



Photo: City of Saskatoon

Strategic Traffic Safety Action Plan for the City of Saskatoon

Summary Report | October 2013

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Introduction

A “Traffic Safety Action Plan” (TSAP) is an upper-level traffic safety policy that provides a scientific, data-driven, four to five year comprehensive safety document for the jurisdiction.

PURPOSE

The purpose of the TSAP is to assist the City of Saskatoon to allocate its limited budget in the most efficient way possible when identifying and improving areas of safety concern in Saskatoon.

STAKEHOLDERS

The following stakeholders provided data or feedback for the development of a TSAP for the City of Saskatoon:

- City of Saskatoon (COS)
- COS Traffic Safety Committee (TSC)
- Saskatoon Board of Education (SBOE)
- Saskatchewan Government Insurance (SGI)
- Saskatoon Health Region (SHR)
- Saskatoon Police Service (SPS)

OBJECTIVES

- Identify safety emphasis areas
- Develop target goals for each emphasis area
- Provide network screening results for each emphasis area
- Provide safety improvement strategies for each emphasis area

SCOPE

The TSAP's area of study is limited to the City of Saskatoon, Saskatchewan. Existing collision data (2001-2010) were obtained from SGI. This project's outcomes are intended for use in Saskatoon only. The results may not be transferable to neighbouring cities or communities.

SAFETY MEASURES

Five different collision severities were analyzed as safety measures: They are: 1) total, 2) fatal, 3) injury, 4) property damage only (PDO), and 5) fatal or injury (FI) collisions. To analyze and highlight the City of Saskatoon's traffic safety issues as effectively as possible, the study uses only “total” and “fatal or injury” collisions. This is because:

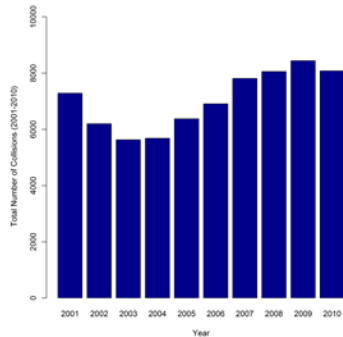
- Fatal collisions were extremely rare in Saskatoon. Being rare and random, fatal collisions cannot be used as a sole safety measure.
- The total number of collisions largely reflect the same collision patterns as PDO collisions over the period.

This project was jointly funded through a partnership between the City of Saskatoon and the Saskatchewan Centre of Excellence for Transportation and Infrastructure (SCETI).

Collision History

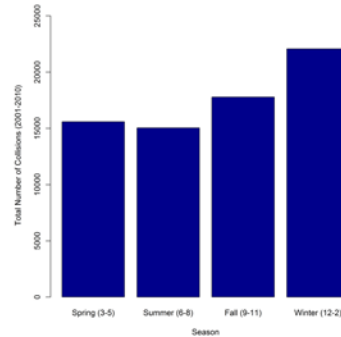
Total Number of Collisions

ANNUAL



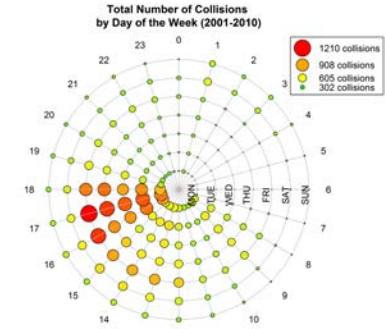
- Increasing trend (2003 – 2010)
- 7,049 total collisions per year

SEASONAL



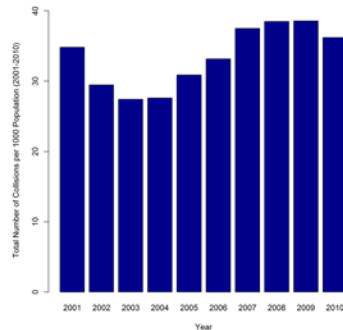
- Peak Season: Winter (31%; 22,073)
- Peak Months: Dec. & Jan. (23%; 16,014)

DAILY & HOURLY



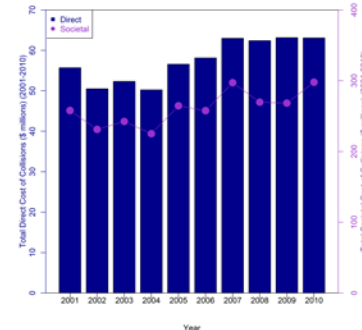
- Peak Day: Friday (18%; 12,732)
- Peak Time: 3pm – 6pm (24%; 17,136)

COLLISIONS PER CAPITA



- Increasing trend (2003 – 2010)
- 33 total collisions per 1000 population per year

COSTS

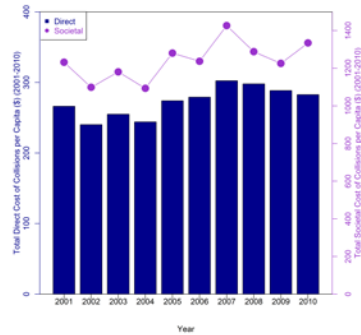


- Increasing trend (2003 – 2010)
- Direct Cost: \$57.52 million per year
- Societal Cost: \$261.20 million per year

Collision History

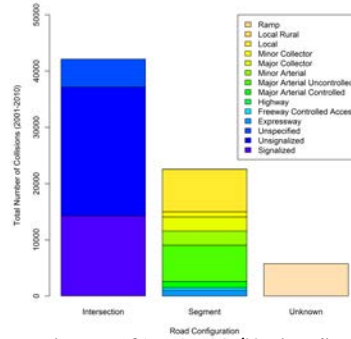
Total Number of Collisions (Cont'd)

COSTS PER CAPITA



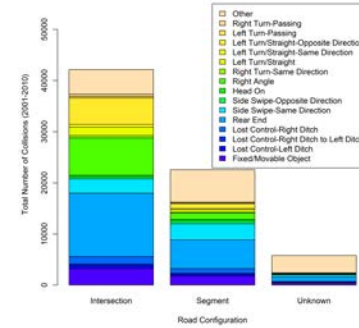
- No clear increasing or decreasing trend
- Direct Cost per Capita: \$273.01 per year
- Societal Cost per Capita: \$1,240.01 per year

ROAD CLASSIFICATION



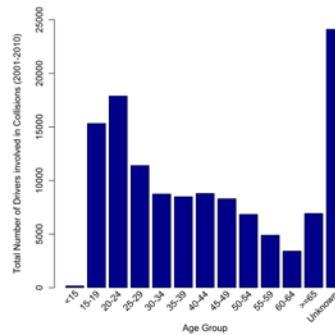
- Intersections: 60%; 42,138 (Unsignalized 54%, 22,880; Signalized 34%, 14,250)
- Segments: 32%; 22,571 (Major Arterial Uncontrolled 29%, 6,439; Local 33%, 7,557)

COLLISION CONFIGURATION



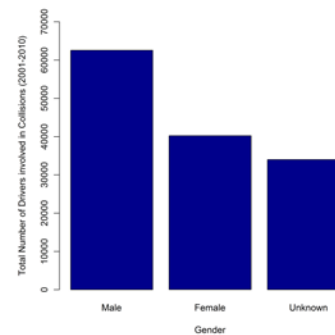
- Intersections: 60%; 42,138 (Rear End 29%, 12,399)
- Segments: 32%; 22,571 (Rear End 25%, 5,607)

AGE GROUP



- 15 – 24 years old: 27%; 33,220

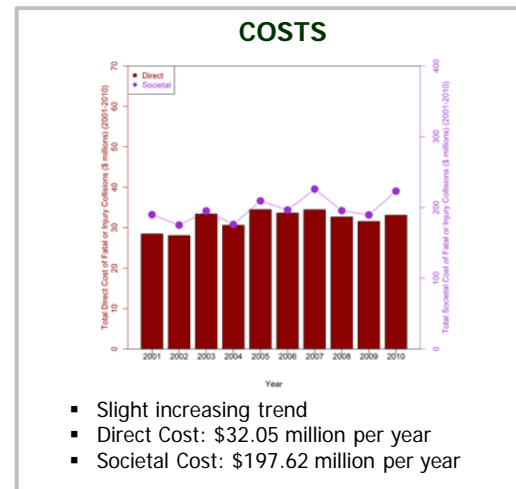
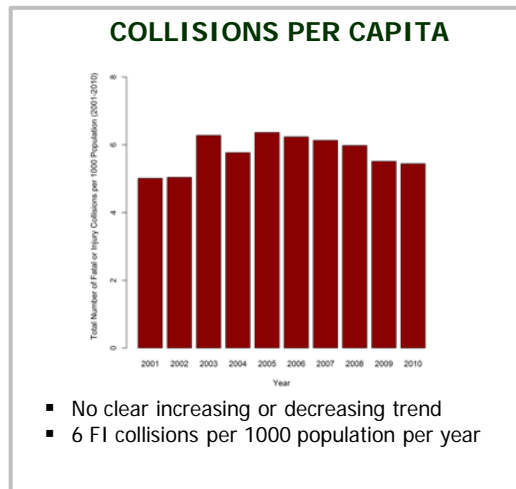
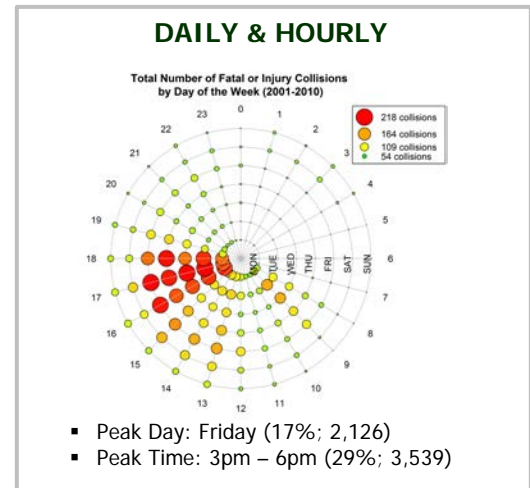
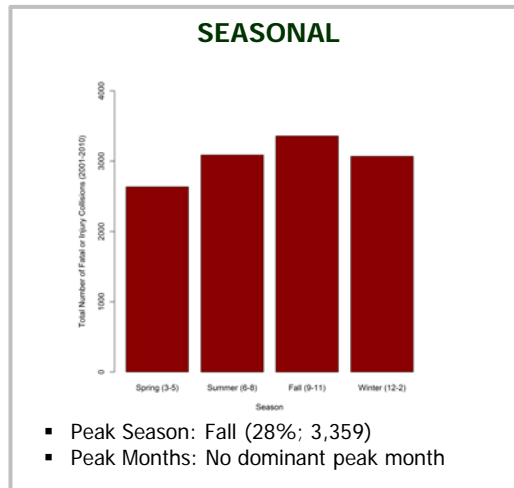
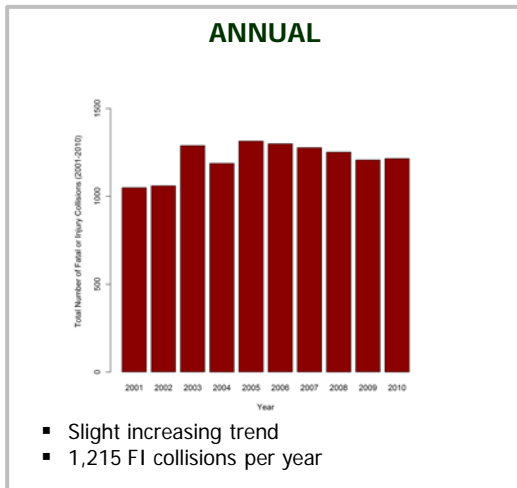
GENDER



- Male Drivers: 46%; 62,578
- Female Drivers: 29%; 40,226

Collision History

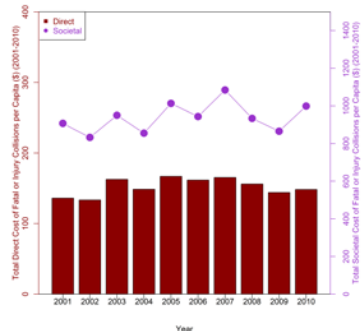
Total Number of Fatal or Injury Collisions



Collision History

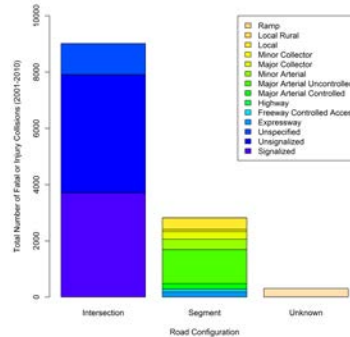
Total Number of Fatal or Injury Collisions (Cont'd)

COSTS PER CAPITA



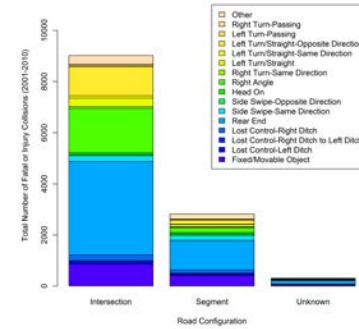
- No clear increasing or decreasing trend
- Direct Cost per Capita: \$152.36 per year
- Societal Cost per Capita: \$938.71 per year

ROAD CLASSIFICATION



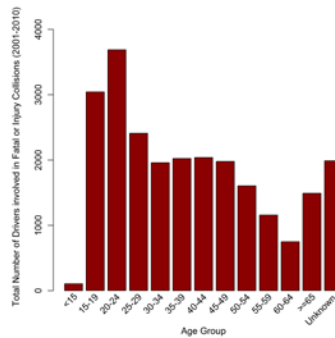
- Intersections: 51%; 9,020 (Unsignalized 47%, 4,207; Signalized 41%, 3,703)
- Segments: 16%; 2,821 (Major Arterial Uncontrolled 43%, 1,209; Local 15%, 416)

COLLISION CONFIGURATION



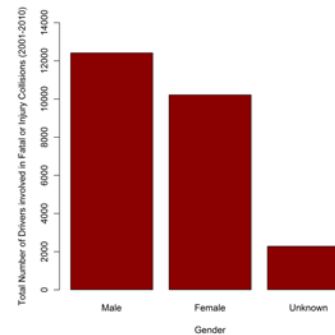
- Intersections: 51%; 9,020 (Rear End 41%, 3,659)
- Segments: 16%; 2,821 (Rear End 41%, 1,158)

AGE GROUP



- 15 – 24 years old: 28%; 6,730

GENDER

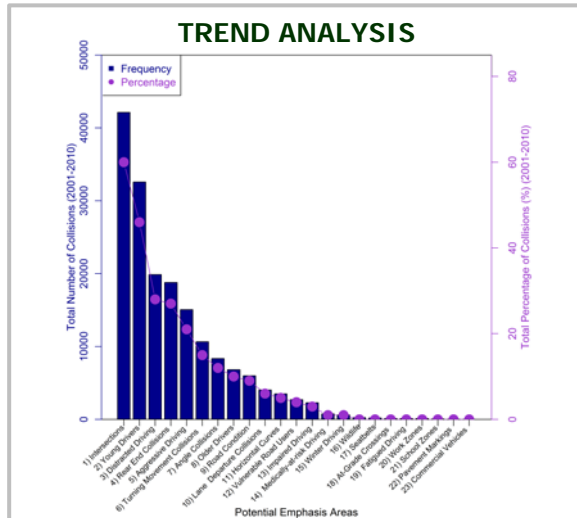


- Male Drivers: 50%; 12,415
- Female Drivers: 41%; 10,215

Emphasis Area and Target Goal Selection Process

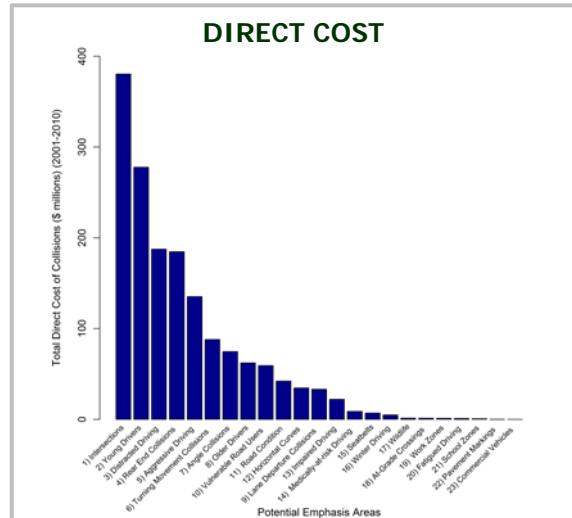
1) Review emphasis areas in existing TSAPs

- Federal-level TSAP (CCMTA (2011))
- Provincial-level TSAP (Saskatchewan (2010), Alberta (2006), British Columbia (2010))
- Municipal-level TSAP (Burlington (2006), Edmonton (2007), Grande Prairie (2011), Hamilton (2009), New Westminster (2007), Ottawa (2011), Red Deer (2007), Strathcona County (2008) and North Vancouver (2010))
- AASHTO's TSAP (AASHTO (2005))

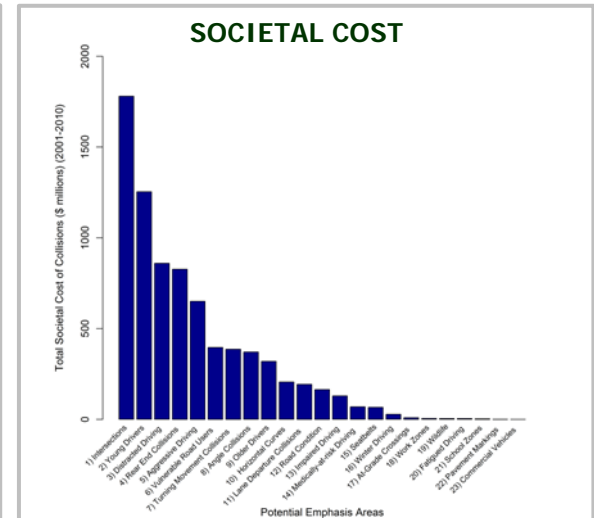


The 13 potential emphasis areas with 2% or more of the total collisions are:

1. Intersections (60%)
2. Young Drivers (46%)
3. Distracted Driving (28%)
4. Rear End Collisions (27%)
5. Aggressive Driving (21%)
6. Turning Movement Collisions (15%)
7. Angle Collisions (12%)
8. Older Drivers (10%)
9. Road Condition (9%)
10. Lane Departure Collisions (6%)
11. Horizontal Curves (5%)
12. Vulnerable Road Users (4%)
13. Impaired Driving (3%).



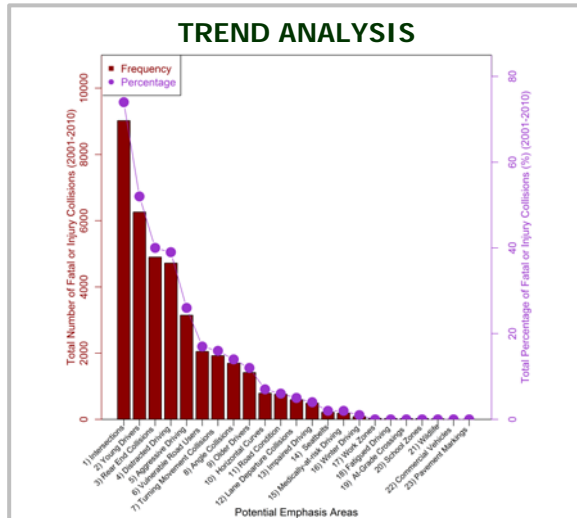
- Intersections: \$380.52 million
- Young Drivers: \$277.90 million



- Intersections: \$1.78 billion
- Young Drivers: \$1.25 billion

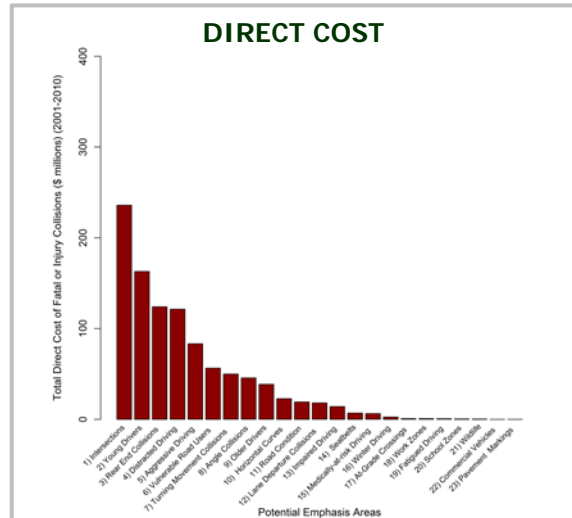
Emphasis Area and Target Goal Selection Process (Cont'd)

- 2) Consider various collision configurations and contributing factors in SGI's collision database as potential emphasis areas.
- 3) Investigate the number of total and FI collisions for each potential emphasis area.
- 4) Estimate and compare the direct and societal costs for each potential emphasis area.
- 5) Communicate among stakeholders to finalize the emphasis areas for the City of Saskatoon.
- 6) Adopt "Vision Zero" approach (zero fatal or injury collisions over long term period) to determine target goal.

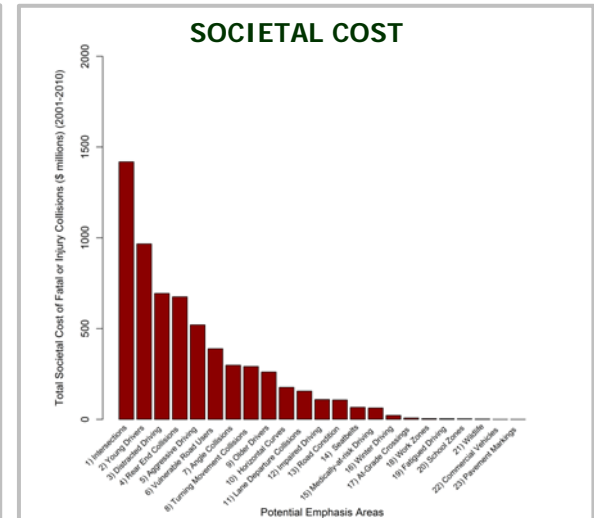


The 13 potential emphasis areas that are greater than 2% of FI collisions are as follows:

1. Intersections (74%)
2. Young Drivers (52%)
3. Rear End Collisions (40%)
4. Distracted Driving (39%)
5. Aggressive Driving (26%)
6. Vulnerable Road Users (17%)
7. Turning Movement Collisions (16%)
8. Angle Collisions (14%)
9. Older Drivers (12%)
10. Horizontal Curves (7%)
11. Road Condition (6%)
12. Lane Departure Collisions (5%)
13. Impaired Driving (4%).



- Intersections: \$235.95 million
- Young Drivers: \$163 million



- Intersections: \$1.42 billion
- Young Drivers: \$967.01 million

Saskatoon's Emphasis Areas and Target Goals (Vision Zero)

Emphasis Area #1: Aggressive Driving

- Aggressive Driving collisions stem from driver's frustration with congested roads. Saskatoon is one the fastest growing cities in Canada and congestion is likely increasing.
- Ranked Fifth in terms of total collisions (21%) and fatal or injury collisions (26%).
- Target Goal: 10% reduction by 2017 (equivalent to 34 fewer fatal or injury aggressive driving collisions).

Emphasis Area #2: Distracted Driving

- The use of new communication technologies, such as handset devices, is a fast growing safety problem in Saskatoon.
- Ranked Third in terms of total collisions (28%) and Fourth in terms of fatal or injury collisions (39%).
- Target Goal: 10% reduction by 2017 (equivalent to 46 fewer fatal or injury distracted driving collisions).

Emphasis Area #3: Impaired Driving

- Although the number of impaired driving collisions is small, the consequences are severe, and public demand for action is very high.
- Ranked Thirteenth in terms of total collisions (3%) and fatal or injury collisions (4%).
- Target Goal: 10% reduction by 2017 (equivalent to 5 fewer fatal or injury impaired driving collisions).

Emphasis Area #4: Intersections

- Far more collisions occur at intersections than on road segments.
- Ranked First in terms of total collisions (60%) and fatal or injury collisions (74%).
- Target Goal: 10% reduction by 2017 (equivalent to 91 fewer fatal or injury collisions at intersections).

Emphasis Area #5: Older Drivers

- Saskatoon's population is aging. Potential safety issues relating to older drivers need to be considered.
- Ranked Eighth in terms of total collisions (10%) and Ninth in terms of fatal or injury collisions (12%).
- Target Goal: 10% reduction by 2017 (equivalent to 13 fewer fatal or injury collisions involving older drivers).

Emphasis Area #6: Vulnerable Road Users

- Although the number of vulnerable road user collisions is relatively small, the consequences of these collisions are very severe.
- Ranked Twelfth in terms of total collisions (4%) and Sixth in terms of fatal or injury collisions (74%).
- Target Goal: 10% reduction by 2017 (equivalent to 20 fewer fatal or injury collisions involving vulnerable road users).

Emphasis Area #7: Young Drivers

- Young people are involved in many collisions related to the selected emphasis areas, e.g., distracted driving and impaired driving.
- Ranked Second in terms of total collisions (46%) and fatal or injury collisions (52%).
- Target Goal: 10% reduction by 2017 (equivalent to 60 fewer fatal or injury collisions involving young drivers).

Safety Strategies/Programs Education

Strategy/Program		Description	Stakeholders	Emphasis Areas							No. of Emphasis Areas Involved
ID	Title			#1: Aggressive Driving	#2: Distracted Driving	#3: Impaired Driving	#4: Intersections	#5: Older Drivers	#6: Vulnerable Road Users	#7: Young Drivers	
1	Awareness Campaigns using Multimedia and Community Newsletters	Local broadcasting channels (radio, TV, community newsletters, CAA articles, etc.) create and promote awareness.	COS TSC, Radio and TV Stations, SGI	Enhance	Enhance	Enhance	Enhance	Enhance	Enhance	Enhance	7
2	Awareness Campaigns using Social Media and Various Organizations' Homepages	Popular social media (e.g., Facebook) and stakeholders' homepages (e.g., COS, SPS) can be used to create and promote awareness.	COS, SGI, SPS	Enhance	Enhance	Enhance	Enhance		Enhance	Enhance	6
3	Educational Activities targeted at High Schools	Traffic safety themed activities can be designed for high school students. These activities can be coordinated and promoted by Saskatoon School Board of Education.	SBOE, SGI	Introduce	Introduce	Introduce			Introduce	Introduce	5
4	Message Boards	Billboards or changing message signs create and promote awareness, and advise drivers of safety issues and associated regulations and fines.	COS TSC, SGI	Enhance	Enhance	Enhance				Enhance	4
5	Awareness Week	An awareness week can be used to create and promote awareness.	COS TSC, SGI	Introduce	Introduce	Enhance					3
6	Rollover Simulator Demonstrations at High Schools	SGI demonstrates its rollover simulator at Saskatoon high schools to emphasize the safety benefits of seatbelts in severe rollover collisions.	SBOE, SGI							Enhance	1
7	Smartphone Apps	Smartphone apps can be used to create and promote awareness. For example, SGI's Safe Ride App provides information on taxis, designated driving services, etc.	SGI			Enhance					1

Enhance: Expand and improve existing program(s)

Introduce: Create new program(s)

Safety Strategies/Programs

Education (Cont'd)

Strategy/Program		Description	Stakeholders	Emphasis Areas							No. of Emphasis Areas Involved	
ID	Title			#1: Aggressive Driving	#2: Distracted Driving	#3: Impaired Driving	#4: Intersections	#5: Older Drivers	#6: Vulnerable Road Users	#7: Young Drivers		
8	Operation Red Nose (ORN)	Operation Red Nose (ORN, operationrednose.com) is a national road safety campaign focused on reducing impaired driving during holiday periods. ORN volunteers to drive impaired or tired people and their vehicles home from parties, events, etc.	SGI			Enhance						1
9	55 Alive (Mature Driver Course)	55 Alive is a free six-hour course that educates older drivers about how the physical changes of aging can affect driving, and explains how older drivers with, for example, compromised vision or hearing, can adapt to adverse road and weather conditions. At least 12 participants are required in each class.	Saskatchewan Safety Council, SGI					Enhance				1

Safety Strategies/Programs Enforcement

Strategy/Program		Description	Stakeholders	Emphasis Areas							No. of Emphasis Areas Involved
ID	Title			#1: Aggressive Driving	#2: Distracted Driving	#3: Impaired Driving	#4: Intersections	#5: Older Drivers	#6: Vulnerable Road Users	#7: Young Drivers	
1	Selective Enforcement Programs	Selective enforcement programs may use highly visible and/or invisible law enforcement. Collision maps can be used to select the program's locations/times.	SGI, SPS	Enhance	Enhance	Enhance	Enhance		Enhance	Enhance	6
2	Highly Visible Enforcement (HVE)	Liquor enforcement team (LET) officers provide highly visible enforcement (HVE) within and around drinking establishments to continually reinforce the message that impaired drivers will be stopped and arrested.	SPS			Enhance					1
3	Report Impaired Drivers (RID) Program	The RID program is a new road safety initiative that encourages residents to call 911 to report a suspected impaired driver. RID allows the public to assist law enforcement in finding and removing impaired drivers from the roads. RID also serves as a warning to impaired drivers that many eyes are watching them.	COS TSC, SGI			Enhance					1
4	High Collision Intersection Enforcement	Saskatoon police officers have been focusing on enforcement at intersections considered high-risk from past collision statistics. An intersection collision map can be used to select the target intersections/times.	SPS				Enhance				1

Safety Strategies/Programs Enforcement (Cont'd)

Strategy/Program		Description	Stakeholders	Emphasis Areas							No. of Emphasis Areas Involved
ID	Title			#1: Aggressive Driving	#2: Distracted Driving	#3: Impaired Driving	#4: Intersections	#5: Older Drivers	#6: Vulnerable Road Users	#7: Young Drivers	
5	Multi Agency Seat Belt Team (MASTeam) Seatbelt Checkstops	The MASTeam program focuses on seatbelt enforcement. Enforcement agencies throughout Saskatchewan conduct stopchecks to enforce seatbelt use. To target young drivers, a young driver collision map can be used to select the program's locations/times.	SPS							Enhance	1

Safety Strategies/Programs Engineering

Strategy/Program		Description	Stakeholders	Emphasis Areas							No. of Emphasis Areas Involved
ID	Title			#1: Aggressive Driving	#2: Distracted Driving	#3: Impaired Driving	#4: Intersections	#5: Older Drivers	#6: Vulnerable Road Users	#7: Young Drivers	
1	Improved Road Surface Friction/Winter Maintenance	Winter maintenance programs (e.g., sanding and snowplowing) improve road surface friction on high speed roadways and high classification roadways (e.g., Circle Drive and major/minor arterials).	COS, SGI	Enhance			Enhance	Enhance		Enhance	4
2	Clearview Street Signs	Street name signs that use the Clearview font and larger street name plates are designed to help drivers to find their route, choose their lane, etc. and thus negotiate the intersection more safely and more easily.	COS				Introduce	Introduce		Introduce	3
3	Well Maintained Pavement Markings	Missing and faded pavement markings (crosswalks, lane markings, lane ending indicators, etc.) at/near City intersections are maintained throughout the year to ensure good visibility. Clear markings are important at all intersections, but may be especially important at locations screened as high collision locations.	COS				Enhance	Enhance		Enhance	3
4	Improved Traffic Signal Operation	Traffic signal phasing at high collision intersections. Possible countermeasures include providing a protected left-turn signal phase, prohibiting left-turns, and extending the yellow, green, or red signal phase as appropriate.	COS	Enhance			Enhance		Enhance		3

Safety Strategies/Programs

Engineering (Cont'd)

Strategy/Program		Description	Stakeholders	Emphasis Areas							No. of Emphasis Areas Involved
ID	Title			#1: Aggressive Driving	#2: Distracted Driving	#3: Impaired Driving	#4: Intersections	#5: Older Drivers	#6: Vulnerable Road Users	#7: Young Drivers	
5	Professional Engineering Projects Designed to Improve Surface Infrastructure (e.g., in-service road safety review projects)	In-service safety review projects can be conducted at selected intersections to determine engineering countermeasures that will improve the surface infrastructure. Typical engineering countermeasures include adding exclusive left/right turn lanes, installing advanced signal change warning signs, etc. An intersection collision map can be used to select target intersections for in-service road safety review projects.	COS, SGI				Enhance		Enhance		2
6	Red Light Cameras	Red light cameras are installed at high collision intersections.	COS, SGI	Enhance			Enhance				2
7	Engineering Projects that help to reduce Peak Period Congestion	Certain types of aggressive driving (e.g., speeding and unsafe lane changing) are known to stem from drivers' frustration with congested roads. COS's various surface infrastructure projects are designed to reduce congestion on the road network and can therefore help to reduce aggressive driving.	COS	Enhance							1
8	Changeable Message Signs	Changeable message signs are installed at locations where aggressive driving is leading to collisions. The signs may also be used to advise road users of adverse weather and road conditions.	COS TSC, SGI	Enhance							1
9	Speed Reader Boards	Speed reader boards are installed at locations where aggressive driving is leading to collisions. The signs show each driver his or her speed.	COS TSC, SGI	Enhance							1

Safety Strategies/Programs

Engineering (Cont'd)

Strategy/Program		Description	Stakeholders	Emphasis Areas							No. of Emphasis Areas Involved	
ID	Title			#1: Aggressive Driving	#2: Distracted Driving	#3: Impaired Driving	#4: Intersections	#5: Older Drivers	#6: Vulnerable Road Users	#7: Young Drivers		
10	Photo Radar Technology	SGI has been considering expanding the use of photo radar technology in Saskatchewan from work zones (as at present) to other roadways. The program would need public support and a Cabinet decision.	SGI	Introduce								1
11	Roadway Safety Improvements to reduce the Likelihood and Severity of Collisions	Numerous engineering countermeasures can help to reduce the problem of distracted driving: advance stop signs, advance signing for lane closures, larger and more reflective signage, installation of medians, removal of obstacles, and improved lane marking and delineation of curbs.	COS, SGI		Enhance							1
12	Countdown Pedestrian Signals	Pedestrian signals with countdown timers inform pedestrians how many seconds remain for crossing. The countdown timers may be visual only, or visual and audible.	COS						Enhance			1
13	Bicycle Lane Connectivity (i.e., continuous right-of-way for bicyclists) and Bicycle Friendly Facilities	Bicycle lane connectivity can be provided where possible. During surface infrastructure improvement, raised/exclusive bicycle lanes (rather than curb side bicycle lanes) can be considered to maximize bicyclists' safety.	COS						Enhance			1
14	Winter Maintenance of Transit Facilities	Bus stops where access is impeded by snow, ice or broken pavement are identified, and COS can be informed of these problems by Saskatoon Transit so that the problems can be addressed quickly.	COS, Saskatoon Transit						Enhance			1

Safety Strategies/Programs

Engineering (Cont'd)

Strategy/Program		Description	Stakeholders	Emphasis Areas							No. of Emphasis Areas Involved
ID	Title			#1: Aggressive Driving	#2: Distracted Driving	#3: Impaired Driving	#4: Intersections	#5: Older Drivers	#6: Vulnerable Road Users	#7: Young Drivers	
15	Accessible Pedestrian Signals (APS)	APS communicate information in non-visual formats (e.g., audio).	COS, SGI						Enhance		1
16	Sidewalk Retrofit	Sidewalks can be added to old neighbourhoods with missing sidewalks, or upgrade sidewalks.	COS, SGI						Enhance		1
17	Accessibility Ramps	Create access by adding curb ramps on street corners.	COS, SGI						Enhance		1

Safety Strategies/Programs Legislation

Strategy/Program		Description	Stakeholders	Emphasis Areas							No. of Emphasis Areas Involved
ID	Title			#1: Aggressive Driving	#2: Distracted Driving	#3: Impaired Driving	#4: Intersections	#5: Older Drivers	#6: Vulnerable Road Users	#7: Young Drivers	
1	Work Zone Regulation	Impose tougher fines on motorists who do not reduce their speed when driving in construction zones when workers are present.	COS, SGI	Introduce				Introduce		Introduce	3
2	Driver Improvement Program	Drivers are assigned demerit points every time they are convicted of a traffic offence related to aggressive driving. In Saskatchewan, drivers are currently assigned 4 demerit points for running a stop sign, and 1 demerit point for exceeding the speed limit.	SGI	Enhance							1
3	Administrative Licence Suspension Program (a.k.a. Immediate Roadside Prohibition (IRP) Program)	The licence suspension program is applied at the roadside to drivers with 0.08 BAC. Saskatchewan has various driver licence suspension programs. The sanctions vary with the driver's offence and include 90-day administrative suspensions, roadside suspensions, statutory suspensions, and criminal code suspensions.	SGI, SPS			Enhance					1
4	Ignition Interlocks Program (IIP)	An ignition interlock is an alcohol testing device connected to the ignition and power systems of a vehicle. It prevents an alcohol impaired driver from starting the vehicle. In Saskatchewan, drivers who are convicted of impaired driving, who drive over 0.08 BAC, or who refuse to take a breath test are eligible for the IIP.	SGI			Enhance					1

Safety Strategies/Programs

Legislation (Cont'd)

Strategy/Program		Description	Stakeholders	Emphasis Areas							No. of Emphasis Areas Involved
ID	Title			#1: Aggressive Driving	#2: Distracted Driving	#3: Impaired Driving	#4: Intersections	#5: Older Drivers	#6: Vulnerable Road Users	#7: Young Drivers	
5	Driver Evaluation Program (DEP)	DEPs monitor drivers who have medical conditions that may affect their ability to drive.	SGI					Enhance			1
6	Graduated Driver Licensing (GDL) Program	GDL programs are designed to ensure that young drivers' exposure to higher levels of risk increases incrementally as the drivers gain more experience driving. The details of such programs vary. SGI is considering toughening the current GDL program.	SGI							Enhance	1