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ROAD SAFETY

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CANADIAN COUNCIL OF MOTOR TRANSPORT ADMINISTRATORS  
CONSEIL CANADIEN DES ADMINISTRATEURS EN TRANSPORT MOTORISÉ



Northwest  
Territories Transportation

# NWT Road Safety Plan



June 2015

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## INTRODUCTION

Roads are important transportation links in the Northwest Territories (NWT), connecting remote communities with the National Highway System, supporting the delivery of essential supplies, and enabling effective development of natural resources. Ensuring the safety of the travelling public on territorial roads is a core responsibility of the Government of the Northwest Territories, Department of Transportation (DOT). The challenges of meeting this responsibility in the NWT are unique due to prolonged snow and ice coverage, the effects of climate change on the stability of road infrastructure, short construction and maintenance seasons, and the level of resources required to coordinate effective road safety initiatives and education over a widely dispersed highway system.

DOT delivers many road safety programs and initiatives which have noticeably reduced NWT collision and casualty rates over the past 20 years. Among the most positive trends, a significant decrease in drinking & driving incidents and the increased use of occupant restraints has been achieved. DOT is now paving a new path forward in territorial road safety to build on the success of past efforts and to guide current and future efforts.

The purpose of the NWT Road Safety Plan (RSP) is to guide the department's road safety programs over the next four years in a manner that is collaborative, structured, and focused on the goal of reducing fatalities and injuries on our community roads, winter roads, ice crossings, highways, and trails. These road safety initiatives help advance the long term vision for the transportation system as defined in *Connecting Us: Northwest Territories Transportation Strategy 2015-2040* and will be implemented within the four action plan and annual business planning processes of the department.

Two principal documents informed the NWT's *Road Safety Plan*. The first was *Canada's Road Safety Strategy 2015* (RSS 2015) which set a vision for Canada to have the "safest roads in the world". The guiding document and vision was developed collaboratively by jurisdictions across the country, coordinated by the Canadian Council of Motor Transport Administrators (CCMTA). The RSS 2015 also identified key target groups, contributing factors in road safety, and strategies for increasing safety. The second document, developed by DOT, is entitled *Statistical Trends on Territorial Roads 2013*. This document identifies key trends in road safety in the NWT based on a detailed analysis of over twenty years of territorial traffic collision data.

The NWT Road Safety Plan is the first fully integrated plan that combines road safety efforts from across the department. Staff from divisions who are directly involved with road safety-related initiatives have

worked as a team to produce this plan and will meet regularly to review progress, track results, and enhance the plan in consultation with road safety stakeholders.

## GOAL

*To reduce collisions and fatalities on NWT roads.*

## TIMEFRAME

The department has set a four year timeframe to review and revise this plan, which will be consistent with the review of Canada's RSS 2015. In addition, an interim review will occur at the two year mark to monitor progress. As the opportunity to continue, revise, or renew the RSP arises, the department will highlight emerging and continuing trends in road safety and consider innovative initiatives moving forward.

## CONTRIBUTING FACTORS

The following trends were identified through statistical analysis of over 20 years of traffic collision data as high priority issues affecting safety on territorial roads:

**Impaired Driving:** Driving impaired leads to a weakening of the proper judgment required to operate a motor vehicle. In the past, department efforts related to driver impairment have tended to focus on alcohol-impaired driving, which is reflected in statistical trends. Although alcohol-impaired driving remains a critical issue in the NWT, the department will also be focusing on distracted driving and impairment related to fatigue and drug use, as these trends have quickly become a major issue in the north.

### Alcohol Impaired Driving

Although alcohol-related collisions are declining, alcohol remains a key factor responsible for deaths on NWT roadways. Over a 25 year period (1989 - 2013) there were only 8 years where alcohol did not contribute to fatal collisions.

### Drug Impaired Driving

From 1989 to 2013 the maximum number of collisions attributable to drug-impairment reported in one year was three, and there is no distinguishable pattern from year to year. DOT must continue building its knowledge and information systems to ensure that impairment related to drug use is properly recognized and recorded.

### Fatigue Impaired Driving

As with drug-related impairment, the NWT experiences few fatigue-related collisions, and therefore, no obvious trends can be identified. The number of fatigue-related collisions fluctuates each year, ranging from 0 to 10 collisions. This is a driver condition that is also difficult to detect, resulting in under-reporting. Increased familiarity with symptoms would aid in recognizing this behaviour and educating the public on the dangers of driving while fatigued.

### Distracted Driving

Distracted driving has been on the rise across Canada and the Northwest Territories is no exception. From 1999 to 2008, distracted driving collisions doubled and the number of incidents remains high. The rapid increase in the use of handheld electronic devices is a major contributing factor. While distracted driving is mainly an issue on roads within NWT communities, as cellular service continues to expand it will be important to focus on keeping distracted highway collisions from increasing at the same time.

**Speeding & Driver Error:** The two largest contributing factors to collisions in the NWT are driving at an unsafe speed and driver error. Both highly influence the severity of collisions, together contributing to approximately 45% of all fatal collisions in the NWT. Influencing positive driver behavior in this area has proven difficult in the past and public awareness initiatives have seen

varying results. Enforcement tactics have proven to be the most effective strategy but the NWT struggles to have consistent enforcement presence along the entire NWT highway system.

**Occupant Protection:** Seat belt use is the most important factor affecting outcomes in collision fatalities. An occupant is 13 times more likely to be seriously injured or killed if an occupant restraint is not used during a collision. Fortunately, the use of occupant restraints is growing in the NWT. According to data from the Buckle Up NWT campaign, seat belt use by adult vehicle occupants has risen from 38% to 60%. In Yellowknife, usage is near the Canadian national average of 95%. Continued promotion of occupant restraints through communications and awareness initiatives is important to improving road safety in the NWT.

**Environment:** Environmental factors affecting road safety in the NWT range from icy conditions to the presence of wildlife such as bison on territorial highways. Though ice is reported to have been a factor in close to 50% of reported collisions across the territory on both community roads and highways, weather is generally not seen as a major contributing factor to collisions. Most collisions have occurred while road conditions were in good condition, at 86.2% for collisions occurring in communities and 63.3% of collisions on highways. To date, one fatality in the NWT has been associated with a bison-vehicle collision, but every year an average of two or three persons suffer minor to moderate injuries in a bison-related collision. These collisions cause significant damage to the colliding vehicle as well as a large number of bison mortalities. Tracking these collisions is not always easy; it is estimated that figures reported by DOT represent only half of all bison-vehicle collisions because they only represent reported incidents. New reporting changes as part of the *NWT Wildlife Act* should improve data related to wildlife collisions in future.

**Vehicle Condition:** Technological advancements have led to vehicle designs which reflect increased safety improvements, contributing to the reduction of fatalities nationally. Canada ensures that new vehicles being sold across the country meet 50 federal safety standards, which can be found at Transport Canada's website. Nonetheless, it is still important for drivers to maintain their vehicles and ensure they are in proper working order. Malfunctions can and do occur, affecting

the control drivers have over their vehicles and increasing their likelihood of being involved in a collision.

## TARGET GROUPS

**New, Young & Aging Drivers:** The over-representation of young drivers (defined as those drivers below the age of 25) involved in collisions in the NWT is concerning. Despite representing a small proportion of the NWT driver population, young male drivers account for 31.1% of reported alcohol-impaired drivers, 29.9% of reported speeding drivers, and 21.6% of reported distracted drivers involved in collisions. To protect the safety of all road users, special attention is given to educating and conditioning new and young drivers to drive safely. Verifying the skills and abilities of aging drivers is also a priority.

**High Risk Drivers:** High risk drivers are defined by the Canadian Council of Motor Transport Administrators as anyone who persistently engages in driving behaviours that increase the risk of collisions. Although high risk drivers are estimated to represent only 3% of Canadian drivers and 1 - 2% of drivers in the NWT, they are responsible for an estimated 12% of fatal collisions and 8% of serious driving-related injuries in Canada. These drivers represent a significant challenge to their own safety, the safety of their passengers, and the safety of the travelling public. DOT's High Risk Drivers Program (HRDP) will be designed to instigate positive behavioural change and remediation in serious problem drivers.

**Commercial Drivers:** Commercial carriers play an essential role in the NWT's economy through the delivery of bulk goods and fuels to NWT communities and resource projects. DOT statistics show that collisions involving motor carriers (usually a straight truck or tractor-trailer combination) are more likely to result in fatalities and serious injuries than collisions involving mainly light-duty vehicles. The large size and high speed of these vehicles, occasionally coupled with driver fatigue (commercial drivers often travel long distances in difficult conditions), can be contributing factors to the severity of heavy vehicle collisions. According to the National Transportation Safety Board,

fatigue is a factor in approximately 30% of fatal heavy vehicle collisions in Canada. Monitoring and inspecting commercial vehicles and their drivers is essential to safety on territorial highways.

**Other Road Users:** Pedestrians (including those in motorized wheelchairs and mobility devices), motorcyclists, and cyclists are defined as “vulnerable road users”. The number of collisions involving vulnerable road users in the NWT is low compared to other jurisdictions. With many remote trails in the territory, off-road vehicles such as snowmobiles and all-terrain vehicles (ATVs) are common. This means extra caution must be taken by drivers, particularly during winter months when snowmobiles are in abundant use. Operators of snowmobiles and ATVs must also be aware of road safety and their own unique safety requirements. Off-road vehicle collisions can also be seen as mainly involving inexperienced younger drivers. Nearly 50% of all collisions involve drivers under the age of 24, with over 30% being under the age of 20.

## STRATEGIES

### Communication/Awareness

*Drive Alive* – Drive Alive is a travel safety public awareness campaign developed by the Department of Transportation. Safety campaigns are combined under a single brand to reinforce key messages and reduce resource requirements. Drive Alive funding also supports activities under the GNWT’s Healthy Choices Framework related to personal safety. Providing information on preventable injuries and highway safety are key elements of the program.

#### Campaigns:

- Snowmobile Safety (January) – Online presence, radio ads, and media interviews with messaging about driving with caution and using appropriate equipment, preparing for the unexpected, and staying aware of weather conditions.

- Seat belt safety (February – March) – Online presence, radio ads, and media interviews reminding the travelling public that seat belts are required in the NWT and to drive with caution while using the appropriate safety equipment.
- Bicycle safety (April) - Online presence, radio ads, and media interviews with messaging about riding with caution and using appropriate safety equipment while sharing the road and being aware of your surroundings.
- Sober Driving (May) - Online presence, radio ads, print ads, speaking opportunities, and media interviews reminding the travelling public to give driving their full attention and to never drive while impaired.
- Safe recreational travel (bikes, motorcycles, boats, ATVs) (June) - Online presence, radio ads, news releases, and media interviews with messaging focused on sharing the road and being aware of your surroundings while using the appropriate safety equipment.
- In the Zone (Construction Zones) (July) - Online presence, radio ads, highway signage, and media interviews with messaging about driving according to conditions and staying aware of your surroundings and changing conditions.
- Bison Awareness (August) - Online presence, radio ads, print ads, highway signage, and media interviews with messaging about driving with caution, being aware of your surroundings and changing conditions, and reporting collisions with bison to the Department of Environment and Natural Resources.
- In the Zone (School Zones) (September) - Online presence, radio ads, print ads, and media interviews with messaging about driving with caution and being aware of your surroundings and changing conditions.
- Winter Driving & Bison (October) – Online presence, radio ads, print ads, highway signage, and media interviews with messaging about driving with caution, being aware of your surroundings and changing conditions, preparing for the unexpected, driving according to conditions, and staying aware of weather conditions.
- Winter Driving & Ice Safety (November) - Online presence, radio ads, and media interviews with messaging about driving with caution, being aware of your surroundings and changing conditions, preparing for the unexpected, driving according to conditions, and staying aware of weather conditions.

- Drive Sober (December) - Online presence, radio ads, print ads, speaking opportunities, and media interviews reminding the travelling public to drive with caution, give driving your full attention, and never drive while impaired.
- Impaired Driving (Year-round) - Online presence, radio ads, print ads, speaking opportunities, events, info-cards, flyers, posters, highway signage, and media interviews reminding the travelling public to drive with caution, give driving your full attention, and never drive while impaired.
- High-Risk Driver Interventions (Year-round) - Online presence, radio ads, news releases, flyers, posters, and media interviews reminding the travelling public to drive with caution, give driving your full attention, and never drive while impaired.
- Seat Belts (Year-round) - Online presence, radio ads, and media interviews reminding the travelling public seat belts are required in the NWT and to drive with caution while using the appropriate safety equipment.
- Travel Planning (Year-round) - Online presence, radio ads, news releases, flyers, highway signage, events, info-cards, and media interviews with messaging about preparing for the unexpected, driving according to conditions and staying aware of changing conditions, staying aware of weather forecasts and highway statuses, and wearing reflective materials so you can be seen at night.

*Carrier Safety Ratings* - Since 1990, truck and bus operators in the NWT have held a public label known as a Carrier Safety Rating. In this system, the Registrar of Motor Vehicles reviews a company's safety record in terms of collisions, convictions, inspections, and facility audits to form the basis of a safety rating for a carrier. The availability of these ratings to the general public allows institutions and businesses requiring the services of carriers to make informed service procurement decisions. Carriers with good safety ratings have the benefit of being able to use their ratings to promote their business to customers, while carriers with poor safety ratings are easily identifiable. Therefore, the rating program provides an incentive to commercial operators to meet or exceed operational safety standards.

*Alerts for Drivers* - Alerts for Drivers provide road users with immediate information regarding road conditions and closures through multiple media paths including emails and social media and improved website information.

## **Education/Training**

*Alcohol Awareness Testing* - An alcohol awareness test module will be integrated into the requirements for new drivers studying and writing their driver examination. This will take place during the Class 7 learner's licence assessment. This additional testing will remind new drivers of the dangers and consequences associated with drinking and driving.

*Flashcards Driver Training Tool* – Flashcards will now be used by the department in an effort to improve driver training and education tools. Similar driver training tools are being used in Alberta, Saskatchewan, and P.E.I., with major improvements realized in test scores since their implementation.

*Online Driver Training Manual* - The basic driver licence handbook for the NWT is easily accessible at the department's website in both French and English. Handbooks for motorcycle operators and professional operator licences are also available online, along with an air brake training manual and reference guide. All of these training documents can be downloaded by the public free of charge.

*High Risk Drivers Program (HDRP)* - Through the HRDP and related initiatives, DOT aims to encourage lasting improvement in the driving behaviour of high risk drivers. In circumstances where driver behavior improvements are not achieved, the department is prepared to take corrective action as required to protect public safety on our roads and highways. Long term objectives include a decrease in infractions (convictions, suspensions, etc.) for high risk drivers participating in the program.

The HDRP will include remedial courses and is expected to include in-class training that emphasizes personal responsibility and improved driving habits. The number of graduates from the program and their driving records after program exit will be indicators of the success of the program.

*A Rider's Guide to Moped, Motorcycles, All-Terrain Vehicles, and More in the Northwest Territories* - This is a DOT publication which provides information on the use of small and off-road vehicles. This handbook clearly sets out licensing, age, registration, insurance, and helmet requirements for small vehicle types likely to share NWT roads as well as those vehicles that are prohibited from on-road use.

*Bike Rodeos* - DOT partners annually with municipalities across the NWT and with motor vehicle officers to put on bike rodeos where rules of the road are reviewed, bike training is offered, and educational activities are held for kids. Children are largely the target audience of these rodeos and the department is looking into ways to better target adults on bicycle safety.

*A Field Guide to Ice Construction Safety* – In 2015, DOT revised its field guide on ice construction safety in order to bring safety and working standards up to date and to include strategies for climate change mitigation and adaptation. The booklet was developed to provide guidance to DOT staff and contractors involved in the construction and maintenance of winter roads, ice roads, and ice bridges. It outlines work practices and procedures intended to increase the safety of those working or traveling on winter roads and ice surfaces.

### **Policy, Legislation, & Regulation**

*Administrative Licence Suspensions* - The NWT Administrative Licence Suspension (ALS) program allows law enforcement officers to administer automatic driver's licence suspensions or disqualifications to those suspected of driving while impaired or fatigued. No court conviction is necessary for these suspensions and disqualifications. This includes an automatic 24-hour suspension for those drivers who are believed to be impaired by drugs or alcohol, or who are fatigued, regardless of blood alcohol content (BAC). A 24-hour licence suspension can also be given to driver's with a BAC between 0.05 to 0.08. This suspension can be increased to 30 days if in the past two years the individual was subject to a prior suspension, disqualification, or prohibition for

drinking and driving with a BAC over .08 or for failing to supply a breath or blood sample. A 30-day licence suspension will be given to a novice driver who has any alcohol in their system, if they are below .08 BAC. An automatic 90-day licence suspension will be given to anyone driving with a BAC of 0.08 or greater. This legislation is governed by the NWT *Motor Vehicles Act* and is enforced by the RCMP and municipal enforcement officers.

*Alcohol Ignition Interlock Program* - Through the Alcohol Ignition Interlock Program, an individual convicted of impaired driving under the *Criminal Code of Canada* may apply for an early return of driving privileges if an approved interlock device is installed in their vehicle. This device prevents motor vehicles from starting if the driver's BAC exceeds a pre-set threshold limit. This is determined through a breath sample provided by the driver when attempting to start the vehicle. If no alcohol is detected, the vehicle will start. The driver may also be required to provide a breath sample during their journey at random intervals. The program targets drivers convicted of impaired driving who are at risk of being repeat offenders. The program is currently voluntary in the NWT, unless the client is ordered by a judge to participate.

*Distracted Driving Legislation* - NWT legislation targets driver inattention by making it illegal to use hand-held electronic devices while driving. This complements existing legislation under the Motor Vehicles Act prohibiting drivers from operating motor vehicles without due care and attention (careless driving). Distracted driving fines have nearly tripled since the legislation first came into place. The initial fine set was \$115 when the legislation first came into force in January 2012 and it is currently at \$322. This offence also comes with the issuance of three demerit points. As of April 2015, almost 950 drivers have been convicted for distracted driving since the law came into effect in 2012.

The offence for driving while using a restricted electronic device can be found under section 155.1(2) of the *Motor Vehicles Act*.

*Zero BAC for New Drivers and their Supervisors* - A zero tolerance policy on driving after consuming any amount of alcohol applies to drivers in the Learner and Probationary stage and to individuals accompanying the person learning to operate a motor vehicle or motorcycle. A 30 day administrative licence suspension will commence immediately if the driver's BAC exceeds zero. A 90

day suspension will commence immediately if the driver’s BAC exceeds .08. This legislation supports DOT’s strategy to stop drinking and driving by sending a clear message against it to the territory’s newest and youngest drivers, while simultaneously targeting supervisors of new drivers.

Construction & School Zone Speeding Fines - In 2014, DOT amended the *Motor Vehicles Act* to introduce a new offence for speeding within school zones and construction zones. The monetary penalty for speeding in these zones was doubled compared to speeding outside of these zones.

Speed	Pre-2014 Penalty (fine plus 15% Victim of Crime Surcharge)	Specified (fine plus 15% of Crime)	Current Penalty (fine plus 15% Victim of Crime Surcharge)	Specified (fine plus 15% of Crime)
15 km/h over or less	\$50 + \$7.50		\$100 + \$15	
16 km/h to 30 km/h over	\$75 + \$11.50		\$150 + \$23	
31 km/h to 50 km/h over	\$100 + \$15		\$200 + \$30	

*Speeding Fines Revision* - Speeding fines are currently under review by DOT with plans to bring them in line with similar fines in other Canadian jurisdictions.

*Graduated Driver Licensing Program* - Under the Graduated Driver Licensing (GDL) program, new drivers earn increased driving privileges as they gain more knowledge, skills, and experience. To obtain a full Class 5 licence there are now 2 stages, ensuring that drivers are given a period of at least 24 months to learn and build skills before receiving full driving privileges. Recent changes permit the accumulation of fewer demerit points during Probationary and Learner driving stages before the loss of driving privileges.

**GRADUATED DRIVER LICENSING PROGRAM**

- ❖ After successfully completing a written examination, drivers must complete a period of 12 months, excluding any period of suspension, at the Class 7 or Learner's stage prior to advancing to the next stage of licensure.
- ❖ The Class 7 stage allows only one passenger (a supervising driver) while operating a motor vehicle.
- ❖ The Class 7 stage prohibits operation of a motor vehicle between 11pm and 6am.
- ❖ After successfully completing a road test, drivers at the Class 5P or Probationary stage must complete a period of 12 months, excluding any period of suspension, prior to advancing to a full Class 5 licence. After this time, applicants must apply for this upgrade.
- ❖ Drivers at either the Class 7 or 5P stage are not allowed to have any blood alcohol content while operating a motor vehicle.
- ❖ Drivers at the Class 5P stage are prohibited from having more than one passenger in the front seat while operating a motor vehicle.
- ❖ The minimum age requirement for a Class 5 licence is 17 years old.

*Driver Examinations* - Over the past four years DOT's written and practical driver examinations have been substantially improved to better align with best practices in other jurisdictions. Training sessions were held for driver examiners in 2011 in Yellowknife, Hay River, and Vancouver. As a result of this new knowledge and training, road tests were increased from half an hour to forty-five minutes. These improvements focus on ensuring that new drivers are being adequately tested on road knowledge and driving skills before being licensed to drive a motor vehicle.

*Seniors' Retesting* - DOT retests senior drivers to verify their driving abilities and competence behind the wheel. The NWT follows the Canadian Council of Motor Transport Administrators (CCMTA) driver medical testing standards, which require individuals to complete driver medicals at age 75, 80, and every two years after their 80<sup>th</sup> birthday.

*Motor Vehicle Act Amendments* – The following amendments to the *Motor Vehicles Act* were approved by the 17th Legislative Assembly on March 13, 2014:

**An Act to Amend the Motor Vehicles Act (Bill 5) – Safety Highlights**

- ❖ Defines “driving record” as well as who may gain access to it and under what circumstances
- ❖ Up to 1 year early renewal of driver’s licences/up to 90 day extension on interim driver’s licence
- ❖ Registrar can now *suspend* or cancel a driver’s licence if the Registrar has reasonable ground to believe a driver cannot operate a motor vehicle in a safe manner
- ❖ Suspensions and prohibitions are now in place as long as the Registrar sees fit

*Demerit Point Program* - The Demerit Point Program is designed to identify persistent traffic violators and to address their poor driving behaviours with different sanctions as they progress through the program. The program will undergo administrative improvements, improved processing of points accumulated from other jurisdictions, and replacement of driver interviews with a pass/fail test so that assessments will be based on non-subjective criteria.

*Fines Review* - Fine reviews are being conducted on an ongoing basis. Fines will be modified to ensure that driving-related fines influence positive driving behavior and become more effective deterrents to poor driving.

*National Safety Code* - The National Safety Code (NSC) is a set of national standards supported by provincial and territorial regulations. By establishing management and performance requirements for commercial carriers, the NSC also establishes minimum standards of safety for commercial vehicles and drivers. There are 16 NSC standards, ranging from commercial driver licence requirements to carrier facility audits. Responsibility for mechanical maintenance of vehicles and the actions of their respective drivers is assigned to carriers.

*Partners in Compliance* - Partners in Compliance (PIC) is a safety program that rewards motor carriers rated as “Excellent” by the Province of Alberta by allowing them to bypass weigh scales in the NWT as well. This is intended to encourage compliance with commercial trucking standards. This also allows NWT’s Motor Vehicles Officers to concentrate their efforts on carriers that do not

currently have high safety ratings. PIC establishes the principle that excellent safety performance is a good management decision.

*Transportation of Dangerous Goods Regulations* - Through regulations developed by Transport Canada, DOT focuses on ensuring compliance with the transportation of dangerous goods in the NWT. When needed, Transport Canada provides oversight and support on dangerous goods accidents to promote public safety. Large penalties and fines exist for non-compliance. Educating enforcement on how to apply existing regulations is critical to success in this area.

*Trip Inspection Standards* - Inspections on commercial vehicles in the NWT are to be conducted every 24 hours to ensure safe operating conditions.

*Motorcycle Helmet Standards, Exemptions & Labeling* - In 2011, DOT implemented a system of standards, exemptions, and labeling for motorcycle helmets to encourage their proper use by off-road vehicle operators.

*Motorcycle Floorboards and Foot-pegs* - In 2014, amendments from Bill 5: *An Act to Amend the Motor Vehicles Act* brought forward a new law that requires motorcycle riders and passengers to be able to reach foot-pegs or floor boards with their feet. This provision would prohibit passengers who cannot do so, specifically children, from riding on a motorcycle. Both passengers and operators of motorcycles risk being thrown off balance, potentially causing collisions, if a rider cannot reach the foot-pegs or floorboards of the vehicle.

*Right-Hand Drive Vehicle Inspection Program* - All right-hand-drive vehicles in the NWT, including those that have already been registered, must undergo an inspection process. Registrations on these vehicles will not be renewed until this is done. These inspections are performed by Motor Vehicle Officers stationed in Yellowknife, Hay River, and Inuvik. These inspections are free of charge for the owner.

## Infrastructure/Engineering

*Multi-Use Shoulder Lanes on Highways near Communities* - The regular use of ATVs and snowmobiles in the north for intercommunity travel presents safety challenges. While cycling is also popular on highways close to communities, there is limited space and less than ideal conditions for riding. It is expected that the topic of legally incorporating multi-use shoulder lanes will continue to be open to discussion in the near future. In the meantime, new design and construction of highways within the vicinity of communities now include increased road and shoulder widths.

*Enhanced Safety Improvements* – Within the capital planning process the Department will continue to make incremental spot safety improvements a priority to continue to most critical safety related infrastructure improvements across the highway system. Priority improvements are identified through a combination of vehicle collision statistics and engineering assessments of the system.

## Data/Research

*National Collision Data Base 2* - Since 1999, DOT has been using the National Collision Data Base (NCDB-1) to collect data on all police-reported collisions. In 2006, the NCDB-2 Data Dictionary was finalized and is expected to substantially improve the collection of collision data reporting once it is implemented by all Canadian jurisdictions. The Data Dictionary includes a separate data element for distracted driving which identifies specific sources of distractions, including the use of hand-held electronic devices. DOT is in the process of implementing NCDB-2. With the integration of this system, the NWT will be up to date with the standard of information collection being implemented in jurisdictions across Canada.

DOT will continue to participate on a number of joint research initiatives underway across Canada and the United States coordinated through the various task forces and Committees under the

Council of Minister's Responsible for Transportation and Highway Safety. For example, under the Engineering and Research Support Committee, the Naturalistic Driving Study is currently underway which investigates human factors while driving through examining real time vehicle and driver data through sensors, video and audio collected from volunteer subjects and their vehicles during every day driving.

## Partnerships

*Enforcement Partnership* - DOT continues to strengthen its partnership with law enforcement agencies. Since September 2013, Road Licensing & Safety has held regular meetings with local enforcement officials to update them on current initiatives and to hear any questions, concerns, or recommendations they may have.

*Project GearShift* - Project GearShift is a teen driver safety campaign led by Parachute, a national injury prevention organization. Project GearShift provides members with the tools to effectively reach teen drivers such as educational resources for use in classrooms, peer leadership activities, and techniques for mobilizing community actions related to road safety. The Project GearShift website provides contact information for various partners and lists events targeting teen driver safety that are occurring across the country, encouraging member participation. DOT, through the Drive Alive program, provides support to any NWT school that becomes a Project Gearshift school.

*Commercial Vehicle Safety Alliance* - The Commercial Vehicle Safety Alliance (CVSA) is an international not-for-profit organization that takes a leadership role in supporting issues related to commercial vehicle safety and security. The target audience for this support includes enforcement agencies, industry, and policy makers. The NWT receives training and certification, outreach opportunities, and organizational development in commercial motor vehicle safety and security through CVSA.

*Students Against Destructive Decisions (SADD) and Mothers Against Drunk Driving (MADD)* – The Department will continue to partner with, support and promote NWT community based efforts

to improve road safety, including support for SADD and MADD. These community based efforts have been successful in promoting and advocating for improved safety on our Highway System.

# Appendix A



## Statistical Trends on Territorial Roads



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## Introduction

The Road Safety Strategy 2015, prepared by the Canadian Council for Motor Transport Administrators (CCMTA), is the basis for identifying possible objectives for a road safety plan for the Northwest Territories. The Strategy provides a framework of best practices which each jurisdiction can adopt or adapt to address its specific road safety challenges. Jurisdictions have the responsibility for developing their own plans and also have the option of developing their own quantitative targets for specific casualty reductions during the five-year timeframe. The Road Safety Strategy's ultimate goal is to continue to reduce fatalities and serious injuries caused by collisions on Canada's roads.

The purpose of this document is to identify traffic safety trends and issues in the Northwest Territories with a view to developing a comprehensive traffic safety plan. Most of the information presented in this document was obtained from the Traffic Collision Information System maintained by the Department of Transportation. A reportable collision is any collision involving at least one motor vehicle on a public roadway resulting in death or injury to one or more persons, or a minimum of \$1000 property damage in the absence of deaths or injuries. The collision database, which goes back to 1989, is based on reports submitted by the RCMP who collect information from attending the scene and interviewing persons involved.

Estimates on total vehicle kilometres travelled in the Northwest Territories were obtained from the Canadian Vehicle Survey conducted by Statistics Canada. The estimated vehicle kilometres traveled on the NWT Highway System was taken from the Highway Traffic Report published by the Department of Transportation. Driver population statistics and conviction information under the *Criminal Code* and *Motor Vehicles Act* were obtained from the Registrar's Report, which is also published by the Department. Occupant restraint usage rates for the Northwest Territories and Canada were taken from Transport Canada's road-side surveys.

Trends and traffic safety issues presented in this document include:

- Total collisions and collision rates;
- Time of occurrence of collisions;
- Collisions involving impairment from: alcohol, drugs, fatigue, and distraction/inattentiveness;
- Collisions involving speeding/"driving too fast for conditions" and other driver errors;
- Collisions involving weather and road conditions;
- Collisions involving bison;

- Collisions involving young drivers;
- Collisions involving vulnerable road users;
- Collisions involving motor carriers;
- Use of occupant restraints;
- Traffic safety offences under the *Criminal Code* and *Motor Vehicles Act*;
- Collisions involving off-road vehicles
- Collisions in communities;
- Collisions on the highway system; and
- Collisions on the winter road system.

## Total Collisions and Collision Rates

Figure 1 shows the total number of collisions and persons injured and killed (casualties) in the Northwest Territories from 1989 to 2011.

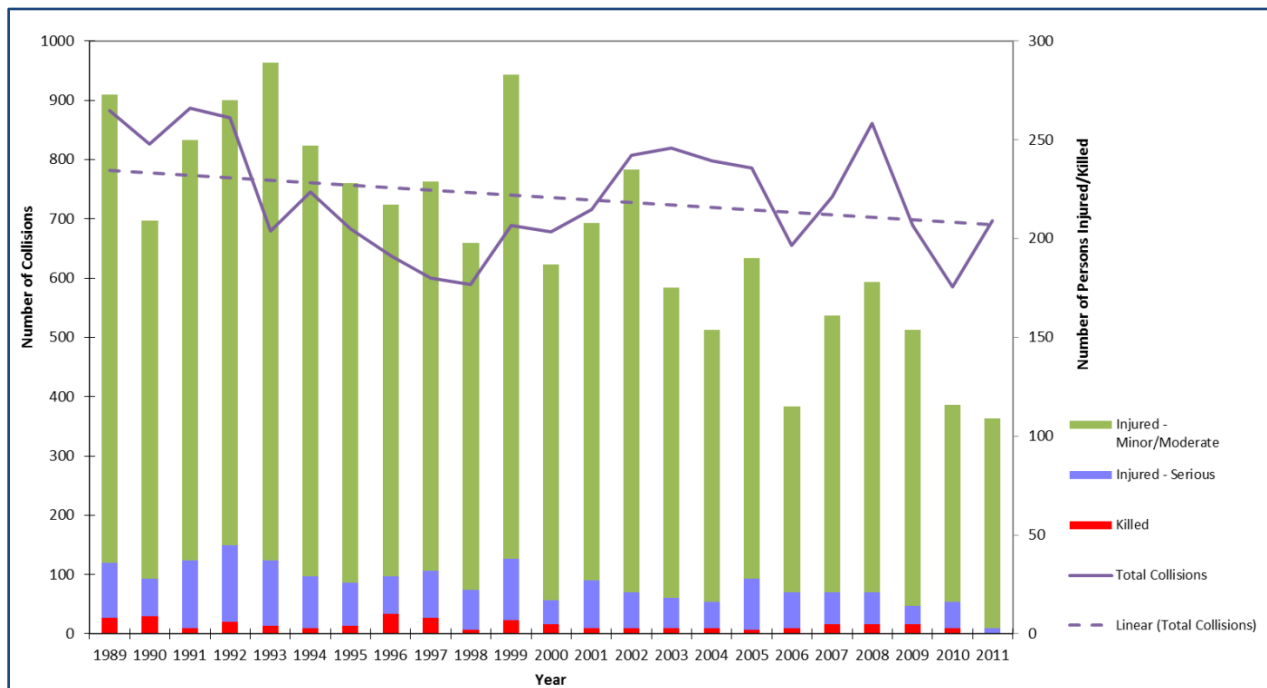


Figure 1: Total Collisions & Persons Injured/Killed, 1989 to 2011

The number of casualties has declined steadily over the 23-year period. An average of 4 to 5 people die each year in collisions and another 200 people suffer injuries. The most fatalities in one year were 10 in 1996, while 1993

had the highest number of injuries at 285. The year 2011 is noteworthy in that it was the first year when no fatalities were reported and only 109 persons were injured.

The total number of collisions has also declined, although this decline has not been steady. Between 1989 and 1992, there was an average of 865 collisions per year. The number of collisions dropped to a low of 589 in 1998, peaked at 819 in 2003, dropped to 655 in 2006, reached a third peak of 861 in 2008, then dropped to an all-time low of 585 in 2010. Reporting definitions remained the same between 1989 and 2011. Beginning in 2012, the Northwest Territories increased the reporting threshold for property damage only collisions to \$2000, conforming to the nation-wide change in threshold level.

Figure 2 compares the total number of collisions occurring from 1989 to 2011 in NWT communities, on the NWT Highway System, and in the Northwest Territories all together. The graph indicates that there were significantly more collisions occurring in communities than on highways, with an average difference of 380 collisions. As a result the total collisions trend largely reflects the pattern of community collisions.

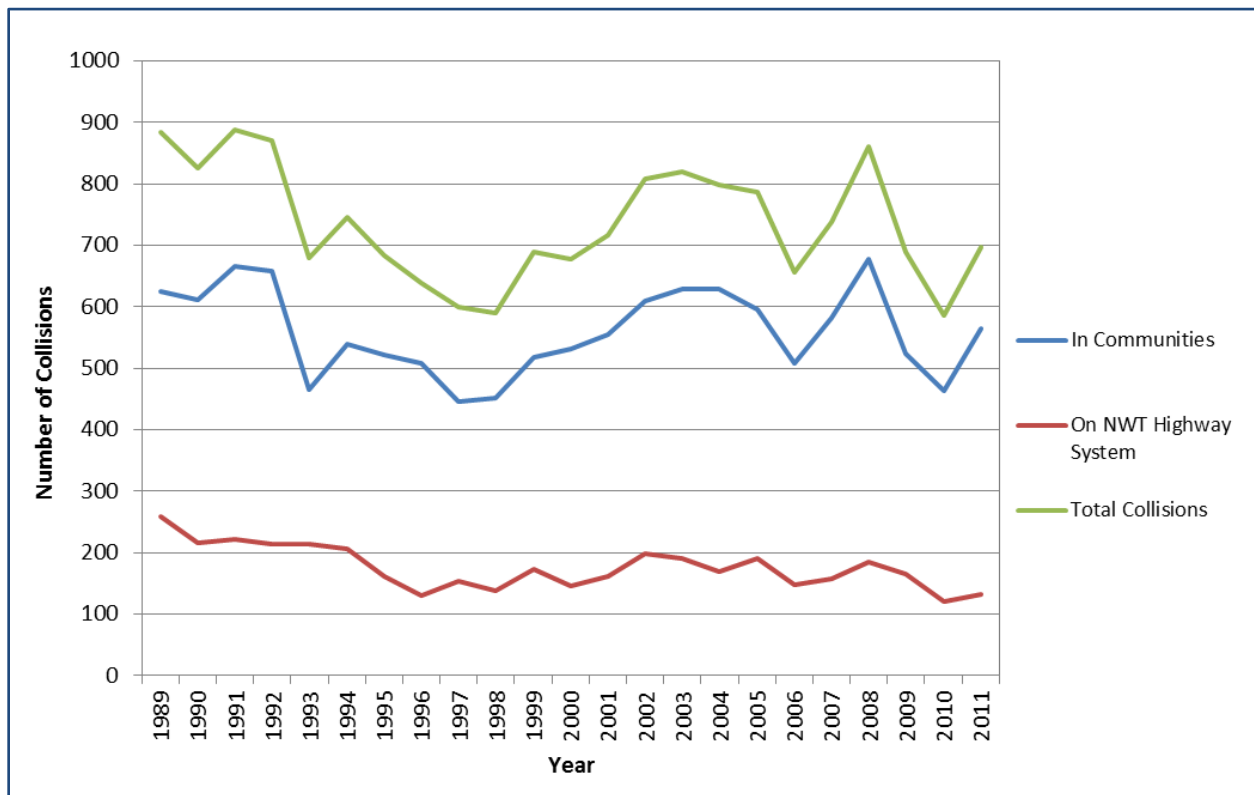


Figure 2: Collisions in Communities vs. NWT Highway System, 1989 to 2011

Table 1 shows the territorial collision rates with respect to registered vehicles, licensed drivers, and population. Presenting the collision data as a per capita rate provides a better understanding of the amount of collisions occurring each year in the NWT with respect to that year’s population size. The table shows that population, licensed drivers, and registered vehicles have steadily increased over the 23 year period, with registered vehicles and licensed drivers seeing percent increases of 60% and 96% respectively. Over the same period collisions declined from 879 collisions in 1989 to 697 collisions in 2011. As a result all three collision rates show a decreasing trend in the Northwest Territories.

**Table 1: Collisions per 100 Registered Vehicles, 100 Licensed Drivers, and 100 Populations, 1989 to 2011**

Year	Registered Vehicles	Licensed Drivers	Population	Total Collisions	Collisions Rates		
					/100 Registered Vehicles	/100 Licensed Drivers	/100 Population
1989	20,257	12,579	37,700	879	4.34	6.99	2.33
1990	20,793	17,418	38,200	821	3.95	4.71	2.15
1991	19,471	18,585	38,700	886	4.55	4.77	2.29
1992	20,632	18,849	39,400	866	4.20	4.59	2.20
1993	21,391	21,218	39,900	677	3.16	3.19	1.70
1994	22,000	22,853	41,700	745	3.39	3.26	1.79
1995	22,350	23,635	41,500	682	3.05	2.89	1.64
1996	22,278	22,297	41,800	638	2.86	2.86	1.53
1997	21,956	20,850	41,800	600	2.73	2.88	1.44
1998	22,201	21,112	41,100	589	2.65	2.79	1.43
1999	25,426	21,699	41,600	689	2.71	3.18	1.66
2000	23,371	22,626	42,100	678	2.90	3.00	1.61
2001	25,936	22,838	41,200	716	2.76	3.14	1.74
2002	28,856	23,223	41,400	807	2.80	3.48	1.95
2003	29,106	24,040	41,900	819	2.81	3.41	1.95
2004	28,305	24,641	42,810	798	2.82	3.24	1.86
2005	28,934	24,703	42,982	786	2.72	3.18	1.83
2006	31,664	24,432	41,861	655	2.07	2.68	1.56
2007	30,078	24,442	42,637	738	2.45	3.02	1.73
2008	31,042	24,323	43,282	861	2.77	3.54	1.99
2009	33,036	24,449	43,439	689	2.09	2.82	1.59
2010	33,688	24,785	43,759	585	1.74	2.36	1.34
2011	32,391	24,691	43,675	697	2.15	2.82	1.60

The data from Table 1 can be seen in graphical form in Figure 3, which better illustrates the downward trends in collision rates in the NWT. There was a significant drop in collision rates from 1989 to 1993, followed by a more consistent decline through to 2011 with fluctuations occurring year to year.

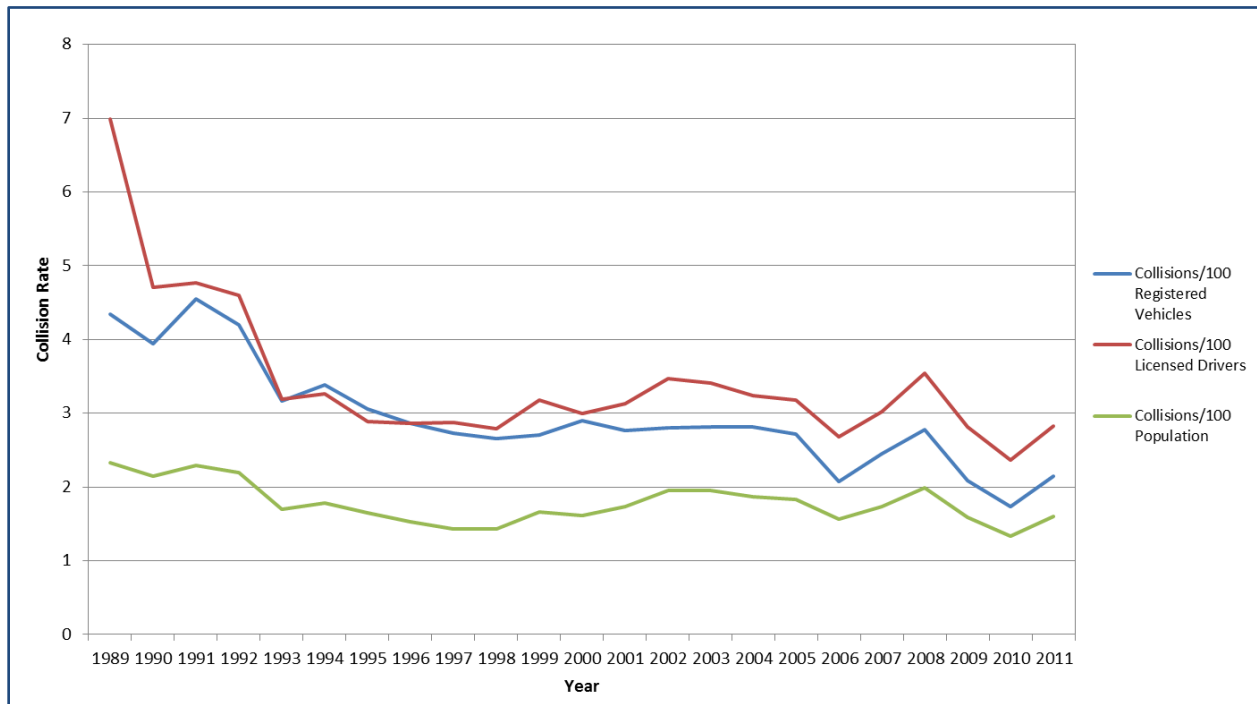


Figure 3: Collisions per 100 Registered Vehicles, 100 Licensed Drivers, and 100 Population, 1989 to 2011

Table 2 shows collision rates per million vehicle-kilometres in the Northwest Territories from 2000 to 2010. The year 2000 was the earliest year that information on the number of vehicle-kilometres travelled (VKT) in the Northwest Territories was available from the Canadian Vehicle Survey. Figure 4 shows the trend in collision rates during the 10-year period. The overall collision rate per million vehicle-kilometres travelled has declined.

Table 2: Collision Rates per Million Vehicle Kilometres Travelled, 2000 to 2010

Year	Vehicle-kilometres travelled (millions) <sup>[1]</sup>	Number of Collisions				Collisions/million vehicle-kilometres			
		Fatal	Injury	Property Damage	Total	Fatal	Injury	Property Damage	Total
2000	300.6	3	128	547	678	0.010	0.426	1.820	2.255
2001	400.1	2	142	572	716	0.005	0.355	1.430	1.790
2002	357.6	3	154	650	807	0.008	0.431	1.818	2.257
2003	364.9	3	130	687	819	0.008	0.356	1.883	2.244
2004	311.3	3	113	682	798	0.010	0.363	2.191	2.563
2005	311.3	2	128	656	786	0.006	0.411	2.107	2.525
2006	380.5	3	88	564	655	0.008	0.231	1.482	1.721
2007	358.7	5	114	619	738	0.014	0.318	1.726	2.057
2008	423.2	5	116	740	861	0.012	0.274	1.749	2.034
2009	314.4	5	103	581	689	0.016	0.328	1.848	2.191
2010	422.2	3	84	498	585	0.007	0.199	1.180	1.386

[1] Source: Canadian Vehicle Survey, TP13627E, Catalogue No. 53F0004XIE, Statistics Canada, 2000-2009. For 2010, models developed by Westbay Research were used to estimate VKT.

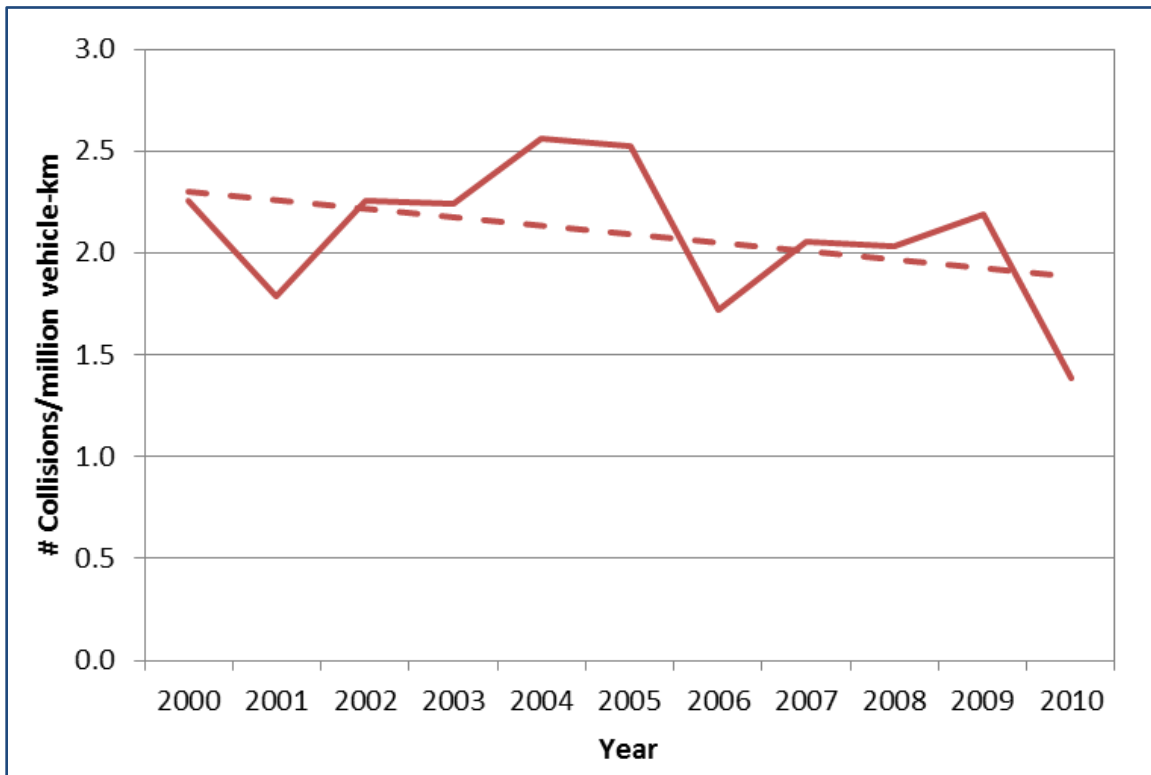


Figure 4: Collisions/Million Vehicle-Kilometres Travelled, 2000 to 2010

## Time of Occurrence

This section looks at the patterns of time and occurrence of collisions across the Northwest Territories. Each analysis looks at the trends in communities and on the highway system separately and together from 1989 to 2011.

## Collisions by Month

Figure 5 shows the distribution of collisions by month from 1989 to 2011 broken down by collisions occurring in communities, on the Highway System, and territorial total. Collisions in the Northwest Territories are least likely to occur during the month of May, accounting for 5.5% of the annual total, and most likely to occur during the month of January, representing 11% of the annual total. It is important to see the community and highway collisions separately as the trends have some significant differences. The summer months of July and August together saw close to 20% of all highway collisions, yet only 13% of collisions occurring in communities. November through to

February was the most critical period for collisions occurring in communities, with 43.2% of community collisions. January accounts for nearly 12% of collisions occurring in communities. The most critical month for collisions occurring on the highway system is October, accounting for almost 12% of all highway collisions.

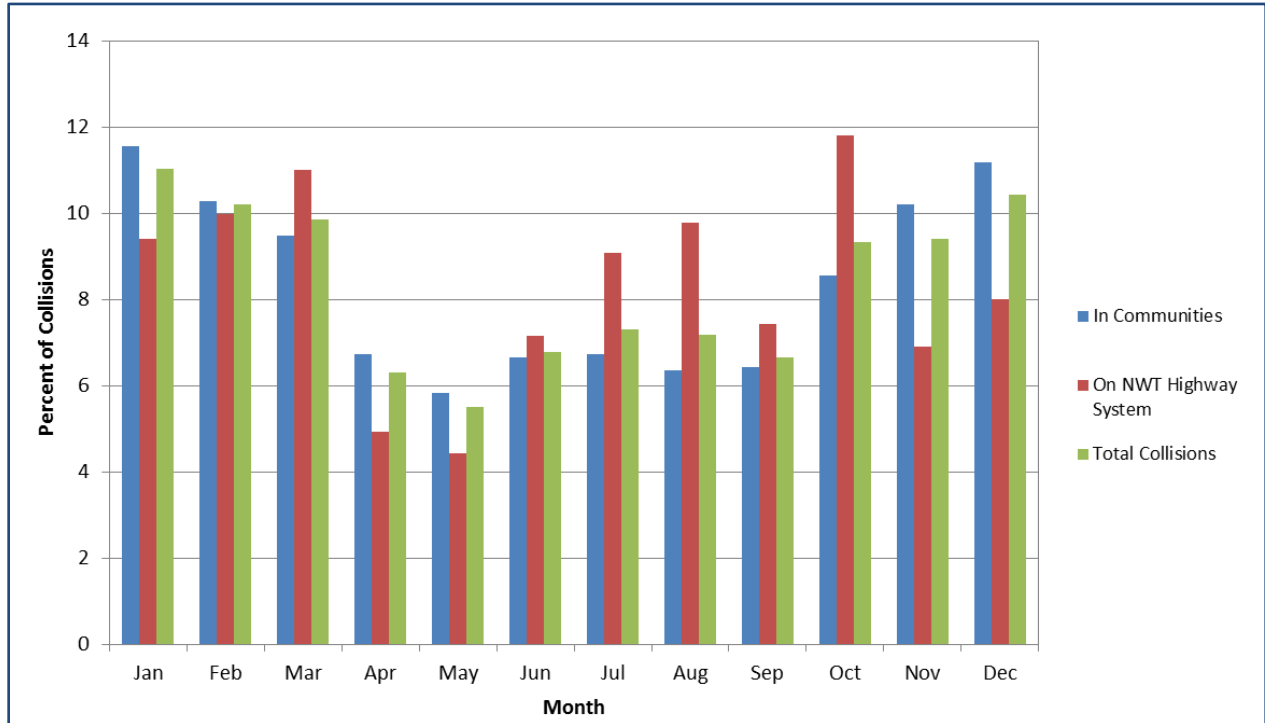


Figure 5: Distribution of Collisions by Month, 1989 to 2011

The next three figures show the breakdown of monthly collisions occurring in communities, on highways, and across the Northwest Territories by the severity of collision. Figure 6 shows the monthly distribution of collisions resulting in property damage. It can be seen that the winter months (October through to March) see overall higher percentages of property damage, with communities peaking in January at 11.8% and highway collisions peaking in March at 12.4%. It should be noted that there are two other spikes in highway collisions, in August 8.7% of collisions result in property damage and in October 12%. The distribution of property damage collisions largely reflects the overall monthly trends of all collisions as shown in Figure 5; this is due to the fact that there are more property damage collisions than injuries and fatalities.

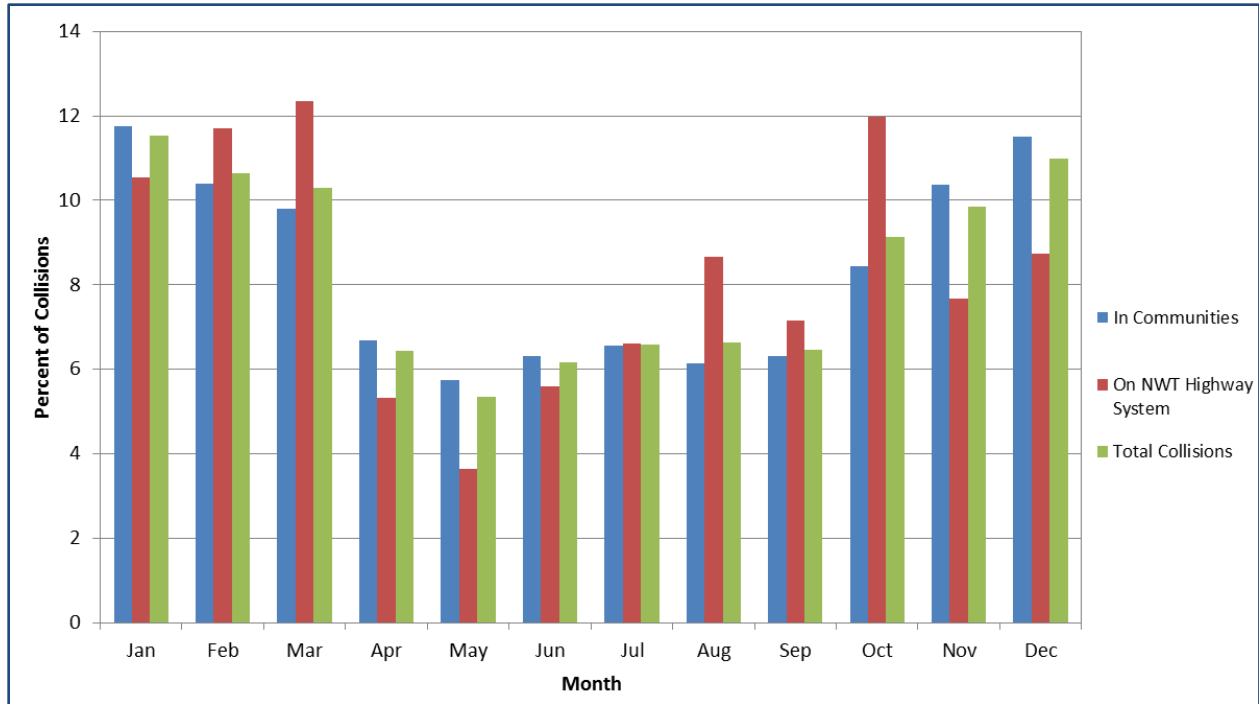


Figure 6: Distribution of Property Damage Collisions by Month, 1989 to 2011

Figure 7 shows the monthly distribution of collisions resulting in injury. The difference between summer and winter months is less distinct and in fact the highest percentage of injury collisions is in July with 10.2%, followed by October with 10.1%. Highway collisions see a dramatic increase in injuries in July and August, reaching 13.6% in July. In communities the percentage of injury collisions remains relative constant around 8% with a dipping trend in the spring.

Figure 8 shows the monthly distribution of fatal collisions, which has a very different trend than that of property damage. The summer months see a higher portion of fatalities than in the winter. June and July see the highest numbers along the highway system, combined the two month period sees over 31% of fatalities. In communities July and August together witness 30% of fatalities. October sees an extreme peak in community fatalities, reaching 25%. It is important to note though that as there are not many collisions resulting in fatalities in the NWT (an average of 4 to 5 people die in collisions each year) the statistical trends are influenced heavily by a single fatality.

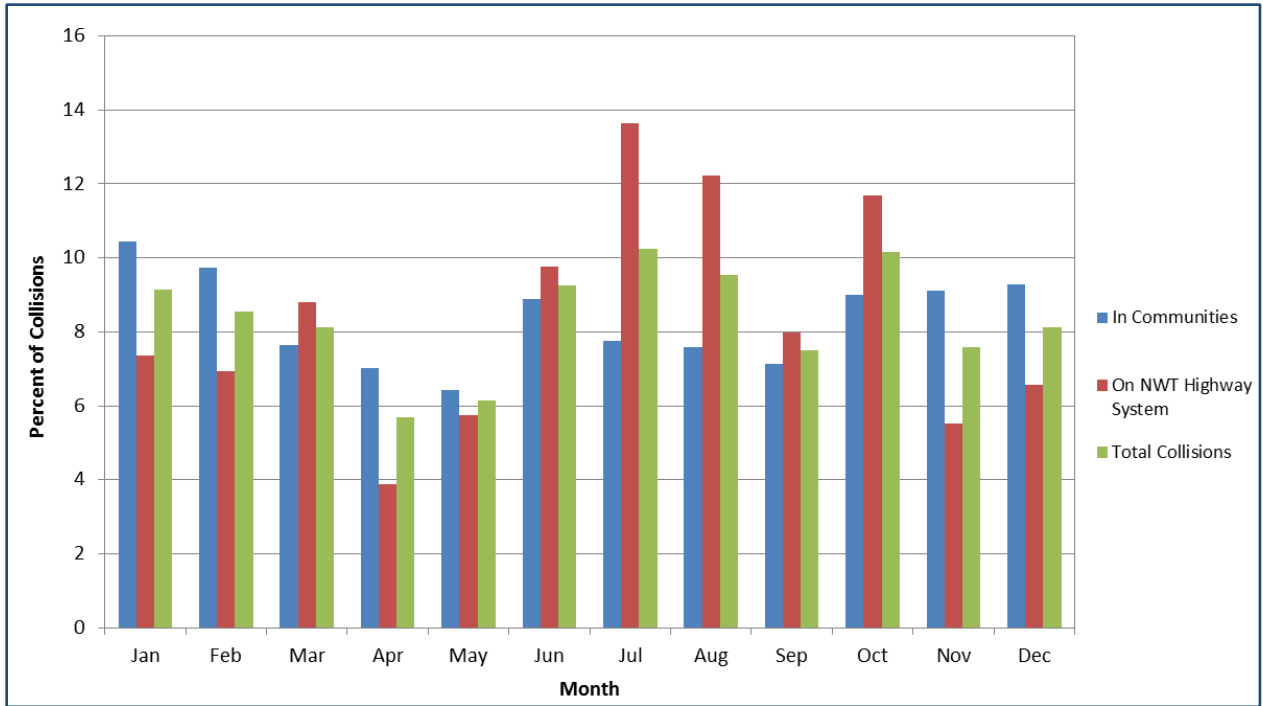


Figure 7: Distribution of Injury Collisions by Month, 1989 to 2011

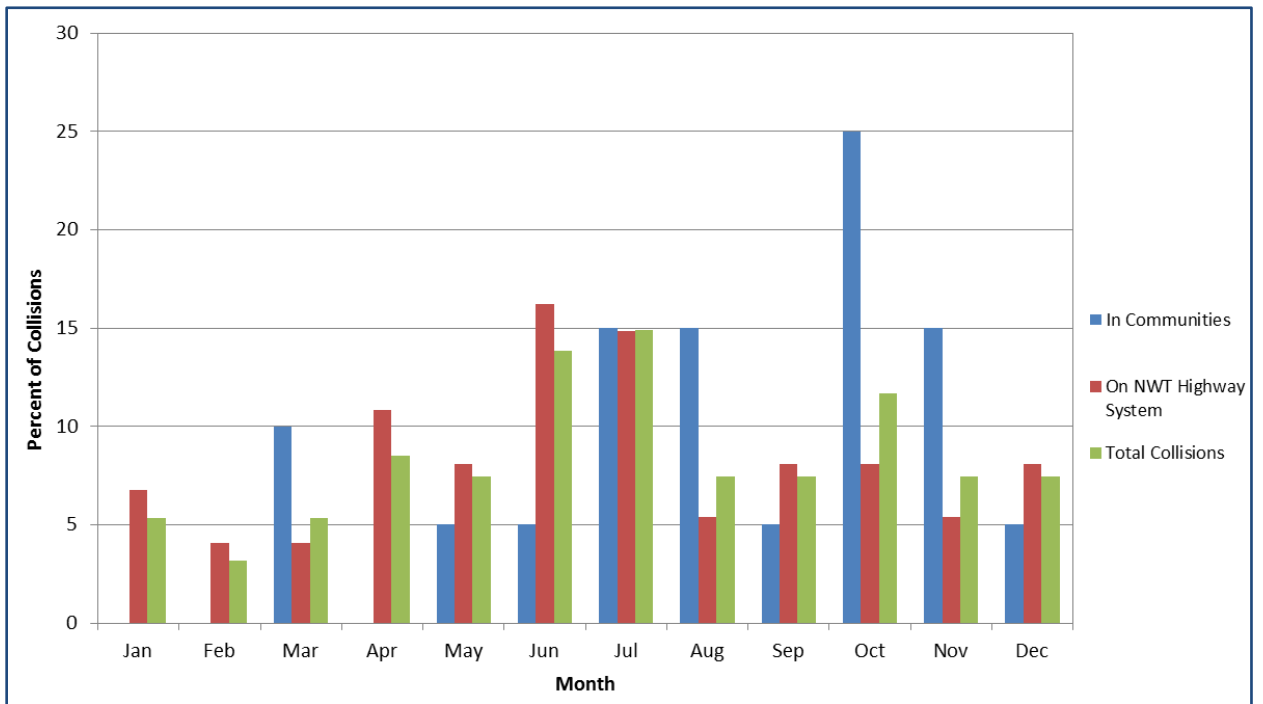


Figure 8: Distribution of Fatal Collisions by Month, 1989 to 2011

## Collisions by Day of Week

The distribution of collisions by day of week from 1989 to 2011 is shown in Figure 9. It can be seen that there is a relatively common trend for both highway and community collisions, where the percentage of collisions gradually builds towards the end of the work week, peaking on Friday and Saturday at approximately 17% each day. Interestingly, on Sunday the percentage of collisions in communities drops to the lowest value of 10.7% while the highway system remains significant at approximately 16%. The trend in total collisions largely reflects the trend in community collisions as overall there are more collisions occurring in communities than on the NWT highway system.

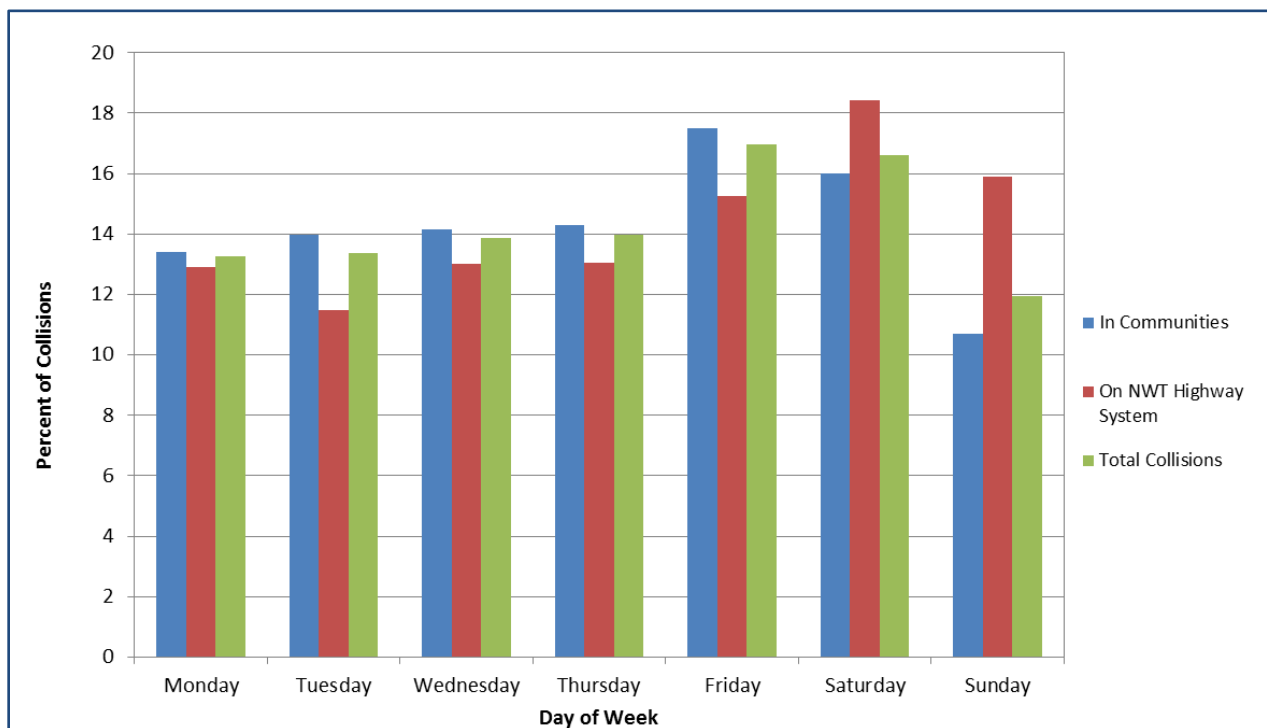


Figure 9: Distribution of Collisions by Day of Week, 1989 to 2011

## Collisions by Time of Day

Figure 10 shows the distribution of collisions by time of day for all NWT collisions occurring from 1989 to 2011, as well as for collisions occurring within communities versus the highway system. It can be seen that the trends of community and highway collisions are similar, however there are some distinct differences. The peak work day traffic flows are directly reflected in the hourly breakdown of collisions in communities. Morning rush hour from 8:00 am to 9:00 am sees a spike in collisions, reaching 5.6% of community collisions, an increase of approximately

4% over the preceding hour. The heavy midday traffic flows are also apparent as collisions peak from 12:00 pm to 1:00 pm with a total of 1008 collisions. The afternoon hours from 1:00 pm to 6:00 pm are relatively constant with approximately 935 collisions each hour. The end of the work day period (3:00pm to 6:00pm) comprises 24.4% of community collisions and 23.2% of total collisions. It is important to note that although highway collisions also peak in the afternoon (4:00 pm to 5:00 pm) there are a significant amount of collisions occurring over the late evening period (7:00 pm to 12:00 am).

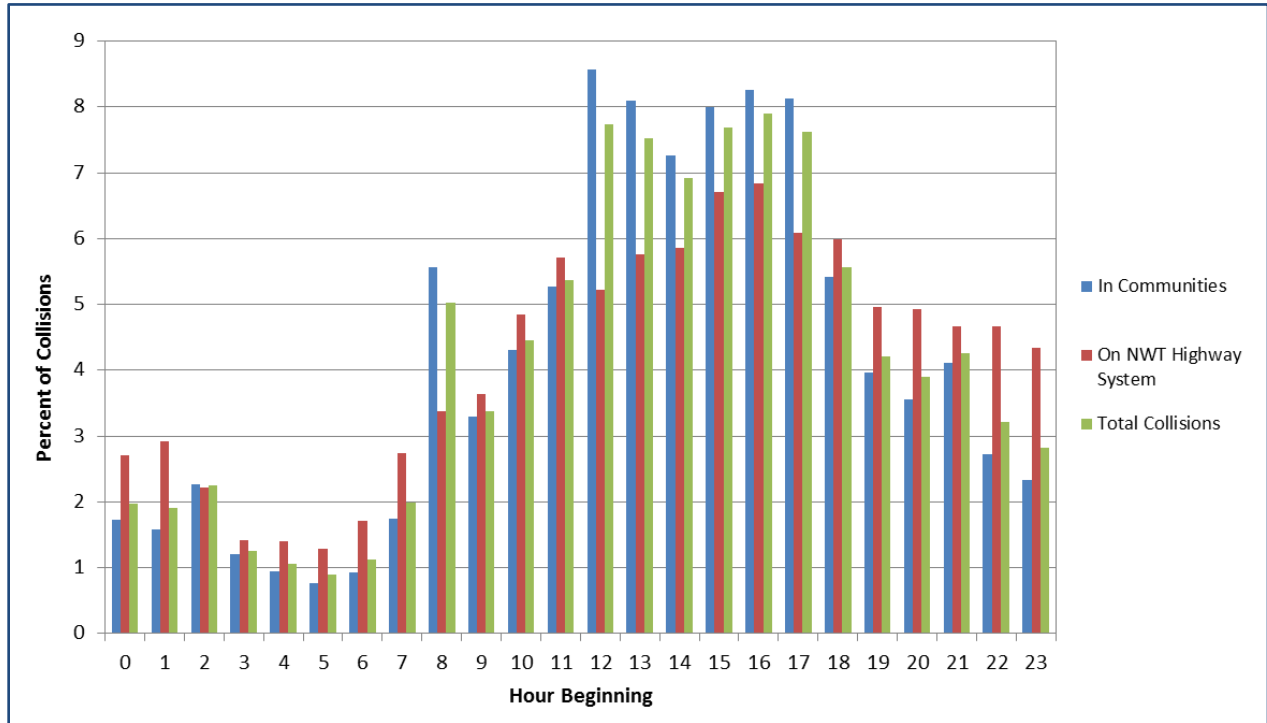


Figure 10: Distribution of Collisions by Time of Day, 1989 to 2011

## Driver Conditions & Actions

Collision contributing factors of human influence can be categorized into driver condition and/or action, where condition relates to the physical and mental state of the driver and action relates to the decision and behavior of the driver. When analyzing the condition of drivers, this report looks at impaired driving which can be further broken down into drinking and driving, drugs and driving, distracted driving, and fatigued driving. The human actions which are explored in more detail are speeding or “driving too fast for conditions” and other driver errors such as following too close, improper turning, and unsafe backing.

## Impaired Driving

Canada’s Road Safety Strategy 2015 identifies impaired driving from four distinct sources: alcohol, drugs, fatigue, and distractions. This section illustrates trends in the number of collisions due to one or more involved drivers being impaired and the number of persons injured and killed in these collisions.

### Alcohol-Related Collisions

Figure 11 shows the number of collisions involving drinking or alcohol-impaired drivers and the number of persons killed and injured between 1989 and 2011. There has been a steady decline in the numbers, particularly following the implementation of the Strategy to Reduce Impaired Driving (STRID) initiatives in late 2004. Some of the initiatives include automatic license suspensions for blood alcohol content between 0.5 and 0.8; automatic driving prohibition for impaired driving under the Criminal Code; and required conditions and fees for the reinstatement of driving privileges, including the participation in programs such as alcohol dependency awareness, driver improvement, and alcohol ignition interlock.

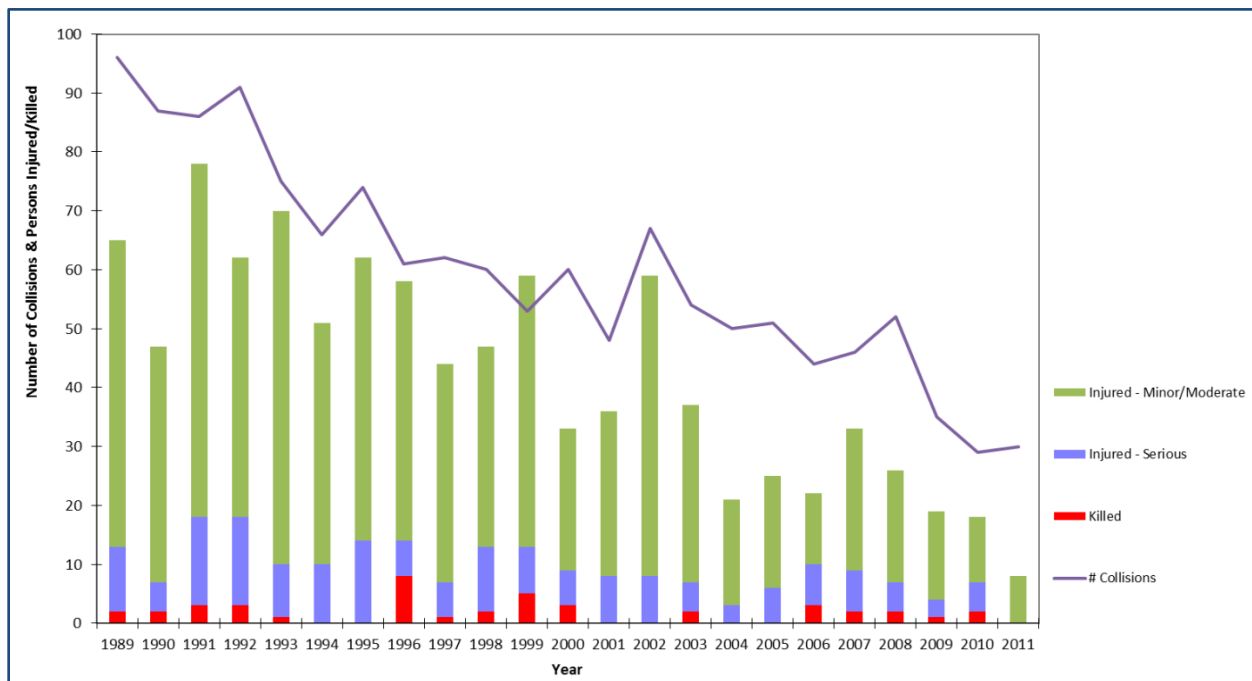


Figure 11: Alcohol Related Collisions & Persons Injured/Killed, 1989 to 2011

Figure 12 shows the number of alcohol related collisions in communities and on the highway system from 1989 to 2011. Similar to the trend shown in Figure 11, the communities are seeing a consistent and significant decrease in alcohol related collisions. On the highway system the decline is much more gradual. The number of alcohol

related collisions on highways and in communities are therefore slowly converging. In 1989, there were 66 collisions in communities and 30 collisions along the highway system that were alcohol related; in 2011 communities and highways reported 17 and 13 alcohol related collisions respectively. This is not to say that the decrease in collisions has been steady. Year to year numbers have fluctuated, but overall alcohol related collisions are fewer.

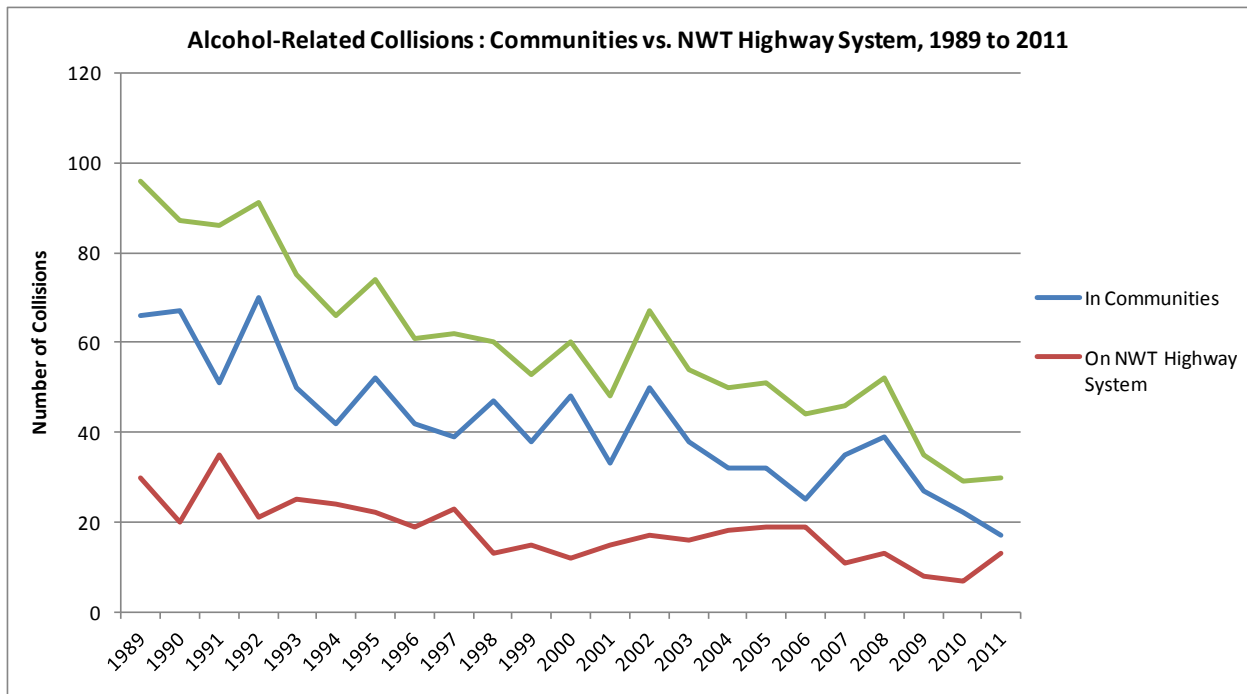


Figure 12: Alcohol Related Collisions - Communities vs. NWT Highway System, 1989 to 2011

It is important to present Figure 13 in conjunction with Figure 12 as it clarifies that alcohol is a major contributor to highway collisions. Figure 12 shows the numbers of alcohol related collisions in communities and on the NWT Highway System but it does not present the total quantity of community vs. highway collisions for reference. It is therefore important to look at the breakdown of percentages of highway and community collisions related to alcohol, as shown in Figure 13. It can be seen that alcohol is consistently involved in a greater percentage of highway collisions than it is in community collisions. In 2011, close to 10% of highway collisions were associated with alcohol whereas it was a contributing factor in only 3% of community collisions. The downward trends shown above are reflected in Figure 13, and it is again apparent that the decrease in alcohol related collisions on the highway system is much less consistent.

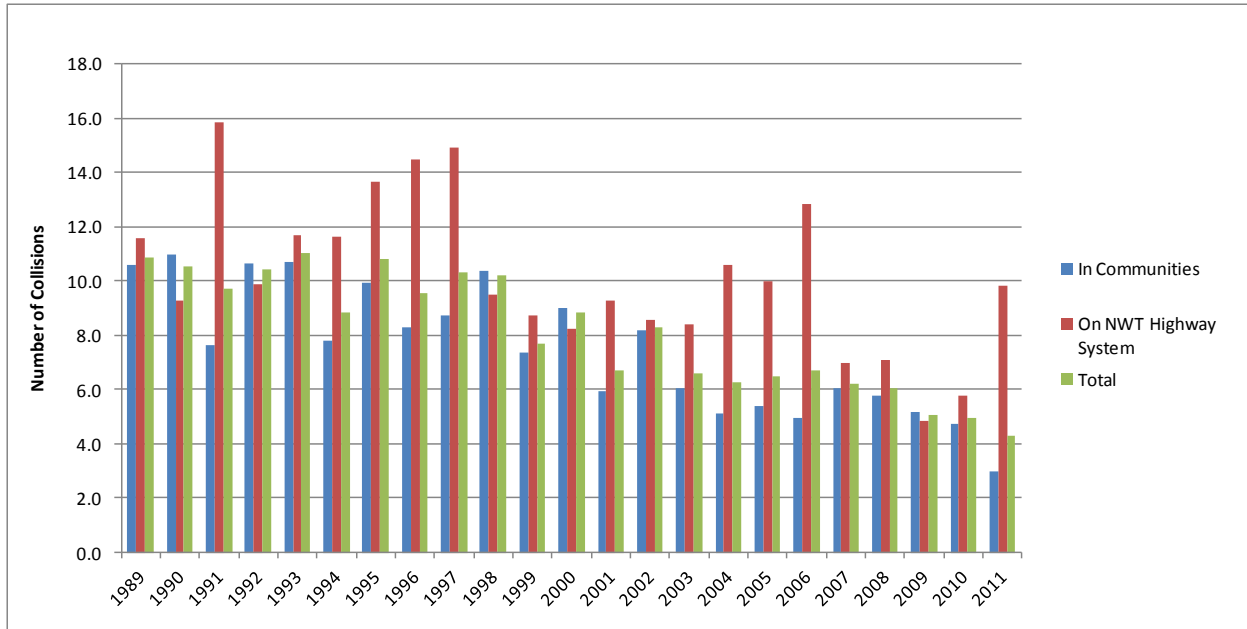


Figure 13: Percentage of Collisions Involving Alcohol - Communities vs. NWT Highway System, 1989 to 2011

Figure 14 depicts the critical relationship between drinking and driving and fatal outcomes of collisions. The figure shows the distribution of collisions involving alcohol by severity from 1989 to 2011. Property damage and injury causing collisions involving alcohol have been consistently declining over the 23 year period. Property damage collisions have decreased from approximately 10% to just below 5%, and injury resulting collisions have declined from just over 20% to 10%. Fatal collisions on the other hand do not show a consistent trend; alcohol is often either a significant factor in a year's fatal collisions or not at all. It is important to note that only 7 out of the 23 years did not have alcohol related fatal collisions, and 8 years saw alcohol as a contributing factor for over 50% of all collisions. This extreme fluctuation is largely due to the low numbers of fatalities that occur in the NWT but it also depicts how alcohol is often a major factor in the most severe collisions.

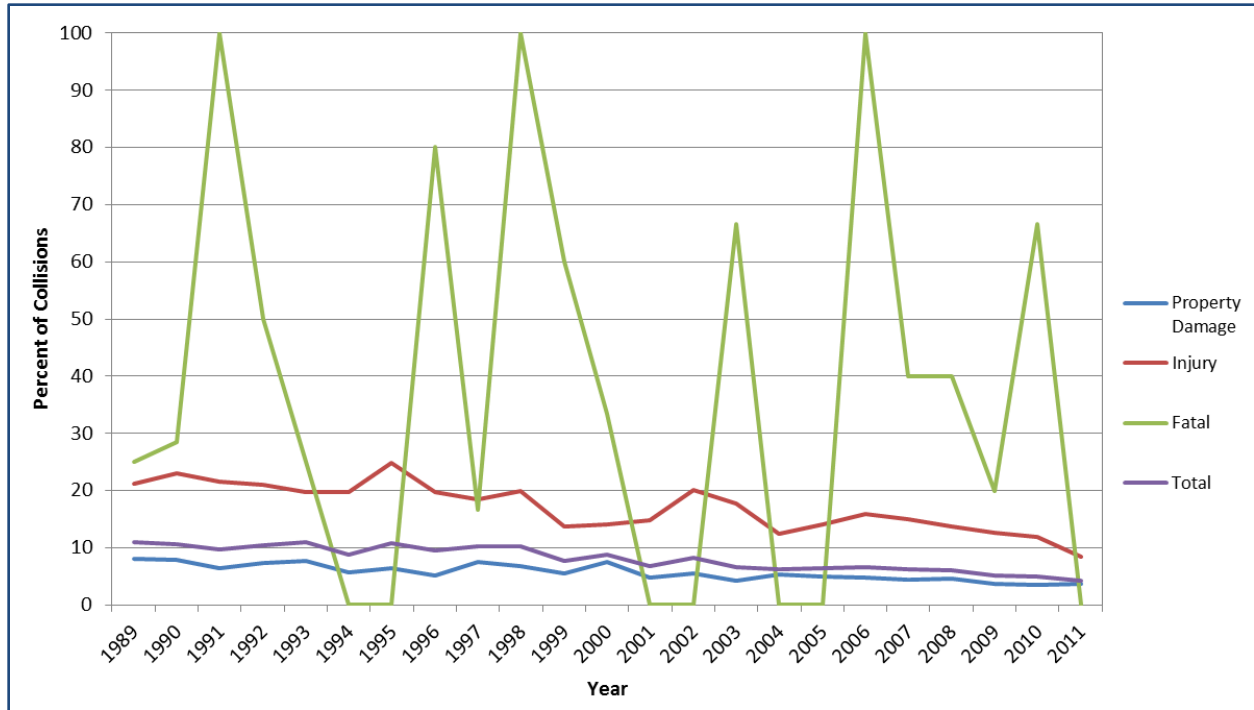


Figure 14: Percentage of Collisions Involving Alcohol by Severity, 1989 to 2011

The next three figures show the breakdown of time of occurrence of alcohol related collisions. This helps to illustrate the critical months, days, and hours that can be targeted through different drinking and driving initiatives. Figure 15 is the distribution by month and shows that both highway and community alcohol related collisions peak in August at 14.9% and 10.9% respectively. It also shows that the highway systems sees more alcohol related collisions over the summer, whereas communities witness more over the winter months.

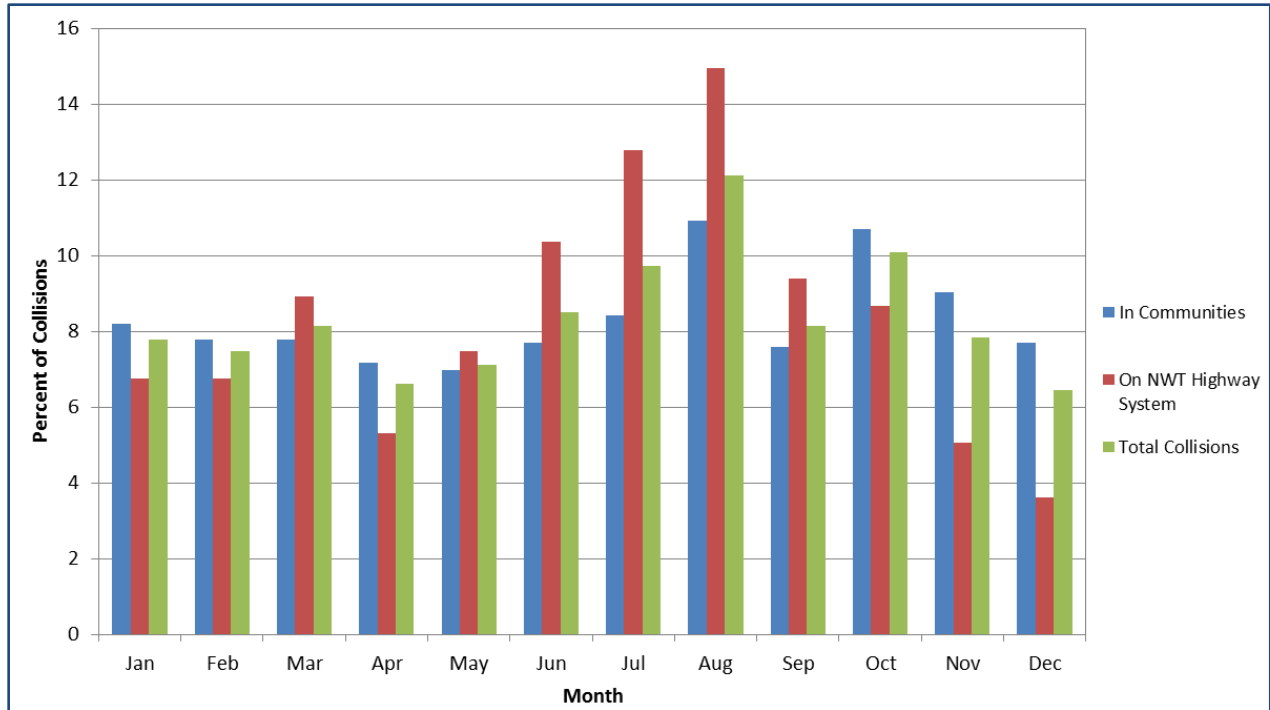


Figure 15: Distribution of Alcohol Related Collisions by Month, 1989 to 2011

Figure 16 presents the distribution of alcohol related collisions by day of week. As expected the weekend sees the majority of alcohol related collisions, Friday through to Sunday see 67% of the total collisions. The extreme peak on Saturday and Sunday are attributed to heavier drinking and night life that occurs Friday and Saturday nights through to the early hours of Saturday and Sunday morning. This can be seen in Figure 17 which shows the distribution of alcohol related collisions by time of day. In communities increased percentages are seen from 20:00 through to 03:00, with a peak at 02:00. The highway system sees a similar trend however one hour earlier from 19:00 through to 02:00, with a peak at 01:00.

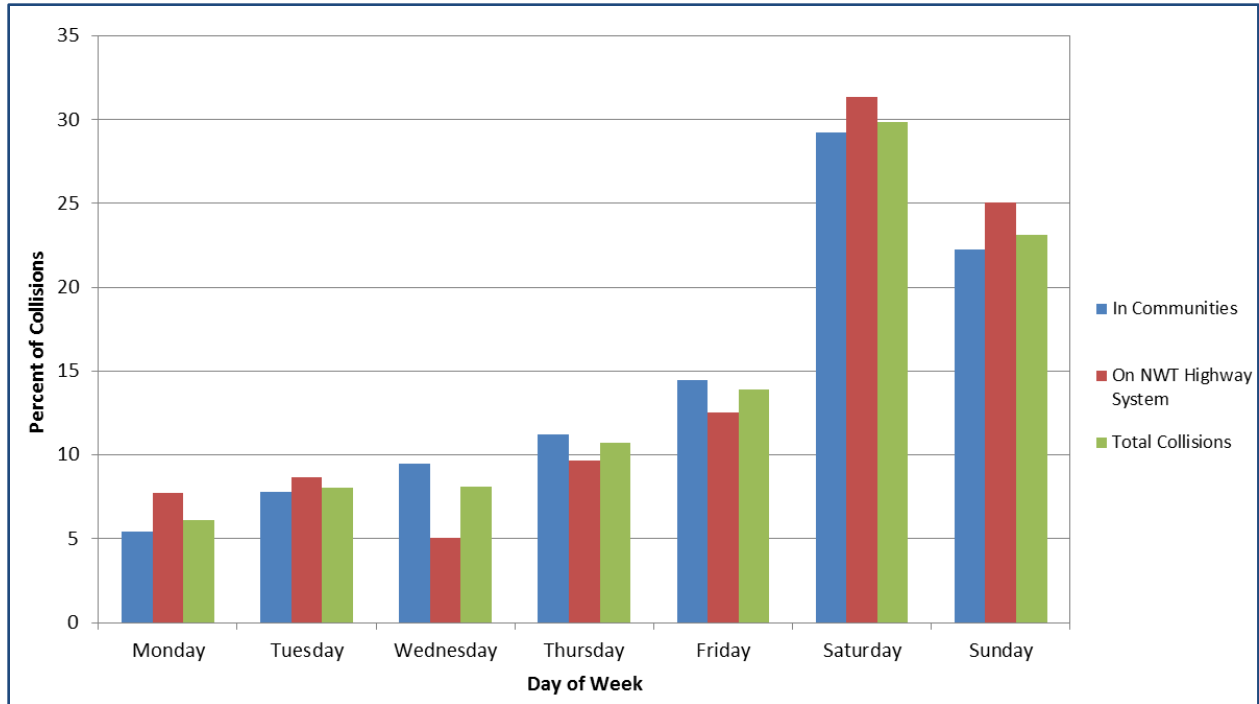


Figure 16: Distribution of Alcohol Related Collisions by Day of Week, 1989 to 2011

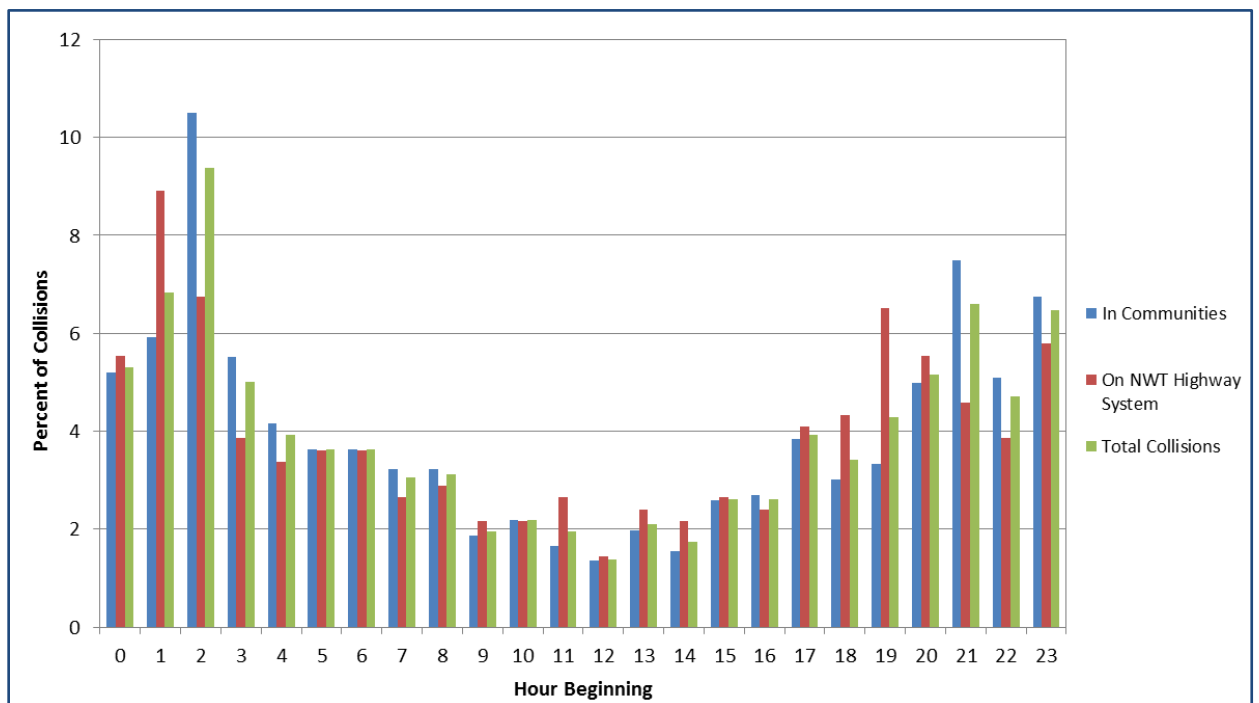


Figure 17: Distribution of Alcohol Related Collisions by Time of Day, 1989 to 2011

Figure 18 shows the characteristics of drinking and alcohol-impaired drivers involved in collisions by a) age group, and b) gender. A collision is considered to be alcohol-related if one or more drivers involved were noted by the RCMP to have been drinking or impaired by alcohol. Over 80 percent of drinking drivers involved in collisions are male and are most likely to be between 25 and 34 years old.

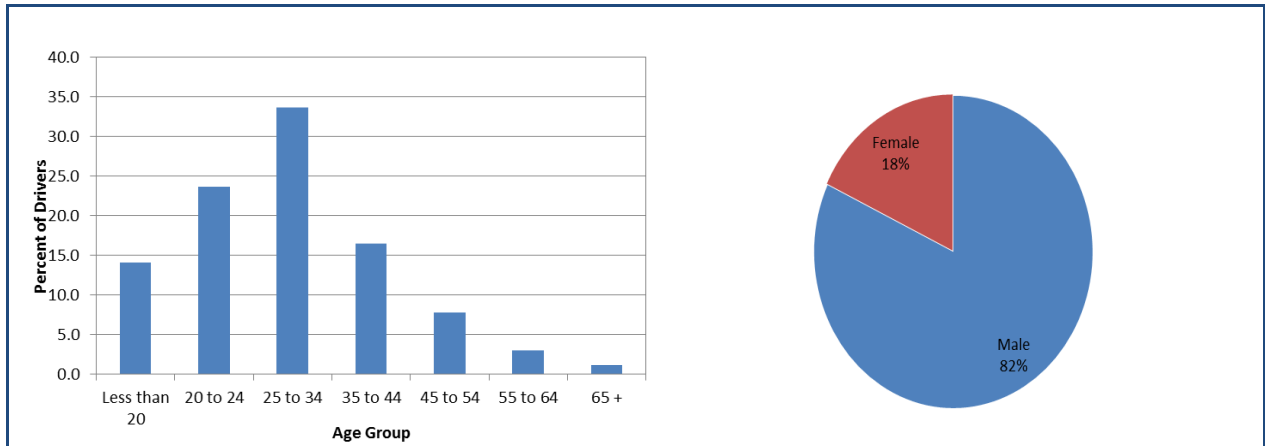


Figure 18a: Drivers in Alcohol Collisions by Age Group, 1989 to 2011

Figure 18b: Drivers in Alcohol Collisions by Gender, 1989 to 2011

## Drug-Related Collisions

Figure 19 shows the number of collisions involving one or more drivers that were suspected of being under the influence of drugs and the resulting number of deaths and injuries between 1989 and 2011. The number of drug-related collisions is very small, and therefore no trends can be identified. The presence of drugs in drivers is more difficult for police to detect than alcohol, resulting in an under-reporting of collisions.

Looking at the statistical trends of drug related collisions in other provincial jurisdictions it appears there is an overall increasing trend in reported collisions. However, it is apparent that the number of reported drug related collisions is influenced by the reporting system. For instance in British Columbia, from 1995 to 2003 there was a gradual increase in drug related collisions, growing from 126 to 215 over the 9 year period. In 2004 there was a significant jump in magnitude of collisions being reported; numbers increased from 215 to 395 collisions and have remained in the vicinity of 400 drug related collisions per year. Figure 20 shows the reported drug related collisions in BC from 1995 to 2007. This increase in collisions coincides with the year that BC adjusted the categorization of human condition factors in their annual Traffic Collision Statistics report, which was used to provide this jurisdictional comparison. In 2004 the factors “drugs (illegal)” and “medication (legal drugs)” changed to “drugs suspected”, “ability impaired by drugs”, and “ability impaired by medication”. This would indicate that

the category “drugs suspected” may allow police more flexibility in reporting drug related collisions, helping to address the issue of under-reported collisions.

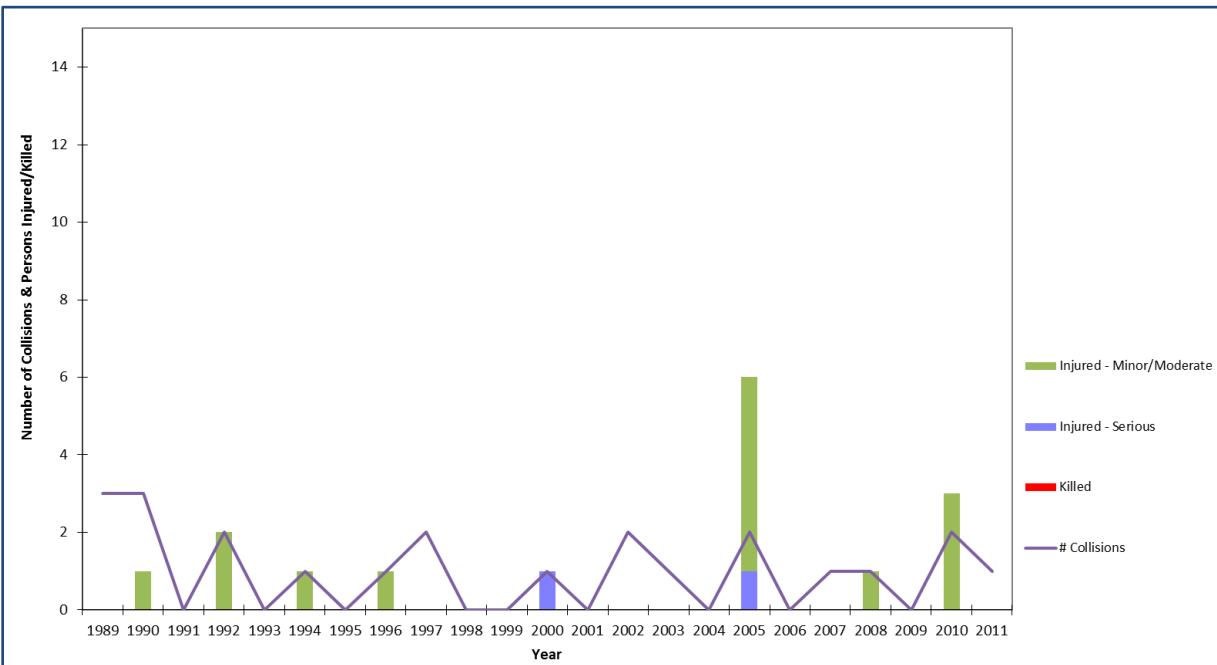


Figure 19: Drug Related Collisions & Persons Injured/Killed, 1989 to 2011

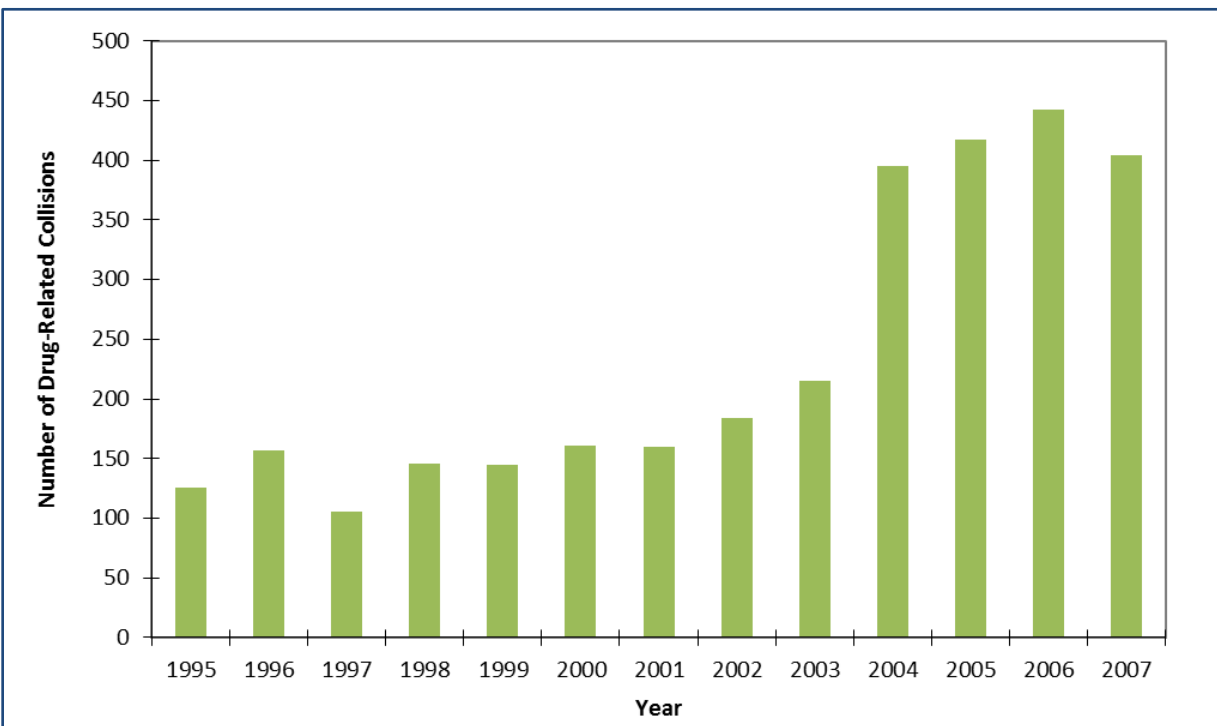


Figure 20: Drug Related Collisions in British Columbia, 1995 to 2007 (Traffic Collision Statistics, British Columbia)

## Fatigue-Related Collisions

Figure 21 shows the number of collisions involving one or more drivers that were suspected of being fatigued or had fallen asleep and the resulting number of deaths and injuries between 1989 and 2011. As with collisions involving drugs, the number of fatigue-related collisions is very small, therefore no trends can be identified. The presence of driver fatigue is also difficult to detect.

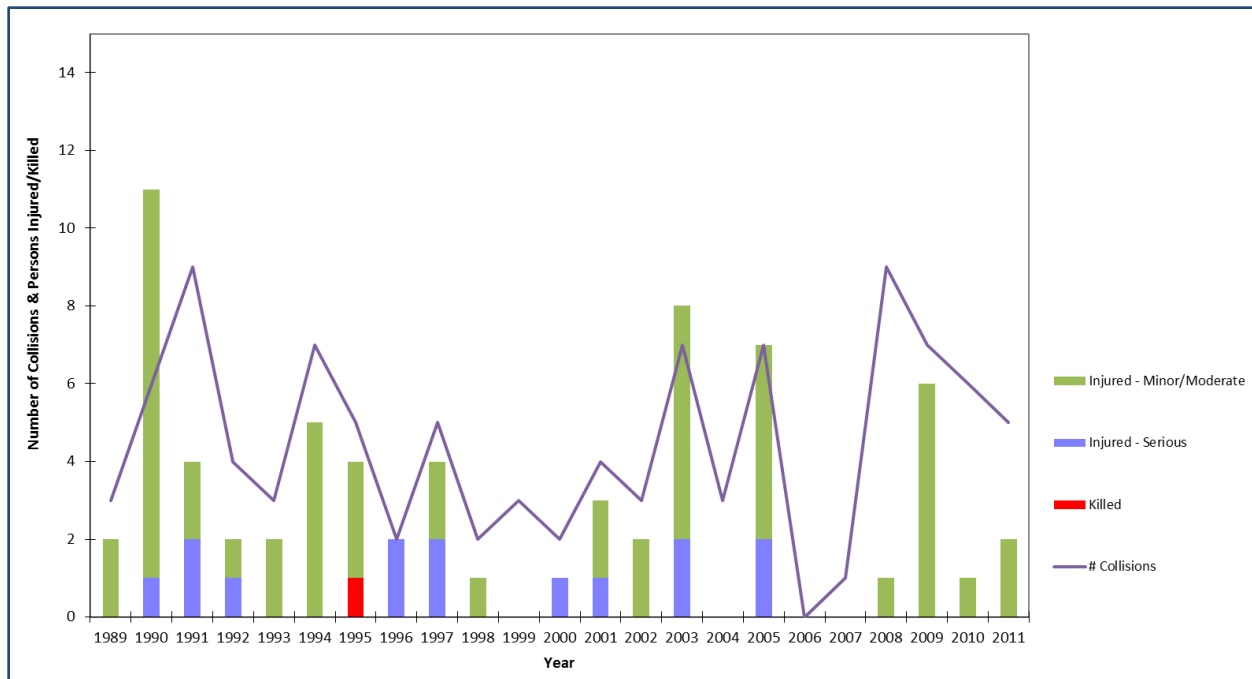


Figure 21: Fatigue Related Collisions & Persons Injured/Killed, 1989 to 2011

As trends of fatigue related collisions are not clear in the NWT it is again important to look at patterns of other jurisdictions. Fatigue related collision data from Alberta Traffic Collision Statistics and British Columbia Traffic Collision Statistics was reviewed and both provinces show fairly constant numbers; neither province appears to have a consistent increasing or decreasing trend. Fatigue related collisions in British Columbia from 1995 to 2007 are shown in Figure 22 and fatigue related collisions in Alberta from 1998 to 2011 are shown in Figure 23.

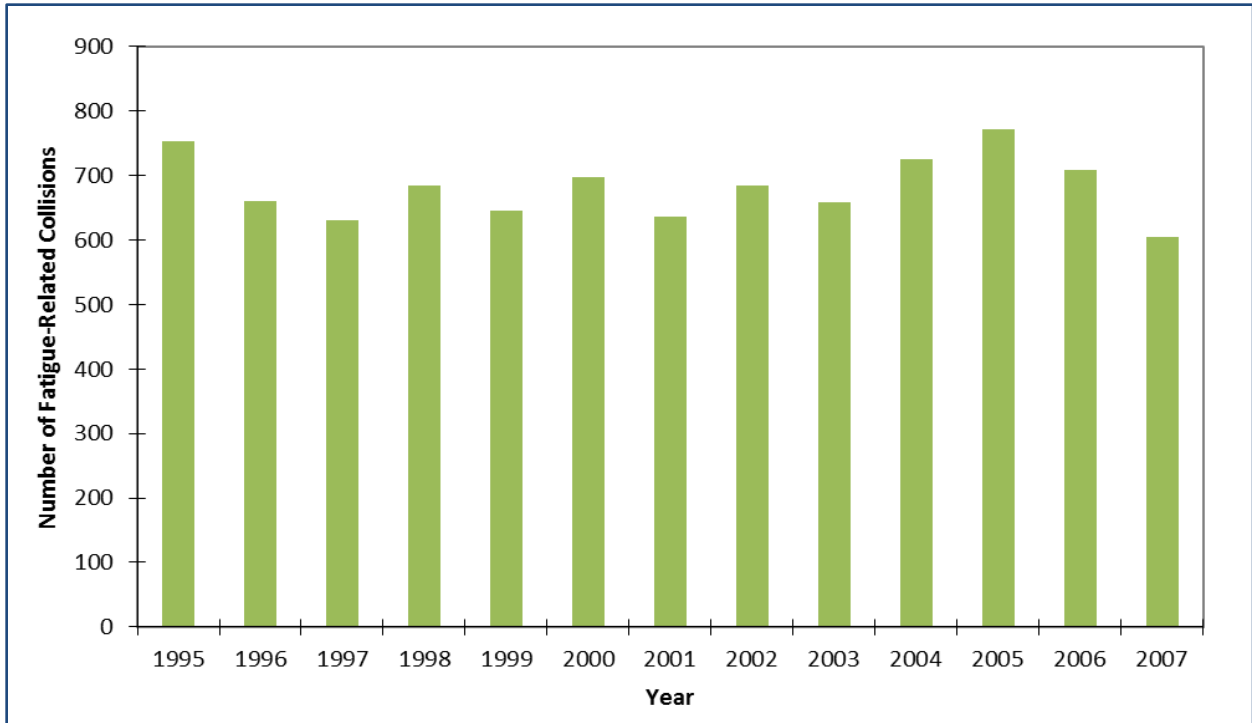


Figure 22: Fatigue Related Collisions in British Columbia, 1995 to 2007 (Traffic Collision Statistics, British Columbia)

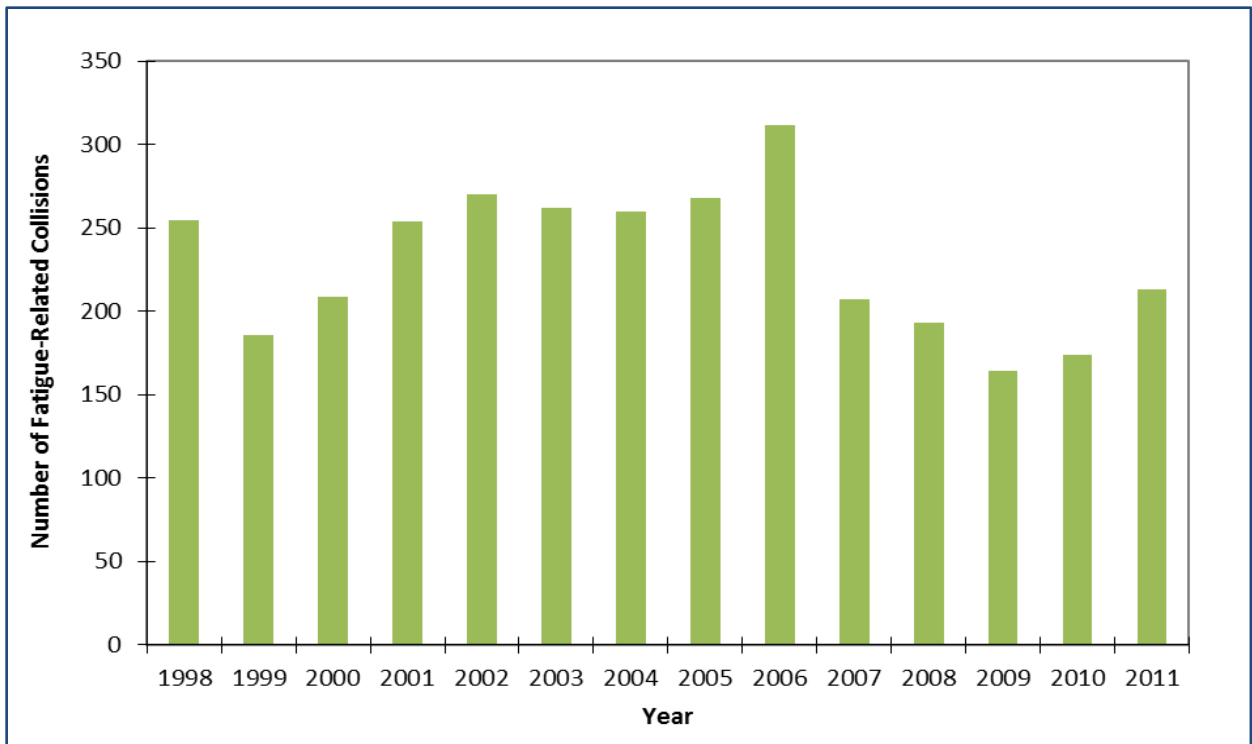


Figure 23: Fatigue Related Collisions in Alberta, 1998 to 2011 (Traffic Collision Statistics, Alberta)

## Distraction-Related Collisions

Distracted driving has been the focus of public concern over the past decade. Several Canadian jurisdictions have introduced legislation to prohibit the use of hand-held electronic devices to curb distracted driving, including the Northwest Territories in January 2012. In 1999, a driver action code to describe driving while distracted or inattentive was introduced with the implementation of the National Collision Database (NCDB-1) data elements and codes in the Traffic Collision Information System. Prior to 1999, driver distraction/inattentiveness could not be identified as a contributing factor to traffic collisions. Unfortunately, the code does not identify the source of distraction, making it impossible to distinguish a causal relationship between collisions and hand-held electronic devices (or other sources).

Figure 24 shows the number of collisions involving one or more drivers that were noted by the RCMP to be distracted or inattentive and the resulting number of deaths and injuries between 1999 and 2011. There is a clear upward trend in the number of collisions due to driver distraction or inattentiveness. Fortunately, the number of casualties has not shown a similar increase.

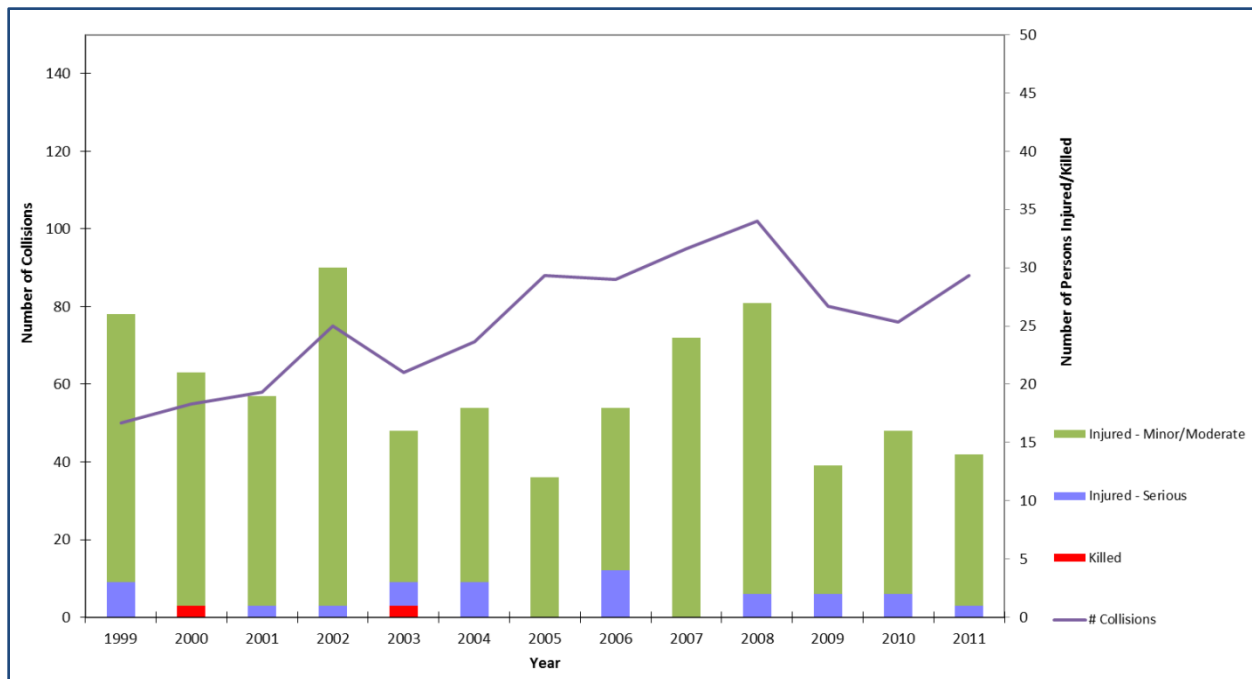


Figure 24: Distracted Driving Related Collisions & Persons Injured/Killed, 1999 to 2011

Figure 25 breaks down distracted driving related collisions from 1999 to 2011 by those that occurred on highways and those that occurred in communities. The upward trend in distracted driving collisions is reflected in the

pattern of community collisions. The number of distracted driving collisions on the NWT Highway System does not show an increasing trend, and instead has remained consistently around 10 collisions each year of the 13 year period. This could reflect the lack of cellular reception along the NWT Highway System. It will be important to note how increasing cellular coverage in the North impacts distracted driving collisions along the NWT Highway System.



Figure 25: Distracted Driving Collisions - Communities vs. NWT Highway System, 1999 to 2011

Figure 26 shows the percentage of collisions involving distracted driving in communities and on highways from 1999 to 2011. The upward trend in community collisions is apparent in the figure. Distracted driving was reported consistently in 8% to 10% of community collisions each year from 1999 to 2004, and then increased to 12% to over 15% from 2005 to 2011. The percentages are more sporadic in highway collisions, but it could be interpreted that there is also a slight increasing trend.

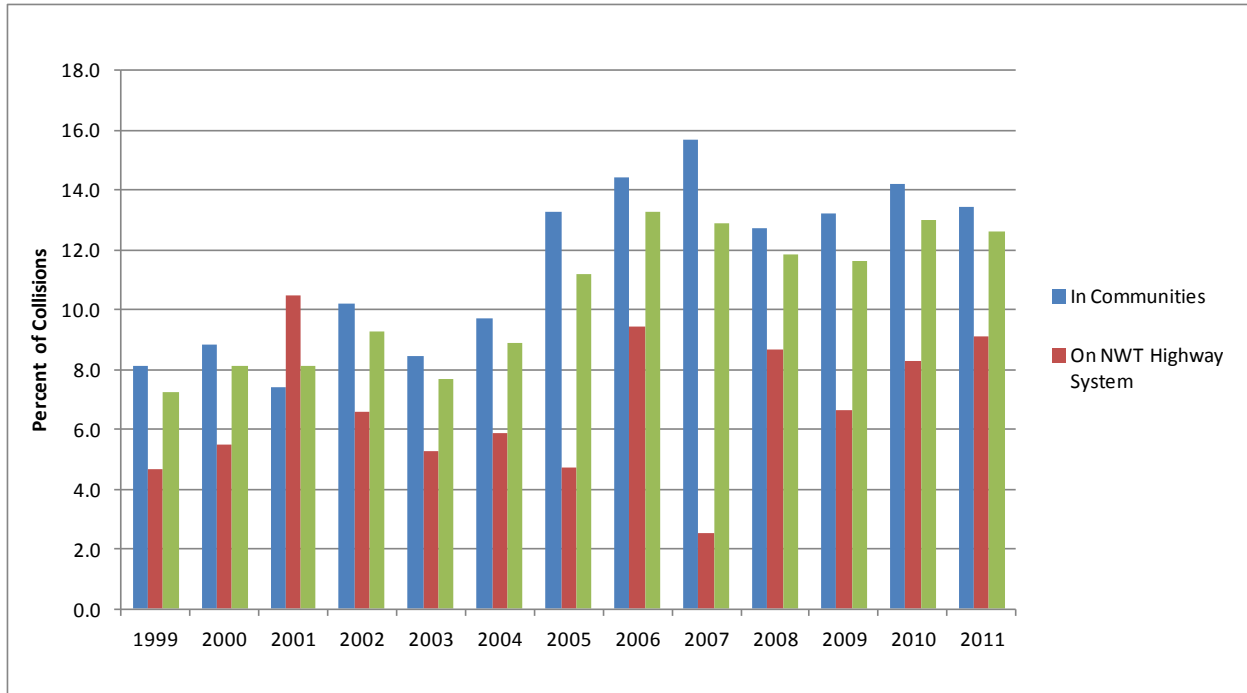


Figure 26: Percentage of Collisions Involving Distracted Driving - Communities vs. NWT Highway System, 1999 to 2011

Figure 27 shows the characteristics of distracted/inattentive drivers in collisions by a) age group, and b) gender. Over two-thirds (68 percent) of distracted drivers involved in collisions are male and over 40 percent are between 25 and 44 years old.

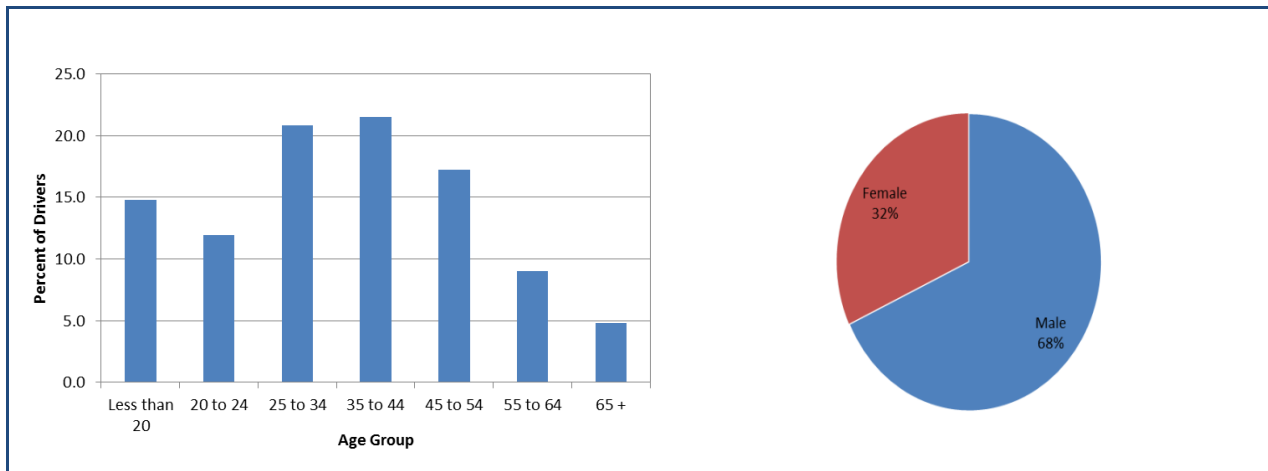


Figure 27a: Distracted Drivers in Collisions by Age Group, 1999 to 2011

Figure 27b: Distracted Drivers in Collisions by Gender, 1999 to 2011

## Summary of Impaired Driving

Figure 28 summarizes the trends in total collisions related to the four impairment factors discussed: alcohol, drugs, fatigue, and distracted driving. Displaying all four trends provides a good visual comparison of their influence on road safety in the Northwest Territories.

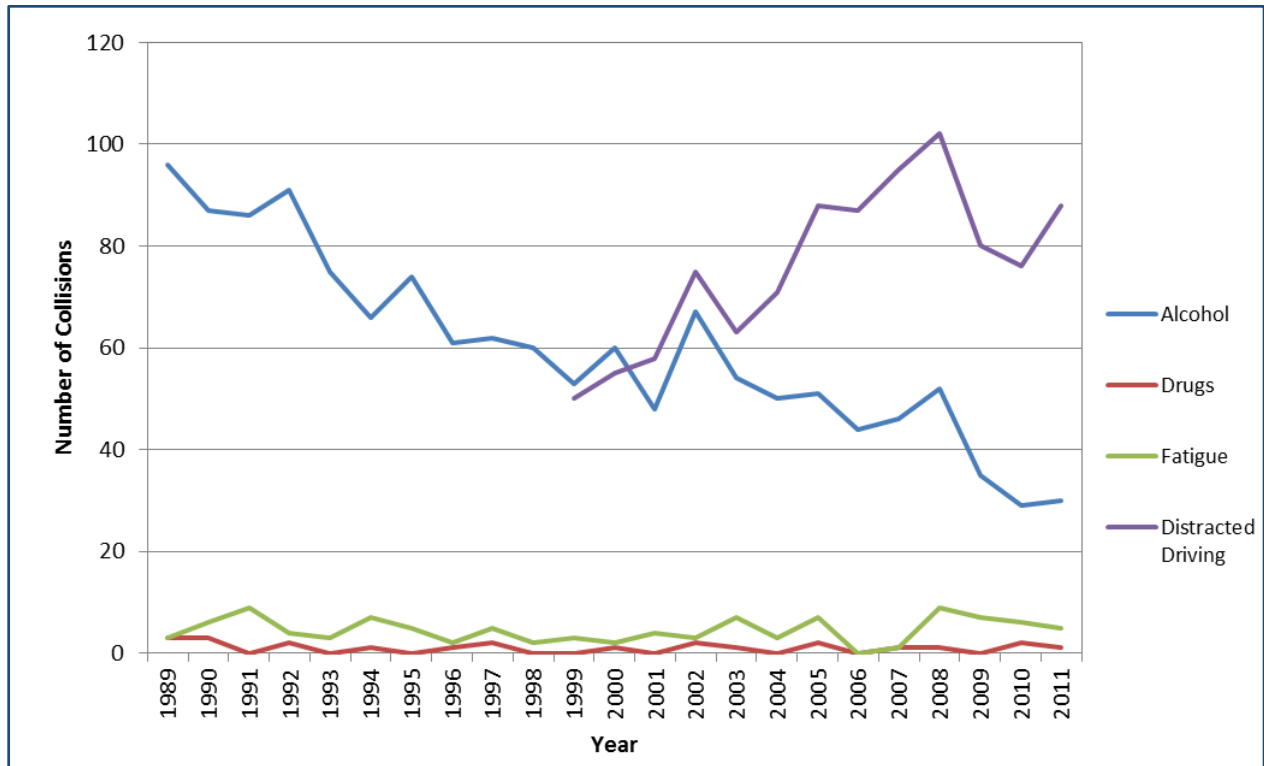


Figure 28: Trends in Impaired Driving Collisions, 1989 to 2011

## Speeding

Exceeding the posted speed limit or driving too fast for conditions continues to be a major concern on the NWT highway system. It was a contributing factor in 45 percent of fatal collisions and in 62 percent of single-vehicle collisions. Figure 29 shows the number of collisions and persons injured/killed where one or more drivers were noted by the RCMP to have been driving too fast for conditions. There has been an overall increase in speed-related collisions between 1989 and 2011, although this increase has not been steady. There was a significant decline between 1989 and 1997, followed by a sharp increase to a peak of 140 collisions in 2003. Since 2003, the number of speed-related collisions has been gradually decreasing.

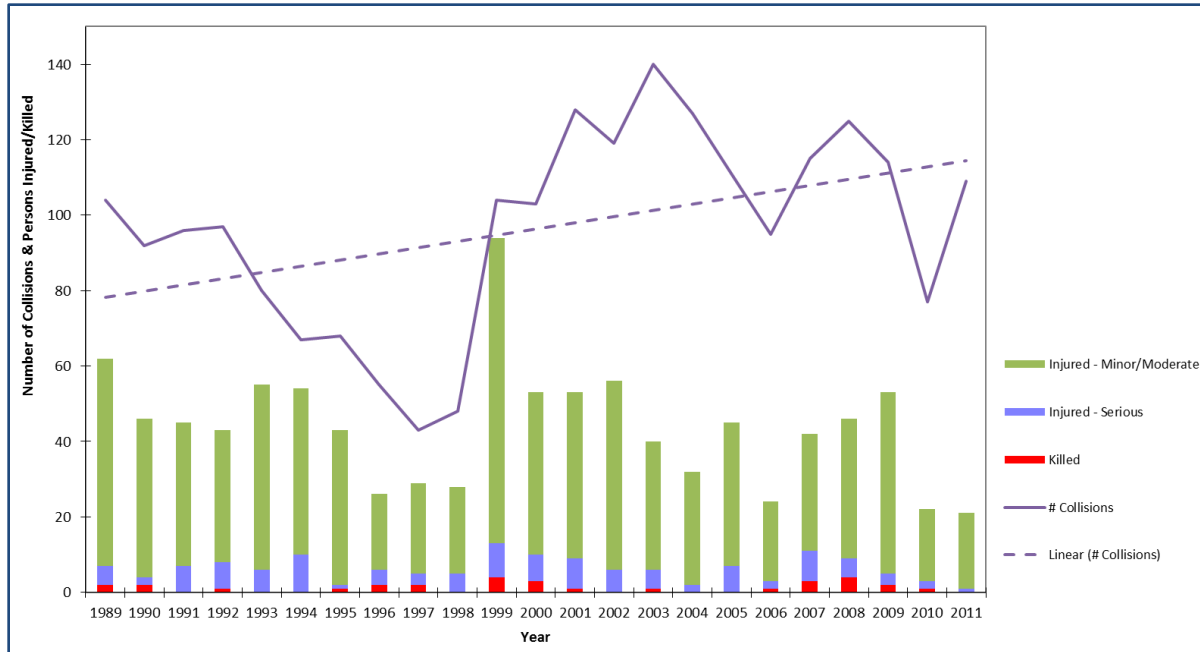


Figure 29: Speed Related Collisions & Persons Injured/killed, 1989 to 2011

Figure 30 compares the number of collisions related to speeding in communities and on the highway system from 1989 to 2011. The trend of total collisions shown in Figure 29 reflects that of community collisions shown in Figure 30, as communities overall see greater numbers of collisions. The number of collisions involving speeding on the highway system remained relatively close to 30 collisions each year.

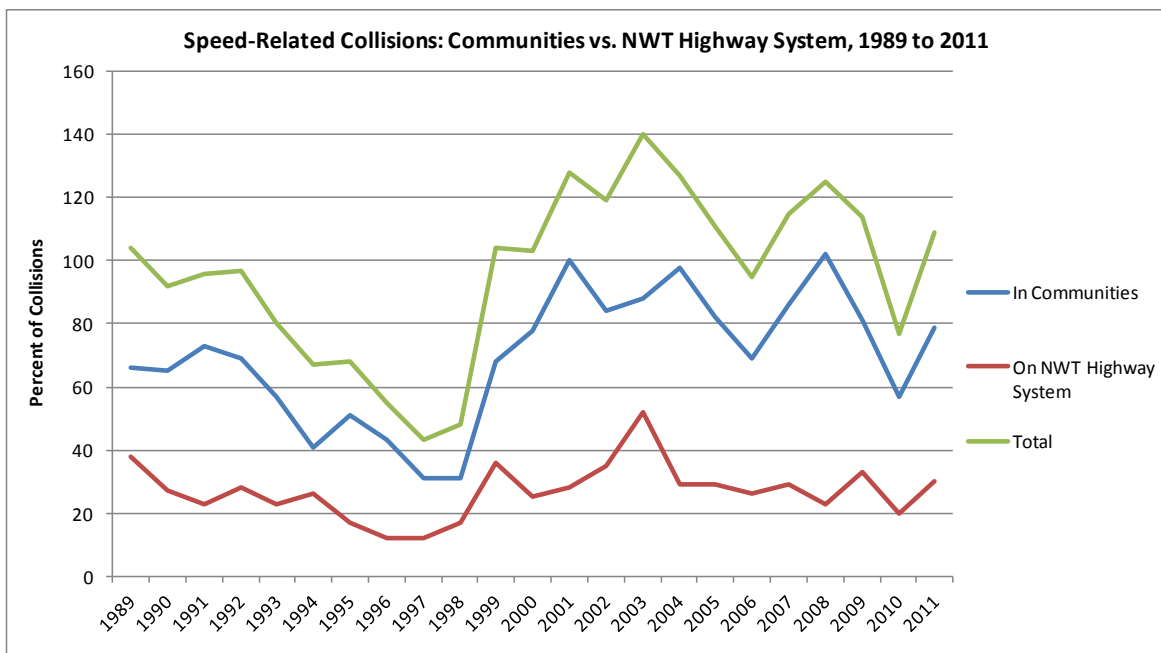


Figure 30: Speed Related Collisions - Communities vs. NWT Highway System, 1989 to 2011

Figure 31 shows the important breakdown of percentage of collisions involving speeding in communities vs. the highway system. This clarifies that although there are more speeding incidents in communities overall, speeding consistently accounts for a higher percentage of highway collisions than it does in communities.

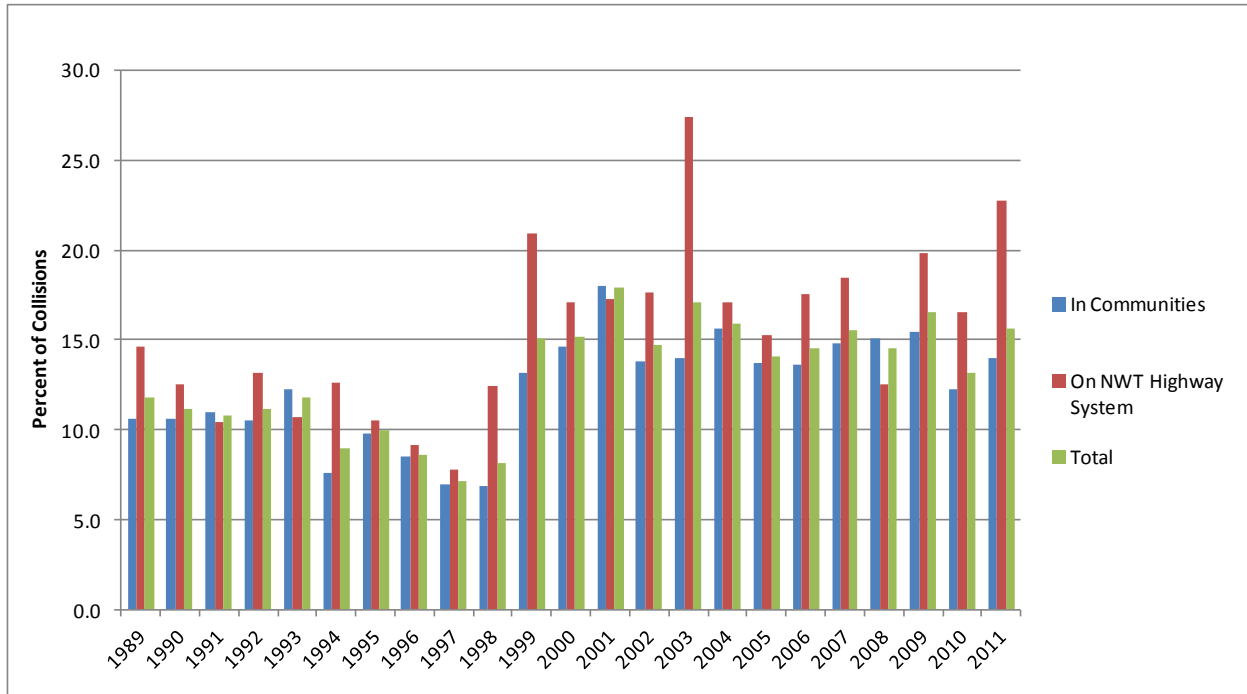


Figure 31: Percentage of Collisions Involving Speeding - Communities vs. NWT Highway System, 1989 to 2011

Figure 32 shows the characteristics of speeding drivers in collisions by a) age group, and b) gender. Over three-quarters (76 percent) of speeding drivers involved in collisions are male and are most likely to be between 25 and 34 years old.

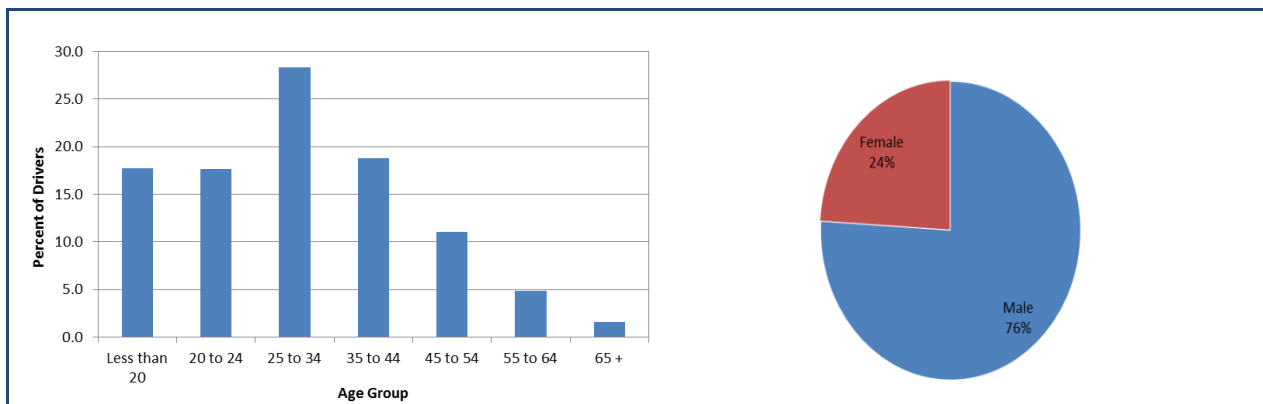


Figure 32a: Drivers in Speed-Related Collisions by Age Group, 1989 to 2011

Figure 32b: Drivers in Speed-Related Collisions by Gender, 1989 to 2011

## Other Driver Error

Driver error, as reported in the NWT, includes the actions of speeding and distracted driving but also accounts for other driver actions such as following too close, improper turning/lane changing, failing to yield, disobeying traffic controls, driving in the wrong direction, unsafe backing, and losing control. As speeding and distracted driving were analyzed as individual topics the remaining driver actions were analyzed as a whole. Together these actions have a major influence on collisions in the NWT. Figure 33 shows the number of collisions related to driver error other than speeding and distracted driving. From 1989 to 2011 total driver error related collisions decreased from approximately 500 collisions to 300 collisions, while fluctuating between 300 and 400 collisions. Comparing this to the total number of collisions in the NWT, which as shown in Figure 2 has fluctuated around 735 collisions, the magnitude of collisions attributed to driver error is apparent. As there are more collisions occurring in communities, it again makes sense that the total trend reflects the community trend. The trend along the highway system has varied less dramatically and follows a slight decline. There are lower numbers of collisions occurring along the highway system, but it is important to understand the percentage of highway and community collisions related to driver error as shown in Figure 34.

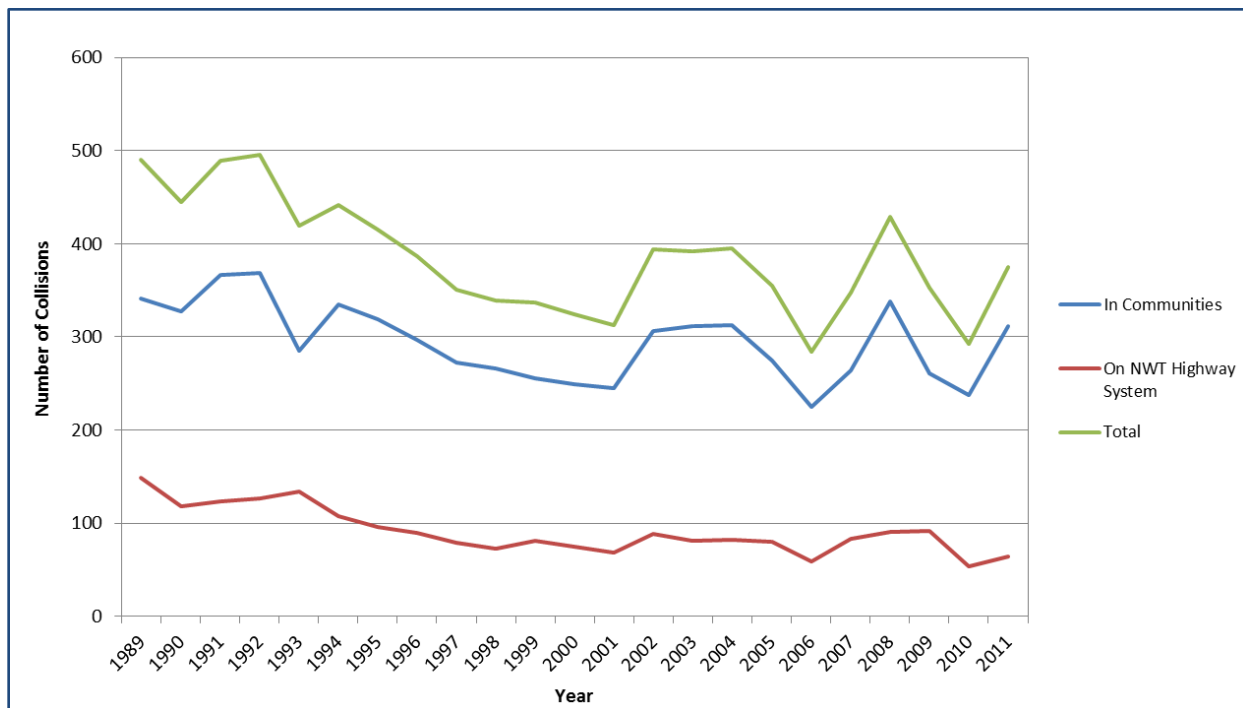


Figure 33: Number of Collisions Due to Driver Error – Communities vs. NWT Highway System, 1989 to 2011

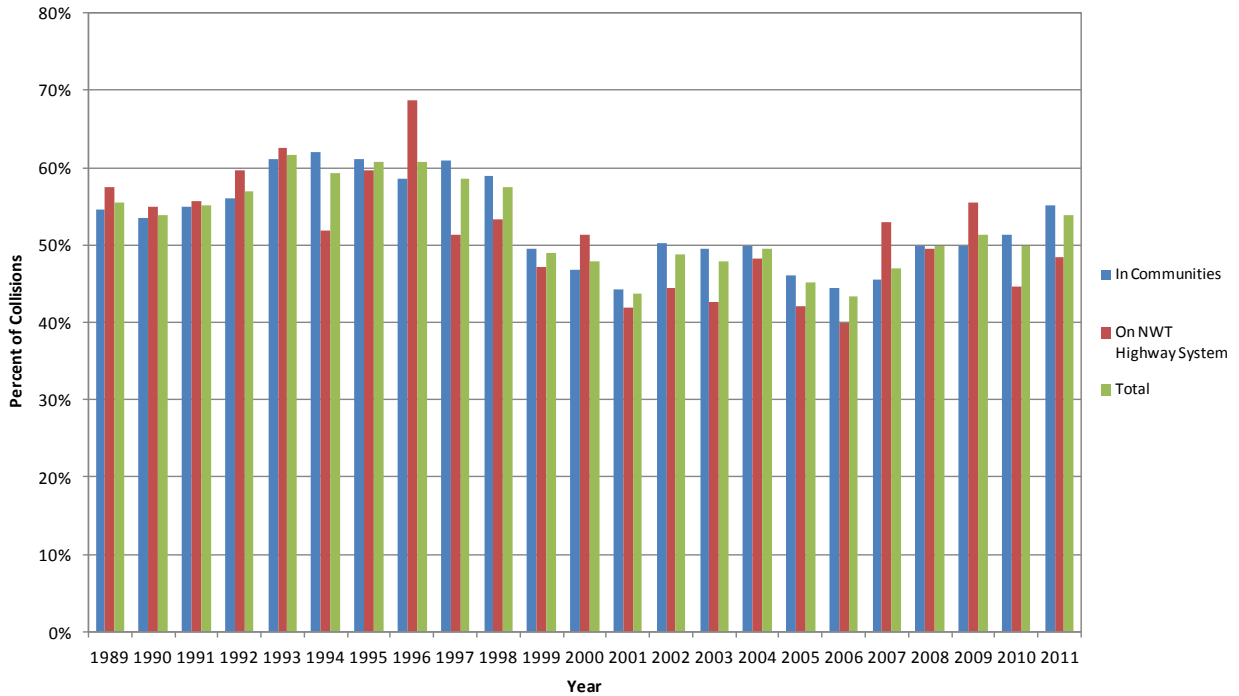


Figure 34: Percentage of Collisions Involving Other Driver Errors – Communities vs. NWT Highway System, 1989 to 2011

Figure 35 shows the breakdown of each considered driver error (including speeding and distracted) and their corresponding relationship with collisions on highways and in communities. It is interesting to note that certain driver errors are much more prominent in communities than along the highways and vice versa, for instance lost control is a factor in 42.4% of highway collisions but only 10.8% of community collisions. Unsafe backing, as one would expect, plays a larger role in community collisions.

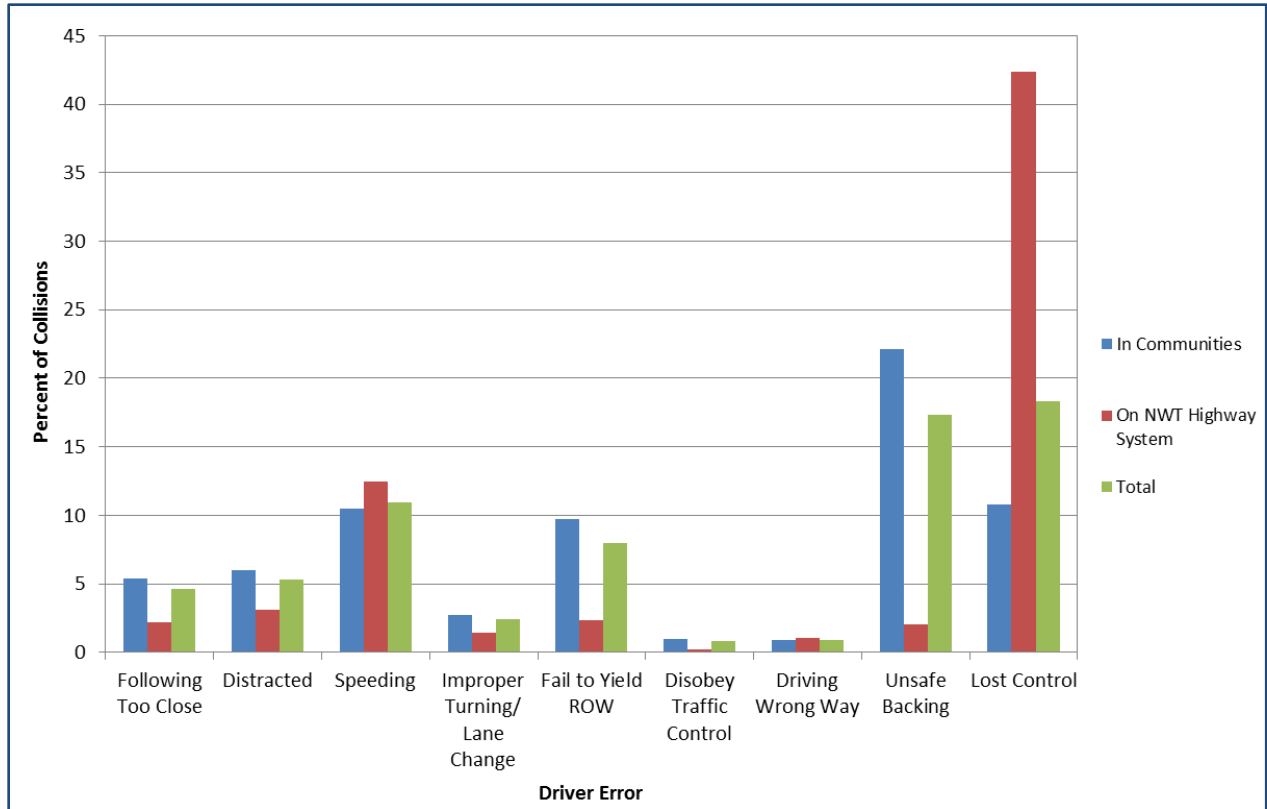


Figure 35: Distribution of Collisions by Driver Error, 1989 to 2011

## Summary of Driver Conditions & Actions

In summary Figure 36 shows the average percentage of collisions from 1989 to 2011 associated with the four critical contributing factors discussed: alcohol, distracted driving, speeding, and other driver errors. The figure shows the percentages for community collisions, highway collisions, and total collisions. On the NWT Highway System alcohol, distracted driving, speeding, and other driver errors contributed to an average of 10.3%, 3.5%, 15.3%, and 51.7% of the collisions respectively, whereas in communities they were associated with 7.5%, 6.6%, 12.4%, and 52.6% respectively. In total, these four factors contributed to approximately 80% of all collisions in the Northwest Territories.

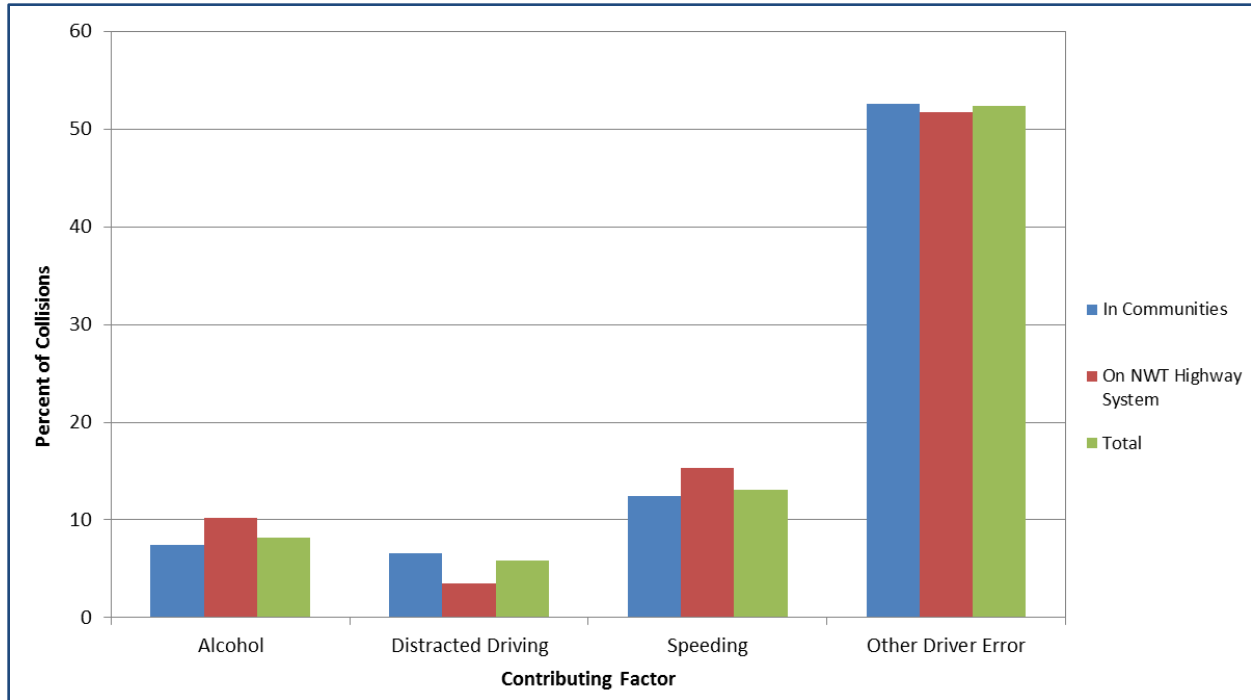


Figure 36: Distribution of Collisions by Contributing Factor - Communities vs. NWT Highway System, 1989 to 2011

## Environmental Conditions

### Weather Condition

Figure 37 shows the distribution of collisions by weather conditions and it can be seen that the majority of collisions, both in communities and along highways, occur in clear conditions. From 1989 to 2011, 65.4% of collisions occurred in clear conditions meaning weather was in no way a contributing factor. When comparing all other weather conditions including overcast, raining, snowing, freezing rain, fog/smoke/dust, and strong wind overcast conditions were the most reported. Approximately 20% of all collisions, both in communities and on highways, were affiliated with overcast weather. Interestingly, snowing conditions were reported in only 8.1% of community collisions and 12.1% of highway collisions. All other conditions were reported in 5% or less of the collisions.

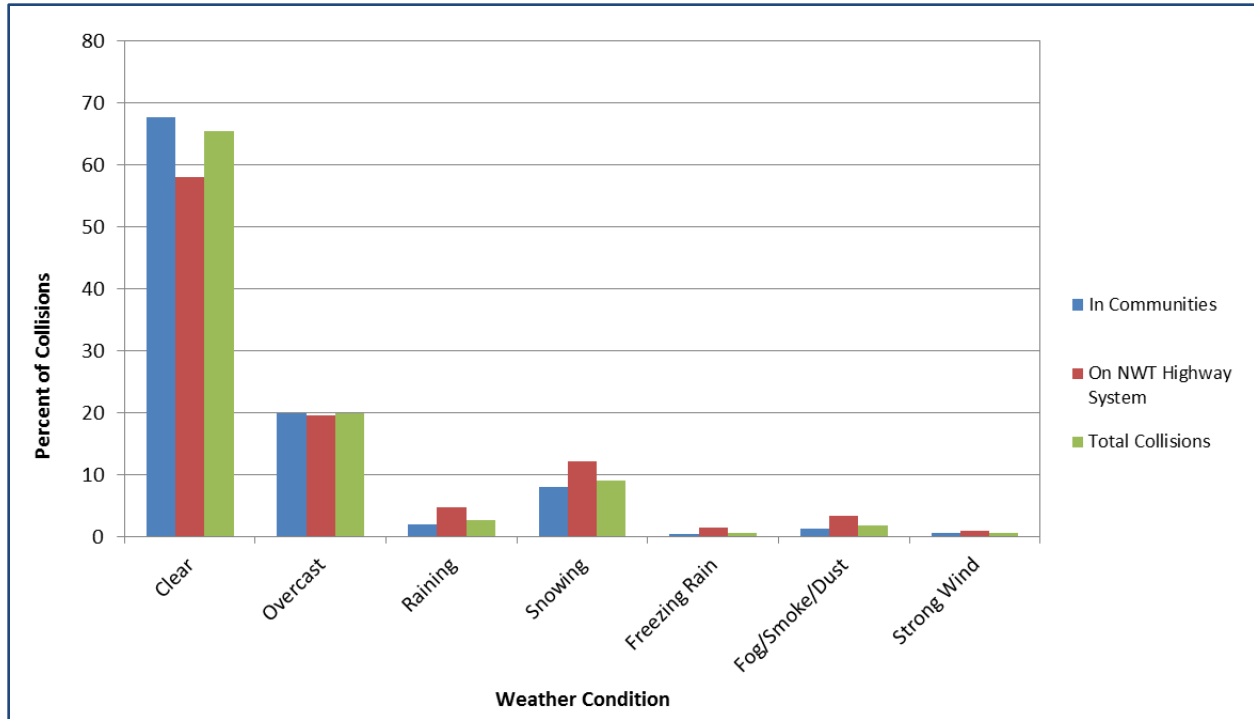


Figure 37: Distribution of Collisions by Weather Conditions, 1989 to 2011

## Road Surface Environmental Condition

Figure 38 shows the distribution of collisions from 1989 to 2011 by road surface environmental condition including dry, wet, fresh snow, slush, icy, and/gravel/dirt, muddy, oily, and flooded. Not surprisingly, icy road surface conditions were reported in close to 50% of all NWT collisions, consistent for both community and highway collisions. This equates to 7,872 collisions being associated to icy road conditions over the 23 year period, making it a critical factor in NWT collisions and the most significant road surface environmental condition. Interestingly, dry road surface conditions contain the second highest percentage of collisions with approximately 30% of all community and highway collisions. All other conditions were reported in fewer than 10% of the collisions.

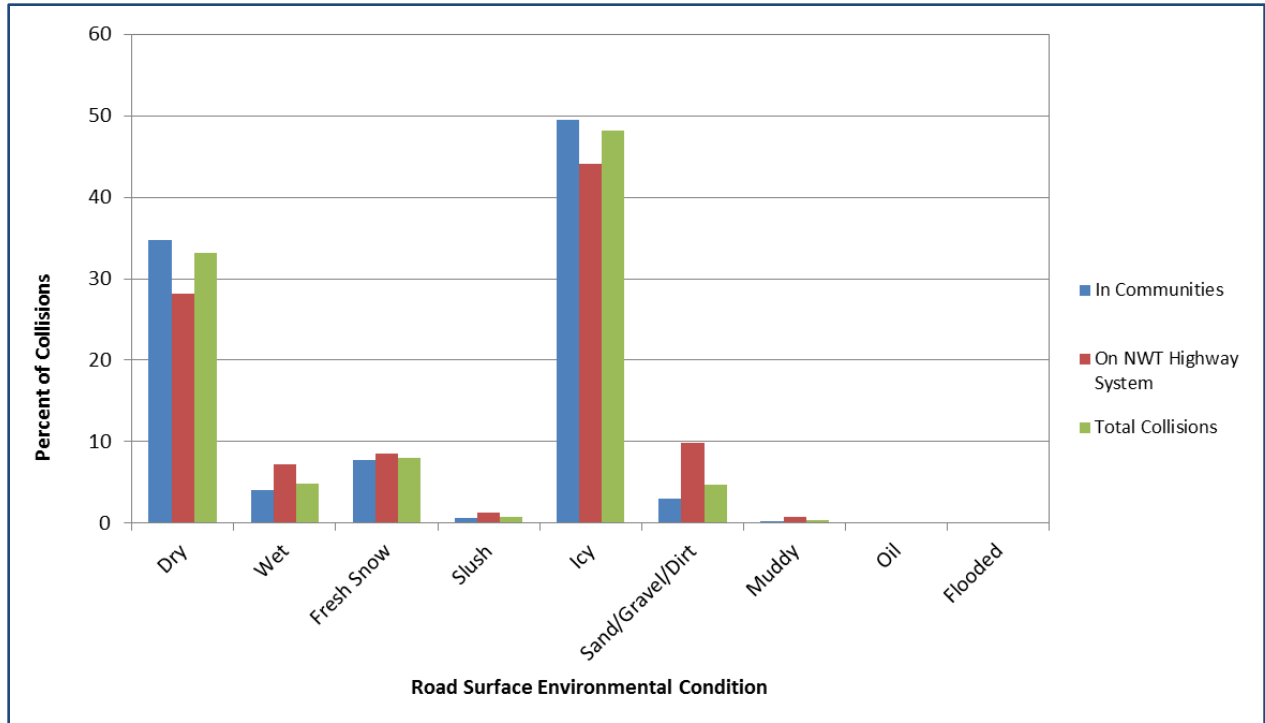


Figure 38: Distribution of Collisions by Road Surface Environmental Condition, 1989 to 2011

## Road Surface Maintenance Condition

Figure 39 shows the distribution of collisions from 1989 to 2011 by physical road surface condition. Overall, 80% of all NWT collisions occurred on roads that were in good condition. It is interesting to note that the percentages of highway and community collisions are less congruent for road surface maintenance condition as with environmental and weather conditions. Communities see 86.2% of collisions occurring on good road surfaces whereas highways see 63.3%. There is also a significant difference between percent of collisions for potholes, 25% of highway collisions are associated with potholes whereas they are reported in only 8.7% of community collisions. This is important as it may be reflecting a higher sensitivity of highway driving to road surface conditions, or it may be reflecting a poorer quality of roads in the NWT Highway System.

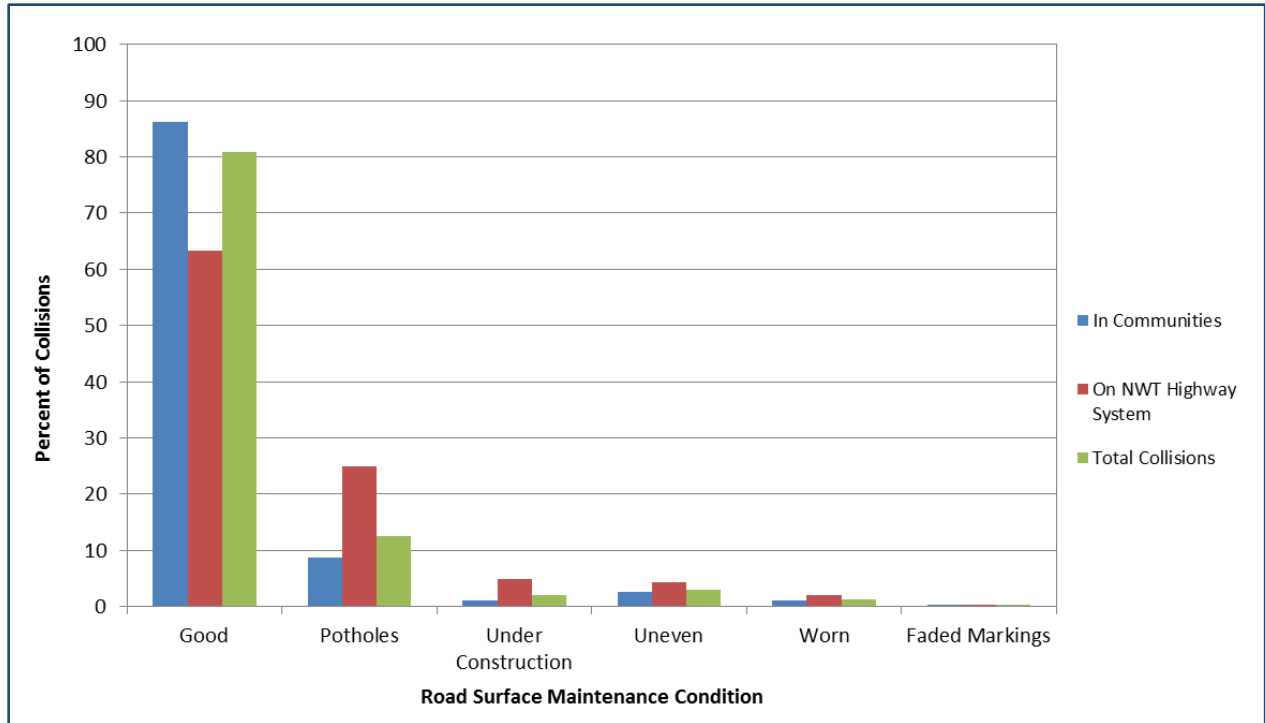


Figure 39: Distribution of Collisions by Road Surface Maintenance Condition, 1989 to 2011

## Bison-Vehicle Collisions

A traffic safety challenge unique to the Northwest Territories is bison-vehicle collisions. Based on data in the Traffic Collision Information System, collisions with bison are most common:

- On Highways #5, #7, and #3 between Fort Providence and Boundary Creek;
- Between the months of August and December; and
- During darkness, dawn and dusk.

While bison-vehicle collisions result in very few injuries to motor vehicle occupants, they do cause a significant amount of damage to the striking vehicle as well as bison mortalities. In close to half of the recorded collisions, the vehicles sustained enough damage that they had to be towed from the scene or be written off. On average, only two to three persons per year suffer minor to moderate injuries in bison-vehicle collisions. Thus far, there has been one fatality associated with a bison-vehicle collision. This occurred on Highway #3 near Chan Lake in October 2009.

Figure 40 shows the number of bison-vehicle collisions and the resulting number of persons killed or injured. The number of collisions has increased over the period, with a peak of 31 reported collisions in 2008. The Department of Transportation has responded by improving highway signage and increased public awareness through the Drive Alive program. During the peak bison season, brochures and radio advertisements are used to inform NWT residents of high bison traffic areas and to provide driving tips to reduce the risk of collision. Since 2008, the number of bison-vehicle collisions has shown a sharp drop.

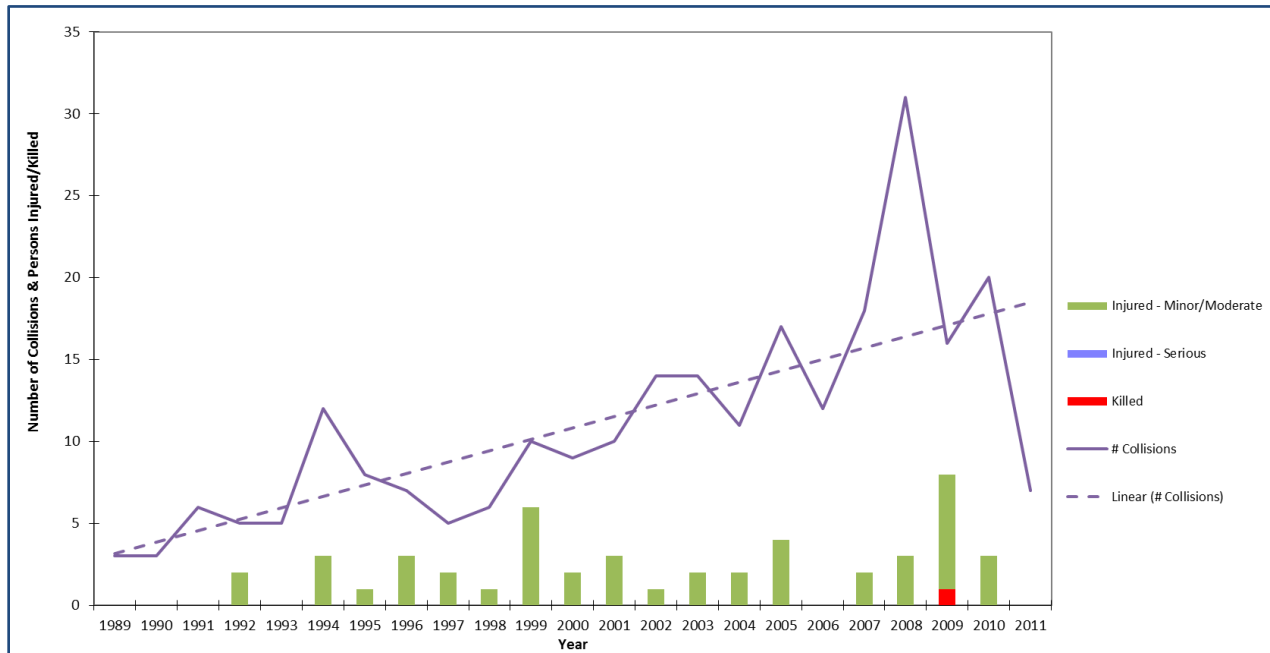


Figure 40: Bison Collisions & Persons Injured/Killed, 1989 to 2011

The Department of Environment and Natural Resources (ENR) also maintains a database of bison-vehicle collisions based on information collected by Resource Officers. An examination of the ENR database show that the characteristics of bison-vehicle collisions are similar to those in the Department of Transportation’s database in terms of where, when, and under what environmental conditions they occur. However, it is important to note that many of the collisions in the ENR database cannot be matched with those in the DOT database. It is estimated that the number of the collisions reported by the Department of Transportation represent only half of all bison-vehicle collisions.

## Young Drivers

Canada’s Road Safety Strategy 2015 defines a young driver as a driver under the age of 25 years. Of particular interest and concern in the Northwest Territories is the over-representation of young drivers in collisions. Drivers aged 15 to 20 years are twice as likely to be involved in a collision than drivers aged 35 to 44 years. On August 1, 2005, the Graduated Driver Licensing Program was introduced to make the process of learning to drive a safer experience. New drivers are required to go through three stages to obtain a full Class 5 licence: Stage 1 – Learner Class, Stage 2 – Probationary Class, and Stage 3 – Full Class, where stages 1 and 2 involve written and practical road examinations respectively. Each stage has a minimum age requirement, a minimum participatory period, and set driver conditions.

Figure 41 shows the number of collisions involving one or more young driver and the corresponding number of persons injured and killed between 1989 and 2011. Both the total number of collisions and casualties show a general decline over the period.

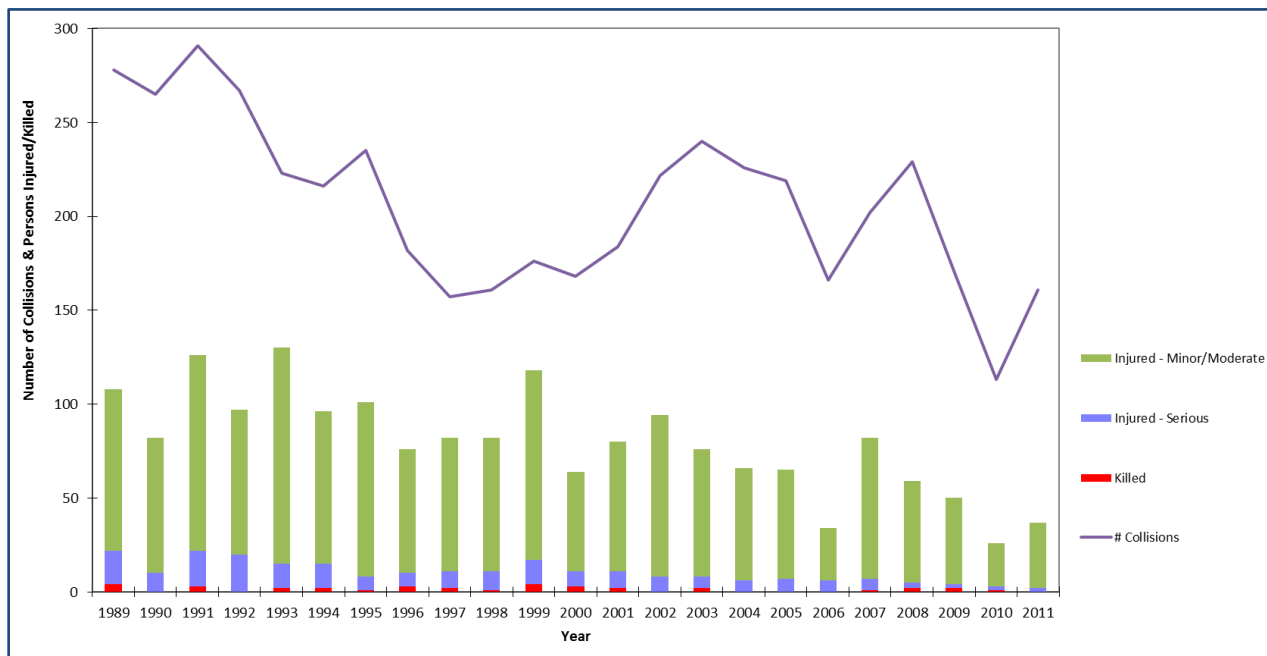


Figure 41: Collisions Involving Young Drivers & Persons Injured/Killed, 1989 to 2011

Figure 42 shows the age distribution of drivers involved in collisions and the general Northwest Territories driver population. From the figure, it can be seen that drivers between the ages of 20 to 24 and 25 to 34 are over-represented in collisions compared to the NWT driver population. In each section discussing collisions related to alcohol, distracted driving, and speeding it was shown that young male drivers represent a significant portion of the population involved in these collisions. In summary, young male drivers of 25 years or less represent only 9.9%

of the NWT driver population but account for 31.1% of drinking drivers, 29.9% of speeding drivers, 21.6% of distracted drivers in collisions.

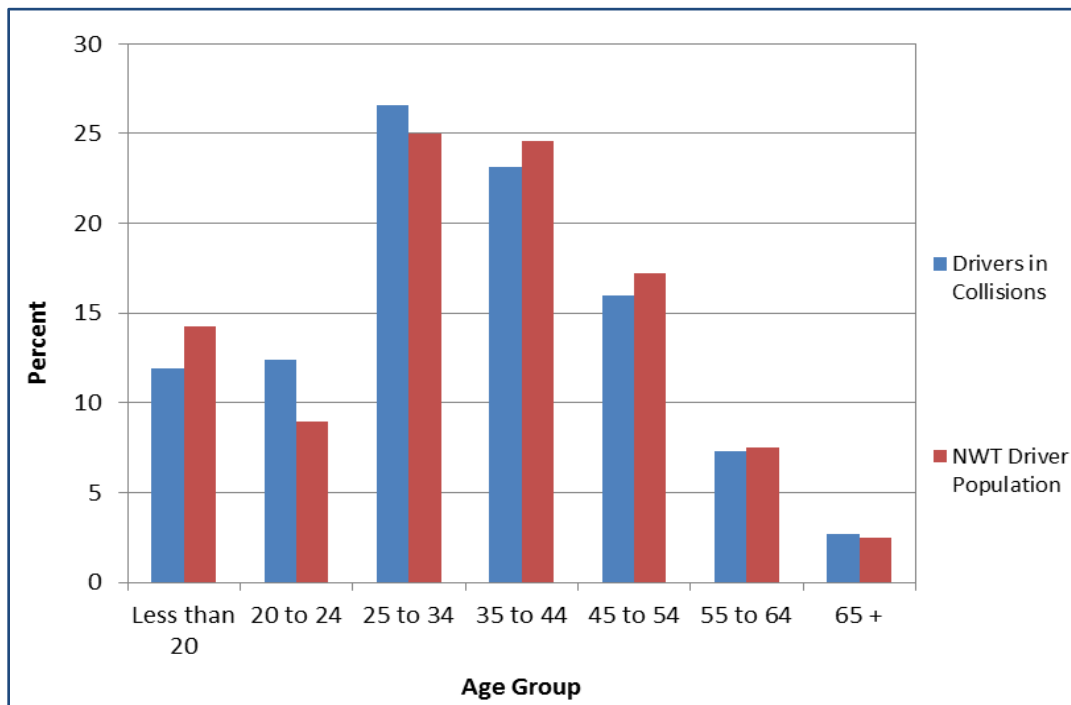


Figure 42: Age Distribution of Drivers in Collisions vs. Driver Population, 1989 to 2011

Table 3 gives the percent breakdown of driver actions as a contributing factor in collisions for a) young drivers, and b) all drivers. From the table, it is interesting to note that young drivers were 50 percent more likely to have been driving too fast for conditions compared to all drivers in collisions (15.4% vs. 10.3%). Young drivers were also significantly less likely to have been driving properly according to the police compared to all drivers (24.0% vs. 33.1%).

Table 3: Driver Action Contributing Factors for Young Drivers and All Drivers in Collisions, 1989 to 2011

Driver Action	Young Drivers in Collisions	All Drivers in Collisions
Following Too Closely	5.1	4.2
Distracted/Inattentive	5.4	4.7
Driving Too Fast for Conditions	15.4	10.3
Improper Turning or Passing	2.3	2.3
Fail to Yield Right-of-Way	8.4	6.9
Disobeyed Traffic Control	1.2	0.8
Driving Wrong Way	1.3	0.9
Unsafe Backing	12.2	14.3
Lost Control	20.9	18.4
Driving Properly	24.0	33.1
Action Unknown	3.8	4.0

## Vulnerable Road Users

The Road Safety Strategy 2015 defines the vulnerable road users target group as pedestrians (including those in motorized wheelchairs and mobility devices), motorcyclists and cyclists.

While the number of collisions involving vulnerable road users in the Northwest Territories is small compared to other jurisdictions, there is a downward trend in both the number of collisions and persons injured and killed between 1989 and 2011, as shown in Figure 43. It is interesting to note the close correlation between the number of collisions and number of casualties.

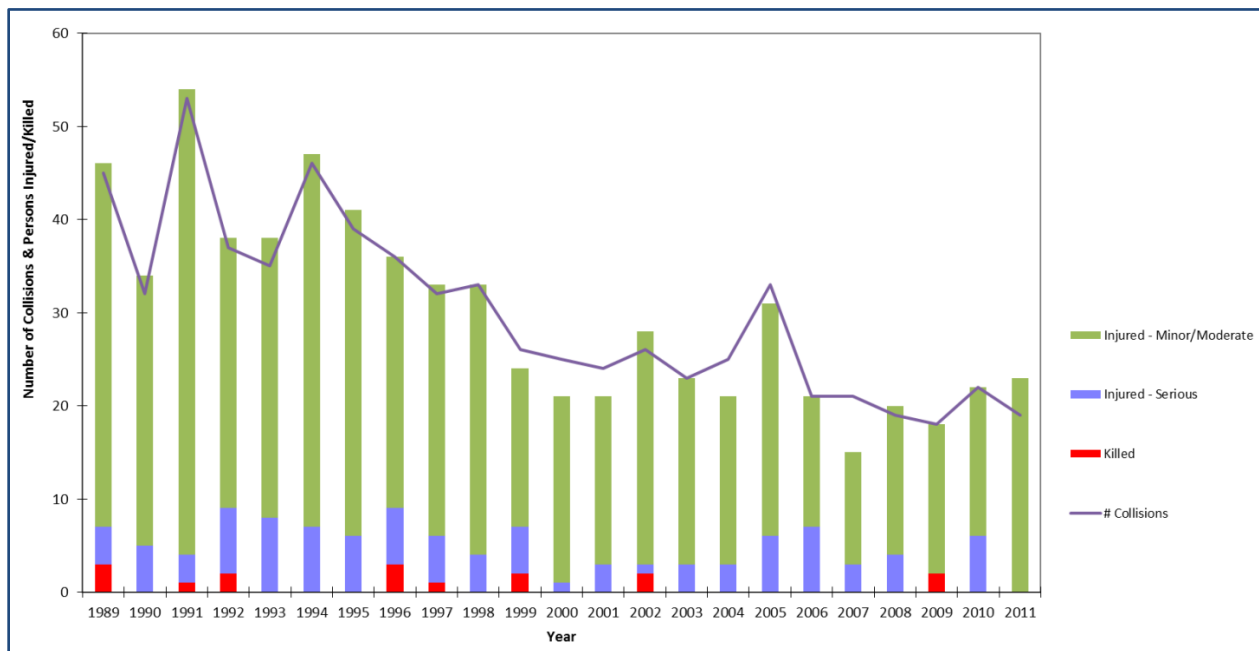


Figure 43: Collisions Involving Vulnerable Road Users & Persons Injured/Killed, 1989 to 2011

## Motor Carriers

In this section, a motor carrier collision is a collision involving a straight truck or tractor-trailer combination. Figure 44 shows the number of collisions involving motor carriers and the resulting casualties from 1989 to 2011. The number of collisions shows a downward trend over the period. The number of persons injured or killed does not show a clear trend due to the low numbers, however there are peaks in 1993, 1994 and 2001. Figure 44 also

shows that collisions involving motor carriers are more likely to result in fatalities and serious injuries than collisions involving light-duty vehicles only.

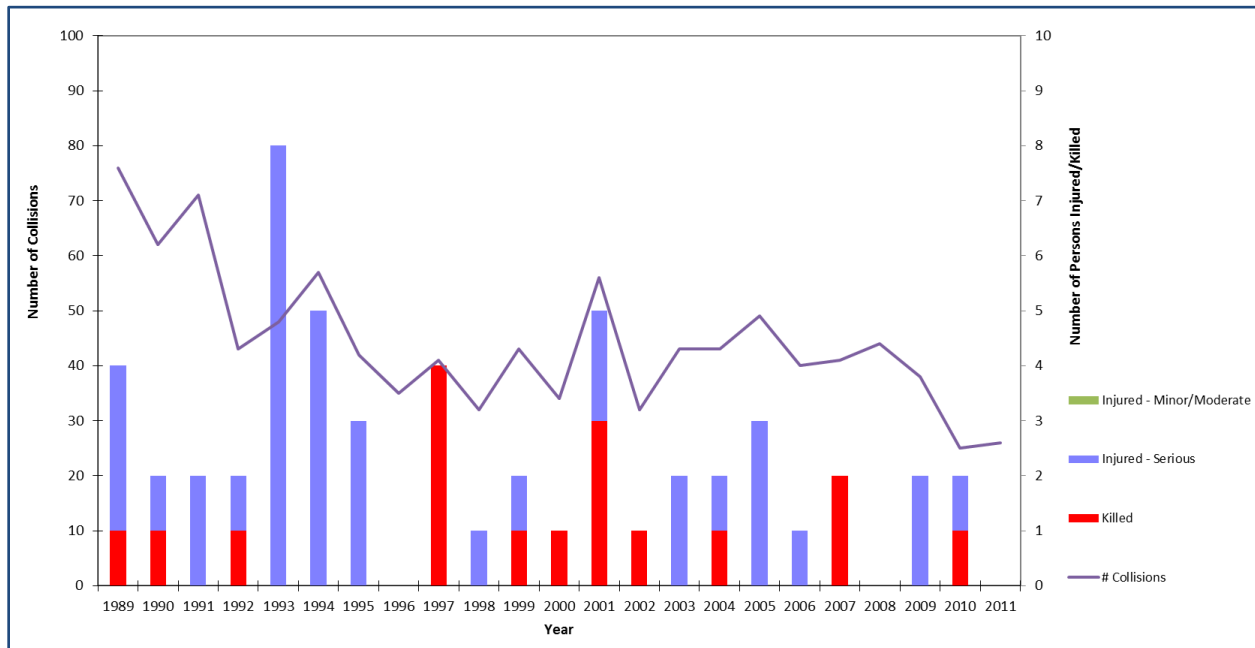


Figure 44: Collisions Involving Heavy Trucks & Persons Injured/Killed, 1989 to 2011

## Occupant Protection

Even though the non-use or improper use of occupant protection does not affect the number of collisions, it does influence the severity of injuries sustained in collisions. Most persons that were fatally or serious injured in collisions were not wearing seat belts or helmets.

Figure 45 shows the number of unrestrained motor vehicle occupants that were killed or injured in collisions between 1989 and 2011. There has been a dramatic reduction in the number of unrestrained casualties during the 23-year period.

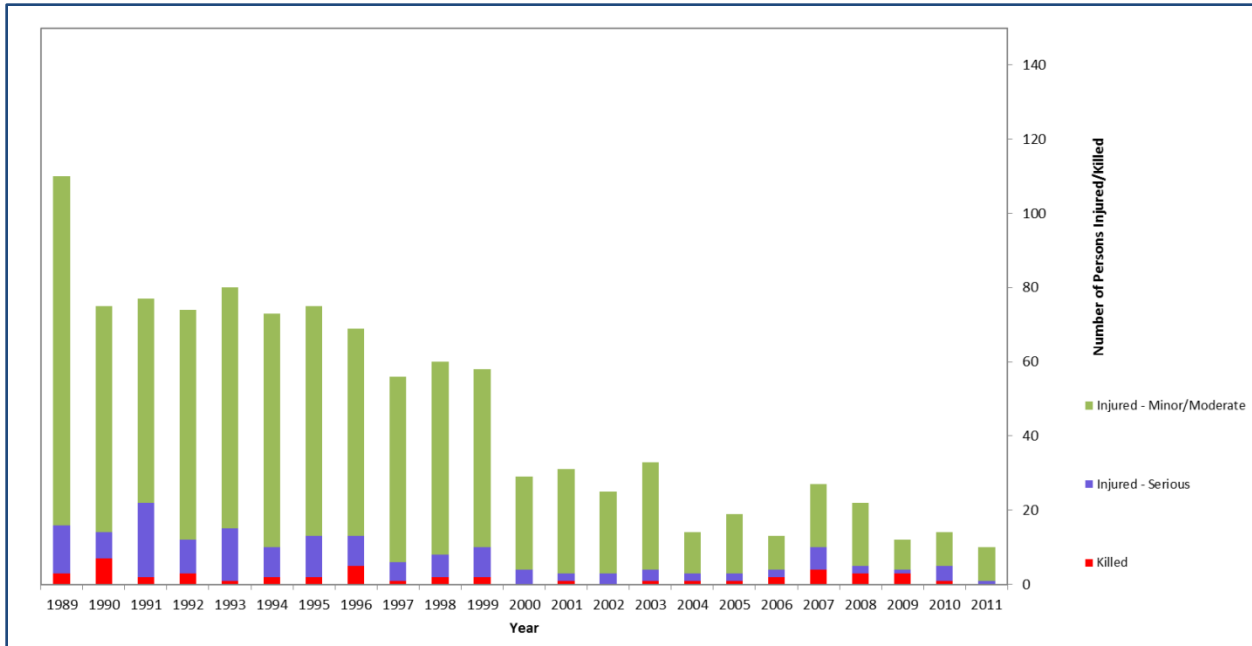


Figure 45: Unrestrained Motor Vehicle Occupants Injured/Killed, 1989 to 2011

Seat belt use among motor vehicle occupants in the Northwest Territories has increased. Transport Canada conducts roadside surveys of occupant restraints on an annual basis. Figure 46 shows seat belt usage rates for Canada and the Northwest Territories from 1993 to 2010. Starting in 2002, the surveys alternate between urban and rural locations, where usage rates tend to be higher and lower respectively. Surveys were not conducted in 1995 and 2008. As can be seen from Figure 46, usage rates in the Northwest Territories lag behind the national average and remain about the lowest in the country. However, the gap is narrowing.

Figure 47 shows the characteristics of unrestrained motor vehicle occupants in collisions by a) age group, and b) gender. Over two-thirds (68 percent) of unrestrained occupants involved in collisions are male and are most likely to be between 25 and 34 years old.

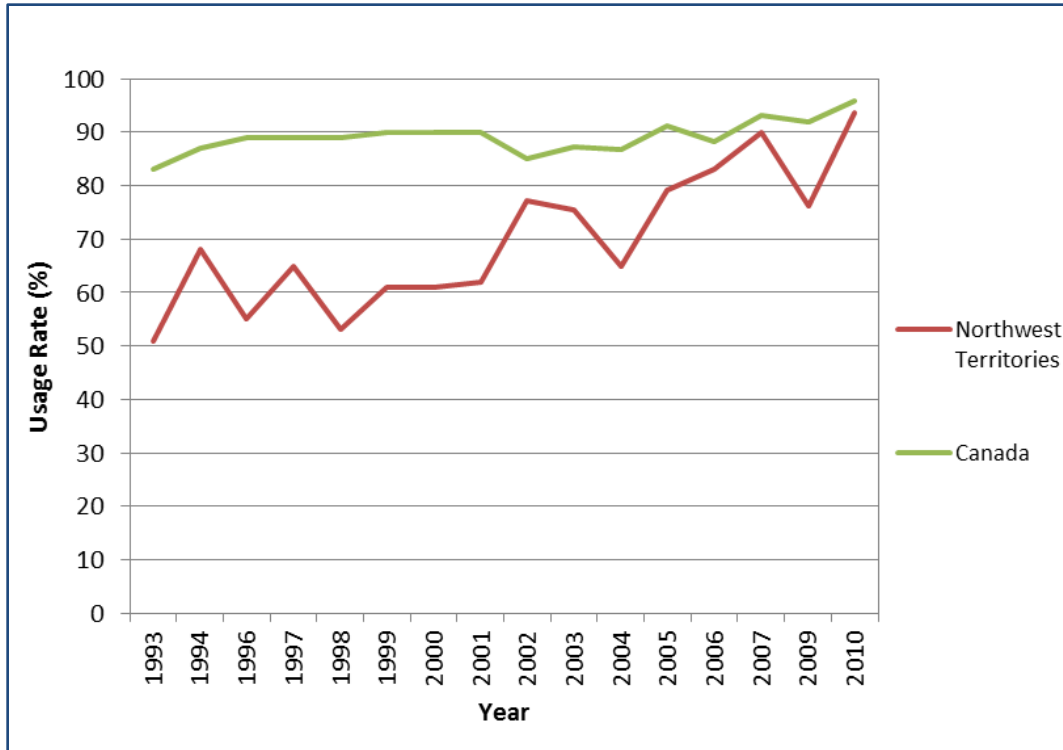


Figure 46: Seat Belt Usage Rates - NWT vs. Canada, 1993 to 2010

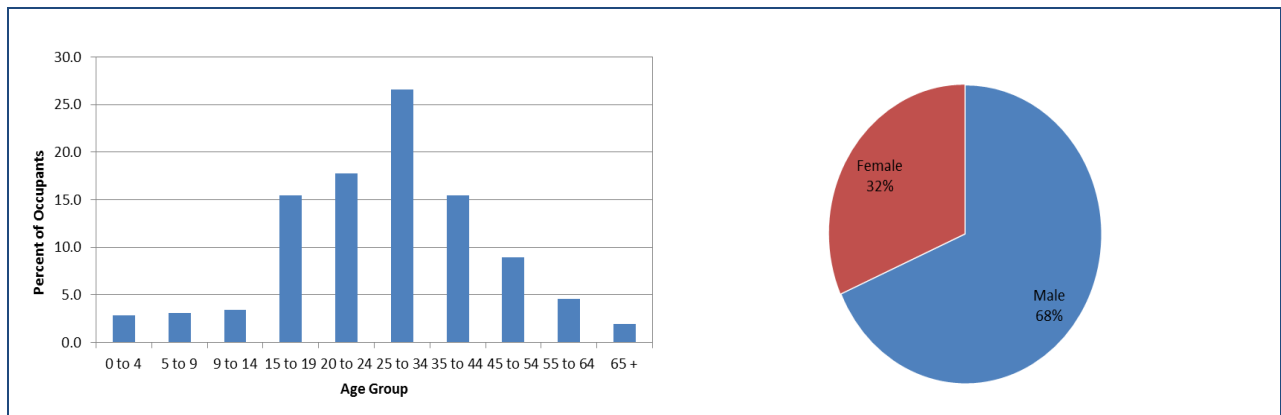


Figure 47a: Unrestrained Motor Vehicle Occupants in Collisions by Age Group, 1989 to 2011

Figure 47b: Unrestrained Motor Vehicle Occupants in Collisions by Gender, 1989 to 2011

The likelihood of sustaining injuries is reduced through the proper use of seat belts. Unrestrained persons are nearly three times more likely to sustain injuries in a collision compared to restrained persons, as shown in Figure 48 a) and b). From Figure 48 a), 24 percent of unrestrained occupants sustained injuries while Figure 48 b) shows that only 9 percent of restrained occupants sustained injuries.



Figure 48a: Injury Outcome of Unrestrained Motor Vehicle Occupants in Collisions, 1989 to 2011

Figure 48b: Injury Outcome of Restrained Motor Vehicle Occupants in Collisions, 1989 to 2011

## Traffic Safety Offences

Offences under the *Criminal Code* and *Motor Vehicles Act* can be an indicator of traffic safety trends, although this is influenced by the level of enforcement. Figure 49 shows the number of convictions issued under the *Criminal Code* and *Motor Vehicles Act* between 1991 and 2011. The trend lines show that there has only been a slight decline in the number of traffic offences during the 20-year period. The number of offences under the *Criminal Code* is significantly lower than the *Motor Vehicles Act* offences in all years. The number of offences under the *Motor Vehicles Act* peaked at around 2,500 in 2003 and 2004. No information is available on the level of enforcement that took place.

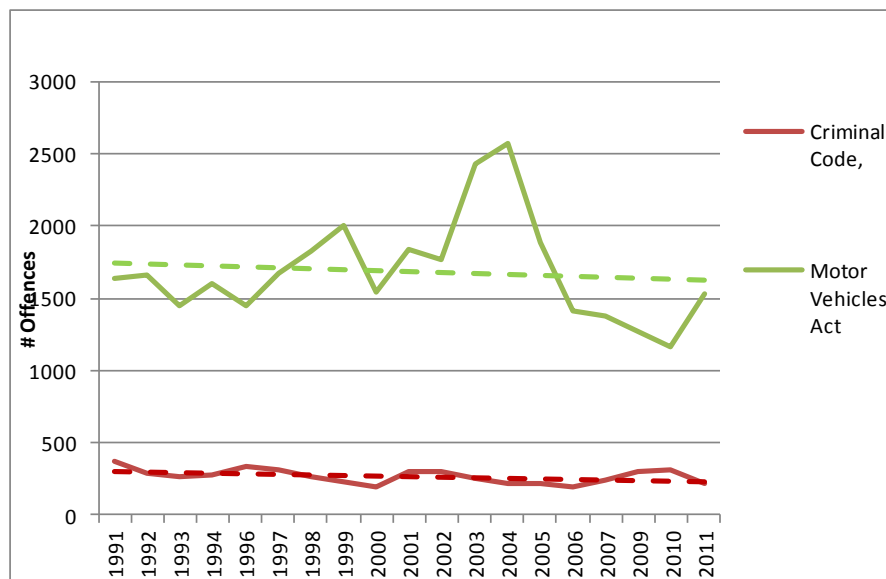


Figure 49: Criminal Code & Motor Vehicles Act Offences, 1991 to 2011

Looking more closely at the types of offences committed, Table 4 gives a breakdown of the proportion of offences by section and offence description under the *Criminal Code* and *Motor Vehicles Act*. Only the ten most common *Motor Vehicles Act* offences are shown in the Table.

**Table 4: Offences under the *Criminal Code* and *Motor Vehicles Act* by Section and Description, 1991 to 2011**

<b><i>Criminal Code</i></b>			<b><i>Motor Vehicles Act</i></b>		
<b>Section</b>	<b>Description</b>	<b>Percent</b>	<b>Section</b>	<b>Description</b>	<b>Percent</b>
249(1)	Dangerous Driving	2.3	169	Speeding	42.1
249(3)	Dangerous Driving Causing Bodily Harm	0.2	146	Operating Vehicle Without Wearing Seat Belt	15.9
249(5)	Dangerous Driving Causing Death	0.1	5	Operating Vehicle Without Registration	10.7
252	Fail to Remain at Scene of Accident	0.5	66	Operating Vehicle Without Valid Driver's License	9.8
253(a)	Impaired by Alcohol or Drugs	30.9	161 & others	Failing to Stop Vehicle	5.1
253(b)	Blood Alcohol Content Over 0.08	51.9	36	Operating Vehicle Without Insurance	3.8
254	Fail to Provide Breath Sample	5.6	154	Careless Driving	1.8
255(2)	Impaired Driving Causing Bodily Harm	0.6	119	Fail to Carry Driver's License	1.3
255(3)	Impaired Driving Causing Death	0.0	81	Driving While Prohibited or Suspended	0.8
259(4)	Driving While Disqualified	7.1	171	Driving at Unreasonable Speed	0.6
354(2)	Unlawfully Take Motor Vehicle Without Owner's Consent	0.3			
	Other CC Offence	0.5			

Nearly 90 percent of offences committed under the *Criminal Code* are related to impaired driving, primarily from alcohol. Over 40 percent of offences under the *Motor Vehicles Act* are related to speeding while another 16 percent are related to the non-use of seat belts and child restraints. These three offence categories figure heavily as either a contributing factor in collisions or injury outcomes. Figure 50 shows trends in the number of traffic offences in the categories of i) impaired driving, including the administrative sanctions under the *Motor Vehicles Act* (introduced in December 2004), ii) speeding, and iii) occupant restraints, from 1991 to 2011.

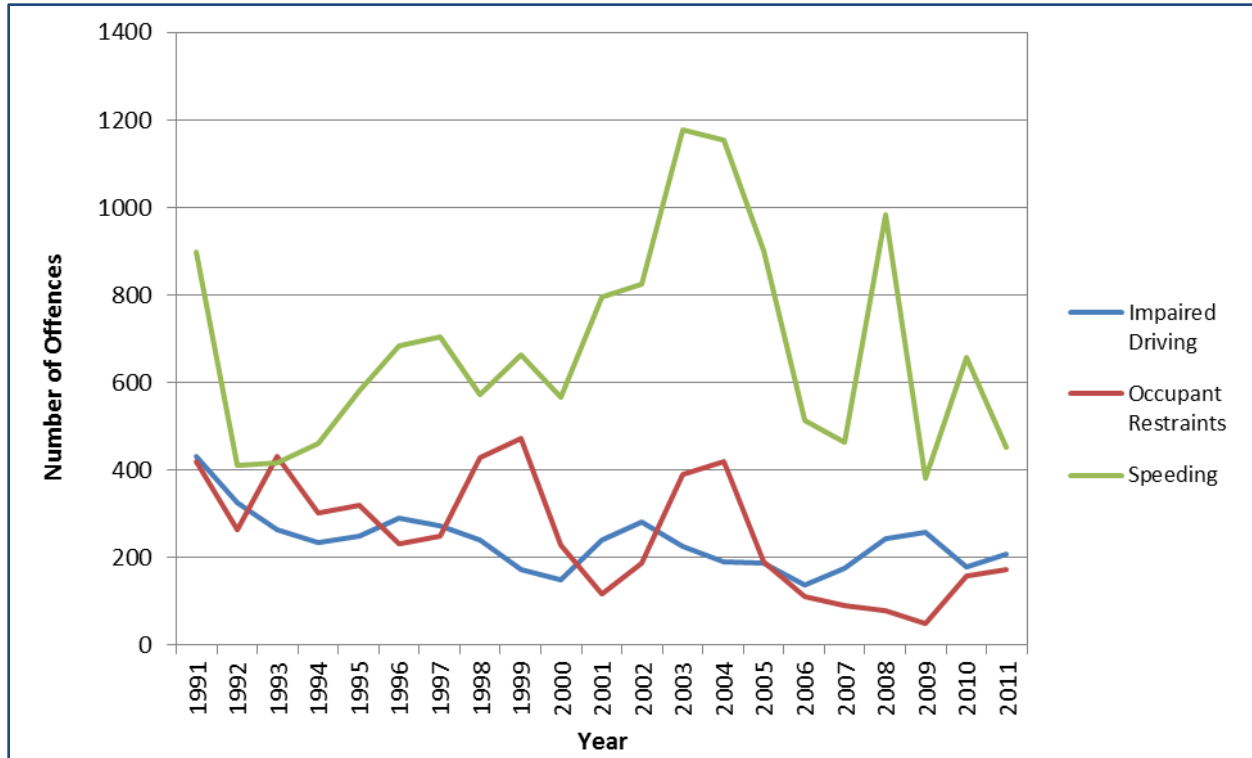


Figure 50: Traffic Offences by Category, 1991 to 2011

There is no clear trend in the number of speeding-related offences during the 20-year period. The 1,176 speeding offences committed in 2003 coincide with the peak in speed-related collisions as shown in Figure 29. The downward trend in the number of impaired driving-related offences is consistent with the declining number of alcohol-related collisions and corresponding casualties in Figure 11. The number of offences for the non-use of occupant restraints is in line with the increasing usage rates as observed in the annual Transport Canada surveys (Figure 46) and the reduction in unrestrained occupants killed and injured in collisions (Figure 45).

## Off-Road Vehicles

Off-road vehicles especially all-terrain vehicles (ATVs) and snowmobiles are widely used in the Northwest Territories. Although it is illegal to drive them along the territorial highway system, most municipalities accommodate them on community roads. Off-road vehicles and their related collisions are therefore found both on and off territorial roads. Figure 51 displays the total off-road vehicle collisions and persons injured or killed in the NWT from 1989 to 2011. There is a slight decline in total collisions largely influenced by the significant drop in collisions after 2008. Up until 2008 the number of collisions fluctuated around 25 each year.

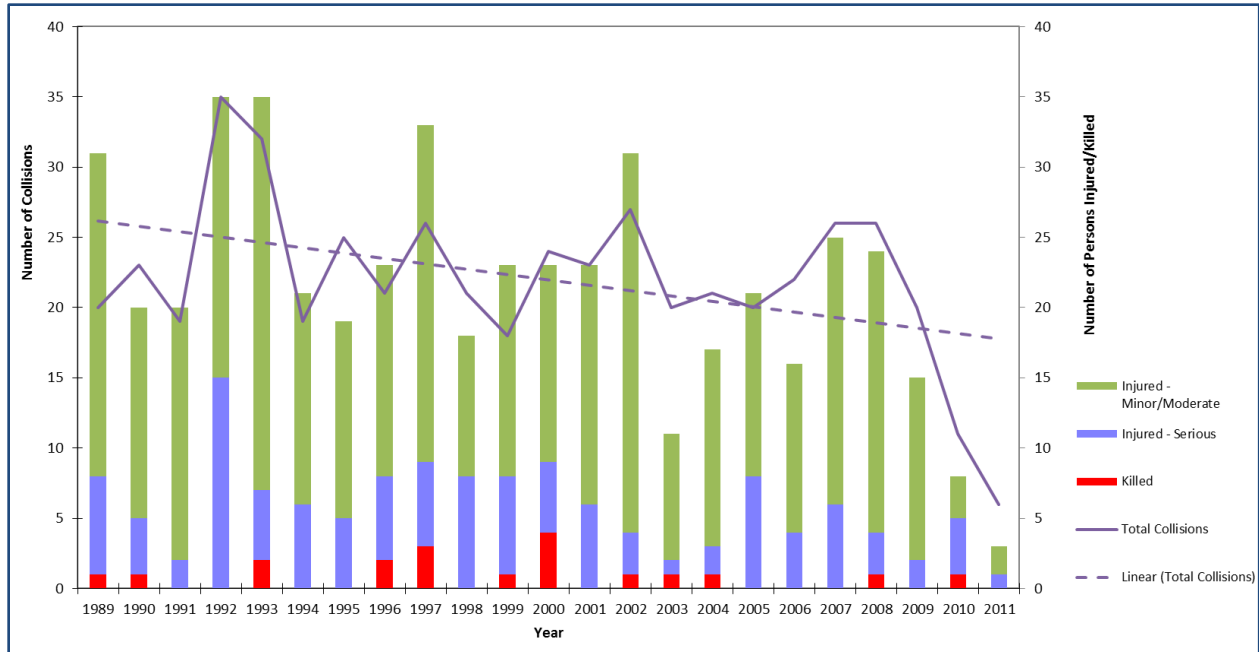


Figure 51: Total Off-Road Vehicle Collisions & Persons Injured/Killed, 1989 to 2011

The following figure shows the distribution of off-road vehicle collisions by month and vehicle type. It can clearly be seen in Figure 52 that the most critical time of year for ATV collisions is over the summer with July reaching approximately 27% of all collisions. Snowmobiles don't see an extreme peak in collisions. Instead trends show that approximately 16% of collisions occur each month from December through to March. The distribution also shows that there are more snowmobile than ATV collisions occurring as the total number of off-road collisions reflects the snowmobile trend.

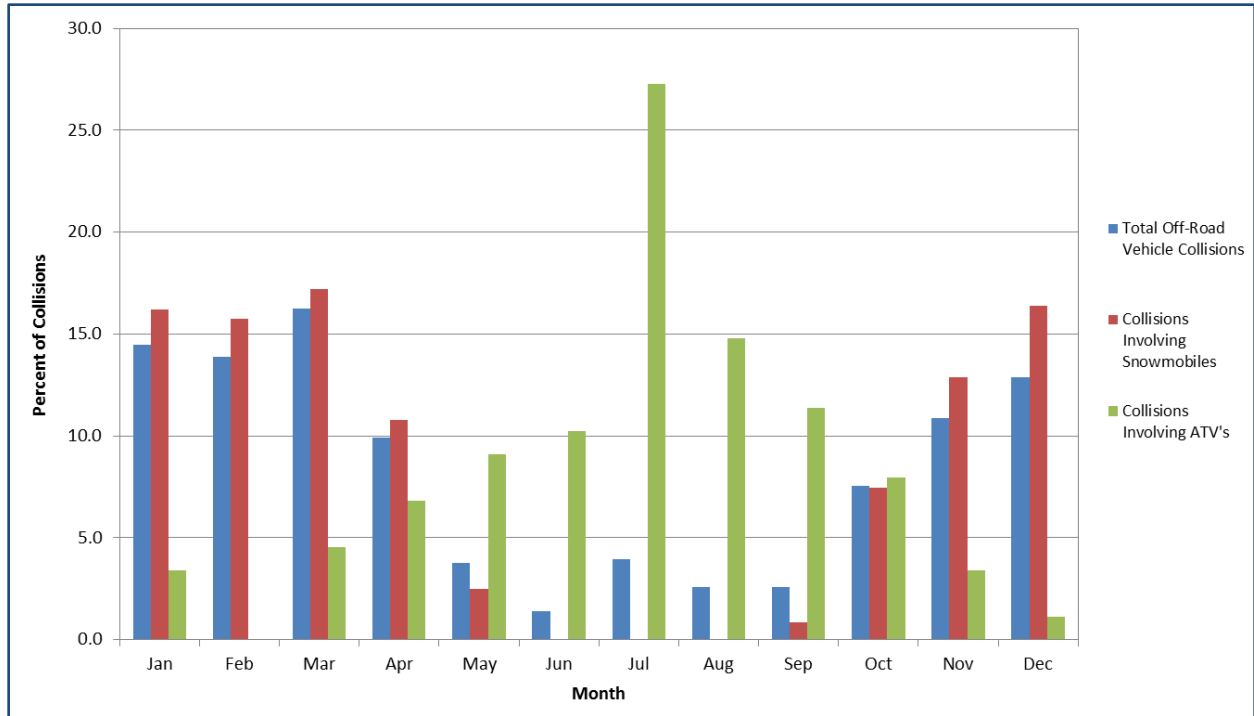


Figure 52: Distribution of Off-Road Vehicle Collisions by Month & Vehicle Type, 1989 to 2011

Figure 53 a) shows the distribution of off-road vehicle collision drivers by age. This is extremely important as it raises the issue that off-road vehicle collisions are largely impacting our youngest NWT residents. Nearly 50% of all collisions involve drivers under the age of 24, with over 30% being under the age of twenty. Figure 53 b) shows the distribution by gender. Three quarters of the drivers involved in off-road vehicle collisions are male.

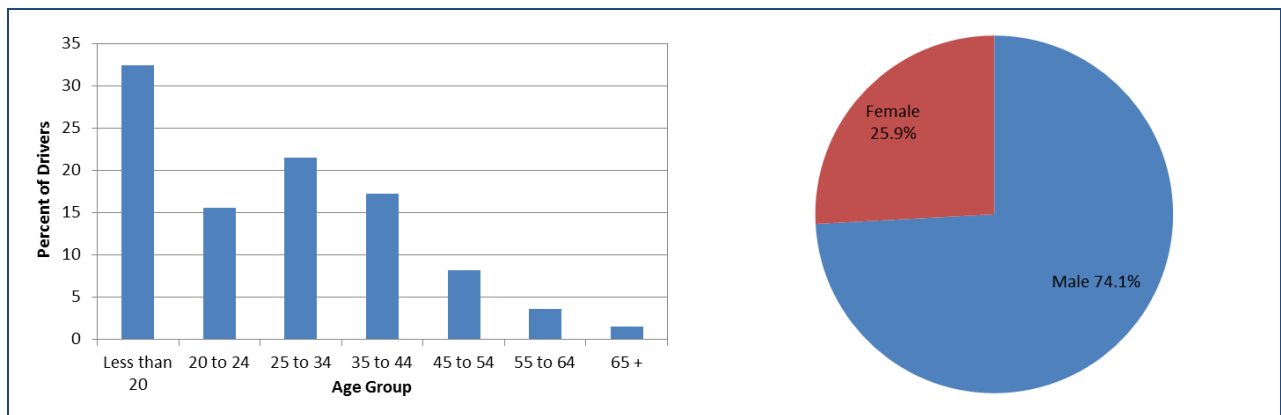


Figure 53a: Age Distribution of Drivers in Off-Road Vehicle Collisions, 1989 to 2011

Figure 53b: Distribution of Drivers in Off-Road Vehicle Collisions by Gender, 1989 to 2011

The following two figures display the relationship between different contributing factors and the severity of the off-road collisions they cause. Figure 54 shows the distribution of driver conditions factors including fatigue,

inexperience, alcohol impairment, drug impairment, illness/lost consciousness, and normal conditions. As with automobile collisions alcohol is a major concern - it plays a role in close to 50% of all off-road fatalities. It is notably the most critical driver condition contributing factor.

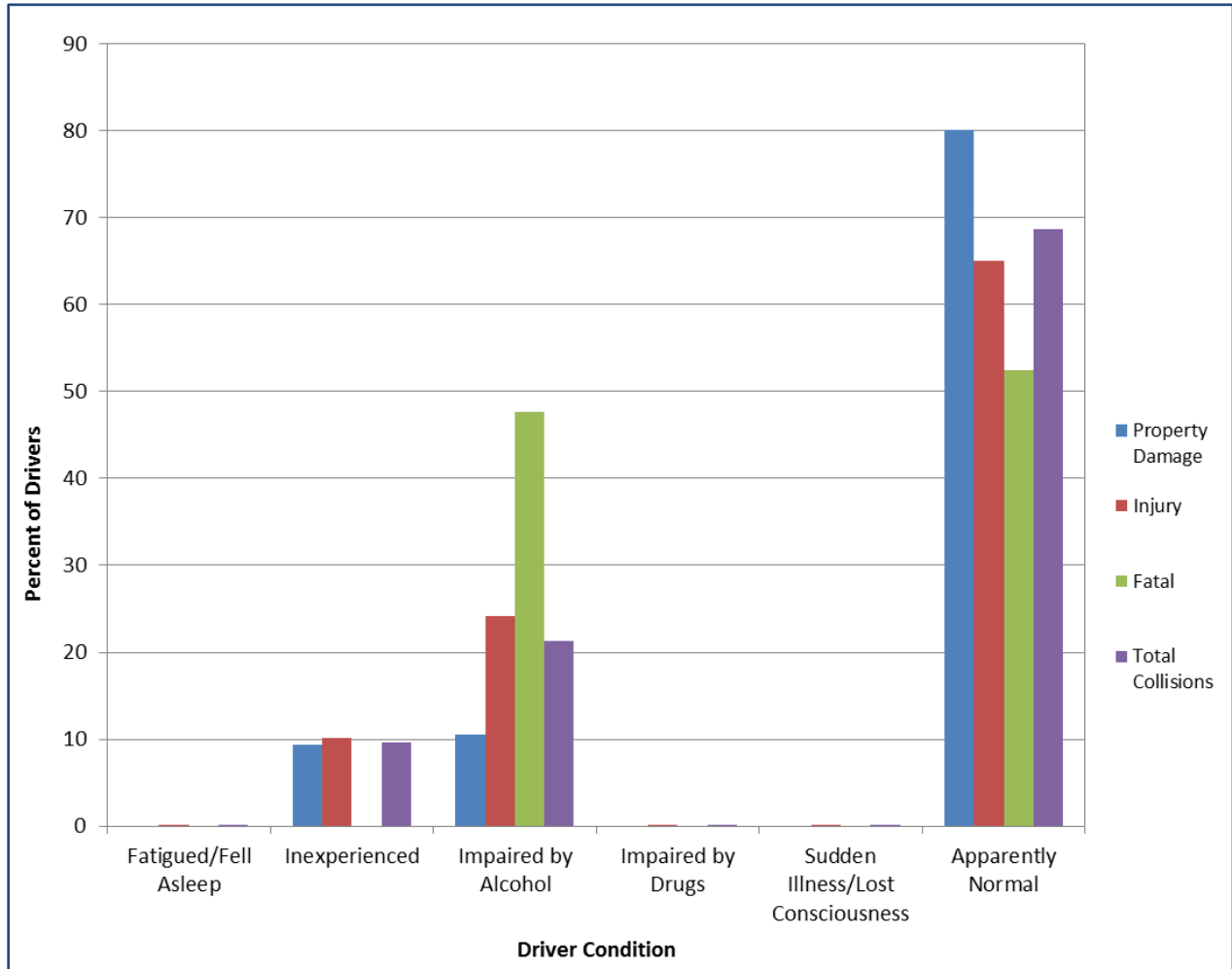


Figure 54: Distribution of Off-Road Vehicle Collisions by Driver Condition and Severity, 1989 to 2011

Figure 55 gives the distribution and severity relationship of collisions influenced by driver actions that include following too close, distracted, speeding, improper turning, fail to yield right-of-way, disobey traffic control, driving wrong way, unsafe backing, lost control, and driving properly. Unlike driver conditions where alcohol was the main contributing factor, there is a wider distribution amongst the driver actions. Speeding, fail to yield ROW, and lost control are each responsible for approximately 15% of the total collisions. It is important to note the severity of speeding, it distinctly plays a larger role in fatal collisions than the other driver actions recorded.

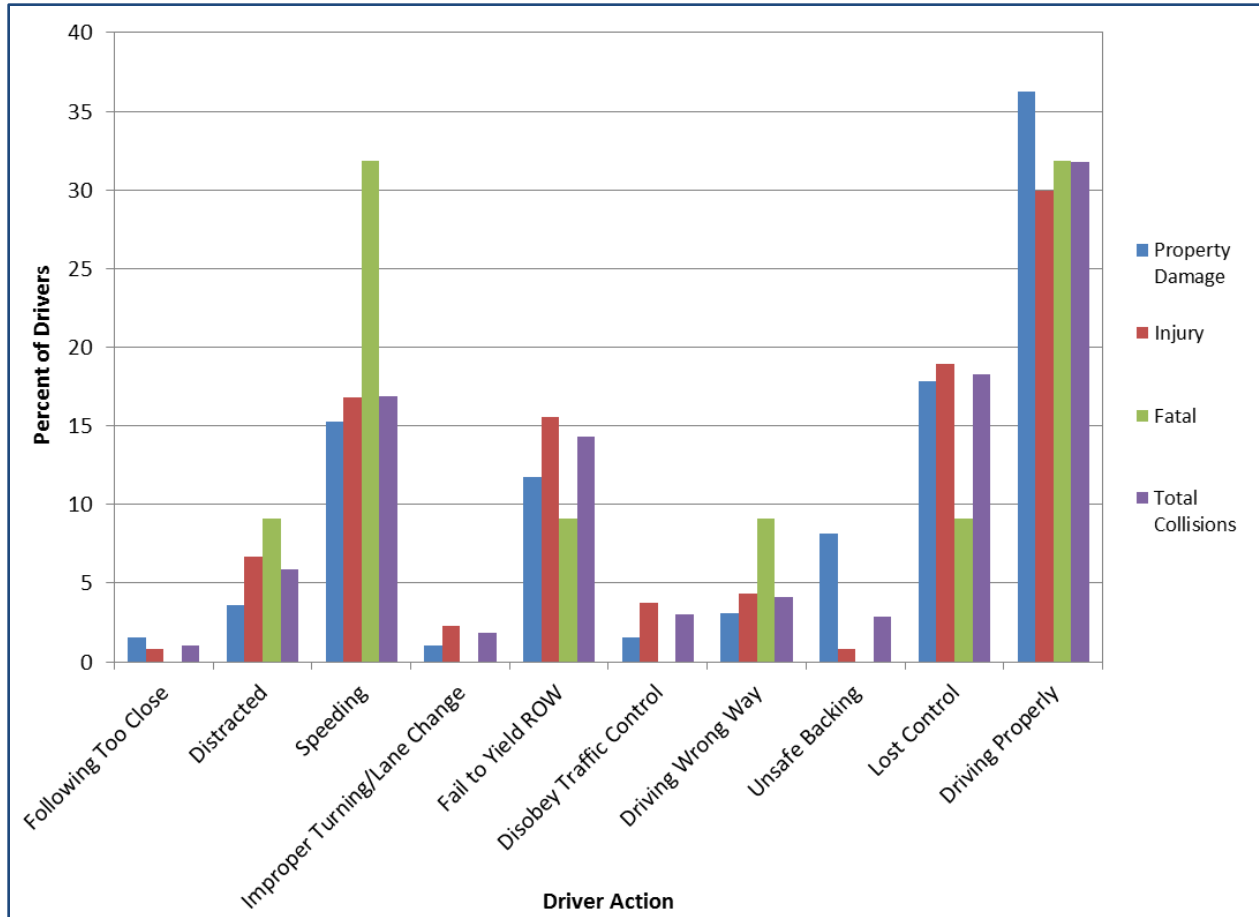


Figure 55: Distribution of Off-Road Vehicle Collisions by Driver Action and Severity, 1989 to 2011

Based on information from the collision database, only 25 percent of occupants of snowmobiles and all-terrain vehicles involved in collisions between 1989 and 2011 were wearing a helmet. Furthermore, during the same period, nearly 80 percent of fatally injured off-road vehicle occupants were not wearing a helmet.

Figure 56 shows the number of un-helmeted off-road vehicle occupants injured and killed in collisions from 1989 to 2011. Despite the low helmet usage rates, it is encouraging to see a downward trend in the number of off-road vehicle casualties where no helmet was worn.

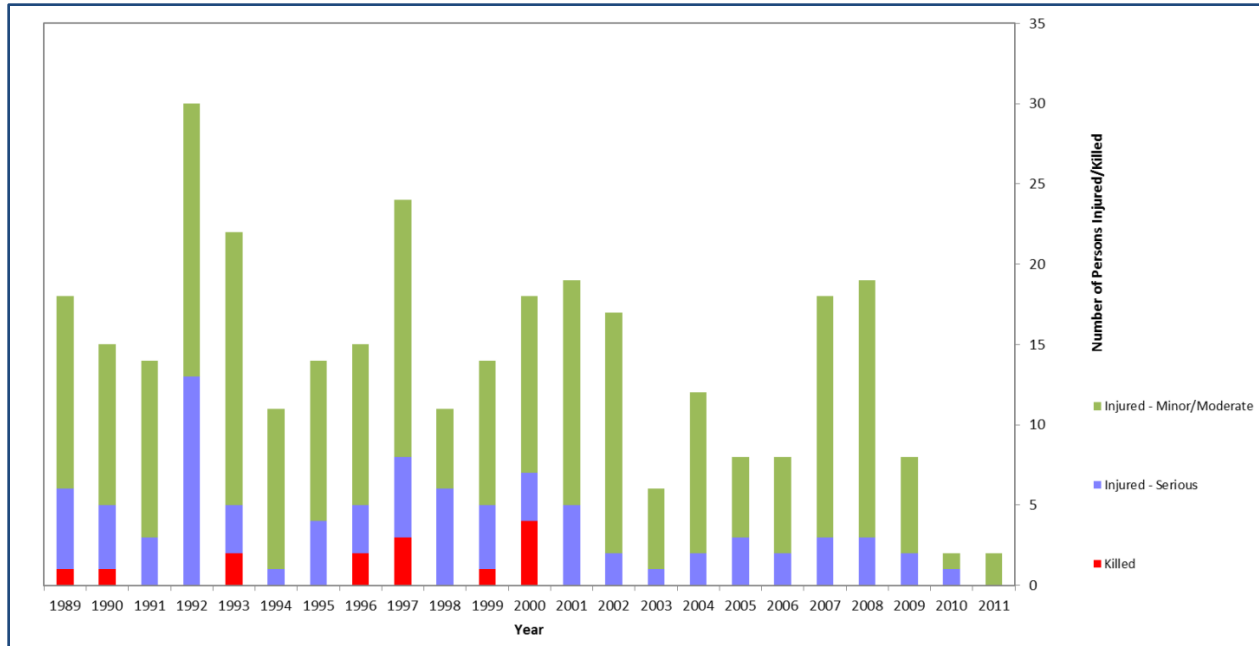


Figure 56: Un-helmeted Off-Road Vehicle Occupants Injured/Killed, 1989 to 2011

## Collisions in Communities

In order to provide a better understanding of the collisions occurring in communities across the Northwest Territories Table 5 and Table 6 present the average number of collisions per year, the collision rates, the percent of collisions by contributing factor, and the percent use of occupant restraint by community from 1989 to 2011. The communities are broken down by region with subtotals shown for each region.

Table 5 shows that the region with the highest number of collisions is the North Slave Region. This is expected as it includes the city of Yellowknife with a population close to 20,000, whereas most other Northwest Territories communities have a population under 4,000. It is informative to look at the collision rates presented in Table 5 as this accounts for variance in population. The rates included are collisions per 100 licensed drivers, collisions per 100 registered vehicles, and collisions per 100 population. The Inuvik Region and North Slave Region see the highest collision rates with 2.42 and 2.47 collisions per 100 licensed drivers respectively. The three communities with the highest collisions rates are part of the Inuvik Region. They are Ulukhaktuk, Inuvik, and Tuktoyaktuk. The NWT overall has an average of 559 collisions per year occurring within communities, with average fatal collisions and injury collisions of 0.9 and 79 collisions per year respectively. The collision rate per 100 licensed drivers for the NWT communities is 2.27.

Table 6 presents the percent of collisions involving alcohol, distracted driving, and speeding for each community, as well as the percent of collision victims wearing occupant restraints and helmets. The Fort Simpson Region has the highest percentage of alcohol related collisions and distracted driving collisions with 16.7% and 12.3% respectively. The Inuvik Region has the highest percentage of speeding related collisions with 13.5%. The following communities reported over 25% of collisions to be related with alcohol: Deline, Fort Good Hope, Fort Providence, and Detah. The communities Fort Good Hope, Ulukhaktok, Wrigley, and Whati reported over 20% of collisions relating to speeding, while Tulita, Ulukhaktuk, and Wrigley reported over 25% of collisions relating to distracted driving. The average occupant restraint use for all collision victims in the NWT communities was 84.8%. The Inuvik Region saw the lowest occupant restraint use at 57.9%.

Table 5: Average number of Collisions and Collision Rates by Community, 1989 to 2011

Community	Average Number of Collisions per Year, 1989 to 2011				Exposure Indicators			Collision Rates		
	Fatal	Injury	Property Damage	Total Collisions	Licensed Drivers 2011	Registered Vehicles 2011	Population 2011	Collisions/ 100 Licensed Drivers	Collisions/ 100 Registered Vehicles	Collisions/ 100 Population
<b>A) INUVIK REGION</b>										
AKLAVIK	0.0	2	2	3	213	157	660	1.59	2.16	0.51
COLVILLE LAKE	0.0	0	0	0	30	21	152	0.72	1.04	0.14
DELINE	0.0	1	1	2	180	118	561	1.16	1.77	0.37
FORT GOOD HOPE	0.1	1	3	4	168	110	557	2.33	3.56	0.70
FORT MCPHERSON	0.0	1	3	5	289	281	816	1.62	1.67	0.58
INUVIK	0.0	9	50	59	1,861	2,139	3,463	3.17	2.76	1.70
NORMAN WELLS	0.0	2	5	7	487	795	862	1.54	0.94	0.87
PAULATUK	0.0	0	0	0	54	41	345	0.72	0.95	0.11
SACHS HARBOUR	0.0	0	0	0	37	43	126	1.18	1.01	0.35
TSIIGEHTCHIC	0.0	0	0	1	61	68	131	0.86	0.77	0.40
TUKTOYAKTUK	0.2	2	4	7	248	261	920	2.70	2.57	0.73
TULITA	0.0	1	2	2	152	134	574	1.57	1.78	0.42
ULUKHAKTOK	0.0	1	1	2	58	76	482	3.00	2.29	0.36
<b>SUB TOTAL</b>	<b>0.4</b>	<b>20</b>	<b>73</b>	<b>93</b>	<b>3,838</b>	<b>4,244</b>	<b>9,649</b>	<b>2.42</b>	<b>2.19</b>	<b>0.96</b>
<b>B) FORT SIMPSON REGION</b>										
FORT LIARD	0.0	1	3	3	214	283	582	1.61	1.21	0.59
FORT SIMPSON	0.1	1	11	12	738	974	1,269	1.67	1.26	0.97
JEAN MARIE RIVER	0.0	-	0	0	18	28	71	0.48	0.31	0.12
NAHANNI BUTE	0.0	0	0	0	26	28	113	0.84	0.78	0.19
TROUT LAKE	0.0	0	0	0	32	39	99	0.27	0.22	0.09
WRIGLEY	0.0	0	0	1	51	65	117	1.11	0.87	0.48
<b>SUB TOTAL</b>	<b>0.1</b>	<b>2</b>	<b>14</b>	<b>17</b>	<b>1,079</b>	<b>1,417</b>	<b>2,251</b>	<b>1.55</b>	<b>1.18</b>	<b>0.74</b>
<b>C) SOUTH SLAVE REGION</b>										
ENTERPRISE	0.0	-	0	0	60	148	109	0.51	0.21	0.28
FORT PROVIDENCE	0.0	1	3	4	283	378	790	1.49	1.12	0.53
FORT RESOLUTION	0.1	1	3	4	255	315	496	1.50	1.21	0.77
FORT SMITH	0.0	5	22	27	1,597	2,256	2,490	1.70	1.20	1.09
HAY RIVER	0.1	5	44	48	2,685	4,875	4,075	1.80	0.99	1.19
KAKISA	0.0	0	0	0	1	-	56	8.70	0.00	0.16
<b>SUB TOTAL</b>	<b>0.2</b>	<b>12</b>	<b>72</b>	<b>84</b>	<b>4,881</b>	<b>7,972</b>	<b>8,016</b>	<b>1.72</b>	<b>1.05</b>	<b>1.05</b>
<b>D) NORTH SLAVE REGION</b>										
BEHCHOKO	0.0	3	10	13	736	761	2,146	1.70	1.65	0.58
DETTAH	0.0	0	1	1	198	254	259	0.40	0.31	0.30
GAMETI	0.0	0	0	0	90	77	317	0.39	0.45	0.11
WEKWEETI	0.0	-	-	-	44	61	145	0.00	0.00	0.00
WHATI	0.0	0	0	1	144	125	512	0.36	0.42	0.10
YELLOWKNIFE	0.1	42	310	351	13,602	17,424	20,248	2.58	2.02	1.73
<b>SUB TOTAL</b>	<b>0.1</b>	<b>45</b>	<b>321</b>	<b>365</b>	<b>14,814</b>	<b>18,702</b>	<b>23,627</b>	<b>2.47</b>	<b>1.95</b>	<b>1.55</b>
<b>NWT TOTAL</b>	<b>0.9</b>	<b>79</b>	<b>480</b>	<b>559</b>	<b>24,612</b>	<b>32,335</b>	<b>43,543</b>	<b>2.27</b>	<b>1.73</b>	<b>1.28</b>

Table 6: Contributing Factor and Occupant Restraint Use by Community, 1989 to 2011

Community	Percent of Collisions Involving			Collision Victims	
	Alcohol	Speeding	Distracted Driving	% Wearing Occupant Restraints	% Wearing Helmets
<b>A) INUVIK REGION</b>					
AKLAVIK	21.8	15.4	10.5	32.9	4.9
COLVILLE LAKE	40.0	0.0	40.0	0.0	0.0
DELINE	27.1	18.8	4.3	29.8	0.0
FORT GOOD HOPE	26.7	21.1	2.2	13.5	0.0
FORT MCPHERSON	16.7	16.7	3.7	38.7	0.0
INUVIK	9.1	12.2	9.0	67.1	20.3
NORMAN WELLS	20.3	11.0	11.0	64.7	66.7
PAULATUK	22.2	11.1	0.0	0.0	0.0
SACHS HARBOUR	20.0	10.0	0.0	55.6	0.0
TSIIGEHTCHIC	16.7	16.7	10.0	80.0	14.3
TUKTOYAKTUK	19.5	14.9	13.2	26.4	14.5
TULITA	21.8	10.9	34.4	12.7	0.0
ULUKHAKTOK	10.0	32.5	25.0	57.7	39.5
<b>SUB TOTAL</b>	<b>13.3</b>	<b>13.5</b>	<b>9.9</b>	<b>57.9</b>	<b>15.1</b>
<b>B) FORT SIMPSON REGION</b>					
FORT LIARD	19.0	6.3	4.7	55.5	38.5
FORT SIMPSON	15.9	10.2	13.3	81.3	36.4
JEAN MARIE RIVER	0.0	0.0	50.0	0.0	0.0
NAHANNI BUTTE	20.0	0.0	25.0	100.0	0.0
TROUT LAKE	0.0	0.0	0.0	50.0	0.0
WRIGLEY	23.1	23.1	25.0	68.4	0.0
<b>SUB TOTAL</b>	<b>16.7</b>	<b>9.6</b>	<b>12.3</b>	<b>74.6</b>	<b>37.5</b>
<b>C) SOUTH SLAVE REGION</b>					
ENTERPRISE	0.0	0.0	0.0	100.0	0.0
FORT PROVIDENCE	26.8	8.2	8.7	64.8	0.0
FORT RESOLUTION	20.5	11.4	14.6	38.1	0.0
FORT SMITH	7.5	10.3	14.6	77.4	29.4
HAY RIVER	7.9	7.5	10.2	87.5	29.2
KAKISA	0.0	0.0	0.0	100.0	0.0
<b>SUB TOTAL</b>	<b>9.3</b>	<b>8.5</b>	<b>11.7</b>	<b>80.7</b>	<b>16.0</b>
<b>D) NORTH SLAVE REGION</b>					
BEHCHOKO	21.5	13.9	11.5	68.2	9.0
DETTAH	26.7	6.7	0.0	60.0	0.0
GAMETI	0.0	0.0	20.0	30.0	0.0
WEKWEETI	0.0	0.0	0.0	0.0	0.0
WHATI	8.3	33.3	11.1	10.0	0.0
YELLOWKNIFE	4.5	13.1	11.8	92.6	57.1
<b>SUB TOTAL</b>	<b>4.5</b>	<b>13.1</b>	<b>11.8</b>	<b>92.5</b>	<b>47.6</b>
<b>NWT TOTAL</b>	<b>7.4</b>	<b>12.4</b>	<b>11.5</b>	<b>84.8</b>	<b>17.8</b>

## Collisions on the NWT Highway System

Figure 57 shows the number of collisions on the eight numbered highways making up the NWT Highway system, along with the estimated vehicle kilometres travelled (VKT) and the corresponding collision rates from 1993 to 2011. The VKT is estimated by multiplying the average annual daily traffic (AADT) collected by traffic counters by the length of the highway segment (in kilometres), and by 365. The VKT information from the Canadian Vehicle Survey, as presented earlier, is an estimate of the total vehicle kilometres travelled in the Northwest Territories, including travel within communities. The VKT estimates discussed in this section applies only to the eight numbered highways. The year 1993 is the earliest year that traffic volume data is available to estimate VKT.

From Figure 57, it can be seen that the total number of collisions has declined despite the steady increase in the amount of travel taking place on the eight numbered highways. This has resulted in reduced collision rates as represented by the green line.

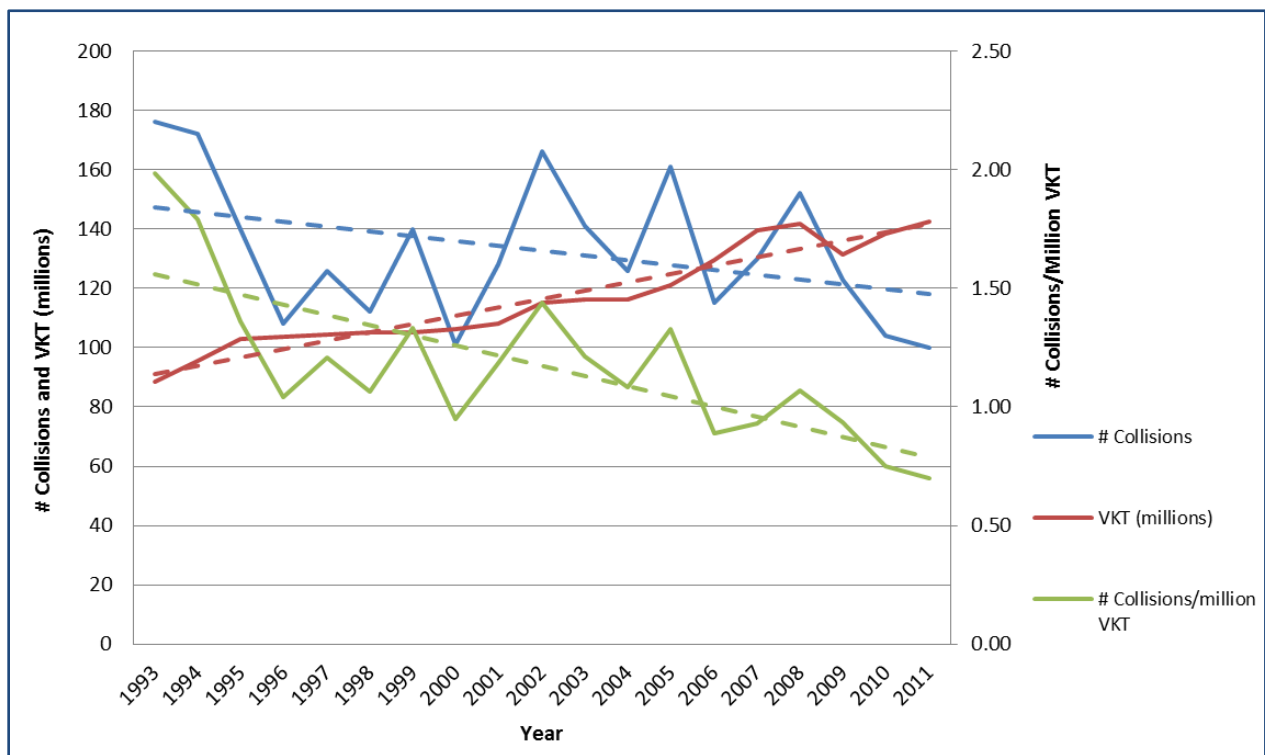


Figure 57: Collision Rates on Numbered Highways, 1993 to 2011

Table 7 presents the percent of collisions involving alcohol, speeding, distracted driving, and unusual road conditions for each numbered highway of the NWT Highway System from 1989 to 2011. The table shows that the community access roads and Highway 2 saw the highest percent of alcohol related and distracted driving related

collisions, with alcohol contributing to 22.7% and 19.9% respectively, and distracted driving contributing to 9.2% and 7.5%. The access roads, Highway 8, and Highway 2 reported 23.1%, 19.3%, and 18.8% speeding related collisions respectively. It is interesting to note that the community access roads and Highway 2 reported high values for all three contributing factors. The table also shows that most highways reported close to 50% of collisions involving unusual road surface conditions. Interestingly Highway 7 reported close to 70% of collisions associated with unusual road conditions. In this study an unusual road condition was defined to include potholes, under construction, uneven, worn, and faded markings.

**Table 7: Contributing Factor and Occupant Restraint Use by Highway, 1989 to 2011**

Highway	Percent of Collisions Involving:				Collision Victims % Wearing Occupant Restraints			
	Alcohol	Speeding	Distracted Driving	Unusual Road Condition	Killed	Injured	Not Injured	All Victims
HIGHWAY 1	7.2	14.0	3.5	47.9	36.4	75.3	86.9	70.4
HIGHWAY 2	19.9	18.8	7.5	26.5	0.0	60.6	89.8	66.9
HIGHWAY 3	7.7	13.0	2.2	44.9	27.3	74.7	88.6	70.3
HIGHWAY 4	11.3	11.0	3.1	50.5	40.0	69.3	85.5	67.7
HIGHWAY 5	7.6	11.8	1.7	42.4	0.0	67.8	90.2	70.6
HIGHWAY 6	8.8	10.5	5.3	45.6	0.0	67.6	90.0	74.0
HIGHWAY 7	8.3	11.3	4.5	69.2	100.0	80.6	89.3	75.8
HIGHWAY 8	10.1	19.3	2.1	55.2	30.0	55.3	74.4	56.0
ACCESS ROADS	22.7	23.1	9.2	41.8	0.0	61.5	85.7	65.4
WINTER ROADS	10.8	20.6	0.7	70.3	100.0	45.9	67.2	48.9
<b>AVERAGE 1989 - 2011</b>	<b>10.6</b>	<b>15.3</b>	<b>3.4</b>	<b>47.6</b>	<b>29.0</b>	<b>68.0</b>	<b>84.5</b>	<b>66.0</b>

Figure 58 shows trends in collision rates on three selected highway segments from 1993 to 2011. This is to illustrate the effect of reconstruction efforts to improve highway safety. The three highway segments include:

- Highway #8 between the Yukon/NWT Border and Tsiigehtchic;
- Highway #3 between Behchoko and Yellowknife; and
- Highway #1 between Highway #3 and Highway #7.

Highway #8 between the Yukon/NWT Border and Tsiigehtchic historically has the highest collision rate on the NWT Highway system. Reconstruction of this highway segment began more than a decade ago, including roadway widening, straightening curves and improved drainage. Collision rates have dropped dramatically, from an average of over 4 collisions/million vehicle-kilometres in 1993 to an average of just over 1 collision/million vehicle-kilometres in 2011.

The reconstruction of Highway #3 between Behchoko and Yellowknife began in 1999 and was completed in 2006. Prior to reconstruction, this highway segment was a narrow, windy gravel road with over 160 curves. The highway is now wider and significantly straighter with a chip seal surface. This has resulted in a reduction in collision rates, although the reduction is not as dramatic as Highway #8.

Collision rates for Highway #1 between Highway #3 and #7 is shown for comparison, since no major changes were made to this segment during the period. As can be seen from the figure, collision rates have remained steady between 1993 and 2010. Chip sealing of this highway segment began in 2010, and this is expected to lower collision rates in the future. The collision rate history for all segments of the eight numbered highways is shown in Appendix A.

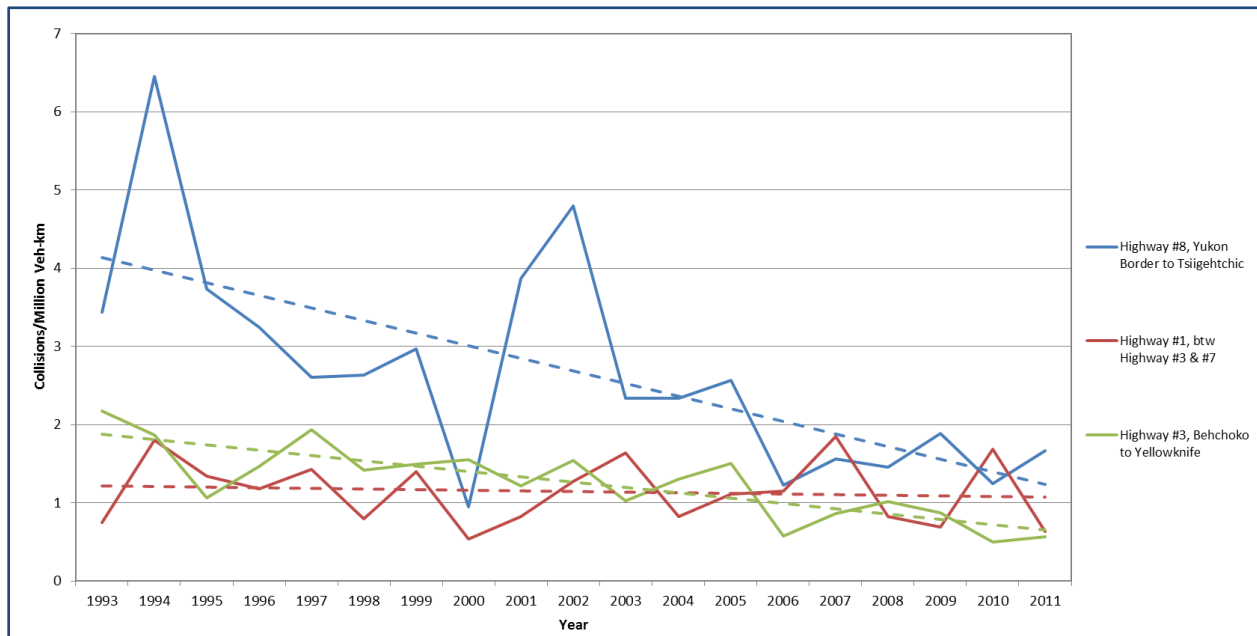


Figure 58: Collision Rates on Selected Highway Segments, 1993 to 2011

Figure 59 shows the distribution of collisions occurring on each of the eight numbered highways by kilometre location from 1989 to 2011. A detailed list of collisions occurring at each of these locations is shown in Appendix B. From the figure, the following high-collision locations can be identified:

- Highway #1 near Highway #2 (Enterprise);
- Highway #1 near Km 471 (Fort Simpson Access);
- Highway #2 between Km 37 and Km 41 (Hay River Town Limits);
- Highway #3 between Km 334 and Km 338 (Yellowknife City Limits);

- Highway #3 at Highway #4;
- Highway #4, Km 2;
- Highway #5 near Hay River Reserve Access;
- Highway #5 between Km 263 and Km 266 (Fort Smith Town Limits); and
- Highway #8 near Km 259 (Inuvik Airport Access).

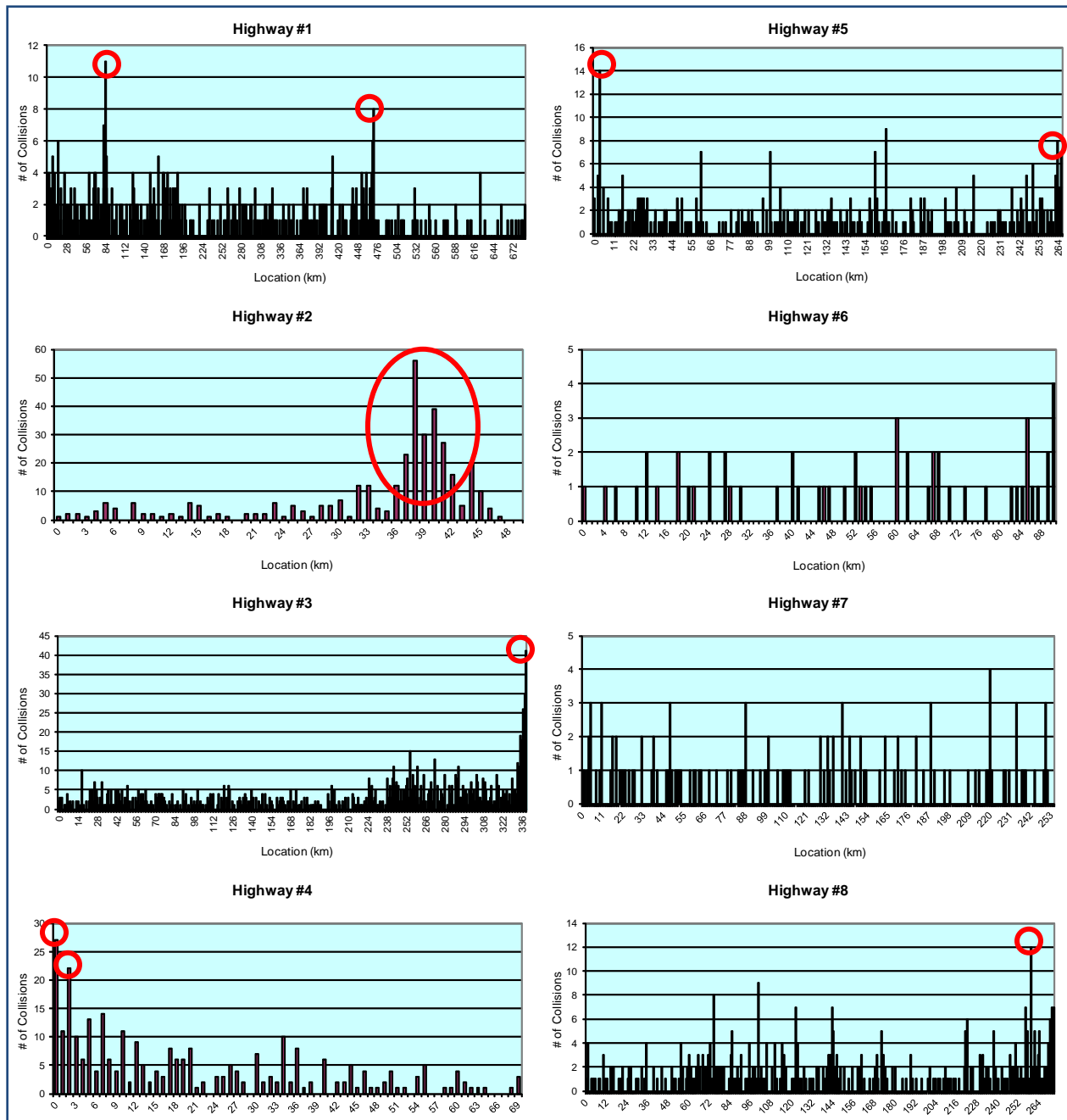


Figure 59: Distribution of Collisions on Numbered Highways, 1989 to 2011



HWY 8 near km 259 Inuvik Airport Access



HWY 1 near km 471 Fort Simpson Access



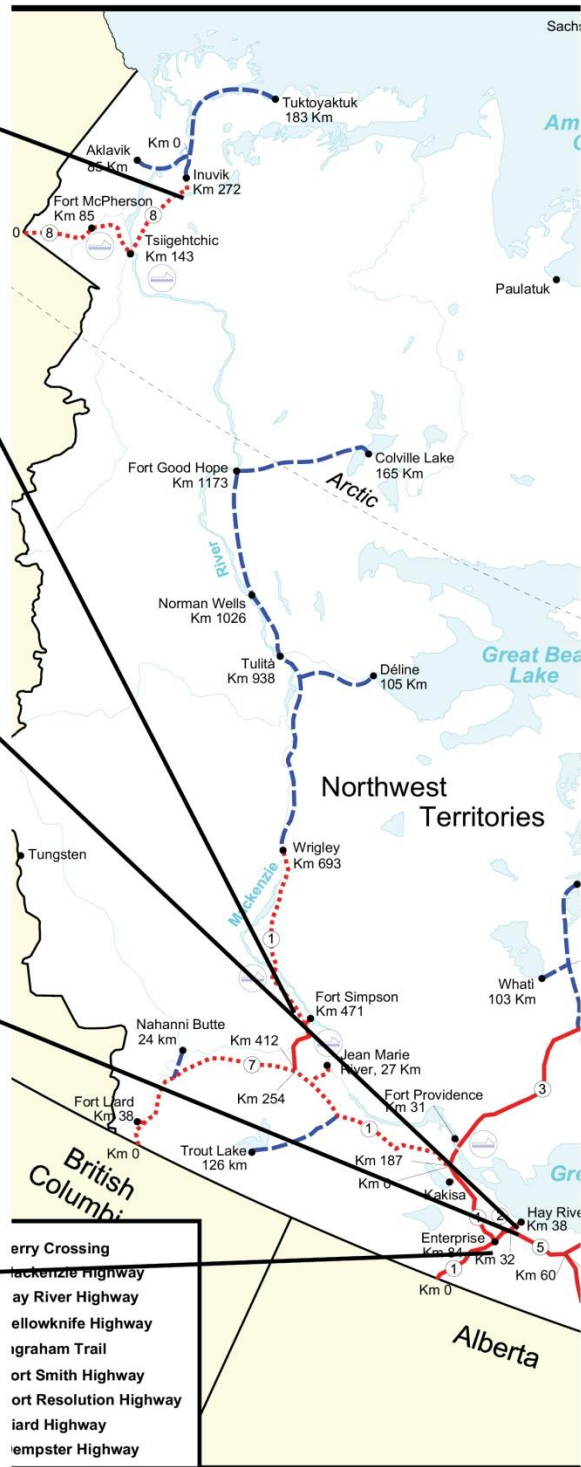
HWY 2 km 37 to 41 Hay River Town Limits

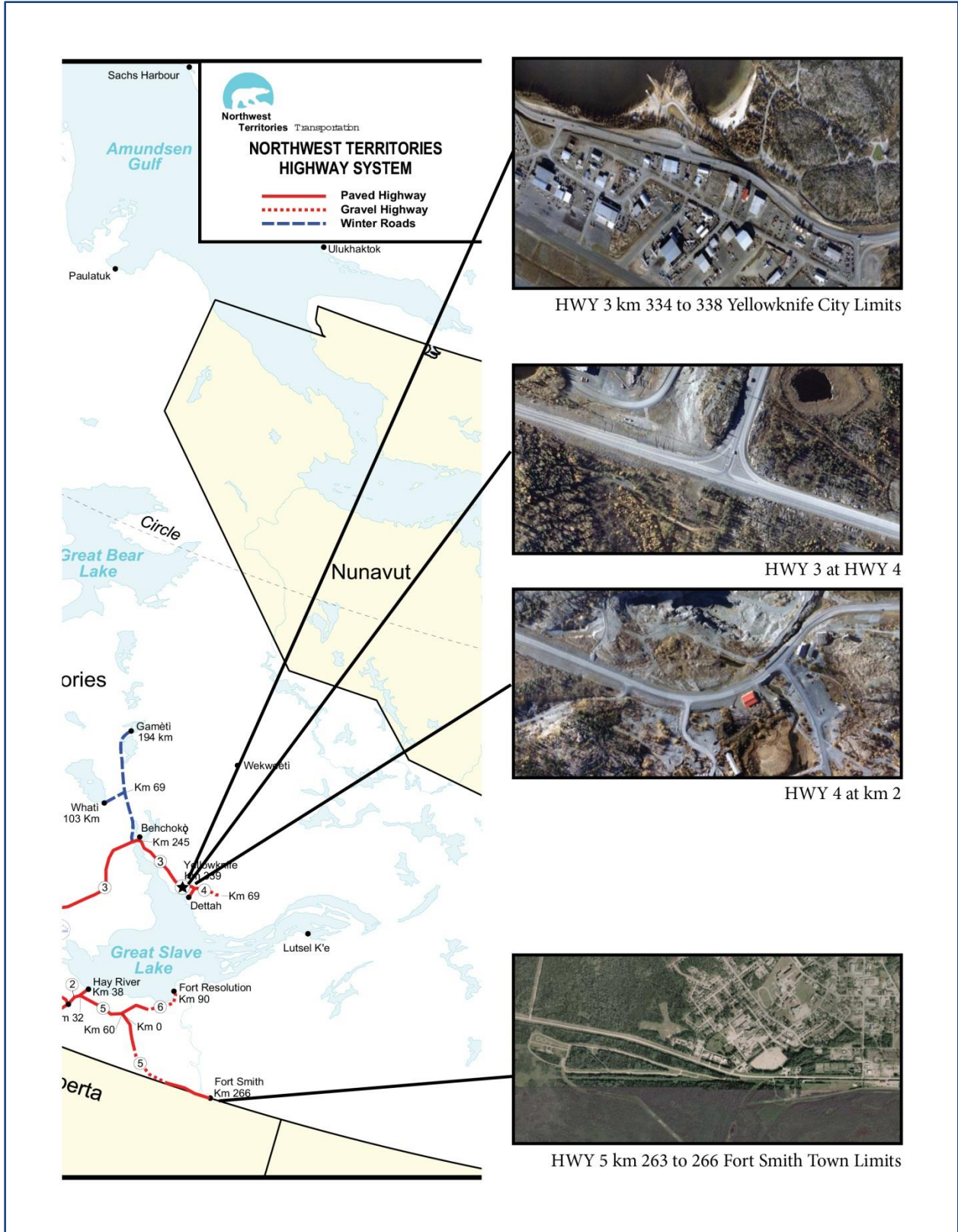


HWY 5 at Hay River Reserve Access



HWY 1 near HWY 2 Enterprise





## Highway #1 near Highway #2

Between 1989 and 2011, 26 collisions occurred on Highway #1 in the immediate vicinity of Enterprise. Only 3 collisions were multi-vehicle, including a motorcyclist that was fatally injured when struck by a tractor-trailer unit attempting to turn left to access the Enterprise Weigh Scale. Most of the collisions were single vehicle rollovers or ran off road. Traffic averages 300 vehicles per day.

## Highway #1 near Km 471

Twenty-three collisions occurred between kilometre 467 and 474 on Highway #1 in the vicinity of the Fort Simpson Access Road between 1989 and 2011. Two fatal collisions occurred during this time. Both collisions involved pedestrians. Only two collisions involved two or more vehicles. The average traffic is approximately 1100 vehicles per day.

## Highway #2 between Km 37 and Km 41

The concentration of collisions along Highway #2 between McRorie Road (km 37.0) and the Airport Access Road (km 41.1), is attributable to the high traffic volumes (average traffic over 2500 vehicles per day) coupled with the concentration of intersections. Over 170 collisions occurred on this 4 kilometre stretch of highway during the 23-year period; none of them were fatal. Just over half of the collisions involved two or more vehicles, and were largely related to crossing and turning movements at intersections.

## Highway #3 between Km 334 and Km 338

This highway segment carries the highest traffic volumes on the NWT Highway system with an average annual daily traffic volume in excess of 6000 vehicles per day. This segment includes the intersections with Old Airport Road, Idaa Road (Yellowknife Airport Access) and access to Fred Henne Park Day Use Area and Campground. There were nearly 100 collisions on this 4-kilometre stretch of road between 1989 and 2011, including 4 fatalities in 4 separate collisions.

One fatal collision involved a pedestrian on the curve between the Yellowknife Airport and Long Lake (km 335). Another fatal collision involved a motorcyclist striking a guard rail near the same location. The other two fatal

collisions were single vehicle rollovers that both occurred in the summer of 2007, resulting in the death of a driver in one collision (near km 337.7) and a passenger in the other (km 334.5).

Some improvements to these highway segments have been made or are planned to be done in the near future. During the reconstruction of Highway #3 in 1999, the road surface near km 335 was widened and sight lines were improved by blasting back the rock face by the Yellowknife Airport. In July 2012, additional street lighting was installed at the intersection of Idaa Road (Yellowknife Airport Access).

### Highway #3 at Highway #4

The Highway #3 and #4 intersection is the busiest intersection along the NWT Highway System, over an average of 5000 vehicles pass through it daily. Fifty-five collisions took place at this intersection during the 23-year period. Over 60 percent of the collisions involved two or more vehicles, and none of the collisions were fatal. Since 2008, there has been an increase in the number of left-turn-across-path collisions where a vehicle travelling southbound on Highway #4 struck a northbound vehicle attempting to turn left onto Highway #3. This may be attributable to increased traffic originating from the Niven Lake Subdivision.

In 1999, additional street lights were installed and signage improvements were made, resulting in fewer eastbound vehicles on Highway #3 overshooting the intersection and striking the guardrail. Problems at this intersection may be mitigated to some extent with the completion of the Highway #4 Realignment Project in 2013/2014. Highway #4 will intersect Highway #3 near km 337.3.

### Highway #4, Km 2

Twenty-two collisions occurred at this location which is in the vicinity of the S-curve at the bottom of Giant Hill. All but three of the collisions were single vehicle. None of the collisions resulted in fatalities. This highway segments handles approximately 1200 vehicles per day.

Traffic will be diverted to a highway with a straighter alignment when the Highway #4 Realignment Project is completed in 2013/2014.

## Highway #5 at Hay River Reserve Access

Eight collisions took place at the intersection of Highway #5 and the Hay River Reserve Access Road, while another 6 collisions occurred between km 2.0 and the Hay River Bridge. Twelve of the collisions were single vehicle in nature. Only three persons were injured in two separate collisions. Traffic averages approximately 600 vehicles per day.

## Highway #5 between Km 263 and Km 266

The concentration of collisions along Highway #5 within the Fort Smith Town Limits (km 263 to km 266), is attributable to the relatively high traffic volumes (average traffic over 1,000 vehicles per day) coupled with closely-spaced intersections. Five of the collisions involved two or more vehicles. Seventeen persons were injured in 10 collisions.

## Highway #8 near Km 259

Eleven collisions took place on Highway #8 in the vicinity of the Inuvik Airport Access Road between 1989 and 2011, resulting in 1 fatality and 2 injuries. Nine of the collisions were single-vehicle. Traffic averages nearly 1000 vehicles per day.

## Collisions on the NWT Winter Road System

Winter roads make up a significant portion of the NWT Highway System. There is close to 1500 km of winter road in the Northwest Territories and just over 2000 km of all-weather highway including access roads. There are over ten communities in the NWT that solely depend on the winter road system for ground transportation access. Resource development also relies heavily on winter roads for the movement of equipment and supplies to remote work sites. This means that the winter roads see heavy motor carrier traffic over a short window of approximately five months.

Figure 60 shows the total collisions that occurred on the winter road system from 1989 to 2011 and the number of persons injured or killed as a result. The number of collisions and casualties has seen large fluctuations over the

23-year time period, but overall there is a decreasing trend. It can be seen that there are few fatalities and serious injuries occurring on the winter roads; four fatalities occurred between the year 2000 and 2003. Figure 61 is the distribution of winter road collisions by the contributing factors alcohol, distracted driving, speeding, and other driver error. Speed plays a role in 18% of winter road collisions and other driver error accounts for 56% - this includes the driver action “lost control”.

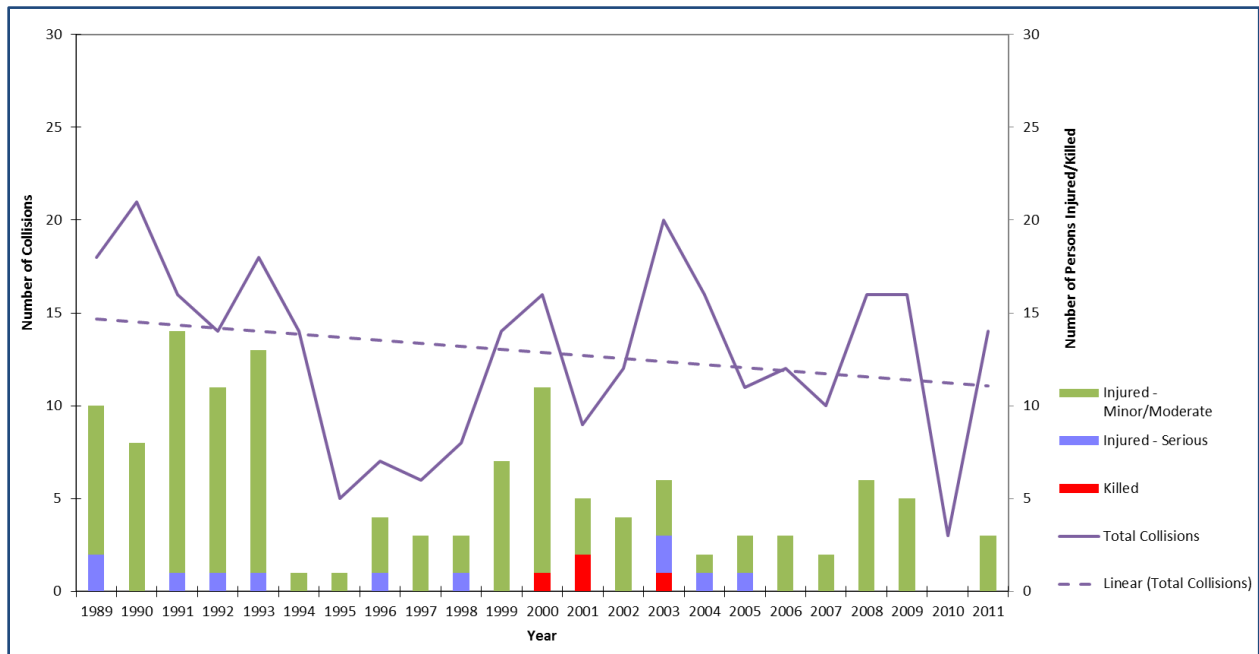


Figure 60: Total Collisions on Winter Roads & Persons Injured/Killed, 1989 to 2011

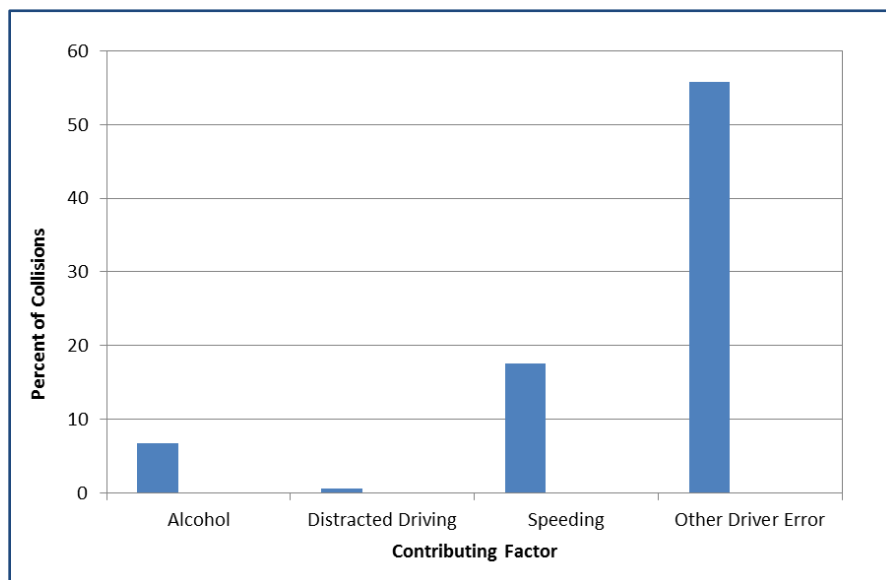


Figure 61: Distribution of Winter Road Collisions by Contributing Factor, 1989 to 2011

## Appendix A: Collision Rate History (Collisions/Million VKT), 1993 to 2011

Highway Segment	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Hwy #1 - AB Border to Hwy #2	0.83	0.31	1.19	0.48	0.91	0.00	0.90	1.27	0.68	0.64	0.53	1.32	1.03	0.92	0.85	1.05	1.04	0.26	0.13
Hwy #1 – Hwy #2 to Hwy #3	0.92	1.07	0.80	0.33	0.33	0.57	0.70	0.11	0.11	0.40	0.78	0.78	0.44	0.34	0.07	0.63	0.60	0.27	0.46
Hwy #1 – Hwy #3 to Hwy #7	0.50	1.80	1.35	0.78	1.43	0.80	1.40	0.54	0.82	1.27	1.48	0.82	1.11	1.15	1.85	0.82	1.28	1.69	0.63
Hwy #1 – Hwy #7 to Fort Simpson	3.64	2.50	3.08	5.38	4.62	0.77	0.77	0.77	2.31	0.77	1.54	0.77	2.31	0.77	2.30	0.00	2.31	0.67	2.86
Hwy #1 – Fort Simpson to Wrigley		0.63	4.17	4.17	0.77	1.67	3.33	2.50	4.17	2.00	1.67	1.67	1.88	1.58	2.47	2.14	2.86	5.00	2.14
Highway #1 – Total	0.91	1.06	1.34	0.96	1.00	0.52	1.05	0.70	0.75	0.78	0.94	0.98	0.93	0.73	0.78	0.83	1.10	0.73	0.62
Highway #2 – Total	3.82	2.68	1.51	1.07	1.93	1.72	1.06	1.29	2.24	1.44	1.49	1.49	1.91	1.46	1.72	1.42	1.41	1.15	0.45
Hwy #3 – Hwy #1 to Fort Providence	1.11	0.97	0.83	0.86	0.00	0.63	1.67	0.63	1.14	1.28	1.50	0.75	0.95	0.70	0.42	0.78	0.24	1.40	0.00
Hwy #3 – Fort Providence to Behchoko	2.15	2.14	1.23	1.13	0.79	0.89	1.16	0.82	1.31	1.64	1.43	0.71	1.67	0.99	0.67	1.24	0.88	0.77	0.61
Hwy #3 – Behchoko to Hwy #4	1.73	1.58	0.71	0.94	1.21	1.13	0.94	0.93	0.92	1.00	0.87	1.06	1.02	0.50	0.77	1.02	0.60	0.54	0.51
Highway #3 – Total	1.83	1.72	0.92	1.01	0.94	1.00	1.08	0.87	1.08	1.26	1.13	0.91	1.25	0.68	0.71	1.09	0.67	0.67	0.51
Highway #4 – Total	2.10	2.28	2.03	1.25	1.87	1.33	1.67	1.81	1.64	1.78	1.51	1.10	2.05	1.78	1.52	1.30	1.18	0.36	0.86
Hwy #5 – Hwy #2 to Hwy #6	3.08	2.31	0.79	0.23	1.11	1.94	0.83	1.14	0.59	2.00	1.39	0.83	0.56	0.59	0.00	1.00	0.75	0.98	1.30
Hwy #5 – Hwy #6 to Fort Smith	2.54	1.32	1.74	0.94	2.33	1.00	1.61	1.13	1.83	1.45	1.32	1.03	1.36	1.90	1.56	1.38	1.51	1.62	1.38
Highway #5 – Total	2.74	1.68	1.40	0.65	1.88	1.35	1.33	1.13	1.38	1.65	1.35	0.96	1.08	1.41	1.03	1.22	1.19	1.39	1.35
Highway #6 – Total	0.80	1.92	1.85	1.11	0.77	0.36	2.59	0.00	0.37	1.79	0.34	0.34	0.71	0.38	1.02	0.34	0.40	0.00	0.37
Hwy #7 – BC Border to Fort Liard	1.25	1.11	0.00	1.54	0.67	0.63	1.88	0.00	0.63	0.00	1.88	0.63	1.25	0.53	1.36	1.33	0.67	1.82	1.33
Hwy #7 – Fort Liard to Hwy #1	2.11	0.00	3.75	1.11	0.83	0.74	4.44	2.40	0.42	3.46	2.22	2.22	2.59	1.11	1.24	0.50	0.50	0.61	0.81
Highway #7 – Total	1.85	0.31	2.43	1.25	0.77	0.70	3.49	1.46	0.50	2.14	2.09	1.63	2.09	0.87	1.27	0.73	0.55	0.91	0.96
Hwy #8 – YT Border to Tsiigehtchic	3.48	6.96	3.33	3.45	2.96	2.96	3.45	1.03	4.14	5.00	2.42	2.42	2.70	1.22	1.56	1.46	1.46	1.25	1.67
Hwy #8 – Tsiigehtchic to Inuvik	2.46	1.97	1.45	0.66	0.65	1.49	1.03	0.78	0.81	2.31	1.19	1.64	1.47	0.88	1.03	1.18	1.00	0.33	0.88
Highway #8 - Total	2.74	3.33	1.98	1.56	1.35	1.91	1.75	0.86	1.87	3.23	1.60	1.90	1.90	1.01	1.24	1.29	1.19	0.65	1.13
<b>All Highways</b>	<b>1.99</b>	<b>1.79</b>	<b>1.36</b>	<b>1.04</b>	<b>1.21</b>	<b>1.06</b>	<b>1.33</b>	<b>0.95</b>	<b>1.18</b>	<b>1.44</b>	<b>1.21</b>	<b>1.08</b>	<b>1.33</b>	<b>0.89</b>	<b>0.93</b>	<b>1.07</b>	<b>0.94</b>	<b>0.75</b>	<b>0.70</b>

## Appendix A: Collision Rate History (Collisions/Million VKT), Average 1993 to 2011

Highway Segment	Average 1993 to 2011
Hwy #1 - AB Border to Hwy #2	0.75
Hwy #1 – Hwy #2 to Hwy #3	0.51
Hwy #1 – Hwy #3 to Hwy #7	1.13
Hwy #1 – Hwy #7 to Fort Simpson	2.01
Hwy #1 – Fort Simpson to Wrigley	2.49
Highway #1 – Total	0.88
Highway #2 – Total	1.65
Hwy #3 – Hwy #1 to Fort Providence	0.83
Hwy #3 – Fort Providence to Behchoko	1.17
Hwy #3 – Behchoko to Hwy #4	0.95
Highway #3 – Total	1.02
Highway #4 – Total	1.55
Hwy #5 – Hwy #2 to Hwy #6	1.13
Hwy #5 – Hwy #6 to Fort Smith	1.52
Highway #5 – Total	1.38
Highway #6 – Total	0.81
Hwy #7 – BC Border to Fort Liard	0.97
Hwy #7 – Fort Liard to Hwy #1	1.64
Highway #7 – Total	1.37
Hwy #8 – YT Border to Tsiigehtchic	2.79
Hwy #8 – Tsiigehtchic to Inuvik	1.22
Highway #8 - Total	1.71
<b>All Highways</b>	<b>1.17</b>

## Appendix B: List of Collisions – Highway #1 near Highway #2

Km Location	Date	Severity	Configuration	Persons Injured	Persons Killed
82.0	Jul 2 1995	Injury	Rear End	6	0
82.0	Mar 2 2002	Property Damage	Ran Off Road	0	0
82.0	Feb 19 2003	Property Damage	Single Vehicle Rollover	0	0
82.0	Jan 28 2007	Property Damage	Ran Off Road	0	0
82.0	Feb 18 2007	Property Damage	Rear End	0	0
82.8	Jul 28 1989	Fatal	Left Turn Across Path	0	1
82.8	Nov 5 2005	Injury	Single Vehicle Rollover	2	0
83.0	Feb 3 1989	Injury	Ran Off Road	2	0
83.0	May 16 1995	Property Damage	Single Vehicle Rollover	0	0
83.0	Oct 14 1997	Injury	Single Vehicle Rollover	1	0
83.0	Dec 30 2007	Injury	Single Vehicle Rollover	2	0
83.0	Feb 29 2008	Injury	Single Vehicle Rollover	1	0
83.0	Dec 30 2011	Property Damage	Single Vehicle Rollover	0	0
83.8	Jan 11 1989	Property Damage	Ran Off Road	0	0
83.8	Feb 27 1999	Property Damage	Collision – Parked Vehicle	0	0
83.8	Nov 5 2003	Property Damage	Ran Off Road	0	0
83.8	Sep 24 2004	Property Damage	Rear End	0	0
83.8	Jan 5 2006	Property Damage	Single Vehicle Rollover	0	0
83.8	May 30 2009	Injury	Single Vehicle Rollover	1	0
84.0	Jun 13 1991	Property Damage	Collision – Fixed Object	0	0
84.0	Nov 15 1992	Property Damage	Collision – Fixed Object	0	0
84.0	Oct 18 1993	Property Damage	Single Vehicle Rollover	0	0
84.0	Jan 1 2004	Property Damage	Ran Off Road	0	0
85.0	Sep 11 1993	Injury	Single Vehicle Rollover	1	0
85.0	Feb 11 2003	Property Damage	Ran Off Road	0	0
85.4	Sep 13 2004	Injury	Single Vehicle Rollover	1	0

## Appendix B: List of Collisions - Highway #1 near Km 471

<b>Km Location</b>	<b>Date</b>	<b>Severity</b>	<b>Configuration</b>	<b>Persons Injured</b>	<b>Persons Killed</b>
467.8	Feb 1 2009	Property Damage	Collision – Other Animal	0	0
468.0	May 30 1989	Injury	Single Vehicle Rollover	1	0
468.0	Dec 28 2003	Property Damage	Single Vehicle Rollover	0	0
468.3	Feb 3 2009	Fatal	Collision - Pedestrian	0	1
469.0	May 18 1991	Injury	Single Vehicle Rollover	1	0
469.0	Nov 21 1992	Injury	Rear End	1	0
469.3	Feb 8 2001	Property Damage	Single Vehicle Rollover	0	0
469.8	Jul 4 2004	Injury	Single Vehicle Rollover	1	0
469.8	Jan 13 2007	Injury	Ran Off Road	4	0
470.0	May 22 1991	Injury	Collision – Fixed Object	1	0
470.0	Jun 21 1991	Injury	Single Vehicle Rollover	3	0
470.0	Jul 5 1994	Property Damage	Rear End	0	0
470.0	May 22 2005	Property Damage	Ran Off Road	0	0
471.0	Oct 22 1989	Property Damage	Single Vehicle Rollover	0	0
471.0	Aug 18 1990	Property Damage	Single Vehicle Rollover	0	0
471.0	Aug 1 1995	Injury	Single Vehicle Rollover	2	0
471.0	Aug 8 1996	Property Damage	Ran Off Road	0	0
471.0	Mar 27 1997	Property Damage	Collision – Fixed Object	0	0
471.0	Mar 2 2005	Property Damage	Ran Off Road	0	0
471.3	Nov 19 1995	Property Damage	Collision – Fixed Object	0	0
471.3	Mar 4 2006	Injury	Single Vehicle Rollover	1	0
471.6	Feb 10 2009	Property Damage	Collision – Fixed Object	0	0
473.6	Dec 16 1999	Fatal	Collision - Pedestrian	0	1

## Appendix B: List of Collisions - Highway #2 between Km 37 and Km 41

Km Location	Date	Severity	Configuration	Persons Injured	Persons Killed
37.0	May 20 1989	Property Damage	Collision – Fixed Object	0	0
37.0	Mar 29 1989	Property Damage	Passing – Right Turn	0	0
37.0	May 23 1991	Injury	Rear End	1	0
37.0	Jul 14 1991	Injury	Single Vehicle Rollover	2	0
37.0	Mar 2 1994	Property Damage	Passing – Left Turn	0	0
37.0	Sep 7 1994	Injury	Ran Off Road	1	0
37.0	Jun 30 1997	Injury	Right Angle	2	0
37.0	Jul 7 1998	Property Damage	Other Multi-Vehicle	0	0
37.0	Jan 21 1999	Property Damage	Single Vehicle Rollover	0	0
37.0	Nov 4 1999	Injury	Rear End	2	0
37.0	Dec 14 2000	Property Damage	Rear End	0	0
37.0	Dec 13 2002	Property Damage	Right Angle	0	0
37.0	Aug 7 2004	Property Damage	Other Multi-Vehicle	0	0
37.0	Feb 28 2008	Property Damage	Ran Off Road	0	0
37.0	Oct 21 2009	Injury	Right Angle	1	0
37.0	Jan 21 2010	Property Damage	Ran Off Road	0	0
37.1	Dec 28 2004	Property Damage	Single Vehicle Rollover	0	0
37.1	Apr 17 2008	Property Damage	Ran Off Road	0	0
37.2	Aug 11 2001	Injury	Collision - Pedestrian	1	0
37.4	Oct 24 1992	Property Damage	Right Angle	0	0
37.4	Jul 7 2008	Property Damage	Right Angle	0	0
37.4	Dec 17 2008	Property Damage	Other Multi-Vehicle	0	0
37.4	Dec 4 2010	Property Damage	Right Angle	0	0
37.6	Dec 21 2002	Property Damage	Ran Off Road	0	0
37.7	Feb 23 2001	Property Damage	Collision – Fixed Object	0	0
38.0	Dec 12 1989	Property Damage	Right Turn Into Traffic	0	0
38.0	Oct 21 1989	Property Damage	Other Multi-Vehicle	0	0
38.0	Aug 10 1989	Property Damage	Ran Off Road	0	0
38.0	Apr 15 1989	Injury	Sideswipe Same Direction	1	0
38.0	Apr 21 1989	Property Damage	Right Angle	0	0
38.0	Mar 6 1989	Property Damage	Sideswipe Opposite Direction	0	0
38.0	Dec 7 1990	Property Damage	Rear End	0	0
38.0	Jan 20 1991	Property Damage	Single Vehicle Rollover	0	0
38.0	Jan 31 1991	Property Damage	Single Vehicle Rollover	0	0
38.0	Feb 24 1991	Property Damage	Single Vehicle Rollover	0	0
38.0	Apr 14 1991	Property Damage	Other Multi-Vehicle	0	0
38.0	Jul 5 1992	Property Damage	Ran Off Road	0	0
38.0	Nov 18 1992	Injury	Single Vehicle Rollover	1	0
38.0	Oct 10 1992	Property Damage	Single Vehicle Rollover	0	0
38.0	Jul 14 1993	Injury	Single Vehicle Rollover	1	0
38.0	May 9 1993	Property Damage	Left Turn Across Path	0	0
38.0	Jun 7 1993	Injury	Collision – Fixed Object	2	0
38.0	Dec 3 1993	Injury	Right Angle	2	0

Km Location	Date	Severity	Configuration	Persons Injured	Persons Killed
38.0	Nov 6 1993	Injury	Other Multi-Vehicle	2	0
38.0	Jun 14 1994	Property Damage	Sideswipe Same Direction	0	0
38.0	Jul 10 1994	Injury	Other Multi-Vehicle	3	0
38.0	Aug 30 1994	Property Damage	Rear End	0	0
38.0	Sep 2 1994	Injury	Right Angle	1	0
38.0	Sep 7 1994	Injury	Rear End	4	0
38.0	Nov 14 1994	Injury	Single Vehicle Rollover	4	0
38.0	Oct 22 1994	Injury	Single Vehicle Rollover	2	0
38.0	Nov 19 1994	Injury	Single Vehicle Rollover	4	0
38.0	Jan 2 1995	Property Damage	Ran Off Road	0	0
38.0	Jan 6 1995	Property Damage	Single Vehicle Rollover	0	0
38.0	Feb 3 1995	Property Damage	Other Multi-Vehicle	0	0
38.0	Mar 24 1995	Property Damage	Other Multi-Vehicle	0	0
38.0	Aug 11 1995	Property Damage	Passing – Left Turn	0	0
38.0	Nov 21 1995	Injury	Collision – Fixed Object	1	0
38.0	Aug 3 1997	Injury	Collision - Pedestrian	1	0
38.0	Aug 9 1997	Property Damage	Right Angle	0	0
38.0	Nov 13 1997	Property Damage	Collision – Fixed Object	0	0
38.0	May 30 1998	Injury	Single Vehicle Rollover	1	0
38.0	Dec 21 1998	Injury	Other Multi-Vehicle	1	0
38.0	Jul 2 2003	Property Damage	Left Turn Across Path	0	0
38.0	Jan 4 2005	Property Damage	Ran Off Road	0	0
38.0	Feb 6 2007	Property Damage	Rear End	0	0
38.0	Feb 26 2008	Injury	Rear End	1	0
38.0	Oct 23 2008	Property Damage	Collision – Fixed Object	0	0
38.0	Apr 13 2010	Property Damage	Rear End	0	0
38.0	Nov 24 2010	Property Damage	Right Angle	0	0
38.1	May 5 1999	Property Damage	Rear End	0	0
38.2	Dec 12 1991	Property Damage	Other Multi-Vehicle	0	0
38.2	Jul 17 2007	Property Damage	Right Angle	0	0
38.3	Dec 15 1990	Injury	Right Angle	1	0
38.3	Aug 23 1997	Property Damage	Right Angle	0	0
38.3	Dec 1 1997	Injury	Sideswipe Opposite Direction	4	0
38.3	Sep 26 1998	Property Damage	Single Vehicle Rollover	0	0
38.3	Jun 9 2000	Property Damage	Right Angle	0	0
38.3	Sep 15 2001	Injury	Right Angle	1	0
38.6	Jan 9 1999	Property Damage	Other Single Vehicle	0	0
38.7	Dec 22 2003	Property Damage	Sideswipe Opposite Direction	0	0
38.7	Dec 13 2006	Property Damage	Head-on	0	0
38.8	Nov 3 1990	Property Damage	Collision – Fixed Object	0	0
38.8	Jan 16 1993	Property Damage	Right Angle	0	0
38.8	Dec 18 1993	Injury	Right Angle	1	0
38.8	Aug 2 1996	Injury	Right Angle	1	0
38.8	Sep 2 1997	Injury	Left Turn Across Path	2	0
38.8	Oct 8 1998	Property Damage	Right Angle	0	0
38.8	Jul 7 2001	Property Damage	Right Angle	0	0

Km Location	Date	Severity	Configuration	Persons Injured	Persons Killed
38.8	Aug 18 2002	Property Damage	Rear End	0	0
38.8	Oct 28 2003	Property Damage	Right Angle	0	0
38.8	Jan 4 2004	Property Damage	Right Angle	0	0
38.8	Apr 3 2005	Property Damage	Sideswipe Same Direction	0	0
38.8	Aug 31 2006	Property Damage	Rear End	0	0
38.8	Nov 14 2006	Injury	Sideswipe Same Direction	1	0
38.8	Feb 19 2007	Property Damage	Other Multi-Vehicle	0	0
38.8	Jun 6 2007	Property Damage	Rear End	0	0
38.8	Dec 9 2009	Property Damage	Rear End	0	0
38.8	Dec 11 2009	Property Damage	Collision – Fixed Object	0	0
39.0	Sep 30 1989	Injury	Ran Off Road	2	0
39.0	Jan 7 2004	Injury	Ran Off Road	1	0
39.0	Sep 26 2011	Injury	Collision - Pedestrian	2	0
39.1	Nov 9 1996	Property Damage	Other Multi-Vehicle	0	0
39.1	Jul 9 1998	Property Damage	Other Multi-Vehicle	0	0
39.1	Sep 21 1998	Injury	Rear End	2	0
39.1	Sep 8 1999	Injury	Rear End	1	0
39.1	Oct 18 2000	Injury	Rear End	1	0
39.2	Apr 6 2005	Property Damage	Rear End	0	0
39.2	Jan 19 2009	Property Damage	Rear End	0	0
39.5	Jun 6 1989	Property Damage	Collision – Fixed Object	0	0
39.5	Jan 9 1989	Property Damage	Rear End	0	0
39.5	Feb 18 1993	Property Damage	Other Multi-Vehicle	0	0
39.5	Jan 20 2006	Property Damage	Passing – Right Turn	0	0
39.5	Mar 3 2007	Injury	Right Turn Into Traffic	1	0
39.5	Feb 27 2009	Injury	Sideswipe Opposite Direction	2	0
39.5	Oct 4 2009	Property Damage	Rear End	0	0
39.6	Jul 3 2000	Property Damage	Single Vehicle Rollover	0	0
39.6	May 23 2007	Property Damage	Ran Off Road	0	0
39.7	Mar 13 1994	Injury	Single Vehicle Rollover	1	0
39.7	Nov 30 1995	Property Damage	Collision – Fixed Object	0	0
39.7	Mar 4 1996	Property Damage	Other Multi-Vehicle	0	0
39.7	Mar 8 1996	Property Damage	Collision – Fixed Object	0	0
39.7	Jun 30 1996	Injury	Single Vehicle Rollover	1	0
39.7	Nov 10 1996	Property Damage	Collision – Fixed Object	0	0
39.7	Jun 18 1998	Property Damage	Other Multi-Vehicle	0	0
39.7	Oct 19 2001	Property Damage	Collision – Fixed Object	0	0
39.7	Jan 13 2006	Property Damage	Collision – Fixed Object	0	0
39.7	Jan 14 2006	Property Damage	Collision – Fixed Object	0	0
39.7	Nov 22 2008	Property Damage	Collision – Fixed Object	0	0
40.0	Oct 14 1989	Property Damage	Collision – Fixed Object	0	0
40.0	Oct 28 1989	Injury	Single Vehicle Rollover	1	0
40.0	Sep 19 1989	Property Damage	Collision – Fixed Object	0	0
40.0	May 3 1989	Property Damage	Ran Off Road	0	0
40.0	Jul 10 1990	Property Damage	Collision – Fixed Object	0	0
40.0	Jun 27 1990	Injury	Left Turn Across Path	1	0

Km Location	Date	Severity	Configuration	Persons Injured	Persons Killed
40.0	Jan 18 1992	Property Damage	Collision – Fixed Object	0	0
40.0	Jul 25 1992	Injury	Collision - Pedestrian	1	0
40.0	Aug 20 1993	Injury	Single Vehicle Rollover	2	0
40.0	Nov 27 1993	Property Damage	Other Multi-Vehicle	0	0
40.0	May 21 1996	Injury	Collision - Pedestrian	1	0
40.0	Oct 3 1997	Injury	Other Multi-Vehicle	3	0
40.0	Jan 19 1997	Injury	Single Vehicle Rollover	1	0
40.0	Jan 5 1998	Property Damage	Collision – Fixed Object	0	0
40.0	Jan 16 1998	Property Damage	Collision – Fixed Object	0	0
40.0	Feb 13 2000	Property Damage	Collision – Fixed Object	0	0
40.0	Aug 12 2000	Property Damage	Single Vehicle Rollover	0	0
40.0	Oct 25 2009	Property Damage	Single Vehicle Rollover	0	0
40.2	Nov 16 2002	Property Damage	Ran Off Road	0	0
40.2	Aug 23 2003	Injury	Sideswipe Same Direction	2	0
40.6	Dec 20 2004	Property Damage	Other Multi-Vehicle	0	0
40.7	Dec 19 2000	Property Damage	Single Vehicle Rollover	0	0
40.7	Feb 12 2003	Property Damage	Single Vehicle Rollover	0	0
40.9	Dec 14 2008	Property Damage	Head-on	0	0
41.0	Feb 6 1989	Injury	Other Single Vehicle	1	0
41.0	Jul 8 1990	Property Damage	Rear End	0	0
41.0	Jun 1 1990	Property Damage	Ran Off Road	0	0
41.0	Jul 28 1991	Injury	Ran Off Road	1	0
41.0	Jul 30 1992	Property Damage	Passing – Left Turn	0	0
41.0	Mar 22 1993	Property Damage	Sideswipe Opposite Direction	0	0
41.0	Aug 1 1994	Injury	Single Vehicle Rollover	1	0
41.0	Oct 25 1994	Property Damage	Passing – Left Turn	0	0
41.0	Jan 28 1995	Injury	Collision – Fixed Object	1	0
41.0	Aug 13 1995	Injury	Single Vehicle Rollover	1	0
41.0	May 7 2009	Property Damage	Sideswipe Same Direction	0	0
41.1	Dec 11 1989	Injury	Single Vehicle Rollover	1	0
41.1	Feb 5 1989	Injury	Other Multi-Vehicle	2	0
41.1	Oct 27 1994	Property Damage	Collision – Fixed Object	0	0
41.1	Nov 12 1994	Injury	Collision – Fixed Object	1	0
41.1	Apr 29 1996	Property Damage	Collision – Fixed Object	0	0
41.1	Nov 6 2006	Property Damage	Sideswipe – Same Direction	0	0
41.2	Sep 13 2000	Injury	Single Vehicle Rollover	1	0
41.4	Jan 18 2003	Property Damage	Single Vehicle Rollover	0	0
41.4	Dec 28 2003	Injury	Single Vehicle Rollover	2	0

## Appendix B: List of Collisions - Highway #3 between Km 334 and Km 338

Km Location	Date	Severity	Configuration	Persons Injured	Persons Killed
334.5	Aug 4 2001	Injury	Single Vehicle Rollover	1	0
334.5	Jul 13 2007	Fatal	Single Vehicle Rollover	1	1
335.0	Oct 6 1989	Property Damage	Collision – Fixed Object	0	0
335.0	Dec 20 1989	Property Damage	Single Vehicle Rollover	0	0
335.0	Jan 1 1989	Fatal	Collision - Pedestrian	0	1
335.0	Nov 16 1990	Property Damage	Collision – Fixed Object	0	0
335.0	Jul 22 1990	Property Damage	Collision – Fixed Object	0	0
335.0	Jul 6 1991	Property Damage	Ran Off Road	0	0
335.0	Aug 1 1991	Fatal	Collision – Fixed Object	0	1
335.0	Feb 8 1992	Injury	Collision – Fixed Object	2	0
335.0	Aug 8 1992	Injury	Ran Off Road	1	0
335.0	Dec 16 1992	Property Damage	Other Multi-Vehicle	0	0
335.0	Feb 5 1994	Property Damage	Collision – Fixed Object	0	0
335.0	Oct 22 1994	Property Damage	Collision – Fixed Object	0	0
335.0	Dec 16 1994	Injury	Single Vehicle Rollover	1	0
335.0	Dec 10 1996	Property Damage	Collision – Fixed Object	0	0
335.0	Oct 19 1998	Injury	Collision – Fixed Object	1	0
335.0	Oct 19 1998	Injury	Ran Off Road	1	0
335.0	Aug 2 2008	Property Damage	Sideswipe Opposite Direction	0	0
335.7	Jun 25 1993	Property Damage	Right Angle	0	0
335.7	Feb 23 1997	Property Damage	Right Angle	0	0
335.7	Jul 4 2009	Injury	Ran Off Road	1	0
335.7	Jul 25 2011	Injury	Passing – Left Turn	1	0
335.7	Aug 3 2011	Property Damage	Right Turn Into Traffic	0	0
336.0	Jul 28 1989	Property Damage	Ran Off Road	0	0
336.0	Jan 15 1989	Injury	Other Multi-Vehicle	1	0
336.0	Nov 27 1990	Property Damage	Collision – Fixed Object	0	0
336.0	Mar 23 1990	Property Damage	Passing – Left Turn	0	0
336.0	Jan 17 1990	Property Damage	Collision – Fixed Object	0	0
336.0	Sep 15 1991	Property Damage	Other Multi-Vehicle	0	0
336.0	Dec 6 1992	Injury	Collision – Fixed Object	1	0
336.0	Feb 9 1994	Property Damage	Collision – Fixed Object	0	0
336.0	Nov 1 1996	Property Damage	Ran Off Road	0	0
336.0	Jan 31 2007	Property Damage	Single Vehicle Rollover	0	0
336.0	Jul 8 2008	Property Damage	Rear End	0	0
336.1	May 21 2003	Injury	Single Vehicle Rollover	1	0
336.4	Jan 10 2002	Injury	Rear End	1	0
336.7	Mar 10 1989	Property Damage	Head-On	0	0
336.7	Mar 30 1989	Injury	Left Turn Across Path	2	0
336.7	Jun 22 1990	Property Damage	Other Multi-Vehicle	0	0
336.7	Dec 19 1993	Property Damage	Other Multi-Vehicle	0	0

Km Location	Date	Severity	Configuration	Persons Injured	Persons Killed
336.7	Feb 18 1994	Property Damage	Other Multi-Vehicle	0	0
336.7	Mar 10 1995	Property Damage	Head-On	0	0
336.7	Nov 13 1995	Property Damage	Collision – Fixed Object	0	0
336.7	Feb 16 1997	Property Damage	Other Multi-Vehicle	0	0
336.7	Jun 10 1998	Injury	Left Turn Across Path	1	0
336.7	Jul 1 1998	Injury	Sideswipe Same Direction	1	0
336.7	Nov 22 1998	Property Damage	Other Multi-Vehicle	0	0
336.7	May 3 2003	Property Damage	Collision – Fixed Object	0	0
336.7	Feb 29 2004	Property Damage	Collision – Fixed Object	0	0
336.7	Jul 22 2004	Property Damage	Ran Off Road	0	0
336.7	Aug 23 2004	Property Damage	Sideswipe Same Direction	0	0
336.7	Dec 3 2004	Property Damage	Ran Off Road	0	0
336.7	Feb 14 2005	Property Damage	Right Angle	0	0
336.7	Jul 26 2005	Injury	Single Vehicle Rollover	1	0
336.7	Aug 1 2005	Property Damage	Right Angle	0	0
336.7	Jun 3 2007	Injury	Right Angle	2	0
336.8	Sep 26 1999	Property Damage	Single Vehicle Rollover	0	0
336.8	Jul 26 2003	Property Damage	Right Angle	0	0
336.8	Nov 14 2011	Property Damage	Ran Off Road	0	0
337.0	Apr 9 1998	Property Damage	Ran Off Road	0	0
337.0	Oct 12 2005	Injury	Head-On	2	0
337.0	Feb 6 2006	Property Damage	Single Vehicle Rollover	0	0
337.7	May 19 2007	Fatal	Single Vehicle Rollover	0	1
338.0	Dec 28 1989	Property Damage	Collision – Fixed Object	0	0
338.0	Jul 23 1989	Injury	Collision – Fixed Object	1	0
338.0	Feb 18 1989	Property Damage	Sideswipe Opposite Direction	0	0
338.5	Oct 10 1991	Property Damage	Right Turn Into Traffic	0	0
338.0	Dec 20 1991	Property Damage	Single Vehicle Rollover	0	0
338.0	Jul 17 1992	Property Damage	Ran Off Road	0	0
338.0	Nov 5 1994	Property Damage	Collision – Fixed Object	0	0
338.0	Nov 19 1995	Injury	Collision – Fixed Object	2	0
338.0	Nov 13 1998	Injury	Collision – Fixed Object	1	0
338.0	Nov 29 2007	Property Damage	Single Vehicle Rollover	0	0
338.0	Dec 17 2007	Injury	Head-On	1	0
338.0	May 4 2008	Property Damage	Single Vehicle Rollover	0	0
338.0	Dec 31 2008	Property Damage	Collision – Fixed Object	0	0
338.0	Mar 12 2009	Property Damage	Single Vehicle Rollover	0	0
338.0	Dec 27 2009	Property Damage	Ran Off Road	0	0
338.0	Dec 2 2010	Injury	Single Vehicle Rollover	1	0
338.0	May 4 2011	Property Damage	Sideswipe Opposite Direction	0	0
338.2	Jul 27 1999	Injury	Ran Off Road	1	0
338.2	Dec 21 2009	Property Damage	Ran Off Road	0	0
338.2	Dec 21 2009	Injury	Rear End	2	0
338.3	Feb 4 2000	Property Damage	Collision – Fixed Object	0	0
338.3	Oct 17 2001	Injury	Head-On	3	0
338.3	Nov 17 2001	Property Damage	Ran Off Road	0	0

<b>Km Location</b>	<b>Date</b>	<b>Severity</b>	<b>Configuration</b>	<b>Persons Injured</b>	<b>Persons Killed</b>
338.3	Dec 21 2007	Property Damage	Ran Off Road	0	0
338.4	Dec 21 2002	Injury	Ran Off Road	1	0
338.4	Nov 8 2003	Property Damage	Single Vehicle Rollover	0	0
338.4	Dec 7 2004	Property Damage	Other Multi-Vehicle	0	0
338.5	Sep 10 1996	Property Damage	Other Multi-Vehicle	0	0
338.5	May 23 2003	Property Damage	Ran Off Road	0	0
338.5	Nov 25 2005	Injury	Ran Off Road	1	0
338.5	Nov 21 2007	Property Damage	Sideswipe Opposite Direction	0	0
338.5	Jan 27 2010	Property Damage	Ran Off Road	0	0
338.6	May 16 2004	Property Damage	Rear End	0	0
338.6	Oct 16 2006	Property Damage	Right Angle	0	0
338.7	Apr 15 2006	Property Damage	Single Vehicle Rollover	0	0

## Appendix B: List of Collisions - Highway #3 at Highway #4

Date	Severity	Configuration	Persons Injured	Persons Killed
Oct 13 1989	Property Damage	Collision – Fixed Object	0	0
Aug 15 1989	Injury	Other Single-Vehicle	2	0
Feb 19 1989	Property Damage	Rear End	0	0
Jan 29 1989	Property Damage	Collision – Fixed Object	0	0
Dec 8 1990	Property Damage	Ran Off Road	0	0
Dec 7 1990	Property Damage	Other Multi-Vehicle	0	0
Dec 16 1990	Property Damage	Other Multi-Vehicle	0	0
Aug 11 1990	Property Damage	Collision – Fixed Object	0	0
Dec 12 1991	Property Damage	Collision – Fixed Object	0	0
Sep 26 1992	Property Damage	Passing – Left Turn	0	0
May 8 1993	Injury	Collision – Fixed Object	6	0
Aug 15 1993	Injury	Collision – Fixed Object	2	0
Nov 16 1994	Property Damage	Left Turn Across Path	0	0
Aug 5 1995	Injury	Collision – Fixed Object	1	0
Dec 13 1995	Property Damage	Collision – Fixed Object	0	0
Oct 3 1996	Property Damage	Right Angle	0	0
Oct 2 1996	Property Damage	Collision – Fixed Object	0	0
Jul 28 1997	Property Damage	Other Multi-Vehicle	0	0
Oct 31 1997	Property Damage	Collision – Fixed Object	0	0
Jan 8 1999	Property Damage	Collision – Fixed Object	0	0
Feb 23 1999	Injury	Ran Off Road	1	0
Mar 10 2000	Injury	Rear End	1	0
May 15 2000	Property Damage	Collision – Fixed Object	0	0
Feb 28 2001	Property Damage	Right Turn Into Traffic	0	0
Sep 13 2001	Property Damage	Single Vehicle Rollover	0	0
Jul 29 2002	Property Damage	Rear End	0	0
Nov 8 2003	Property Damage	Collision – Fixed Object	0	0
Dec 29 2004	Property Damage	Right Angle	0	0
Mar 17 2006	Property Damage	Ran Off Road	0	0
Jan 30 2008	Property Damage	Rear End	0	0
Jun 11 2008	Property Damage	Rear End	0	0
Jan 14 2009	Property Damage	Rear End	0	0
Feb 5 2010	Property Damage	Rear End	0	0
Jan 23 2011	Property Damage	Other Multi-Vehicle	0	0
Feb 16 2011	Property Damage	Rear End	0	0
Jan 4 1989	Injury	Other Multi-Vehicle	1	0
Feb 1 1990	Property Damage	Other Multi-Vehicle	0	0
Feb 24 1991	Injury	Right Angle	5	0
Oct 6 1995	Injury	Right Angle	3	0
Nov 28 1995	Property Damage	Collision – Fixed Object	0	0
Oct 4 1996	Injury	Collision – Fixed Object	1	0
Nov 16 2000	Injury	Left Turn Across Path	2	0
Dec 3 2001	Property Damage	Collision – Fixed Object	0	0

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<b>Date</b>	<b>Severity</b>	<b>Configuration</b>	<b>Persons Injured</b>	<b>Persons Killed</b>
Dec 10 2003	Property Damage	Left Turn Across Path	0	0
Feb 22 2005	Injury	Left Turn Across Path	2	0
Mar 1 2005	Injury	Left Turn Across Path	4	0
Jun 11 2005	Injury	Single Vehicle Rollover	1	0
Jul 20 2006	Property Damage	Collision – Fixed Object	0	0
Mar 7 2008	Injury	Left Turn Across Path	2	0
Jun 26 2008	Property Damage	Left Turn Across Path	0	0
Jan 23 2009	Property Damage	Left Turn Across Path	0	0
Jun 12 2009	Injury	Left Turn Across Path	2	0
Jan 19 2010	Injury	Left Turn Across Path	2	0
Feb 1 2011	Injury	Left Turn Across Path	1	0
Feb 16 2011	Injury	Left Turn Across Path	4	0

## Appendix B: List of Collisions - Highway #4 near Km 2

Km Location	Date	Severity	Configuration	Persons Injured	Persons Killed
1.5	Oct 19 1999	Injury	Single Vehicle Rollover	3	0
1.5	Dec 13 2000	Property Damage	Rear End	0	0
1.5	May 19 2002	Injury	Rear End	1	0
1.5	Dec 22 2011	Property Damage	Collision – Fixed Object	0	0
2.0	Nov 2 1989	Property Damage	Other Multi-Vehicle	0	0
2.0	Sep 30 1989	Property Damage	Collision – Fixed Object	0	0
2.0	Jan 24 1989	Injury	Ran Off Road	1	0
2.0	Sep 1 1990	Property Damage	Single Vehicle Rollover	0	0
2.0	Feb 15 1991	Property Damage	Rear End	0	0
2.0	Aug 5 1991	Property Damage	Ran Off Road	0	0
2.0	Oct 24 1995	Property Damage	Collision – Fixed Object	0	0
2.0	Dec 1 1995	Injury	Collision – Fixed Object	1	0
2.0	Jun 24 1997	Property Damage	Ran Off Road	0	0
2.0	Nov 15 2001	Property Damage	Ran Off Road	0	0
2.0	Apr 28 2003	Property Damage	Ran Off Road	0	0
2.0	Jun 4 2004	Property Damage	Collision – Fixed Object	0	0
2.0	Nov 20 2005	Injury	Ran Off Road	1	0
2.0	Apr 15 2006	Property Damage	Collision – Fixed Object	0	0
2.0	Apr 20 2006	Property Damage	Ran Off Road	0	0
2.0	Jan 7 2008	Property Damage	Ran Off Road	0	0
2.0	Mar 12 2009	Property Damage	Collision – Fixed Object	0	0
2.0	Sep 1 2011	Property Damage	Ran Off Road	0	0

## Appendix B: List of Collisions - Highway #5 at Hay River Reserve Access

<b>Km Location</b>	<b>Date</b>	<b>Severity</b>	<b>Configuration</b>	<b>Persons Injured</b>	<b>Persons Killed</b>
2.0	May 20 1993	Property Damage	Single Vehicle Rollover	0	0
2.0	Aug 28 1993	Property Damage	Ran Off Road	0	0
2.0	Oct 20 1993	Property Damage	Collision – Fixed Object	0	0
2.0	Oct 29 1998	Injury	Collision – Fixed Object	2	0
2.0	Oct 20 2010	Property Damage	Ran Off Road	0	0
2.2	Nov 11 2000	Property Damage	Collision – Fixed Object	0	0
2.5	Nov 12 1998	Property Damage	Ran Off Road	0	0
2.5	Dec 30 1998	Property Damage	Sideswipe Same Direction	0	0
2.5	Feb 5 2002	Property Damage	Ran Off Road	0	0
2.5	Oct 13 2002	Property Damage	Ran Off Road	0	0
2.5	Dec 6 2005	Property Damage	Rear End	0	0
2.5	Jul 23 2008	Property Damage	Ran Off Road	0	0
2.5	Nov 4 2008	Property Damage	Ran Off Road	0	0
2.5	Nov 25 2010	Injury	Ran Off Road	1	0

## Appendix B: List of Collisions - Highway #5 between Km 263 and Km 266

Km Location	Date	Severity	Configuration	Persons Injured	Persons Killed
262.7	Mar 25 1993	Injury	Right Angle	1	0
262.7	Sep 4 1994	Injury	Single Vehicle Rollover	1	0
262.7	Feb 22 1997	Property Damage	Other Multi-Vehicle	0	0
263.0	Jan 1 1997	Injury	Single Vehicle Rollover	2	0
263.0	Dec 17 2008	Injury	Rear End	1	0
263.8	Sep 21 2008	Injury	Single Vehicle Rollover	1	0
264.0	Jan 8 1990	Property Damage	Collision – Fixed Object	0	0
264.0	Sep 29 1991	Injury	Single Vehicle Rollover	5	0
264.0	Oct 17 1992	Property Damage	Collision – Fixed Object	0	0
264.0	Apr 17 1997	Injury	Other Single-Vehicle	1	0
264.1	Dec 11 1992	Property Damage	Other Multi-Vehicle	0	0
264.1	Jul 13 1993	Property Damage	Passing – Left Turn	0	0
264.6	May 25 1991	Injury	Single Vehicle Rollover	3	0
264.6	Jan 5 1998	Property Damage	Other Multi-Vehicle	0	0
264.9	Jan 11 2005	Property Damage	Collision - Animal	0	0
265.0	Sep 1 2007	Property Damage	Ran Off Road	0	0
265.9	Aug 25 2006	Injury	Single Vehicle Rollover	1	0
266.0	Sep 11 1990	Property Damage	Collision - Animal	0	0
266.0	Jun 22 1990	Injury	Ran Off Road	1	0
266.0	Nov 13 1993	Property Damage	Ran Off Road	0	0
266.0	Oct 7 1994	Property Damage	Passing – Left Turn	0	0
266.0	Oct 31 2009	Property Damage	Ran Off Road	0	0
266.0	Jan 9 2010	Property Damage	Single Vehicle Rollover	0	0

**Appendix B: List of Collisions - Highway #8 near Km 259**

<b>Km Location</b>	<b>Date</b>	<b>Severity</b>	<b>Configuration</b>	<b>Persons Injured</b>	<b>Persons Killed</b>
259.0	Nov 24 1989	Injury	Single Vehicle Rollover	1	0
259.0	Mar 14 1989	Property Damage	Other Multi-Vehicle	0	0
259.0	Feb 1 1990	Property Damage	Passing – Right Turn	0	0
259.0	Jan 27 1990	Property Damage	Other Multi-Vehicle	0	0
259.0	Jun 7 1992	Fatal	Collision – Fixed Object	0	1
259.0	Oct 8 1992	Property Damage	Other Multi-Vehicle	0	0
259.0	Nov 12 1992	Property Damage	Other Multi-Vehicle	0	0
259.0	Jan 16 2005	Injury	Ran Off Road	1	0
259.3	Feb 15 2003	Property Damage	Collision – Fixed Object	0	0
259.3	Feb 9 2004	Property Damage	Rear End	0	0
259.3	Feb 12 2006	Property Damage	Single Vehicle Rollover	0	0