Chapter 35
Highways and Infrastructure—Addressing Road Safety Concerns on Existing Highways

1.0 Main Points

Saskatchewan has one of the highest fatality rates resulting from vehicle collisions in Canada. While 93% of vehicle collisions have human factors (like distracted driving) as contributing factors, 34% of vehicle collisions have roadway factors (like condition of the road surface) as contributing factors.

The Ministry of Highways and Infrastructure (Ministry) is responsible for managing the province's 26,175 kilometers of highways.[1] This includes maintaining safe road conditions. Its Safety Improvement Program objective is "to reduce the frequency and severity of collisions on provincial highways".[2]

For the period September 1, 2014 to August 31, 2015, the Ministry had, other than for the following, effective processes to address safety concerns raised on existing provincial highways. The Ministry needs to develop and follow a consistent process for tracking receipt of and responding to road safety complaints. In addition, it needs to set out criteria for selecting safety improvement projects to complete in the upcoming year, and require its staff to keep its analysis and rationale for selecting those projects. Also, it needs to give senior management periodic reports on the achievement of its road safety improvement program objectives.

This chapter describes the results of our audit on the effectiveness of the Ministry's processes to address safety concerns raised on existing provincial highways.

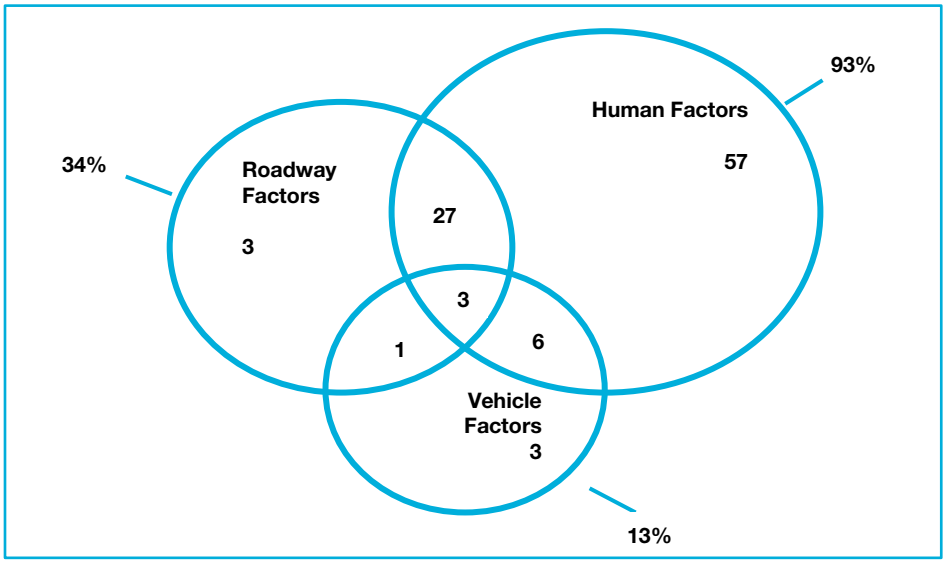
2.0 Introduction

2.1 Vehicle Collisions and Contributing Factors

Collisions are random events and many factors can contribute to them. These include human factors,[3] vehicle factors,[4] and environmental conditions/roadway factors including road condition.[5,6] As shown in **Figure 1**, these multiple factors often overlap. For example, 34% of vehicle collisions have roadway factors as a contributing cause and 30% of vehicle collisions have both roadway factors and human factors as contributing causes (i.e., 27% plus 3%). Also, 57% of vehicle collisions have human factors as the sole cause.

[1] *Ministry of Highways and Infrastructure 2014-15 Annual Report*, p.4.
[2] SIP 200-1, p.1.
[3] Human factors could include distracted driving, driving while impaired, speed or failure to yield.
[4] Vehicle factors could include vehicle defect, load shifted or spilled.
[5] Environmental conditions could include: road condition, animal action, weather conditions.
[6] Example of roadway factors includes the condition of the surface or structure of the road which includes design.

Figure 1—Contributing Factors to Vehicle Collisions



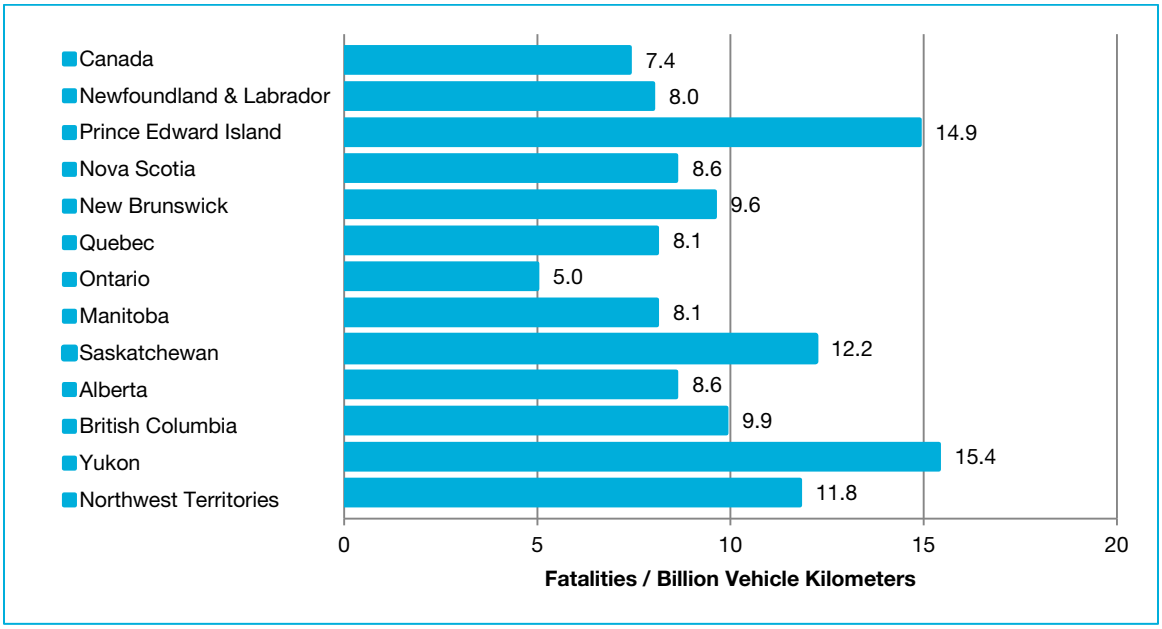
Source: Ministry of Highways and Infrastructure information, adapted from the American Association of State Highway and Transportation Officials *Highways Safety Manual – Volume 1.*

Roadway factors can lead the public, municipalities, other government agencies and Ministry staff to express concerns about road safety (e.g., adequacy of turning lanes, lighting or signage, pedestrian crosswalks, traffic signals, road condition).

2.2 Collisions in Saskatchewan

As shown in **Figure 2**, in 2008, Saskatchewan had one of the highest fatality rates resulting from vehicle collisions in the country.

Figure 2—Canadian Fatalities per Billion Vehicle-kilometres by Province/Territory[a]



Source: Canadian Motor Vehicle Traffic Collision Statistics 2008, www.tc.gc.ca/eng/motorvehiclesafety/tp-tp15145-1201.htm (17 September 2015). 2008 is the most recent statistics available at September 2015.

[a] These numbers are fatalities occurring on all roadways in a province and include municipal roads that are not under Provincial control.

Because collisions are random, the frequency and severity of collisions can vary significantly over the short-term[7] (i.e., in one year there may be many collisions whereas the following year there may be only a few). As shown in **Figure 3**, from 2009 to 2013 collisions on Saskatchewan provincial highways in total and those resulting in injuries have increased by almost 9% (i.e., by 614) and by almost 7% (i.e., by 123) respectively.

In 2013, vehicles travelled over 9.4 billion kilometers on Saskatchewan highways.[8] This is comparable to 2012 travel.[9] In 2013, on average, 21 collisions occurred per day on Saskatchewan highways. This has increased from 19 per day on average in 2012.[10] The Ministry has estimated that collisions on provincial highways in 2013 costed society over $630 million.[11]

Figure 3—Collisions on Saskatchewan Provincial Highways from 2009 to 2013

Year	Total Collisions	Collisions Resulting in Injury	Collisions Resulting in Fatalities	Collisions With Road Condition as a Contributing Factor
2009	6,923	1,811	97	1,622
2010	7,008	1,766	96	915
2011	7,621	1,876	107	1,453
2012	6,867	1,749	128	1,231
2013	7,737	1,934	85	2,038

Source: Saskatchewan Government Insurance's *Saskatchewan Traffic Accident Facts*; 2013 is the most recent statistics available at September 2015.

In 2013, the Legislative Assembly of Saskatchewan (Assembly) recognized the need to improve traffic safety in Saskatchewan. In March 2013, the Assembly appointed a Special Committee on Traffic Safety. In August 2013, the Committee tabled its final report in the Assembly that included 26 recommendations to address safety concerns on highways. As shown in **Figure 4**, the Committee directed five of those recommendations at the Ministry either solely or in conjunction with other agencies (e.g., Saskatchewan Government Insurance [SGI]). These include recommendations to address high-collision intersections, wildlife collisions, and the need for rest stops on major highways.

Figure 4—Extract of Highways-related Recommendations from the *Final Report of Special Committee on Traffic Safety*

Recommendation 19 – Your committee recommends Saskatchewan Government Insurance and the **Ministry of Highways and Infrastructure** work with municipalities to address high collision intersection concerns.

Recommendation 20 – Your committee recommends Saskatchewan Government Insurance, the Ministry of Environment and the **Ministry of Highways and Infrastructure** continue to work together on solutions to mitigate wildlife collisions.

Recommendation 23 – Your committee recommends the **Ministry of Highways and Infrastructure** study the need for rest stops on major highways.

Recommendation 24 – Your committee recommends Saskatchewan Government Insurance and the **Ministry of Highways and Infrastructure** partner with municipalities and First Nations communities to address local concerns.

[7] Ministry of Highways and Infrastructure, adapted from the *American Association of State Highway and Transportation Officials Highways Safety Manual – Volume 1*.
[8] Saskatchewan Government Insurance (2014), 2013 *Saskatchewan Traffic Accident Facts*, p.107.
[9] Ministry of Highways and Infrastructure (2013), *Travel on Saskatchewan Highways*, p. iv.
[10] Calculated based on *Saskatchewan Traffic Accident Fact* information in **Figure 3** divided by 365 days.
[11] Calculated using cost information per type of collision from the Ministry of Highways and Infrastructure (2015), *Vehicle Collision Cost Review*.

Recommendation 26 – Your committee recommends Saskatchewan Government Insurance, the **Ministry of Highways and Infrastructure** and the Ministry of Justice work collaboratively to establish a standardized protocol and reporting system for highway closures.

2.3 Responsibility for Highways Safety

SGI and the Ministry share responsibilities for the safety of the motoring public on provincial highway systems (e.g., the roadway and human factors).

SGI is responsible for most traffic-safety legislation, programs, and policies.

The Ministry is responsible for road safety, and the regulation and protection of "public improvements"[12] under *The Highways and Transportation Act, 1997*.[13] This includes responsibility for the continuous improvement of safety of the design features of the road (e.g., turning lanes, lighting, guardrails, pedestrian crosswalks, the location and type of intersections, highway access points), as well as pavement marking and signage (e.g., exit signs). The Ministry is responsible for assessing and improving the design features of existing provincial highways.

The Design and Innovation Division (Division) within the Ministry is responsible for road design safety and traffic guidance. The Division is responsible for reviewing concerns raised about safety on highways and determining which projects to address these concerns the Ministry should undertake, when, and how. In 2014-15, the Ministry spent $6.8 million (2013-14: $8.2 million) on its Safety Improvement Program.[14]

Being aware of and addressing safety concerns reduces the impact of collisions on society such as loss of life and/or quality of life, lost productive capacity, policing costs, and court costs. A reduction of collisions also reduces the impact on the health care system.

3.0 Audit Objective, Scope, Criteria, and Conclusion

The objective of this audit was to assess the effectiveness of the Ministry of Highways and Infrastructure's processes used for the period September 1, 2014 to August 31, 2015 to address safety concerns raised on existing provincial highways.[15]

For the purposes of this audit, safety concerns relate to the design features of the road. These include those raised by the public or internally by staff within the Ministry of Highways and Infrastructure. This audit does not include safety concerns related to winter maintenance or construction work zones.

We examined the Ministry's policies and procedures that relate to identifying, ranking and addressing safety concerns on existing highways. We assessed the Ministry's

[12] *The Highways and Transportation Act,* 1997 defines a **public improvement** to include: an airport, ditch, ferry, fire-guard, land required for securing material in connection with road works, a public highway, real and personal property that has been or will be a public improvement, a railway, rest stop or transit system.
[13] Section 3 of *The Highways and Transportation Act, 1997*.
[14] *Ministry of Highways and Infrastructure 2014-15 Annual Report*, p.11, and *Ministry of Highways and Infrastructure 2013-14 Annual Report*, p.11.
[15] For the purposes of this audit, provincial highways means both paved and gravel roads under the responsibility of the Ministry. It does not include grid roads which are the responsibility of the individual municipalities.

processes and tested a sample of identified safety concerns to assess whether it followed its policies and procedures and whether it addressed safety concerns in a timely manner.

To conduct this audit, we followed the standards for assurance engagements published in the *CPA Canada Handbook – Assurance*. To evaluate the Ministry's processes, we used criteria based on our related work, reviews of literature including reports of other auditors, and consultations with management. Management agreed with the criteria (see **Figure 5**).

Figure 5—Audit Criteria

1. Define strategy to address road safety concerns
1.1 Establish specific road safety objectives, strategies, and performance measures
1.2 Gather baseline information on performance measures related to road safety
1.3 Document procedures for assessing individual road safety concerns
2. Develop plan to address road safety concerns
2.1 Gather information on road safety concerns
2.2 Determine resources required to address road safety concerns (e.g., human resource, financial)
2.3 Rank road safety concerns using set criteria
2.4 Select road safety concern projects
2.5 Assign responsibilities for road safety concern projects
3. Carry out plan to address priority road safety concerns
3.1 Carry out priority road safety concern projects
3.2 Monitor to ensure priority road safety concerns are addressed within appropriate timeframe
4. Monitor achievement of road safety objectives
4.1 Review and analyze progress on performance measures against baseline information
4.2 Report on performance measures against baseline information
4.3 Use information to adjust future road safety concern projects

We concluded that, for the period of September 1, 2014 to August 31, 2015, the Ministry of Highways and Infrastructure had, other than the following, effective processes to address safety concerns raised on existing provincial highways. The Ministry needs to:

- **Develop and follow a consistent process for tracking receipt of and responding to road safety complaints**
- **Set out, in writing, the criteria for selecting safety improvement projects to complete in the upcoming year**
- **Require its staff to keep its analysis and rationale for selecting safety improvement projects to complete in the upcoming year**
- **Give senior management periodic reports on the achievement of its road safety improvement program objectives**

4.0 Key Findings and Recommendations

4.1 Strategy to Address Concerns

We expected that the Ministry would have processes to set out specific objectives and strategies related to addressing road safety concerns raised (e.g., response times). The Ministry would have a documented process to identify, and assess and rank road safety concerns. It would set related performance measures (e.g., collision reduction measures) and gather baseline information to enable assessment of its progress towards addressing safety concerns.

4.1.1 Documentation of Complaint Tracking Needed

The Ministry's *Safety Improvement Program Manual* (SIP Manual) sets out the purpose of the Ministry's Safety Improvement Program as "to reduce the frequency and severity of collisions on provincial highways through the implementation of infrastructure related safety improvements." The SIP Manual requires the Ministry to analyze and respond to every external complaint that it receives.[16] It defines external complaints as those it receives from the general public, businesses, or other government agencies. It also requires the Ministry to investigate every fatal collision to determine its cause and whether deficiencies in highway conditions may have contributed.[17]

The Ministry receives complaints in various ways (e.g., phone calls, emails, letters or in person). Complaints are typically directed to its Deputy Minister's Office or to individual branches within the Ministry.

The Deputy Minister's Office formally documents and tracks external complaints it receives and when it responds to the complainant. The SIP manual specifies that the Ministry is to respond to safety complaints brought forward within a few weeks. We found, consistent with the Ministry's expectations, for the complaints received by the Deputy Minister's Office that we examined, the Ministry responded to the complainant within one month of receipt of the complaint. Correspondence to complainants set out next steps the Ministry planned to undertake to determine a solution to the complaint (e.g., completing a speed study or traffic study). We found that the Ministry completed those studies.

However, the Ministry's Design and Innovation Division did not consistently document or track all external and internal road safety complaints it received or when it responded to external complaints. For example, in our testing, we found that it did not keep a record of the complaints it received or record how and when it responded to them. It uses a database (SIP database) to track only those complaints which it deems a safety improvement project is necessary.

Not having a consistent process across the Ministry for documenting and tracking road safety complaints increases the risk that a road safety concern may not be appropriately considered and addressed as needed. Also, lack of documentation of its handling of

[16] SIP 200-1, p. 1.
[17] Ibid., p. 1.

complaints reduces the Ministry's ability to show that complaints were handled appropriately.

1. **We recommend that the Ministry of Highways and Infrastructure develop and follow a consistent process for tracking complaints about road safety.**

The SIP Manual outlines the Ministry's process for analyzing complaints or issues, and for recommending projects to address identified road safety concerns. **Exhibit 5.0** sets out, in a flowchart, the process the Ministry uses. This process includes analyzing safety complaints raised and determining if the complaint identifies a valid road safety concern, and whether a safety improvement project is necessary. It has based this process on best practices of other jurisdictions (both within Canada and internationally).

4.1.2 Baseline Information on Road Safety Concerns Gathered

The Ministry expects all provincial highways be constructed and maintained within minimum design standards.[18] *The Ministry of Highways and Infrastructure Design Manual* sets out its minimum design standards for particular sections of a highway (e.g., design of intersections, curve of road based on speed). It maintains this manual based on national and international best practices. The Ministry has modified certain practices from national and international best practices to address needs specific to Saskatchewan roads (i.e., wide fluctuations in temperatures, and winter conditions).

The minimum design standards provide the Ministry with a baseline for deciding whether safety improvements to existing roads are necessary (i.e., for each concern raised, staff determine if the existing road design meets current minimum design standards).

In addition, the Ministry uses another baseline measure called Collision Modification Factors (CMFs). The United States Department of Transportation developed CMFs. CMFs estimate the potential change in the frequency and severity of collisions resulting from a safety improvement. For example, a CMF of 0.60 means implementing a particular safety improvement has the potential to reduce collision frequency by 40%. The CMFs help the Ministry to determine the cost-benefit of the safety improvement proposed.

4.2 High-Priority Concerns Not Defined

We expected the Ministry to compile information on safety concerns raised through internal and external sources and from analysis of road safety statistics and studies (e.g., report from the Special Committee on Traffic Safety). It would determine and assign responsibilities and the resources required to address the concern (e.g. staff, material costs, and equipment costs). We also expected the Ministry to determine when a concern does not require action and would systematically prioritize and select projects.

[18] When the Ministry makes changes to its minimum design standards, it uses those standards on future maintenance or safety improvement projects. It can take several years before a particular highway is upgraded to meet current minimum design standards.

We expected the Ministry to complete, for those projects identified as a priority, the required work within an appropriate timeframe. It would periodically assess its progress towards completing priority projects.

4.2.1 Information on Road Safety Concerns Gathered

The Ministry compiles information on safety concerns from various sources to help it identify and understand road safety concerns. Sources include:

- Information from complaints it has received. Although as noted above, it does not have a consistent process to track all complaints about road safety and its response to those complaints.
- Information on collisions from SGI's collision information database. This database contains information on the number of collisions, type of collision (e.g., property damage, injury, fatality) and the location of the collision.
- Network screening studies.[19] The Ministry does network screening studies every three to five years. It uses these studies to analyze high collision sections and intersections on provincial highways. For example, its 2015 *Road Safety & Network Screening Study* identified road locations with safety concerns looking at the total number of collisions and collision rates concentrating on three key forms of collisions: road departure, animal-related, and winter-related.
- External studies. For example, 2013 *Final Report of the Special Committee on Traffic Safety*.[20]

The Division used the above information to analyze road safety concerns and to assess potential road safety improvement projects.

4.2.2 Processes for Assessing Road Safety Concerns Followed

The SIP Manual outlines the Ministry's process for reviewing road safety concerns, identifying solutions, and selecting projects to complete. It also sets out who is responsible for these steps. Its process requires staff to determine whether an identified road safety concern requires a safety improvement (the Ministry calls these "warranted concerns").[21] The Ministry tracks all warranted concerns in its SIP database including key information resulting from the Ministry's analysis of the concern and its proposed solution. At August 2015, the Ministry had 383 potential SIP projects in its database.

Its SIP Manual provides standardized resources and costs. The Ministry's *Safety Improvement Program Project Prioritization Guideline* outlines costs related to implementing specific safety improvements (e.g., costs to install an acceleration lane,

[19] "Network screening" is the term used by the Ministry for the work it performs in collecting information on the total number of collisions and collision rates on highways within the provincial highway system. Network screening is used to identify high collision intersections which may require safety improvements to reduce the severity and/or number of collisions occurring at that location.

[20] See http://docs.legassembly.sk.ca/legdocs/Legislative%20Committees/TSC/Reports/130830Report1-27-TSC.pdf (3 October 2015).

[21] The Ministry uses the term "warranted" to mean a project, either safety improvement, resurfacing or major capital project, if carried out could improve road safety at that location.

per metre cost of installing guardrails, etc.). The Ministry expects staff to use this information as guidance to propose solutions. The SIP database automatically calculates the estimated cost associated with the type of treatment selected (e.g., turning lane, guardrail, flashing lights).

For the warranted concerns we tested, the Ministry followed its processes to assess concerns raised and to determine further action required, if any. The Ministry analyzed the concern and kept documentation to support its recommended course of action (proposed solution/potential SIP project).

Other information in the SIP database includes the number of collisions at the specific location, and the cost vs. benefit to complete a proposed project. The Ministry uses the database to calculate and automatically assign a "priority score" to a proposed solution (potential SIP project). The priority score calculation takes into account costs of the proposed solution, effectiveness of the proposed solution (using CMF's), and collision history for that particular area of concern. The calculation can be adjusted for other factors (e.g., abnormal peak traffic, results of any consultant's studies, future traffic growth). Higher scores reflect projects that address higher safety risks.

At August 2015, priority scores for potential SIP projects ranged from 0 to 85. As reflected in **Figure 6**, 14% of the projects had scores greater than 49.

Figure 6—Breakdown of Potential SIP Projects by Priority Scores at August 31, 2015

Priority Scores	Number of Potential SIP Projects	% of Total Potential SIP Projects
80 or higher	3	1
60 – 79	23	6
50 – 59	27	7
30 – 49	95	25
29 or lower	235	61
Total	**383**	**100**

Source: Ministry of Highways and Infrastructure records.

For potential projects in the SIP database that we tested, all priority scores were correctly calculated in accordance with the Ministry's process.

4.2.3 High-Priority Projects Not Clearly Defined

The Ministry's SIP Manual expects the Division to develop a project plan each year that sets out which safety improvement projects the Ministry plans to do in the upcoming year (SIP annual project plan).

The Ministry has three regions (northern, central and southern); staff in each region are responsible for the highways in their geographical area. To develop the SIP annual project plan, the Division asks staff located in its regions to recommend projects for completion in the upcoming year to the Safety Improvement Project Committee (SIP Committee) for its review and approval.

The SIP Committee is comprised of members of the Ministry's Design and Innovation Division. The Committee includes Senior Project Managers of each region and a Ministry

engineer. The Ministry noted that the Committee recognizes that funding available for the upcoming year impacts the number of projects selected for inclusion in the finalized current year project plan.

Using the listing of potential SIP projects as the starting point, each region recommends projects for its region. In deciding which project to recommend, Ministry staff advised us that regions do not rely exclusively on the priority score included in the SIP database. Rather, regions may recommend a project with a lower priority score when the Ministry has plans for major capital project or major maintenance work in the same highway section. For example, the Ministry leverages work on a resurfacing maintenance project to address a road safety concern that a potential SIP project was designed to address. Ministry staff also noted potential SIP projects with lower priority scores may be done sooner if the Ministry can share the costs of the project with a partner (e.g., private-sector company, municipality). For these situations, sharing costs can increase the priority score given the cost-benefit ratio is improved (one of the factors influencing the priority score). In these situations, the Ministry adjusts the estimated cost in the SIP database to reflect the potential cost-sharing.

While Ministry staff could explain their project selection process, we found that the Ministry did not have complete written criteria or guidance (in its SIP Manual or other documents) to guide decisions on which projects to include in the SIP annual project plan. Also, they could not clearly explain which projects they regarded as high-priority (that is, projects that must be addressed in the near term).

Lack of documented criteria increases the risk that the regions may recommend projects without consistent consideration of road safety risks that proposed SIP projects were designed to address. It also increases the risk that the Ministry may not focus its resources on addressing high-risk road safety concerns putting the traveling public at risk. Use of clear criteria would help ensure projects designed to address high road safety risks are completed as soon as possible and are not unduly delayed in favor of other government priorities.

2. We recommend the Ministry of Highways and Infrastructure set out, in writing, the criteria for selecting safety improvement projects to complete in the upcoming year.

In April 2015, the SIP Committee approved a 2015-16 project plan comprised of 15 projects. In our examination of this plan, we noted the following. The plan included five projects that were not in the SIP database. Ministry staff noted it included two of these projects at the direction of the Ministry's senior management. The plan also included 6 projects with priority scores of 28 to 49; these priority scores were lower than 53 potential SIP projects with priority scores of 50 to 85. The Ministry was unable to provide us with its supporting analysis or rationale for selecting some of these projects, included in the plan, over those with higher priority scores. The Ministry indicated that a number of the selected projects were tied to other significant construction projects in the area. However, neither the regions nor the Committee documented the basis for their selection decisions.

To gain insight as to how long high-risk projects remain unaddressed, we looked at the length of time potential SIP projects with higher priority scores have been in the SIP database.

Figure 7—Length of Time Potential SIP Projects with Priority Scores over 49 Outstanding at August 31, 2015

SIP Priority Scores	Number of Years in SIP Database	% of Total Potential SIP Projects
80 or higher	1.7 to 3.8	1
70 – 79	0.6 to 3.4	2
60 – 69	0.5 to 6.0	4
50 – 59	0.5 to 6.0	7

Source: Ministry of Highways and Infrastructure records.

Figure 7 shows that many projects with high priority scores have been outstanding for more than three years, some as long as six years. Management has not documented why it has not completed these higher priority SIP projects or whether it has addressed the related safety concern in some other manner.

Maintaining documented analysis or rationale for safety improvement selection decisions would increase the transparency of the Ministry's decisions.

3. We recommend the Ministry of Highways and Infrastructure require its staff to keep its analysis and rationale for selecting safety improvement projects to complete in the upcoming year.

For projects on the annual SIP project plan, management monitors the completion of the projects during the year. Management reviews reports that compare actual to budgeted costs for each project. Ministry staff also provides management with status updates on the projects related to expected completion time frames.

4.3 Monitoring Achievement of Road Safety Objectives Needed

We expected the Ministry to review, analyze, and report on its progress on achieving the safety improvement program objectives. It would adjust its program based on the information gathered.

4.3.1 Analysis Needed on Progress of Meeting Program Objectives

As previously noted, the Ministry's Safety Improvement Program's purpose (objective) is "to reduce the frequency and severity of collisions on provincial highways through the implementation of infrastructure-related safety improvements". However, we found management receives limited information as to whether its safety improvements are reducing the frequency and severity of collisions. For example, senior management does not receive summarized information on the analysis of trends in collisions overall or by

highway section, the frequency and severity of the collisions that occurred where road factors were a contributing cause, and results of studies (external studies and internal network screening).

Without such analysis and information, management may not know if the Ministry is focusing its resources on the right safety improvement projects. Without reporting on results of meeting program objectives, the Ministry may not know if road safety projects were successful and if the resources spent on road safety improvement projects were worthwhile.

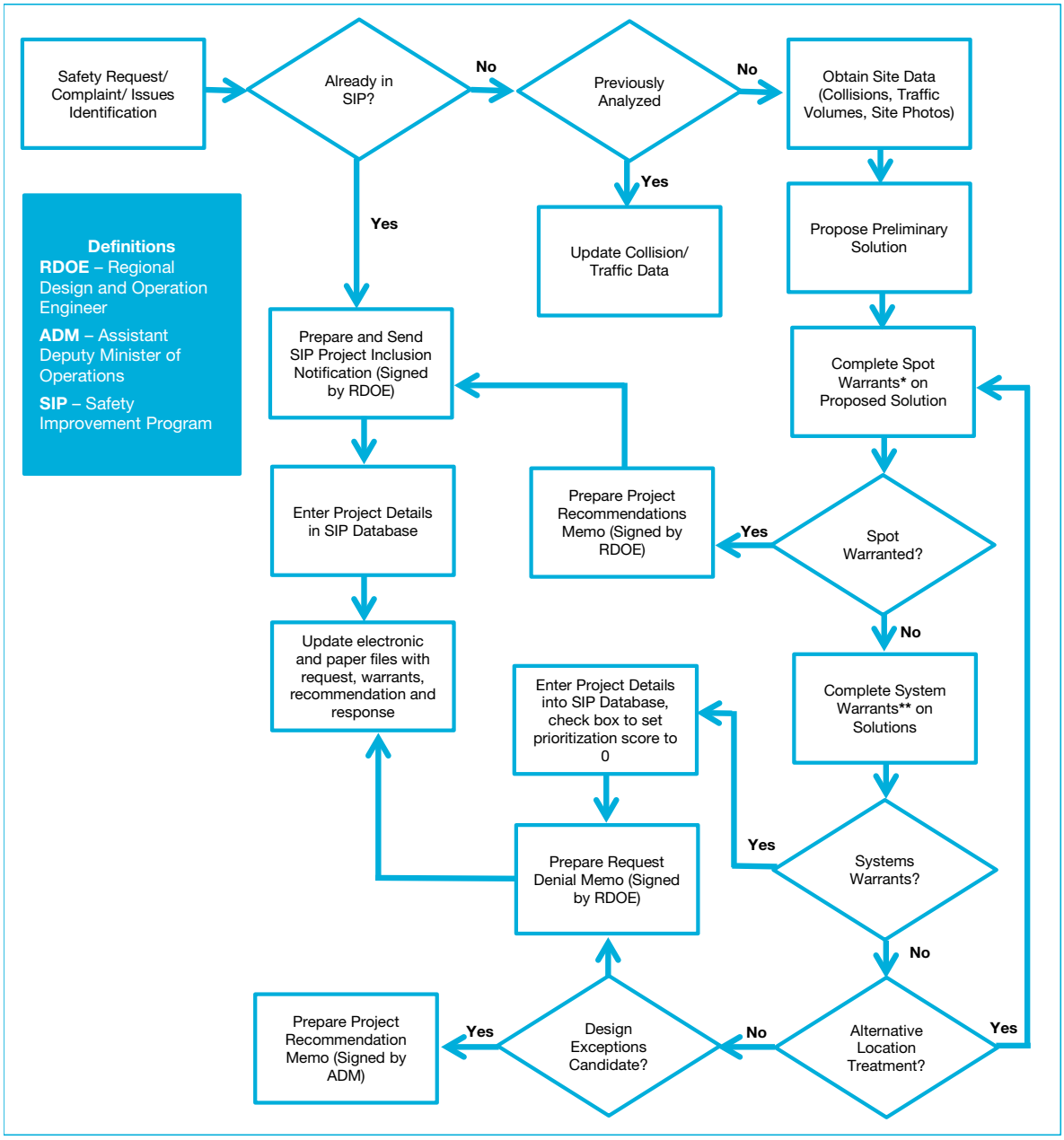
4. We recommend that the Ministry of Highways and Infrastructure give senior management periodic reports on whether its road safety improvement program helped reduce the frequency and severity of collisions.

4.3.2 Information Used to Adjust Future Road Safety Concern Projects

The Ministry uses information it has from past road safety concern projects to adjust its future road safety concern projects. For example the Ministry may adjust future projects as a result of uncontrollable factors (i.e., if projects are significantly and consistently delayed because of weather, then it may in future years select a larger number of projects to complete in order to fully utilize the budget) or it may adjust expected timelines for completion based on prior experience (e.g., commence planning for individual projects earlier). Management has also indicated that it plans to perform a full review of the Safety Improvement Program.

The Ministry also undertakes various studies related to road safety, completed either by individuals within the Ministry or external advisors. For example, its 2015 *Intersection Countermeasure Study* analyzed various available alternatives for safety improvements (e.g., use of roundabouts, traffic signals or alternative intersection configurations). The Ministry expects to use the results of this study to inform future safety improvement decisions.

5.0 EXHIBIT: FLOWCHART PROCESS TO ASSESS COMPLAINTS



Source: Safety Improvement Program Manual, section SIP 200-2, p.1.
*Spot Warrants are assessments of possible safety improvements for a particular section of the highway.
**System Warrants are assessments of safety improvements to meet minimum design standards.

6.0 Selected References

American Association of State Highway and Transportation Officials. *An introduction to the Highway Safety Manual.* Washington: Author. www.highwaysafetymanual.org/Documents/HSMP-1.pdf (4 September 2015).

Canadian Motor Vehicle Traffic Collision Statistics. (2008). Ottawa: Transport Canada. www.tc.gc.ca/eng/motorvehiclesafety/tp-tp15145-1201.htm (17 September 2015).

Legislative Assembly of Saskatchewan. (2013). *Special Committee on Traffic Safety – Final Report*. Regina: Author. http://docs.legassembly.sk.ca/legdocs/Legislative%20Committees/TSC/Reports/130830Report1-27-TSC.pdf (3 October 2015).

Office of the Auditor General of Canada. (2007). *Report of the Auditor General of Canada – Transportation Capital Program and Property Management*. Ottawa: Author.

Office of the Provincial Auditor of Saskatchewan. (2014). *2014 Report – Volume 2, Chapter 33, Government Relations – Processes to Assess Public Concerns*. Regina: Author.

Office of the Provincial Auditor of Saskatchewan. (2010). *2010 Report – Volume 1, Chapter 7, Highways Maintenance*. Regina: Author.

Saskatchewan Government Insurance. (2013). *Traffic Safety in Saskatchewan*. Regina: Author.

Saskatchewan Government Insurance. (2009-2014). *Saskatchewan Traffic Accident Facts*. Regina: Author. http://www.sgi.sk.ca/about/publications/collisionstats/index.html (29 July 2015).

Saskatchewan Ministry of Highways and Infrastructure. (2014). *Annual Report for 2013-14*. Regina: Author.

Saskatchewan Ministry of Highways and Infrastructure. (2015). *Annual Report for 2014-15*. Regina: Author.

Saskatchewan Ministry of Highways and Infrastructure. (2013). *Travel on Saskatchewan Highways*. Regina: Author.

Western Australian Auditor General. (2015). *Main Roads Projects to Address Traffic Congestion*. Perth: Author.