- Using a handheld electronic device (e.g., tablet or game console)
- Adjusting or programming a GPS

Within the study period, a total of 300 fatal and injury collisions were defined as distracted driving, which accounts for 40% of the total fatal and injury collisions occurring in North Bay. The history of reported distracted driving collisions is shown in **Figure 8**.

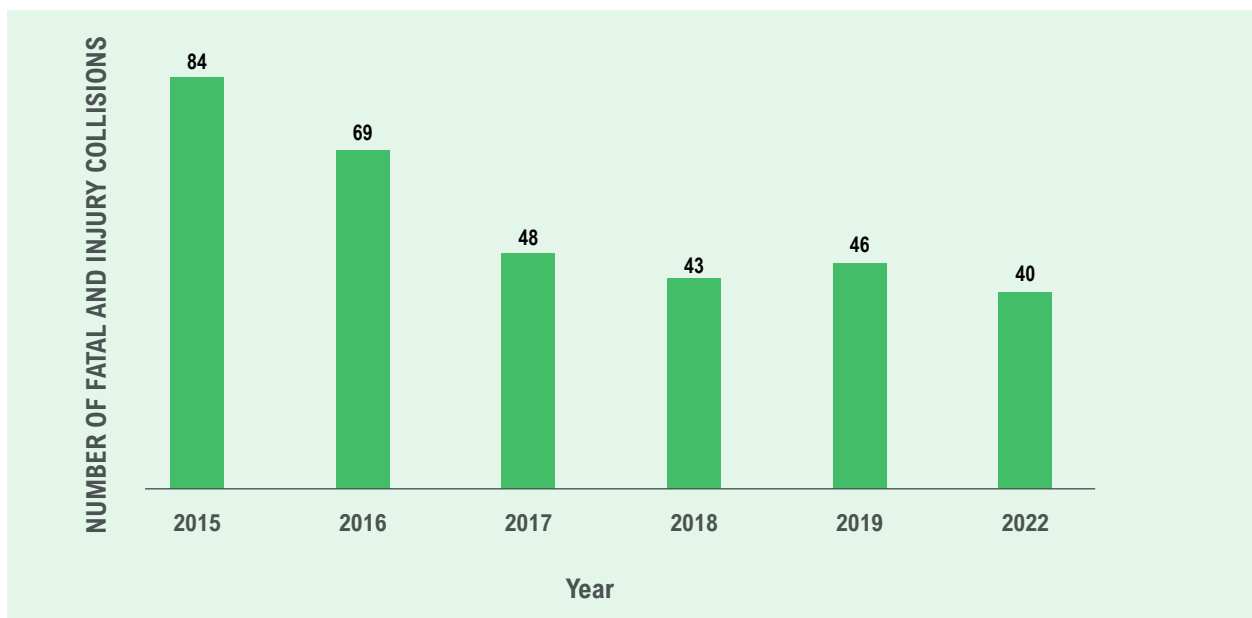


Figure 8: Annual Fatal and Injury Distracted Driving Collisions

In total, there are 5 countermeasures included in the Road Safety Strategy Action Plan to address distracted driving. Examples are shown below:



Shoulder and/or Centreline Rumble Strips



Guide Rail Upgrades



Enhanced Pavement Markings



Police Enforcement Focused on Distracted Driving



Distracted Driving Educational Campaigns

The complete list of distracted driving countermeasures can be found in the Road Safety Strategy Action Plan in **Appendix A**.

Pedestrians

Pedestrians are among the most vulnerable road users, facing a significantly higher risk of serious injury or death when involved in traffic collisions. Unlike motorists, who are protected by vehicles, pedestrians have little to no physical protection, making even low-speed impacts potentially life-threatening.

Within the six-year study period, there was a total of 80 fatal and injury collisions involving pedestrians, which accounts for approximately 10% of total fatal and injury collisions in the City. Additionally, collisions involving pedestrians accounted for 100% of fatal collisions occurring in North Bay within the study period. Figure 9 shows the history of fatal and injury collisions involving pedestrians in North Bay.

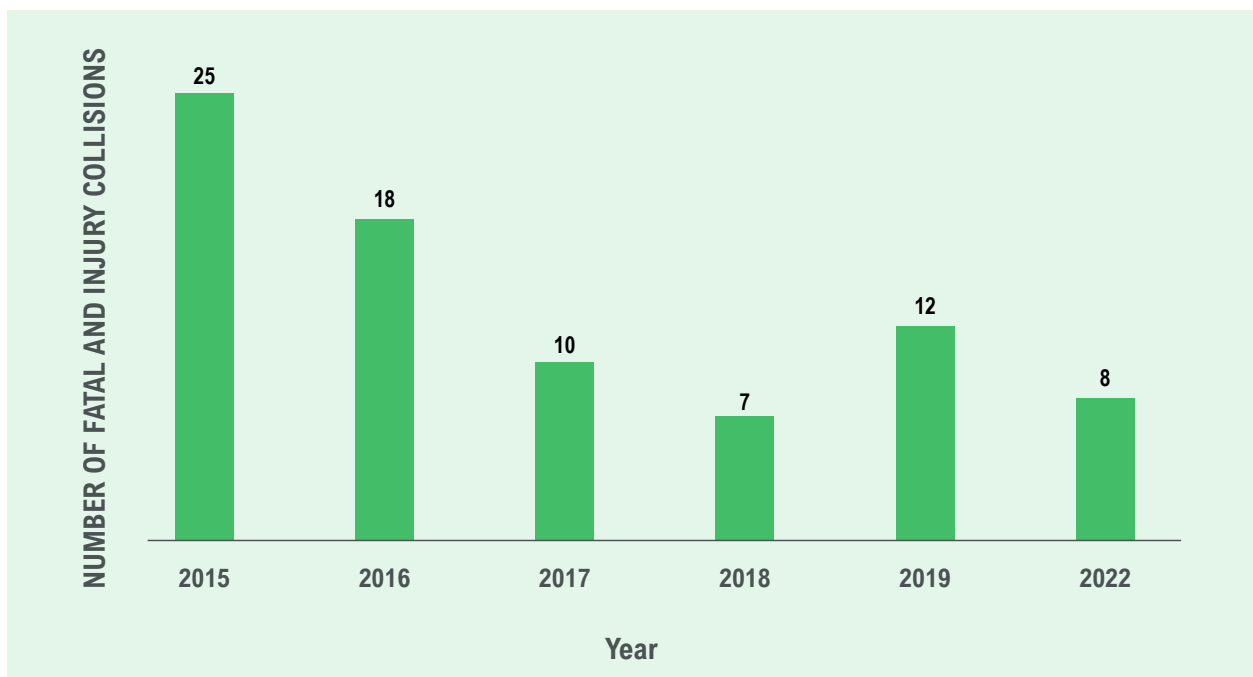


Figure 9: Annual Fatal and Injury Pedestrian Collisions

A combination of engineering, enforcement, and education & enforcement countermeasures are suggested to reduce the number of pedestrian related collisions in the City. In total, there are 15 countermeasures included in the Road Safety Strategy Action Plan. Examples of countermeasures to address pedestrian collisions in North Bay are shown below:



Pedestrian Countdown Timers



Sidewalk Network Expansion



Zebra Crossing Pavement Markings



Leading Pedestrian Intervals (LPIs)



Accessibility Improvements

The complete list of pedestrian countermeasures can be found in the Road Safety Strategy Action Plan in **Appendix A**.

Cyclists

Similar to pedestrians, cyclists are at a heightened risk of serious injury or death when involved in a motor vehicle collision. Within the study period, there was a total of 59 fatal and injury collisions in the City involving cyclists, contributing to 7% of the total fatal and injury collisions occurring in North Bay. The annual number of fatal and injury collisions involving cyclists has noticeably declined since 2014. However, there is still work to be done. Prioritizing cyclist safety reduces the frequency and severity of collisions and encourages the development of safer, more inclusive urban environments. The history of cyclist collisions in the North Bay is shown in **Figure 10**.

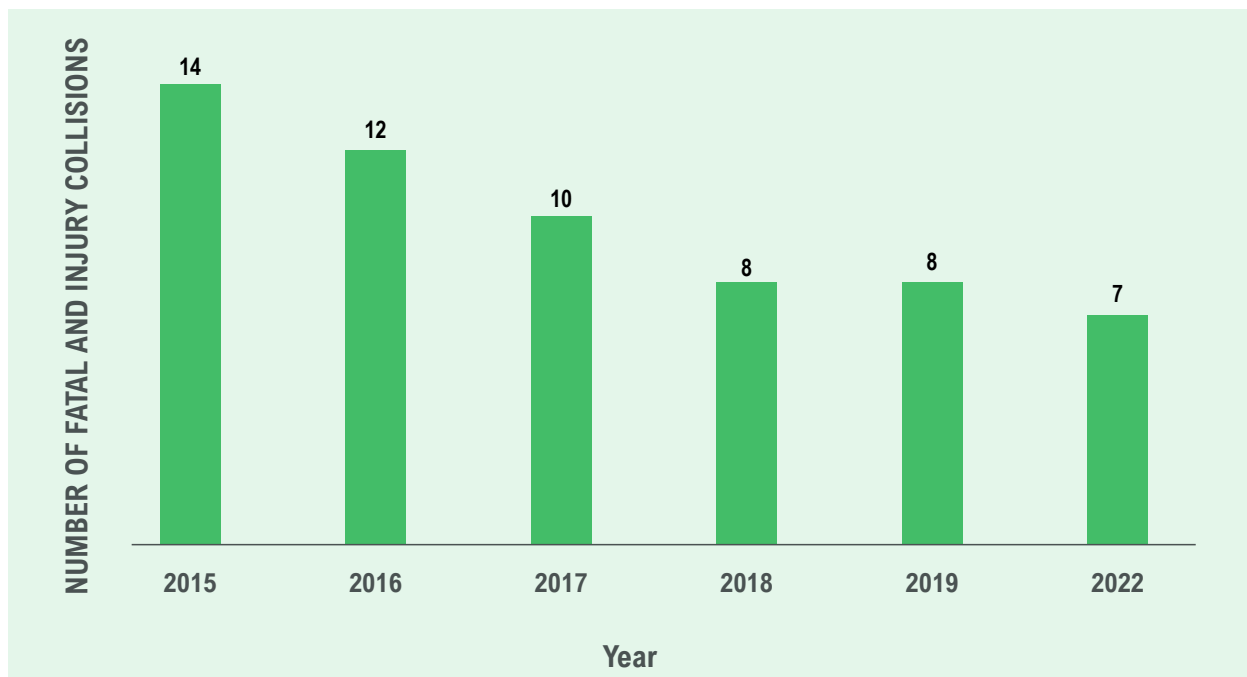


Figure 10: Annual Fatal and Injury Cyclist Collisions

A combination of engineering, enforcement, and education & enforcement countermeasures are suggested to reduce the number of cyclist-related collisions in the City. In total, there are 7 countermeasures included in the Road Safety Strategy Action Plan. Examples of countermeasures to address cyclist collisions in North Bay are shown below:



New Cycling Infrastructure (Off-Road Facilities)



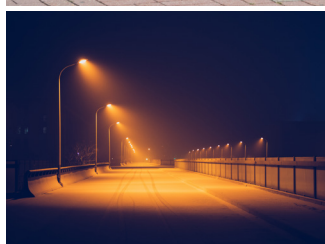
Bicycle Signals



Crossrides



Cyclist Safety Educational Campaigns



Improved and Continuous Illumination

The complete list of cyclist countermeasures can be found in the Road Safety Strategy Action Plan in **Appendix A**.

School Zones

A school zone refers to an area on a street near a school or a designated crossing leading to a school with the likely presence of younger pedestrians or cyclists. Although school zones were not exclusively analyzed during collision analysis as this information was unavailable, school children are also known as vulnerable road users, and collisions involving school children generally have a higher severity of injury. Improving school zone safety may also improve active school travel (i.e., using human-powered travel to get to and from school, including cycling, rollerblading, skateboarding, and scootering).

In total, there are 5 countermeasures included in the Road Safety Strategy Action Plan to address school zone safety. Examples of countermeasures are shown below:



Establishing School Zones



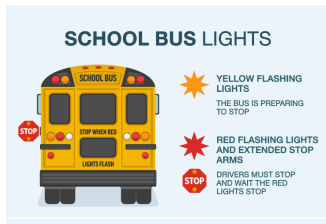
Crossing Guard Program



School Crossings



Safe Neighbourhood Program



School Zone Safety Educational Campaigns

The complete list of school zone countermeasures can be found in the Road Safety Strategy Action Plan in **Appendix A**.

Moving Forward

The City's Road Safety Strategy outlines a plan to address North Bay's specific road safety challenges, with the goal of reducing fatal and serious injury collisions by a minimum of 15% within five years while also progressing toward the long-term vision of eliminating such collisions entirely. Achieving this requires the commitment of the City and partner agencies, along with the approval of additional human and financial resources to implement the Action Plan. It is essential to embed a strong traffic safety culture into the decision-making process across the City and its transportation partners. Fostering this positive safety culture involves:

- Creating an environment where traffic safety is prioritized and continually pursued
- Collaborating with City staff, road safety partners, and the public to share ideas and gather feedback
- Incorporating data in all decision-making
- Prioritizing safety in existing, expanding, and new programs, projects, and initiatives

Next Steps

Within the next five years, the City and its road safety partners will implement numerous countermeasures to reduce fatal and injury collisions across North Bay. The Road Safety Strategy is a dynamic, evolving framework designed to guide safety management efforts. To ensure meaningful improvements in road safety, regular meetings between the City and partner agencies are essential. These meetings will allow for decisions on budgets, priorities, and goals while providing a platform to assess progress and hold all partners accountable.

Resources

The implementation of the Road Safety Strategy will require additional resources (both human and financial). Implementing the Road Safety Strategy will require an investment in 3.5 additional full-time employees, which can be achieved through a combination of new hires, reallocating existing staff, and engaging external contractors or consultants.

The estimated budget for the five-year Road Safety Strategy is \$9.2 million¹. This value includes the total estimated cost for all countermeasures comprised in the Action Plan, not including operating costs. **Figure 11** illustrates the annual budget required for the Road Safety Strategy.

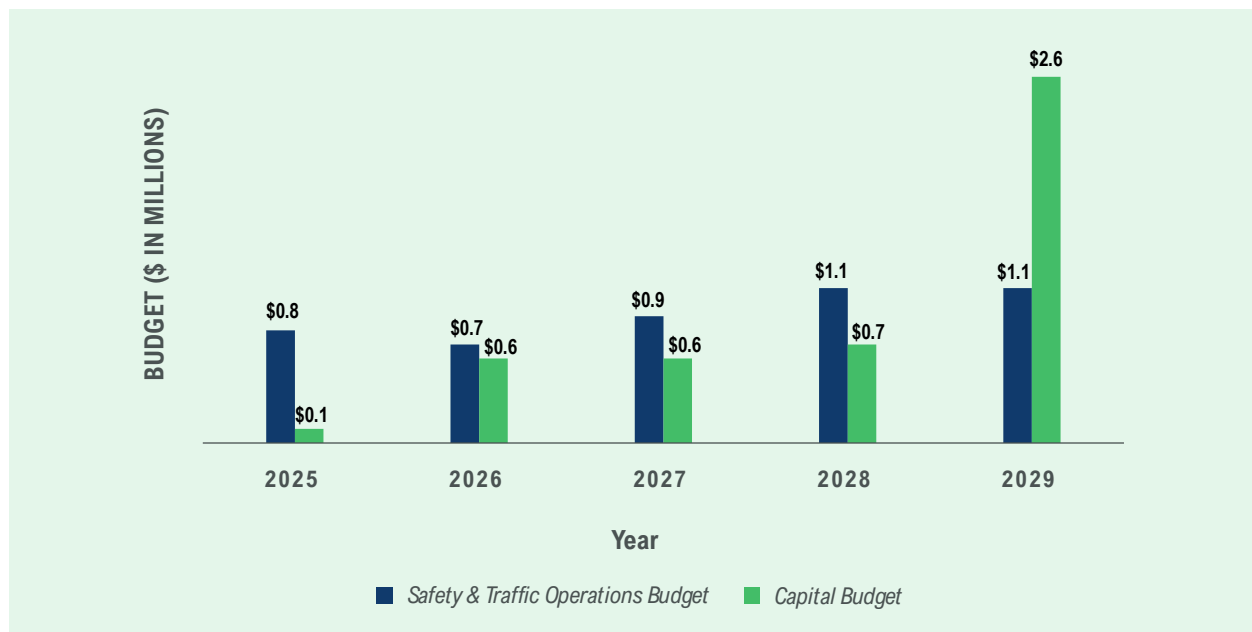


Figure 11: Road Safety Strategy Annual Budget

As shown, the annual budget increases toward the end of the Road Safety Strategy timeline. This increase is due to the implementation of larger, more costly countermeasures (such as traffic signals and roundabouts), which require extensive engineering studies and approvals before they can be executed.

Monitoring and Evaluation

The progress of the Road Safety Strategy will be assessed and documented annually in the Road Safety Report. The Strategy includes a robust evaluation and monitoring system, backed by key performance indicators and a data collection program, to track progress and ensure the success of efforts to reduce fatal and injury collisions.

The success of the Road Safety Strategy will be evaluated based on various components, including but not limited to:

- The number of countermeasures implemented
- The reduction of total fatal and serious injury collisions
- The reduction of emphasis on area-specific fatal and serious injury collisions
- The reduction of vehicular speed
- Feedback from the public

¹ The Road Safety Strategy budget is contingent on all budget approvals by Council.

What Can You Do?

Whether you're driving, walking, cycling, or using transit, staying aware of what to expect when navigating the transportation network is important. Roadway users can encounter various potentially hazardous situations. Here are actions you can take to help the City reach its goal and contribute to the vision of safer roads:

- Adapt to changing conditions like weather, construction zones, and other unexpected factors.
- Educate yourself and others on proper driving behaviours.
- Understand, respect, and obey all rules of the road.
- Respect other road users around you.
- Check your condition, your vehicle's condition, and minimize distractions before you start driving.
- **Prioritize safety at all times.**



Appendix A

Road Safety Strategy Action Plan

Emphasis Area	No.	Countermeasure	4 E's	Type	Description	CMF	Five-Year Implementation Total
General Road Safety Management 	GEN-01	Traffic Inquiry Prioritization Tool	Engineering	EX	Develop an inquiry intake priority procedure for optimal/objective handling of public requests	-	1
	GEN-02	Identification of Training Needs and Sources for Personnel Professional Growth	Engineering	REC	Identify opportunities for the the City staff to expand their skills and knowledge, and find appropriate training sources to enhance professional growth and align with organizational safety goals.	-	1
	GEN-03	Library of Resources and Reference Materials	Engineering	REC	Assemble a digital library and obtain / purchase copies of provincial (MTO), national (TAC) and international (FHWA, AASHTO) manuals on traffic safety and operations	-	1
	GEN-04	Traffic Count Program Needs Assessment	Engineering	REC	- Determine optimal locations for the count program - Implement refinements to data collection periods and seasons - Develop procedures to estimate AADT at intersections based on TMC data while using time of day, day of week and day of month conversion factors - Develop procedures to estimate AADT on road segments based on ATR data while using time of day, day of week and day of month conversion factors	-	1
	GEN-05	Road Safety Database Development	Engineering	REC	- Purchase a subscription to an enterprise data hosting platform - Incorporate Primary and Secondary Road Safety data into the data hosting platform - Training staff to efficiently use the data hosting platform for day-to-day applications	-	5
	GEN-06	Road Safety Database Update	Engineering	REC	- Develop procedures to assess the quality of road safety data - Conduct regular updates/audits of the collision database - Conduct regular update/audit of infrastructure database - Conduct regular update of traffic volume database	-	4
	GEN-07	Pedestrian and Cyclist Count Program	Engineering	REC	- Explore and adopt different technologies for collecting pedestrian and cyclist counts - Develop procedures to estimate pedestrian and cyclist volumes at intersections based on TMC data - Develop procedures to estimate pedestrian and cyclist volumes at midblock crossing based on adopted data collection technologies - Collect and estimate pedestrian and cyclist volumes	-	1
	GEN-08	Speed Data Collection Program	Engineering	REC	- Explore and adopt different technologies for collecting historical and real-time speed data - Develop procedures to estimate speed noncompliance on road segments - Collect and estimate speed non-compliance - Analyze the collected Speed Data and Identify High Risk Locations with Speeding Issues	-	5
	GEN-09	Network Screening Program	Engineering	REC	- Collect and assemble necessary data - Develop Safety Performance Functions (SPFs) - Conduct Network Screening using Empirical Bayes Method - Identify sites with higher Potential for Safety Improvements (PSI) - Consider all Road users - Preparing high-priority list Targetting Different collision Types	-	1
	GEN-10	Systemic Safety Review Program	Engineering	REC	- Collect and assemble necessary data - Identify risk factors and assign them to sites - Identify and rank sites with one or more risk factors - Identify systemic safety treatments - Consider all road users	-	1
	GEN-11	In-Service road Safety Review Program	Engineering	REC	Develop and implement a program to conduct in-service road safety reviews at top-ranked locations in the City	-	15
	GEN-12	Complete Streets Guidelines	Engineering	REC		-	1
	GEN-13	Develop Vision Zero Dashboard	Engineering	REC	Present Road Safety program progress through variety of KPIs using a variety of visualization tools such as Power BI dashboards.	-	1
	GEN-14	Annual Road Safety Report	Engineering	REC	Prepare a road safety report summarizing the key KPIs on annual basis for presentation to the Council and Public	-	5
	GEN-15	Road Safety Audits within Minor and Major Capital Processes	Engineering	REC	Implement a program to include RSAs within capital processes.	-	5
	GEN-16	Evaluation Program (Before-After Studies)	Engineering	REC	Conduct regular before-after studies determining the effects of different countermeasures following the best practice approaches	-	5

Emphasis Area	No.	Countermeasure	4 E's	Type	Description	CMF	Five-Year Implementation Total
General Road Safety Management	GEN-17	City Standards and Specifications Update	Engineering	REC	Identify and develop the required standards and policies to facilitate the seamless traffic safety business unit operation.	-	5
	GEN-18	Incorporate Safety in Design and Planning	Engineering	REC	- Review the City's current planning policies and design guidelines to identify gaps - Incorporate safety in the City's planning and design procedures	-	1
	GEN-19	Neighbourhood Traffic Calming Plan	Engineering	REC	A Neighbourhood Traffic Calming Plan aims to enhance safety by implementing traffic calming measures such as speed bumps, traffic circles, and narrowed roads to reduce vehicle speeds and cut-through traffic in residential areas.	-	1
	GEN-20	Knowledge Sharing & Consistent Messaging between Neighbouring Municipalities	Education & Engagement	REC	By sharing best practices, data, and educational resources, this program ensures a unified approach to road safety messaging and enforcement across municipal borders. The goal is to create a seamless, cohesive experience for drivers, pedestrians, and cyclists, reducing confusion and improving overall safety on shared road networks. In addition, this effort aims to create a partnership with area enforcement agencies that agree to and develop consistent enforcement activities and incident / injury prevention messaging. With all agencies consulted and working together there is no overlap of messaging and consistency of geo-political area needs. Inclusion of the Prosecutors will encourage consistency in prosecution outcomes.	-	5
Intersections 	INT-01	All-Way Stop Signs	Engineering	EX	Convert Minor-road Stop Control (MRSC) to All-way Stop Controls (AWSC). All-way stop is less efficient but has a greater level of safety.	0.3	5
	INT-02	Turn Restrictions	Engineering	EX	A full-time or part-time turn prohibition may be appropriate where congestion is causing collisions. Care should be taken not to simply relocate the problem elsewhere, however.	-	5
	INT-03	Traffic signals (maintenance and operations)	Engineering	EX	Changing stop-controlled intersections to traffic signal-controlled intersections	0.86	5
	INT-04	Traffic Control Visibility at Stop Controlled Intersection	Engineering	FUTR	This program improves traffic control visibility at stop-controlled intersections, ensuring that signs are easily seen by drivers to enhance safety and reduce the risk of collisions. The visibility of the stop sign can be enhanced by providing flashing beacons if warranted	0.97	5
	INT-05	Intersection Lighting	Engineering	FUTR	Install lighting at intersections (vehicular-level & pedestrian-level) where no lighting existed before and/or upgrade existing lighting to meet standards.	0.67	3
	INT-06	Roundabouts	Engineering	FUTR	Convert of stop-controlled intersections to roundabouts	0.32	1
	INT-07	Added left-turn lanes	Engineering	REC	Left-turn lanes at intersections, especially in free-flow conditions, will reduce rear-end collisions.	0.72	1
	INT-08	Left-turn signal phases (protected / protected+permissive)	Engineering	REC	Providing fully protected left-turn phases at intersections reduces conflicts with pedestrians and cyclists. With the implementation of protected turning movements, turning vehicles are given exclusive right-of-way in sequence, eliminating collision with oncoming vehicles and pedestrians.	0.718	5
	INT-09	Left-turn traffic calming	Engineering	REC	Left-turn traffic calming consists of modifying the median island, typically at a signalized intersection, to reduce the turning radius, and therefore, slower. This assists in preventing vehicle-pedestrian collisions.	0.82	3
	INT-10	Rumble strips at intersections approaches	Engineering	REC	Installing rumble strips at approaches to intersections alert drivers of upcoming conflict zone and decision making point	-	1
	INT-11	Curb Tightening with Truck Aprons	Engineering	REC	Corner design that with single curb line that is usable by the vast majority of road users, with mountable zone for use by infrequent larger control vehicles such as fire trucks.	0.981	1
	INT-12	Automated Speed Enforcement	Engineering	FUTR	Implementation Automated Speed Enforcement following consultation and approval by the Ontario government. Applicable to Community Safety Zones and school zones. Steps to successful deployment of ASE. Step 1. Identify area for deployment using incident, complaint, enforcement data. Step 2. Media (print, social, radio, local television) of results of data research and intention of speed enforcement to be utilized to slow traffic. Step 3. Deployment of Speed Feedback Signs for a set period. Step 4 Data review to access impacts on speed if any Step 5. Media advised and Deploy Automated Speed Enforcement devices for set period of time. Step 6 Traffic review to access if motorist behaviour has slowed down. Step 7 Media release reporting on success or failure of deployment.	0.52	0

Emphasis Area	No.	Countermeasure	4 E's	Type	Description	CMF	Five-Year Implementation Total
Intersections	INT-13	Red Light Cameras	Engineering	FUTR	Automated enforcement of violation of the red indication at signalized intersections. Should reduce intentional red light running behaviours to reduce right angle collisions. See steps of ASE. The differences being Step 3 does not apply and the cameras will be permanently deployed.	0.789	0
Distracted Driving 	DIST-01	Shoulder and/or Centerline Rumble Strips	Engineering	FUTR	Rumble strips are texturing of the pavement, either parallel or perpendicular to the direction of vehicle travel. They are used to ensure drivers stay within their lanes (centre line or edge line), or to alert drivers of a need to slow down or stop, or to other upcoming changes that may not be anticipated by an inattentive driver	0.558	5
	DIST-02	Guide rail upgrades	Engineering	REC	Guide rail and end treatments should be updated to the latest MASH standards and with considerations given to all road users	-	1
	DIST-03	Enhanced pavement markings	Engineering	REC	Enhanced pavement markings are advanced road surface markings that use highly visible and durable materials, such as reflective paints or thermoplastics, to provide improved visibility and guidance for drivers.	0.893	5
	DIST-04	Police Enforcement Focuses on Distracted Driving	Enforcement	FUTR	This program conducts monthly enforcement initiatives specifically targeting distracted driving. Through regular and focused efforts, it aims to reduce distractions behind the wheel and enhance overall road safety. Attorney General Provincial Prosecutors must be engaged to insure consistency in prosecution outcomes	-	1
	DIST-05	Distracted Driving Education Campaigns	Education & Engagement	FUTR	The education campaigns that focus on distracted driving such as "Leave the Phone Alone", "Heads Up!", and etc. With all agencies consulted and working together there is no overlap of messaging and consistency of geo-political area needs. An education session with all enforcement personall to educate the officers on the dangers and realities of distracted driving so officers enforce with knowledge as to why it is important. Research developed by Transport Canada, Traffic Injury Research Foundation, Health Units should be cited and utilized in media campaigns to educate the public.	0.91	1
Aggressive Driving 	AGG-01	Speed Feedback Signs Program	Engineering	EX	Radar speed boards relay exact travel speeds to drivers, to encourage compliance with the posted speed limits.	0.95	10
	AGG-02	Community Safety Zones (Speed Reduction, Traffic Calming)	Engineering	EXP	Implement additional Community Safety Zones or school zones, as appropriate. School zones are areas near schools where there are special speed limits and other traffic regulations designed to protect students as they travel to and from school. A community safety zone (CSZ) is a designated area on a roadway where traffic violations (e.g., speeding) are subject to higher fines and penalties.	0.93	10
	AGG-03	Dragon teeth	Engineering	EXP	Pavement marking application to encourage drivers to slow down. Dragon's Teeth are triangular road markings perpendicular to the edge of the carriageway often used at gateways to give the effect of road narrowing	0.93	5
	AGG-04	Centre Median	Engineering	FUTR	Installation of centre median to prevent cross-median crashes in urban areas and to allow access restriction.	-	1
	AGG-05	In-road flexible speed signs	Engineering	REC	In-road signs are located between travelled lanes and are used to narrow lanes to make drivers to slow down	0.85	15
	AGG-06	Urban shoulders	Engineering	REC	Pavement marking application to minimize drivers driving on shoulder, create buffer from curb and to narrow the lane width	0.93	10
	AGG-07	Speed humps/cushions	Engineering	REC	Speed cushions or speed humps are vertical deflection on the roadway designed to be traversed at a reduced speed and thereby enhance safety	0.6	10
	AGG-08	Police Enforcement Focuses on Aggressive Driving	Enforcement	FUTR	Development and delivery of a targeted enforcement program focusing on speeding, improper passing, stunt driving, and seatbelt usage. Attorney General Provincial Prosecutors must be engaged to insure consistency in prosecution outcomes In addition, the inclusion of the NBRHS ER is to allow for understanding of impacts injury has on hospital over burden and patient wait times. With this knowledge media releases can be tailored to include that data to reinforce who is being impacted by aggressive driving.	-	1

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Aggressive Driving	AGG-09	Aggressive Driving Education Campaigns	Education & Engagement	FUTR	The education campaigns that focus on aggressive driving such as "Speed Kills", "Keep Your Cool", and etc. With all agencies consulted and working together there is no overlap of messaging and consistency of geo-political area needs. In addition, the inclusion of the NBRHS ER is to allow for understanding of impacts injury has on hospital over burden and patient wait times. With this knowledge media releases can be tailored to include that data to reinforce who is being impacted by aggressive driving. It is strongly advised to use positive-based messaging vs. using fear-based messaging, especially with youth. Evidence shows that campaigns that use fear-based messaging are not effective in the long term and not with all audiences. The messaging are more likely to change behaviour and make communities better, safer places to live in using positive based messaging.	0.91	1
Pedestrians 	PED-01	Pedestrian Crossovers (PXOs)	Engineering	EX	Pedestrian crossings protected by signs, pavement markings, and at the highest level, flashing lights. Defined by provincial statute. Provides protected crossing opportunities and safety benefits. Pedestrian crossovers are intended for locations where some pedestrian demand exists, but the demand does not justify installation of traditional traffic or pedestrian signals	0.82	5
	PED-02	Sidewalk Maintenance Program	Engineering	EX	The Sidewalk Maintenance Program ensures safe pedestrian pathways by implementing regular inspection, repair, and upkeep of sidewalks. By prioritizing maintenance, the program aims to enhance pedestrian safety and accessibility in communities.	-	5
	PED-03	Accessibility Improvements (curb ramps, tactile plates, audible pedestrian signals)	Engineering	EX	The Accessibility Improvements program focuses on enhancing accessibility for all pedestrians by installing features such as curb ramps, tactile plates, and audible pedestrian signals. By improving infrastructure, the program aims to create a more inclusive and safe environment for people with disabilities.	-	5
	PED-04	Ditch Enclosure	Engineering	EX	The Ditch Enclosure program focuses on enclosing roadside ditches to enhance safety and aesthetics. By containing ditches, the program aims to minimize hazards for motorists, pedestrians, and wildlife while improving the overall appearance of roadways.	-	5
	PED-05	Sidewalk Network Expansion	Engineering	EXP	Building new sidewalks, especially where missing links in a system are completed, provides safety for pedestrians who would otherwise be forced to walk on the street/road or take circuitous routing.	-	5
	PED-06	Zebra Crossing Pavement Markings	Engineering	FUTR	Ladder-style crosswalk markings to emphasize the presence of a crosswalk. Refer to TAC Pedestrian Crossing Control Guide and Ontario Traffic Manual Book 15 for details	0.6	15
	PED-07	Pedestrian Countdown Timers	Engineering	FUTR	The Pedestrian Countdown Timers program implements timers at crosswalks to display the remaining time for pedestrians to safely cross. By providing clear and visible countdowns, the program aims to enhance pedestrian safety and improve traffic flow.	0.912	15
	PED-08	Pedestrian Refuge Island Program	Engineering	FUTR	The Pedestrian Refuge Island Program creates safe havens for pedestrians at designated crossing points, enhancing safety and accessibility. By installing refuge islands, the program aims to reduce pedestrian exposure to traffic and promote safer crossing experiences.	0.64	5
	PED-09	Leading Pedestrian Intervals (LPI)	Engineering	FUTR	The Leading Pedestrian Intervals (LPI) program prioritizes pedestrian safety by giving pedestrians a head start to cross intersections before vehicle traffic begins moving. By providing pedestrians with an early start, the program aims to enhance visibility and reduce potential conflicts between pedestrians and turning vehicles.	0.81	25
	PED-10	Reducing Pedestrian Delays	Engineering	FUTR	Shortening the traffic signal cycle length can allow pedestrians to cross the street more frequently, but it can also lead to increased vehicle delay and congestion, which may have negative impacts on traffic flow and safety.	-	5
	PED-11	Setback Pedestrian Crossing	Engineering	FUTR	A setback pedestrian crossing is a type of crosswalk where the crossing is moved from the intersection than traditional, which reduces pedestrian crossing distance.	-	5

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Pedestrians	PED-12	Walking Speed Adjustments	Engineering	REC	Altered traffic signal timings to accommodate slower walkers, either elderly or disabled. Usage based on high percentages of the target audiences. Reduces conflicts between pedestrians and vehicles.	0.49	15
	PED-13	Bus Stop Location Reviews & Relocation	Engineering	REC	Bus stop reviews are a formal assessment on the safety impact of either adding or relocating transit stops.	-	5
	PED-14	Police Enforcement Focuses on Pedestrian Safety	Enforcement	FUTR	Police Enforcement program aims to improve pedestrian safety by deploying law enforcement officers to monitor and enforce pedestrian-related regulations. Through proactive patrols and targeted interventions, the program seeks to reduce pedestrian collisions and promote compliance with traffic laws. Attorney General Provincial Prosecutors must be engaged to insure consistency in prosecution outcomes In addition, the inclusion of the NBRHS ER is to allow for understanding of impacts injury has on hospital over burden and patient wait times. With this knowledge media releases can be tailored to include that data to reinforce who is being impacted by aggressive driving.	-	1
	PED-15	Pedestrian Safety Education Campaigns	Education & Engagement	FUTR	The education campaigns that focus on pedestrian safety such as "Be Safe Be Seen", "Stay Alert, Stay Safe", "Heads Up!", and etc. With all agencies consulted and working together there is no overlap of messaging and consistency of geo-political area needs.	0.91	1
Cyclists 	CYC-01	New Cycling Infrastructure (off-road facilities)	Engineering	EXP	Protected cycling facilities off-road (separated by bollards, separated by barriers or a bike track), the location selected by ActiveTrans Priority Tool - methodology for prioritizing bicycle and pedestrian improvements along existing roads.	0.37	1
	CYC-02	New Cycling Infrastructure (on-road facilities)	Engineering	EXP	On road, painted lane adjacent to the general purpose lanes, the location selected by ActiveTrans Priority Tool - methodology for prioritizing bicycle and pedestrian improvements along existing roads.	0.86	1
	CYC-03	Bicycle Signals (Planned to be installed on McKeown Avenue)	Engineering	EXP	A bicycle signal is a traffic light specifically designed to regulate bicycle movement at intersections, improving safety and efficiency for cyclists.	-	1
	CYC-04	Crossrides	Engineering	REC	Crossride (bicycle crossing) pavement markings may be implemented at intersections and unsignalized driveways to highlight the presence of cyclists crossing and organize their movements.	0.6	1
	CYC-05	Improved and Continuous Illumination	Engineering	REC	Enhance cyclist safety by ensuring consistent and adequate lighting on roads and bike paths, increasing visibility for cyclists	-	1
	CYC-06	Police Enforcement Focuses on Cyclist Safety	Enforcement	FUTR	By enforcing traffic laws and promoting cyclist awareness, the program aims to reduce collisions and create safer environments for cyclists and other road users. Attorney General Provincial Prosecutors must be engaged to insure consistency in prosecution outcomes. In addition, the inclusion of the NBRHS ER is to allow for understanding of impacts injury has on hospital over burden and patient wait times. With this knowledge media releases can be tailored to include that data to reinforce who is being impacted by aggressive driving.	-	1
	CYC-07	Cyclist Safety Education Campaigns	Education & Engagement	FUTR	The education campaigns that focus on cyclist and small mobility device user safety include helmet education, driving around cyclist, and etc. With all agencies consulted and working together there is no overlap of messaging and consistency of geo-political area needs.	0.91	1
School Zones 	SCH-01	Establishing School Zones (School timing plan, gateway treatment, pavement marking, parking, crossings, enforcement, active school travel plan, and school parking plan)	Engineering	EXP	Establish additional School Zones, as appropriate. School Zones are areas near schools where there are special speed limits and other engineered measures to protect students as they travel to and from school.	-	10
	SCH-02	Crossing Guard Program	Engineering	EXP	Trained adults that ensure that pedestrians are crossing at the appropriate times and locations. May be implemented at existing pedestrian crossings or traffic signals. Implementation based on defined demand.	-	5
	SCH-03	School Crossings	Engineering	FUTR	The School Crossings program focuses on ensuring the safety of students and pedestrians at school crossing zones. Through the implementation of safety measures, such as crossing guards, signage, and speed limits, the program aims to create secure environments for children to travel to and from school.	0.63	15

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School Zones	SCH-04	Safe Neighborhood	Engineering	FUTR	The Safe Neighborhood program is dedicated to fostering safety and security within communities. By implementing a range of initiatives, such as neighborhood watch programs, improved lighting, and community engagement, the program aims to create environments where residents feel safe and connected.	-	5
	SCH-05	School Zone Safety Education Campaigns	Education & Engagement	FUTR	The education campaigns that focus on safety within and near school zones, such as "Back to School Safety" Campaigns, "Slow Down" Campaigns. With all agencies consulted and working together there is no overlap of messaging and consistency of geo-political area needs.	0.91	1