Second Draft Report

Road Safety Strategy

City of Saint John
Transportation Strategic Plan Phase 3

Prepared for City of Saint John
by IBI Group

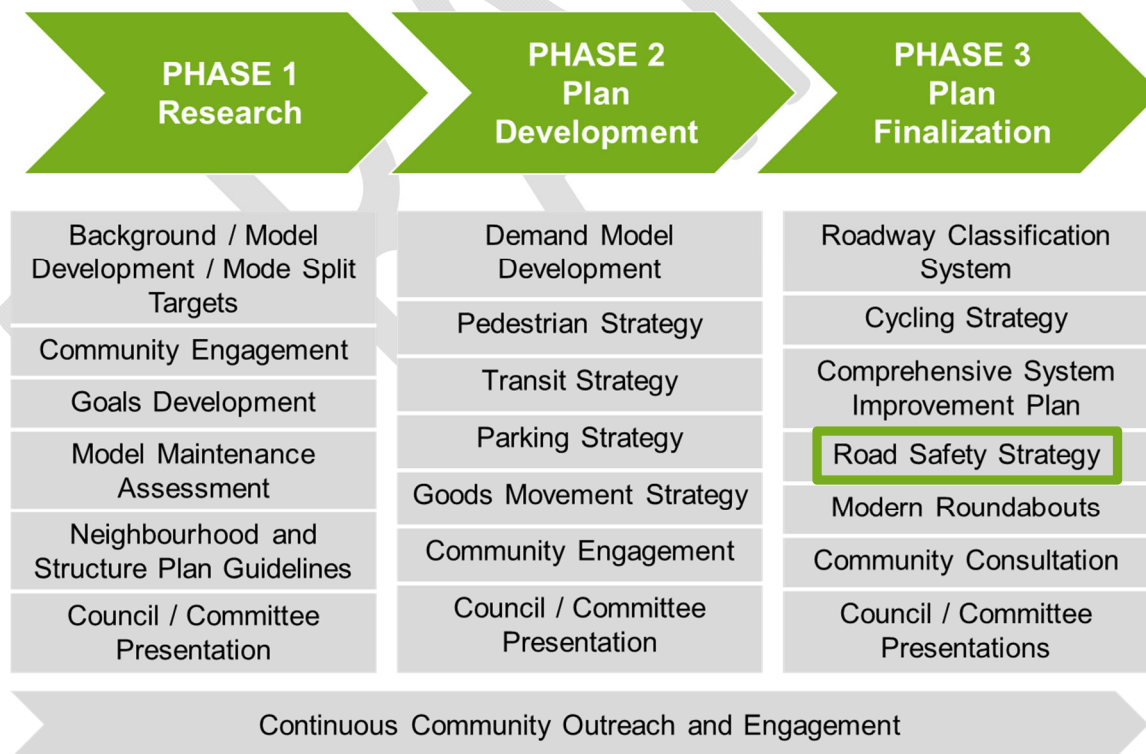October 30, 2020

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1   Introduction

The City of Saint John is preparing a transportation strategic plan (MoveSJ) that is being completed in three phases (research, plan development, and plan finalization). MoveSJ aims to quantify existing conditions and recommend improvements to the transportation system over a 25 year horizon. The primary objectives of MoveSJ are to guide the growth of an integrated multi-modal transportation system, taking into account unique road users such as pedestrians, cyclists, public transit users, and truckers, among others. MoveSJ also strives to provide a safe, efficient, and accessible network for all who live and work in the City of Saint John.

As part of the project's third phase, this report summarizes the Road Safety Strategy (RSS). The emphasis of this strategy is on providing overall best practices for improving the safety of all road users, as well as highlighting how safety can be interwoven with the other strategies and initiatives being put forward. **Exhibit 1-1** provides further details regarding the MoveSJ project framework.

Exhibit 1-1: MoveSJ Planning Process

PHASE 1 Research	PHASE 2 Plan Development	PHASE 3 Plan Finalization
Background / Model Development / Mode Split Targets	Demand Model Development	Roadway Classification System
Community Engagement	Pedestrian Strategy	Cycling Strategy
Goals Development	Transit Strategy	Comprehensive System Improvement Plan
Model Maintenance Assessment	Parking Strategy	Road Safety Strategy
Neighbourhood and Structure Plan Guidelines	Goods Movement Strategy	Modern Roundabouts
Council / Committee Presentation	Community Engagement	Community Consultation
	Council / Committee Presentation	Council / Committee Presentations

Continuous Community Outreach and Engagement

2   Existing Saint John Road Safety Context

The City of Saint John has a number of existing documents that guide the implementation of safety measures. It is important to know what strategies and initiatives currently exist, to understand how they overlap with the RSS, where the RSS can support other initiatives, and where there are gaps to be filled.

These documents, as well as the manner in which data is currently collected, stored, and analyzed, are described in this section.

2.1   Existing City Policies and Practices

Between 2010 and 2018, a number of strategic documents with safety-related policies, guidelines, and/or strategies, were published by the City of Saint John.

PlanSJ – City of Saint John Municipal Plan

The City's 2011 Municipal Plan (PlanSJ) places greater emphasis on improving active transportation, and the safety of vulnerable road users, such as pedestrians and cyclists. This shift in priorities is consistent with global trends throughout this time period, and reflects the public's desire to have modal choice, and to reduce their reliance on personal motor vehicles. Policies set out in the PlanSJ Municipal Plan that target road user safety include[1]:

- Improve investments into multi-modal modes of transportation;

- Consolidate accesses on arterial and collector streets (i.e. access management);

- Encourage pedestrian connectivity and circulation, including providing pathway connections, to enhance the safety and convenience of pedestrians;

- Improve pedestrian amenities, including effective winter maintenance, barrier free access, and visible and safe pedestrian crossings;

- Improve signage and way finding for all road users;

- Develop and maintain a fully connected network for non-motorized traffic throughout the City, using both on-street and off-street infrastructure, as appropriate; and

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[1] https://www.saintjohn.ca/site/media/SaintJohn/Municipal%20Plan%20for%20web%202012-01-12.pdf

- Improve active transportation (AT) routes and infrastructure on overpasses.

The strategic documents also emphasize the importance of finding a balance between road users – to ensure that the safety and security of all road users is properly accommodated in road design, and that the transportation system remains balanced for a range of road users.

City of Saint John Trails and Bikeways Strategic Plan Summary Document

The Trails and Bikeways Strategic Plan is a comprehensive document from 2010 that outlines how to create a connected trail and bikeways network throughout the City of Saint John. The goal of the plan is *"to promote a sustainable and healthy lifestyle by providing opportunities for active lifestyles and mobility options for all the City's residents"*[2].

The study included route identification and assessment, bottlenecks and conflict area identification, network development and standards, and an implementation strategy. The study also provided direct input into the PlanSJ Municipal Plan, and a number of policies laid out in that document are reflective of the recommendations of the Trails and Bikeways Strategic Plan. Progress has been made on implementing some of the recommendations of the Trails and Bikeways Strategic Plan; however, specifics regarding updates and improvements to the network are covered by the Pedestrian Strategy and the Cycling Strategy, which are being completed as separate parts of the transportation strategic plan.

City of Saint John Traffic Calming Policy

The correlation between speed and safety is well known, and in 2012, the City of Saint John released a Traffic Calming Policy to target speed reductions on neighbourhood streets. The policy goal, as stated in the document, is *"…to reduce vehicular traffic speed on City streets to within the posted speed limit and/or reduce vehicle traffic volume on a Local street to 1000 vehicles per day or less to improve community and road users' safety."*[3]

The document is a detailed action plan to re-design neighbourhood streets to encourage the desired driving behaviours, and to inspire increased active transportation. A full implementation process is detailed in the policy document, and illustrated in Exhibit 2-1.

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[2] https://www.saintjohn.ca/site/media/SaintJohn/May%2012%202010%20Final%20Report.pdf

[3] https://www.saintjohn.ca/site/media/SaintJohn/Traffic_Calming_2012.pdf

Exhibit 2-1: Traffic Calming Plan Implementation Process *(Source: City of Saint John Traffic Calming Policy)*

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┌─────────────────┐    ┌──────────────┐    ┌──────────────┐    ┌──────────────┐
│ Fulfill         │ ⇒  │ Follow       │ ⇒  │ Implement    │ ⇒  │ Trigger      │
│ Community's     │    │ Traffic      │    │ Proactive    │    │ Opportunity  │
│ Expectation of  │    │ Calming      │    │ Transportation│   │ for Potential│
│ a Balanced Use  │    │ Policy       │    │ Planning     │    │ Traffic      │
│ of City Streets │    │              │    │              │    │ Calming Plan │
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┌─────────────────┐    ┌──────────────┐    ┌──────────────┐    ┌──────────────┐
│ Develop Traffic │ ⇐  │ Identify     │ ⇐  │ Prioritize   │ ⇐  │ Measure      │
│ Calming         │    │ Timing of    │    │ Requested    │    │ Traffic      │
│ Measures        │    │ Plan         │    │ Plan         │    │ Speed and/or │
│                 │    │ Development  │    │              │    │ Volume       │
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        ⇓
┌─────────────────┐    ┌──────────────┐    ┌──────────────┐    ┌──────────────┐
│ Seek Input from │ ⇒  │ Conduct      │ ⇒  │ Refine Plan  │ ⇒  │ Common       │
│ Emergency and   │    │ Neighbourhood│    │ with         │    │ Council      │
│ Transit         │    │ Meeting      │    │ Neighbourhood│    │ Considers    │
│ Services        │    │              │    │ Input        │    │ Approval of  │
│                 │    │              │    │              │    │ Plan Where   │
│                 │    │              │    │              │    │ Required     │
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                       ┌──────────────┐    ┌──────────────┐    ┌──────────────┐
                       │ Update       │ ⇐  │ Measure      │ ⇐  │ Implement    │
                       │ Policy       │    │ Performance  │    │ Plan         │
                       │              │    │ of Plan      │    │              │
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Key components within the outlined implementation plan that are also included in the RSS are that the plan is data-driven (Step 5 requires measured evidence to justify pursuing action), engages the public and relevant stakeholders, such as emergency and transit services, and includes a process by which to update policy based on the measured performance of implemented strategies.

While the Traffic Calming Policy is a comprehensive document that touches on all elements required to successfully reduce vehicular operating speed on local streets, the document does not address speeding concerns on arterial and collector roads. Typically, collisions that result in serious injury or death occur on roads with higher posted speed limits (e.g., collectors and arterials), and are less prevalent on local roadways, where speed limits (and operating speeds) are generally lower. This is not to say that traffic calming measures to reduce vehicular speeds on local roads are not impactful, but rather that a speed management policy that targets operating speeds on collector and arterial roadways should also be developed for maximum benefit.

Winter Management Plan for Streets and Sidewalks

Canadian winters bring a unique set of challenges to road safety and transportation operations. Adequately preparing for winter road conditions can have a profound impact on road user safety, for both vehicle occupants and active transportation users.

The Winter Management Plan for Streets and Sidewalks outlines a set of standards and best practices for maintaining safe road conditions for all users year round.

2.2   Related Transportation Strategic Plan Documents

Road safety is not an isolated subject; it is part of a system that consists of vehicle and street design, government policy, and user behaviour. Therefore, improving road safety is also not an isolated strategy, but rather safety must be embedded in all aspects of city building.

As outlined in the introduction, this Road Safety Strategy is only one component of a larger Transportation Strategic Plan. Other documents and strategies that have a significant safety component to them are outlined below.

Pedestrian Strategy

Within the Transportation Strategic Plan is a Pedestrian Safety Strategy, which outlines design principles, key considerations, as well as common pedestrian collision types and potential contributing factors. The importance of vehicle speed for pedestrian safety is also emphasized – at higher operating speeds, drivers have narrower fields of view, slower reaction times, longer stopping distances, and there is a higher impact force on the pedestrian (i.e., higher risk of injury or death).

For the development of the pedestrian strategy, the City provided available locational data, within the Southern Peninsula, of traffic incidents involving vulnerable road users (i.e., pedestrians, cyclists, and motorcyclists). The data provided is presented in **Exhibit 2-2**.

Design principles for safe urban streets:

- People come first;
- Design for safety;
- Street context is crucial;
- Flexibility is an asset

Exhibit 2-2: Southern Peninsula Pedestrian, Cyclist, and Motorcyclist Incidents 2012-2016
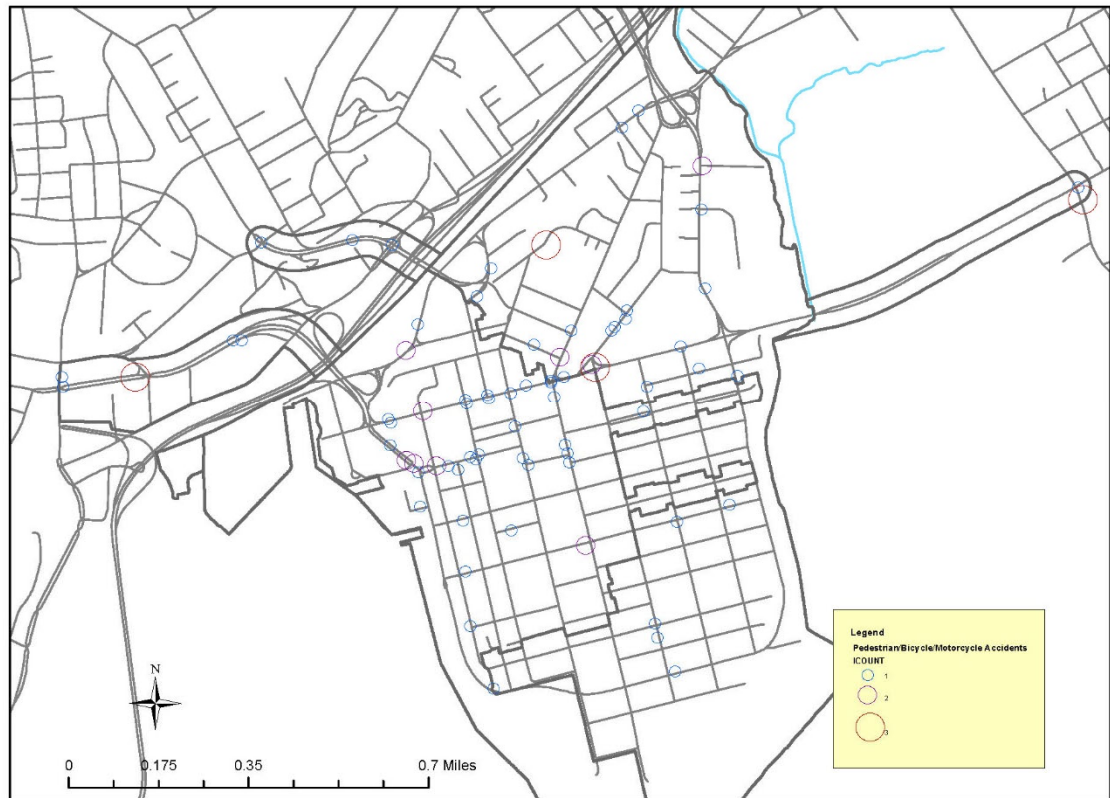
Improving the pedestrian realm typically requires improving both actual and perceived pedestrian safety; if people don't feel safe on the streets, they won't walk on the streets. Additional safety related strategies contained in the Pedestrian Strategy include:

- Integrate Complete Streets into City policy and all aspects of street planning, design, maintenance, and operations;

- Adopt a school crossing guard warranting system;

- Update the Traffic Calming Policy to include speed 'cushions' (speed bumps that allow large emergency vehicles to pass over them at higher speeds);

- Update the pedestrian walking speed and clearance intervals at signalized intersections (typically, this implies a reduction in assumed walking speeds to reflect an aging population and those with mobility challenges);

- Update the Transportation Impact Study guidelines to require an analysis of sidewalk requirements and other pedestrian infrastructure a part of the submission package;

- Update street design guidelines to include the following objectives: reduce traffic speeds, keep cities compact, create streets that are for people, not just cars, make public transportation safe, affordable, and convenient, and use data mapping and analysis techniques to identify problem spots and target design fixes;

- Create a pedestrian facilities maintenance strategy; and

- Develop a sidewalk infill strategy.

Truck Route Strategy

Trucks are critical for economic growth within a city. However, it is important to balance the needs of the goods movement industry, with those of other road users, in particular vulnerable road users. Recommendations in the truck route strategy with safety implications include:

- Manage large truck deliveries in South Central Peninsula (e.g., by adopting a policy that significantly reduces the number of loading zones that can accommodate larger trucks);

- Adequately sign designated truck routes based on signage warrants; and

- Explore policies and legislation that would mandate that trucks use highways more for intra-city trips.

Other Strategies

In addition to the strategies described above, the MoveSJ project framework includes planned strategies related to roadway classification, comprehensive system improvements, cyclists, modern roundabouts, and community consultation, which will all have a direct or indirect impact on how road user safety is managed in City projects.

Specifically, the implementation of cycling infrastructure, roundabouts as intersection control, and systemic improvements that reflect the current understanding safety performance, stand to have a direct, positive impact on road user safety.

At the same time, community consultation and roadway classifications that reflect the needs of all road users can increase knowledge sharing and awareness of safety issues and concerns. The strategies discussed in this section were not available for review at the time of writing; however, they will be developed with explicit consideration for road user safety.

2.3   Existing Road Safety Data

As in most jurisdictions, the primary source of road safety data, in Saint John, is police collision reports. Under the existing system, when police respond to a collision, they complete a collision report form. The collision form used by the Saint John police is a standard form issued by the New Brunswick Department of Transportation and Infrastructure (DTI), and it contains the base required fields for collision analysis, such as the location, date and time, collision configuration, actions and conditions of involved parties, light and weather conditions, and resulting injury code. All of this information can be used by road safety professionals to identify trends and diagnose contributing factors.

Since 2017, the Saint John Police Force has been working with the Province to provide collision data in a manner that allows the Province to convert the data into a useable electronic format for analysis (before 2017, alternative, manual processes existed for data sharing and storage).

When this Road Safety Strategy was initiated, there was not a sufficient amount of electronic collision data available to develop a truly "data-driven" RSS. Therefore, it is recommended that the City proceed instead with a systemic, "policy-driven" approach to improving traffic safety in the short term. This approach focuses first on updating standards, guidelines, and processes to better address road user safety in future work (e.g., trying to avoid repeating the mistakes of the past based on our current understanding of road user behaviours and the influences of infrastructure design and traffic controls). Then, as electronic data become more available, they can be used to refine and focus initiatives based on the stated goals and objectives, and identify locations with histories of relatively poor safety performance.

Under the proposed approach, potential sites for improvement can still be identified based on geometric and operational characteristics (i.e., risk factors), as opposed to collision history. This is an effective approach to improving and standardizing safety throughout a road network. A drawback to a purely policy-based approach is that the specific locations with the greatest need for improvement might not be treated first. Comprehensive road safety data can complement the systemic approach by providing municipalities with the information required to prioritize improvement sites, and allocate resources to sites with the higher potential for improvement.

The Saint John Police currently have the ability to use keywords searches to sort through police call logs and develop heat maps that illustrate where the specified type of collision is more prevalent. These heat maps can provide some initial input and direction on where to focus mitigation measures and direct resources. **Exhibit 2-3** provides a sample heat map, showing the locations of collisions involving deer between the years 2013 and 2018.

Exhibit 2-3: Heat Map of Collisions Involving Deer (2013-2018)
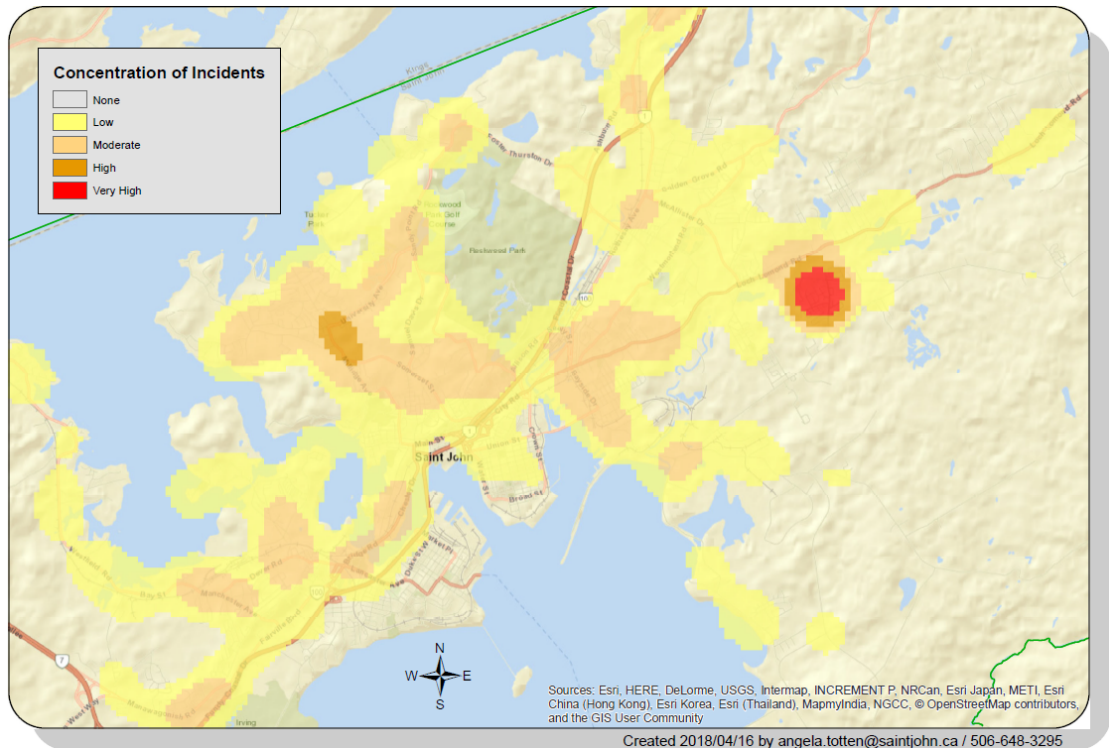
Comprehensive, long-term road safety data is also necessary for agencies to understand and measure the impact of implemented measures. Resources are finite, and it is important to properly identify the measures with the most effective safety impacts in an unbiased manner.

3 Guiding Principles and Approach

The dominant thought that has taken the spotlight in the transportation industry is simple, yet profound.

Death and Serious Injury are Unacceptable Outcomes of Mobility.

The above statement paraphrases the Vision Zero philosophy that jurisdictions across the globe have been adopting over the past two decades. The subsections below outline several guidelines and approaches to road safety, including Vision Zero, which are currently used by other jurisdictions to guide their road user safety efforts. These guidelines and approaches have been incorporated into the Saint John Road Safety Strategy.

3.1 The Context for a Strategic Road Safety Plan

A strategic road safety plan is usually the outcome of a larger integrated safety management process, and that process is, ideally, part of a complete Integrated Road Safety Management System. These concepts are defined in great detail in NCHRP Report 501 – Integrated Safety Management Process.

In brief, the integrated safety management system is the environment in which the integrated safety management process is created, supported, and allowed to evolve. The safety management system is comprised of a legislative, funding, and organizational framework, as shown in the figure to the right. A critical component is a consistent approach at the leadership level, with different agencies stakeholders working together, in a coordinated manner.
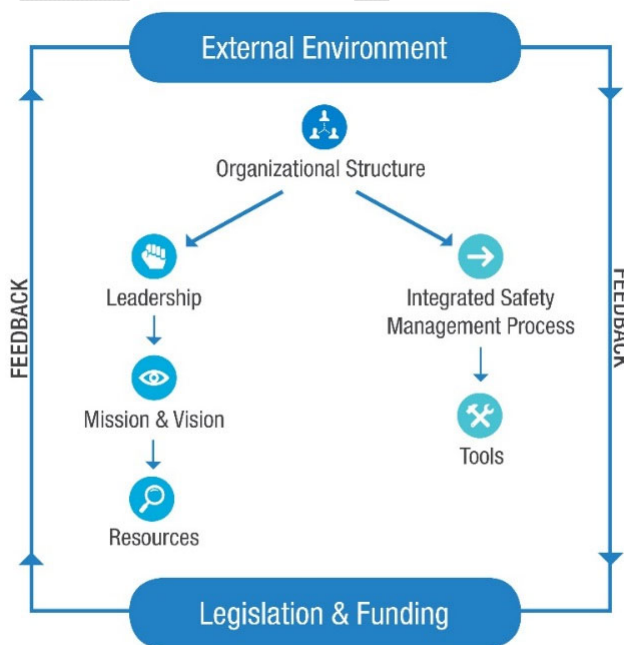
Adapted from Figure 2-1. Components of the ISMSystem of NCHRP Report+501

The integrated safety management process is an iterative loop, consisting of the following six steps:

1. Review highway traffic, geometric, and safety data;
2. Establish emphasis areas and safety goals;

3.   Develop objectives, treatment strategies, and preliminary action plans to address the emphasis areas;

4.   Determine the appropriate combination of treatment strategies for the identified emphasis areas;

5.   Develop detailed action plans; and

6.   Implement the strategic road safety plan and evaluate performance.

The products of the above six steps are illustrated in **Exhibit 3-1**.

Exhibit 3-1: Steps within the ISM Process
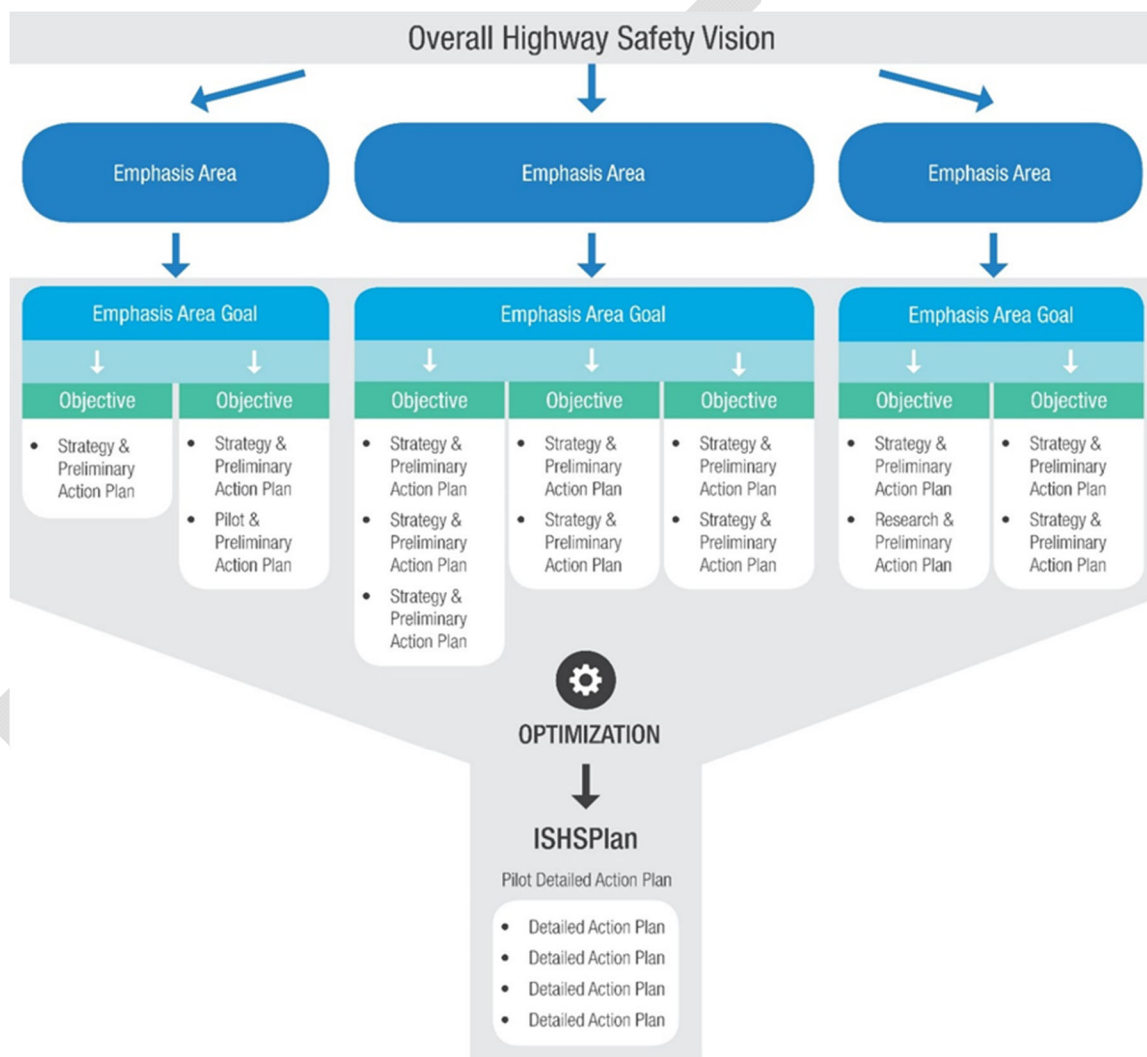
Adapted from Figure 2-5. Example of Overall Highway Safety Vision of NCHRP Report+501

The strategic road safety plan is the sum of the detailed action plans that are intended to address each of the identified emphasis areas (i.e., specific safety issues), and as such, the plan is typically revised on an annual basis through the integrated safety management process. The process includes measuring safety

performance, analysing contributing factors, evaluating treatment options, creating an action plan, implementing the plan, and repeating the process.

With time, the intent is that improvements in the safety performance of the road network will be achieved, and the emphasis areas will change to address the next most pressing safety issues.

3.2   Vision Zero

Vision Zero[4] is a global movement pursuing a transportation network with zero people killed or seriously injured, across all modes of transportation, as a result of motor-vehicle collisions. Originating in Sweden, in 1997, this vision has been embraced by municipalities across the globe. Within Canada, cities that have adopted a Vision Zero (or Towards Zero) approach include: Edmonton, AB; Vancouver, BC; Toronto, ON; and Ottawa, ON.

A key element of Vision Zero is that it strives to change the perception that serious "accidents" are just one of the unavoidable costs of mobility. The movement is rooted in the simple fact that serious collisions – not accidents – are preventable, and that no loss of life, however small the number, is acceptable. This thinking requires a shift in the social climate, and the support of engineers, planners, politicians, and road users alike. The Vision Zero approach recognizes that humans are fallible, and that mistakes will be made. This approach disperses responsibility among system designers, policymakers, and road users, to ensure that those inevitable mistakes do not result in a serious injury or death.

There are two main objectives:

1.   Reduce the likelihood that collisions will occur; and

2.   Minimize the consequences and severity of the collisions that do occur.

3.3   Safe Systems Approach

The guiding principle of the Safe Systems approach is similar to that of Vision Zero; that people inevitably make mistakes, but it is not acceptable for those mistakes to result in serious injuries or the loss of life on our roads. The Safe Systems Approach takes on a holistic view of the road transportation system and the interactions between key inputs (i.e., looking beyond the driver). It is a framework of principles geared towards designing a more forgiving road transportation system. This is particularly important when designing a system that accommodates vulnerable road users (e.g., pedestrians, cyclists, and motorcyclists).

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[4] Some organizations have adopted the less ambitious "Towards Zero" terminology to describe their plans; however, the critical elements of those programs are consistent with programs that use the Vision Zero name.

There are four defining principles within the Safe Systems approach. These principles challenge the way we think about road safety and encourage us to identify and address all of the contributing factors. The defining principles are as follows:

1. **People make mistakes** – collisions will occur;

2. **People are vulnerable** – there are limits to our ability to withstand trauma;

3. **We need to share responsibility** – everyone has a role to play in improving road safety; and

4. **We need to strengthen all parts of the system** – when fatalities and serious injuries occur, there is rarely a single cause.

Exhibit 3-2 illustrates the Safe Systems Approach. At the centre, is the recognition that there is a limit to the amount of force a human body can withstand, and that protecting people should be paramount. The next four components are the key inputs that are recognized to have a significant impact on the likelihood and seriousness of a collision, and are the focus of many mitigation measures. These four inputs are:

1. **Safe Roads** – this input focuses on explicitly accounting for safety at the planning stage, and incorporating safety in the road design;

2. **Safe Speeds** – vehicle speeds have a direct correlation with sustained injury during a collision. This input focuses on reducing speeds from all aspects, including reduced speed limits and improved compliance;

3. **Safe People** – this input focuses on reducing unsafe behaviour, such as distracted driving and drinking and driving; and

4. **Safe Vehicles** – this input focuses on improving the safety of vehicles, through both improved technology and improved regulations, and requires working with industry partners.

Road users are often the target of scrutiny for not following the rules of the road, and there has been a lot of attention on so called "victim blaming" in recent years. However, while drivers, cyclists, and pedestrians are a significant portion of the system, they are still only one part, and their actions are often motivated by failures or inequities in roadway design. The responsibility for road safety is shared by everyone, including policy makers, engineers, and educators, among others. Instead of questioning what the driver did wrong, the safe systems approach questions how the driver could have prevented the collision *and* how the road design could have prevented the collision. Countermeasures and strategies that use a combination of these factors will be critical in achieving the overall goal of reducing the number of fatal and injury collisions in Saint John.

Exhibit 3-2: Safe Systems Approach

Safe Systems Approach
Canada's Road Safety Strategy 2025

3.4   Canada's Road Safety Strategy 2025

Canada's Road Safety Strategy 2025 is a document introduced in 2016, by the Canadian Council of Motor Transport Administrators (CCMTA). This strategy provides road safety professionals, in both the public and private sectors, with principles, strategies, countermeasures, and best practices that are standardized across the country. It recognizes that the battle towards Vision Zero is a universal and collaborative one, and aims to provide a framework that governments can use to develop their own, tailored, road safety plans.

The principles outlined in Canada's Road Safety Strategy are:

- Adopt a Safe Systems Approach;

- Have a 10-year strategy (historically governments have developed 5-year strategies); and

- Provide an inventory of best practices targeting key emphasis areas.

A key component to recognize is the benefits of embracing a 10-year timeline. Users, and governments, tend to place significant emphasis on "Quick Win" projects, and expect immediate improvements. It is important to understand the reality that policy and design changes take time, and that collision data collection can take 3 years, or longer, following implementation. Other cities and countries that have adopted a Vision Zero approach did not experience meaningful change until after several years of sustained effort. Embracing a longer timeline for evaluating the effectiveness of implemented strategies sets the strategy up for success. However, it is important to monitor and evaluate strategies on a continuous basis, and to have a mid-term review of the overall plan. This will ensure that investments are being properly allocated.

While a 10-year plan is encouraged as a long-term, vision-setting goal, breaking it down into shorter, two-year road safety action plans, can help kick-start the program and track progress in the short to medium term. This is especially important in the beginning when there is a critical need to create a baseline for measuring success, and to gain public support and momentum in the project.

4   Proposed Strategies

The proposed road safety strategy for the City of Saint John is outlined in Exhibit 4-1 and expanded on in the sections below.

Exhibit 4-1: Outline of Proposed Strategies

4.1   Make Road Safety Part of the Organizational Culture

Culture is, in essence, the beliefs and attitudes of a particular group of people. Around the world, cities and communities are experiencing a shift in their attitudes towards their streets, and are changing their culture to prioritize safety over speed and vehicle-moving capacity. To enact real change in Saint John, the City needs to embrace a Vision Zero, Towards Zero (or similar) philosophy, and set about implementing strategies that reflect the culture they want to live.

Strategy 1: Commit to a Definitive Vision for Road User Safety

As discussed in previous sections, Vision Zero is a movement to eliminate all traffic fatalities and serious injuries. Committing to Vision Zero, or a similar safety-first vision, sets an ambitious goal that reinforces that it is not enough to just reduce traffic fatalities. All fatalities are preventable, and it is simply our culture that has desensitized us to collision outcomes. Committing to Vision Zero sets a standard for what is acceptable, and also connects Saint John with the global movement towards this change.

Committing to zero traffic fatalities or injuries is a long-term strategy. The experience of others who have joined the movement is that significant change may only be observed after years of sustained effort, and that strategies need to be evaluated, modified, and tailored to local conditions. Setting realistic, achievable short-term goals is equally as important as setting the overarching Vision Zero goal. For example, committing to making sure the number of KSI collisions does not increase. However, committing to the long-term goal is key to ensuring all other goals are working in parallel.

Once the vision is established, a system needs to be put in place to make sure that all stakeholders understand their respective roles in achieving the goals and objectives that are set in pursuit of the vision. This step might also involve updating departmental performance measures to be better aligned with a safety-first vision.

Strategy 2: Embrace the Safe Systems Approach

The Safe Systems Approach, described above and illustrated in **Exhibit 4-2**, embodies the philosophy that people make mistakes, but those mistakes should not cost them their lives. When first developing a RSS, it is tempting to focus on physical changes – the coloured quadrants of the diagram. However, implementing those physical changes in isolation, or in the "less optimal" locations, is not an efficient use of resources. It can be more effective to begin with the outer ring, such as leadership, standards, data, research and evaluation, and legislation and policy.

Leadership and coordination are two key areas that can drive positive change. Leadership is about setting the direction,

Exhibit 4-2: Safe Systems Approach

Safe Systems Approach
Canada's Road Safety Strategy 2025

and making sure the necessary resources, tools, and processes are in place to support the defined vision. A culture change must be cultivated, beginning at the highest level, and aligning all levels and all departments within the organization towards the vision. This will ensure consistent messaging and goal setting among all stakeholders. Other leadership elements include setting administrative priorities and supporting organizational readiness – before an organization can move towards a new vision, it must resolve competing issues and practices.

Coordination, partnerships, and buy-in from stakeholders is also critical in a safe systems approach. Everybody must work towards improving safety as their primary goal. Progress comes more quickly when the effort is sustained on multiple fronts, and not delayed by stakeholders with a lack of knowledge or understanding of the new ideas. As well, partnerships and the sharing of resources can help make the defined vision a reality faster than going it alone. Establishing a working group with stakeholders from different departments (e.g., Engineering, Pedestrian and Traffic Management, Police, Emergency Services, etc.) should be considered, and Senior Leadership needs to set performance targets for each department that promote a common interest in improving road user safety and encourage cooperation.

Strategy 3: Educate and Engage Partners and the Public

Education is one of the 3 E's of traffic safety, along with engineering and enforcement, all of which are key elements required in the creation of safe communities. The value of education, in comparison with the more tangible engineering and enforcement, is often overlooked. However, the path to road safety requires actions from all stakeholders and all road users, and educating and engaging them early on in the process will improve overall understanding of issues and allow for targeted investment.

The City of Toronto's "The Art of Distraction" campaign is an excellent example of engaging the public, and bringing awareness and sensitivity to the very real consequences of traffic collisions. Toronto has also released a series of infographics outlining proper use of streets. It is a recognition that people do not intentionally cause collisions. Sometimes they are distracted or inattentive, but other times they are simply unaware of (or have forgotten, or become complacent in) the proper use of the roadway. Education is an often-forgotten step in the introduction of new road user facilities and traffic controls – designs that make perfect sense to transportation professionals can be totally unintuitive to members of the public, which can result in unintended safety consequences.

Image Source: The City of Toronto's "The Art of Distraction" Campaign

Given the range of weather experienced in Saint John, targeted educational material should be released at the beginning of transitional seasons to remind users of proper use of the road under different conditions (e.g., winter vs spring). As well, as infrastructure gets updated, it is important to ensure that the public is aware of the changes, the reasons for them, and how they can help/contribute to safer roads.

Often, getting buy-in from stakeholders is about overcoming a lack of knowledge or understanding that may limit some stakeholders' ability to adopt new ideas. Such limitations could be due to a lack of resources and concerns of increased burden, or simply "fear of change." Therefore, hosting workshops (or lunchtime learning sessions) that encourage knowledge sharing between City departments, and with outside stakeholder agencies, can be an effective way to overcome resistance to change, and to provide opportunities to share resources and introduce new tools.

4.2   Focus on a Data-Driven Approach

A data-driven, decision-making approach is the most efficient way to invest in road safety improvements. More complete and reliable data allows for realistic goals to be set, better quality decisions to be made, and positive public support to be earned. Embedding quality data into the decision-making process ensures that strategies and countermeasures are evaluated in an equitable and justifiable manner, and improves the chances of getting the best return on investments.

Strategy 4: Improve the quality and availability of relevant safety data

The premise of creating a comprehensive data source from which to base decisions is a simple one that typically does not face opposition. Collecting quality data and creating said database is somewhat trickier.

The City of Saint John already has a system in place by which to collect road safety data – police reports. The police reports contain most of the information required for a comprehensive collision analysis, such as the sequence of events, the time of incident, the severity of the outcomes, the road conditions, etc. As noted above, the Saint John Police Force is working with the Province to provide collision data in a manner that allows the Province to convert the data into a useable electronic format for analysis.

A potential opportunity for data sharing is to create a data warehouse that is shared between the DTI and the City of Saint John (and Saint John Police, should they choose to participate). Such a data warehouse would allow City users to obtain the raw data they need for their daily operations, analysis, and investigations, and could be used as a medium by which to aid the Province in digitizing the police reports, should they require aid. The platform should also allow for sharing analysis done by either government body[5].

Depending on the level of flexibility and control the City desires, there are options to either purchase a commercially available off-the-shelf system, or work with another department to do the data analytics in-house. It is recommended to open discussions with neighbouring jurisdictions, such as the Cities of Moncton and Fredericton, to see if there are opportunities for collaboration.

The province of Ontario currently employs a similar system, known as ARIS (Authorized Requester Information System). The Ministry of Transportation of Ontario (MTO) is responsible for maintaining records related to traffic safety, including collision reports, and maintains a database of records. Municipalities can apply to become Authorised Requesters – a status which permits them to access and download records related to their jurisdiction. This allows the province to control the integrity of the data, and ensure privacy and proper use

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[5] It is our understanding that City of Saint John staff have recently engaged the Province in initial discussion related to collision data management and data sharing that will move this strategy forward.

of the data, while also allowing municipalities to access the data they need, when then need it.

Strategy 5: Establish a starting point

Road safety strategies typically begin with a baseline of performance measures – an analysis of the previous 1-5 years through which hotspots and emphasis areas are identified and prioritized. Strategy 4 will create this baseline, but that doesn't mean that the City shouldn't begin investing in road safety improvements sooner – the starting point and direction will just need to be established through other means.

The Municipal Plan is a good source for identifying priorities that reflect the current perceptions and understandings with respect to road safety. The Municipal Plan identifies a number of transportation and mobility goals and the City is working at systematically improving infrastructure to achieve these goals. The goal that is the focus of the overall Transportation Strategic Plan is:

"Develop and maintain a balanced transportation system that meets the needs of all community members with a variety of options including active transportation opportunities such as cycling and walking, good public transit service to key destinations within the Primary Development Area, private automobiles, and taxis."

Strategies and countermeasures to improve a number of these identified goals are included within the overall Transportation Strategic Plan, including:

- Pedestrian Strategy;
- Goods Movement Strategy;
- Cycling Strategy; and
- Modern Roundabouts Strategy.

Potential Starting Points:

1. Consult the DTI;

2. Align with the Move SJ Municipal Plan;

3. Align with other Strategies within the TSP; and

4. Consult stakeholders, including the public.

Within each of these strategies, community engagement is an excellent tool by which to identify and prioritize specific initiatives. Residents are the people who use the streets on a day-to-day basis, and who know the intimate details of their neighbourhoods. Road safety is in part about perceived safety, and user comfort, as well as actual safety performance. Residents bring this local knowledge that is often lacking from numerical data.

This Road Safety Strategy is set to be shared with the community as part of planned community engagement on all of Move SJ Phase 3. The City could use the bottlenecks, obstacles, and other priorities identified as a starting point when determining where to focus initial efforts towards improving road safety. Example questions to ask could include:

- Rank the following issues based on your priority, with 1 as the highest priority:

  - **Safety:** do you feel safe and comfortable when using the roadway, either walking or driving?

  - **Congestion:** are you constantly in stop-and-go traffic, or taking longer than expected to arrive at your destination?

  - **Parking:** are you satisfied with when and where public parking is allowed, and whether parking is free or paid?

  - **Active transportation:** do you feel safe and comfortable on sidewalks and bike lanes, are they present where you need/want them?

  - **Pavement conditions:** are the roads in good condition, or are there locations where ride comfort or drainage are problematic?

- Do you believe that collisions are an acceptable outcome and risk of using the roadway?

- From the list below, what do you think are the 3 most pressing road safety issues that need to be addressed in Saint John?

  - Speeding in residential areas

  - Speeding on major roads

  - Distracted driving

  - Impaired driving

  - Aggressive driving

- Traffic volumes

- Pedestrian safety

- Cyclist safety

- Collisions with wildlife

- Weather-related collisions

- Other (please elaborate)

An interactive map is an excellent tool that allows residents to place a "pin" on a map and note specific locations and concerns. Example questions for which residents could select locations on a map include:

- Where would pedestrian safety most benefit from a new controlled crossing?

- Is there a location where speeding is prevalent?

- Do you know of a location where there is a significant safety concern? Identify both the location and the concern.

These questions can provide insights into where the community feels there are important safety concerns. For example, key bottlenecks, obstacles, and other priorities identified in previous strategies include:

- Long walking distances associated with the physical size of the City;

- Lack of available pedestrian crossing opportunities along key corridors (e.g., Rothesay Avenue, Bayside Drive, McAllister Drive, Main Street, and Fairville Boulevard);

- Pedestrian and cycling facilities along Reversing Falls Bridge should be physically separated from motorized traffic;

- A multi-use pathway should be installed on one side of the Courtenay Bay Causeway;

- Reduce the number of lanes on the Main Street Viaduct from six to four, and install a multi-use trail; and

- Many signalized intersections do not provide pedestrian crossings on all legs.

Focusing improvements in these areas is a good way to garner public support and maintain momentum while continuing to gather data. Greater emphasis should be placed on identified issues that align with the Municipal Plan, as well as issues that provide safety benefit to vulnerable road users. As soon as data is available, it should be used to validate, quantify, and prioritize the identified problem areas, as well as add additional locations.

Strategy 6: Conduct a Preliminary Network Screening Study

As soon as the data permits, the City should undertake a network screening study to conclusively identify locations for further investigation and potential treatment. The study will also provide data to either support or contradict the potential locations previously selected (i.e., in Strategy 5).

The available data for the first network screening study will likely only consist of a few years of data. Therefore, it is suggested to conduct a two-stage network screening process, an initial screening, and a secondary screening.

The initial screening would consider all available collision data, as opposed to focusing on a subset of the data, such as signalized intersections, or collisions that resulted in serious injury or fatality only. The output of the initial screening will be a list of locations with high concentrations of collisions, but will likely be too big to be actionable.

1 Initial Screening
- Analyze all available data

2 Secondary Screening
- Refine and prioritize the list of locations using evaluation criteria

The secondary screening further refines the list of locations. The criteria used to further refine the list should be reflective of the stated goals and objectives of the road safety plan. For example, if one of the goals is to reduce the number of pedestrian collisions in the City, then the number of pedestrian collisions should be one of the evaluation criteria. Other potential evaluation criteria include:

- Collision Severity Index;
- Number of collisions involving vulnerable road users;
- Absolute number of collisions;
- Collision rate;
- Traffic volumes; and
- Planned modifications.

The result of the secondary screening is a prioritized list of the 10-20 collision-prone locations that will be the focus of safety improvements. Once the re-prioritized short-list of intersections is compiled, potential short and long term recommendations should be identified for each site.

Comprehensive network screening studies should be completed on a regular base (e.g. every 5 years) to ensure that infrastructure investments are being allocated to locations with the highest potential for improvement.
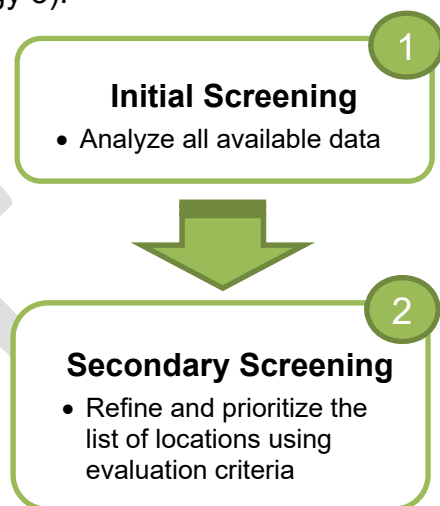
Strategy 7: Prioritize Common Emphasis Areas

Road safety strategies are typically organized by emphasis areas, each with their own set of strategies and countermeasures. As noted above, emphasis areas are often selected through a comprehensive data analysis, but they are also influenced by the agencies stated goals, objectives, and priorities. There are also a few emphasis areas that are common between agencies that have developed road safety strategies, and are, in part, a result of the road safety culture and roadway design standards that are similar among Canadian agencies. These common emphasis areas (listed below) are likely applicable to the City of Saint John, and are an excellent means of immediately taking action prioritizing resources. As data becomes available, these emphasis areas can be refined and expanded upon to better suit the local context.

The City of Saint John Transportation Strategic Plan includes a number of distinct strategies that overlap and influence one another. Some of the independent strategies, such as the Pedestrian Strategy, would often be included as a recommendation within a Road Safety Strategy as they are a key vulnerable road user. The strategies proposed below are intended to complement and integrate with the strategies proposed in these parallel reports.

The recommended emphasis areas, along with a brief description and list of potential countermeasures, is outlined below.

Emphasis Area 1: Vulnerable Road Users

Vulnerable road users include pedestrians, cyclists, school children, and older adults. While the total number of collisions involving vulnerable road users is typically relatively low, the consequences are severe with a high likelihood of the collision resulting in serious injury or death. Potential countermeasures are outlined below.

Emphasis Area 1: Vulnerable Road Users	
Strategy	**Description**
Install pedestrian crossings	Suggested locations are where there are long distances between controlled crossings. Pedestrian crossings should include the addition of pavement markings, zebra striping, and amber beacons.
Install sidewalks	Prioritize areas that have no sidewalks, and areas that are 'missing links' within the overall sidewalk network. It is recommended to coordinate with road reconstruction programs.

Emphasis Area 1: Vulnerable Road Users	
Strategy	**Description**
Reduce crossing distances	On local and collector roads, curb extensions can be installed to reduce crossing distances while also reducing driver operating speed and improving the visibility of pedestrians. On arterial roads, reduced curb radii can reduce crossing distances while also slowing down drivers making a right-turn.
Pavement marking improvements	Improvements include re-painting stop bars and crosswalk markings that are worn and adding improvements, such as zebra stripping to crosswalks, to improve the visibility of pedestrians. Signalized intersections along arterials should be prioritized, but all crossings can benefit from enhanced pavement markings.

Emphasis Area 2: Aggressive & Distracted Driving

The line between aggressive driving and distracted driving is being blurred as many of the dangerous behaviours, including speeding, driving too fast for the current conditions, following too closely, and failing to yield the right-of-way, overlap. Potential countermeasures are outlined below.

Emphasis Area 2: Aggressive & Distracted Driving	
Strategy	**Description**
Education campaigns	Selfish roadway culture is on the rise with drivers believing that they have the right, and not the privilege, to drive. Education campaigns to remind users of the dangers of the road, and what it means to be a 'good driver' can be effective in realizing a culture change that can reduce unsafe behaviour.

Emphasis Area 2: Aggressive & Distracted Driving	
Strategy	**Description**
Reduced curb radii	Smaller curb radii encourage drivers to reduce the speed at which they take the corner, which improves driver reaction time and reduces the collision severity, in the event a collision occurs. Smaller curb radii also reduces pedestrian crossing distance, limiting the exposure of these vulnerable road users.
Targeted enforcement	Police enforcement will focus on aggressive and distracted driving.
Proactive deployment of traffic calming measures	The City's existing Traffic Calming Policy includes a number of strategies that target aggressive & distracted driving, such as speed humps, street narrowing, and raised crosswalk. Proactive deployment of these geometric changes can prompt drivers to pay closer attention to their task at hand while encouraging aggressive drivers to reduce their speeds.

Emphasis Area 3: Speeding

Vehicle speed has a direct impact on the extent of injury, especially when vulnerable road users are involved. Higher speeds carry a higher risk of serious injury or fatality occurring by reducing a drivers' field of vision, reducing driver reaction time, increasing vehicle stopping distance, and increasing the amount of force inflicted on the vulnerable road user at impact. Reducing operating speeds is a strategy that could be included as part of the other emphasis areas (i.e., Vulnerable Road Users and Aggressive & Distracted Driving). However, speed reductions can have such a significant impact on the risk of serious injury or fatality that is included as its own emphasis area, with its own set of associated strategies. Potential countermeasures are outlined below.

Emphasis Area 3: Speeding	
Strategy	**Description**
Reduce speed limits	Reducing operating speeds (lower speed limits) allows for improved driver reaction time and larger stopping distances, reducing both the likelihood a collision will occur, as well as the severity if one does occur. Requires enforcement support.
Speed reader signs (radar speed displays)	Trailers that display driver speeds in comparison with the posted speed can influence driver behaviour by making them aware of when, and by how much, they are exceeding the speed limit.
Reduce lane widths	There is a direct correlation between lane widths and vehicle speeds. Lane widths should be designed to encourage the desired operating speed. The City of Toronto has developed a *Lane Widths Guideline* (described further in this report), which recommends a width of 3.0-3.3m for urban streets.
Targeted enforcement	Police enforcement will focus on locations with known excessive speeding.

Additional strategies for addressing speeding-related fatalities are provided in *NCHRP Report 500 Volume 23: A Guide for Reducing Speeding-Related Crashes.* The document provides an overview of a multi-pronged approach that focuses on the 3 E's: engineering, education, and enforcement. The strategies recommended as part of the "Speeding" emphasis area are ones that other municipalities are adopting and can typically be implemented within a relatively short timeframe. It is recommended to consult the NCHRP Report for additional context, background information, and targeted strategies.

Strategy 8: Measure Success

Data are only useful if you listen to what they tell you. Realistic and attainable goals, and key performance indicators (KPIs), are vital in measuring the success of any plan. Goals should be carefully selected to ensure that they convey the intention of the strategy, and that they can be evaluated with the available data. For example, in the short-term, goals should be to reduce the number of serious collisions, or to begin a downward trend, as opposed to completely eliminating them.

KPIs are variables that can translate goals into measurable metrics. They can quantify how well implemented strategies are working, and can be used to identify road safety trends. KPIs should be evaluated on a regular basis, and be communicated in a way that is easy for all to understand. Potential KPIs include:

- Number of streets with reduced speed limits;

- Number of kilometres of new sidewalks;

- Number of kilometres of new cycling infrastructure;

- Number of implemented zones (e.g. school safety zone or community safety zone);

- Number of implemented geometric modifications;

- Percent change in total number of injury or fatal collisions;

- Speed limit compliance rates;

- Pedestrian and cyclist volumes;

- Distance between controlled pedestrian crossings;

- Number of collisions with alcohol or drugs involved;

- Social cost of collisions; and

- Emergency response time.

Outcomes that one department may consider a success, another may consider to be a failure. For example, prohibiting a right turn on red improves intersection safety by eliminating the conflict between some movements, however it can also result in additional delays and queuing for right-turn and through movements. Leadership and coordination are required to set clear priorities for the organization, and to provide alignment across all departments to ensure the collective group is working towards a united goal of safety first. KPIs for departments that are affected by safety initiatives should be re-evaluated to better align with the overall safety objectives.

4.3 Build Safer Streets

Waiting for collisions to occur before taking action is a costly approach, and does not account for the near misses, perceived safety, or underrepresentation in the data from people avoiding the area. Cities should be proactive in prioritizing road safety in policies and guidelines, and building safety best practices into street design. Safe modal choice leads to modal shift, which leads to improved public health and placemaking for residents, as well as safer roads.

Strategy 9: Create and Update Design Guidelines to Prioritize Safety

It is easier, and more cost effective, to incorporate safety into new projects rather than to mitigate the poor safety performance of flawed designs. This is

especially true in dense urban centres, which are also where the highest concentration of vulnerable road users tend to be present. Many streets and sidewalks within the City of Saint John have reached the end of their structural life, and are in need of rehabilitation, or reconstruction. The City should update, create, or reference policies and guidelines that require all redesigns to prioritize road user safety, especially for vulnerable road users. Potential updates to design guidance are summarized in the table below, with additional details following.

Exhibit 4-3: Potential Design Guideline Updates

No.	Design Guideline	Description	References
1	Street Design	» Defining street types establishes a hierarchy of use and ensure a balance between users » Embed safety in a standardized & systemic manner	» City of Toronto Complete Streets Guidelines » Municipal Plan Policy TM-4
2	Transportation Impact Study	» Include assessing impacts to road safety as a requirement for development approval » Prioritize approvals for developments that improve road safety	» City of Windsor TIS Guidelines » Municipal Plan Policy TM-4
3	Curb Radii	» Smaller curb radii requires vehicles to slow down when turning the corner » Pedestrian crossing distances are reduced » Pedestrian visibility is increased	» City of Toronto Curb Radii Guidelines

Design Guideline 1: Street Design

Policy TM-4 in the Municipal Plan states that "a street hierarchy should be identified and designed to accommodate traffic within the development and provide connections to adjacent areas"[6]. The Municipal Plan also defines four street types, by which to classify all streets within the City: local streets, collector streets, arterial streets, and freeways. Defining street types is an excellent

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[6] MoveSJ Municipal Plan

strategy for establishing a hierarchy of use, ensuring a balance between users, and embedding safety in a standardized and systemic manner.

The City of Toronto's Complete Streets Guidelines provides a comprehensive overview of how to define street types, and use them to guide the development of a Complete Network. It is important to understand that not every street will, or should, serve all users. Rather, different streets should prioritize different uses, and be connected such that every user can navigate and use the transportation system to meet their needs and objectives (i.e., a Complete Network).

The City of Saint John currently has a Traffic Calming Policy, which outlines an implementation plan by which vehicular speed can be reduced on local streets. This is an example of taking a street type (local streets), defining it to prioritize safety over operational speed, and providing guidance and direction on how to achieve this goal. Target objectives for the other corridor types should be identified, and similar implementation processes, and toolboxes of mitigation measures, should be developed for speed management on those corridors.

It is important that the standards and guidelines developed are flexible, and that they allow for design deviations and innovations. Emphasis should be placed more on the desired outcomes, and less on the exact technical specifications.

Design Guideline 2: Transportation Impact Study

The City of Saint John requires developers to undertake a transportation impact study to assess the impacts that a proposed development will have on the surrounding transportation network. Currently, the impact to vehicular operations and capacity is a key determinant on whether a project gets approved, but improvements to vehicular operations typically come at the expense of road user safety. The City should update their guidelines to include assessing impacts to road safety as a requirement, and prioritize approvals for developments that improve road safety and encourage a modal shift (e.g., assessing multi-modal level of service). Policy TM-4 of the Municipal Plan contains a number of related objectives, and the Pedestrian Strategy contains a similar recommendation; and

Design Guideline 3: Curb Radii Guidelines

Smaller curb radii requires vehicles to slow down when turning the corner, reduces pedestrian crossing distances, and increases pedestrian visibility and storage area, all of which reduces the potential for, and resulting impact of, collisions. The City of Toronto developed a curb radii guideline in 2017 to provide guidance on determining the appropriate size of curb radii at intersection corners. The City of Saint John should consider creating an adapted version of their own, or using the City of Toronto's to improve road user safety at intersections.

5   Implementation Plan

This section takes the strategies proposed in Section 4 and outlines a proposed timeline for action. This implementation plan will setup the framework for the City to spearhead a culture change and install some quick win countermeasures that garner positive community support, while providing opportunities for data-driven refinement and re-prioritization as more information becomes available.

Years 1 & 2

- Establish a road safety working group that includes committed and empowered representatives from various City departments, elected officials, law enforcement, public health, etc.;

- Commit to a definitive vision, such as "To eliminate road fatalities and serious injuries in Saint John," "To reduce the rate of collisions that result in injury," or "To build a road safety culture that promotes safe streets and behaviours;"

- Have senior leadership adopt the stated vision and set performance targets for each department that promote a common interest in improving road user safety and encourage cooperation;

- Continue to work with the Police Force and the Province to develop a comprehensive collision dataset and data management and analysis tools;

- Set specific near-term goals and objectives based on public feedback and council direction; and

- Establish key performance indicators by which to measure success in a manner that aligns with the stated vision.

Year 3 & 4

- Undertake a design standards review and update related policies and standards to ensure that substantive safety is reflected in the design direction provided by the City;

- Continue to educate the public about ongoing safety initiatives, including how to properly identify and use transportation facilities and traffic controls; and

- Select countermeasures from the identified emphasis areas and strategies to implement. Examples include: targeted enforcement of aggressive and distracted driving, install speed reader signs, install sidewalks, and improve pavement markings, implement leading pedestrian intervals, or conduct road safety audits. Use input from public engagement, City planning processes, capital projects lists,

and the existing Police database to identify preliminary locations for installation.
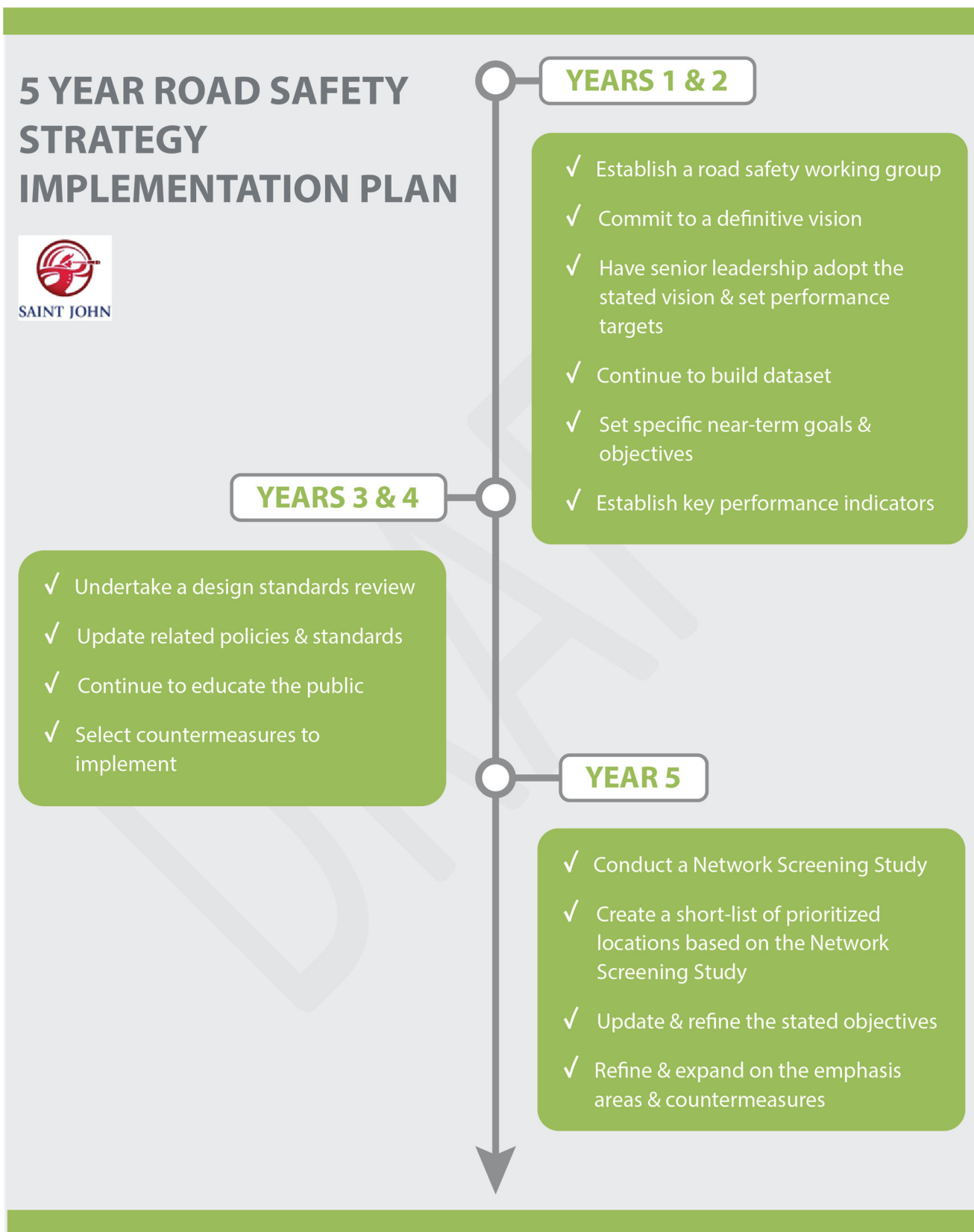
Year 5

- Conduct a Network Screening Study;

- Based on the Network Screening Study, create a list of 10-20 collision-prone locations that will be the focus of safety improvements;

- Update and refine the stated objectives based on the network screening results; and

- Refine and expand on the identified emphasis areas and countermeasures based on the network screening results.

A summary of the emphasis areas and associated countermeasures are presented in **Exhibit 5-1**, and the 5 year implementation plan is illustrated in **Exhibit 5-2**.

Exhibit 5-1: Emphasis Areas & Countermeasures

	Emphasis Areas		
	Vulnerable Road Users	Aggressive & Distracted Driving	Speeding
Countermeasures	» Install pedestrian crossings	» Education campaigns	» Reduce speed limits
	» Install sidewalks	» Reduced curb radii	» Speed reader signs
	» Reduce crossing distances	» Targeted enforcement	» Reduce lane widths
	» Make pavement marking improvements	» Proactive deployment of traffic calming measures	» Targeted enforcement

Exhibit 5-2: 5 Year Implementation Plan

5 YEAR ROAD SAFETY STRATEGY IMPLEMENTATION PLAN

SAINT JOHN

YEARS 1 & 2

√ Establish a road safety working group

√ Commit to a definitive vision

√ Have senior leadership adopt the stated vision & set performance targets

√ Continue to build dataset

√ Set specific near-term goals & objectives

√ Establish key performance indicators

YEARS 3 & 4

√ Undertake a design standards review

√ Update related policies & standards

√ Continue to educate the public

√ Select countermeasures to implement

YEAR 5

√ Conduct a Network Screening Study

√ Create a short-list of prioritized locations based on the Network Screening Study

√ Update & refine the stated objectives

√ Refine & expand on the emphasis areas & countermeasures

The implementation plan illustrated above is a suggestion that allows for the momentum to be sustained, while allowing for required timelines for council approval and resource allocation. The plan should be considered a moving target that gets evaluated and updated as needed. Beyond Year 5, comprehensive network screening studies should be completed on a regular basis (e.g. every 5 years) to ensure that infrastructure investments are being allocated to locations with the highest potential for improvement, and that new technologies and countermeasures are incorporated as appropriate. It is important to bear in mind that the benefits of implemented strategies to improve road safety may not be reflected in the data for a number of years. Therefore, it is important to allow for a sufficient amount of time to pass before removing a countermeasure or moving on to a new emphasis area. Similarly, evaluating the effectiveness of implemented countermeasures and related policies is critical to developing a safe road system and sustaining progress towards the road safety vision.