





ST. ALBERT TRANSPORTATION SAFETY PLAN 2018-2025





September 2018

Prepared by:

TranSafe

WATT Consulting Group

ACKNOWLEDGEMENTS

City Team / Steering Committee

Dean Schick – Project Owner, Transportation; Engineering
Sudip Barua – Project Manager / Technical Lead, Transportation; Engineering
Garnet Melnyk – Municipal Enforcement Service
Jason Alaeddine – Municipal Enforcement Service
Marci Ng – Corporate Communications and Design
Tim Gaultois – RCMP – Traffic Services Unit
Bruce McGilvray – RCMP – Traffic Service Unit

Consulting Team

Dean Cooper – Watt Consulting Group – Project Manager
Raheem Dilgir – TranSafe Consulting – Technical Lead
Ian Wilson – Watt Consulting Group
Mavis Johnson - Traffic Injury Research Foundation

City Stakeholders

Cindy de Bruijn – Community & Social Development
Curtis Bauer – Economic Development
John Reid – Development Services; Engineering
Jay Mason – Public Works
Louise Stewart – Public Works
Katie Mahoney – Planning and Development
Kristina Peter – Planning and Development
Will Steblyk – St. Albert Transit
Dustin Creviston – St. Albert Transit
Aleks Cieply – Capital Projects; Engineering
Percy Janke – Fire Services
Michael Bos – Fire Services
Les David Mroz – Fire Services
Daniele Podlubny – Recreation and Parks

Additional Stakeholders

Alberta Health Services (AHS)
Alberta Motor Association (AMA)
Alberta Motor Transport Association (AMTA)
Alberta Transportation (Office of Traffic Safety)
Canadian National Institute for the Blind (CNIB)
CN Rail
St. Albert and District Chamber of Commerce
Sturgeon School Division
Greater North Central Francophone Education Region No. 2

SUPPORTING DOCUMENTS

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https://stalbert.ca/uploads/2016/census/2016-StAlbert-Census.pdf

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https://stalbert.ca/uploads/PDF-reports/PolicingAnnualReport-2016.pdf

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St. Albert RCMP Annual Performance Plan, 2018

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EXECUTIVE SUMMARY

This Transportation Safety Plan is the first for the City of St. Albert and identifies the commitment of the community towards safer roads and travel. It was developed through an evidence-based approach, with direct influence from similar industry strategies, city collision statistics, existing programs and projects and input of stakeholders involved in the delivery of services to the community.

The St. Albert Transportation Safety Plan documents a strategy to enhancing safety for all road users through a holistic approach using the “5 E’s” of traffic safety – Engineering, Education, Engagement, Enforcement and Evaluation. Awareness and actions involving shared accountability between safety practitioners, public service representatives, community leaders, community partners, and residents alike, will empower greater movement towards a community where no injuries or fatalities occur as a result of motor vehicle incidents.

Reducing injury and fatal collisions as a priority aligns to the global initiative of **Vision Zero**, and at a community level, supports the five pillars of sustainability: Social, Economic, the Built Environment, the Natural Environment, and Culture.

STRATEGIC FRAMEWORK

Aligned to the "5 E's", the objective of Vision Zero, and the pillars of sustainability; a strategic framework has been developed to guide the development and implementation of this Plan. This framework consists of a vision, mission, guiding principles, objectives, and timeline.

The vision for the Transportation Safety Plan is:

A COMMUNITY WORKING TOGETHER SO YOUR FAMILY ARRIVES SAFELY

The meaning behind this vision is further articulated as follows:

A COMMUNITY – St. Albert is a community of residents and visitors known for their desire to continually improve the city.

WORKING TOGETHER – Transportation safety is a shared responsibility for all residents, visitors, City leaders and service providers.

SO YOUR FAMILY – Transportation safety impacts everyone. Decisions you make directly impact yourself, your family, and the families of others.

ARRIVES SAFELY – A future is envisioned where transportation fatalities and major injuries are rare.

In support of achieving this vision, the City of St. Albert has developed a mission statement.

MISSION STATEMENT

The City of St. Albert will work together with its partner organizations and the public to ensure that this vision is a reality. This will be accomplished by implementing the 5 E's (Engineering, Education, Engagement, Enforcement and Evaluation) based on a set of guiding principles, geared towards the elimination of fatalities and major injuries within its transportation system.

Each part the 5 E's play an important roll in advancing safety within St. Albert.

Engineering refers to physical changes to the roadway and development of design guidelines

Education refers to making organizations or the public aware of issues, programs, and rules to empower them to make the right decisions, in the interest of public safety.

Engagement refers to communicating and collaborating with partners in transportation safety and/or the public to select and develop the appropriate strategies.

Enforcement refers to the protection of public safety and traffic laws by enforcement officials, from the municipal or the policing sector.

Evaluation refers to the effective review and management of transportation safety strategies.

The principles that will guide the City and its partners in its mission to achieve the stated vision are identifiable through the acronym **INSPIRE** and are described as follows.

Integration: Ensuring safety considerations are a high priority in project planning, program management, community design, construction and within communications

Network: Developing the relationships and partnerships between stakeholders and members of the community to collaborate on influencing safety through a holistic and multi-faceted approach.

Sustainability: Achieving reliable and sustainable funding to promote long-term success.

Protection of the Most Vulnerable: Encouraging active and accessible travel modes, by providing priority for pedestrians and cyclists, with consideration made for all mobility levels.

Innovative: Being a leader in adapting to new trends and developing new ideas.

Respect: Developing a culture of respect between partners and among all road users; recognizing the diversity of stakeholders; and fostering opportunities for collaboration and cooperation.

Evidence-based: Strategies will be based on evidence of success in St. Albert or comparable jurisdictions and will be continuously monitored, evaluated and information shall be shared.

The overall objective of the Transportation Safety Plan is to aggressively pursue a set of strategies (in partnership with others, where appropriate) that will minimize the risk of fatality and injury on our roads and culminate in their eventual elimination. The focus of the Transportation Safety Plan is on injury and fatal collisions. This distinction is made to recognize and prioritize the prevention of harm associated with more-serious incidents, which causes the most tragedy and loss of productivity to a community. The target set to evaluate ongoing success of this Plan is **a *year-to-year reduction in fatalities and injuries.***

In an effort to meet the objective of the Transportation Safety Plan, strategic focus areas were selected as follows:

Intersections: Intersections are a key aspect of the transportation network, but also an area of high conflict in time and space between all road users.

Vulnerable Road Users: Vulnerable road users (including pedestrians, cyclists, motorcyclists, and the visually-, hearing-, or mobility-impaired) have a higher likelihood of suffering an injury when involved in a collision.

Vehicle Speeds: Excessive speed can have an impact on both the number and severity of collisions on the roadway.

Distraction: Driver distraction (including mobile device use) is an increasing contributor to crashes.

Young Drivers: Drivers between the ages of 16 and 25 are the highest-risk age group for collisions based on a number of factors, such as inexperience and alcohol/drug use.

Safer Vehicles: Safety can be improved through the development and use of vehicle safety technology.

Specific projects have been developed for each of the individual focus areas. These projects account for the City to take a Safe System approach with regards to road system management. Safe systems are designed with the human being at its centre, taking human fallibility and vulnerability into account, and accepting that even the most conscientious person may make a mistake at some point. The goal of safe systems is to ensure that these mistakes do not lead to a collision; or, if a collision does occur, it is sufficiently controlled to not cause a death or a life-changing injury. Safe systems are made up of four main components:

1) Safer Roads: roads are designed to reduce the risk of collisions occurring, and the severity of injuries if a collision does occur. Safety features are incorporated into the road design from the outset. Examples of actions from this Plan that align are Neighbourhood Traffic Calming, smart channel turning movements, Complete Streets Design Guidelines.

2) Safer Speeds: Speed limits in safe systems are based on aiding crash avoidance and a human body's limit for physical trauma. An unprotected pedestrian hit at over 40km / hr has a significant risk of death or life-changing injury. Examples of actions from this Plan that align are network speed evaluations (inclusive of neighbourhood speeds), Neighbourhood Traffic Calming, school and playground zone evaluations

3) Safer Vehicles: Vehicles are designed, built and regulated to minimize the occurrence and consequences of collisions, with the emphasis on collision survivability. There are two main strands to safer vehicles – technology and road-worthiness. Although this

aspect of Safe Systems is not specific under the control of St Albert; this Plan aligns with actions identified to have the City aware and capable of supporting new technologies.

4) Safer Road Use: Everyone who uses roads is encouraged to use roads safely and comply with road rules. Emphasis is placed on a philosophy of shared and proportionate responsibility. Examples of actions from this Plan that align are Complete Streets Guidelines, network screening and reporting on safety, educational safety campaigns and enforcement activities.

Actions of the strategies created in this Plan represent involvement and attention of stakeholders representing all 5 E's – Engineering, Education, Encouragement, Enforcement and Evaluation.

PLAN DEVELOPMENT

Development of the plan and the strategic framework consisted of an evidence-based approach involving three key steps:

- Industry Practice Review
- Stakeholder Consultation
- Data Analysis

Each of these areas was key in understanding the state of transportation safety within St. Albert and on a local, provincial, and national level.

Industry Practice Review

The objective of the industry practice review was to contextualize the development of the Transportation Safety Plan and identify approaches that could be incorporated to lead to an effective and successful plan for St. Albert.

Two key plans reviewed were the Alberta Traffic Safety Plan 2015 and Canada's Road Safety Strategy 2025. Both documents align in their strategic objectives of a Safe System Approach and the Toward Zero vision, reducing traffic fatalities year-to-year, eventually to zero. A number of opportunities exist for St. Albert to align with these national and provincial plans and have been included within the Transportation Safety Plan.

A review was conducted on transportation safety plans from the eleven municipalities in Canada with documented transportation safety plans including Edmonton, Red Deer, and Strathcona County. St Albert, as the second smallest municipality on the list, has an opportunity to be a leader in transportation safety among smaller municipalities.

Select international municipalities' plans were also reviewed and provided information on good practices throughout the world. A number of good practices were identified during the review including setting both aspirational and numeric safety targets, incorporating the safe system

approach, including a longer-term planning horizon, empowering public road safety champions, and securing sustainable funding.

Transportation safety will be shaped by a number of trends. Some of the trends that the City of St. Albert will be monitoring and researching further are as follows.

- Urban densification and complete streets
- Human factors research
- Automated and Connected Vehicles
- Car sharing and hailing services
- Smartphone applications and opportunities

Stakeholder Consultation

Two groups of stakeholders were engaged during the development of the Transportation Safety Plan:

- **Internal Stakeholders:** Representatives from 13 City departments and services were engaged to help develop the vision, mission, objectives, and priorities of the Transportation Safety Plan
- **External Stakeholders:** Individuals from 20 groups and organizations were surveyed to better understand each group / organization's transportation safety issues and barriers they experience in St. Albert

The outcomes of this engagement shaped the development of the plan and provided a check to ensure that the Plan was appropriate for St. Albert and that key concerns were addressed.

Data Analysis

The primary data source was collision data between 2012 and 2016 with speed survey and enforcement data also being used. Notable statistics and trends observed in the collision data include the following.

- St. Albert has had 63 major injuries and 6 fatal injuries between 2012 and 2016.
- No fatal collisions occurred from 2014 to 2016.
- Pedestrian and cyclist injury collisions have increased since 2014
- Approximately 58% of total collisions and 75% of injury and fatal collisions occurred at intersections
- Rear-end, left-turn and right angle are the leading injury collision types
- The most pronounced age categories in injury collisions are 16-20 and 21-25

Traffic collisions result in a significant burden to the community and society. Costs from these collisions can include property damage, insurance costs, delay to traffic, health care, lost productivity, legal costs, and indirect costs such as pain and suffering. The Capital Region

Intersection Safety Partnership recently updated a study looking at average costs of collisions. The total costs (direct plus indirect), by type were:

- Property Damage only – $14,006 per collision
- Injury – $207,060 per collision
- Fatal – $6,927,379 per collision

Based on the reported collisions in St. Albert, the resulting social cost over the 5-year period, 2012 to 2016, is over $265 million, or over $50M per year.

PLAN IMPLEMENTATION

An implementation plan has been developed separately to integrate the safety strategies identified within this plan. Areas of influence to implementing the plan are:

Prioritization – Projects and Strategies have been assigned timeframes based on a number of factors such as connection to other projects, timelines, and benefit.

Governance – Ongoing leadership for the implementation of the Transportation Safety Plan shall ensure that information is shared and transparent in the creation of Project Charters to generate confidence in the evidence-based approach.

Training and Staff – The need for additional staff should be reviewed annually to ensure that the require personnel is available to implement the projects and strategies and reach the objectives outlined.

Funding – Several projects and strategies may align with existing operational or capital budget submissions while other will require development of new project charters. Alternative sources of funding, such as fine revenues or grants or partnerships with community or industry groups, should be sought.

Communication – Public participation and communication is a critical piece of the implementation of the Transportation Safety Plan. Effective communications about the Plan, individual projects, annual reporting and progress, and day-to-day safety issues and concerns will play a vital role in the success of the plan.

Coordination – Ongoing coordination with regional and provincial safety partners enables St. Albert to take advantage of existing programs, share knowledge, and partner on pilot projects.

Monitoring and evaluation – A formalized monitoring and evaluation plan will help ensure that progress is being made and that changes can be incorporated as required. Some of the key components of such a plan included compiling and tracking relevant data, collecting “before” data, cross-sectional studies, and public surveys.

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OVERVIEW

This Transportation Safety Plan is the first for the City of St. Albert and identifies the commitment of the community towards safer roads and travel. The vision and mission statements represent an understanding and appreciation for full community involvement in achieving the aspiration of no fatalities or injuries as a result of motor vehicle collisions on our roadways.

Aligned with national and provincial traffic safety strategies, this plan incorporates a Safe System approach, which is a philosophical belief that responsibility for transportation safety is shared between road users, designers and regulators. Safe transport is recognized as the most important outcome of the road network; safety is priority. And although a Safe System requires alert, compliant and responsible road users, it also acknowledges that humans may not be prone to error, and thus advocates for vehicles and roads that are forgiving in the event of such error. This strategy is not intended to commit the City to the significant funding and resource allocation that would be involved with a complete transition to Safe System; however, new development, programs and transportation network upgrades will consider Safe System design and the vision of no severe collision incident occurrence in our city.

The Plan is intended to be a public document, utilized to align project resource allocation and requests and a tool for evaluation of transportation safety within the community. It shall provide guidance on program planning and transportation safety decision-making and generate stakeholder and public discussion to influence transportation safety within the community.

GLOSSARY OF TERMS

At-fault Driver - A driver who is responsible for a collision due to faulty driver action including following too closely, improper lane change, speeding, careless driving, failing to yield right of way, sign/signal violation, and distracted driving

Capital Region - Former name of the Edmonton Metropolitan Region[1].

Collision - A motor vehicle collision occurs when a vehicle, as defined by the Alberta Traffic Safety Act, comes in contact or collides with another vehicle, pedestrian, cyclist, animal, road infrastructure or debris.

Collision Rate – The number of collisions divided by a normalizing variable, such as population.

Fatal Collision – A collision where at least one person is killed as a result of the collision.

Injury Collision – A collision where at least one person seeks medical treatment as a result of the collision. This category includes fatal collisions.

Injury Only Collision – A subcategory of injury collision that excludes fatal collisions.

Left Turn Phasing – The operation of the left turn at a signalized intersection. Protected phasing (Green Arrow) allows left turns to proceed with the right-of-way. Permitted phasing requires left turning vehicles to yield to oncoming vehicles and pedestrians.

Minor Injury – An injury that requires medical treatment but does not result in hospitalization.

Major Injury – An injury that results in a person being admitted to the hospital.

Property Damage Only Collision – A collision where damage is only incurred to non-human items and with damage exceeding $2,000.

Safe System – A holistic approach to road safety which emphasises that the responsibility of reducing risk is shared by road users and those who design, maintain and operate all parts of the road transport system.

Three-Year Average Collision Rate – The average of three consecutive years of collision rates. Aims to reduce year-to-year fluctuations in the data.

Vision Zero – A target of no fatalities (and no major injuries) within the transportation network.

Young Driver – A person under the age of 25 who operates a motor vehicle.

[1] http://emrb.ca/

ACRONYMS

TSP – Transportation Safety Plan

CRISP – Capital Region Intersection Safety Partnership

TAC – Transportation Association of Canada

RSS 2025 – Canada's Road Safety Strategy 2025

TMP – Transportation Master Plan

ITS – Intelligent Transportation Systems



1.0 INTRODUCTION

St. Albert is a vibrant and growing community that sustains and cherishes its unique identity and small-town values. The St. Albert Community Vision and Pillars of Sustainability (2015)[2] present a single, shared vision for the community with the five pillars of sustainability:

1. Social
2. Economic
3. Built Environment
4. Natural Environment
5. Cultural

Transportation impacts multiple elements of life and supports all five of the City's pillars. There is an expectation and demand that the City's transportation network is safe, efficient, and accessible to support all modes of travel. To meet this expectation, the City shall follow a Safe System approach when designing and managing the network. Safe systems are designed with the human being at its centre, taking human fallibility and vulnerability into account, and accepting that even the most conscientious person may make a mistake at some point. The goal of safe systems is to ensure that these mistakes do not lead to a collision; or, if a collision

[2] https://stalbert.ca/cosa/admin/stafuture/

does occur, it is sufficiently controlled to not cause a death or a life-changing injury. Safe systems are made up of four main components:

1) Safer Roads: roads are designed to reduce the risk of collisions occurring, and the severity of injuries if a collision does occur. Safety features are incorporated into the road design from the outset

2) Safer Speeds: Speed limits in safe systems are based on aiding crash avoidance and a human body's limit for physical trauma. An unprotected pedestrian hit at over 40km / hr has a significant risk of death or life-changing injury.

3) Safer Vehicles: Vehicles are designed, built and regulated to minimize the occurrence and consequences of collisions, with the emphasis on collision survivability. There are two main strands to safer vehicles – technology and road-worthiness.

4) Safer Road Use: Everyone who uses roads is encouraged to use roads safely and comply with road rules. Emphasis is placed on a philosophy of shared and proportionate responsibility.

This Transportation Safety Plan is a comprehensive document identifying the status of transportation related safety in St. Albert, and linking the efforts associated with Engineering, Education, Enforcement, Engagement, and Evaluation towards the fundamental objective of "Vision Zero", in which no fatality or major injury occurs on St. Albert's road network. It is intended to formalize the City's pledge to influence and improve transportation safety throughout the community, using an evidence-based and targeted approach.

The Transportation Safety Plan is organized into the following sections:

Section 1: Introduction and Outline:
This section provides the intent and outline of the document.

Section 2: Transportation Safety Plan Development Process:
This section looks at the foundational steps taken in developing this Plan including industry practice review, stakeholder consultation, and data analysis.

Section 3: Current State of Transportation Safety:
This section describes alignment with municipal policy and transportation safety statistics and trends within St. Albert from 2012 – 2016.

Section 4: Strategic Framework:
This section outlines the City's vision and principles for transportation safety.

Section 5: Proposed Strategies and Projects:
This section details strategies and projects in support of the City's vision.

Section 6: Transportation Safety Plan Implementation:
This section discusses considerations for the successful implementation of the Plan.



2.0 PLAN DEVELOPMENT PROCESS

The Transportation Safety Plan is an evidence-based document bringing together industry practices, stakeholder input, and historic collision data. Each of these areas provided valuable information that helped shape the final product. This section details the process and findings of the Transportation Safety Plan development and provides next steps for moving forward.

2.1 INDUSTRY PRACTICE REVIEW

In the development of St. Albert's Transportation Safety Plan, a first phase consisted of carrying out a review of industry practices, with the objective of contextualizing the development of such a plan and identifying approaches that could be incorporated to lead to an effective and successful plan for St. Albert.

The industry review consisted of a review of transportation safety plans prepared by higher levels of government, and other progressive or comparable municipalities in Canada and abroad. The following sections summarize plans that influenced the development of the St. Albert Transportation Safety Plan.

2.1.1 Canada's Road Safety Strategy

Canada's Road Safety Strategy 2025[3] (RSS 2025) presents a framework for reducing traffic injuries and fatalities in Canada. As per previous editions (2015 and 2020) it retains the long-term vision of "*Making Canada's roads the safest in the world*" but has been updated with the vision of *Towards Zero.*

The Towards Zero vision is not a target to be achieved by a certain date, but rather is inspirational in nature. This vision will continue beyond the RSS 2025's timelines and highlights the desire for the best road safety outcomes for all Canadian jurisdictions. In addition, multiple principles key to the strategy's success have been aligned with international best practices in road safety. This includes the adoption of the Safe System Approach and a 10-year time frame. The strategy continues to be flexible which allows Canadian jurisdictions to implement road safety programs that meet their own specific needs.

RSS 2025 is based on three guiding principles:

1. Adopt a Safe System Approach: an approach which recognizes that road users are prone to error, and that the system should be designed to limit these errors and reduce the negative consequences, using all available tools.
2. Downward trend towards zero: a year-to-year reduction in traffic fatalities and serious injuries until their eventual elimination.
3. Based on best practices: practices that have achieved reductions should be replicated and expanded for maximum impact.

RSS 2025 does not provide specific strategies, but discusses road user initiatives, road infrastructure initiatives and vehicle initiatives in the following categories:

- Policy/legislation/regulation
- Education/training
- Communication/awareness
- Enforcement
- Information/Data/Research
- Technology

[3] Canada's Road Safety Strategy 2025 (http://roadsafetystrategy.ca/files/RSS-2025-Report-January-2016-with%20cover.pdf)

2.1.2 Alberta's Traffic Safety Plan 2015

The Province of Alberta established an integrated Traffic Safety Plan in 2007. To advance the current vision for traffic safety, it has adopted a system-wide approach which is called a Safer System Approach.

The Alberta Traffic Safety Plan aligns with the Canada RSS 2025 (with regard to its strategic objectives, risk groups, contributing factors and interventions), and has been implemented in three- to five-year time frames. It is supported through annual operating plans (action plans) that explain "who" (agency/department) is required to do "what" and "when" during the calendar year.

Alberta was one of the first provinces not only to develop a comprehensive and integrated strategic traffic safety plan, but also to develop a "Traffic Safety Plan Calendar" which brings focus to key emphasis areas at specific times throughout the year. The priority actions for Alberta were established by reviewing the matrix in Canada's RSS (and the evidence-based research that is on the CCMTA website[4]) and the most recent collision data for Alberta.

Alberta's Traffic Safety Plan 2020 is still under development, but it is on the Minister's priority list.

2.1.3 Industry Practice Review Influence on St. Albert's Strategy

In summary, opportunities for St. Albert to align with national and provincial plans include:

- Alignment of target year: 2025
- Adoption of safe system approach
- Development of framework for action plan as part of strategic plan
- Accessing traffic safety funds (through the Albert Traffic Safety Fund)
- Alignment to existing Provincial and Federal initiatives, training and programs
- Continue to lead and support evidence-based CRISP initiatives

2.1.4 Municipal Transportation Safety Plans in Canada

Transportation safety plans published by other municipalities across Canada were researched. Formal published plans for 11 Canadian municipalities were reviewed in detail. The municipalities are listed in **Table 2.1**, along with the population and year of plan publications.

It should be noted that there are several other municipalities within the country that have adopted a Vision Zero statement, have had safety programs in place for several years, or are in

[4] The Canadian Council of Motor Transport Administrators (http://ccmta.ca)

the process of developing a TSP. Other municipalities with documented transportation safety programs or activities are listed in **Appendix A**.

TABLE 2.1: CANADIAN MUNICIPAL TRANSPORTATION SAFETY PLANS REVIEWED

MUNICIPALITY	PROVINCE	2016 POPULATION	STRATEGY CREATION / UPDATE YEAR
St. Albert	AB	64,645	2018
Surrey	BC	517,887	2017
Edmonton	AB	932,546	2006, 2011, 2016
Vancouver	BC	631,486	2016
Toronto	ON	2,731,579	2016
Strathcona County	AB	98,044	2008, 2014
Calgary	AB	1,239,220	2013
London	ON	383,822	2013
Saskatoon	SK	233,222	2013
Whitehorse	YK	25,085	2013
Ottawa	ON	934,243	2012
Red Deer	AB	100,418	2006, 2009

The review indicates that municipalities with a safety plan, with the exception of Whitehorse, are larger in population than St. Albert. This presents an opportunity for St. Albert to be a leader in transportation safety among smaller urban municipalities. It also revealed that the development of municipal transportation safety plans has largely been undertaken within the past five years, with the exception of Edmonton, Strathcona County and Red Deer in Alberta; therefore, the longer-term impacts of these TSPs are yet to be realized.

The review of Canadian municipal transportation safety plans identified the following good practices:

- Planning horizons were typically five years.
- Most of the larger municipalities adopted an overall vision that aspired to zero fatalities and serious injuries (see **Appendix B**).
- Public consultation was included in the development of some plans but not all.
- Collision reduction targets were established for specific focus areas in most plans, and for overall collisions in a handful of the plans.

- The majority reflected approaches beyond the traditional 3 E's of transportation safety, (see **Appendix B**).
- Most municipalities demonstrated the potential cost savings of the plan.
- Health data was utilized to capture and better understand injury collisions.
- Establishment of both aspirational and numeric transportation safety targets.
- Development of a systemic approach of the widespread implementation of proven countermeasures.
- Focus of improvement efforts at intersections.
- Establishment of internal processes that require explicit safety reviews on projects.
- Having public champions for transportation safety.
- Transformation of public culture by demonstrating institutional and corporate culture change.
- Investment of traffic fines revenue back into safety programs.
- Positive approaches to enforcement, e.g. rewards for good driving.
- Collision data was the most readily available data; however, additional sources (such as speed) were used in some jurisdictions.

2.1.5 International Transportation Safety Plans

A handful of strategies developed by municipalities outside of Canada were reviewed and the following section summarizes unique approaches or practices within the documents:

a) Seattle, Washington, USA:

- Empathy is identified as a strategic approach, to improve transportation safety culture by treating all road users with respect
- Includes an appeal directly to the public to partner with the City in order to be successful in eliminating injuries and fatalities
- Includes a strong emphasis on speed management (reducing speeds and speed variances) as a way to reduce collision severity
- Strategies include complete streets, fatal collision reviews and improved communication

b) New York City, New York, USA:

- Includes a strong message from the Mayor to the public.
- Established a permanent Vision Zero task force and website.

- Uses different vocabulary, e.g. “regulation” and “design” (instead of engineering and enforcement). New vocabulary can help achieve new results.
- The document identifies partnerships with numerous private companies and associations, towards improving vehicle fleets and other initiatives
- Strategies include: publishing crash data in a public-friendly manner, taking control of the automated enforcement program, passing legislation to lower the City-wide speed limit, establishing several arterial and neighbourhood "slow" zones, and making a transportation safety curriculum available to all schools, consultation with the elderly, making public health data available, and promoting more research

c) Edinburgh, Scotland:

- Long-term (10-year) plan.
- Presents what financial benefit could be realized if Vision Zero implemented.
- Commits to report on transportation safety evaluation annually and update every two years.
- Strategies include: supporting E-learning systems for transportation safety training in schools, pre-driver events to influence behaviours, starting a cycling safety working group, promotion of the health benefits of cycling, support for numerous campaigns, including "self-policing" family and friends, establishing corridor approaches, improving incident response, and minimizing sidewalk clutter

d) Melbourne, Australia:

- Aligns with corporate objectives.
- Provides detailed context setting: description of city, e.g. unique aspects of transportation network.
- Presents office and human resources requirements to deliver on plan.
- Specifies the years each program should be delivered.
- Strategies include: lower speed limits on select corridors, reduced waiting times for pedestrians at signalized crossings, separated bike lanes, replacement of metal plate covers with higher-friction concrete for motorcycles, further implementation of several behavioural change programs, including games and use of humour

e) Stockholm, Sweden:

- Long-term (10-year) plan.
- Provides non-collision metrics, including speeds, proportion of "safe" intersections, proportion of traffic travelling below the speed limit, etc.
- Proportion of vehicles driving within the speed limit rose from 50% in 2006-09 to 75% in 2012. This is due to setting reasonable speed limits based on the intended use and modes, and reinforcing them with physical measures, even on higher-class roads.
- Reported gains in seatbelt and bicycle helmet use.
- Specific strategies include: increasing speed compliance, public knowledge about transportation safety, and safe pedestrian/bicycle crossings.

f) Summary

The review of international municipal transportation safety plans identified the following themes, for consideration in St. Albert:

- Value placed on health and safety as a part of social responsibility.
- Strong emphasis on speed management
- Partnerships with the private sector.
- Emphasis on engagement and the effective communication of transportation safety plans and programs to the public.
- Empowerment of the public and family victims as champions for transportation safety.

2.1.6 Edmonton Metropolitan Region Municipal Transportation Safety Strategies

The City of Edmonton and Strathcona County are two municipal agencies that have created and have been through processes of updating their own transportation safety strategies within the Edmonton Metropolitan Region. For an overview of context of these strategies, see **Section 2.1.5**.

Some general notes on the transportation safety strategies from municipalities in the Edmonton Metropolitan Region with St. Albert are:

- The City of Edmonton's Office of Traffic Safety was established as a result of Edmonton's first Traffic Safety Plan in 2006.
- The City of Edmonton is the first major Canadian city to adopt Vision Zero, a global initiative to eliminate motor vehicle fatalities and major injuries.
- Edmonton reports a 55% reduction in injury collisions since the first transportation safety strategy was developed.

- This is attributed in large part to the City's speed management strategy, the use of multiple data sources (such as health data and traffic conflict data), and the widespread application of engineering measures including protected left-turn phases and smart right-turn channels.

- Strathcona County reports modest reductions in overall crash rates. This is attributed to more-recent implementation of measures, not yet translating into improved performance on the roads. Public perception of transportation safety has improved over time.

2.1.7 Capital Region Intersection Safety Partnership (CRISP)

At the regional level, the CRISP organization is a leader in transportation safety (www.drivetolive.ca). The City of St. Albert is a founding member of CRISP since in 2001. CRISP partners share resources and expertise to implement on-going, collaborative and integrated intersection safety research and initiatives to reduce the frequency and severity of intersection collisions in the Edmonton Metropolitan Region. Initiatives are evidence-based and integrate best practices in the areas of education, engineering and enforcement followed by evaluation of results, and target four priorities: red light violations, pedestrian safety, speed and high crash locations.

2.1.8 Emerging Trends

Transportation safety will be shaped by various trends. Some of the trends that the City of St. Albert will be monitoring and researching further are as follows.

Urban Densification and Complete Streets

Land use planning and densification will impact transportation safety by shifting transportation towards alternative modes such as walking and cycling. This will be accompanied by a need to enhance the design of the transportation system for these modes, including providing more dedicated and connected facilities. Complete streets concepts have been embraced by the City and provide for more creative and context-sensitive road layouts that are consistent with limiting congestion and encouraging all transportation modes.

Human Factors Research

Driver behaviour and error plays a role in approximately 95% of motor vehicle collisions. While advances have been made over the past several years in safety modelling (collision prediction) based on infrastructure elements, more recent research in modelling driver's behaviour is leading to a greater understanding of these errors and their contribution to collision occurrence.

The Transportation Research Board's Strategic Highway Research Program (SHRP 2) has undertaken the Naturalistic Driving Study (NDS) to address the role of driver performance and behavior in transportation safety by placing "black boxes" in thousands of vehicles for several months, monitoring everything from driver eye and body movements, speed, distractions, pre-collision actions and avoidance manoeuvres. A similar Transport Canada study is underway in Canada in Saskatchewan (results not available at the time of the St Albert strategy creation).

Autonomous and Connected Vehicles

An **autonomous vehicle** (AV) is a driverless vehicle; it is a vehicle that does not require human monitoring or interaction. It is also referred to as a fully automated system, fully autonomous vehicle, self-driving vehicle, or driverless vehicle. These vehicles use technologies to replace the human as the driver, such as sensors to detect obstacles, software algorithms to make driving decisions, and electronic equipment to brake, accelerate, and steer the vehicle without any human participation in the driving task. electronic equipment to brake, accelerate, and steer the vehicle without any human participation in the driving task.

Connected vehicles are vehicles that use any number of different communication technologies to communicate with the driver, other cars on the road and the connected infrastructure. Vehicle to Vehicle (V2V) (truck platooning), Vehicle to Infrastructure (V2I), and Vehicle to Everything (V2X) are examples of the practical application of connected vehicle technology.

Vehicles with automated features have the potential to influence safety through the elimination of human errors, such as - delayed reaction time, unsafe following distance, and distracted driving.

The Society of Automotive Engineers (SAE) has established a classification system describing the levels of vehicle automation, summarized in **Table 2.4**. Over time, vehicles will become more autonomous and approach Level 5 (full) automation. The dark blue line separates the tasks that will become autonomous over time from those that require driver intervention. Generally, the literature predicts a 50-90% safety improvement from AVs rising with the level of adoption. With up to 90% of collisions attributed in part to human error, fully autonomous vehicles have the potential to reduce collisions by 90%. Vision Zero goals become much more realistic with the evolution of autonomous vehicles.

TABLE 2.2: LEVELS OF VEHICLE AUTOMATION

SAE Level	Name	Narrative Definition	Execution of Steering and Acceleration/ Deceleration	*Monitoring* of Driving Environment	Fallback Performance of *Dynamic Driving Task*	System Capability *(Driving Modes)*
Human driver monitors the driving environment						
0	No Automation	the full-time performance by the *human driver* of all aspects of the *dynamic driving task*, even when enhanced by warning or intervention systems	Human driver	Human driver	Human driver	N/A
1	Driver Assistance	the *driving mode*-specific execution by a driver assistance system of either steering or acceleration/ deceleration using information about the driving environment and with the expectation that the *human driver* will perform all remaining aspects of the *dynamic driving task*	Human driver and system	Human driver	Human driver	Some driving modes
2	Partial Automation	the *driving mode*-specific execution by one or more driver assistance systems of both steering and acceleration/deceleration using information about the driving environment and with the expectation that the human driver will perform all remaining aspects of the *dynamic driving task*	**System**	Human driver	Human driver	Some driving modes
Automated driving system ("system") monitors the driving environment						
3	Conditional Automation	the *driving mode*-specific performance by an automated driving system of all aspects of the *dynamic driving task* with the expectation that the *human driver* will respond appropriately to a *request to intervene*	System	**System**	Human driver	Some driving modes
4	High Automation	the *driving mode*-specific performance by an automated driving system of all aspects of the *dynamic driving task*, even if a *human driver* does not respond appropriately to a request to intervene	System	System	**System**	Some driving modes
5	Full Automation	the full-time performance by an *automated driving system* of all aspects of the *dynamic driving task* under all roadway and environment conditions that can be managed by a *human driver*	System	System	System	**All driving modes**

Source: CCMTA White Paper, Automated Vehicles in Canada (November 2016)

Automated and connected vehicles could represent a fundamental change in the role of automobiles, trucks, and buses. The ability to operate without a driver creates the potential for drastic reductions in collisions, congestion, and infrastructure designs that account for human factors. When combined with advances in car sharing and vehicle pooling, entirely new modes become possible that offer affordable, on-demand mobility without the need to own a vehicle.

The Canadian Senate's Transportation and Communications Committee is currently studying how to ensure a smooth transition to AV, and how they would function on icy roads.

There is opportunity for the City of St. Albert to participate in this evolution by monitoring discussions involving Transport Canada, the provincial government, and other municipalities across Canada. The City will also assess the readiness of its infrastructure to safely accommodate autonomous vehicles and be supportive to piloting new under the right circumstances.

Specific strategies to understanding and responding to this industry shift are provided in this Plan.

Car sharing and hailing services (on-demand mobility)

The use of car sharing services (e.g. carpooling, Pogo, ZipCar) and ride-hailing services (e.g. Uber, Lyft, TappCar) has been on the rise and most projections suggest further increases. This presents both a challenge and an opportunity for ensuring transportation safety in these more on-demand and transient trips. Issues such as regulation, insurance, driver behaviour, and familiarity with non-owned vehicles each present a range of transportation safety issues that will need to be addressed at multiple levels of government and jurisdiction. Specific strategies regarding this shift are provided in the Plan.

Smartphone Applications and Opportunities

The increasing use of mobile devices presents both challenges and opportunities for transportation safety. Applications (such as navigation devices, and immediate access to emergency services) exist that attempt to improve the safety of vehicle use; however, they can also present issues due to distraction and technology malfunction.

Smartphones are also a key medium for public education, but their safe use as part of a trip (before, during, and after) needs to be carefully considered in the interest of transportation safety. Smartphones with newer operating systems have features that recognize when the user may be driving, and several apps exist that can disable or limit the use of the device while driving. Specific recommendations regarding the development of applications are provided among the strategies in this Plan.

2.2 STAKEHOLDER CONSULTATION

Consultation was conducted with internal stakeholders (City of St. Albert departments and Emergency/ Protective Services) and with external stakeholders to better understand existing transportation safety activities within the city and to identify issues and areas of concern.

Public consultation related to transportation safety was conducted as part of the Transportation Master Plan (2015) and was not repeated as part of the Transportation Safety Plan development. Opportunities for public consultation on specific issues are identified among the strategies and projects in the Plan.

2.2.1 Steering Committee

A steering committee was formed to guide the direction of the Transportation Safety Plan. It was comprised of representatives from the Transportation department, Corporate Communications & Design department, Municipal Enforcement, and the RCMP.

The Steering committee supported the development of consultation material, project strategy and provided input throughout the process on deliverables and actions.

Steering committee meetings were held at regular intervals during the development of the Plan.

2.2.2 Internal Stakeholders

During the stakeholder engagement, City staff from different departments, inclusive of emergency services were contacted. Groups represented during the development of the Transportation Safety Plan were inclusive of:

- Municipal Enforcement
- Corporate Communications & Design
- Community & Social Development
- St. Albert Transit
- Recreation and Parks
- Economic Development
- Development Services
- Public Works
- Planning and Development
- Capital Projects
- Fire Services
- Transportation Branch – Engineering Services
- RCMP Traffic Services Units

The formats for engagement occurred via an online survey, and also included two targeted workshops.

Workshop #1

The first workshop was conducted early in the plan development to determine the current culture of transportation safety and relevant activities within City departments, and to receive input on key transportation safety issues and priorities for the Transportation Safety Plan.

A questionnaire was circulated to the internal stakeholders prior to the meeting and a summary of the questionnaire and workshop results is available in **Appendix C**. The workshop focused on:

- Providing an overview of traffic safety planning in Canada
- Receiving input on the vision and mission of the Transportation Safety Plan through group exercises.

Through the workshop process, it was apparent that there is significant agreement between the various departments regarding the importance of directing more resources towards transportation safety. There was also valuable discussion outlining planning and coordination that will be required to successfully improve transportation safety.

Workshop #2

A second workshop was conducted with the internal stakeholders as the plan contents were further developed, with the following objectives:

- Provide a draft list of strategies and projects
- Share the proposed structure of the Transportation Safety Plan
- Receive input on the project list, priorities, and proposed plan structure

The group exercise and discussion generated valuable feedback on the list of projects as well as new projects. The perspective from each of the City departments was valuable to ensure the Transportation Safety Plan is appropriate for all of St. Albert. The result of this workshop was a more refined project list.

2.2.3 External Stakeholders

There are several third-party groups / organizations within the City of St. Albert that are impacted or play a part in traffic safety. A questionnaire was developed to inquire on each group / organization's safety issues and barriers they have experienced in St. Albert.

From twenty organizations that were contacted to provide feedback towards the Plan, the following eleven organizations provided input:

- Alberta Health Services (AHS)
- Alberta Motor Association (AMA)
- Alberta Motor Transport Association (AMTA)
- Alberta Transportation (Office of Traffic Safety)
- Canadian National Institute for the Blind (CNIB)
- CN Rail
- St. Albert and District Chamber of Commerce
- Sturgeon School Division
- Greater North Central Francophone Education Region No. 2

- Land Developers
- Representative for bicycles

The feedback received represented a good cross-section of organization type and identified various concerns of each respondent.

2.2.4 Public Participation

No direct consultation of the public was conducted as part of the development of the Transportation Safety Plan.

Three key factors contributed to this approach.

1. **Previous Consultation** – Significant consultation was conducted as part of the Transportation Master Plan and the Transportation Safety Plan is based on its outcomes. Feedback received as part of the Transportation Master Plan has been considered during the development of this plan.
2. **Evidence-Based Approach** – The preparation of the first Transportation Safety Plan for the City of St. Albert has relied largely on data and collision trending in the city. Further focus on strategies align to what has been proven to be successful in St. Albert or other jurisdictions.
3. **Future Consultation** – Consultation with the public will be included as part of the implementation of many of the projects within the Transportation Safety Plan as well as the development of future Transportation Safety Plans.



3.0 CURRENT STATE OF TRANSPORTATION SAFETY

Both the current municipal policy and the vehicle collision trends provide an indication of the current state of transportation safety within St. Albert. This section provides information on these two perspectives.

3.1 MUNICIPAL POLICY CONTEXT

Transportation impacts many aspects of life for both residents and visitors to the community and as such, there are opportunities to align the Transportation Safety Plan with other City Plans and Policies. **Table 3.1** identifies the support aligned from such planned policies or existing policies.

TABLE 3.1: MUNICIPAL POLICY AND PLAN CONTEXT

POLICY / PLAN	YEAR PUBLISHED	SCOPE AND POLICIES / PLANS IN SUPPORT OF TRANSPORTATION SAFETY
Traffic Impact Assessment Guidelines	2018	These guidelines will outline necessary information to be shared and criteria to be evaluated during the process of review for proposed development; including traffic and safety impacts and the mitigations that are to be provided to address identified issues.
Complete Streets Design Guidelines	2018	These guidelines will influence how streets are designed in the future. Complete Streets is a design approach that balances the needs of all roadway users. Whether you drive, bike, walk or take the bus, Complete Streets are designed to provide safe, comfortable and convenient access for all users at all ages.
Intelligent Transportation System (ITS) Strategy	2018	As recommended in both the Transportation Master Plan and the Smart City Master Plan, the ITS Strategy will outline ways of using technology to improve traffic movements, form both a safety and efficiency perspective.
City Strategic Plan	2017	The plan guides Administration's corporate and financial planning efforts. St. Albert is a safe, effective and accessible transportation network that supports public and active modes of movement.
Cyclist and Pedestrian Safety Action Plan	2017	The City prepared a multi-phase action plan and process that can provide learnings from fatal or major injury incidents. While this was focused on cyclists and pedestrians, it can be applied to all modes.
Neighbourhood Traffic Calming Policy, Process and Guidelines	2016	The process provides a uniform and consistent approach for the initiation, assessment, public participation, implementation and evaluation of traffic calming requests within the City of St. Albert that is consistent the overarching policy.
Smart City Master Plan	2016	A Smart City is an urban area that solves its core issues through innovation and collaboration, and that applies new technologies and data for the benefit of all. This plan includes the recommendation to move towards a more intelligent transportation system to improve safety, including emergency vehicle priority at intersections and reviewing opportunities related to connected and autonomous vehicles.

POLICY / PLAN	YEAR PUBLISHED	SCOPE AND POLICIES / PLANS IN SUPPORT OF TRANSPORTATION SAFETY
Downtown Redevelopment Plan	2016	The updated plan guides public and private development downtown over the next 25 years to ensure that downtown continues to evolve into a place for residents and visitors alike. It includes objectives and policies to ensure that street networks are balanced for all modes of transportation and that all people can move throughout the community safely and comfortably. Specific plans include wider curb lanes on some streets to safely accommodate cyclists, and universal accessibility.
Corridor Plans and Safety Reviews	2015	An in-service road safety review of St. Albert Trail and the Boudreau Road / Giroux Road corridors was conducted. This included a review of the collision data, detailed on-site observations including traffic conflict studies, and an active transportation and human factors review. This resulted in several recommendations, ranging from intersection operations and sight line issues to the adequacy of pedestrian facilities and signage, as well as signal and pavement marking enhancements.
St. Albert Transportation Master Plan (TMP)	2015	A comprehensive planning document that will help the City of St. Albert prepare for growth and change over the next 27 years. Recommended actions include the development of a Traffic Safety Strategy, post-fatalities safety review processes, annual network screening, in-service reviews, and road safety audits.
Safe Journeys to School	2015	Prepared for the City in partnership with School Districts and members of the public, this comprehensive report documents the review of safety in the vicinity of all 26 existing schools and two planned schools in the city, spanning four school districts. It identified eight principles for effective school traffic safety management, and several recommendations at the city-wide level and for each individual school, to address safety issues.
Environmental Master Plan	2014	The Environmental Policy provides the City of St. Albert with the overall direction for its environmental performance and provides the framework for the setting of its environmental objectives and targets. This includes a vision for air quality that features fewer vehicles per capita on our roads, more walkers and cyclists, transit is a competitive and convenient mode of travel, and right-sizing City vehicles. Greater confidence of safety for alternative modes of travel may influence mode shift.

POLICY / PLAN	YEAR PUBLISHED	SCOPE AND POLICIES / PLANS IN SUPPORT OF TRANSPORTATION SAFETY
Municipal Development Plan	2013	The vision statement states that St. Albert needs a safe, efficient flow of traffic while maintaining the serenity and safety of our neighbourhoods, and to pursue innovative approaches for the movement of people and goods through and within the community. Design principles should ensure that neighbourhoods are designed and developed in a manner to make them safe, and that new Area Structure Plans provide safe roadway access, and safe and convenient roadway crossings for pedestrians and bicycles.
Social Master Plan	2013	The plan outlines what is required to create a community that takes care of its most vulnerable, while providing opportunities for everyone to realize their potential in a thriving, caring, connected community in which people feel safe. Strategies include neighbourhood design that promote community safety.
Transit Long Term Department Plan	2013	A strategic policy and planning document that is intended to provide a framework for the development of future transit services for the next 15 years. It also aims to position transit as a key component of the community that must be recognized and accommodated in future land-use planning decisions. It recognizes transit as a statistically safer mode than the automobile, and promotes enhanced operator training, fully accessible bus stops and regular bus maintenance.
Recreation Master Plan	2012	The plan outlines what is needed to provide resources and services for citizens to access recreational opportunities. Includes ensuring that existing trails are connected, safe and able to provide for recreation and active transportation uses.

3.2 MOTOR VEHICLE COLLISION TRENDS

As a foundation for the development of this evidence-based Plan, and to provide a baseline for future performance measurement, a review of motor vehicle collision trends over the past five years was conducted.

The Plan includes a four-year term evaluation of collision data (2012 to 2015). Multi-year evaluations assist in mitigating impacts from a single year to year comparison and allow for a wider range of data to be evaluated to recognize trending behaviour.

Motor vehicle collisions reported in 2016 were reviewed as part of the scope of work in creating the Plan, and provided influence over strategies moving forward; however, it was identified that the process for reporting injury related collisions changed between 2015 to 2016 (resulting in an

increased number of reported injury collisions that could not be verified to have resulted from actual collision occurrence). The process change involved stronger follow-up and verification of incident outcomes by the RCMP. Due to this discontinuity, the four-year term of 2012 through 2015 collision information was used as the foundation for this Plan; with 2016 collision information proposed as a "baseline year" to which further consistent practices of reporting will allow greater accuracy in evaluations of effectiveness of strategies and the Plan itself.

Section 3.2.1 describes trends in injury collisions, which were used as the basis for many of the contents of this Plan. This is followed by **Section 3.2.2**, which enables a comparison of 2016 based on all collisions (not only injury); and **Section 3.2.3** which presents trends in the 2016 data that will be used as a baseline for future monitoring of the Plan.

3.2.1 Historic Injury Collision Trends (2012-2015)

A total of 603 injury collisions (including 6 fatal collisions) were reported in the city over the four-year period between 2012 and 2015, for an average of 150 per year, or one every two to three days. The total of injury collisions declined by 18% between 2012 and 2015 and have been consistent over the final two years. See **Figure 3.1**.

Major injuries (defined as collisions in which persons with injuries or complaints of pain who went to a hospital and were subsequently admitted, even if for observation only) have remained relatively constant between 2012 and 2015, with an average of 11 per year. The yearly breakdown is provided in **Figure 3.1** and **Figure 3.2**.

Six fatal collisions occurred over the same period, but all occurred prior to 2014.

Figure 3.1: Total Injury Collisions

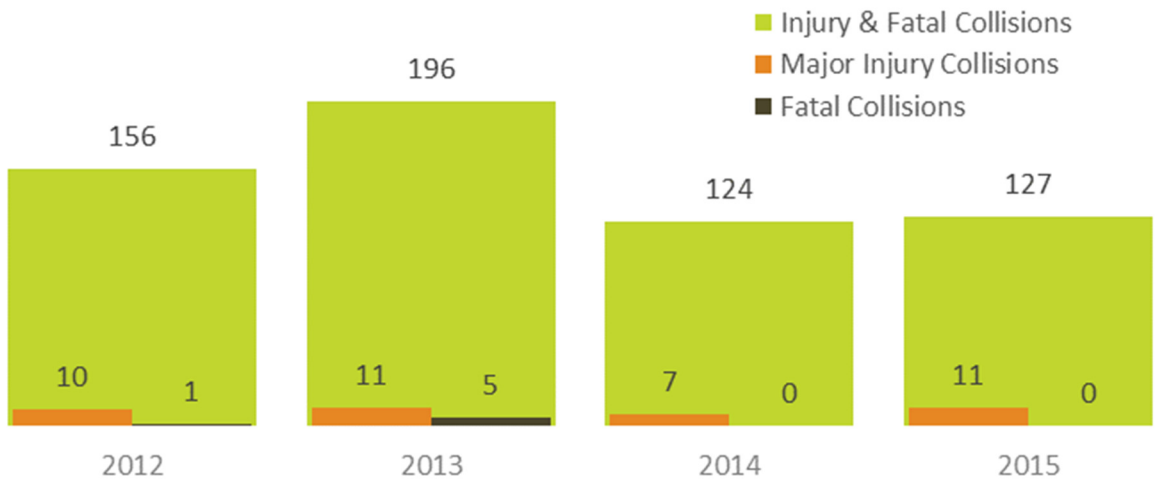
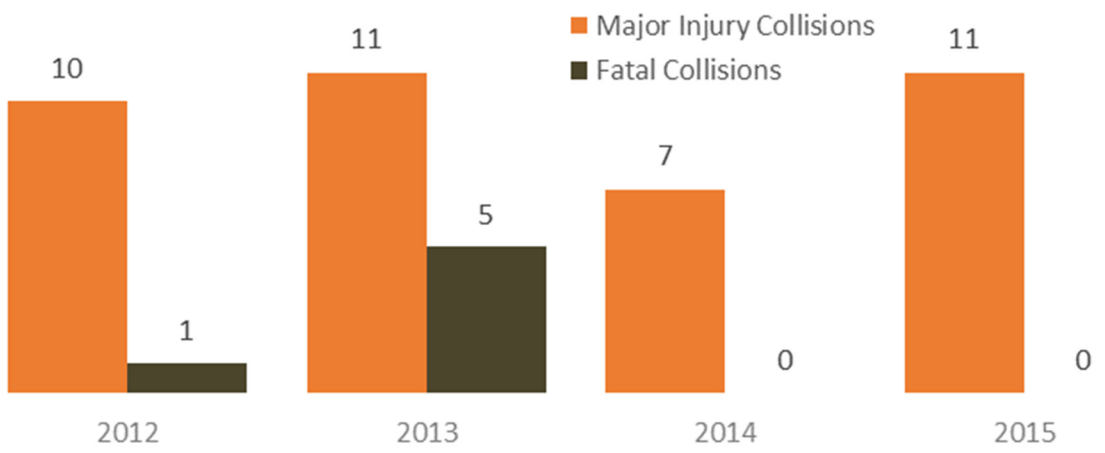
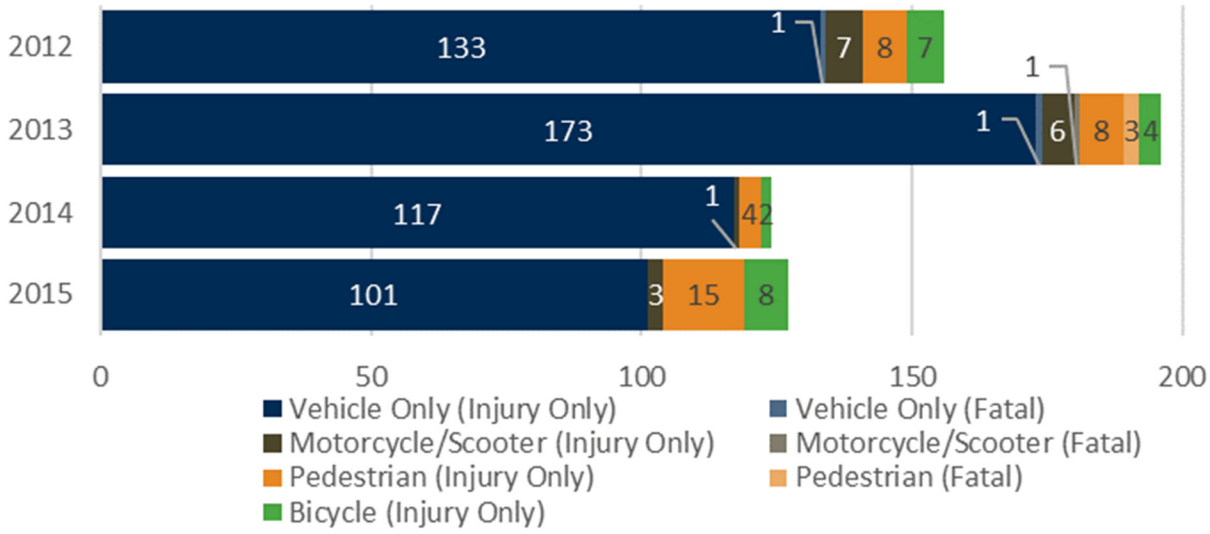


Figure 3.2: Fatal and Major Injury Collisions



From 2012 to 2015, 12% percent of all injury collisions, 46% of major injury collisions, and 67% of fatal collisions involved vulnerable road users (pedestrians, bicycles and motorcycles); however, collisions with vulnerable road users accounts for only 3% of the total collisions. Motorcycle / Scooter collisions were higher in 2012 and 2013, while Pedestrian and bicycle collisions were highest in 2015 as shown in **Figure 3.3**.

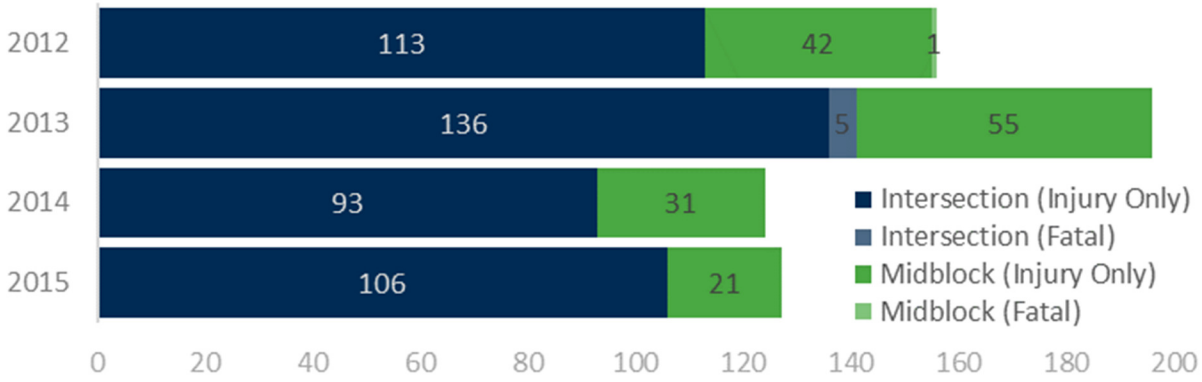
Figure 3.3: Number of Injury Collisions by Mode



Approximately 58% of collisions occurred at intersections, with 42% of collisions occurring at midblock locations (including driveways). Intersections include signalized, stop-controlled and yield-controlled locations. Injuries and fatalities occur more often at intersections, accounting for

approximately 75% of injury collisions. Midblock collisions have been declining, and were lowest in 2015, as shown in **Figure 3.4**.

Figure 3.4: Number of Injury Collisions by Location Type



Common types of collisions that have resulted in injury or a fatality, with the percentage at which they represent the overall occurrence are:

Rear-end collisions: 40% - typically occur due to vehicles following too closely, vehicle speed, or driver inattention. Rear end incidents also tend to increase with adverse weather / road conditions and during higher congestion periods.

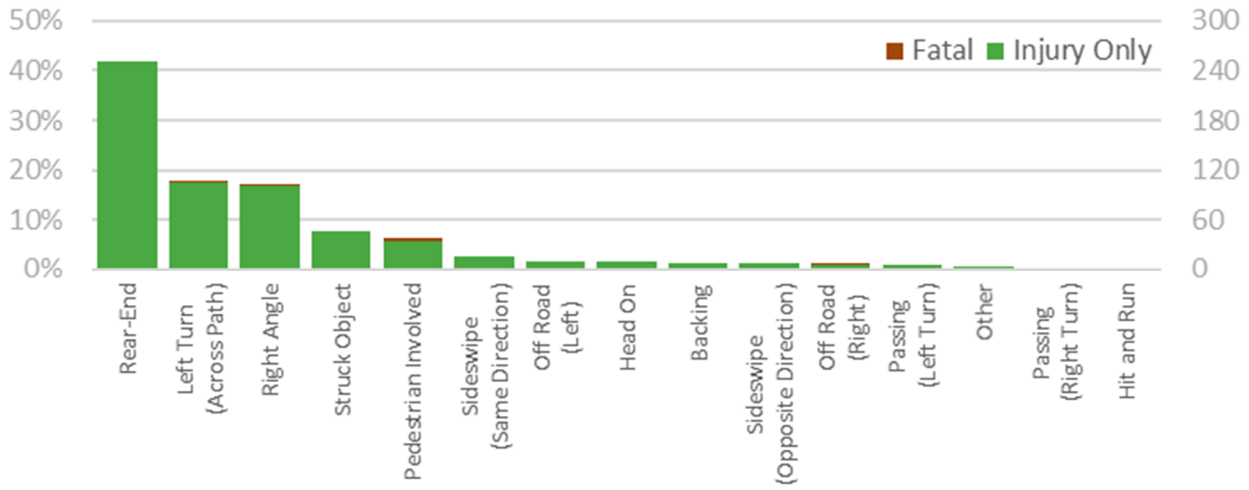
Left turn across path collisions: 17% - typically occur when left turn vehicles accept an inadequate gap in the opposing traffic stream during the permissive left turn phase. There was a substantial increase in left turn across path collisions from 2014 to 2015. Further analysis at specific locations can be conducted to determine the locations and causes of these increases.

Right angle collisions: 17% - occur between vehicles approaching at right angles to one another, such as at intersections. At signalized intersections, they are typically caused by red light running, or at unsignalized intersections or driveways by motorists accepting an inadequate gap in traffic or failing to come to a stop.

Struck object collisions: 8% - may include fixed objects (such as roadside signs), parked vehicles and wildlife, and may also include miscoded pedestrian and cyclist collisions.

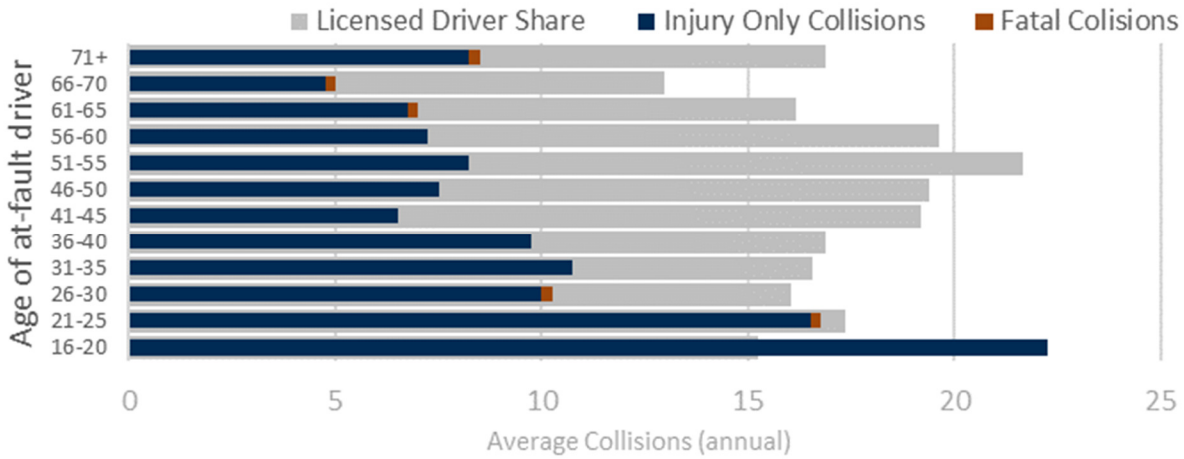
The percentage and total number of injury collisions by collision type are listed in **Figure 3.5**.

Figure 3.5: 2012-2015 Total Injury Collisions by Type



Demographics of the drivers involved indicate that the highest-risk group for injury collisions is aged 16 to 20 followed by drivers 21 to 25, and 66-100. **Figure 3.6** shows the breakdown for all age categories with the St. Albert licensed driver share of each age group.

Figure 3.6: Average Annual Injury Collisions by Age – 2012 to 2015



3.2.2 Historic Total Collision Trends (2012 – 2016)

While the total collisions (property damage, injury, and fatal) were not the primary source of data used in the development of this for the Plan; the information does provide a method to compare the 2012 to 2015 data with 2016 data.

The total vehicle-only collisions (incidents not involving vulnerable road users), with three-year average, for the years 2012 through 2016 is provided in **Figure 3.7**.

Figure 3.7: Total Vehicle Only Collisions

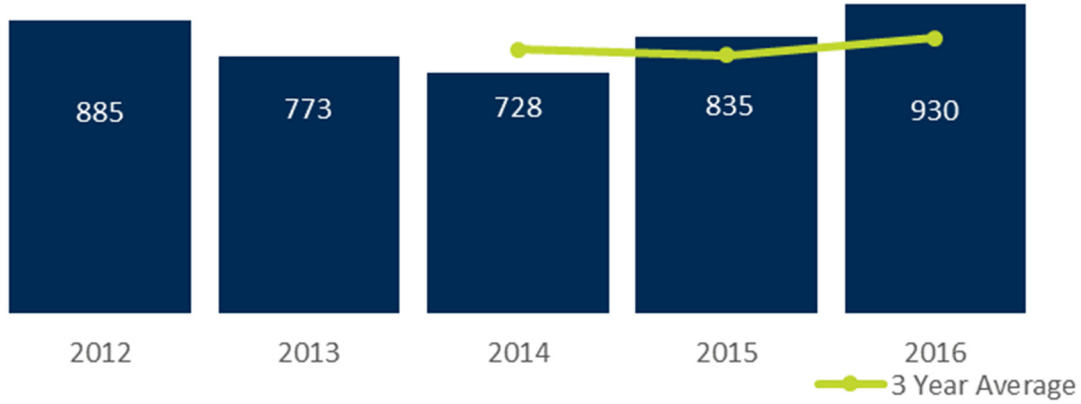
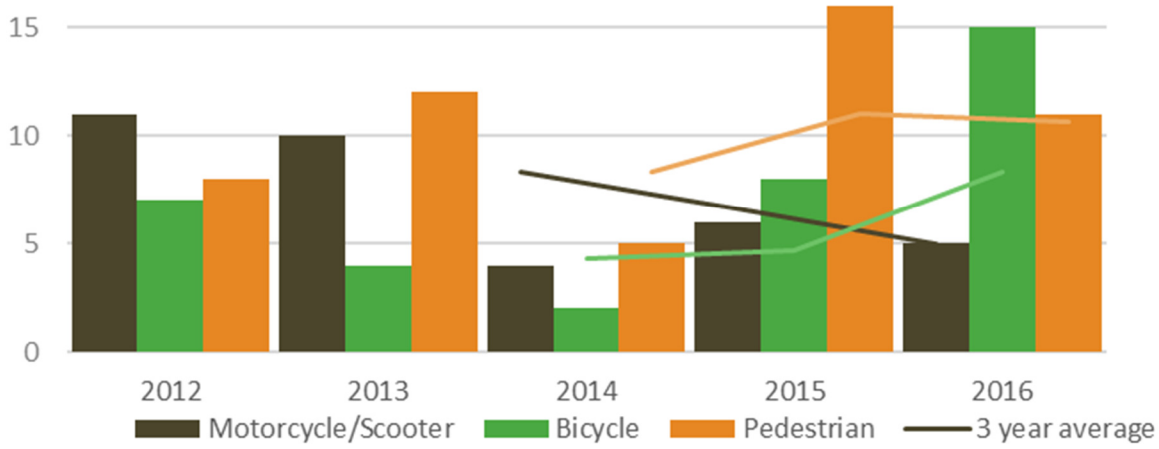


Figure 3.8 provides the breakdown of motor vehicle collisions involving vulnerable road users over the same time interval.

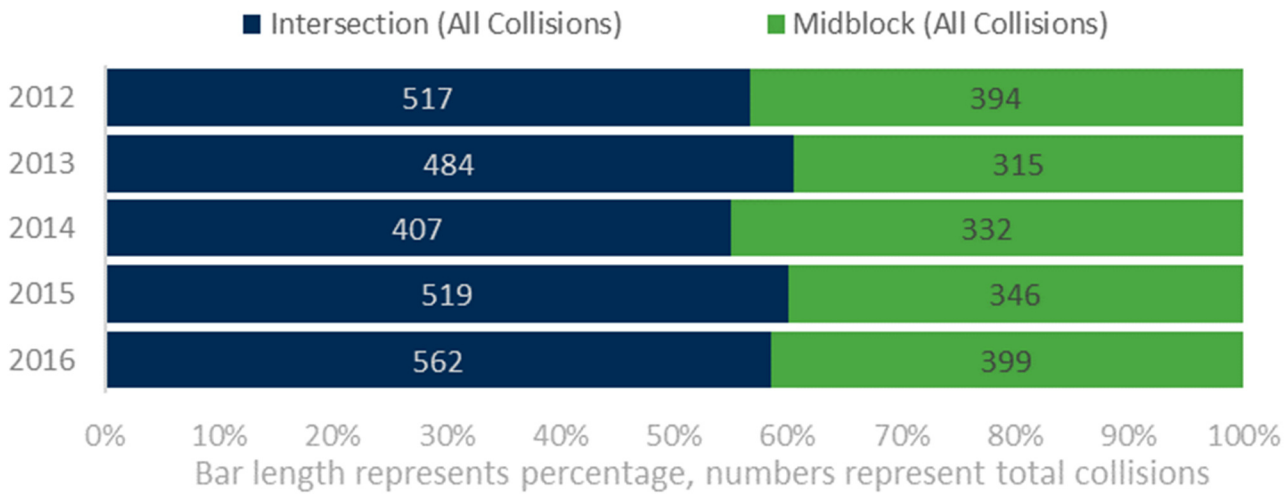
Figure 3.8: Total Collisions Involving Vulnerable Road Users



2014 had the lowest number of vehicle-only collisions while 2016 had the highest. The three-year average for vehicle-only collisions has been fluctuating slightly with a drop in 2015, but an increase in 2016. The average number of motorcycle/scooter collisions have been decreasing over this interval with bicycle and pedestrian collisions both higher than their average amount in 2012.

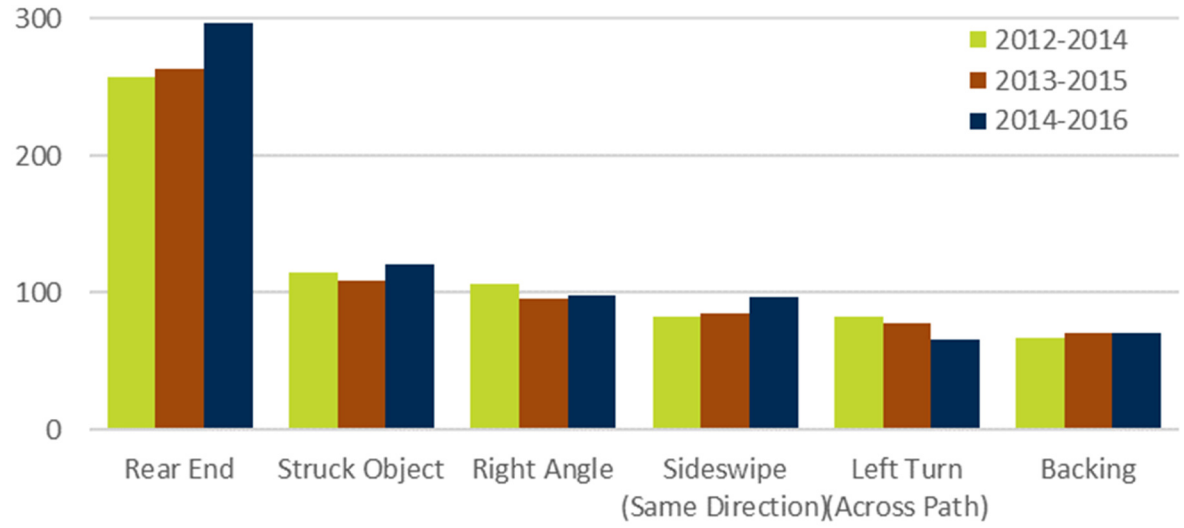
The location types of collision occurrence have been relatively consistent between 2012 and 2016 with 55% to 60% of collisions occurring at intersections annually, as shown in **Figure 3.9**. This suggests that neither intersection nor midblock collisions are becoming more prevalent.

Figure 3.9: Location Type of Collisions – All Collision Types



The top six total collision types are the same as with injury collisions for the years 2012 through 2016 and are shown in **Figure 3.10**.

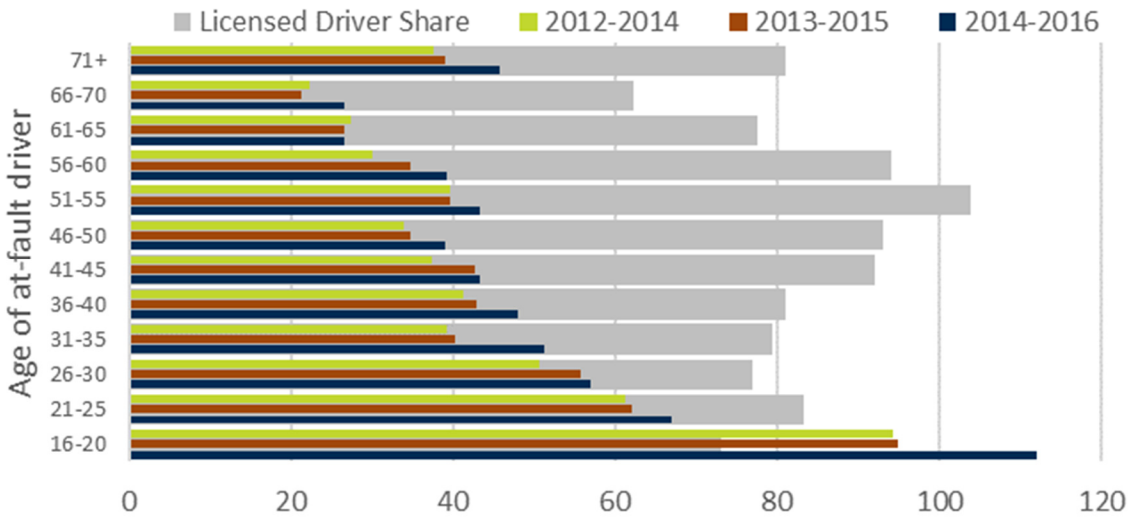
Figure 3.10: Annual Total Collisions by Type – Top 6



Rear end collisions are the most common collision type and have been increasing since 2013; accounting for approximately 35% of the total collisions in 2014, 2015, and 2016. No significant trends in the remaining top five collision types were observed. The drop in left turn (across path) incidents in 2014 coincides with the introduction of protected only left turn signal phasing at intersections along St. Albert Trail.

The three-year average for the number of total collisions by age group of at-fault driver is provided in **Figure 3.11**.

Figure 3.11: Average Annual Collisions by Age – All Collision Types



The trend reinforces that the highest-risk age groups are 16-20 and 21-25.

3.2.3 Baseline Data

Given the change in reporting between 2015 and 2016, it is not possible to directly compare the injury collisions in 2016 to previous years. This change is, at least in part, responsible for a significant increase in the injury collisions reported in 2016.

Due to the differences between the datasets, collision data from 2016 onwards will form the baseline and be used to assess the impact of implementation of the future safety strategies.

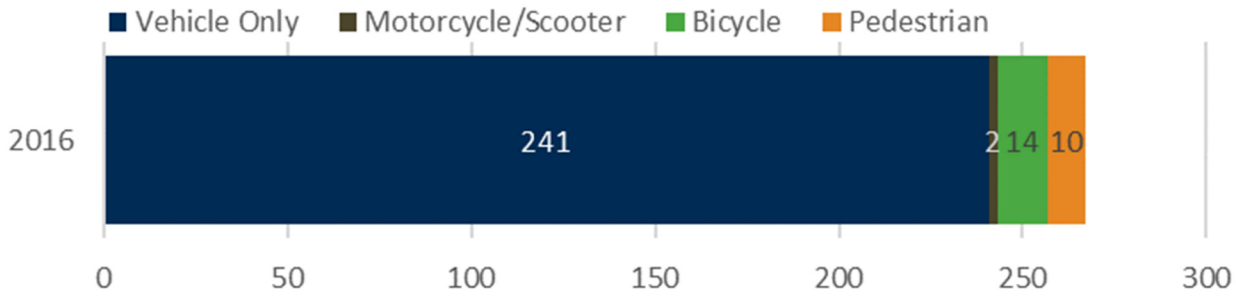
Figure 3.12 shows the number of injury collisions with a breakdown of the major injury collisions. Note, no fatal collisions occurred in 2016.

Figure 3.12: 2016 Injury Collisions



The breakdown of the injury collisions by mode is provided in **Figure 3.13**.

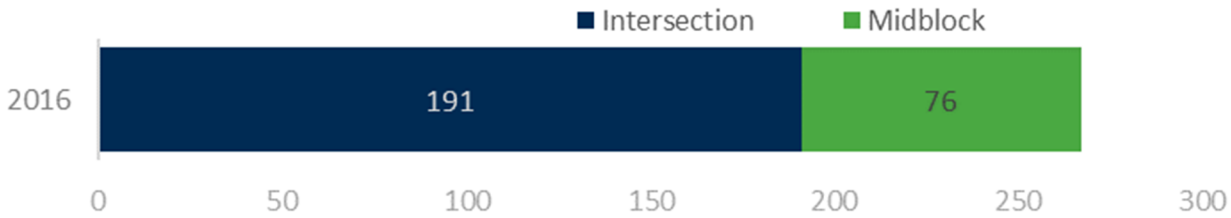
Figure 3.13: Number of Injury Collisions by Mode



The vehicle-only collisions represent 90% of the injury collisions with a small amount of vulnerable road user collisions. There was a significant increase in bicycle collisions in 2016, which may be related to the increase in cycling and is worthy of further investigation.

As shown in **Figure 3.14**, the proportion of injury collisions at intersections is higher than the total collisions. Approximately 72% of injury collisions occur at intersections compared to approximately 58% of total collisions occurring at intersections.

Figure 3.14: Number of Injury Collisions by Location



The breakdown of injury collisions by type is show in **Figure 3.15**. The top four collision types for injury collisions are:

1. Read End – 47%
2. Right Angle – 17%
3. Left Turn (across path) – 11%
4. Struck Object – 11%

Figure 3.15: 2016 Injury Collisions by Type

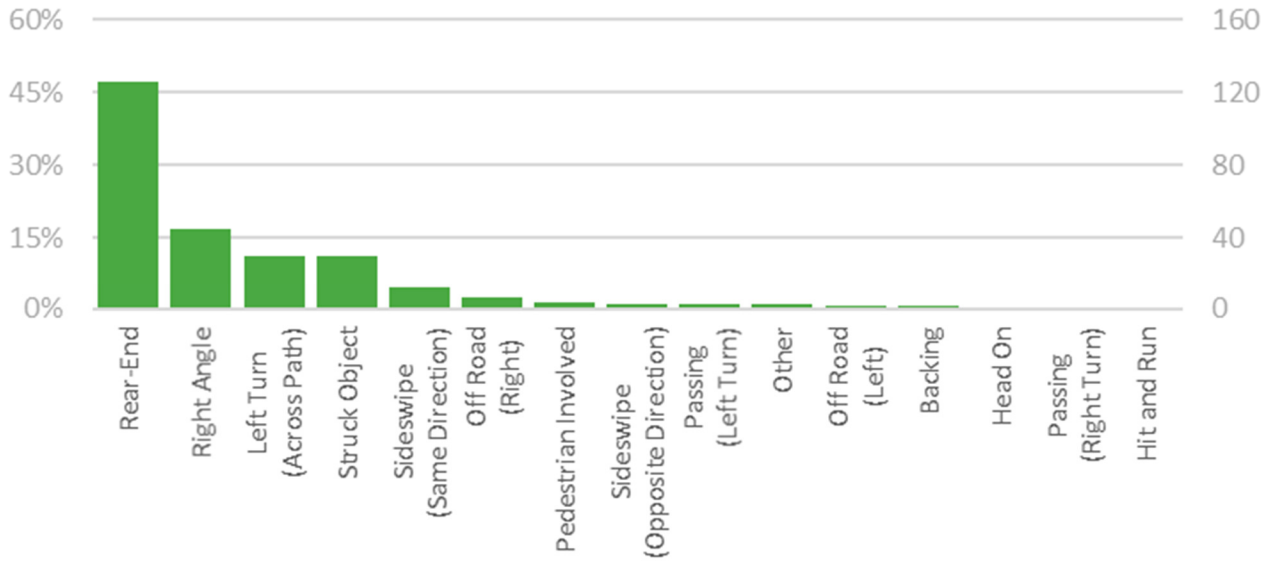
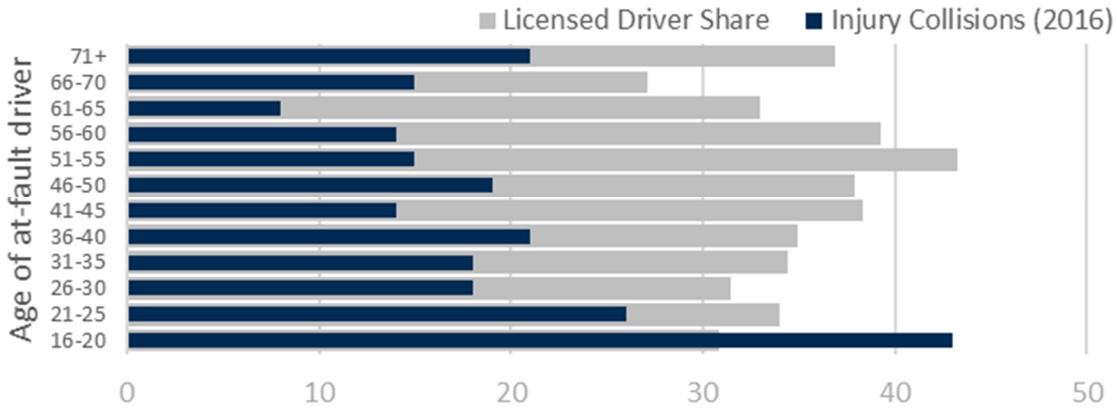


Figure 3.16 shows the breakdown of age for at-fault drivers in injury collisions for the 2016 collision data with the St. Albert licensed driver share of each age group. This highest number of injury collisions age groups were 16-20 and 21-25.

Figure 3.16: 2016 Injury Collisions by Age



3.2.4 Conclusions from Collision Analysis

From detailed collision analysis, the following key conclusions are drawn:

Between 2012 and 2015:

- Injury collisions declined and have stabilized
- No fatal collisions occurred in 2014, 2015, and 2016
- Pedestrian and bicycle injury collisions have increased
- Rear-end, left-turn and right angle are the leading injury collision types
- The most pronounced age categories in injury collisions are 16-20 and 21-25

In 2016:

- Total collisions significantly increased (especially rear and right-angle types)
- Bicycle collisions continued to increase while pedestrian collisions declined
- Collisions with at-fault young drivers significantly increased

3.3 COST OF COLLISIONS

Traffic collisions result in a significant burden to the community and society. In any collision, there are direct costs associated from damages incurred (inclusive of private and public property), medical response or treatment, insurance costs, and delays to traffic operations. Injuries need to be treated and add costs to the health care system and result in lost productivity due to the inability to work. Some collisions result in legal costs and further incidental costs.

Indirect costs of collisions are incurred due to pain and suffering, which is based on a willingness-to-pay model.

Municipalities are significantly impacted by the direct and indirect costs of collisions and injuries. To estimate these costs of collisions to society, the Capital Region Intersection Safety Partnership (CRISP) conducted a study in 2010, which was updated in 2018. The average costs of collisions for each consequence category is summarized in **Table 3.2**.

TABLE 3.2: AVERAGE COST OF COLLISIONS (CRISP, 2018)

Collision Type	Direct Cost	Indirect Cost	Total Cost
Fatality	$220,151	$6,707,228	$6,927,379
Injury	$8,350	$198,710	$207,060
Property Damage Only	$14,006	$0	$14,006

Applying these costs to the City of St. Albert, the total costs of collisions over the 5-year period between 2012-2016 are summarized in **Table 3.3**.

TABLE 3.3: TOTAL COST OF COLLISIONS IN ST. ALBERT (2012 – 2016)

Collision Type	Direct Cost	Indirect Cost	Total Cost
Fatality	$ 1,320,906	$ 40,243,368	$ 41,564,274
Injury	$ 7,214,400	$ 171,685,440	$ 178,899,840
Property Damage Only	$ 47,690,430	-	$ 47,690,430
TOTAL	**$ 56,225,736**	**$ 211,928,808**	**$ 268,154,544**

Therefore, collisions in St. Albert have imposed a cost to society of over $265M over 5 years, or over $50M per year.

Investment of resources towards strategies and projects identified in this Plan would be expected to result in significant societal cost savings through the overall reduction of incidents. A component of future evaluation of strategies and the Plan itself, will be analysis of collision occurrence, severity and resulting costs.



4.0 STRATEGIC FRAMEWORK

With consideration of the framework of other City long-term plans and feedback received to date during the multiple plan or guidelines creations; this framework was developed with the input of the steering committee and reflects input from multiple stakeholders.

4.1 VISION & MISSION

The City of St. Albert is a progressive, family-oriented community that values safety. The Vision for Transportation Safety in St. Albert is

A COMMUNITY WORKING TOGETHER SO YOUR FAMILY ARRIVES SAFELY

The meaning behind this vision is further articulated as follows:

A COMMUNITY – St. Albert is a community of residents and visitors known for their desire to continually improve the city.

WORKING TOGETHER – Transportation safety is a shared responsibility for all residents, visitors, and City employees.

SO YOUR FAMILY – Transportation safety impacts everyone. Decisions you make directly impact yourself, your family, and the families of others.

ARRIVES SAFELY – A future is envisioned where transportation fatalities and major injuries are rare.

In support of achieving this vision, the City of St. Albert and its partners have developed a mission statement.

MISSION STATEMENT

The City of St. Albert will work together with its partner organizations and the public to ensure that this vision is a reality. This will be accomplished by implementing the 5 E's (Evaluation, Engagement, Education, Enforcement, and Engineering) based on a set of guiding principles, geared towards the elimination of fatalities and major injuries within its transportation system.

4.2 GUIDING PRINCIPLES

The principles that will guide the City and its partners in its mission to achieve the stated vision may be identified through the acronym **INSPIRE**, and are described as follows:

Integration: Ensuring safety considerations are a high priority in project planning, program management, community design, construction and within communications

Network: Developing the relationships and partnerships between stakeholders and members of the community to collaborate on influencing safety through a holistic and multi-faceted approach.

Sustainability: Achieving reliable and sustainable funding to promote long-term success.

Protection of the Most Vulnerable: Encouraging active and accessible travel modes, by providing priority for pedestrians and cyclists, with consideration made for all mobility levels.

Innovative: Being a leader in adapting to new trends and developing new ideas.

Respect: Developing a culture of respect between partners and among all road users; recognizing the diversity of stakeholders; and fostering opportunities for collaboration and cooperation.

Evidence-based: Strategies will be based on evidence of success in St. Albert or comparable jurisdictions and will be continuously monitored, evaluated and information shall be shared.

4.3 OBJECTIVES AND TIMELINES

In alignment with the vision, mission and guiding principles, the overall objective of the Transportation Safety Plan is to aggressively pursue a set of strategies (in partnership with others, where appropriate) that will minimize the risk of fatality and major injury on our roads and culminate in their eventual elimination.

4.3.1 Focus on Injury Collisions

The focus of the strategies and the subsequent evaluation of the Transportation Safety Plan will be injury collisions (including fatal collisions). While non-injury collisions are also a cost to society, this distinction is made to recognize and prioritize the prevention of harm associated with more-serious incidents, which causes the most tragedy and loss of productivity to a community. Therefore, several of the strategies have the objective of reducing speeds, protecting the most vulnerable (i.e. most prone to injury) road users, and eliminating high-severity collisions at intersections.

In many cases, the strategies are likely to reduce all types of collisions. For example, reduced speeds will tend to reduce the severity of any collisions that occurs; in addition, lower speeds typically reduce the probability of a collision occurring in the first place, by increasing perception, reaction and braking times.

4.3.2 Timelines

The Transportation Safety Plan identifies transportation safety strategies and projects for implementation over the next five-year period and beyond. The specific time horizons that have been set out for the various strategies are:

- **Short-term (1-3 years):** This time period is associated with strategies and projects that are a priority, can be implemented without much capital planning or policy development, or form a foundation for future projects. The strategies expected to yield the greatest benefit-cost should be commenced during this period.
- **Medium-term (3-5 years):** This time period is associated with strategies and projects that require some capital planning and budgeting or policy development or formal evaluation of existing activities. They may have a lower benefit-cost than the short-term measures or be components of “next steps” associated with projects identified in the short-term.
- **Long-term (Greater than 5 years):** This time period is associated with strategies and projects that may require developing extensive partnership and public support prior to implementing.

Some strategies within this Plan are in progress (2018), while others will require program planning and budgeting prior to being able to commence. Some projects will benefit through partnership with stakeholders, which would require additional planning and coordination prior to formal implementation. As a result, some of the short-term strategies may not be planned for until 2019 with funding and implementation then planned for 2020; therefore, unless the strategy is already aligned to existing programs or projects, the implementation periods for this strategy are estimated to be:

- Short-term: 2020-2022
- Medium-term: 2023-2025
- Long-term: After 2025

The end of the medium-term coincides with the time horizon for Canada's Road Safety Vision (2025), and likely the next version of the Alberta Traffic Safety Plan.

This presents an opportunity for an update to the Transportation Safety Plan in approximately 2023 to take effect in 2025 and to align long-term strategies with the newer versions of the plans presented by these higher levels of government.

4.3.3 Key Performance Indicators

A Key Performance Indicator (KPI) is a measurable value to demonstrate how effectively a strategy is achieving its objective. Key performance indicators for each project are important to evaluate the overall impact of implementation. The primary indicators will be the reduction in injury collisions. This will be expressed as a percentage reduction in the injury collision rate (normalized by traffic or pedestrian volume where available, to account for exposure and more meaningfully indicate effectiveness).

Non-collision KPIs can also be identified for several of the strategies and projects, especially for strategies that demonstrate good road safety management, which are difficult to measure using collision data; and for strategies for which collisions are relatively rare (such as pedestrian and bicycle collisions). Non-collision KPIs include:

Traffic conflicts - "Near Misses" are an indicator of collision risk and can be measured objectively before and after project implementation.

Traffic speeds - Any reduction in vehicle travel speeds from the speed management or related measures will likely reduce injuries and fatalities.

Number of management programs implemented, or activities completed (e.g. how many transportation safety staff hired, how many partners reached, public recall of road safety campaigns, how may Road Safety Audits are completed each year).

Public knowledge and satisfaction – obtained through surveys or public reports of concern data.

Yield rates and distances – for measures that require yielding, such as crosswalks or right-turn movements, yield rates and yield locations can be measured in the field and used as an indicator of effectiveness

Traffic violations – violations are indicators of poor behaviour, which are correlated with unfavourable safety performance. For example, rates of red light or speeding infractions can be used as KPIs and are most meaningful when compared to the level of enforcement and compared to violation rates during times when enforcement is absent.

Regardless of the KPI, the safety performance of interventions can be measured using before-and-after analysis or cross-section analysis. These methods are described as part of the Evaluation Strategy in **Section 4.5**.

4.3.4 Targets

The eventual transportation safety target for the City is zero fatalities or injuries on its roadways; where every member of the community arrives safely. Until this is achieved, the City will continue to pursue improvement. The City embraces the spirit of Vision Zero, in which road safety outcomes are placed as a high priority in all decisions made by the City and its partners. To this end, the City will aim for a **year-to-year reduction in fatalities and injuries, and their eventual elimination.**



Image source: Parachute (parachutecanada.org)

4.4 STRATEGIC FOCUS AREAS

Identifying focus areas helps to focus efforts and resources and provides greater opportunity to yield higher benefit-cost.

Focus areas were selected by considering local safety performance data, stakeholder input and industry research.

Focus areas selected for the Transportation Safety Plan are as follows:

Intersections: Intersections are a key aspect of the transportation network, but also an area of high conflict in time and space between all road users.

Vulnerable Road Users: Vulnerable road users (including pedestrians, cyclists, motorcyclists, and the visually-, hearing-, or mobility-impaired) have a higher likelihood of suffering an injury when involved in a collision.

Vehicle Speeds: Excessive speed can have an impact on both the number and severity of collisions on the roadway.

Distraction: Driver distraction (including mobile device use) is an increasing contributor to crashes.

Young Drivers: Drivers between the ages of 16 and 25 are the highest-risk age group for collisions based on a number of factors, such as inexperience, higher levels of aggression, and alcohol/drug use.

Safer Vehicles: Safety can be improved through the development and use of safer vehicles and vehicle safety technology.

4.5 STRATEGIC APPROACHES

4.5.1 "5 E's" of Traffic Safety

Improved transportation safety is a result of combined efforts and actions that require collaboration and resources attributed towards the 5 E's.

Engineering refers to physical changes to the roadway and development of design guidelines. Engineering can address areas such as corridors and intersections, by ensuring geometric designs and traffic controls (signs, signals and pavement markings) are selected that have a favourable safety performance. Planning can be thought of as a broader approach to engineering, by determining and changing the physical environment over larger areas and earlier on in the process, particularly for new developments or new road construction.

Education refers to making organizations or the public aware of issues, programs, and rules to empower them to make the right decisions, in the interest of public safety. There are various forms of education, from City communications to media campaigns, to training activities. Education is most effective when both the content and media are catered to the intended audience, and when it appeals using combinations of information and emotional appeal.

Engagement refers to communicating and collaborating with partners in transportation safety and/or the public to select and develop the appropriate strategies. Effective engagement, conducted early and often, is proven to increase the success rates of strategies and generate sustainable programs.

Enforcement refers to the protection of public safety and traffic laws by enforcement officials, from the municipal or the policing sector. Enforcement activities are aimed at addressing the most unsafe behaviours that lead to crashes, such as speeding, disobeying traffic control, driving without due care, and impaired driving. Groups like the RCMP have their own objectives from the provincial and federal policing authorities to carry out programs, but typically work very closely with municipal staff. Engineering and education (including warnings) are to be considered prior to enforcement, or together with enforcement to achieve the greatest impact.

Evaluation refers to the effective review and management of transportation safety strategies. All programs must have an evaluation strategy to determine their success. Effective evaluation includes a planning phase, in which key performance indicators are identified (such as in the Transportation Safety Plan) and focus areas and numerical targets may be established. The formal evaluation of existing activities is sometimes the logical first step

towards determining if, how and to what extent they should be expanded (e.g. to other locations or user groups). Methods of monitoring success, including the required data and data sources are part of an effective evaluation strategy.

Transportation safety strategies are most effective when they consider and incorporate the multiple aspects of the above lead areas. Engineering changes should be accompanied by education and enforcement to assist in sustainability of the network. Engagement can help increase compliance or improve behaviours and build support for transportation safety initiatives. Evaluation must occur to justify resource allocation towards transportation safety and provide education on the impacts of actions and behavioural changes.

4.5.2 Safe Systems

Safe systems are designed with the human being at its center, taking human fallibility and vulnerability into account, and accepting that even the most conscientious person may make a mistake at some point. The goal of safe systems is to ensure that these mistakes do not lead to a collision; or, if a collision does occur, it is sufficiently controlled to not cause a death or a life-changing injury. Safe systems are made up of four main components:

Safer Roads: roads are designed to reduce the risk of collisions occurring, and the severity of injuries if a collision does occur. Safety features are incorporated into the road design from the outset.

Safer Speeds: Speed limits in safe systems are based on aiding crash avoidance and a human body's limit for physical trauma. An unprotected pedestrian hit at over 40km/hr has a significant risk of death or life-changing injury.



Safer Vehicles: Vehicles are designed, built and regulated to minimize the occurrence and consequences of collisions, with the emphasis on collision survivability. There are two main strands to safer vehicles – technology and road-worthiness.

Safer Road Use: Everyone who uses roads is encouraged to use roads safely and comply with road rules. Emphasis is placed on a philosophy of shared and proportionate responsibility.



5.0 PROPOSED STRATEGIES AND PROJECTS

Three main sources of information were used to identify focus areas for which potential projects for the plan were developed:

Transportation Safety Data - Collision data is one of the primary sources of safety information. The City of St. Albert prepares annual collision statistic reports based on the information collected by the RCMP using the provincial report form. This data provides valuable information into the collision trends within St. Albert. Non-collision data also provides an indication of the potential for collisions and injuries to occur. “Near miss” incidents or reports of public transportation safety concerns, may be sources of non-collision data and an opportunity for the City to expand on its reporting capabilities to influence the strategic plan

Consultation - As discussed in **Section 2.2**, consultation was conducted throughout the project. The information obtained from the steering committee, internal stakeholders, and external stakeholders provided a local perspective on day-to-day transportation safety issues, helping to ensure that the proposed projects were appropriate for St. Albert.

Research - Safety tools and strategies are constantly being developed in other jurisdictions, both within Canada and internationally. As discussed in **Section 2.1**, a review of other municipalities as well as industry best practices and emerging trends was conducted. This process provided valuable information regarding current safety practice. Projects related to this topic were included in the plan when deemed appropriate for St. Albert.

Various strategies and projects have been identified that will help achieve the City's vision of eliminating major injury and fatal collisions within St. Albert. The strategies and projects have been divided into the following six focus areas.

- Intersections
- Vulnerable road users
- Vehicle speeds
- Distraction
- Young road users
- Safer vehicles

There are several projects that span several of the focus areas and all applicable focus areas are identified on the project sheets. In addition, guidance is provided for road safety management processes and tools that are intended to reduce all collisions. This section provides information on the focus areas and includes strategy and project sheets for all the projects.

As discussed in **Section 4.3**, projects were divided into three timeframes:

- Short-term (1-3 years)
- Medium-term (3-5 years)
- Long-term (more than 5 years)

The expected timeframes to completion of each project vary significantly. Many projects will be on-going if implemented in a city-wide basis or may be on-going in the sense of continuous evaluation of the network with the potential of applying the project or mitigation actions. The indicated timeframe provides a prioritization of the projects and the criteria used were:

- Cost-benefit ratio: this is an assessment of the relative benefit of the project based on its estimated cost.
- Relationship to and influence on other projects: several projects for a base for future projects or require specific projects to be implemented before going ahead
- Available resources and effort required
- Significance of issue addressed
- Local context

There are three levels of cost, low, moderate, and high, to indicate the level of cost involved in completing the project. A brief description of each price range is provided below:

- **Low Cost**– A project that requires minimal budget, typically below $25,000. This is primarily research, support, or utilizing effort by another party.
- **Moderate Cost**– A project that requires some budget, typically $25,000 to $100,000. These projects involve additional resources such as staff hours or implementation costs.
- **High Cost**– A project requires significant budget, typically greater than $100,000. These projects are large scale and may have significant staff or implementation costs and/or long durations.

The following section provides a summary of the six focus areas for the City of St. Albert and how they were identified. A summary of all projects and strategies is available in **Appendix D**, will all project sheets in **Appendix E**.

5.1 INTERSECTIONS

Intersections are the locations in a road network where two roadways meet, where vehicles are turning, and where many of the pedestrian and cyclist crossings are located. This connectivity is vital to the road network but requires that road users approach the same points in time and space, creating situations where they come into conflict with one another. Signalized, partially signalized, stop controlled, yield controlled, and uncontrolled intersections all share this characteristic. Safety strategies and projects at intersections seek to:

- Separate critical movements in time
- Separate critical movements in space
- Increase compliance with the prevailing traffic control
- Warn users of the presence of the intersection and other users
- Slow traffic to safer speeds

Within St. Albert, 58% of all collisions and 75% of injury collisions occur at intersections. Given the large proportion of injury collisions, intersections are a key focus area and reduction of injury collisions at intersections is essential to achieve an overall reduction of injury collisions within St. Albert.

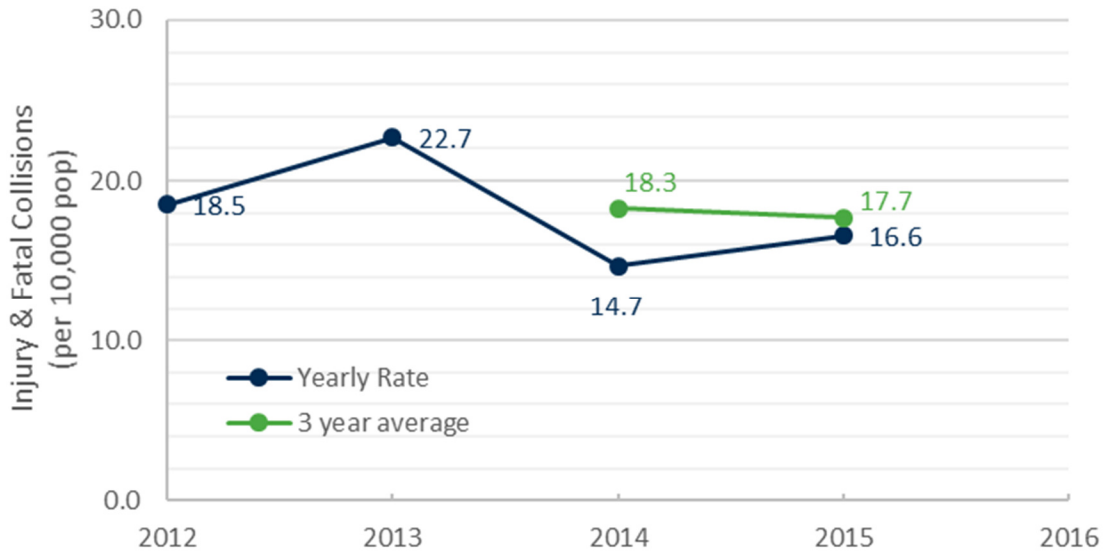
5.1.1 Data

The statistics on intersection collision rates in St. Albert played a key role in project selection. Projects targeting turning movements seek to reduce high severity collisions that occur with these movements. This includes building off the success of the previous conversion of protected/permitted left turn phasing to protected only phasing.

Additional network signal changes and improvements aim to reduce rear-end collisions which account for 43% of the collisions at intersections.

Speeding and red light running can result in collisions and often higher severity collisions such as right-angle collisions. Use of intersection safety cameras can reduce the occurrence of these behaviours and collisions. **Figure 5.1** shows the injury rate per 10,000 population for 2012 to 2015 at intersections.

Figure 5.1: Intersection Injury Collision Rate



5.1.2 Research

Research has shown the safety benefits of new intersection types and design guidelines. The focus of much of the transportation safety literature, including the AASHTO[5] Highway Safety Manual, is on intersection safety; and this is the primary focus of the Capital Region Intersection Safety Partnership (CRISP).

Roundabouts significantly reduce the number of conflict points and the severity of conflicts at an intersection and can reduce the severity of collisions at an intersection.

Changes to right turn geometry has been found to reduce collisions involving right turning vehicles. The City of Edmonton is a local example of a municipality adjusting right turn geometry guidelines to improve safety.

5.1.3 Projects

The following projects and strategies are included with a primary focus on intersections:

- Skid-resistant surfacing

[5] American Association of State Highway Transportation Officials (https://www.transportation.org/)

- Modern roundabout program
- Intersection safety cameras
- Traffic Signal Operation Strategies
    - Adaptive traffic signal control
    - Protected-only left-turn phasing
    - Signal visibility improvements
- Reduce Right-turn Incidents Strategy
    - Implement right turn smart channels
    - Public education regarding free-flow right-turn traffic control

5.2 VULNERABLE ROAD USERS

Vulnerable road users (VRUs) are defined as pedestrians, cyclists, motorcyclists, the visually or hearing impaired, the cognitively challenged and users of mobility aids. Collisions involving VRUs typically result in injury; and when impacted by higher speeds, vulnerable road users have a relatively low chance of survival.

Vulnerable road users not only lack the protection that drivers and passengers in an automobile enjoy but take longer to reach their destination and are also subject to falling. Strategies and projects to aid vulnerable road users aim to:

- Provide protected signal phasing for VRUs.
- Provide safer facilities for VRUs.
- Provide greater warning to both VRUs and drivers in advance of conflict points.
- Compensate for the mobility, sensory and cognitive limitations (i.e. provide full accessibility).
- Educate and encourage drivers and VRUs to share the common road space, exercise courtesy, and communicate with one another.

  Lower vehicle speeds parallel to or in advance of VRU facilities.

Within St. Albert, only 3% of all collisions involve VRUs; however, 12% of injury and 67% of fatality collision between 2012 and 2015 involved VRUs. The high severity of VRU collisions is apparent in the collision data.

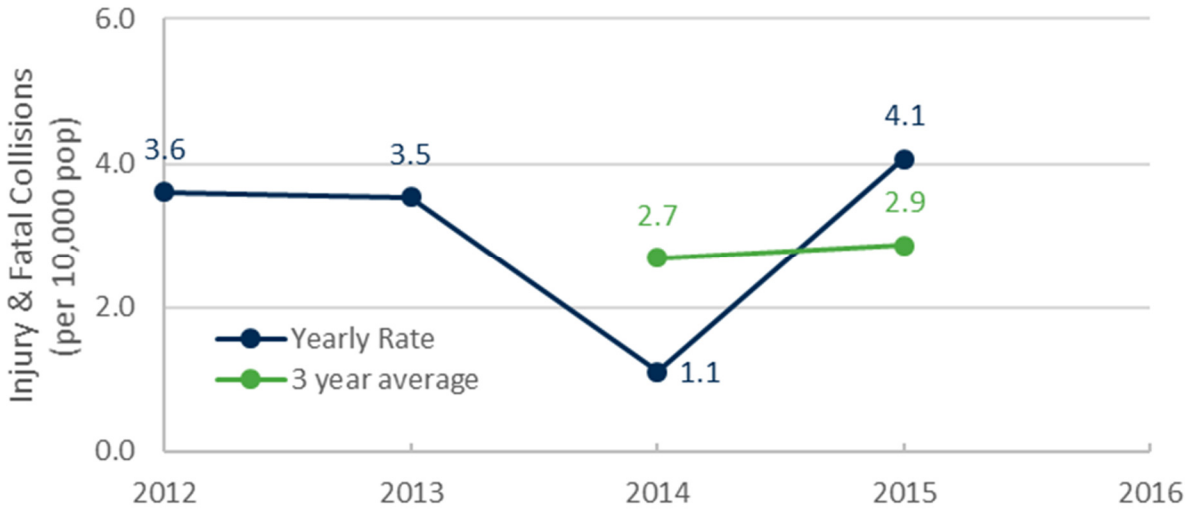
5.2.1 Data

As mentioned previously, the proportion of vulnerable road user collisions that result in injuries or fatalities is significant. Several of the projects aim at increasing the visibility of pedestrians to allow drivers and pedestrians to better communicate. Other projects increase the accommodation and accessibility of VRU facilities to better accommodate road users,

regardless of their mobility. Vehicle speed plays a significant role in the severity of VRU collisions. Projects that address vehicle speed will have an impact on the injury rate of VRUs. A road network that supports VRUs, increases their visibility, and reduces vehicle speeds aims to reduce the number of incidents occurring and lower severity of VRU collisions.

Figure 5.2 shows the injury rate per 10,000 population for 2012 to 2015 of vulnerable road users.

Figure 5.2: Vulnerable Road User Injury Collision Rate



5.2.2 Consultation

Vulnerable road users were mentioned at all stages of the consultation. The concerns raised included school zones, pedestrians, and bicycle safety on the roadway. Projects were added that addressed many of the concerns raised.

5.2.3 Research

The high risk to vulnerable road users is well documented within the transportation safety industry. Significant literature and guidance documents are available that address safety and accessibility for pedestrians, bicycles and motorcycles. The knowledge available in the industry helped shape the projects focusing on vulnerable road users in this plan.

5.2.4 Strategies and Projects

The following projects are included with a primary focus on vulnerable road users:

- School zone review
- Playground zones review
- Pedestrian crossing control warrants

- Rectangular Rapid Flashing Beacons
- Pedestrian Crosswalk Safety Strategy
    - Evaluate success of Point, Pause, Proceed program
    - Evaluate success of fluorescent road markings in crosswalk program
    - Curb extensions and raised crosswalks
    - Review and update pedestrian crosswalk treatments
    - Leading pedestrian intervals
    - Pedestrian countdown signals and accessible pedestrian signals
    - Public education about visibility
    - Prohibit parking near crosswalks
- Bicycle Safety Strategies
    - Partner with cycling groups
    - "Share the Road" education campaign
    - Separated bicycle facilities

5.3 VEHICLE SPEEDS

Speed is both a primary and secondary cause of collisions. When combined with high speeds, collisions (such as rear-ends or red light running) can result in a much higher collision severity. Drivers typically select speeds based on the road design, land use and roadway features, more so than posted speed limits. Strategies and projects for reducing speeds aim to:

- Educate the public about the risks of speeding.
- Provide speed limits consistent with the road design.
- Provide road designs to achieve a target speed.
- Encourage lower speeds in urbanized areas, where access locations are more frequent and VRUs are more prominent.
- Ensure there is a perceived risk of being caught if speeds are non-compliant.

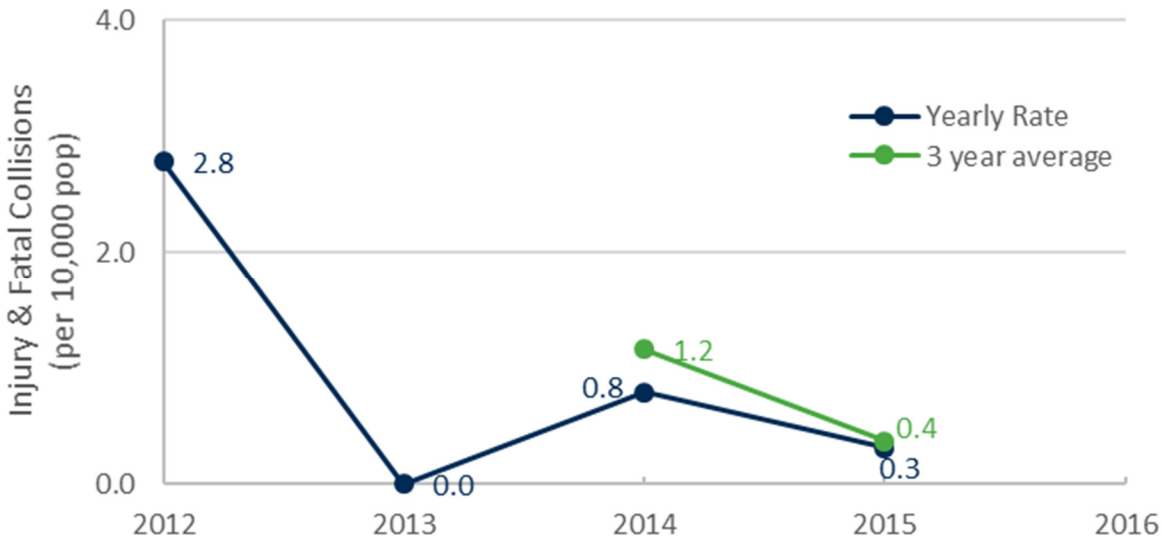
5.3.1 Data

Collision data for intersections involving speeding is not complete because the speed of the vehicle is often not known. However, speed surveys and speed enforcement can provide insight into the statistics of speeding within St. Albert.

Based on the City's 2015 speed surveys, speeding is regularly occurring on the arterial road network, with recorded "hot spots" of speed issues identified within local roadways. Projects have been included to reduce the amount of speeding that occurs within St. Albert.

Figure 5.3 shows the injury rate per 10,000 population for 2012 to 2015 due to excessive speed.

Figure 5.3: Vehicle Speed Injury Collision Rate



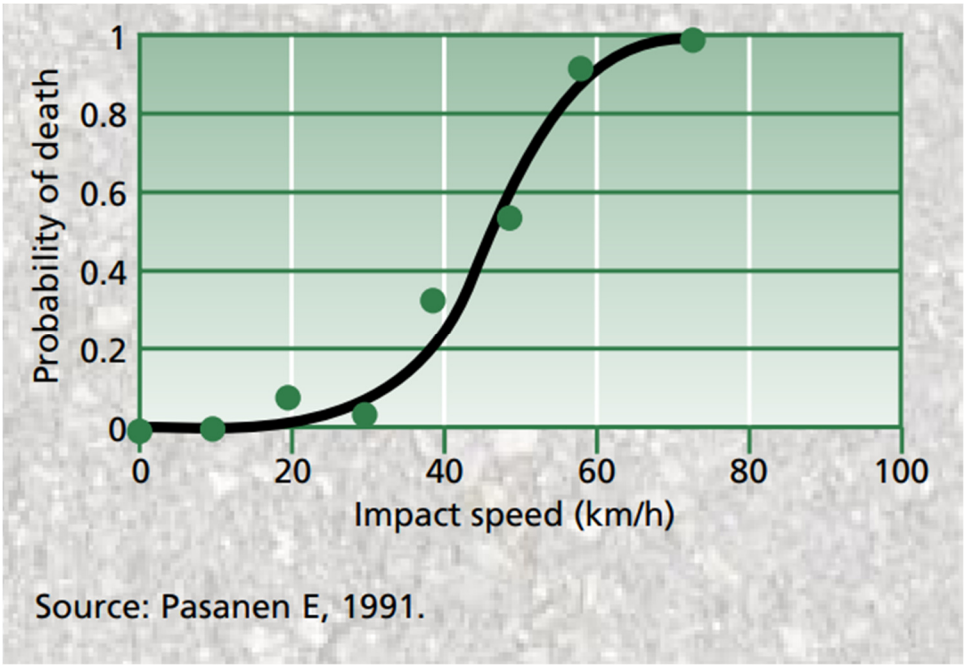
5.3.2 Consultation

Speeding was identified as one of the top safety concerns within the consultation. No specific cause was identified in the consultation, but the focus area was selected, in part, due to the response on the issue.

5.3.3 Research

The relationship between speed and safety is extensively documented. **Figure 5.4** provides an example of the fatality risk of collisions involving pedestrian, by speed. Higher speeds increase stopping distances and impact severity. Many jurisdictions have developed Speed Management Guides, including the City of Edmonton. Drivers will tend to drive at speeds at which they feel comfortable on the roadway, regardless of the posted speed or road condition. Projects have been included to ensure that road designs are appropriate for the desired speed on the roadway. Additionally, variable speed limits offer opportunities to adjust the speed limit due to environmental or traffic conditions.

Figure 5.4: Pedestrian Risk as a Function of the Impact Speed of a Car



5.3.4 Strategies and Projects

The following projects are included with a primary focus on vehicle speeds:

- Speed display devices
- Gateway Treatments
- Safer Speeds and Speed Limits Strategy
    - Revise road classification and design standards
    - Pilot the use of lower speed limits on local roads
    - Review all posted speed limits
    - Variable speed limits
    - Automated speed enforcement program evaluation
    - Neighbourhood traffic calming

5.4 DISTRACTION

Distraction is an increasing contributor to crashes. Distraction happens when drivers look away from, or take their mind away from, the roadway by engaging in other tasks, such as eating, grooming, turning to/speaking with passengers, looking at or playing with car features, listening to loud music or expressing road rage. The fastest growing source of distraction is electronic

mobile devices: talking, listening, browsing and texting. Current legislation bans distracted driving. Strategies and projects to curb distraction are intended to:

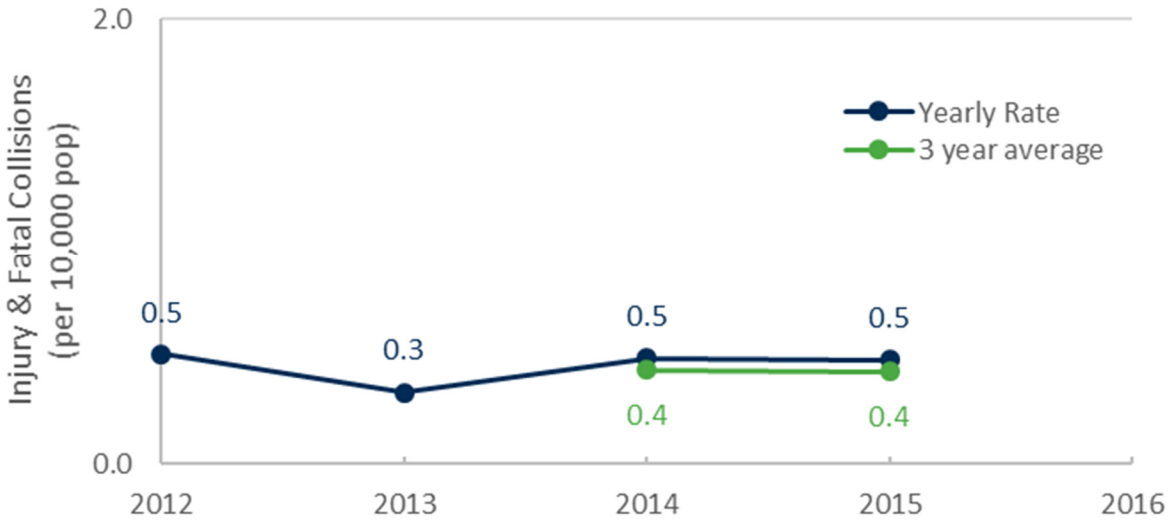
- Educate road users of the risks of distraction
- Disable mobile devices while in motion
- Give enforcement officers the tools they need to identify distraction
- Purchase vehicles that contain collision avoidance systems

5.4.1 Data

Collision data pertaining to distraction and distracted driving is under represented due to distractions being self-reported. The injury rate is shown, but the rate is likely higher than reported. Continued enforcement will work towards reducing distracted driving and may provide information on the amount of distraction on the road network which could be used towards greater public education.

Figure 5.5 shows the injury rate per 10,000 population for 2012 to 2015 due to distraction.

Figure 5.5: Distraction Injury Collision Rate



5.4.2 Consultation

Distracted driving was another key issue raised during consultation. This feedback was an important part of highlighting distraction as a focus area. The City has an opportunity to set an example regarding distraction through their mobile phone policy for all driving staff.

5.4.3 Research

Distraction and distracted driving is a fast-growing issue in every part of the country. Distracted driving legislation was introduced in Alberta in 2011 and it continues to be a key focus area of

transportation safety groups. The growth in the use of mobile devices have been a major part in the prevalence of distracted driving. Many of the projects identified in the plan utilize work done by other groups and aim to increase their effectiveness and build upon their work.

5.4.4 Strategies and Projects

The following projects are included with a primary focus on distraction:

- Distracted Driving Strategy
    - Support Albert Transportation's campaigns addressing "Distractions"
    - Dedicate enforcement resources to undertake focused enforcement
    - Promote AMA's Family Driving Contract
    - Encourage the use of anti-distraction apps
    - Promote existing anti-distraction programs such as "Drop It and Drive"

5.5 YOUNGER DRIVERS

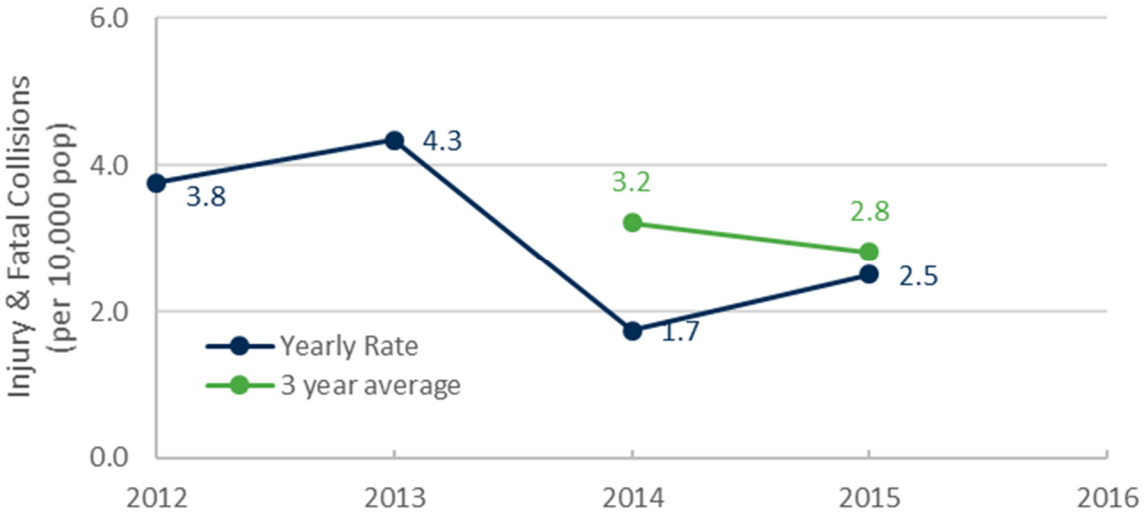
By far the highest risk group for all types of collisions (including injuries and fatalities) is drivers aged 16 to 20, followed by drivers aged 21 to 25. The risk is related to several factors, including inexperience, feelings of invincibility, higher levels of aggression, distraction caused by friends, and driving under the influence (alcohol/drug use). Strategies and projects aimed at young drivers hope to reduce this risk by:

- Building a safety consciousness from a young age.
- Safely transitioning them into becoming safe drivers.
- Understanding the risks associated with certain behaviours, by hearing from peers and victims.
- Empowering them to lead and come together to address their own issues.

5.5.1 Data

Within the City of St. Albert, young drivers (16-20 years old) were at-fault in 21% of total collisions, while this demographic represents only 7% of the population. This age group has the highest total collisions annually, with the 21-25 age group with the second highest. **Figure 5.6** shows the injury rate per 10,000 population for 2012 to 2015 due to at-fault young road users.

Figure 5.6: At-fault Young Drivers Injury Collision Rate



5.5.2 Research

The high collision rate of young drivers is well known within the safety community. Numerous programs have been undertaken to raise awareness with young drivers and attempt to reduce the collision rate. Graduated driver licensing (introduced in 2003) attempts to increase the experience of new drivers and reduce impaired driving. A number of projects under this focus area build off of work by other organizations.

5.5.3 Strategies and Projects

The following projects are included with a primary focus on young road users:

- Young Drivers Strategy
    - Enhanced education for Alberta's Graduated Licensing Program
    - Promote local Drinking/Drug and Driving Counterattack Programs
    - Collaborate with advocacy groups on youth-centred campaigns
    - Encourage the use and development of youth-friendly safe driving apps

5.6 SAFER VEHICLES

Safer vehicles can provide safety in the system independently of the human element and the road infrastructure. Strategies and projects for safer vehicles aim to:

- Educate the public about the safety features in vehicles.
- Ensure corporate vehicle fleets are crashworthy and safe.
- Prepare our roads for autonomous and connected vehicles.

5.6.1 Research

The current development of connected / autonomous vehicles has caused increased attention in this area of transportation safety and therefore, this area is still emerging. The projects account for this fact and attempt to position St. Albert to ensure awareness and preparedness.

5.6.2 Strategies and Projects

The following projects are included with a primary focus on safer vehicles:

- Autonomous & Connected Vehicles Strategies
    - Consult with other municipalities and provincial/national working groups
    - Working committee to review the potential impacts and opportunities
    - Pilot testing autonomous vehicles
    - Include consideration of autonomous vehicles in all future infrastructure planning
- Ride-hailing and Car-sharing Services Strategies
    - Develop a position, create necessary policy, and update bylaws
    - Monitor and evaluate the safety impacts

5.7 PUBLIC PARTICIPATION

The public play a vital role in influencing and improving transportation safety. Strategies and projects for public participation aim to:

- Educate the public about current and recent safety initiatives.
- Evaluate public attitudes toward safety.
- Provide tools and outlets for the public to improve safety for themselves and others.

5.7.1 Strategies and Projects

The following projects are included with a primary focus on public participation:

- Public Participation Strategy
    - Public communication/website about transportation safety and projects
    - Conduct a Knowledge, Attitudes, and Practices Survey
    - Empower crash victims as possible champions for road safety
    - Develop and promote road safety smartphone apps

5.8 TRANSPORTATION SAFETY MANAGEMENT TOOLS AND STRATEGIES

In support of the strategies and projects identified to address specific collision patterns and focus areas, a suite of overarching tools and processes to more effectively prevent all collision types are developed that will:

- Ensure that the collision data system is reliable with consistent minor and major injury definitions, accurate, and has the required functionality.
- Facilitate the collection and analysis of surrogate transportation safety data sources.
- Screen the City's transportation network for patterns and issues.
- Collect, screen and address public comments related to transportation safety.
- Provide the necessary training for staff and Council.
- Incorporate safety input at all stages of the transportation planning and design process.

Implementation of the road safety management tools may be priority; as the output and influence associated with data collection, management and network screening will require a strong base point and ultimately influence the evaluations of the strategy and projects themselves.

5.8.1 Strategies and Projects

The following projects are included that provide road safety management tools and strategies:

- Post-fatality and serious injury reviews
- In-service road safety review program
- Road network screening
- Road Safety Audits program
- System for managing public comments

- Traffic conflict data collection program
- Office of Transportation Safety
- Data Management Strategy
    - Expand collision analysis to focus on injuries
    - Link collision injury reports to health data
    - Develop a safety performance model



6.0 PLAN IMPLEMENTATION

The projects and strategies included in the Transportation Safety Plan have been identified as having the greatest potential for the City to achieve its safety vision and result in significant and lasting impacts on transportation safety within the community. Each strategy may be aligned to an existing program that could result in improvements of service delivery or evolve the programs towards enhanced safety outcomes or analytics.

An implementation strategy will be developed separately and will be a tool utilized towards project development and evaluation of the Transportation Safety Plan itself.

6.1 PRIORITIZATION

Key considerations in prioritizing strategies from the plan for implementation are associated with:

- Alignment to existing programs / processes
- Nature of the strategy to be related to a foundation for further strategy implementation (ensure the policies, processes, guidelines or data collection / management components are completed for overarching support of further actions)
- Public or stakeholder engagement

- Opportunity for alternative funding sources and timelines associated with actions to achieve funding
- Timelines of the strategy: Preference given to short-term timelines
- High benefit: Preference given to strategies expected to result in high return of collision reduction and safety influence
- Low cost: Preference given to beneficial strategies that may have “low cost” output

A summary of all the strategies and projects is provided in **Appendix D**. Estimated benefits and cost are included for each strategy and project, along with suggested implementation time frames.

6.2 GOVERNANCE

Ongoing leadership for the implementation of the Transportation Safety Plan will be critical to its success. A key component shall be that information is shared and transparent in the creation of funding requests and programs and processes are aligned with the Transportation Safety Plan, along with resulting evaluations of strategies and impacts on community safety.

This will generate confidence in a strategic and evidence-based approach and appropriate allocation of resources and allow for Council support to develop community “champions” of the Transportation Safety Plan.

The steering committee that oversaw the development of the plan is best placed to continue to steer its implementation. Benefit may be had by the acknowledgement and incorporation of the Transportation Safety Plan by other City committees (for reference or strategic alignment).

6.3 TRAINING AND STAFFING

The City is already managing several existing safety programs. In order to provide the necessary support to fully implement and expand on these programs, the need for additional staffing should be reviewed annually. Projects that may benefit from additional resources include: data collection and network screening, ongoing public and stakeholder consultation, and communication. Full implementation of the Transportation Safety Plan will include engaging and coordinating the identified transportation safety partners that are identified as the leads and support; documenting the plan’s progress; coordinating with City communications; managing the evaluation components; and reporting to the steering committee chair on a regular basis.

It will be critical for this staff to be focused on the progress of the Plan and not be involved with day-to-day traffic operational safety issues or with public or staff inquiries.

Some road agencies have developed an Office of Traffic Safety. This is presented as one of the recommended Road Safety Management strategies of this Plan.

Cities that have been successful in developing and executing transportation safety plans have allocated direct and necessary resources (human and financial) to lead and monitor the plans’

implementation. This is usually through a staged approach of planning and implementation. The paradigm shift that is required to truly support Vision Zero/Safe System begins with accepting that the responsibility for road safety should be shared by the public and the many types of decision makers and public officials who contribute to the design and management of the system. One element of the Safe System approach is that there needs to be a sustainable committee within the city comprised of representatives who contribute to the system design through their individual program areas. In St. Albert this has been formed and in the first workshop the various key department representatives shared their potential roles in improving transportation safety.

Developing the knowledge of current and future staff is essential. The city should consider joining the Canadian Association of Road Safety Professionals (CARSP) where knowledge sharing, on a variety of road safety topics, is available through webinars, monthly bulletins, the Safety Network Newsletter and its Annual Conference. Webinars are also available through the Transportation Association and the Institute of Transportation Engineers. In addition, the Traffic Injury Research Foundation is a repository for state- of-the-art research on a variety of topics.

6.4 FUNDING

Some strategies may align with existing operational or capital budget submissions and as such may be integrated and communicated within existing project charters. Information shall be provided, acknowledging the alignment to the Transportation Safety Plan and the data, cost-benefit of integrating measures into the programs.

New or separate strategies will be aligned to new proposed project charters, that will be developed through the Transportation Safety Committee and associated stakeholders and brought forward for budget consideration.

Alternative sources of funding will be sought, such as grants, or partnerships with community or industry groups. Additionally, funding sources that have been proven through other agencies experiences are aligned to the use of fines collected as a result of bylaw infractions directed towards transportation safety.

An example of this is in the City of Edmonton, where, in 2014, Edmonton City Council passed City Policy C579, the Traffic Safety and Automated Reserve (TSAER). This funding was established to address the reserve variability associated with automated traffic enforcement and to allow for the accumulation of annual traffic safety program surplus funds. This reserve funds the Office of Traffic Safety; other traffic safety programs as approved by City Council in the capital and operating budget; community infrastructure programs; and programs of the Edmonton Police Service.

6.5 COMMUNICATION

A critical piece of the Transportation Safety Plan implementation involves public participation and communication, in support of "Engagement", identified as one of the 5 E's, or strategic approaches.

Effective communications about the Plan will be required for the individual projects, as well as for the launch of the Plan, annual reporting and progress, important Council considerations, and as a component of responses to unexpected tragic incidents. This includes sustained communication of transportation safety as a core business for the City, together with their partners, emphasizing the shared societal responsibility to support the delivery of the interventions within the plan, that are required to achieve positive results.

The collaboration of transportation, communication, and enforcement representatives, along with any additional applicable stakeholders will be important to get any public communications approved. This is where the role of the transportation safety working group and steering committee will be important to vent strategies and align messaging with overall city and council priorities.

Opportunity may exist to engage with individuals, or organizations that represent individuals, directly impacted by or involved in motor vehicle incidents. Members of the public whose families have suffered as a result of such tragedy may be empowered to share their stories and reach the broader community in the hopes of influencing behaviours and safety culture over time.

Media that may be used, depending on the strategy/projects' target audience(s) and budget include:

- Webpage on the City's website
- Presentation at Council Meetings
- Social media
- St. Albert Gazette
- TV stations
- Radio (including possibly the traffic reports)
- News releases/media advisories of launches or education or enforcement blitzes

The creation of a supportive climate for the transportation safety strategy requires increased public and professional understanding that the level of acceptance of death and serious injury on roadways is disproportionate compared with the risks of other everyday activities. The aim is to decrease public acceptance of severe incident occurrences and apathy towards transportation safety and increase support for cost-effective measures to decrease the frequency and severity of fatal and serious injuries from motor vehicle collisions.

6.6 COORDINATION

Coordination is required between the City and other levels of government to take advantage of existing programs in the Edmonton Metropolitan Region and the province:

- At the provincial level:
    - The Alberta Traffic Safety Plan's traffic safety coordinator will meet regularly with the province's regional traffic safety consultant.
    - The provincial Traffic Safety Calendar should be followed, and the resources available from the province for each month should be utilized.
    - The City may wish to participate in special pilot projects, related to autonomous vehicles or the use of other new technologies, e.g. variable speed limits or other intelligent transportation system strategies. Funds for innovative projects may be available from the province.
- At the regional level:
    - The City should continue to be an active participant in CRISP initiatives and consider approaching CRISP for support on select strategies or recommendations of the Transportation Safety Plan.
    - St. Albert can partner with the City of Edmonton to offer St. Albert as a testing ground for some of its extensive innovative research. Edmonton's Office of Traffic Safety may wish to extend its research to smaller communities like St. Albert, to test the transferability of its research, or as part of a control group for cross-sectional studies.

St. Albert may also choose to become a more visible leader in transportation safety across Canada. The City was a runner-up for the Transportation Association of Canada's Road Safety Engineering Award for the Safe Journeys to School Initiative and was recently awarded the Most Innovative Municipality Award by the Vision Zero Advocate Institute. Opportunity may exist to organize a network with comparable municipalities (in terms of population, layout and/or climate), to share successes and challenges, pool resources, collaborate on research, and challenge each other towards achieving common transportation safety goals.

Opportunity may also exist for the City to collaborate with committees or research groups from the Transportation Association of Canada (TAC), Transport Research Board (TRB), Canadian Institute of Transportation Engineers, Canadian Association of Road Safety Professionals (CARSP), and the Vision Zero Network or other organizations to perform research or testing on new technologies or practices associated with safety innovation.

The City is encouraged to pursue innovation. While these measures may not always comply with published standards such as the Manual of Uniform Traffic Control Devices, it is particularly important that the rationale for these non-standard items be well documented, and that they be monitored and measured, with the assistance of academics if possible. Innovative projects that

can be proven to be successful may encourage changes in the industry and the adoption of new guidelines, especially if they support Safe System and Vision Zero principles.

6.7 MONITORING AND EVALUATION

A formalized monitoring and evaluation plan will help ensure that progress is being made and that changes can be incorporated as required. The identification of the approach to key performance indicators, targets and milestones was discussed in **Section 4.3**.

The new values of the cost of collisions to be published by CRISP can be incorporated to demonstrate the potential cost / benefits of investments.

The key components of an effective monitoring and evaluation plan are as follows:

- Compile and implement relevant and effective evaluation methods.
- Use non-collision metrics to bridge issues associated with the scarcity, delay and inaccuracies with collisions/collision data.
- Ensure “before” (baseline) data needs are identified and collected prior to strategy implementation.
- Conduct “before and after” evaluations for significant safety initiatives. Before and after evaluations based on collision data should consider at least one year (and preferably three years) of data. Before-and-after studies based on other data, such as speeds or conflicts, can be conducted just before the treatment and following an adjustment period after the treatment is implemented.
- Where appropriate, conduct cross-sectional studies. These are studies in which the safety performance at the treated location is compared to similar but untreated locations.
- Conduct public satisfaction surveys.
- Update key performance indicators for each transportation safety strategy as data availability improves.
- Prepare a spreadsheet/database for the systematic tracking and documentation of progress on the list of strategies and projects.
- Seek opportunity to collaborate on strategy statistical analysis with post secondary institutions.
- Conduct community surveys
- Undertake KAP surveys (Knowledge, Attitude and Practices) – which, unlike traditional community surveys, are focused on identifying community attitudes to major transportation safety issues; determining community perceptions and reported behaviour in key focus areas and identifying any changes in perceptions and behaviours compared with previous years.

6.8 NEXT STEPS

The Transportation Safety Plan provides an overarching vision, mission and objectives with key strategies for the City's success towards a safer community. The document is intended to be a dynamic document, with evaluation performed not only on the strategies recommended and completed, but review and updates performed on the plan itself.

With this being the City's first Transportation Safety Plan, a formal Implementation Plan will be developed, allowing for strategic integration of actions into the City's capital planning and for completion of public safety educational components that may be collaborated and expanded upon between stakeholders.

The Transportation Safety Plan targets a timeline from 2018 to 2025, with an update to be prepared prior to 2025. Evaluation of strategies and the plan itself shall be performed annually; however, the optimal evaluation of strategies shall utilize multiple years of data versus a year to year comparison. It is intended that the Plan shall be updated on a five-year time frame, with updates accounting for identification of trends, new or emerging issues, industry practices, and community priorities.

APPENDIX A: MUNICIPALITIES WITH TRANSPORTATION SAFETY PROGRAMS/PLANS

Municipalities with a Traffic Safety Program and/or Plan

Municipalities

- City of Vancouver, BC
- City of Surrey, BC
- City of Richmond, BC
- City of Kamloops, BC
- City of New Westminster, BC
- City of North Vancouver, BC
- City of Penticton, BC
- City of Airdrie, AB
- Strathcona County, AB
- City of Calgary, AB
- City of Edmonton, AB
- City of Red Deer, AB
- Town of Beaumont, AB
- City of Saskatoon, SK
- City of Winnipeg, MB
- York Region, ON
- City of Cornwall, ON
- City of Hamilton, ON
- Region of Peel, ON
- City of Ottawa, ON
- City of Toronto, ON
- City of London, ON
- City of Montreal, QC
- City of Whitehorse, YT
- Halifax Regional Municipality, NS
- City of St. John's, NL

APPENDIX B: INDUSTRY REVIEW FINDINGS SUMMARY TABLES

VISION / PHILOSOPHICAL APPROACHES

	Calgary	Edmonton	London	Montreal	Ottawa	Saskatoon	Strathcona County	Surrey	Toronto	Vancouver	Whitehorse
Vision Zero		✔		✔		✔			✔		
Variation of Vision Zero					✔			✔		✔	
Safe System	✔						✔	✔			✔
Safe Mobility	✔							✔			
Core Values or Principles	✔			✔			✔	✔		✔	

STRATEGIC APPROACHES (E'S)

	Calgary	Edmonton	London	Montreal	Ottawa	Saskatoon	Strathcona County	Surrey	Toronto	Vancouver	Whitehorse
Engineering	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Enforcement	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Education	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Evaluation	✔	✔			✔			✔		✔	✔
Enhanced Data		✔					✔		✔	✔	
Engagement	✔	✔									✔
Empathy			✔								
Emergency Service					✔						
Legislation/Advocacy						✔		✔		✔	✔

APPENDIX C: INTERNAL STAKEHOLDER FINDINGS SUMMARY

INTERNAL STAKEHOLDER CONSULTATION SUMMARY

Internal Stakeholder Questionnaire

A questionnaire was distributed to assess the City's current priority and activities and to identify the challenges that may be limiting collective progress. Responses to the questionnaire were received from:

- RCMP Traffic Services,
- Municipal Enforcement,
- Community and Social Development,
- Economic Development,
- Development Services,
- St. Albert Transit,
- Capital Projects,
- Transportation Branch – Infrastructure and Safety,
- Public Works-Infrastructure Roads,
- Parks and Open spaces,
- Planning and Development, and
- Fire Services.

All recipients rated Traffic Safety as a *high* priority and felt that the TSP would influence and benefit the City, and most indicated that it is already a primary consideration in their department's capital plans or that they knew where to look for the appropriate funding resources, both internally and externally, and that investing in the TSP would represent a better investment of some of the existing budgets.

The top traffic safety issues identified were:

- Speeding (identified by over 50%),
- Distracted Driving,
- Work Zone Safety, and
- Pedestrian/Cyclist issues.

The biggest challenges for influencing/improving traffic safety were;

1. Streets are generally designed for moving vehicles rather than pedestrians and cyclists;
2. The lack of resources (human and financial); and
3. Limited knowledge of staff and external partners regarding traffic safety.

Other challenges included the increased traffic volume and development; and the need to better engage younger community members.

The existing traffic safety culture in the city was described as a “like or hate enforcement”; that the residents wanted to be in a community where they feel safe, but often do not see their own personal role in keeping the roads safe. While traffic safety is important to road users, many still believe that traffic efficiency (the movement of traffic) is still more important.

While there was a clear understanding of the availability and value of collision data reports prepared by the Engineering Department, the potential value of data from the hospital or health unit was unknown to most departments. Finally, a particular strength of the City, which supports regional transportation and consistency, is the relationship with its neighbouring municipalities, through the Capital Region Intersection Safety Partnership (CRISP) and otherwise.

Workshop #1

A workshop with key City staff, including the RCMP and Transit, was held on June 14, 2017. This included presentations with background information and group discussions aimed at establishing the foundational elements of the TSSP. The key outcomes were as follows:

Vision
The City would like to make a statement that is bold, brings the community together and communicates the traffic safety aspirations for the City/Community. The discussions highlighted the City’s desire to provide safety for all road users and to have no injuries or deaths on its roads.

Mission
The City’s direction as to how the vision might be achieved was captured by the following values and principles:

- Proactiveness
- Innovation
- Collaboration
- Personal and shared responsibilities
- Integration
- Evidence-based
- Participation
- Sustainable
- Co-operative
- Holistic - Planning and Design

Overall Targets

Overall targets that would indicate success in achieving the Vision and Mission Overall were discussed. Numerical targets were forgone in lieu of the overall aspirational target of zero death and injuries. The question of zero injuries - or zero *serious* injuries - was left outstanding. Other targets and metrics were identified as follows:

- Speed data

- Traffic conflicts (reporting “near misses”)
- Level community engagement
- Specific monitoring of pedestrian and young driver collisions
- Public surveys following campaigns

The importance of ongoing monitoring and evaluation was fully endorsed by the attendees.

APPENDIX D: PROJECT AND STRATEGY SUMMARY

St Albert Transportation Safety Plan
Strategy and Project Sheet Summary

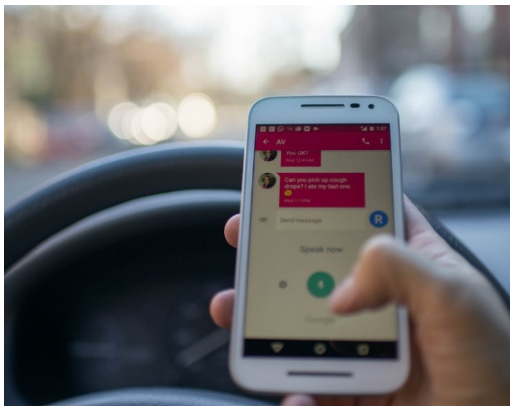
ID	Traffic Safety Strategy/Project	Time Frame				Alignment to 5 "E"s of Safety					Estimated Cost		
		Ongoing	Short (1-3 years)	Medium (3-5 years)	Long (5+ years)	Engagement	Education	Enforcement	Engineering	Evaluation	Low (<$25,000)	Moderate ($25,000 - $100,000)	High (>$100,000)
DST-S1-A	Distracted Driving Strategy - Support Albert Transportation's campaigns addressing Distractions		✔				✔				✔		
DST-S1-B	Distracted Driving Strategy - Dedicate enforcement resources to undertake focused enforcement of distracted driving		✔					✔					✔
DST-S1-C	Distracted Driving Strategy - Promote AMA's Family Driving Contract		✔				✔				✔		
DST-S1-D	Distracted Driving Strategy - Encourage the Use of Anti-Distraction Apps		✔			✔	✔				✔		
DST-S1-E	Distracted Driving Strategy - Promote Existing Anti-Distraction Programs such as "Drop It and Drive"		✔			✔	✔				✔		
INT-P1	Skid-Resistant Surfacing		✔						✔	✔		✔	
INT-P2	Modern Roundabout Program		✔			✔	✔	✔	✔	✔			✔
INT-P3	Intersection Safety Cameras		✔				✔	✔	✔	✔		✔	
INT-S1-A	Traffic Signal Operation Strategies - Adaptive Traffic Signal Control		✔				✔		✔	✔			✔
INT-S1-B	Traffic Signal Operation Strategies - Protected-only Left-Turn Phasing		✔						✔	✔		✔	
INT-S1-C	Traffic Signal Operation Strategies - Signal Visibility Improvements		✔					✔	✔		✔		
INT-S2-A	Reduce Right Turn Incidents - Implement Right Trun Smart Channels		✔			✔	✔		✔	✔			✔
INT-S2-C	Reduce Right Turn Incidents - Public Education Regarding Free-Flow Right-turn Traffic Control			✔			✔				✔		
PP-S1-A	Public Participation Strategy - Public Communication/website about traffic safety and projects		✔			✔	✔					✔	
PP-S1-B	Public Participation Strategy - Conduct a Knowledge, Attitudes, and Practices (KAP) Survey		✔			✔						✔	
PP-S1-C	Public Participation Strategy - Promote National Day of Rememberance for Road Crash Victims		✔			✔	✔				✔		
SV-S1-A	Autonomous & Connected Vehicles - Consult with Municipal, Provincial, and National Working Groups		✔			✔						✔	
SV-S1-B	Autonomous & Connected Vehicles - Pilot Testing Autonomous Vehicles in St. Albert		✔							✔	✔		
SV-S1-C	Autonomous & Connected Vehicles - Consider Autonomous Vehicles in all Future Infrastructure Planning			✔					✔		✔		
SV-S2-A	Ride-hailing and Car-sharing Services - Creaate Necessary Policy, and Update Bylaws		✔			✔	✔	✔			✔		
TSM-P1	Post-Fatality and Serious Injury Reviews		✔			✔	✔	✔	✔	✔		✔	
TSM-P2	In-Service Road Safety Review Program		✔				✔	✔	✔	✔		✔	
TSM-P3	Road Network Screening		✔						✔	✔		✔	
TSM-P4	Road Safety Audits Program		✔						✔	✔	✔		
TSM-P5	System for Managing Public Comments			✔		✔				✔		✔	
TSM-P6	Traffic Conflict Data Collection Program			✔						✔		✔	
TSM-P7	Office of Transportation Safety				✔	✔	✔	✔	✔	✔			✔
TSM-S1-A	Data Management Strategy - Expand Collision Analysis to Focus on Injuries		✔				✔			✔	✔		
TSM-S1-B	Data Management Strategy - Link Collision Injury Reports to Health Data				✔					✔		✔	
TSM-S1-C	Data Management Strategy - Develop a Safety Performance Model				✔					✔		✔	
VRU-P1	School Zones Review		✔			✔	✔	✔	✔	✔		✔	
VRU-P2	Playground Zone Review		✔			✔	✔	✔	✔	✔		✔	
VRU-P3	Pedestrian Crossing Control Warrants		✔						✔			✔	
VRU-P4	Rectangluar Rapid Flashing Beacons		✔								✔		
VRU-S1-A	Pedestrian Crosswalk Safety Strategy - Point-Pause-Proceed/ Cyclist Dismount Sign Program		✔			✔				✔	✔		
VRU-S1-B	Pedestrian Crosswalk Safety Strategy - Enhanced Road Marking in Crosswalks		✔			✔				✔	✔		
VRU-S1-C	Pedestrian Crosswalk Safety Strategy - Curb Extensions and Raised Crosswalks		✔						✔			✔	
VRU-S1-D	Pedestrian Crosswalk Safety Strategy - Leading Pedestrian Intervals		✔				✔		✔			✔	
VRU-S1-E	Pedestrian Crosswalk Safety Strategy - Pedestrian Countdown Signals and Accessible Pedestrian Signals		✔						✔		✔		
VRU-S1-F	Pedestrian Crosswalk Safety Strategy - Public Education about Visibility		✔				✔					✔	
VRU-S1-G	Pedestrian Crosswalk Safety Strategy - Prohibit Parking Near Crosswalks		✔				✔	✔	✔		✔		
VRU-S2-A	Bicycle Safety Strategy - Educational Campaign		✔				✔				✔		
VRU-S2-B	Bicycle Safety Strategy - Separated Bicycle Lanes		✔			✔	✔		✔				✔
VS-P1	Speed Display Devices		✔				✔	✔	✔		✔		
VS-P2	Gateway Treatments				✔	✔		✔	✔				✔
VS-S1-A	Safer Speeds and Speed Limits Strategy - Revise Road Classification and Design Standards		✔						✔				✔
VS-S1-B	Safer Speeds and Speed Limits Strategy - Pilot the use of Lower Speed Limits on Local Roads		✔					✔	✔			✔	
VS-S1-C	Safer Speeds and Speed Limits Strategy - Review All Posted Speed Limits		✔					✔	✔			✔	
VS-S1-D	Safer Speeds and Speed Limits Strategy - Variable Speed Limits		✔				✔	✔	✔				✔
VS-S1-E	Safer Speeds and Speed Limits Strategy - Automated Speed Enforcement Program	✔								✔			✔
VS-S1-F	Safer Speeds and Speed Limits Strategy - Neighbourhood Traffic Calming	✔				✔			✔			✔	
YD-S1-A	Young Drivers Strategy - Enhanced Education For Alberta's Graduated Licensing Program			✔			✔				✔		
YD-S1-B	Young Drivers Strategy - Promote Local Drinking/Drug and Driving Counterattack Programs			✔			✔	✔			✔		
YD-S1-C	Young Drivers Strategy - Encourage the Use and Development of Youth-Friendly Safe Driving Apps			✔		✔	✔					✔	
RSIP-1	Rail Safety Improvement Program- At grade Crossing Signage and Road Marking Improvements		✔						✔			✔	
RSIP-2	Rail Safety Improvement Program- Rail Corridor Fencing		✔						✔				✔
RSIP-3	Rail Safety Improvement Program- Access Control				✔				✔				✔

APPENDIX E: PROJECT AND STRATEGY SHEETS

Strategy Sheet: DST-S1

DISTRACTED DRIVING STRATEGIES

Focus Area: Distraction



Distracted driving has emerged as one of the most prominent road safety concerns in Canada and worldwide in the past decade. Studies show distracted drivers find it difficult to remain in an appropriate lane position, maintain a consistent following distance and speed, and have longer reaction times due to distractions. The City's website states that driver distraction contributes up to 30% of collisions, and that distracted drivers are three times more likely to be involved in a collision than an attentive driver. Distracted driving was reported in 1.1% of all collisions and 1.8% of injury collisions in St. Albert[6]. Due to the tendency for drivers to fail to admit to driving while distracted, the true percentages are undoubtedly higher than the data suggests.

Project: DST-S1-A

1. SUPPORT ALBERTA TRANSPORTATION'S CAMPAIGNS ADDRESSING DISTRACTION

The Provincial Traffic Safety Plan identifies an annual calendar with monthly focused target areas for safety campaigns. One of the month's focus areas is Distracted Driving and opportunity exists for use of information generated and distributed by the Province.

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	**Education**
Cost	Enforcement
Low	Engineering
<$25,000	Evaluation
Other Focus Areas:	Young Drivers
Focus Lead:	Communications;
Support:	Engineering, Enforcement, Alberta Transportation, School boards, Local media (newspaper)

Implementation Plan

1. Align City safety campaigns with the Provincial monthly calendar
2. Utilize Provincial safety campaign information relevant to fact sheets, and safety videos on the City website, or in public facilities.
3. Collaborate with the local Alberta Traffic Safety Consultant to align information and identify collaboration opportunity.
4. Continue the process annually, engaging with relevant stakeholders and updating data and text for messaging.

[6] Based on 2012-2015 collision data.

Project: DST-S1-B

2. DEDICATE ENFORCEMENT RESOURCES TO UNDERTAKE FOCUSED ENFORCEMENT OF DISTRACTED DRIVING

A main challenge associated with detecting distracted drivers is the sporadic, intermittent nature of distraction. Whereas drivers that are alcohol-impaired or that do not use a seatbelt are more consistently affected throughout their trip, drivers that are distracted may only be distracted for short or variable periods of time. As such, it can be difficult for police officers to detect drivers, for example as a result of window tinting, at the specific instances when drivers are distracted.

Time frame	Strategic Approach
Short	Engagement
1-3 years	Education
Cost	**Enforcement**
High	Engineering
>$100,000	Evaluation
Other Focus Areas:	Young Drivers
Focus Lead:	RCMP
Support:	Municipal Enforcement Engineering

Implementation Plan

1. Seek resources such as vehicles and equipment for RCMP officers to enhance capability of enforcing against distracted driving. This is relevant to type of vehicles and monitoring equipment that allow for visibility of driver behaviour in vehicles.
2. Perform network screening to identify incidents / locations that may be aligned to collisions involving distracted driving – for example, rear end collisions.
3. Continue joint operations enforcement activities, inclusive of distracted driving enforcement.

Project: DST-S1-C

3. PROMOTE AMA'S FAMILY DRIVING CONTRACT

The AMA has put together a Family Driving Contract that attempts to get everyone on the same page when it comes to recognizing and correcting negative driving habits, such as Distracted Driving[7].

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	**Education**
Cost	Enforcement
Low	Engineering
<$25,000	Evaluation
Other Focus Areas:	Young Drivers
Focus Lead:	Engineering
Support:	Municipal Enforcement, Communications, School Boards, Driving School, AMA Local Youth Groups

Implementation Plan

1. Investigate opportunity to align AMA information with the Provincial Safety Calendar and messaging.

Opportunity – pending resource capability

1. Provide enforcement school liaison officers with information to provide to students.
2. Partner with local driving schools to promote information to new drivers
3. Partner with elementary schools to promote information to students for information to parents

[7] http://ama.ab.ca/wp-content/uploads/2016/02/distracted-driving-family-contract.pdf

Project: DST-S1-D

4. ENCOURAGE THE USE OF ANTI-DISTRACTION APPS

Many apps are currently available that prevent sending or receiving calls when driving. This technology is very promising. Examples: *Apple.OS11* "Do Not Disturb while Driving"; *CellControlDrive ID* attaches to the windshield and works with an app to block drivers from sending or receiving messages; *Drivemode* – Android based app can read text messages aloud; *Live 2TXT*– Android based app can block incoming text messages and calls while turned on. It will be important to monitor this technology. However, the City can make its citizens and workers aware of these apps and encourage their use.

Time frame	Strategic Approach
Short (1-3 years)	Engagement
	Education
Cost	Enforcement
Low	Engineering
<$25,000	Evaluation
Other Focus Areas:	Young Drivers
Focus Lead:	Engineering
Support:	IT Community and Social Development Enforcement School Boards Driving Schools AMA Local Youth Groups

Implementation Plan

1. Monitor Provincial educational campaigns for any alignment to anti-distraction apps and notifications
2. Discuss and seek opportunities and information on available apps and notifications relevant to Distracted Driving through the Capital Region Intersection Safety Partnership (CRISP).
3. Pending results of identifying available anti-distraction apps and alignment to the Provincial Safety Calendar or partnership through CRISP - Increase awareness of the apps and benefits through educational campaigns (align with Distracted Driving month safety campaign)

Opportunity – pending resource capability

1. Increase awareness of the apps and benefits through media campaigns (align with Distracted Driving month safety campaign)
2. Collaborate with driving schools to inform new drivers of the technology and encourage the use.
3. Collaborate with schools to promote and encourage the use of the technology to students.
4. Collaborate with local registry / insurance agencies to promote use of the technology.

Project: DST-S1-E

5. PROMOTE EXISTING ANTI-DISTRACTION PROGRAMS SUCH AS "DROP IT AND DRIVE"

Due to the increasing prevalence of distraction driving via the use of mobile electronic devices, advocacy non-profit organizations have developed programs to address the issue. Drop It And Drive™ (DIAD) is a Traffic Injury Research Foundation (TIRF[8]) education program focused on preventing distraction-related road user fatalities and injuries. The focus for teen presentations[9] (grades 8-12) is to provide them with the science of 'how and why' distracted driving, and even distracted walking, is risky behaviour. It also covers the roles and responsibilities of non-drivers, as pedestrians and passengers, and how they can actively contribute to road safety through their own choices. Personal stories are shared to highlight the real consequences of a moment's distraction; it is not gory but is reality-based. At the end of the presentation they feel empowered, through increased knowledge and understanding, to be road safety ambassadors within their families, school and community.

Time frame	Strategic Approach
Short (1-3 years)	Engagement
	Education
Cost	Enforcement
Low	Engineering
<$25,000	Evaluation
Other Focus Areas:	Young Drivers
Focus Lead:	Engineering,
Support:	RCMP, Community and Social Development Driving Schools School Boards Local Youth Groups CRISP

Implementation Plan

1. Investigate the "Drop it and Drive" program
2. Pending results of investigation of the program - discuss and seek opportunities of any application and partnership with capital region partners.

[8] www.tirf.ca

[9] http://dropitanddrive.com/workshops/youth-workshops/

Strategy Sheet: INT-P1

SKID-RESISTANT SURFACING

Focus Area: Intersections

Approximately 27% of injuries in St. Albert were reported during adverse road conditions[10] (wet, snow-covered or icy). The friction between vehicle tires and the road is reduced during these conditions, requiring drivers to travel at lower speeds or start braking much earlier in order to stop at the same location. Skid-resistance surfacing can improve braking distance by improving friction.

The City has experimented with skid-resistant surfacing in the past. While testing showed improvements to braking distances, the impact on collisions or traffic signal compliance has not been formally measured.

Opportunity exists to investigate various pavement treatments, such as micro-surfacing, Stone Mastic Asphalt (SMA), and standard asphalt in relation to stopping distance and influence to safety.

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
Moderate	**Engineering**
$25,000 - %100,000	**Evaluation**
Other Focus Areas:	Vehicle Speeds
Focus Lead:	Engineering,
Partners:	Public Works



Implementation Plan

1. Research various types of pavement surface treatments for impacts in improved stopping distances and safety
2. Perform network screening and identify intersections of high rear-end collisions
3. Apply treatments at high-priority locations, align work with capital network improvements where possible.
4. Maintain the condition of treatments as required.
5. Evaluate the installations in terms of the influence on safety and collision occurrence
6. Depending on the success, expand the more cost-effective products to other locations.

[10] 160 of 603 Injury & Fatal Collisions in 2012-2015 were reported with adverse road conditions

Strategy Sheet: INT-P2

MODERN ROUNDABOUT PROGRAM

Focus Area: Intersections

Modern roundabouts have the potential to reduce injury collisions by 76%, by slowing vehicles and eliminating conflict points[11]. Single-lane roundabouts are associated with the more significant reductions due to the reduced complexity compared to multilane roundabouts. Roundabouts also offer congestion relief and vehicle emissions reduction when applied in the right context. Roundabouts also act as gateway treatments and can be attractively landscaped. Therefore, where space is available, road agencies across Canada are adopting policies to review the feasibility of converting stop-controlled or signalized intersections to roundabouts.

Time frame	Strategic Approach
Short (1-3 years)	Engagement
Cost	Education
High >$100,000	Enforcement
	Engineering
	Evaluation
Other Focus Areas:	Vehicle Speeds
Focus Lead:	Engineering
Partners:	Public Works, Emergency Services, Transit, Communications

Implementation Plan

The expanded use of roundabouts will require network analysis for feasibility of implementation and prioritization of candidate locations, with public education about roundabouts, followed by pilot installations and close monitoring. To successfully implement a Modern Roundabout program, the following phases are recommended:



1. Update engineering standards for roundabout design (TAC, FHWA)
2. In alignment with transportation network improvements, conduct an evaluation or feasibility study to identify if intersections of planned improvements could be redesigned to a roundabout
3. In alignment with new development applications, during development drawing review evaluate feasibility to integrate roundabout intersection designs

Opportunity – pending resource capability

1. Perform network screening to identify candidate locations for intersection redesign to roundabouts
2. Conduct a feasibility analysis of candidate intersection sites
3. Perform conceptual and preliminary design work to align with future network improvements

[11] [1]Rodegerdts, L., M Blogg, E. Wemple, E. Myers, M. Kyte, M. Dixon, G. List, A. Flannery, R. Troutbeck, W. Brilon, N. Wu, B. Persaud, C. Lyon, D. Harkey, D. Carter. Roundabouts in the United States. National Cooperative Highway Research Program Report 572. Transportation Research Board, National Academies of Science, Washington, D.C., 2007

Strategy Sheet: INT-P3

INTERSECTION SAFETY CAMERAS

Focus Area: Intersections

The successful deployment of intersection safety cameras (also known as "Red Light Cameras") is an important part of any signalized intersection safety strategy and is currently in effect in St. Albert, with a handful of permanent intersection safety cameras at locations on St. Albert Trail. The locations are selected by Municipal Enforcement based on collision history, following an evaluation of the site to ensure necessary provincial criteria are met.

Time frame	Strategic Approach
Short (1-3 years)	Engagement
Cost	Education
Moderate $25,000 - $100,000	Enforcement
	Engineering
	Evaluation

Other Focus Areas:	Vehicle Speeds Vulnerable Road Users
Focus Lead:	Municipal Enforcement,
Partners:	RCMP, Communications, Engineering

Intersection safety cameras (ISC) have a strong correlation with the reduction in red light violations, and consequently a reduction in right-angle collisions. ISC have led to a 20% reduction in (more severe) right-angle collisions[12]; however, rear end collision impact is dependent upon the site characteristics. While the safety impacts of intersection safety cameras in the City are anecdotally positive, the program has not been formally evaluated. An evaluation of the impacts of red-light cameras in the Province (including St. Albert) in 2014 revealed that severe collisions at intersections with red light cameras decreased by 32%[13].



Implementation Plan

1. Perform network screening to highlight intersection locations that are candidates meeting necessary criteria for Intersection Safety Camera Installations. Inclusive of safety improvements prior to enforcement activity. (Engineering)
2. Utilize Provincial Automated Enforcement Guidelines to evaluate recommended candidate sites for Intersection Safety Devices
3. Review and align objectives of the intersection safety camera program, consistent with the objectives of the Transportation Safety Plan. (Municipal Enforcement)
4. Prioritize and plan expansion of the Intersection Safety Device program

[12] Sayed, T., de Leur, P. (2006), "Evaluation of Edmonton's Intersection Safety Camera Program", Transportation Research Board Annual Conference 2007, Washington, In print for the *Transportation Research Record.*
Persaud, B., Council, F., Lyon, C., Eccles, K and Griffith, M, "A Multi-Jurisdictional Safety Evaluation of Red Light Cameras", 84th Transportation Research Board Meeting, Washington DC, 2005, pp. 1-14.
[13] AECOM, Alberta Transportation Intersection Safety Device Program – Red Light Camera Analysis (March 2014)

Strategy Sheet: INT-S1

TRAFFIC SIGNAL OPERATION STRATEGIES

Focus Area: Intersections



In constrained urban environments, improving signal operations is one of the few methods for improving safety on congested corridors. It is intuitive that the smoother the flow of traffic along an arterial, the "safer" the arterial should be. The National Cooperative Highway Research Program's Guide for Reducing Collisions at Signalized Intersections (Report 500)[14] defines one strategy as "Employ Signal Coordination". Some of the key factors for that strategy in the report included:

- Reducing the number and frequency of required stops and
- maintaining constant speeds for all vehicles can help to reduce rear-end conflicts.
- Increased platooning can create more gaps of increased length for permitted vehicle movements (such as permitted left turns and right turns on red) at intersections and result in improved intersection operation.
- Platooning will contribute to consistent vehicle speeds along a corridor, which will help reduce rear-end type crashes.

In St Albert, a significant proportion of motor vehicle collisions occur along the arterial corridors of St Albert Trail and Boudreau Road. Emphasis of signal operations may be targeted along these roadways and expanded upon throughout the city.

[14] [1] NCHRP Report 500 – Guidance for Implementation of the AASHTO Strategic Highway Safety Plan, Volume 12: A Guide for Reducing Collisions at Signalized Intersections, Transportation Research Board, 2004

Project: INT-S1-A

1. ADAPTIVE TRAFFIC SIGNAL CONTROL

The City's Transportation Master Plan (2015), identifies the need to adopt an Adaptive Signal Control system, which is a signalization strategy that dynamically optimizes signal timing plans along a corridor in real time based on measured traffic flows. This signal system would be able to adapt to the vehicles on the roadway and potentially significantly reduce rear end collisions by improving traffic flow.

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
High	Engineering
>$100,000	Evaluation
Other Focus Areas:	Vehicle Speed
Focus Lead:	Engineering
Partners:	Communications, IT

Implementation Plan

1. Complete the Intelligent Transportation Systems Strategy
2. Ensure field level traffic signal equipment can support the integration of adaptive signal control. 1st Priority = St Albert Trail
3. Install necessary field level sensors for corridor vehicle flow detection (1st Priority St Albert Trail)
4. Collect up to date traffic data to set expected parameters
5. Collect up to date data as a base point of corridor travel times, delay, vehicle emissions
6. Pilot forms of artificial intelligence and adaptive signal control systems
    a. Set predetermined criteria on how systems will be evaluated for effectiveness
7. Complete an evaluation of the artificial intelligence technologies to measure performance effectiveness and move forward with network improvements (as prioritized by need).
8. Pending results of the evaluation – expand the adaptive / smart signal applications
9. Monitor and maintain the system

Project: INT-S1-B

2. PROTECTED-ONLY LEFT-TURN PHASING

The City's installations of protected-only left-turn signal phasing in 2014, at select intersections on St. Albert Road has been highly successful with a 96 percent reduction in left-turn collisions for the applicable travel directions. Through appropriate network screening and evaluation, further candidates may be identified, and the safety improvement implemented.

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
Moderate	Engineering
$25,000 - $100,000	Evaluation
Other Focus Areas:	Vulnerable Road Users
Focus Lead:	Transportation
Partners:	Communications

Implementation Plan

1. Perform a network screen of collision occurrences at signalized intersections to identify left turn incident prone locations.
2. Conduct a protected-only left turn warrant analysis; this may be inclusive of timed increases of traffic volumes to reflect future demand based on growth or increased travel volumes.
3. From warrant analysis, identify locations that warrant the implementation of protected only left turn movements
4. Complete public media notifications of changes
5. Install protected only left turns, with notification of signal operation changes in the field
6. Monitor and evaluate effectiveness of implemented protected only left turn operations

Project: INT-S1-C

3. SIGNAL VISIBILITY IMPROVEMENTS

Limited signal visibility can be an issue during night-time or low visibility conditions and can result in red-light violations and severe injury collisions. Installing reflective borders on primary signal heads can reduce collisions by between 5 and 10 percent.[15]

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
Low	Engineering
<$25,000	Evaluation
Other Focus Areas:	-
Focus Lead:	Engineering
Partners:	Communication Public Works

Implementation Plan

1. Perform network collision screening to identify red-light violations or failure to obey traffic control collisions at signalized intersections.
    a. Prioritize network locations based on data.
2. Pilot the implementation of reflective backboards on signal heads and monitor and evaluate effectiveness in reducing collision occurrence, or increased signal compliance by drivers.
3. Implement network wide if proven effective; through a prioritized location strategy.



[15] http://trrjournalonline.trb.org/doi/abs/10.3141/2019-07

Strategy Sheet: INT-S2

REDUCE RIGHT TURN INCIDENTS

Focus Area: Intersections

Rear-end and sideswipe incidents comprise 44% of the total injury collisions in the City[16]. Several of the rear-end collisions occur in right-turning roadways, when vehicles stop to turn right and following vehicles collide with stopped vehicles. These incidents are synonymous with the right-turn geometry being incompatible with the traffic control; for example, yield control for wide turning geometry.

Project: INT-S2-A

1. SMART CHANNEL RIGHT TURN DESIGN

Several of the City's rear-end collisions occur in right-turning roadways, when vehicles stop to turn right and following vehicles collide with stopped vehicles. These incidents are synonymous with the right-turn geometry being incompatible with the traffic control; for example, yield control for wide turning geometry.

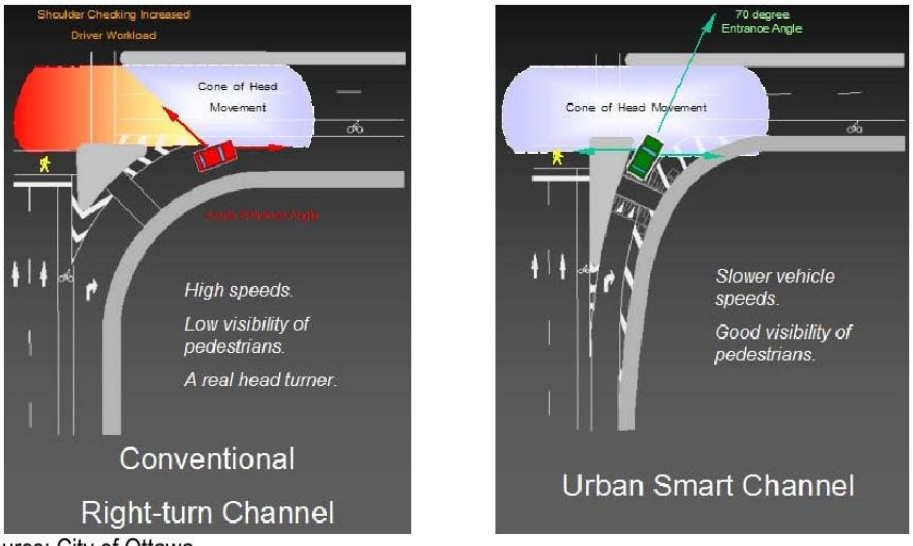
By reducing the right-turn radius and creating a "smart" right-turn channel with a smaller right-turn island, right-turn speeds are reduced and sight lines for right-turn motorists of conflicting traffic and pedestrians improve. Pilot projects in the City of Edmonton have been found to reduce collisions by 75%.

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
High	Engineering
>$100,000	Evaluation
Other Focus Areas:	Vulnerable Road Users Vehicle Speed
Focus Lead:	Engineering
Partners:	Planning and Development Communications

Implementation Plan

1. Develop Smart Channel Right Turn design standards
2. Update Municipal Engineering Standards; incorporating the Smart Channel Right Turn Design
3. Incorporate smart channel designs (as a standard) for all applicable capital project charter work
4. Design and conduct a smart channel right turn information form and education messaging - Align to safety website and messaging
5. At a top priority location construct smart channel design and perform analysis of impacts to right turn incidents

Channelized right-turn lane designed for pedestrians compared to the conventional design



Source: City of Ottawa

[16] Based on 2012-2015 collision data, 42% of all injury/fatality collisions were rear end and 2% were sideswipe – Same direction

Project: INT-S2-C

2. PUBLIC EDUCATION REGARDING FREE-FLOW RIGHT-TURN TRAFFIC CONTROL

There is a lack of public understanding and compliance with the “free-flow” right-turn lanes; for example, motorists stop when it is unnecessary. Enhanced public education about smart right-turn channels and free-flow right-turn lanes and expected driver behaviour and considerations may improve upon overall driver awareness and actions to mitigate collision occurrences.

Implementation Plan

1. Develop public education campaign / seek campaigns “in use” around appropriate behaviour for free-flow conditions
2. Utilize the City website safety page for dissemination of information – promote the safety page

Time frame	Strategic Approach
Medium	Engagement
(3-5 years)	**Education**
Cost	Enforcement
Low	Engineering
<$25,000	Evaluation
Other Focus Areas:	-
Focus Lead:	Communication
Partners:	Engineering RCMP Municipal Enforcement Driving Instruction Agencies School Boards

Strategy Sheet: PP-S1

PUBLIC PARTICIPATION STRATEGIES

Focus Area: Public Participation

A cornerstone of an effective community traffic safety program is the development of a healthy traffic safety culture shared by its members. Engaging with residents on issues, strategies and outcomes, is a key aspect of developing and strengthening the culture in St Albert. The result is a community that places value on safe mobility, makes it a priority, and actively promotes it. To be successful in the development of such a culture, the following strategies target action to ensure that residents have access to relevant information they need through convenient and multifaceted processes.



Project: PP-S1-A

1. PUBLIC COMMUNICATION/WEBSITE ABOUT TRANSPORTATION SAFETY AND PROJECTS

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
Moderate	Engineering
$25,000 - $100,000	Evaluation
Other Focus Areas:	-
Focus Lead:	Communications
Partners:	Engineering RCMP, School Boards, Alberta Transportation CRISP

The City currently has a dedicated traffic safety webpage on the City website with information relating to a number of areas such as Pedestrian Safety, Young Drivers, Distracted Driving, and Intersection Safety. The information provided on this page is valuable and should continue to be provided and updated. In order to provide the public with more knowledge of ongoing projects, the key items to communicate to the public are:

- Active Projects
- Future Projects
- Past Projects and Outcomes

Providing this information will familiarize the public with the progress made with regards to transportation safety and also provide context for many of the initiatives they may be observing throughout the city. This knowledge should help to promote a traffic safety culture in St. Albert. The website may also provide links to resources of public interest provided by other agencies, including some of those mentioned in the Transportation Safety Plan.

Implementation Plan

1. Review current relevant traffic safety information shared on the City website
    a. Confirm information shared is correct and consistent
    b. Identify and address any inaccuracies or gaps of information that may exist.
2. Engage with internal stakeholders to confirm what information they currently share, and information that may be missing; and the capability of resources to gather, compile and share information
    a. Strategize regarding the collection of “new” data or information and allocate appropriate resources to perform actions.
    b. Identify information items that may be provided from partners’ websites (if not already).
3. Identify staff leads for information gathering and messaging related to updates to the City website
4. Through the Communications group, review the layout and relevant traffic safety information on the website to connect information and make the experience of “finding” information friendly and accessible.

   a. Plan the layout of information within the City website with communications and corporate staff.
   b. Review other City's websites, identify good practices.
5. Integrate local context photos and graphics in the delivery of messages – which may require design team assistance
6. Run the adjusted website and promote its changes / updates through media messaging
7. Encourage active and vocal residents or stakeholders to refer to the website for "updates" on City projects, policies and initiatives.
   a. Monitor resident inquiries and usage of the website to influence further updates or additional information to ensure clear and concise messaging to benefit site users.

Project: PP-S1-B

2. CONDUCT A KNOWLEDGE, ATTITUDES, AND PRACTICES (KAP) SURVEY

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
Moderate	Engineering
$25,000 - $100,000	Evaluation
Other Focus Areas:	-
Focus Lead:	Engineering
Partners:	Strategic Services & Communications, RCMP, Municipal Enforcement

A KAP Survey collects information on road user Knowledge, Attitudes and Practices. It involves interviews and focus groups to glean some understanding of what the general public perceive as traffic safety issues and what their attitudes are towards "risk" on the road.

A KAP survey is a quantitative method (predefined questions formatted in standardized questionnaires) that provides access to quantitative and qualitative information. KAP surveys reveal misconceptions or misunderstandings that may represent obstacles to the activities that we would like to implement and potential barriers to behavior change. Note that a KAP survey essentially records an "opinion" and is based on the "declarative" (i.e., statements). In other words, the KAP survey reveals what was said, but there may be considerable gaps between what is said and what is done.

A KAP survey can be conducted on a specific target population (such as commercial vehicle operators, students, or seniors). Respondents are randomly selected from a complete sampling frame. The target group may share common characteristics, such as youth under 18 years old, commercial vehicle operators (here the KAP questionnaires are aimed at individuals), or a more general population, e.g. a town or village (questionnaires aimed at households). Open-ended interviews and focus groups can complement a KAP survey, allowing further exploration of a situation or problem, and potentially highlighting aspects that are not yet known. These methods combine observations and open interviews and help deepen topics addressed in the KAP survey.

The results of a KAP survey provide a gauge on how the City of St. Albert's transportation safety activities are impacting the public. Repeating the survey on a bi-annual basis will allow changes and trends to be observed.

Implementation Plan

1. Investigate opportunity for St Albert's stronger involvement in the regional traffic safety culture survey through engagement with Capital Region Intersection Safety Partnership.

Project: PP-S1-C

3. PROMOTE NATIONAL DAY OF REMEMBERANCE FOR ROAD CRASH VICTIMS

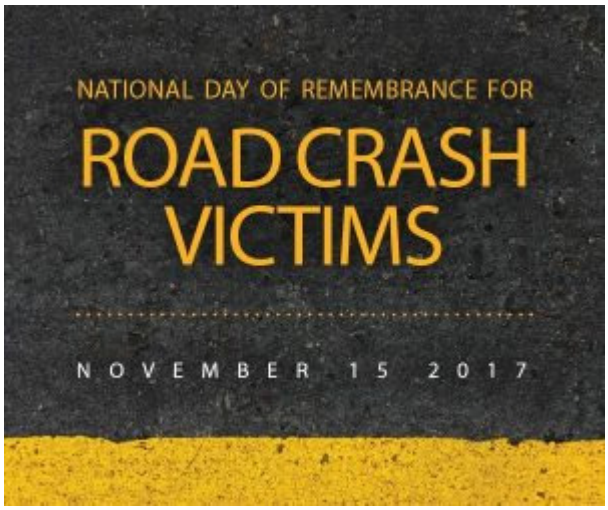
In Canada, a day in November has been designated as a National Day of Remembrance for Road Crash Victims in Canada. This is an opportunity to publicly remember the thousands of Canadian victims of traffic collisions and to acknowledge our collective responsibility in preventing serious injuries and deaths on our streets, roads and highways. It is time to speak out against the devastation caused by carelessness, recklessness and impaired judgment behind the wheel.

The City may commemorate the National Day of Remembrance for Road Crash Victims. CCMTA[17] develops tools that jurisdictions can use. City Councils can be encouraged to officially recognize this Day and hold a moment of silence. Families and friends in cities such as New York and Toronto have successfully given a "face" to road safety; these groups proclaim that no deaths on our roads are acceptable.

Time frame	Strategic Approach
Short (1-3 years)	**Engagement**
Cost	**Education**
Low	Enforcement
<$25,000	Engineering
	Evaluation
Other Focus Areas:	Young Road Users
Focus Lead:	Communications
Partners:	Engineering, Community and Social Development, CRISP, Alberta Transportation

Implementation Plan

1. Investigate messaging from the CCMTA
2. Align messaging and local context for information sharing through the City website and campaign to commemorate the National Day of Remembrance for Road Crash Victims



[17] Canadian Council of Motor Transport Administrators. http://ccmta.ca/en/

Strategy Sheet: SV-S1

AUTONOMOUS & CONNECTED VEHICLE STRATEGIES

Focus Area: Safe Vehicles



Automated and connected vehicles could represent a fundamental change in the role of automobiles, trucks and buses. The ability to operate without a driver creates the potential for significant reductions in collisions, congestion and infrastructure designs that account for human factors. When combined with advances in car sharing and vehicle pooling, entirely new modes become possible that offer affordable, on-demand mobility without the need to own a vehicle.

Current transportation planning practices assume the vehicle fleet will not change substantially in the future. However, the progress in testing fully autonomous by technology leaders (such as Google) and automakers (such a Tesla and Mercedes) suggests that these vehicles will likely be on public roads within 10 to 15 years.

Automated vehicles and driver assistance technologies (including those that already come standard with newer vehicles) have the potential to reduce crashes, prevent injuries, and save lives. Of all serious motor vehicle crashes, up to 95 percent are due to human error or human condition. Fully automated vehicles that can see more and act faster than human drivers, could greatly reduce driving errors, and the resulting crashes and injuries. Due to the significant safety benefits and implications on several aspects of mobility and lifestyle, municipalities need to stay aware of the progress that is being made and be prepared to support and incorporate forthcoming technology.

The Federal Government's Senate recently issued a much-anticipated report entitled *Driving Change: Technology and the Future of the Automated Vehicle*, on the regulatory and technical issues associated with the transition to autonomous vehicles. The Canadian Council of Motor Vehicle Transport Administrators has also developed tools and is developing national policies that will guide provincial and municipal legislation and implementation.

While the higher levels of government are responsible for most aspects of autonomous vehicles, such as vehicle standards, regulation, licensing and insurance; municipal governments will be responsible for areas such as:

- Road infrastructure
- Vehicle movement and enforcement
- Public transportation

Therefore, the suggested actions for the City of St. Albert are related to becoming involved in these discussions, assessing its level of preparedness, and identifying particular areas of interest and leadership.

Project: SV-S1-A

1. CONSULT WITH MUNICIPAL, PROVINCIAL, AND NATIONAL WORKING GROUPS

The City of St. Albert can participate in this evolution by monitoring discussions involving Transport Canada, the Provincial government, and other municipalities across Canada. Other than Transportation Association of Canada (TAC), there are also networking opportunities through Alberta Urban Municipalities Association (AUMA), Federation of Canadian Municipalities (FCM), and Canadian Institute of Transportation Engineers (CITE).

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
Moderate	Engineering
$25,000 - $100,000	**Evaluation**
Other Focus Areas:	-
Focus Lead:	Smart City
Partners:	Engineering University of Alberta Alberta Transportation City of Edmonton

Implementation Plan

1. Identity at least one national industry organization (such as TAC, ITE, CCMTA) and one municipal-based organization, such as FCM to participate in discussions with to stay fully aware of developments. Also discuss CAV with the City of Edmonton and Alberta Transportation.
2. Seek opportunity for staff participation in discussion groups and committees.

Project: SV-S1-B

3. PILOT TESTING CONNECTED VEHICLES

Further to the recommendation of the Smart Cities plan, the City may wish to serve as a pilot community for new vehicle technologies.

In Alberta, the Government of Canada contributed $3.66 million which includes $1.3 million from the Asia-Pacific Gateway and Corridor Transportation Infrastructure Fund for the ACTIVE AURORA project. Launched at the University of Alberta and led by the University of Alberta and the University of British Columbia, ACTIVE AURORA provides real-world test zones, combined with laboratory settings, where conditions can be customized to simulate various situations.

The City Council has commenced an initiative to implement a CV pilot program of I to V and V to I infrastructure, to optimize operations on St Albert Trail. Roadside equipment and vehicles are being set up, and the project is scheduled to start in 2018.

Time frame	Strategic Approach
Short	**Engagement**
(1-3 years)	Education
Cost	Enforcement
Low	Engineering
<$25,000	Evaluation
Other Focus Areas:	-
Focus Lead:	Engineering
Partners:	IT, Communications, U of A

Implementation Plan

1. Continue collaboration with the University of Alberta and Smart Centre of Transportation on the “St Albert Trail Optimization’ project that incorporates connected vehicle technology.
2. Review of the readiness of its current infrastructure to safely accommodate connected vehicles
3. Collaborate with traffic signal manufactures to prepare field level integration of upcoming technologies that will enable support for connected vehicle integration at the broader level.

Project: SV-S1-C

4. CONSIDER AUTONOMOUS VEHICLES IN ALL FUTURE INFRASTRUCTURE PLANNING

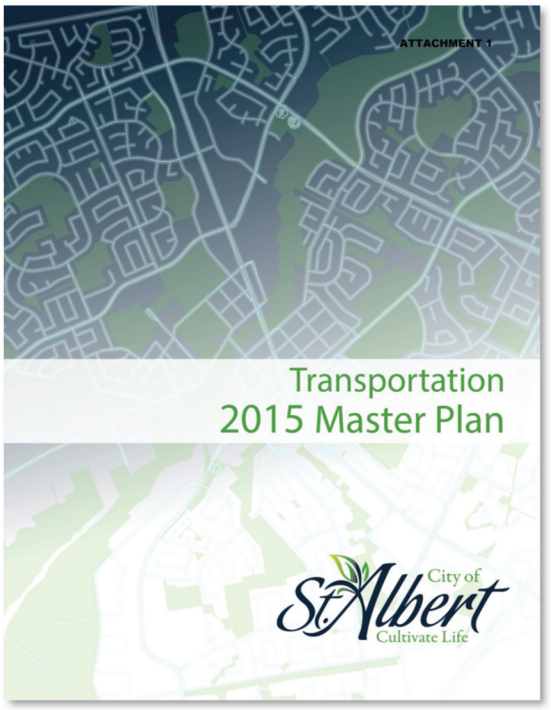
Several Canadian cities are studying how automated vehicles will impact their long-term transportation plans. Toronto's City Council has committed to review the potential of automated public transit within its municipal transit system. Calgary and Vancouver have similarly committed to studying the impact AVs can have on their transportation plans.

Because major infrastructure projects that are being designed and built now will last for 30 to 50 years or more, i.e., well into the autonomous vehicle era, we recommend that all transportation-related infrastructure projects, especially major ones, include a detailed AV impact assessment study.

Time frame	Strategic Approach
Medium	Engagement
(3-5 years)	Education
Cost	Enforcement
Low	**Engineering**
<$25,000	Evaluation
Other Focus Areas:	-
Focus Lead:	Engineering
Partners:	Planning, Economic Development U of A Alberta Transportation

Implementation Plan

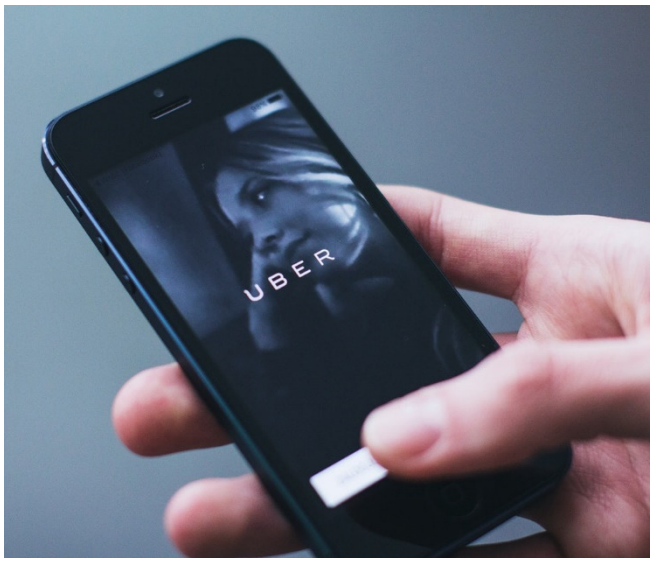
1. During the City's update of the Transportation Master Plan, integrate a review of other long-term transportation plans and consult with municipalities and Alberta Transportation regarding its revised approach to planning in the context of autonomous vehicles.
2. Appropriately incorporate connected and autonomous vehicles in the City's next update to its Transportation Master Plan.



Strategy: SV-S2

RIDE-HAILING AND CAR-SHARING SERVICE STRATEGIES

Focus Area: Safe Vehicles



There is a continued growth in the supply of, and demand for, ride-hailing and ride-sharing services in Canada, including the Capital Region. The two areas may be described as:

1) Car-sharing - refers to sharing of vehicles by passengers to reduce vehicle costs, traffic congestion and automobile emissions. It is a modern variation of carpooling, which has been in practices for several years. In recent years, companies such as ZipCar and Pogo have emerged in the Capital Region to offer the vehicles. It's common for these companies to use Smart Cars, and to rent parking spaces from the road authority. A simplistic way of describing car-sharing is as an alternative to renting a car on an hourly basis, but still driving yourself around.

2) St Albert's Vehicle for Hire bylaw (and the Alberta "Transportation Network Company Regulations") differentiate between "ride-sharing" and "ride-hailing":

   - Ride-Sharing is done through an app with pre-determined destination / routes, and they are not allowed to be "hailed" by someone on the street (i.e., it all must be done through the app). Examples are Uber / Lyft / TappCar

   - Ride-hailing is more aligned to traditional taxi services and refers to when a person hails a car and is immediately picked up and driven to their destination for a time and distance-based fee.

The use of developed Apps make it easier and convenient for customers to utilize these services, including payment. Changing lifestyles and trends in vehicle ownership convenience associated with these services are strong selling points. They are generally favourable in terms of reducing congestion and vehicle emissions; however, the safety implications are not well-understood.

The City's Smart City Plan stated that St. Albert residents are proud that the community embraces new transportation models and technologies, supporting vehicle and ride sharing models that enable more efficient use of physical assets and provide new sources of income to city residents, and serving as a national test site for emerging vehicle technologies.

Project: SV-S2-A

1. POLICY AND BYLAW UPDATES

As public transportation will start to take new forms in the future, through the shared economy and ridesharing, the City needs to prepare for that future paradigm shift.

While rideshare companies have the potential to help reduce the need for a private automobile, safety and legislative concerns continue to make it controversial in many jurisdictions. St Albert has introduced new "Vehicle for Hire" regulations into its Business Licence Bylaw, which were approved in June 2017, and came into effect on January 1st, 2018.

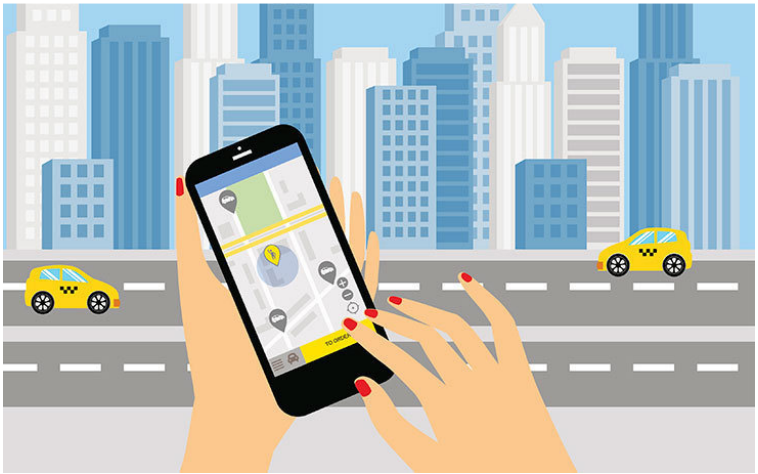
Time frame	Strategic Approach
Short (1-3 years)	Engagement
	Education
Cost	Enforcement
Low <$25,000	Engineering
	Evaluation
Other Focus Areas:	-
Focus Lead:	Business Licensing
Partners:	Communications, RCMP, Municipal Enforcement, Alberta Transportation

In May 2016, the Alberta government introduced new rules to regulate ride-hailing companies such as Uber. Until this Bill, the Province had no regulations of any kind aligned to taxi / ride sharing type businesses. Under Bill 16, anyone who wants to drive for such a company will have to have a professional Class 4 licence, commercial vehicle insurance and a satisfactory police information check.

St. Albert's "Vehicle for Hire" regulations, found in the Business Licence Bylaw, regulate ride-sharing companies as "Transportation Network Companies." The regulations require that ride-sharing businesses provide a "Transportation Network Company Certificate of Approval" from the province to prove that they are in compliance with the provincial regulations approved in Bill 16. This approach allows the City to confirm that the business is following provincial safety guidelines, while also allowing for easier inter-municipal ride-sharing services due to businesses not having to comply with multiple regulatory regimes from different levels of government.

Implementation Plan

1. Manage and maintain the City's current Bylaw regulations.
2. Be aware of relevant provincial / federal information on legislation and control of services.
3. Update bylaws as necessary



Strategy Sheet: TSM-P1

POST-FATALITY AND SERIOUS INJURY REVIEWS

Focus Area: Transportation Safety Management

When a fatality occurs in a municipality, particularly in close-knit communities such as St. Albert, it is a difficult and sensitive time. A set of objective procedures should be in place and followed to provide an objective perspective, facilitate diligent follow-up, and result in continuous learning. The RCMP follow a very well-defined and thorough process for assessing the scene, securing the crash site, and collecting facts and evidence. However, such incidents could be followed with an in-depth transportation safety review (following Canadian transportation standard practices) that may result in further identification of measures to prevent further tragedies.

A process would be inclusive of reviewing a defined "area" beyond the site of the incident, performing multiple site visits to investigate road user behaviour, and analysis of collision history that may result in immediate mitigations and longer-term improvements to both the site and other locations in the City where similar characteristics exist.

Implementation Plan

1. Develop a clear definition of a "serious injury"
2. Evaluate and revise (as required), the process followed in previous reviews.
3. Develop a plan for conducting the reviews internally or with outside assistance, or a combination.
4. Secure annual funding that can be used either for post-fatality/serious injury reviews or proactive road safety reviews
5. Communicate to the public the results of each review and the actions taken in response.
6. Monitor and perform specific network screening in follow up to actions taken to improve sites and report on impacts.
7. Evaluate and update the process (if necessary) following each review.



Strategy Sheet: TSM-P2

IN-SERVICE ROAD SAFETY REVIEW PROGRAM

Focus Area: Transportation Safety Management

Following annual road network screening (for collision occurrences and safety issue identification), it is recommended that an in-service road safety review is conducted at priority locations and corridors. An in-service road safety review consists of a specific review of the roadway geometry, collision data, site investigation of road user behaviours, and analysis of potential human factors to uncover influences contributing to the occurrence of motor vehicle collisions and the potential for injuries and conflict at the location. The result of the review is the identification of treatments to reduce injuries and collision occurrence. It also contains an economic evaluation that prioritizes improvements by the project benefit-cost over the life of the improvement.

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
Moderate	Engineering
$25,000 - $100,000	Evaluation
Other Focus Areas:	Intersections
Focus Lead:	Engineering
Partners:	RCMP, Communications

Implementation Plan

1. Review the existing Transportation Association of Canada Guidelines for In-Service Road Safety Reviews and more recent documents (such as Alberta Transportation's Methods of Reducing Collisions on Alberta Roads18 and Capital Region Intersection Safety Partnership's Safe System report19)
2. Adopt a set of guidelines consisting of a combination of the above documents. Include Safe System elements in support of this Transportation Safety Plan.
3. Adopt a process to conduct in-service road safety reviews, including the number of locations per year and the types of network locations to target or criteria used to establish priority or trigger of investigation.
4. Decide on a delivery model for in-service reviews (in-house / external
5. consultants / combination).
6. Identify the training requirements for City staff to manage or conduct the reviews.
7. Identify corridors / intersection locations via the city network screening process as candidates for in-service road safety review.
8. Allocate an annual budget to accommodate in-service reviews.
9. Following completion of an in-service review, develop an implementation plan for safety improvements, with associated project charter (funding) source.
10. After implementing the immediate improvements, conduct an evaluation to demonstrate the value of the in-service review process.

[18] http://www.transportation.alberta.ca/planningtools/Documents/Morcoar/

[19] http://drivetolive.ca/research/safe-systems/

Strategy Sheet: TSM-P3

ROAD NETWORK SCREENING

Focus Area: Transportation Safety Management

The City currently prepares annual motor vehicle collision reports entitled “St. Albert Collision Statistics”. These reports provide recognition of overall City-wide trends and a cursory road network analysis, including collision density mapping and a list of priority intersections ranked by overall collision frequency, severity and collision type. The City has also conducted in-service safety reviews of select high-collision corridors over the past several years and also implemented various safety improvements; however, there has been no definitive updates or follow-up reporting on actions taken and results of safety improvements made within these reports.

The primary benefit of road network screening is to focus improvement efforts at locations where greater reductions in injury can be achieved, and to evaluate effectiveness of actions taken. An annual collision report should be supplemented by a documented mitigation strategy that is updated through on-going network analysis and identifies impacts and results of safety improvements made to date, with further candidate locations or projects planned.

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
Moderate	**Engineering**
$25,000 - $100,000	**Evaluation**
Other Focus Areas:	Intersections
Focus Lead:	Engineering
Partners:	RCMP, Communications, Alberta Transportation, Alberta Health Services

Implementation Plan

The City can further enhance its collision network screening program and formalize a mitigation strategy as follows:

1. Seek additional applicable data collection, such as traffic volumes, pedestrian / cyclist volumes, on corridors or at intersection locations to feed into analysis.
2. Seek additional reporting capability of network safety concerns (public reports of concern, “near miss” information) to align with recorded collision incidents.
3. Account for exposure in the ranking of locations (e.g. traffic volumes) to highlight locations that may benefit the most from improvements.
4. Analyze locations separately by road classification.
5. Document the results of the network screening in the annual report.
6. Plan and budget for the completion of in-service road safety reviews at priority locations identified through the network analysis. (Align to Project TSM-P2)
7. Complete a Mitigation Strategy; identifying priority locations, mitigation measures, schedule / action plan, evaluation criteria and time frame, and actual evaluation of past improvements made.
8. Communicate to the public the action taken as a result of the annual collision statistics and network screening.
9. Communicate to the public the results of evaluation of the safety improvements made, and further candidate locations or actions planned

Strategy Sheet: TSM-P4

ROAD SAFETY AUDITS PROGRAM

Focus Area: Transportation Safety Management

Road safety audits (RSAs) refer to safety-focused multi-modal independent safety reviews conducted during the planning and design stages of new road or development projects, or temporary traffic control schemes.

In the past, RSAs have been conducted occasionally on unique or contentious projects. However, the City does not currently have a policy on when to conduct RSAs. The Transportation Association of Canada (TAC) and Alberta Transportation have both published guidelines on the procedures for conducting RSAs (including a new TAC RSA Guide for Active Transportation).

The benefits of conducting design safety audits on a more systematic basis are:

- Low cost of making safety improvements prior to construction
- Encourages development industry to take ownership of traffic safety, and safety improvements can be funded by them
- Reviews roadway elements beyond the traditional standards, including all road users and project interfaces

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
Low	**Engineering**
<$25,000	**Evaluation**
Other Focus Areas:	-
Focus Lead:	Transportation,
Partners:	Planning

Implementation Plan

1. Incorporate road safety as part of the City's new TIA guidelines
2. Develop an RSA process, identifying the types of projects for which RSAs should be conducted (e.g. projects of a certain size, complexity).
3. Pending training funding and availability, provide RSA training for conducting or managing RSAs

Strategy Sheet: TSM-P5

SYSTEM FOR MANAGING PUBLIC COMMENTS

Focus Area: Transportation Safety Management

Citizen engagement and satisfaction are important to the City. Comments from the public regarding traffic and safety are currently received by the City through various channels, such as:

- In person
- By phone (general reception or specific departments)
- By Email (general reception or specific departments)
- Via social media

Other than front desk visits or phone calls / e-mails to its general reception or to specific departments, the City's website presents contact options via social media. The City has recently completed a public participation policy[20] which outlines engagement principles and standards. For larger initiatives, opportunities are provided for the public to comment on various specific initiatives during their development – for example during the development of the Safe Journeys to School report.

For daily operational safety issues, the City has a policy to respond to comments within 48 hours. However, the process for logging, tracking and responding is relatively informal, and a significant proportion staff time for strategic or scheduled programs is taken up by various requests. While the personal touch is important and should be maintained, there are opportunities for streamlining and responding to maintain a good level of service while being more efficient, scalable and providing better documentation for both succession and evaluation purposes.

Reports of public concern or near misses also provide opportunity for network analysis in a more proactive format; capturing opportunities of improvement or consistencies of conditions resulting in potential issue(s) prior to incidents occurring. It is recommended that the City create a user-friendly format to allow residents to identify traffic safety concerns, integrating opportunity of GIS / mapping and simple and concise drop downs with additional capabilities to provide details as necessary.

Time frame	Strategic Approach
Medium (3-5 years)	**Engagement**
	Education
Cost	Enforcement
Moderate $25,000 - $100,000	Engineering
	Evaluation
Other Focus Areas:	-
Focus Lead:	IT
Partners:	Engineering, Communications



[20] https://stalbert.ca/uploads/legislative/C-CAO-20_-_Public_Participation_Policy_including_Attachment.pdf

Implementation Plan

The following will help develop and operate a system for collecting and processing traffic safety comments from the public.

1. Review current public engagement processes in detail, as relevant to traffic safety.
2. Investigate other municipality's processes for receiving and responding to public traffic safety questions / concerns
3. City process development activities:
    a. Develop criteria for what constitutes a traffic safety issue
    b. Develop a flow chart that identifies the process, the system should cover the following components:
        i. Reception of comments
        ii. Validation of the complaints
        iii. Provision of an immediate response to routine comments
        iv. Comments database and summary
        v. Protocols to handle comments
        vi. Coordination with stakeholders (RCMP, Municipal Enforcement, Engineering)
        vii. Response strategy
4. Upgrade to a management system that can accomplish the above steps in an automated manner, including typical responses (not necessarily aligned to direct individual response) and reporting trends in the public comments.
5. Develop standardized responses for the most common complaints, that can be handled by administrative staff
    a. Consider making a version of the system public so that the public can provide objective information so that concerns can be efficiently addressed.
6. Have more complex advanced complaints directed to a single source with specific traffic safety expertise, preferably a dedicated road safety staff member.
7. Provide the necessary training to implement the new system.
8. Communicate the successes of the system back to the public.

Strategy Sheet: TSM-P6

TRAFFIC CONFLICT DATA COLLECTION PROGRAM

Focus Area: Transportation Safety Management

Collision data is the most objective and robust source of traffic safety information; however, due to sources of information, manual inputting, and various stakeholders involved throughout the process, there may also be accuracy and reliability issues.

Traffic conflicts are a data source that can be used to supplement collision data. Traffic conflicts (more commonly known as “near collisions” or “close calls”) are incidents in which two road users approach the same point in time and space and evasive action on the part of one, or both, prevents a collision. The number and severity of traffic conflicts can provide insight into which movements are encountering collision risks and the contributing factors.

There are documented methods for conducting traffic conflict studies and automated video analysis tools on the market can be used. There are also documented correlations between collisions and conflicts.

Time frame	Strategic Approach
Medium	Engagement
(3-5 years)	Education
Cost	Enforcement
Moderate	Engineering
$25,000 - $100,000	Evaluation
Other Focus Areas:	Intersections Vulnerable Road Users
Focus Lead:	Engineering
Partners:	RCMP Municipal Enforcement, Communications, Alberta Transportation

Implementation Plan

1. Align traffic data conflict analysis with In-Service Road Safety Reviews at priority locations of collision occurrences
2. Pending budget approval and resource capability, conduct internal staff training regarding the traffic conflict principles and procedures.
3. Review the market for automated video-based traffic conflict tool, select a supplier and pilot it at a high collision location in the City.
4. Repeat Step 1 based on the data from the video-based tool.
5. Consider establishing a program for manual or automated traffic conflict data collection, or a combination.
6. Prepare basic guidelines and instruction for key stakeholders, such as school district staff or other special interest groups, regarding the traffic conflict collection method, so that safety concerns can be reported in a more objective manner.
7. Continue to correlate collision and conflict data on a more widespread basis and develop collision or conflict prediction models based on the correlation.
8. Integrate future network screening based on these models.

Strategy Sheet: TSM-P7

OFFICE OF TRANSPORTATION SAFETY

Focus Area: Road Safety Management

Time frame	Strategic Approach
Long (>5 years)	Engagement
Cost	Education
High	Enforcement
>$100,000	Engineering
	Evaluation
Other Focus Areas:	-
Focus Lead:	Engineering
Partners:	RCMP Municipal Enforcement Communications Alberta Transportation City of Edmonton (Office of Traffic Safety)

Some municipalities have developed an Office of Traffic Safety (OTS). An OTS can be a separate division within Transportation Engineering and Planning, or another appropriate department, consisting of multiple staff and a specific mandate. The primary purposes of an OTS are to coordinate the transportation safety activities of an agency, and to implement a Transportation Safety Plan. Having a recognized OTS makes a statement both within the corporation and to the public that transportation safety is a corporate priority. It also allows assigned staff to be focused, can justify dedicated funding, and may improve interdepartmental coordination.

The functions of the OTS would likely include:

- Conducting research of best practices.
- Monitoring and evaluating the City's progress towards achieving transportation safety targets through ongoing review of the collision data.
- Providing direction and training to other departments to implement aspects of the TSSP.
- Coordinating community engagement and developing communications messages.
- Coordinating the identified partners and successful integration of the 5 E's.
- Liaising with CRISP and the Alberta Traffic Safety Program staff.

The implementation of an Office of Transportation Safety could start with one individual, but due to the extent of activities captured in the TSP and the diversity of functions and skills required, two full-time staff would likely be required. As the City grows and transportation safety programs grow, or as the public demands more safety interventions, and the value of transportation safety investments become more recognized; there will be a need for more organizational infrastructure and interdepartmental coordination.

The increasing attention for autonomous vehicles (AV) will also likely require an additional dedicated staff member (i.e. a transportation safety plan coordinator) in the future to coordinate how the corporation addresses the transition towards AV. Current transportation safety functions can also be considered for centralization in the future, such as data management and the review of public concerns.

Implementation Plan

1. Contact the City of Edmonton Office of Traffic Safety to generate knowledge on their experiences and actions in establishing their Office of Traffic Safety.
2. Identify required resources and staging of growth or development of the Office.
    a. Identify current positions that may be incorporated into an OTS and identify resources that may be required (with expected "triggers") to move forward.
3. Establish a relationship with regional partners as related to the OTS and seek opportunity of regional collaboration or integration of a larger OTS

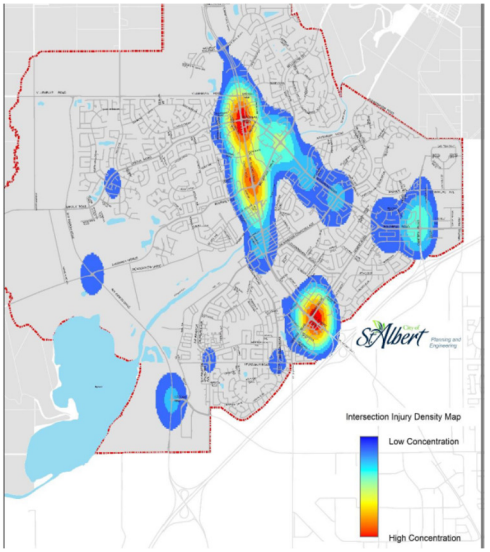
Strategy Sheet: TSM-S1

DATA MANAGEMENT STRATEGY

Focus Area: Transportation Safety Management

Data collection and management is integral to traffic safety, since traffic safety decisions should be based on evidence. The management of this data includes standards and processes for data input, review, maintenance, accessibility, usability, and analysis of data. Quality data management will enable:

- Accurate representation of collision trends, related to spatial, temporal, and causal data
- Effective monitoring and evaluation of traffic safety programs
- Reporting of crash statistics to the public
- Enhanced ability to distinguish collisions occurring on private property and on provincial roads from public city roads
- A better educated and more supportive public
- Opportunity to collaborate with regional partners on sharing Edmonton Metropolitan Area collision information



Project: TSM-S1-A

1. EXPAND COLLISION ANALYSIS TO FOCUS ON INJURIES

In support of the public health approach to road safety that the City is adopting as part of this Plan, it is suggested that the analysis be expanded to place the focus on injuries: 1) major injuries (including fatal injuries) and 2) all injuries (including minor injuries).

The analysis that is conducted for the Annual Collision Statistics report should be repeated separately for major injury collisions so that trends in the major injury collisions are accurately monitored and that the progress of the Plan with respect to all injuries and major injuries be reported on.

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
Low	Engineering
<$25,000	Evaluation
Other Focus Areas:	-
Focus Lead:	Engineering
Partners:	RCMP Municipal Enforcement Communications Alberta Transportation

Implementation Plan

1. Separate major injury collision records from minor injury collision records within the central database.
2. Perform separate data analysis on total injury collisions and major injury collisions. Where trends in major injury collisions may be statistically insignificant due to low numbers, conclusions may be drawn from the total injury database.
3. Integrate the analysis of major injuries into the Annual Collision Statistics report, within a separate section of the report.
4. Focus safety actions, communication and resources towards the mitigation of all injuries and report on program / project success or impacts in terms of both major injuries and all injuries.

Project: TSM-S1-B

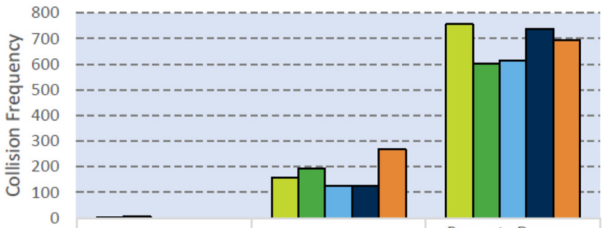
2. LINK COLLISION INJURY REPORTS TO HEALTH DATA

In the longer term, undertake a project (or participate in existing projects led by others) to link police-reported injury data to hospitalization or ambulance data. This would make it easier to separate minor from major injuries, and better to understand the causal factors for the more severe injuries. Joint data use will also provide the opportunity for the City and police to work more closely with health agencies to find out the types of information that may help reduce injury trauma in the future.

Time frame	Strategic Approach
Long (>5 years)	Engagement
	Education
Cost	Enforcement
Moderate	Engineering
$25,000 - $100,000	Evaluation
Other Focus Areas:	-
Focus Lead:	Emergency Services,
Partners:	Engineering, Communications, CRISP, Alberta Health Services

Implementation Plan

1. Engage with Alberta Health Services to determine appropriate data to track
2. Review existing initiatives - involving AHS, AT, ACICR, University of Alberta, Edmonton OTS and others - to link collision and health data and consider participating in these initiatives (including sharing the City's data for this purpose). Note, this may start as a feasibility study, to determine data availability and resource requirements for linking data on different platforms and conducting this linking analysis on an ongoing basis.



	Fatal	Injury	Property Damage Only
2012	1	155	755
2013	5	191	603
2014		124	615
2015		127	738
2016		267	694

Opportunity – pending resource capability

1. If no such projects are already underway, consider partnering with the above agencies to initiate one, using St. Albert as a pilot.
2. Once a system is set up, determine the City's role in the linking, storage and analysis of the larger database.
3. Test the system for one year to identify issues and determine the long-term sustainability of a linked database.
4. If successful, implement the linked database into the City's analysis activities, and use the results to provide more informed mitigations for traffic injury prevention and post-incident management. Work with partners in health to identify and implement recommendations in the future.

Project: TSM-S1-C

3. DEVELOP A SAFETY PERFORMANCE MODEL

To better understand the relationship between various sources of safety data, it is suggested that they be managed in a way that they all be stored in a similar way and linked where possible, with a visual interface if possible. For example, for a given location, it should be possible to call up the collision data, traffic volumes, public concerns, enforcement violations, and any traffic conflict data. The compilation of this data integrated into the City's GIS would enable more effect spatial analysis and visual representation.

The outcome would be what is commonly referred to as a safety model, in which the data sources could be used to perform predictive analysis. For example, if certain measures were proposed throughout the road network or at specific locations, the model would be able to estimate the safety impacts and sensitivity analysis could be conducted.

This process would take experiences from both St. Albert and other jurisdictions and translate them to the City's network, to use as a tool for both planning and evaluation.

Time frame	Strategic Approach
Long (>5 years)	Engagement
	Education
Cost	Enforcement
Moderate	Engineering
$25,000 - $100,000	**Evaluation**
Other Focus Areas:	-
Focus Lead:	Transportation
Partners:	Planning and Development, GIS, RCMP Municipal Enforcement Communications, City of Edmonton (OTS) CRISP Alberta Transportation

Implementation Plan

1. Identify all internal stakeholders who maintain or generate safety-related data and form a working group
2. Identify all safety-related data to include and any data overlaps. It can start with traffic control, traffic volume and collision data, but should have the capability of including information such as lane geometry and improvement history.
3. Develop the procedures and requirements for entering relevant data, such as frequency of updates, and required data format for the City's GIS.
4. Develop a standardized tool / location where the data will be stored (if not within the GIS)
5. Trial the process for a year and review its use
6. Implement the process and continue to engage with stakeholders as required
7. Provide internal training for the use of this module of the GIS, so that staff in various departments can have a greater knowledge of safety and incorporate the consideration into planning, design and operational decisions.
8. Consider making this module of the GIS available for the public to view, so that they can also have a greater knowledge of safety performance of different roadways, make informed comments and questions to City staff, and better understand the impacts of improvements over time.

Strategy Sheet: VRU-P1

SCHOOL ZONE REVIEW

Focus Area: Vulnerable Road Users

Time frame	Strategic Approach
Short (1-3 years)	Engagement
	Education
Cost	Enforcement
Moderate	Engineering
$25,000 - $100,000	Evaluation
Other Focus Areas:	Vehicle Speeds
Focus Lead:	Engineering
Support:	Municipal Enforcement Communications School Boards

The City of St. Albert currently has 28 schools, to which there are approximately 25 school zones and 17 city-managed elementary school playgrounds marked as playground zones.

The school zones feature a 30 km/h posted speed limit during the stated hours of operation. School zones are in effect from 8:00 am to 4:00 pm on school days.

These hours may not be appropriate for every school. Situations such as early arrival and after school programs result in student activity around the school outside the school zone hours. A full review of the school zone hours is recommended to be conducted to ensure zones are consistent and in effect for appropriate hours. This review should include relative arrival and departure times of schools and identification of pre and post school care. Warrants should be conducted for on-site playgrounds and alignment with playground zones should be investigated. In addition to this review, the possibility of combining school zones into playground zones and having a single reduced speed zone in St. Albert should be reviewed. Several municipalities within Alberta are also in the process of converting school zones to playground zones to extend the hours of effectiveness and make the zones applicable every day of the week and all times of the year. These municipalities include Edmonton, Red Deer, and Calgary.



Implementation Plan

1. Engage with stakeholders such as school boards and school site representatives to discuss appropriateness of school zone times (school operational hours)
2. Engage municipalities and review time frames, zone setups, processes and associated information for School Zones.
3. Assess local conditions to ensure a change is appropriate such as:
   - Number and timing of after school programs
   - Number and locations of schools without a playground
4. Summarize the information / data collected and associated results of zone requirements based on Provincial Guidelines
5. With the data collected and compiled, stakeholder feedback and final recommendations from Provincial scoring from site evaluations; provide a recommendation for School / Playground Zones and appropriate time of day.
6. Communicate proposed changes to the public
7. Update the Traffic Bylaw as required.
8. Implement the change and install consistent signage

Strategy Sheet: VRU-P2

PLAYGROUND ZONE REVIEW

Focus Area: Vulnerable Road Users

Time frame	Strategic Approach
Short (1-3 years)	Engagement
	Education
Cost	Enforcement
Moderate	Engineering
$25,000 - $100,000	Evaluation
Other Focus Areas:	Vehicle Speeds
Focus Lead:	Engineering
Partners:	Municipal Enforcement, Communications, School Boards

The City of St. Albert currently has 58 Neighbourhood play parks and 17 city-managed elementary school playgrounds. Currently the City follows Provincial Guidelines related to Playground Zones and operates with both Playground Zones (where there is a reduction of the posted speed to 30 km/hr) and Playground Areas (where there are warning signs but no reduction of roadway speed).

The Playground Zones operate with a 30 km/h posted speed limit during the Provincial hours of operation from 8:30 am to one hour after sunset, 7 days a week, every day of the year. These hours are not posted on site, and instead rely on driver awareness of provincial regulated playground hours. Having both playground zones and playground areas may create confusion and non-uniformity throughout the city, and operating playground hours tied to the sun creates uncertainty in drivers' ability to assess whether a zone is in effect; which makes enforcement more challenging.



Municipalities have been given the authority to revise the default provincial hours of effectiveness for playground zones. It is suggested that the City consider the costs and benefits of revising playground zone hours to align to a dedicated period that may reflect actual demand of playgrounds and conflict periods, coordinate with regional changes made by surrounding jurisdictions, and provide easier and direct communication on times playground zones are in effect to both residents and visitors to the community.

Further to the flexibility in establishing the times for playground zones, several municipalities within Alberta are also in the process of converting school zones to playground zones to extend the hours of effectiveness and make the zones applicable every day of the week and all times of the year.

It is suggested that St. Albert engage in conversations with these municipalities, conduct consultations, and develop an updated policy on the deployment of playground zones. This may include pilot conversions, with evaluations of the impacts on speed and collisions.

Implementation Plan

1. Engage with other communities to review current processes and zone setup
2. Perform traffic / pedestrian counts in playground zones to collect data on volumes and times of day. From data – identify when volumes of pedestrians are highest and could present conflict or risk
3. Assess local conditions by utilizing the Alberta Guidelines for Playground Zones – conduct site investigations and score each school location / roadway based on Playground Criteria.
   Make specific note of site improvements to locations that would be beneficial – for example; placement of fencing would eliminate the recommendation as a "zone".
4. Summarize the information, data and results of site investigations from Provincial Guidelines
5. With the data collected and compiled and final recommendations from Provincial scoring from site evaluations; provide a recommendation for Playground Zones and appropriate time of day.
6. Communicate proposed changes to the public and stakeholders
7. Update the Traffic Bylaw as required.
8. Implement the change

Strategy Sheet: VRU-P3

PEDESTRIAN CROSSING CONTROL WARRANTS

Focus Area: Vulnerable Road Users

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
Low	Engineering
< $25,000	Evaluation
Other Focus Areas:	Intersections
Focus Lead:	Engineering
Partners:	Communications

Pedestrian crossing controls are intended to bring awareness to drivers where pedestrian conflict points exist, and provide the required crossing opportunities for pedestrians. Warrants are prepared for the systematic and consistent application of different styles of pedestrain crossing treatments (such as an unmarked crossing, signed and marked crossing, warning flasher crossing, ½ signal crossing) across a municipality, which is critical for compliance and safety.

The Transportation Association of Canada (TAC) and other organizations provide guidelines on the warrants for each of these devices, including the RRFB and the newer designs associated with all crosswalk types.

St. Albert warrants should reference the latest version of the TAC Pedestrian Crossing Control Guide (set for spring 2018 release) and ensure that all minimum standards are adhered to; however, seek opportunity to exceed and apply warrant processes for the enhanced treatments used by the City. Conducting a review of the warrant systems will help to encourage the more consistent and context-sensitive application, primarily on the basis of pedestrian safety (including accommodations for the most vulnerable users: the elderly, the disabled and the visually- or hearing-impaired).

Automated tools can be developed for systematic use of municipal staff and consultants. Consideration of the crosswalk control practices specific to the City - including their use in conjunction with schools, fluorescent crosswalks, curb extensions and raised crosswalks - would be incorporated into the revised guidelines.



Implementation Plan

1. Obtain and evaluate the 2018 TAC Pedestrian Crossing Control Guidelines – for comparison to City Guidelines and RRFB installs
2. Update Municipal Engineering Standards as related to pedestrian crossing treatments
3. Perform network screening to identify current network pedestrian crossing conditions and alignment to updated Guidelines;
4. Prioritize crossing improvements for updating necessary locations to meet new Guidelines
5. Implement necessary improvements

Strategy Sheet: VRU-P4

RECTANGULAR RAPID FLASHING BEACONS

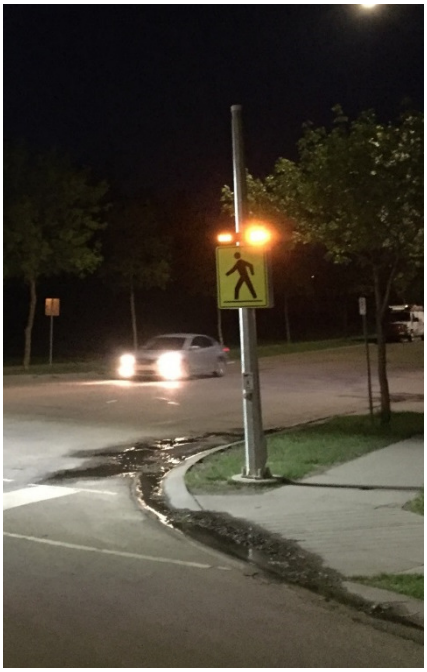
Focus Area: Vulnerable Road Users

Rectangular Rapid Flashing Beacons (RRFBs) are pedestrian-activated, high-intensity flashing beacons that warn drivers of the presence of a pedestrian using a crosswalk. RRFBs consist of two rapidly and alternately flashed rectangular amber indications having LED-array based pulsing light sources. RRFBs were approved in 2016 as a traffic control device by Transportation Association of Canada, and will be included in the updated Pedestrian Crossing Control Manual (2018, pending) and the Sixth Edition of the Manual of Uniform Traffic Control Devices for Canada (2018, pending). Recent research indicates that RRFBs have reduced pedestrian collisions by 35-50%[21]. The City of Calgary has found a YIELD compliance of above 90% at locations, and well as improved yield distances and a reduction in vehicle-pedestrian conflicts.

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
Low	Engineering
<$25,000	Evaluation
Other Focus Areas:	Vehicle Speed Distraction
Focus Lead:	Engineering
Partners	Public Works, RCMP, Communications

Implementation Plan

1. Obtain and evaluate the 2018 TAC Pedestrian Crossing Control Guidelines – for comparison to City Guidelines and RRFB installs
2. Perform network screening (aligned to Project VRU-P3), and capture what existing pedestrian crossings are candidates for RRFB installation. Note – this is following updating the City's Pedestrian Crossing Guidelines based from the TAC Guidelines
3. Where necessary, collect updated traffic and pedestrian volumes and compare to the updated pedestrian crossing warrant process.
4. Update applicable project charters for implementation of pedestrian crossing control upgrades



[21] Monsere et al, Zegeer et al, 2017

Strategy Sheet: VRU-S1

PEDESTRIAN CROSSWALK STRATEGIES

Focus Area: Vulnerable Road Users

Pedestrians are among the most vulnerable of road users, and pedestrian crosswalks are among the highest risk locations in the road network. Given the size and speed of vehicles and the lack of protection for pedestrians, collisions with pedestrians typically result in injury. Pedestrian comfort, for various ages and mobility capabilities (children, seniors, and differently abled) are also important considerations of pedestrian safety.



Project: VRU-S1-A

1. POINT-PAUSE-PROCEED / CYCLIST DISMOUNT SIGN PROGRAM

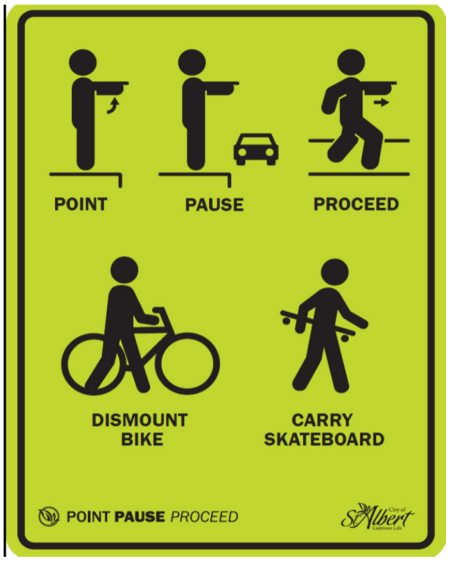
Time frame	Strategic Approach
Short	Engagement
(1-3 years)	**Education**
Cost	Enforcement
Low	Engineering
<$25,000	Evaluation
Other Focus Areas:	Intersections
Focus Lead:	Engineering
Partners:	Communication, RCMP, Cycling Clubs School Boards Youth Groups

The City of St. Albert rolled out the Point-Pause-Proceed program in 2016. The purpose of the program is to encourage pedestrians to communicate by signaling their intent to cross a roadway to drivers when crossing the road at marked or unmarked pedestrian crossings that do not operate with warning systems. During the launch of the program, a number of educational items were released including signs at crosswalks, brochures, posters, and social and print media. There are currently approximately 50 locations in the city with Point-Pause-Proceed signage.

From 2012 to 2017 (inclusive) there have been forty-six (46) cyclist related motor vehicle collisions on St Albert roadways. As is common with incidents involving an active mode road user (such as pedestrian, cyclist, skate boarder), most incidents have resulted in severe outcomes. Of the collisions that occurred in St. Albert, there were a total of forty (40) resulting injuries and one (1) fatality. This represents 89% of the incidents resulting in severe outcomes.

Opportunity exists to align messaging for both safer pedestrian behaviour with safer cyclist behaviour, it is recommended the sign program of Point, Pause and Proceed continue, but the sign design be modified to add the messaging for cyclist behaviour to dismount. Placement of signs should be targeted at:

- Marked pedestrian crossings with higher volumes of vulnerable pedestrians / cyclists (for example school zones or playground zones)
- Marked pedestrian crossing at which pedestrian / cyclist reports of concerns are received or collision occurrences have happened that could be influenced by signage.



Due to the current generally low rates of pedestrians and cyclists using point, pause and proceed or dismounting behaviour, the signage should be accompanied by further campaigns (information provided to targeted users and

available for general public (i.e., website), and this should be accompanied by messaging for the driving public to anticipate both pedestrian and cycling movements across City roadways.

Implementation Plan

1. Set criteria for placement / use of signs. Target areas include:
    - Marked pedestrian crossings, with high volumes of vulnerable users crossing the roadway
    - Marked pedestrian crossings, that have experienced pedestrian / cyclist collisions
    - Marked pedestrian crossings where public concern is reported and may be associated with improved road user behaviour - including through programs such as Neighbourhood Traffic Calming or Safe Journeys to School
    - Note – restrictions of use of the shared messaging of Point, Pause and Proceed and Cyclists Dismount exist and will be associated with the style of pedestrian crossing treatment. For example: A warning system of lights or signalized crossing may have a message for cyclists to dismount, but should not have Point, Pause and Proceed messaging.
2. Perform network review of locations that meet necessary criteria and respond as necessary to reports of public concern.
3. Through any planned or responsive maintenance of existing Point, Pause and Proceed signs in the field, replace with the new design of signage, pending appropriateness to have dual messaging.

Project: VRU-S1-B

2. ENHANCED ROAD-MARKING IN CROSSWALKS

The City of St. Albert implemented a high visibility fluorescent crosswalk program in 2016. The program consisted of the installation of high-visibility yellow material between the standard white bars on a typical zebra crosswalk. Since the launch, this treatment has been installed at approximately 40 pedestrian crossings.

Public response has been highly positive, expanding the number of installations, but no formal evaluation has been conducted of their effectiveness or public satisfaction.

Time frame	Strategic Approach
Short (1-3 years)	Engagement
	Education
Cost	Enforcement
Low	**Engineering**
<$25,000	Evaluation
Other Focus Areas:	Intersections
Focus Lead:	Engineering
Partners:	Communication

Implementation Plan

1. Align enhanced road-marking material with a treatment result from the updated Pedestrian Crossing Control Guidelines
2. Set criteria for the placement of enhanced road-marking material
3. Perform network review of locations that meet necessary criteria.
4. Apply the updated Guidelines for crossing control treatments
5. Update the Municipal Engineering Standards with road-marking treatment and criteria



Project: VRU-S1-C

3. CURB EXTENSIONS AND RAISED CROSSWALKS

Curb extensions and raised crosswalks are pedestrian safety devices that provide more defined crossing points, increase crosswalk and pedestrian visibility to motorists, reduce approach speeds, and shorten crossing distances for pedestrians. In addition, curb extensions provide greater definition of on-street parking, discourage parking near crosswalks, and may reduce driver behaviour of performing u-turns at intersections. Curb extensions are proven to reduce pedestrian collisions by 30-50%[22] and raised crosswalks are proven to reduce collisions by up to 30%[23].

Time frame	Strategic Approach
Short (1-3 years)	Engagement
Cost	Education
Moderate $25,000 - $100,000	Enforcement
	Engineering
	Evaluation
Other Focus Areas:	Vehicle Speeds
Focus Lead:	Engineering
Partners	Planning, Public Works, Emergency Services

Implementation Plan

1. Align installation of measures to Neighbourhood Traffic Calming and Safe Journeys to School
2. Engage internal stakeholders to address maintenance and other potential issues
3. Integrate curb extensions (with other traffic calming measures) into Municipal Engineering Standards
4. Monitor effectiveness of curb extensions and make changes as needed





[22] Zein, S. et al, TAC Canadian Guide for In-service Road Safety Reviews, 2004

[23] Elvik and Vaa, Handbook of Road Safety Measures, 2004

Project: VRU-S1-D

4. LEADING PEDESTRIAN INTERVALS

Leading pedestrian intervals (LPIs) allow pedestrians to begin their crossing before vehicles are permitted to enter the intersection. This increases the visibility and reduces conflicts with pedestrians crossing turning vehicles.

The City of St. Albert currently has LPIs at approximately 6 intersections. A review of safety and compliance will provide valuable information on the effectiveness of the LPIs in St. Albert.

Continued use and implementation of the leading interval will provide additional safety to pedestrian crossing at intersections. However, LPIs should be avoided at intersections with leading protected left turn phases, to avoid further conflicts.

Time frame	Strategic Approach
Short (1-3 years)	Engagement
	Education
Cost	Enforcement
Low <$25,000	**Engineering**
	Evaluation
Other Focus Areas:	Intersections
Focus Lead:	Engineering
Partners:	Communications

Implementation Plan

1. Network screening for applicable locations to utilize leading pedestrian intervals (locations cannot have advance protected left turns)
2. Establish criteria for consideration and prioritization of leading pedestrian intervals
3. At identified candidate sites, perform evaluation to establish if criteria for leading pedestrian intervals are met
4. Pending the network screening – identify if incidents involve left turning movements or right turning movements and evaluate impacts of further operational changes such as Protected Only Left Turns (See Project INT-S1-B) or No Right Turn on Red.
5. At locations meeting criteria implement leading pedestrian interval operations
6. Make information available on the City website for the rational and descriptions of leading pedestrian intervals and impacts

Project: VRU-S1-E

5. PEDESTRIAN COUNTDOWN SIGNALS AND ACCESSIBLE PEDESTRIAN SIGNALS

Pedestrian countdown signals (PCS) improve pedestrian safety by alerting pedestrians of the time remaining to complete their crossing. Accessible Pedestrian Signals (APS) provide audible information to pedestrians to assist blind or low vision pedestrians to safely cross the roadway.

Currently all traffic signals in the City have PCS while 40 of the approximately 60 signals in St. Albert have APS. APS are added at a rate of approximately three to four locations per year. The standard for all new signals includes both PCS and APS.

Continuation of the use and conversion to APS with PCS will provide pedestrians with additional safety at signalized intersections. As the technology becomes more reliable, enhancements such as Automated Pedestrian Detection (APD) should also be implemented, to provide protection regardless of compliance with push-button activation.

Time frame	Strategic Approach
Short (1-3 years)	Engagement
	Education
Cost	Enforcement
Low <$25,000	**Engineering**
	Evaluation
Other Focus Areas:	Intersections
Focus Lead:	Engineering
Partners:	Communications

Implementation Plan

1. Develop an APS standard for new installation of signals

2. Perform network assessment of current infrastructure and conditions and identify locations that are not operating with APS
3. Develop criteria and prioritize locations for installation of the APS system
4. Integrate and update the Transportation Systems Management Project Charter to install APS throughout the City through the prioritized strategy
5. Collaborate with signal manufacturers on standardizing the use of Pedestrian Countdown Timers
6. Communicate the impacts and expectations of Pedestrian Countdown timers with the operational shift of traffic signals to Adaptive Signal operations – loss of proactive countdowns – key messages on focusing on the driver indications versus countdown dependency (pending results of collaborative work with signal manufacturer)

Project: VRU-S1-F

6. PUBLIC EDUCATION ABOUT VISIBILITY

Visibility during the winter months is a concern in northern communities, such as St. Albert. The short days result in darkness and low sun for majority of the day; including peak traffic hours. Visibility is a concern for all road users, but particularly for cyclists and pedestrians - without lights or reflective clothing.

Public education campaigns run in the autumn, as days begin getting darker, can remind road users to watch out for each other. Such educational campaigns can also include distributing reflective or light-up items for pedestrians to wear on their person.

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	**Education**
Cost	Enforcement
Moderate	Engineering
$25,000 - $100,000	Evaluation
Other Focus Areas:	Intersections,
Focus Lead:	Communications
Partners:	Engineering, RCMP, Municipal Enforcement, CRISP, Schools, Cycling Groups Walking/ Running Clubs

Implementation Plan

1. Develop or integrate a public educational campaign for the autumn identifying the issue(s) and provide tips to residents – Align to the Provincial Safety Calendar

Project: VRU-S1-G

7. PROHIBIT PARKING NEAR CROSSWALKS

The current City Traffic Bylaw (Section 44K) restricts stopping within 5 metres of a crosswalk.

Pending the specific design or layout of a pedestrian crossing location, this may still be within the sight triangle in certain situations that could result in a legally parked or stopped vehicle blocking visibility of a pedestrian or a pedestrian's ability to see traffic.

It is suggested that the bylaw be changed to a minimum of 10 metres on either side of a crosswalk, and that at busier crosswalks, no stopping signs be installed a minimum of 15 metres on the near side of a crosswalk, to be consistent with the recommendations of the TAC Pedestrian Crossing Control Manual (2012).

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	**Education**
Cost	**Enforcement**
Low	**Engineering**
<$25,000	Evaluation
Other Focus Areas:	-
Focus Lead:	Engineering
Partners:	Communication, RCMP, Municipal Enforcement

Implementation Plan

1. Review the TAC Pedestrian Crossing Manual and other publications / research to assess the applicability for St. Albert.
2. Update the Traffic Bylaw to reflect the findings of the review.
3. Review site specific locations starting with high pedestrian areas and higher-class roadways.
4. Communicate and educate the public on changes.

Strategy Sheet: VRU-S2

BICYCLE SAFETY STRATEGIES

Focus Area: Vulnerable Road Users

Bicycles typically share the road with vehicles, but as a vulnerable road user, the likelihood of being injured in a collision is significantly higher[24]. The lower number of bicycles on the roadway also impacts drivers' expectation regarding the presence of bicycles. A key aspect of bicycle safety is to ensure that all road users are watching for each other, respectful and working together – sharing the roadway environment.



The current Canadian benchmark with respect to best practices for bicycle accommodation for safety is the Transportation Association of Canada (TAC) Geometric Design Guidelines for Canadian Roads (Chapter 5 - Bicycle Integrated Design).

Project: VRU-S2-A

1. EDUCATIONAL CAMPAIGNS

Where cycling facilities do not exist, bicycles must share the roadway with vehicles. In communities without a mature cycling culture, this can lead to driver frustration. A "share the road" campaign can have two primary purposes:

- Inform everyone that vehicles and bicycles should share the roadway
- Communicate to both groups to look out for each other and work together
-

Time frame	Strategic Approach
Short (1-3 years)	Engagement
	Education
Cost	Enforcement
Low	Engineering
<$25,000	Evaluation
Other Focus Areas:	Vehicles Speeds
Focus Lead:	Communications
Partners:	Engineering, RCMP, Municipal Enforcement, Cycling Groups, School Boards

While a campaign of this nature has not been specifically run by St. Albert; St. Albert drivers have been exposed to Edmonton and provincial campaigns. This campaign would be an excellent opportunity to partner with the neighbouring municipalities and run concurrent campaigns. More specialized campaigns to encourage more cycling and education can be developed over time.

[24] 1. Bicycle Injury Rate 100%, Vehicle Injury Rate 14% (2013-2015, Injury and Fatality as percent of total collision)

Implementation Plan

1. Develop or integrate a public educational campaign(s) on Bicycle Safety – Align to the Provincial Safety Calendar
   Special Note
   With regard to cyclist education and safe behaviour encouragement, there is the aligned strategy VRU-S1-A: Point, Pause, Proceed and Cyclist Dismount Sign Program, on page 113 of the Safety Plan.

Project: VRU-S2-B

3. SEPARATED BICYCLE FACILITIES

Separated bicycle lanes provide a designated space for cyclists on the roadway. There are varying levels of separation from a painted buffer to a physical barrier or vertical separation. The safety provided to the cyclists is determined by the type of facility selected; however, all facilities will reduce the vehicle and bicycle conflicts.

Introduction of separated bicycle facilities supports the recommendations of bicycle lanes identified in the Safe Journeys to School Report (2015).

In conjunction with Complete Streets design (expected Complete Streets Design Guidelines in 2018), installation of separated bicycle lanes in new development areas will allow for adequate space for preferred design of the lanes. Based on the success of the separated lanes in the new development areas, retrofit of existing roadways to include separated bicycle lanes can be explored.

Guidance for bicycle facility selection and design is provided in the Transportation Association of Canada Geometric Design Guidelines for Canadian Roads (Chapter 5 - Bicycle Integrated Design). This reference represents the current Canadian best practices for bicycle accommodate for safety.

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
High	Engineering
>$100,000	Evaluation
Other Focus Areas:	-
Focus Lead:	Engineering
Partners:	Planning and Development UDI, Development Stakeholders

Implementation Plan

1. Finalize the Complete Streets Design Guidelines
2. Update Municipal Engineering Standards to reflect the Complete Streets Design Guideline
3. Utilize the Complete Streets Design Guidelines and updated Municipal Engineering Standards for all forthcoming planning and development applications, along with new construction projects where Complete Streets may be applicable
4. As per the Transportation Master Plan recommendations, perform a network review of existing connectivity gaps for active modes.
5. Using criteria, prioritize the existing network gaps for capital work
6. Develop an Active Transportation Plan to address overall network walking and cycling accommodation and needs

Strategy Sheet: VS-P1

SPEED DISPLAY DEVICES

Focus Area: Vehicle Speeds

Time frame	Strategic Approach
Short (1-3 years)	Engagement
	Education
Cost	Enforcement
Low <$25,000	Engineering
	Evaluation
Other Focus Areas:	Vulnerable Road Users
Focus Lead:	Engineering
Partners:	RCMP Municipal Enforcement Communications

Speed display devices (or SDD's) - also commonly known as "driver/speed feedback signs" and "speed radar displays" - are growing in their deployment and their demonstrated effectiveness. This is evidenced by their inclusion in various traffic control device manuals, including the US Manual on Uniform Traffic Control Devices, and several provincial traffic control manuals and the Sixth Edition Manual of Uniform Traffic Control Devices for Canada (2018, pending).

Research by Hallmark et al (2015) indicated that speed display devices may reduce collisions by 5%; by reducing vehicle speeds and increasing driver alertness. Expected influence on driver speeds is highest immediately following installation and in direct vicinity of the signs; however, the long-term effects and impact the signs have beyond their immediate area are less certain.

The City is currently implementing speed display devices through capital programs such as Safe Journeys to School and Neighbourhood Traffic Calming.



Implementation Plan

1. Monitor and evaluate impact of installation of speed display signs, as related to site conditions "pre" and "post" installation. Note – as these devices are aligned with larger scope program delivery, the evaluation is reflective of site conditions prior and following potential multiple safety improvement actions.
2. Perform network screening to identify high speed areas and collision prone sites, that may be used to target areas of implementation.
    a. Use of the Neighbourhood Traffic Calming Criteria and Scoring may align to the evaluation of "need" to place speed display devices.
3. Review the Transportation Association of Canada (TAC) Speed Display Device Guidelines
4. Develop a warrant or installation program aligned to the TAC Speed Display Guidelines and local context / programs.
5. Compare results of the network screening that were identified as candidate sites to the TAC Guidelines and applicable developed City Guidelines. Evaluate sites and prioritize installations – based on alignment to other programs or if "stand alone" align to safety improvement and enforcement activities.

Opportunity – pending resource capability

1. Evaluate opportunity of installations aligned to enforcement sites; so that drivers who are aware of the speed limit and of their own speeds and still choose to exceed the speed limit are deserving of resulting violation fines.

Strategy Sheet: VS-P2

GATEWAY TREATMENTS

Focus Area: Vehicle Speeds

Time frame	Strategic Approach
Long (>5 years)	Engagement
	Education
Cost	Enforcement
High >$100,000	Engineering
	Evaluation
Other Focus Areas:	Vulnerable Road Users Distraction
Focus Lead:	Engineering
Partners:	Planning and Development

In 2015, 57% of collisions in St. Albert were identified as involving non St Albert residents as the "at-fault" driver, with a break down of origin of drivers being:

- 44% from City of Edmonton
- 23% from Sturgeon County

In 2016, this proportion dropped to 43%; nevertheless, it remains a significant proportion of the total collisions and indicates an area of influecne that regional traffic may have in St Albert as it comes to safety. The key corridor of St Albert Trail has the highest number of collisions involving non residents as "at-fault" drivers, followed by Boudreau Road.

While a large percentage of vehicles on St. Albert Trail are non-residents, this pattern may suggest that some of them fail to make the adequate transition from a higher-speed (rural area or big City) environment to a smaller more residential community. This pattern is consistent with research that indicates that collisions increase near urban/rural transitions.



Photo Source: Raheem Dilgir

A Gateway Treatment is a traffic calming measure that is designed to define a transition to an environment requiring a reduction in speed and an increase in attentiveness. Gateway treatments are encouraged:

- Where there is a transition in the land use (rural to suburban, or suburban to urban);
- Where the speed limit changes by 20 km/h or more; or
- Where collisions are concentrated near this transition (including collisions involving vulnerable road users).

There may be opportunity to consider installation of gateway treatments at key entrances to the City, as well as larger lower-speed areas such as the downtown core. Detailed guidelines for gateway treatments are available in the Alberta Transportation publication MORCOAR[25]: These guidelines are oriented towards rural-to-urban transitions, but can be adapted to areas within urban municipalities. Gateway treatments can be made to contain attractive features and become a source of pride for residents.

Implementation Plan

1. Review the MORCOAR guidelines for Gateway Treatments
2. Detailed analysis of the spatial analysis of collisions involving non-resident at-fault drivers
3. Identify candidate locations for installations
4. Decide on the type of gateway (e.g. containing only cross-sectional and vertical features, or also overhead features)
5. Identify other geometric or traffic control measures to implement in conjunction, e.g. speed display devices, medians
6. Pilot one or two gateways and evaluate the changes in speed nearby and impact on collisions over a larger geographic area.

[25] Methods of Reducing Collisions on Alberta Roads - http://www.transportation.alberta.ca/PlanningTools/Documents/Morcoar/MORCOAR%20Phase%202%20FINAL%20Report.pdf

Strategy Sheet: VS-S1

SAFER SPEEDS AND SPEED LIMITS

Focus Area: Vehicle Speeds



An indicator used for vehicle speed evaluation of roadways is “85 Percentile Speed”. This is the speed at or below which 85 percent of all vehicles are observed to travel under free-flowing conditions past a monitored point. Vehicle speed data is collected by the City at various sites annually.

Past recorded 85th Percentile Speeds by road classifications:

- Local Roads: All 85th percentile speeds were recorded to be within 10 km/hr of posted speed limit.
- Collector Roads: –
  - Approximately 14% of sites evaluated recorded 85th percentile speeds between 10 and 15 km/hr above the posted speed limit.
  - Approximately 4% of sites evaluated recorded 85th percentile speeds greater than 15 km/hr above the posted speed limit.
- Arterial Roads:
  - Approximately 62% of sites evaluated recorded an 85th percentile speed greater than 15 km/hr above the posted speed limit.
  - Approximately 29% of sites evaluated sites recorded 85th percentile speeds between 10 and 15 km/hr above the posted speed limit.

Speed enforcement data indicates that speed violations nearly doubled from 2014 to 2015, with a total of 52,582 speed violations recorded using traditional enforcement, plus 4,049 additional violations through intersections (measured by Intersection Safety Devices) in 2015. This is influenced in part by the technology used for enforcement, an increase in the number of cameras and coverage time; and these values are indicators of speed becoming an increasing problem.

An important part of a transportation safety program is related to how vehicle speeds are managed within the municipality. Lower speeds result in a significant lower probability of severe injury, particularly when pedestrians and cyclists are involved.

Vehicle speeds are the result of road design, speed limits and speed enforcement, among other factors. Specific projects the City can undertake in support of safer vehicle speeds are described in this section.

Project: VS-S1-A

1. REVISE ROAD CLASSIFICATION AND DESIGN STANDARDS

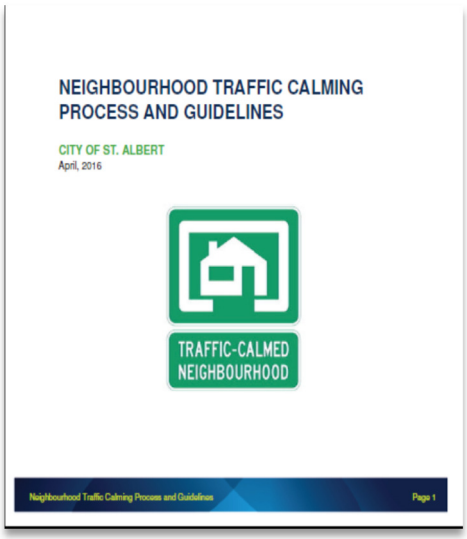
The starting point of an effective speed management program is to ensure that lower speed designs are provided for lower class roadways such as collectors and local roads. Lower speed designs include reduced lane width and curb radii. Complete street concepts, traffic-calming measures, enhanced landscaping and other pedestrian and cyclist-friendly features also encourage lower speeds.

The City proposes a revision to it's existing road classification system as part of aligning roadway function and land use within the Complete Streets Design Guidelines. The design standards associated with roadways are to be reviewed from a safety perspective and updated as required within the Municipal Engineering Standards (MES).

Time frame:	Strategic Approach
Short (1-3 years)	Engagement
Cost:	Education
High >$100,000 (aligned with full MES Updates)	Enforcement
	Engineering
	Evaluation
Other Focus Areas:	Vulnerable Road Users, Intersections
Focus Lead:	Engineering
Partners:	Planning, Public Works, Transit, Emergency Services Urban Development Institute

Implementation Plan

1. Finalize Complete Streets Design Guidelines
2. Integrate new roadway design standards from the Complete Streets Design Guidelines and Neighbourhood Traffic Calming measures into the Municipal Engineering Standards
3. Apply new design standards for new development approval and applicable capital project transportation network work
    a. Align Network Improvements (as per the 2018 Transportation Network Strategy) with use of the Complete Streets Guidelines and perform stakeholder engagement and integrate new roadway cross-section design. Example - project of North St Albert Trail





Project: VS-S1-B

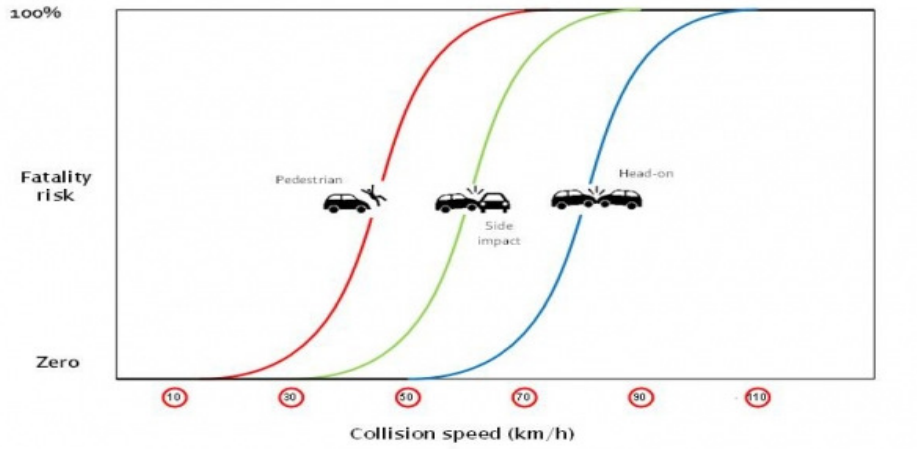
2. PILOT THE USE OF LOWER SPEED LIMITS ON LOCAL ROADS

Lower speed limits are appropriate for neighbourhood roadways, including collector and local roads. Speed limits lower than 50 km/h may be considered for these roads, given their primary function is to allow access to residential homes and the nature of use of roadways in neighbourhoods by vulnerable road users. These roads are also designed with narrower lanes and tighter curb radii at corners, and further typical land use in vicinity to these roads are playground zones and school zones.

Given the influence that vehicle travel speed has on the outcome of potential severity of motor vehicle collisions, particularly those that involve pedestrians or vulnerable road users (as per Figure 1 below), the benefit of reduced speeds is also aligned to a Safe System approach to roadway design and operations.

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	**Enforcement**
Moderate	**Engineering**
$25,000 - $100,000	Evaluation
Other Focus Areas:	Vulnerable Road Users
Focus Lead:	Engineering
Partners:	RCMP, Communication, Municipal Enforcement, Transit, Public Works, CRISP, City of Edmonton (OTS)

Figure 1: Collision Speeds and Severity Rate



Implementation Plan

1. Align piloting of reduced neighbourhood speeds with delivery of the Neighbourhood Traffic Calming program – note: any reduction is pending resident support or feedback during the traffic calming engagement process.
    a. Linking roadway redesign (with reduced design speeds) may provide greater support of adherence to reduced speed versus simply reducing posted speeds with no roadway design changes).
2. Review of best practice reports and other municipality processes aligned to reduction of neighbourhood speeds.
3. Seek engagement and collaboration with Edmonton Municipal Region partners through the Capital Region Intersection Safety Partnership (CRISP) on potential to perform more regional engagement and opportunity to time any integration of neighbourhood speed reduction regionally.
4. Perform network screening of neighbourhood level motor vehicle collisions / use information as education and engagement tools.
5. Investigate impacts of reduced neighbourhood speeds – including service delivery (such as Transit, Waste Management), anticipated travel times for residents, signage and field needs to support any changes
6. Monitor and report on vehicle travel speeds in the city / use information as education and engagement tools.

7. Pending results of Neighbourhood Traffic Calming program actions and information received from regional partners or other communities – develop a strategy on neighbourhood speed limits. Considerations involve – traffic calming / road design, city-wide or targeted areas, impact to special areas such as School or Playground Zones
    a. NOTE – this program delivery should align and be linked to Project VS-S1-C for larger network considerations.

Project: VS-S1-C

3. REVIEW ALL POSTED SPEED LIMITS

Engineered speed limits are established based on the following principles for a road segment:

- Horizontal alignment
- Average lane width
- Roadside hazards
- Pedestrian and cyclist exposure
- Pavement surface
- Intersections and driveways
- On-street parking

There are, however, additional factors that may influence a driver's decision making in travel speed:

- Road user volumes: this is related to the number of vehicles, pedestrians, cyclists
- Type(s) of vehicle(s)
- Pavement conditions
- Weather / visibility
- Adjacent land use
- Driving ability / capabilities

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	**Enforcement**
Moderate	**Engineering**
$25,000 - $100,000	Evaluation
Other Focus Areas:	Vulnerable Road Users
Focus Lead:	Engineering
Partners:	RCMP, Municipal Enforcement, Communications

A form of recognizing driver's perception of "safe speed" in comparison to the engineered posted speed is through data collection aligned to capturing 85th percentile speed (definition of 85th percentile speed is provided at the beginning of the Safer Speeds and Speed Limits Strategy Page).

A systematic method for incorporating these criteria to arrive at a speed limit value is provided in the Transportation Association of Canada (TAC) Guidelines for Establishing Posted Speed Limits. The determined value should be compared with the prevailing 85th percentile speed. Opportunity exists for the City to re-evaluate current posted roadway speeds, as per TAC guidelines, and perform an investigation into comparison of operating speeds (actual recorded speeds) with the posted speeds. This provides confirmation of appropriate engineered speeds that are also in context with local / resident behaviour and expectations.

Implementation Plan

1. Perform network screening of 85th percentile vehicle speeds on various roadways and roadway classifications.
2. Identify and compare 85th percentile speeds to the posted speed limits on the roadway.
3. Perform an updated TAC evaluation of posted speed limits throughout the City.
    a. Integrate the evaluation results of the 85th percentile speeds with posted speeds in the TAC posted speed review
    b. As a component of this investigation, seek to align opportunity of "variable speed" integration
4. Pending results of the speed review; update posted speeds within the field and via the Traffic Bylaw

Project: VS-S1-D

4. VARIABLE SPEED LIMITS

A “Variable Speed Limit” (VSL) is a variation on posted speed limit traffic control in which regulatory posted speed limits can be changed. They have been proven in leading to both safety and operational benefits. Typically, the speed limits are changed to reflect a safer driving speed along a particular road section, based on the expected or real-time conditions, such as traffic, road surface and weather conditions.

Speed limits are considered safest and most appropriate when they reflect the roadway environment. Because static speed limits are set according to ideal conditions (i.e. clear weather and free-flow traffic), they become less effective during variable conditions. Variable speed limits can provide a more real-time and accurate reflection of the prevailing conditions, and hence can improve speed limit compliance, traffic flow and traffic safety.

Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
High	Engineering
>$100,000	Evaluation
Other Focus Areas:	-
Focus Lead:	Engineering
Partners:	Municipal Enforcement, RCMP, Communications



Implementation Plan

1. Complete the network speed review (Project VS-S1-C of this strategic area)
    a. As part of the investigation, identify candidate road areas or locations that may be relevant to variable speed use.
    b. Set criteria and factors that may be involved with variable speeds
2. Review other jurisdictions experience / lessons learned / reports on use of variable speeds.
3. Pilot the use of variable speeds along a priority corridor or area and investigate impacts for safety and operations.
4. Pending results of the network review and pilot project, expand upon use of variable speeds.

Project: VS-S1-E

5. AUTOMATED SPEED ENFORCEMENT PROGRAM

An effective speed enforcement program is critical to this strategy, especially where self-regulating measures such as traffic calming devices are not present. Enforcement efforts should be focused at locations with a higher incidence of speed-related collisions and higher-severity collisions; and where compliance with the speed limit is shown to be low.

While manned enforcement is necessary, greater coverage can be achieved with an effective automated enforcement program. Existing provincial speed campaigns (both speed in general and speed in school/playground zones and unsafe speed for conditions) also offer an opportunity for the City to spread the message locally about the risks of speeding.

Time frame	Strategic Approach
Ongoing	Engagement
	Education
Cost	Enforcement
High	Engineering
>$100,000	**Evaluation**
Other Focus Areas:	Intersections, Vulnerable Road Users, Distraction, Young Road Users
Focus Lead:	Engineering
Partners:	Communication, Municipal Enforcement, Alberta Transportation, Photo Enforcement Contractor

Implementation Plan

1. Perform network screening of motor vehicle collisions and capture incidents to which speed may be an influence; identifying locations
2. Perform network screening of 85th percentile speeds and compare these to posted speed limits
3. Collaboration between Transportation and Enforcement to share information related to speed and collision occurrences and alignment of enforcement sites to prone issue locations identified.
    a. On-going information sharing and update to enforcement strategies with an “evidence based” approach to site selection
4. Evaluation on impacts of enforcement activities on speeds recorded and collisions occurrences
5. Proactive communication of direct local influence on speeds and collisions that enforcement activity has

Project: VS-S1-F

6. NEIGHBOURHOOD TRAFFIC CALMING (ONGOING)

St. Albert currently follows a Neighbourhood Traffic Calming Policy and process. These establish a uniform and consistent approach for the initiation, assessment, public engagement, implementation and evaluation of Traffic Calming requests that address vehicular speeding and excessive vehicle volumes at the neighbourhood level, within the City of St. Albert.

Time frame	Strategic Approach
Ongoing	Engagement
	Education
Cost	**Enforcement**
Within Existing Budgets	**Engineering**
	Evaluation
Other Focus Areas:	Intersections, Vulnerable Road Users, Distraction, Young Road Users
Focus Lead:	Engineering
Partners:	RCMP, Communications, Municipal Enforcement, Planning and Development, UDI, Development Community

Implementation Plan

1. Complete the pilot of Neighbourhood Traffic Calming in the communities of Erin Ridge and Erin Ridge North, following the Traffic Calming Policy and Process.
    a. Continue expansion of the program based on network screening and resident requests
2. Evaluate the effectiveness and lessons learned from running the program
    a. Operational: Monitor sites for speed, collision occurrences,
    b. Resident opinion: Engage with residents to identify perceived impacts of traffic calming and confidence in safety in the communities
3. Update the program from lessons learned and impacts of actions
    a. An example of “lessons learned” and influence on the traffic calming program is the utilization of temporary measures for a predetermined time prior to permanent installation. This allows for further resident engagement and evaluation of measures prior to capital investment.
4. Continue to support and expand upon the implementation of Neighbourhood Traffic Calming
    a. Alignment to “evidence based” target areas – use of data with public concerns
    b. Alignment to enforcement activity

Strategy Sheet: YD-S1

YOUNG DRIVERS STRATEGY

Focus Area: Young Drivers

In 2015, road users aged 16-20 years old, who represent only 7% of the City's population, were identified in 31% of motor vehicle collision occurrences as the "at-fault" driver.[26], This is the highest representation of all age groups. The over-representation of young drivers in fatal and other collision types is common in many jurisdictions; with contributing factors including: aggressive driving, distracted driving, driving under the influence, inexperience, and the ownership of sports cars.

Traditional approaches to improving young drivers safety have focused around more driver training courses. Many studies and reviews of evidence indicate that both school-based and post-license driver training consistently fail to deliver safety benefits (Roberts and Kwan 2001; Ker et al 2003)[27]. Research conducted in Sweden shows that learners who received more hours of on-road supervised driving experience subsequently had fewer crashes than learners with fewer hours. (Gregerson et.al 2003).

It is particularly important that the City empower and collaborate with young residents to develop these programs for their peers. Therefore, it should identify and collaborate with existing youth organizations, or start new groups aimed at further developing and implementing the ideas presented in this Plan.

Project: YD-S1-A

1. ENHANCED EDUCATION FOR ALBERTA'S GRADUATED LICENSING PROGRAM

Alberta's Graduated Licensing (GDL) program ensures new drivers, regardless of age, get the support, skills and experience they need to handle the complex task of driving. To further inform its youth about the program, the following initiatives may be pursued by the City:

Implementation Plan

1. Review information and link to resources on the City website, provided by the Alberta Motor Association – including a Parent Coaching Guide and a Driving Contract between parents and teens. Look for alignment of information to the Provincial Safety Calendar

Time frame	Strategic Approach
Medium	Engagement
(3-5 years)	**Education**
Cost	Enforcement
Low	Engineering
<$25,000	Evaluation
Other Focus Areas:	-
Focus Lead:	Communications
Support:	Municipal Enforcement, RCMP, CRISP, School Boards, Alberta Transportation, Alberta Motor Association

[26] based on 2012-2015 collision data

[27] www.saddalberta.com

Project: YD-S1-B

2. PROMOTE LOCAL DRINKING/DRUG AND DRIVING COUNTERATTACK PROGRAMS

Time frame	Strategic Approach
Medium	Engagement
(3-5 years)	Education
Cost	Enforcement
Low	Engineering
<$25,000	Evaluation
Other Focus Areas:	Vehicle Speeds
Focus Lead:	RCMP / Municipal Enforcement
Support:	CRISP, School Boards, AMA, School Boards, Alberta Transportation

Alcohol or drug abuse while driving remains a problem in Alberta. Programs that discourage these dangerous behaviours are available; the City, RCMP and School Districts can continue to ensure these programs reach students.

There is also a common misconception among teens that drug impairment is less serious than alcohol impairment. In some urban parts of the country, young people are more likely to "toke and drive" than they are to drink and drive.

Students Against Drunk Driving (SADD) has chapters throughout the Province, including one at Paul Kane High School in St. Albert. Other schools can be encouraged to set up chapters. Also, the City can link its website to SADD programs, or those of other advocacy groups that focus on youth road safety.

Programs should be updated to understand how to deal with drug abuse, especially with the opioid crisis and the pending legalization of marijuana.

Implementation Plan

1. Contact the Provincial Traffic Safety representative for the St Albert area and seek messaging and information
2. In alignment with the Provincial Safety Calendar; provide information and any links to resources on the City website.

Opportunity – pending resource capability

1. Contact local senior high schools to encourage areas of engagement and collaboration.
    a. Emphasize engagement and leading actions by students / for students.
2. Seek community champions and engage on opportunities for messaging and information sharing.

Project: YD-S1-C

3. ENCOURAGE THE USE OF YOUTH-FRIENDLY SAFE DRIVING APPS

In-vehicle monitoring technologies installed in the vehicles of young drivers are designed to prevent risky behaviours, either by restricting speeds, locking out certain functions (such as the radio) or deterring risky behaviour by triggering a report to be sent to parents if a driving violation is committed. For example, TIRF's Young and New Driver Centre is currently developing a section on "In-vehicle monitoring" which is showing promise as a tool to reduce the risk of teen/young drivers.

Time frame	Strategic Approach
Medium	Engagement
(3-5 years)	Education
Cost	Enforcement
Moderate	Engineering
$25,000 - $100,000	Evaluation
Other Focus Areas:	-
Focus Lead:	Smart City
Support:	Communications, Engineering, RCMP Municipal Enforcement, Community and Social Development, IT/Technical Services, CRISP, City of Edmonton (OTS), Alberta Transportation, AMA

Implementation Plan

1. Identify stakeholders that are developing or encouraging safe driving apps regionally and nationally
2. Through the Capital Region Intersection Safety Partnership or other initiatives, seek sharing opportunities with stakeholders
3. Obtain information, research, and emerging trends relating to safe driving apps
4. Through the Capital Region Intersection Safety Partnership, seek opportunity to partner with stakeholders in the promotion of apps

Strategy Sheet: RSIP

RAIL SAFETY IMPROVEMENT PROGRAM

Focus Area: Intersections and Vulnerable Road Users

There is approximately 8.3 km of rail corridor that exists within the City boundaries on the west side of the City, that includes eight at grade rail crossings. The rail line is operated and maintained by CN Rail; however, its integration with the larger transportation network and resulting conflict points between train movement and road users (vehicles and pedestrians) and potential risk that is involved in daily rail activities makes it an area to target to maintain the safety record that the City currently holds. Although there have been limited collision occurrences in the City, there have been multiple actions taken in the past, and further actions planned for the future, to ensure the rail crossings and corridor are safe.

Actions completed in the past have been inclusive of performing rail corridor and at grade crossing safety assessments. Results of assessments performed in 2012 were improved at grade crossing warning systems being installed at multiple sites along the corridor; where warning lights and crossing arms were installed for both vehicle and pedestrian protection.

Further corridor and crossing safety assessments were conducted in 2015 which provided recommendations for the rail line and crossings to meet updated "At Grade Rail Crossing Standards" (2014), while also considering the City's objective to ascertain support for whistle cessation. The fundamental objectives of the safety assessments were:

- Observe existing crossing conditions with special attention to trespassing
- Reduce collision risk within the grade crossing environment
- Minimize the frequency and severity of preventable crashes
- Consider the safety of grade crossing users
- Verify compliance with appropriate technical standards
- Ensure that collision mitigation measures / factors aimed to eliminate or reduce the identified safety problems are considered, evaluated and documented for review /action by the appropriate authorities

Project: RSIP-1

1. AT-GRADE CROSSING SIGNAGE AND ROAD MARKINGS IMPROVEMENTS

Signage and road markings located at grade crossings of the rail line provide advance warning, notification and direction to road users. Slight amendments occurred in signage placement and road marking applications in the 2014 standards update and as such, work is required to relocate signage and markings for distance and spacing while also ensuring these devices are in good condition.

Implementation Plan

1. Review safety assessment recommendations aligned to all signage and road marking activity.
2. Perform recommendations.
3. Perform condition assessments and maintain all signage and road markings



Time frame	Strategic Approach
Short	Engagement
(1-3 years)	Education
Cost	Enforcement
Moderate	**Engineering**
$25,000 - $100,000	Evaluation
Other Focus Areas:	-
Focus Lead:	Engineering
Support:	CN Rail

Project: RSIP-2

2. RAIL CORRIDOR FENCING

At various sites along the rail corridor, there is evidence of routine trespassing. This behaviour generates unnecessary risk and is completely preventable. While there have not been occurrences of direct train-pedestrian incidents in the City, the outcome of severity of such an occurrence is such that proactive measures to prevent this conflict is an important aspect to the overall safety of rail operations.

Transport Canada, through it's Rail Safety Improvement Program (RSIP) provides opportunity for municipalities to achieve federal funding towards rail safety improvement projects. In 2018, St Albert was successful in receiving a federal grant to be applied specifically towards corridor fencing.

Time frame	Strategic Approach
Short (1-3 years)	Engagement
Cost	Education
High >$100,000	Enforcement
	Engineering
	Evaluation
Other Focus Areas:	-
Focus Lead:	Engineering
Support:	CN Rail

Implementation Plan

1. Perform rail corridor investigations – identifying rail right of way, current / existing barriers preventing trespassing, constraints for fencing placement, priority areas of trespassing occurrence.
2. Design fencing – ensure non-mountable, account for access for maintenance (corridor and fencing maintenance), account or investigate wildlife accommodation / protection
3. Prioritize fencing placement
4. Install fencing based on prioritized needs





Project: RSIP-3

3. ACCESS CONTROL

Time frame	Strategic Approach
Long	Engagement
(>5 years)	Education
Cost	Enforcement
High	Engineering
>$100,000	Evaluation
Other Focus Areas:	-
Focus Lead:	Engineering
Support:	CN Rail Transport Canada

Two access locations adjacent to the rail corridor were identified through the safety assessments as concerns due to proximity and impact to the rail line and at grade crossings:

1) Riel Drive commercial access immediately west of the Riel Drive / Sir Winston Churchill Avenue intersection rail crossing.
2) Meadowview ball diamonds access, immediately west of the Meadowview Drive / Mission Avenue intersection rail crossing.

The impacts of these existing access points are the proximity to the rail crossing and the risk of vehicles queuing over the rail line. Both sites are “all access”, meaning vehicles can enter and exit by both right turn and left turn movements. A vehicle accessing the site by turning left must yield to oncoming and as such, pending opposing traffic volume, vehicles may stop and be lined up across the tracks behind the turning vehicle.

Implementation Plan

1. Submit applications for Federal RSIP funding to address engineering / design and construction actions to improve the design of the access sites.
2. Pending results of RSIP Grant applications, perform design work
3. Pending results of RSIP Grant applications, perform necessary construction work



