Evaluation of the Alberta Administrative Licence Suspension Program

FINAL REPORT

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howardresearch
& MANAGEMENT CONSULTING INC.

ALBERTA IS
GETTING TOUGH
on
DRUNK DRIVERS

AALS
Alberta Administrative Licence Suspension

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1. The AALS program development and evaluation committees

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2. Executive Summary

In Canada, 36% of all drivers fatally injured in traffic collisions had consumed alcohol (Traffic Injury Research Foundation of Canada, 2002). Each year in Alberta over 100 lives are lost and over 2,000 people are injured in alcohol-related collisions. In 1999, prior to the introduction of Alberta Administrative Licence Suspension (AALS) legislation, 22.8% of drivers who were involved in fatal collisions had consumed alcohol prior to the collision. Further, as the severity of the collision increased, the involvement of alcohol dramatically increased.

Administrative licence suspension programs are one method used to reduce impaired driving. Such programs allow automatic suspension of driving privileges for drivers charged with alcohol-related offences immediately after they test positive, or refuse to be tested for alcohol use. In Canada, ten jurisdictions have implemented or, at least, introduced enabling legislation for administrative licence suspensions by the end of 2001 (CCMTA, 2001).

The Alberta Administrative Licence Suspension Program (AALS) came into effect on December 1, 1999.[1] The AALS Program is the first piece of legislation to be passed as part of the Traffic Safety Act (Bill 24). The Traffic Safety Act became law on May 20, 2003.

A Provincial Impaired Driving Committee (PIDC), comprised of representatives from Alberta Infrastructure and Transportation, Alberta Alcohol and Drug Abuse Commission, Mothers Against Drunk Driving (MADD), Alberta Motor Association, Alberta Health and Wellness, Alberta Justice and Attorney General, Alberta Solicitor General, Alberta Appellate Council, other government ministries, Alberta Centre for Injury Control and Research, Aboriginal Affairs and Northern Development, and provincial police services served as a steering committee for the program. (This group provides ongoing advice for the portion of the Traffic Safety Initiative dealing with impaired driving.) Members of the PIDC have also served as a subcommittee for the development of both the AALS program and the terms of reference for its evaluation.

The AALS allows for tougher and immediate consequences for drivers caught drinking and driving. The AALS enhances current impaired driving laws in which first, second, and third convictions result in one, three, or five-year suspension of driver privileges. Specifics of the AALS program include the following:

1. Immediate 24-hour licence suspension,[2]

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[1] This date coincided with the kick-off of the pre-Christmas Checkstop campaign.
[2] The immediate 24-hour suspension was added in May 2003.

2. Automatic three-month licence suspension or disqualification for providing a breath or blood sample greater than .08 or refusing to provide a breath or blood sample;
3. Automatic six month licence suspension or disqualification if the offense results in bodily harm or death; and
4. A 21-day temporary permit to allow the driver to set his or her affairs in order.

2.1 Goal and Scope of the Evaluation

The goal of the evaluation was to assess the effectiveness of the Alberta Administrative Licence Suspension (AALS) Program in reducing the incidence of impaired driving behaviour and alcohol-related collisions in the province. The evaluation included examination of existing data sources and collection of additional data, including interviews with key stakeholders and a media scan, in an attempt to confirm the core assumptions that link the program to anticipated outcomes.

The evaluation sought to provide credible evidence that would facilitate determination if and to what extent any changes in driver behaviour, collision rates, and court system impacts over time in Alberta could be <u>attributed</u> to the AALS program. To this end, the most rigourous methods of evaluation allowed by data collected in Alberta, and some comparison data from Saskatchewan, were used.

2.2 Key Findings

Key findings are organized according to process outcomes and effects on the court system, specific deterrence outcomes and general deterrence outcomes.

These areas should also be viewed in terms of short, intermediate, and long-term outcomes. Expectations for effects in these areas should be viewed accordingly. The strongest effects of the legislation would be expected to occur at the process level (appeal process and court system). More moderate effects would be expected in terms of specific deterrence (recidivism) and more modest effects in terms of general deterrence (effect in the general population).

<u>2.2.1 Process outcomes and effects on the court system</u>

- An average of 7,656 AALS suspensions have been issued per year.

- Approximately 118 AALS suspensions are appealed to the Transportation Safety Board each year.

- The median number of days between AALS suspension date and AALS Transportation Safety Board hearing date was 17 days.

- The median number of days between the Transportation Safety Board receiving the appeal and the hearing date was 9 days.

- The Transportation Safety Board appeal process appears to have become more efficient with the passage of time. The median number of days between an application being received and the hearing date reducing from 10 days in 2000, to 8 days in subsequent years.

- The rate at which appeals to an AALS suspension resulted in the suspension being revoked by the Transportation Safety Board increased from 30% in the first full year of the legislation to over 52% in subsequent years.

- Comparing the three years preceding AALS legislation to the three years following, the number of non-trial guilty pleas before the courts increased by 3.3%.

- Comparing the three years preceding AALS legislation to the three years following, the number of guilty pleas on first appearance before the courts increased by 48%.

- Comparing the three years preceding AALS legislation to the three years following, the number of cases that went to trial decreased by 26%. A trend toward decreasing trials predated AALS implementation, therefore, caution is warranted in attributing this change to AALS legislation.

- Comparing the three years preceding AALS legislation to the three years following, there was a 52% reduction in the median time between first and last court appearance.

2.2.2 Specific Deterrence

- The two year conviction recidivism rate decreased by 24% after the introduction of the AALS.

- Comparing the three years preceding AALS legislation to the three years following, the recidivism rate for alcohol involved drivers in casualty collisions decreased by 19%.

2.2.3 General Deterrence

- Comparing the three years preceding AALS legislation to the three years following, the number of casualty collisions involving alcohol decreased by 6%.

- Comparing the three years preceding AALS legislation to the three years following, the number of fatal collisions involving alcohol decreased by 12%.

- Comparing the three years preceding AALS legislation to the three years following, the number of nighttime casualty collisions involving alcohol decreased by 7%.

- There is no evidence that AALS legislation reduced the number of alcohol involved police attended property damage only collisions.

- Comparing the three years preceding AALS legislation to the three years following, the number alcohol involved drivers involved in casualty collisions decreased by 6.5%.

- Comparing the three years preceding AALS legislation to the three years following, decreases in the number of alcohol involved drivers in casualty collisions were found in all demographic groups except those in the 45-55 age group.

- Comparing the three years preceding AALS legislation to the three years following, decreases in the number of alcohol involved drivers in casualty collisions were largest for males as well as those in the 18-24 age range.

- There is no evidence that AALS legislation reduced incidences of Blood Alcohol Concentration (BAC) positive or BAC over .08 rates among fatally injured drivers.

- There is no evidence that AALS legislation decreased average BAC level among those apprehended by police for impaired driving.

- There is no evidence that AALS legislation had an impact on the total number of alcohol involved charges laid.

- Public awareness of the AALS legislation has diminished over time. Though public awareness strategies have continued to be implemented, they have not been implemented at the same intensity as at the start of the program.

- There are indications that many of the general deterrence effects of the AALS program were limited to the first year of program introduction.

- Those with higher rates of impaired driving had more knowledge of AALS. This suggests that media campaigns were successful at targeting this high risk group.

2.2.4 Program Assumptions

- Those with more knowledge of AALS had higher rates of impaired driving behaviour suggesting that media campaigns effectively targeted at risk demographics.

- There was evidence to support that knowledge of AALS consequences may reduce drunk drinking.

2.3 Conclusions and Recommendations

Overall, the AALS program appears to have been very effective in terms of primary deterrence (i.e., reducing recidivism of alcohol related offences), but somewhat less effective in terms of general deterrence (i.e., reducing rates of drunk driving in the general public). Much of the effect on the general public was limited to the first year after AALS implementation. The waning effectiveness after the first year is likely due to reduced public awareness of the consequences of driving under the influence as related to the AALS legislation. The media scan and declining public awareness over time as reported in the public opinion survey, both support for this conclusion. This suggests that the AALS program, while effective, can be more effective through enhanced and sustained public awareness efforts. The following recommendations are made:

1. AALS legislation appears to have been an effective tool in reducing the prevalence of impaired driving on Alberta roads. This program should be continued.

2. Compelling evidence suggests that the full potential of the program has not yet been realized. We recommend that in order to realize this potential, a substantial and sustained public awareness and promotion campaign should be implemented. This campaign should highlight consequences of impaired driving in regards to the AALS legislation as well as the consequences of being convicted of impaired driving related offenses. The effectiveness of these campaigns will likely be enhanced by also highlighting the probability of apprehension. These campaigns should target those demographic groups that demonstrate a high incidence rate of impaired driving behavior (i.e., young males) as well as those in the 45-55 age demographic.

3. Though the rate at which AALS suspensions are appealed is currently very low (less than 2% approximately 118 per year). The rate at which Transportation Safety Board appeals are being allowed (i.e., suspension revoked) is over 50%. One factor that may influence this high percentage is that with the maturing of the AALS program, only those cases with the strongest merit are being brought forward to the Board for appeal. It is recommended that Alberta Infrastructure and Transportation review the appeal decision process to determine if any changes are required.

4. Once the full potential of the current legislation is realized, the following suggestions from key stakeholders should be considered with respect to strengthening the program:

   a) Increasing penalties for individuals who continue to drive after they have lost their licence,

b) Reducing officer discretion with respect to the option of issuing a 24-hour licence suspension,
c) Seizing vehicles of those given a licence suspension, and
d) Reducing the length of the suspension grace period.

3. Context

3.1 Introduction

In Canada, 36% of all drivers fatally injured in traffic collisions had consumed alcohol (Traffic Injury Research Foundation of Canada, 2002). Each year in Alberta over 100 lives are lost and over 2,000 people are injured in alcohol-related collisions. In 1999, prior to the introduction of AALS legislation, 21% of drivers who were involved in fatal collisions had consumed alcohol prior to the collision. Further, as the severity of the collision increased, the involvement of alcohol dramatically increased.

Administrative licence suspension programs are one method used to reduce impaired driving. Such programs allow automatic suspension of driving privileges for drivers charged with alcohol-related offences immediately after they test positive, or refuse to be tested for alcohol use. In Canada, ten jurisdictions have implemented or, at least, introduced enabling legislation for administrative licence suspensions by the end of 2001 (CCMTA, 2001).

The Alberta Administrative Licence Suspension Program (AALS) came into effect on December 1, 1999.[3] The AALS Program is the first piece of legislation to be passed as part of the Traffic Safety Act (Bill 24). The Traffic Safety Act became law on May 20, 2003.

3.2 Background

A Traffic Safety Initiative task force, originally convened in 1996, involved the collaborative efforts of representatives from 29 organizations which advocated for administrative licence suspensions. This multi-stakeholder group contributed to the design and implementation of enabling legislation, new policy and regulations, administrative and systems infrastructure, appropriate police training, and effective public communication strategies.[4]

A Provincial Impaired Driving Committee (PIDC), comprised of representatives from Alberta Infrastructure and Transportation, Alberta Alcohol and Drug Abuse Commission, Mothers Against Drunk Driving, Alberta Motor Association, Alberta Health and Wellness, Alberta Justice, Attorney General Alberta Appellate Council , Alberta Centre for Injury Control and Research, Alberta Solicitor General, Aboriginal Affairs and Northern Development, Calder Bateman Communications and provincial police services served as a steering committee for the program. (This group provides ongoing direction for the impaired driving portion of the Traffic Safety Initiative.) Members of the PIDC provided

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[3] This date coincided with the kick-off of the pre-Christmas Checkstop campaign.

[4] Four fundamental elements of the program involve policy (legal/constitutional), forms (for field and administrative use), systems (for maintaining and tracking records) and training.

membership for a subcommittee for the development of the AALS program and the terms of reference for program evaluation.

Research conducted by Steering Committee and sub-committee members indicated the need for stiffer penalties for drunk driving.[5] Research also indicated that an administrative licence suspension was an effective tool to combat impaired driving and its recurrence. Constitutionality issues were also researched. Consultation was undertaken with Manitoba's licence suspension program, and additionally with Nova Scotia, B.C. and Ontario. Legal advice and guidance was provided by experts from the Department of Justice and the Attorney General. Reviews were also conducted on challenges that had occurred across Canada. Logistical issues were addressed with assistance from Edmonton Police Service and the RCMP. Municipal and rural police services also contributed to the development of the AALS by providing input and feedback on processes and products of the program. Representatives of Alberta Justice and the Attorney General who are responsible for supporting impaired driving legislation (Public Security, Court Services, and Criminal Law) also provided input into the program.

Throughout program development, both project progress and management processes were assessed (regular review of action plans by sub-committees and reporting back to main working committee). Field-testing of the form used by police was an effective tool for internal program improvement.

3.3 Program Rationale and Purpose

The AALS is part of the Alberta Traffic Safety Initiative and part of the Alberta Infrastructure and Transportation business plan. The aim of the program is to improve traffic safety in Alberta by providing law enforcement with a new tool to remove drunk drivers from Alberta's roadways.

The AALS is strongly supported by Alberta's police services, AADAC, MADD, Alberta Motor Association, Solicitor General, Alberta Justice, and other government ministries.

3.4 Program Description

The AALS allows for tougher and immediate consequences for drivers caught drinking and driving. The AALS enhances current impaired driving laws in which first, second, and third convictions result in one, three, or five-year suspension of driver privileges. Specifics of the AALS program include the following:

1. Immediate 24-hour suspension of driver's licence[6];

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[5] The Canada Safety Council estimated that there are over 16 million incidents of drunk driving every year in Canada, but many fewer charges. In Alberta each year, 100 deaths and more than 2000 injuries result from drinking and driving. In 1998 one in five drivers involved in fatal collisions involved alcohol.
[6] The immediate 24-hour suspension was added in May 2003.

2. Automatic three-month driver's licence suspension or disqualification for providing a breath or blood sample more than .08 or refusing to give a breath or blood sample;
3. Automatic six month driver's licence suspension or disqualification if the offense results in bodily harm or death; and
4. A 21-day temporary permit to allow the driver to set his or her affairs in order.

The program is enforced by police who complete the AALS Form (see Appendix A) driver. The driver is issued a temporary permit. The AALS Form is forwarded to data entry personnel by the police, and then information is shared electronically between police, the Justice Online Information Network (JOIN) and the Motor Vehicles System (MOVES).
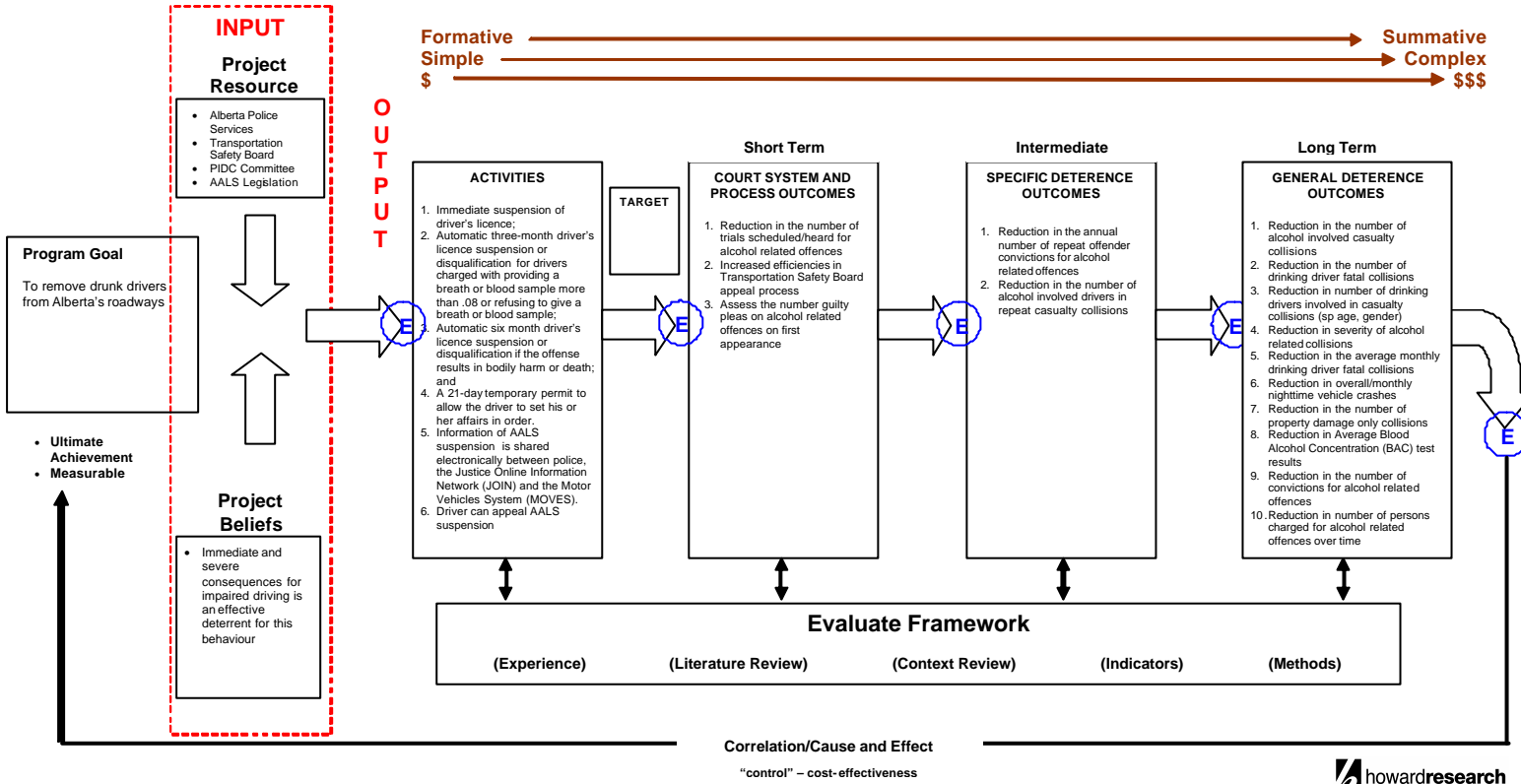
3.4.1 Concurrent Legislative Change

Shortly after the AALS program was introduced, another legislative change took effect that increased the penalties for repeat offenders. In 1999, a five year window was used to determine whether a client was a first time offender or a repeat offender (if the time between alcohol convictions was more than five years, the client was considered a first time offender). This designation would determine the length of the suspension attached to the conviction. On December 1, 2000, that window was expanded to six years and was, and will be, increased by one year each December 1 until December 1, 2004, when the assessment period will be 10 years.

3.5 Program Logic Model

A logic model of the AALS program was created by Howard Research. A logic model depicts the specific target of a program, why a program exists (rationale/assumptions/goals), what is done to achieve success (resources/activities), and what is expected to be achieved (outcomes). What goes into the program (assumptions, resources, and efforts) are often referred to as INPUTS and what results the project should achieve can be labeled OUTPUTS (Rush & Ogborne, 1991). Based upon a review of the literature and AALS program documentation the logic model presented on the following page was developed.

This model is obviously a simplistic portrayal of the activities and outcomes of the AALS program, but it does provide an overall lens through which the results of the evaluation results may be viewed. The overall categorization of OUTPUTS into short, intermediate, and long term outcomes follows the logic that process outcomes will be achieved early and that specific deterrence outcomes will likely be achieved before general deterrence outcomes as the latter require widespread and sustained public awareness of the consequences of impaired driving vis a vis AALS legislation.

AALS PROJECT LOGIC MODEL

INPUT

Project Resource

- Alberta Police Services
- Transportation Safety Board
- PIDC Committee
- AALS Legislation

Program Goal

To remove drunk drivers from Alberta's roadways

- **Ultimate Achievement**
- **Measurable**

Project Beliefs

- Immediate and severe consequences for impaired driving is an effective deterrent for this behaviour

OUTPUT

Formative → Summative
Simple → Complex
$ → $$$

ACTIVITIES

1. Immediate suspension of driver's licence;
2. Automatic three-month driver's licence suspension or disqualification for drivers charged with providing a breath or blood sample more than .08 or refusing to give a breath or blood sample;
3. Automatic six month driver's licence suspension or disqualification if the offense results in bodily harm or death; and
4. A 21-day temporary permit to allow the driver to set his or her affairs in order.
5. Information of AALS suspension is shared electronically between police, the Justice Online Information Network (JOIN) and the Motor Vehicles System (MOVES).
6. Driver can appeal AALS suspension

TARGET

Short Term

COURT SYSTEM AND PROCESS OUTCOMES

1. Reduction in the number of trials scheduled/heard for alcohol related offences
2. Increased efficiencies in Transportation Safety Board appeal process
3. Assess the number guilty pleas on alcohol related offences on first appearance

Intermediate

SPECIFIC DETERENCE OUTCOMES

1. Reduction in the annual number of repeat offender convictions for alcohol related offences
2. Reduction in the number of alcohol involved drivers in repeat casualty collisions

Long Term

GENERAL DETERENCE OUTCOMES

1. Reduction in the number of alcohol involved casualty collisions
2. Reduction in the number of drinking driver fatal collisions
3. Reduction in number of drinking drivers involved in casualty collisions (sp age, gender)
4. Reduction in severity of alcohol related collisions
5. Reduction in the average monthly drinking driver fatal collisions
6. Reduction in overall/monthly nighttime vehicle crashes
7. Reduction in the number of property damage only collisions
8. Reduction in Average Blood Alcohol Concentration (BAC) test results
9. Reduction in the number of convictions for alcohol related offences
10. Reduction in number of persons charged for alcohol related offences over time

Evaluate Framework

(Experience)　(Literature Review)　(Context Review)　(Indicators)　(Methods)

Correlation/Cause and Effect

"control" – cost-effectiveness

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3.6 Structure of this Report

This report is presented in several sections that mirror the program structure as set out in the Program Logic Model.

Presentation of findings is prefaced by a description of the evaluation methodology, and outcomes of the brief literature review and synthesis. The first section reporting findings focuses on short-term process outcomes, the second on intermediate-term specific deterrence outcomes, and the third section on long-term general deterrence outcomes.

Stakeholder perspectives on the programs effectiveness are then presented. The next section focuses on an examination of the assumptions underlying general deterrence theory. The final section of the report presents conclusions and recommendations of the study.

NOTE: It should be emphasized that this report does not present the specific details of all analyses described in the Evaluation Plan. In order to produce a clear evaluation report that is not overloaded with technical detail, only the key findings are presented.

4. Evaluation Methodology

4.1 Goal and Scope of the Evaluation

The goal of the evaluation was to assess the effectiveness of the Alberta Administrative Licence Suspension (AALS) Program in reducing the incidence of impaired driving behaviour and alcohol-related collisions in the province. The evaluation included examination of existing data sources and collection of additional data in an attempt to confirm the core assumptions that link the program to anticipated outcomes.

The evaluation sought to provide credible evidence that would facilitate determination if and to what extent any changes in driver behaviour, collision rates, and court system impacts over time in Alberta could be <u>attributed</u> to the AALS program. Confirmation of causal linkage between driver behaviour and the program through a controlled (randomized control) was not possible as the legislation was introduced province wide. Instead, time series analyses methods were used. In addition, comparisons with Saskatchewan driver behaviour data were made. Saskatchewan was chosen as it was a comparable province without similar legislation.

4.2 Testing Program Assumptions

There are some important assumptions made when a direct link is assumed between specific legislation aimed at deterrence and actual driver behaviour. The most important assumption is that there must be a certain level of awareness of the legislation for it to have an impact on behaviour. When it comes to specific deterrence the link is quite evident. An impaired driver becomes aware of the consequences of their actions when they become involved in the justice system. When it comes to general deterrence, however, it is more difficult to confirm that changes in population behaviour can be attributed to a change in legislation. For example, in Ontario Mann, et al. (2000) found that 76.0% of respondents to a survey identified licence suspension as a consequence of impaired driving. However, the link between drinking and awareness of licence suspension was not made, although impaired driving self report also decreased after licence suspension legislation was implemented.

It is also important to acknowledge that awareness of the consequences of impaired driving may be insufficient to deter behaviour. An individual's perception of the probability of being apprehended or involved in a collision while impaired factors into the individual's decision whether or not to drive impaired. Awareness of the legislation and perception of risk may interact to change behaviour.

In this study, it was important to test the assumption that new legislation (immediate licence suspension) could be directly linked to reduced impaired driving.

In addition to this, the evaluation approach formally tests the assumptions linking legislative changes to behavioural changes using regression techniques that capitalize on existing demographic variations throughout the province.

4.3 Key Evaluation Questions

Evaluation activity was guided by the following <u>Key Evaluation Questions.</u> Some evaluation questions were provided in the Request for Proposals. Others were added by the consultants to enhance the ability to attribute change to the AALS program. It should also be noted that several of the questions could not be answered due to the aggregate nature of some data sources. These are noted in the table below.

1.	**What are the impacts of the new AALS on the reduction of alcohol related traffic collisions in Alberta?**
1a.	Has there been a reduction/change in the number of alcohol involved casualty collisions over time?
1b.	Has there been a reduction/change in the number of drinking driver fatal collisions?
1c.	Has there been a reduction/change in severity of alcohol related collisions?
1d.	Has there been a reduction/change in the average monthly drinking driver fatal collisions?
1e.	Has there been a reduction/change in overall/monthly nighttime vehicle crashes?
1f.	Has there been an age group that has shown a reduction/change in drinking driver casualty collisions?
1g.	Has there been a gender group that has shown a reduction/change in drinking driver casualty collisions?
1h.	Has there been a reduction in the number of property damage only collisions? (if sample data is sufficient to accurately reflect any changes that may have occurred)
*1i.	Are demographic variations in process (4f-4g) significantly related to demographic variations in traffic collisions (1f-1g)?
2.	**What are the impacts of the new AALS on the driving records/behaviors of Albertans?**
2a.	What is the change in Average Blood Alcohol Concentration (BAC) test results before and after the legislation?
2b.	What is the change in the number of convictions for alcohol related offenses?
2c.	What is the change in the annual number of persons charged for alcohol related offences over time?
2d.	What is the change in the annual number of repeat offender convictions for alcohol related offences?
*2f.	Are demographic variations in process (4f-4g) significantly related to demographic variations in driving records/behaviours (2a-2b)?
3.	**What are the impacts of the new AALS on the court system in Alberta?**
3a.	How many people charged and entered guilty pleas (at any time) for refusing to provide a breath sample, providing a breath or blood sample, over .08 and impaired before and after implementation of AALS?

3b.		Has the number of guilty pleas or persons charged on alcohol related offences increased on:
	i)	First appearance?
**	ii)	Second appearance?
**	iii)	Subsequent appearances?
3c.		Has there been a reduction in the number of trials <u>scheduled</u> for alcohol related offences?
3d.		Has there been a reduction in the number of trials <u>heard</u> for alcohol related offences?
4.		**Process**
4a.		What was the average length of time between suspension and a Transportation Safety Board hearing date?
4b.		What was the average length of time between the Board receiving an AALS appeal and a hearing date?
4c.		How many suspensions have been revoked by the Board (i.e., appeal allowed)?
*4d.		How was the population informed about the AALS program?
*4e.		What were the changes in enforcement capacity (e.g., officers per 1000 drivers) over time?
*4f.		To what extent is the population aware of AALS?
*4g.		What is the populations' perception about the risk of apprehension?
*4h.		What additional assumptions link AALS to changes in driver behaviour?

*   Questions added by evaluators
**   Questions that could not be answered with data provided (see Appendix B)

4.4 Data Collection Strategies

4.4.1 Literature Synthesis

In 2001, Beirness conducted a review of administrative licence suspension programs in Canada and internationally. As part of this evaluation, the consultants updated Beirness' review. Our search strategy covered published literature and grey literature (i.e., conference proceedings, government publications). The primary databases searched included Pubmed, Embase, Psycinfo, and Eric. Appropriate web sites and conferences were identified through an internet search using the Google search engine.

The current literature review was conducted to identify and describe the effectiveness of similar programs implemented in other jurisdictions. In addition, the assumptions that link expected outcomes to the implementation of new legislation were examined to identify potential barriers and facilitators to impacting change in the community.

4.4.2 Document Review

This evaluation also included an examination of all documents related to development and implementation of the AALS Program. Additional searches for

police service documentation were also conducted to identify changes in enforcement strategies that may represent alternative explanations for findings.

4.4.3 Media Scan

A media scan was conducted to provide an indication of the amount of media coverage for the AALS program. An assumption of general deterrence is that the public needs to be aware of the legislation for it to have a deterrent effect. Given availability of various data sources, the following periodicals were used as convenience samples: Calgary Herald, Edmonton Journal, Lethbridge Herald, Medicine Hat News, Hanna Herald and The Peace River Gazette. Convenience samples were selected based on the prohibitive costs associated a full province-wide media scan (see Appendix C). The following data elements were gathered: article date, page (prominence), length type of article (letter to the editor, editorial, article).

4.4.4 Stakeholder Interviews

The evaluators conducted 11 stakeholder interviews, either in person or by telephone. Stakeholders included representatives from police agencies (RCMP, Edmonton Police Service, Calgary Police Service, Lethbridge Police), Alberta Health and Wellness, AADAC, Alberta Centre for Injury Control, the legal profession, and Alberta Government.

Questions probed satisfaction with the implementation strategy, perceived barriers and facilitators to implementation, implementation assumptions, potential threats to the validity of attributing changes to the AALS, and perceptions of program effectiveness. (see Appendix D)

4.4.5 Existing Data Sources

The majority of the evaluation activity relied on existing data sources as follows:

- Alberta traffic collision data 1992-2002 inclusive provided by Alberta Infrastructure and Transportation
- Saskatchewan traffic collision data 1992-2002 inclusive provided by Saskatchewan Government Insurance
- Raw data from population surveys provided by Criterion Research Corporation (December 1999 item 4, September 2000, November 2001
- Fatally injured BAC data file provided by the Traffic Injury Research Foundation
- Intoxilyzer data provided by the Calgary Police Service
- Intoxilyzer data provided by the Edmonton Police Service
- Intoxilyzer data provided by the Camrose Police Service
- Alcohol-related offence convictions data provided by Alberta Government Services - Registries, MOVES database

- AALS appeal hearing data provided by Alberta Infrastructure and Transportation
- Alberta Adult Criminal Court survey data for alcohol-related trials provided by Alberta Justice, Attorney General and Canadian Centre for Justice Statistics (CCJS)
- Summary Data on total number of AALS suspended individuals provided by Alberta Infrastructure and Transportation
- Summary data for alcohol related charges provided by Alberta Solicitor General

4.5 Data Analyses

A brief description of the quantitative and qualitative methods used for the evaluation is provided below. Given that the goal of the evaluation program was to establish the effect of the new legislation on quantitative indicators, evaluation activity involved primarily quantitative data analyses.

4.5.1 Literature Review and Synthesis

The literature was analyzed according to key evaluation questions and is presented by type of outcome within specific and general deterrence themes.

4.5.2 Media Scan

Given the small number or articles retrieved (N = 31), the primary analysis was restricted to describing the frequency of AALS articles over time. Secondary analyses identified articles where the AALS legislation was a major or minor theme.

4.5.3 Document Review

Documents were reviewed to provide contextual information for program development and implementation. This information is integrated throughout the evaluation report but is primarily reported in the introduction to this report.

4.5.4 Interview/Qualitative Data

Data was content analyzed according to key evaluation questions. Data were subjected to two levels of analysis. First level analysis identified meaning units. Second-level analysis identified themes common across participants.

<u>4.5.5 Analyses of Existing Quantitative Data</u>

Existing data sources were primarily analyzed using statistical techniques. Where possible, data were analyzed using autoregressive integrated moving average (ARIMA) models. These models were developed using the iterative identification, estimation, and diagnosis strategy outlined by McCleary and Hay (1990). A step function was added to the model to estimate the magnitude and direction of change in indicators after the implementation of AALS. When ARIMA modeling could not be used, various parametric and non-parametric pre-post analyses were employed. These included binomial probability estimation, chi-square analyses, logistic regression analysis, t-tests, regression analyses, and basic descriptives. Most analyses were conducted using SPSS 11.5 and SPSS Trends. Data provided in summary format were analyzed using Excel. A full description of the analyses conducted on each outcome variable is provided in the Evaluation Plan (see Appendix B).

4.6 Literature Review and Synthesis

A brief literature review is presented that is organized according to specific and general deterrence outcomes that have been reported.

In 2001, Beirness conducted a review of administrative licence suspension programs in Canada and internationally. This evaluation updated the Beirness review. The search strategy covered published literature and grey literature (i.e., conference proceedings, government publications). The primary databases searched included Pubmed, Embase, Psycinfo, and ERIC. These databases were selected based on the description provided by Rivara, et al., (1998) for conducting systematic reviews of strategies to prevent motor vehicle injuries. In the Rivera study, a specific search was conducted for licence suspensions and graduated/provisional licensing. This was used as the starting point for the literature review. The review included relevant articles from 1997 – 2003. Additional relevant articles were identified from the reference lists from published articles.

Appropriate web sites and conferences were identified through an internet search using the Google search engine. Relevant web sites were identified and examined for relevant publications and links to other web sites. These were also the sources of conference proceedings, such as the International Conference on Alcohol, Drugs and Traffic Safety. The proceedings for relevant conferences were examined from 1997 through 2003.

At the time of the 2001 review, Beirness examined nine major evaluation studies of licence suspension programs (seven U.S.-based studies and two Canadian studies). These studies indicated that ALS was effective in general deterrence (changed behavior through a threat of a penalty for the behavior) and in specific deterrence (changed behavior among those who have had the penalty imposed upon them).

Through the literature review conducted for this project, a number of reviews were identified that substantiate the findings described in the Beirness (2001) review. These reviews support Beirness's (2001) conclusions regarding the effectiveness of ALS legislation.

4.7 Specific Deterrence

4.7.1 Decreased Recidivism

In three of the nine studies reviewed, Beirness (2001) identified a lower recidivism rate among DWI (Driving While Impaired) offenders who experienced ALS as opposed to DWI offenders charged prior to institution of ALS programs. These studies, in the United States and Canada, indicated that ALS programs impacted drinking and driving recidivism.

Since the Beirness 2001 study, additional studies have also indicated that administrative licence suspension laws appear to decrease recidivism among those with a DWI conviction. Notably, McArthur & Kraus (1999) published a systematic review of the specific deterrent effect of administrative suspension laws in reducing DUI (Driving Under the Influence) recidivism. They identified studies investigating recidivism rates among states with administrative licence suspension laws in the United States. Results indicated that administrative licence suspension laws were correlated with lower recidivism rates for at least one year after the initial suspension. In one of the studies reviewed, data from Nevada indicated a significant decrease in recidivism after implementation of an administrative licence suspension law up to 2.5 years post-implementation. However, at 36 months, the difference was no longer significant. Other studies reviewed contained data similar to that reviewed by Bierness (2001), although the studies were published more recently and may reflect more current data.

These combined data suggest that administrative licence suspension laws were effective in specific deterrence, i.e., in changing the behavior of DWI offenders, at least for one year post-offence. It is important to consider that two of the five states considered in the review did not demonstrate a significant decrease, implying that the success of such legislation was not guaranteed.

4.8 General Deterrence

4.8.1 Reductions in Collisions

Beirness (2001) found that states that enacted ALS reported between 3% and 19% decrease in crashes or driver fatalities. One study based in the United States did not indicate a positive effect on crashes from institution of ALS. In Canada, two studies indicated that ALS legislation was associated with reductions in drinking and driving fatalities. Overall, Beirness (2001) concluded that ALS programs could be positively associated with a reduction in traffic collisions involving alcohol.

Additional reviews also indicated that administrative licence suspension laws appear to be related to reductions in motor vehicle collisions and alcohol-related motor vehicle crashes. Voas, Tippetts, & Fell (2000) reported on a review of studies relating alcohol safety laws to drinking drivers in fatal collisions. Generally, Voas et al found that administrative licence suspension laws were related to reduced alcohol-related fatal collisions. For example, Wagenaar, et al. (1995) identified a reduction of 5% in alcohol-related fatal crashes. In a similar review of United States, Stout, et al. (2000) found that administrative licence suspension laws appeared to reduce motor vehicle fatalities. It is important to note that some of the studies examined in the Voas, Tippetts, & Fell (2000) review overlapped with studies included in the Beirness (2001) review.

ALS laws also appear to have some effect upon motorcycle laws. Zador, et al. (2003) found that ALS laws were associated with a 5% reduction in overall motorcycle fatalities, and a 2% reduction in alcohol-related fatalities.

4.8.2 Reductions in Alcohol Consumption

One study indicated that administrative licence suspension laws may influence alcohol consumption rates among drinking drivers. Stoduto, et al. (2000) found that drinking and driving individuals reported consuming fewer drinks after the introduction of ALS law in Ontario.

4.8.3 Other Effects

In addition to the effects on general and specific deterrence, additional significant effects attributed to administrative licence suspension programs reported include the following:

- Reduced time between offense and date of conviction (Beirness, et al., 1997; Lamble, Stewart, & Boase, 2000).
- Reduced charges for criminal drinking and driving and administrative suspensions (Lamble, Stewart, & Boase, 2000).
- Increased percentage of guilty pleas at first court appearance (Lamble, Stewart, & Boase, 2000).
- Changed knowledge and behavior (e.g., reduced self-reported drinking and driving behavior) (Stoduto, et al., 2000).
- Reduced alcohol consumption among those who reported drinking and driving (Stoduto, et al., 2000).

Note that many of these findings were preliminary and may or may not be confirmed by more recent research.

4.9 Implications

Findings from our review and synthesis of the literature were commensurate with the Beirness (2001) findings in that they demonstrated that ALS programs are

effective, albeit not in every instance. The largest gap in the literature appears to be in the identification of factors that influence the success or failure of an administrative licence suspension law in a particular instance. In the literature, a number of hypotheses are posed. For example, McArthur and Krauss (1999) found indications that public awareness and education campaigns may be connected with successful implementation of administrative licence suspension laws. They also suggested that the introduction of multiple alcohol-related laws at the same time may impact efficacy of ALS laws. Other factors that may influence efficacy include differential police enforcement of legislation, and economic and demographic differences. At the time of data collection, it appeared that there were no studies had explored the validity of these potential influencers.

When the efficacy of the Alberta Administrative Licence Suspension program has been determined, it may be beneficial to explore contributors and detractors from this success to maintain or enhance program success.

5. Key Findings

Key findings are organized according to process outcomes and effects on the court system, specific deterrence outcomes and general deterrence outcomes.

5.1 A. Process Outcomes and Effect on the Court System

KEY FINDING

The appeal process appears to have become more efficient with the passage of time. The rate at which appeals to an AALS suspensions resulted in the suspension being revoked by the Board increased after the full first year of the legislation. This appears to have stabilized at just over 52%.

5.1.1 AALS Suspensions

Summary Data on the total number of AALS suspended individuals provided by Alberta Infrastructure and Transportation were analyzed to describe the number of suspensions administered since the program began.

In the first 44 months of the AALS program [7] 28,076 suspensions, an average of 7656 per year, have been issued in Alberta (see Figure 1). As Figure 1 indicates there has been a decrease in the number of suspensions since January 1, 2000. Though this decrease is small, an average monthly reduction of 20.4 suspensions per year is statistically significant ($p < .05$).

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[7] December 1999 - July 2003 inclusive

Figure 1. Number of AALS Suspensions: Alberta
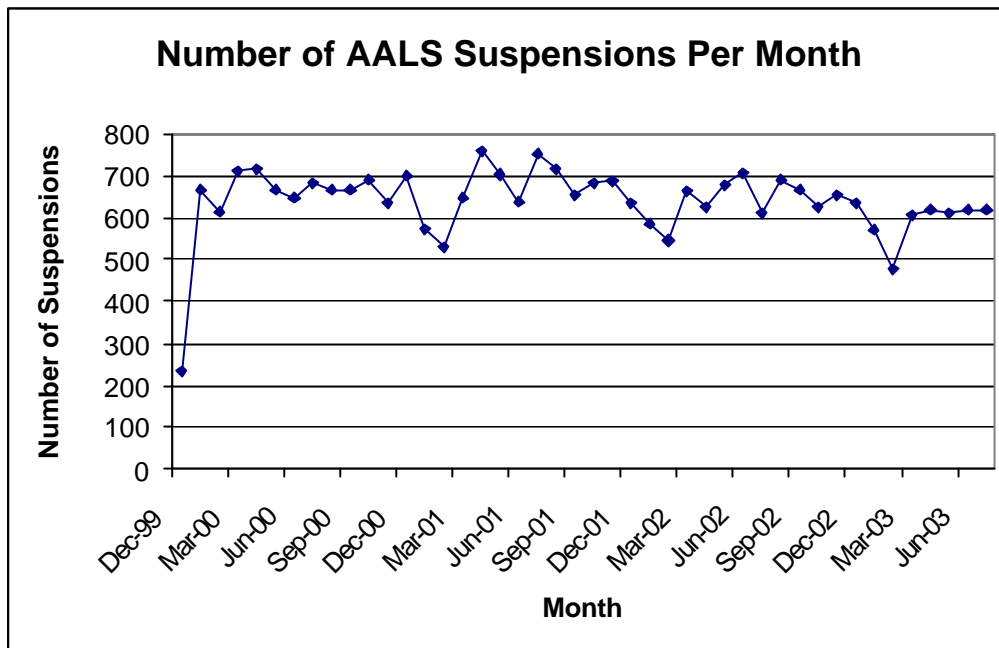
5.1.2 AALS Appeals

AALS appeal hearing data provided by Transportation Safety Board were analyzed to describe the number and outcome of AALS appeals.

Number and Results of Appeals

The appeal data analyzed included all appeals of those whose suspension start date, application received date, or hearing date was prior to December 31, 2002. There were 359 appeals that met these conditions. Of these, 2 (0.6%) were adjourned and not included in the analysis. Of the remaining 357, 170 (47.6%) were dismissed, 162 (45.4%) were allowed, and 25 (7.0%) were abandoned.

Of the 357 appeals, 353 had suspension start dates between January 1, 2000, and December 31, 2002. This represents an average of approximately 118 appeals per year. Of these, the suspension was revoked (appeal allowed) for 161 (45.6%) of the cases. This represents 0.7 % of the 23,729 suspensions initiated over this time period.

These 353 appeals were also analyzed for changes in revocation rates over time (see Figure 2). In 2000, 33 (29.7%) of the 111 appealed suspensions were revoked, in 2001, 54 (52.4%) of the 103 appealed suspensions were revoked, and in 2002, 74 (53.2%) of the 139 appealed suspensions were revoked. The increase between 2000 and 2001 was statistically significant ($\chi^2 = 11.408$, $p < .001$).

Figure 2. Percentage of Appealed Suspensions Revoked: Alberta

Percentage of Appealed Suspensions Revoked
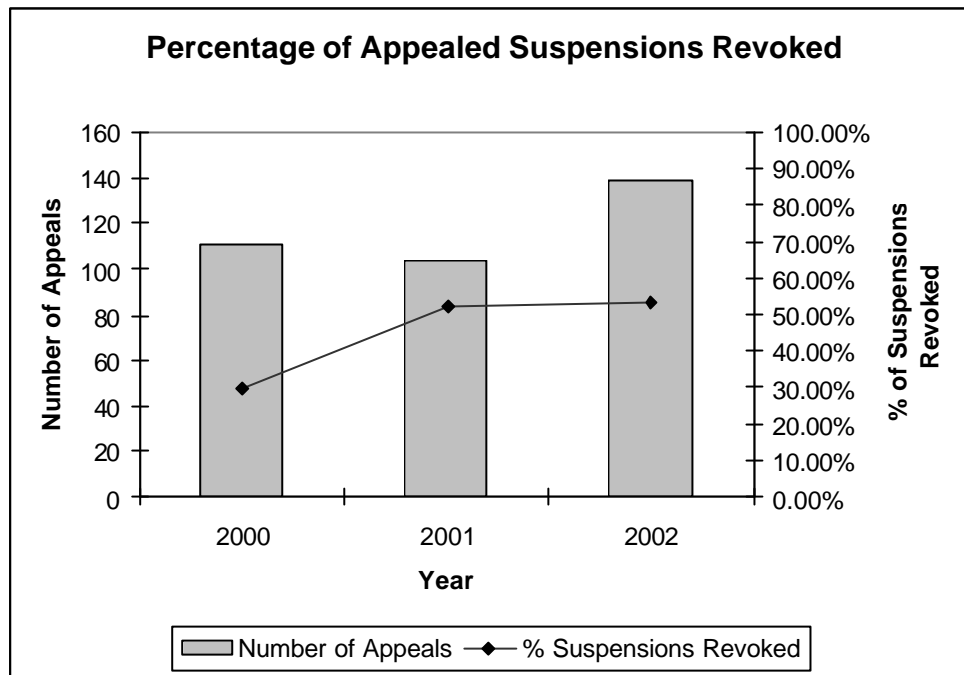
5.1.3 Length of Time Between Suspension Start Date and Hearing Date[8]

AALS appeal hearing data provided by Alberta Infrastructure and Transportation were analyzed to describe the time between suspension start date and hearing date.

For the 353 appeals that had suspension start dates between January 1, 2000, and December 31, 2002, the median number of days between suspension date and hearing date was 17 days. A cumulative percentage frequency distribution was calculated and is presented in Figure 3. As Figure 3 indicates, over 80% of cases were heard within the seventh week (45 days) from the suspension start date.

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[8] For appeals that are abandoned, the hearing date is the date the appeal was abandoned.

Figure 3. Weeks Between Suspension Date and Hearing Date: Cumulative Percentage of Cases: Alberta
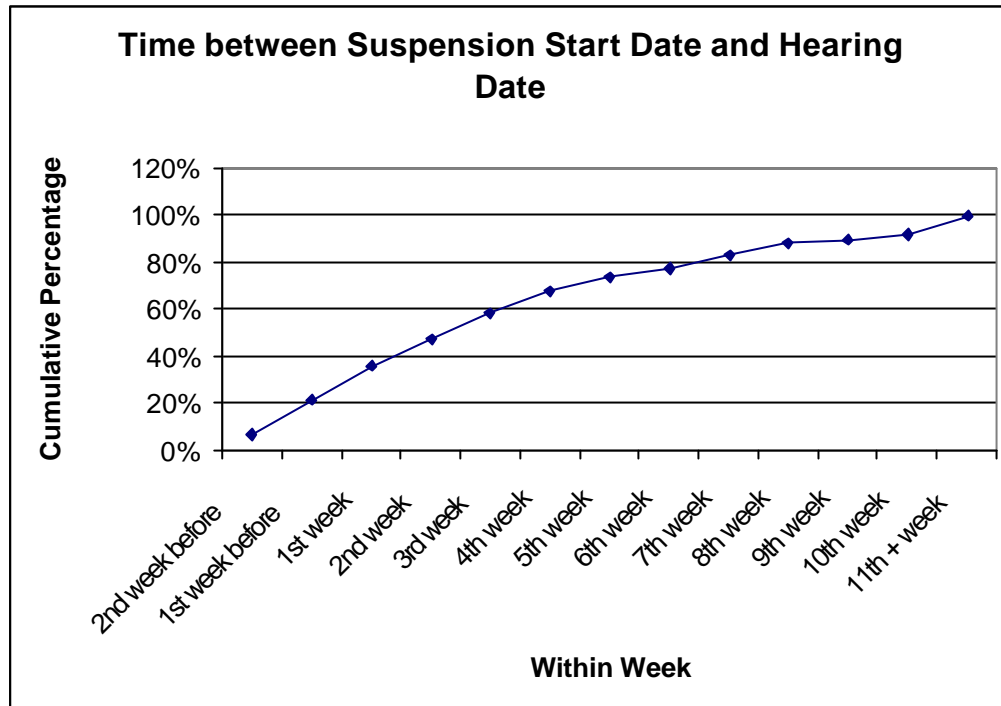
The time between suspension start date and hearing date as a function of appeal result is presented in Table 1.

Table 1. Days Between Suspension Date and Hearing Date as a Function of Hearing Result: Alberta

Result	Median	Over 80% heard within
Abandoned	53 days	392 days
Allowed (Suspension Revoked)	18 days	44 days
Dismissed	14 days	39 days

5.1.4 Length of Time Between Board Receiving an AALS Appeal and Hearing Date

AALS appeal hearing data provided by Alberta Infrastructure and Transportation were analyzed to describe the time between the board receiving the AALS appeal and the hearing date.

For the 353 appeals that had suspension start dates between January 1, 2000 and December 31, 2002, the median number of days between the board receiving the appeal and the hearing date was 9 days. A cumulative percentage frequency distribution was again calculated and is presented in Figure 4. As Figure 4 indicates, over 80% of cases are heard within the second week (14 days) of the suspension start date.

Figure 4. Weeks Between Appeal Received and Hearing Date: Cumulative
Percentage of Cases : Alberta
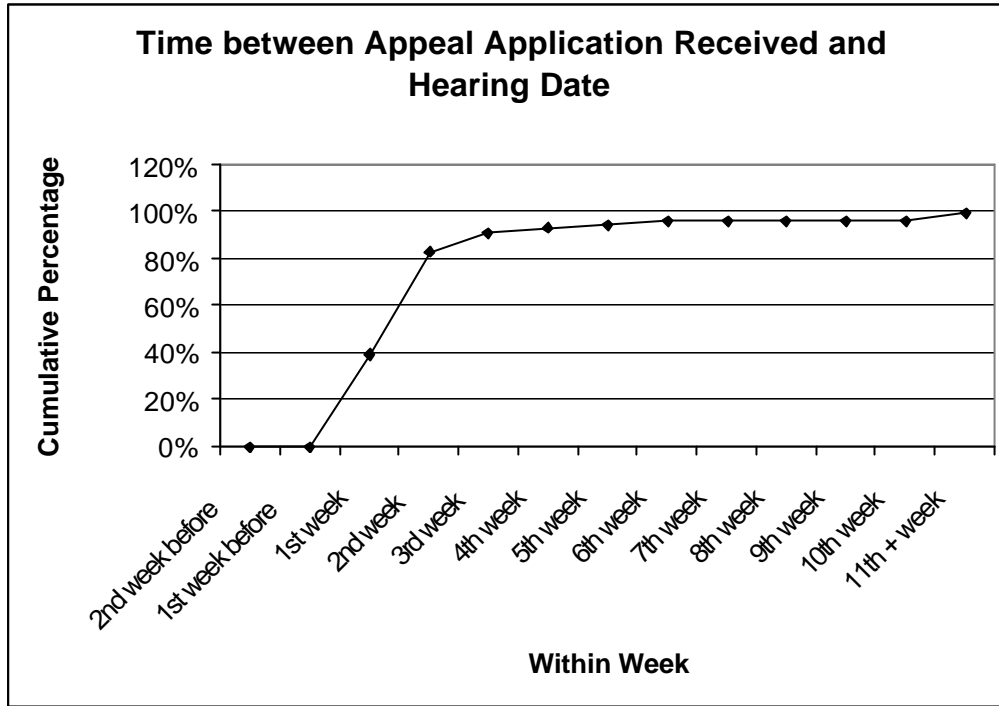
The time between the appeal application being received and the hearing date as
a function of appeal result is presented in Table 2.

Table 2. Days Between Application Received and Hearing Date as a Function of
Hearing Result: Alberta

Result	Median Days	Over 80% heard within
Abandoned	58 days	398 days
Allowed (Suspension Revoked)	8 days	13 days
Dismissed	9 days	14 days

5.1.5 Increased Efficiencies in Appeal Process

The amount of time that elapses between the appeal application being received
and the hearing date can be used as an indicator of the efficiency of the appeal
process. In order to determine if there have been increased efficiencies over time
the time between these events was computed separately for the years 2000,
2001, and 2002. These are presented in the Table 3. As Table 3 indicates, there
were increased efficiencies after the first full calendar year of AALS
implementation. This increased efficiency was statistically significant ($p < .05$).

Table 3. Days Between Application Received and Hearing Date as a Function of Year: Alberta

Year	N	Median	Over 80% heard within
2000	111	10 days	16 days
2001	103	8 days	14 days
2002	139	8 days	13 days

5.1.6 Overall Description of Appeal Process Timeline

On overall description of the appeal process timeline is provided in Table 4. This is provided to illustrate the time involved in each administrative step of the appeal process.

Table 4. Days Between Administrative Steps of the Appeal Process: Alberta

Appeal process	N	Median	Over 80% within
Days between suspension date and appeal received	353	5 days	30 days
Days between appeal received and information request	352	0 days	1 day
Days between information request and information received	352	1 days	4 days
Days between information received and hearing date	352	6 days	11 days
Days between hearing date and date result issued	329*	7 days	11 days

* Results are not issued f or abandoned cases

The appeal process appears to have become more efficient with the passage of time. The rate at which appeals to an AALS suspensions resulted in the suspension being revoked increased after the full first year of the legislation. This appears to have stabilized at just over 52%.

5.1.7 Effect on the Court System

Alberta Adult Criminal Court survey data for alcohol-related trials provided by Alberta Justice was examined for potential effects of AALS on the court system.

KEY FINDING

Overall, the AALS legislation, or the challenge to AALS legislation appears to have had impacts on the court system. The number of non trial guilty pleas increased by 3.3%, the number of guilty pleas on first appearance increased by 48%, and the number of cases that went to trial decreased by 26.0%. These changes were accompanied by a 52% reduction in the median time between first and last appearance, suggesting that the AALS legislation has reduced the tendency to delay court proceedings.

In Figure 5, the number and percentage of individuals (percentage of those charged) who pled guilty before trial are presented by fiscal year[9] beginning in 1994/1995. Given that AALS was implemented seven months into the 1999/2000 fiscal year it is considered a transition year and not included in analyses. A comparison of the three years prior to the transition year to the three years after indicates that the number of pre-trial guilty pleas increased from 18,173 to 18,773—a 3.3% increase (p < .005). This occurred within the context of a non-significant decrease in the total number of individuals charged from 26,785 to 26,349 over the same time period. When viewed as the percentage of pre-trial guilty pleas relative to total charges the rate increased from 67.8% to 71.2%, a 5.0% increase (χ^2 = 13.0, p < .001). As seen in Figure 5, much of this increase occurred in the first full fiscal year after AALS implementation, and subsequent years show a trend back toward pre AALS levels

Figure 5. Number and Percentage of Non-Trial Guilty Pleas: Alberta
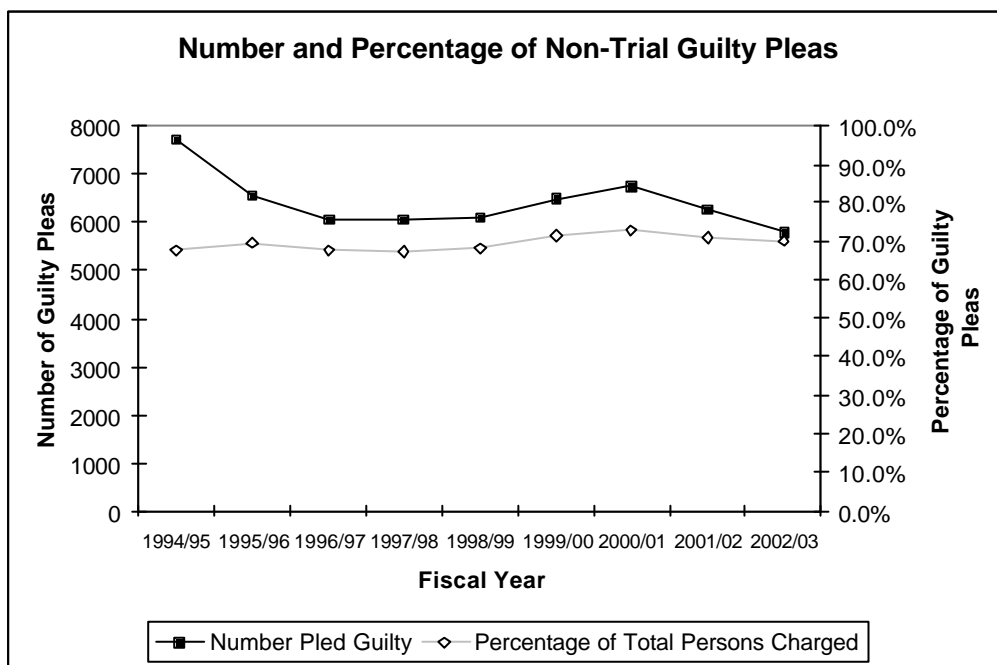
5.1.8 Median Days from First to Last Appearance

Figure 6 presents the median number of days from first to last appearance for all those charged with impaired driving offenses. Given that AALS was implemented seven months into the 1999/2000 fiscal year it is considered a transition year and not included in analyses. A comparison of the three years prior to the transition year to the three years after indicate an average median drop from 112.2 days to 53.3 days, a 52.5% decrease.[10] These results suggest that the AALS program may reduce the tendency for individuals to delay proceedings as the program

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[9] Data were available only in summary format by fiscal year.
[10] Summary data were provided as median elapsed days per fiscal year. This analysis is purely descriptive and cannot be tested for significance.

significantly reduces the benefit (continued driving privileges) of these delay tactics.

Figure 6. Median Days from First to Last Appearance: Alberta

Median Days From First to Last Appearance
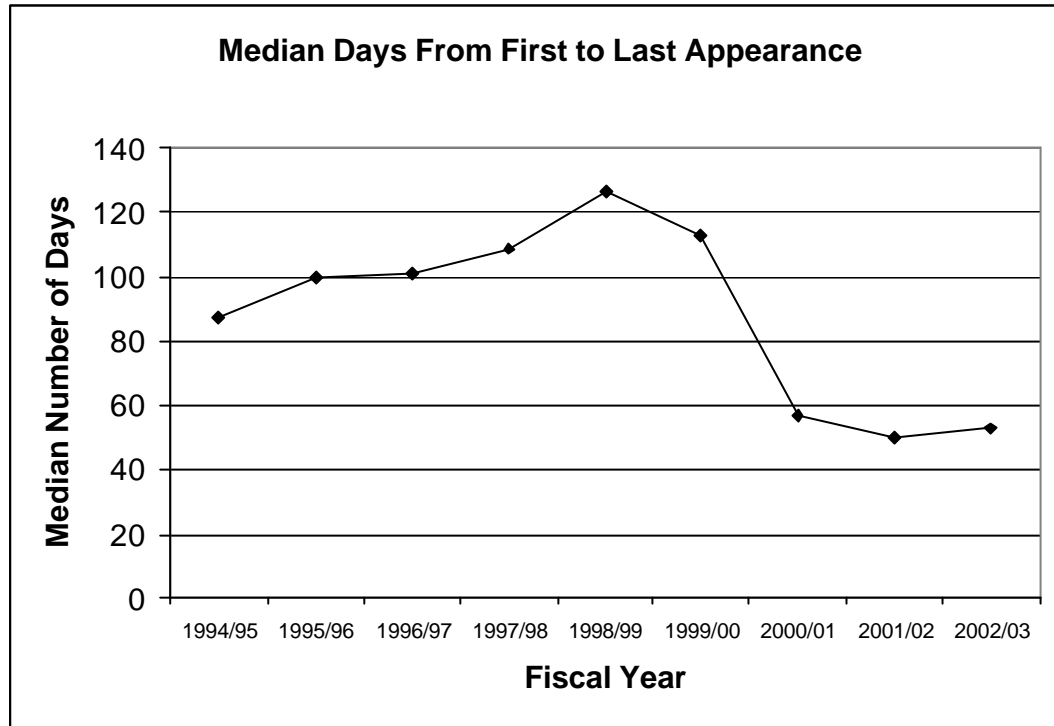
5.1.9 Guilty Pleas on First Appearance

Figure 7 presents the number and percentage of individuals (percentage of those charged) who pled guilty at first appearance by fiscal year. A comparison of the three years prior to the 1999/2000 transition year to the three years after saw the number of pre-trial guilty pleas increase by 48.0% (from 4,430 to 6,655, p < .001). When viewed as the percentage of pre-trial guilty pleas relative to total charges the rate increased from 16.5% to 24.9%, a 50.9% increase ($\chi^2 = 370.42$, p < .001). The number of guilty pleas would be expected to increase as the AALS suspension and criminal suspensions can be served concurrently.

Figure 7. Number and Percentage of Guilty Pleas at First Appearance: Alberta
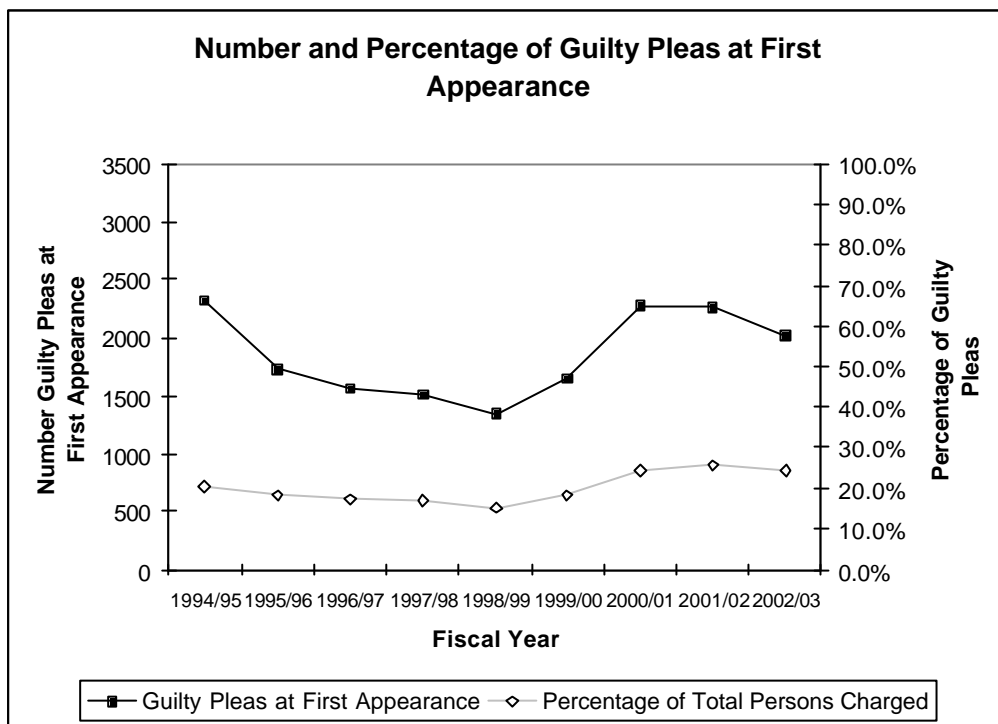
5.1.10 Trials Heard For Impaired Driving Charges

Figure 8 presents the number and percentage of individuals (percentage of those charged) who went to trial for impaired driving charges. A comparison of the three years prior to the 1999/2000 transition year to the three years after saw the number of trials decrease from 2,209 to 1,634, a 26.0% decrease (p < .001). When viewed as the percentage of trials relative to total charges the rate decreased from 8.3% to 6.2%, a 24.8% decrease ($\chi^2 = 71.7$, p < .001). As seen in Figure 8, this trend in decreasing trials predated AALS implementation suggesting caution should be used in attributing this change to AALS legislation.

Figure 8. Number and Percentage of Trials Heard for Impaired Driving Charges:
Alberta
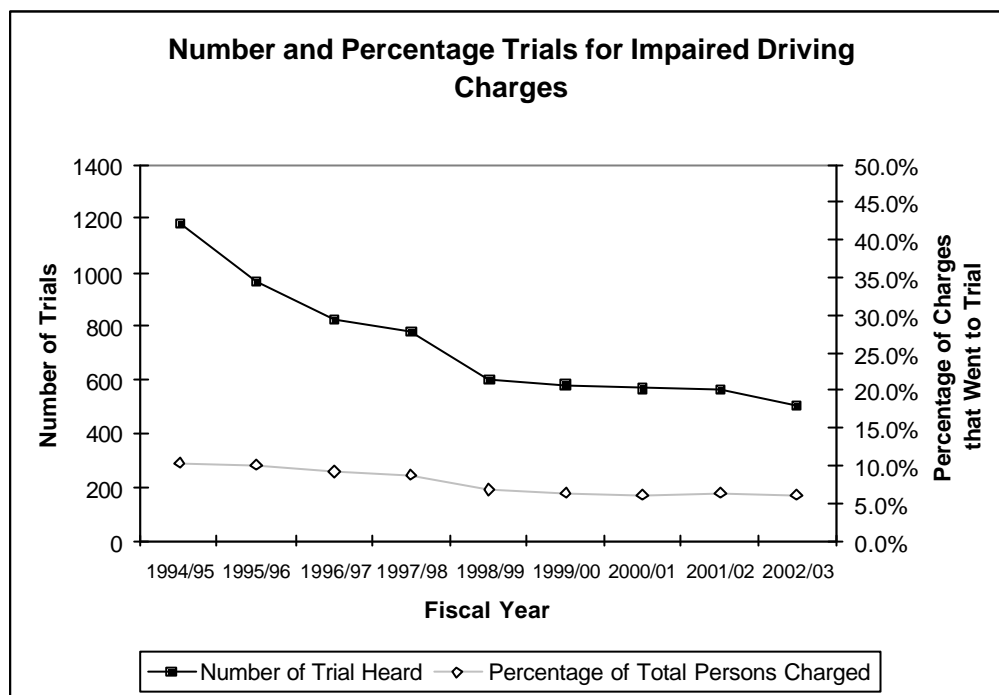
Overall, the AALS legislation, or the challenge to AALS legislation appears to
have had impacts on the court system. The number of non-trial guilty pleas
increased by 3.3%, the number of guilty pleas on first appearance increased by
48%, and the number of cases that went to trial decreased by 26%. This later
effect should be interpreted with caution as a trend toward decreasing trials
predated AALS implementation. These changes were accompanied by a 52%
reduction in the median time between first and last appearance, suggesting that
the AALS legislation has reduced the tendency to delay court proceedings.

5.2 B. Specific Deterrence - Repeat Offenders

KEY FINDING

Overall there is evidence that the AALS legislation may have significantly reduced the
offence recidivism rate. Over a two-year period this reduction may be as high as 24%.
Caution, however is warranted as there is no comparison group to reduce the possibility
of alternative explanations for this finding.

5.2.1 Convictions

Data from the Alberta Government Services - Registries, MOVES database was
analyzed to determine any changes in the number of repeat offender convictions

over time. Only one alcohol-related conviction per offence date was included in the analyses.

All of those offenses that occurred on or after January 1, 1992, and resulted in a conviction on OR prior to December 31, 2002, were included in the analyses. A survival analysis was conducted in which the percentage of individuals who were reconvicted within two years of an earlier offence date were computed. These results are presented by year of offense date in Figure 9. Rates for 2001 and 2002 could not be computed as the two-year window of opportunity for reconviction was not yet realized when the data were provided for analysis.[11]

A comparison of 1997[12] to 2000 saw number of re-offenders within two years decrease from 800 to 572, a 28.5% decrease (p < .001). This occurred within the context of a significant decrease in the total number of offenders from 8,245 to 7,781 over the same time period (p < .001). The percentage of re-offenders to total offenders decreased from 9.7% to 7.3%, a 24.3% decrease (χ^2 = 23.9, p < .001).

These results indicate that the AALS legislation may have had a significant and positive impact on reducing recidivism among those convicted for alcohol-related offences.

Figure 9. Number and Percentage of Re-Offenders Within Two Years of an Earlier Offence Date: Alberta
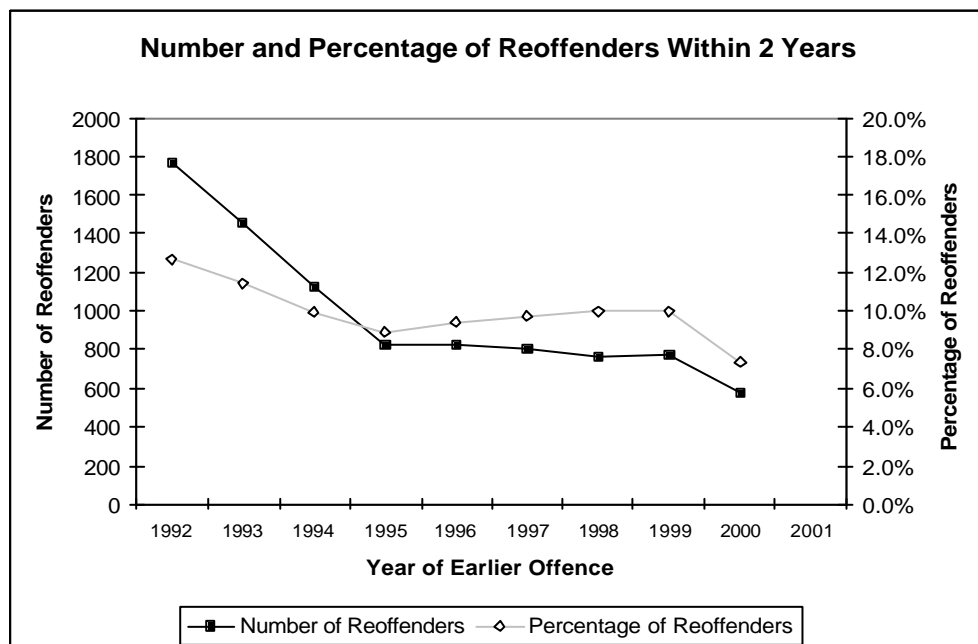
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<u>5.2.2 Alcohol Affected Drivers Involved in Casualty Collisions</u>

Alberta traffic collision data for the years1992-2002 were analyzed for drivers involved in more than one casualty collision for which they were suspected of having consumed alcohol. Given that the incidence rates for this situation are very low, the data were aggregated for a three year pre-post AALS comparison.

In the three years prior to the introduction of AALS there were 4,674 alcohol involved drivers involved in casualty collisions. Of these, 319 did not have operator numbers recorded on the incident report. Of the remaining 4,355 drivers, 4,269 were involved in a single incident and 43 were involved in two incidents. In the three year period after the introduction of the AALS there were 4,370 alcohol involved drivers involved in casualty collisions. Of these, 305 did not have operator numbers recorded on the incident report. Of the remaining 4,065 drivers, 3,994 were involved in a single incident and 35 were involved in two or more incidents (34 were involved in 2 and 1 was involved in 3). The change from 43 repeat offenders to 35 repeat offenders represents a 18.60% reduction post AALS implementation. Given the small numbers this reduction is not significant.

The proportion of repeat offenders to total offenders decreased from 9.97 per 1000 offender to 8.68 per 1000 offenders, a 12.89% reduction. This reduction was not significant.

The sample size of repeat offenses in Saskatchewan in the two-year period pre- and post-AALS (4 and 6 individuals respectively) was too small to conduct meaningful comparisons.

Overall there is evidence that the AALS legislation may have significantly reduced the offence recidivism rate. Over a two -year period this reduction may be as high as 24%. Caution, however is warranted as there is no comparison group to reduce the possibility of alternative explanations for this finding.

5.3 C. General Deterrence

This section presents findings in five areas as follows:

1) Alcohol-involved collisions
2) Alcohol-involved drivers
3) Blood alcohol levels
4) Impaired driving charges
5) Impaired driving convictions

<u>5.3.1 Alcohol-Involved Collisions</u>

Alberta traffic collision data for the years 1992-2002 were analyzed for the changes in the number of alcohol involved fatality and casualty collisions. Were possible, comparisons with Saskatchewan traffic collision data were made. It should be noted that "alcohol involvement" is not captured in the same way in Saskatchewan. Hence, caution is warranted when making comparisons across provinces.

KEY FINDING

AALS legislation appears to have significantly reduced the number of alcohol involved fatal collisions and the number and percentage of alcohol involved nighttime casualty collisions. Reductions in alcohol involved collisions overall were approaching significance.

An examination of trends over time suggest that much of the reductions occurred in the first year after AALS legislation came into effect and that rates returned to previous trends in the second and third years. AALS legislation did not appear to have an effect on police attended property damage only collisions.

Number of Casualty Collisions

In Figure 10, the number of alcohol involved casualty collisions are presented by year beginning in 1992.[13] For comparison purposes similar data from Saskatchewan are also presented.[14]

In the three years prior to the introduction of AALS there were 4,590 casualty collisions involving alcohol (127.5 per month). In the three-year period after the introduction of the AALS there were 4302 casualty collisions involving alcohol (119.5) per month. This represents a 6.3% ($p < .005$) reduction over pre-AALS levels.

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[13] Although data presented in the graph are presented relative to the calendar year, all statistical tests use December 1, 1999, to define the implementation period of the AALS program.
[14] Saskatchewan data is only presented until 2001, as an ALS program was instituted in Saskatchewan in March 2002.

Figure 10. Number of Casualty Collisions that Were Alcohol Involved: Alberta and Saskatchewan
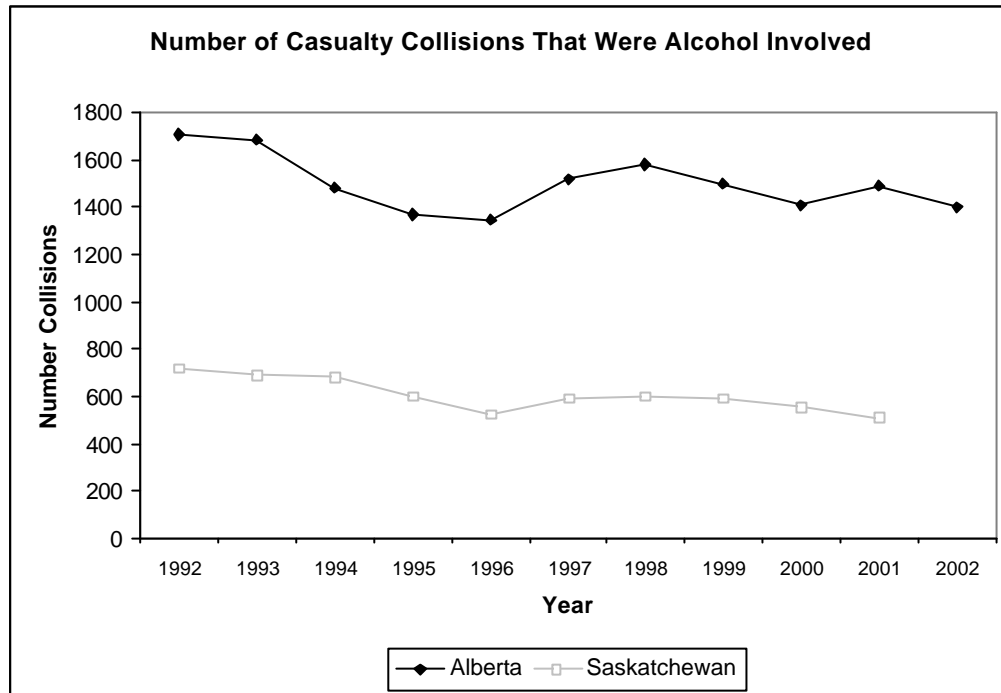
**Number of Casualty Collisions That Were Alcohol Involved**

In examining this reduction relative to a comparison province such as Saskatchewan, Alberta saw a reduction from 3,126 (130.2 per month) to 2,876 (119.8 per month) an 8.0% (p < .005) reduction between two years pre to two years post AALS while Saskatchewan saw a reduction from 1,202 (50.1 per month) to 1,073 (44.7 per month) a 10.7% (p < .01) reduction over the same time period. There was no significant difference between changes in Alberta rates in comparison to Saskatchewan.

Given that Saskatchewan is not an ideal comparison given differences in population size and other characteristics, long-term trend analyses were also conducted. Autoregressive integrated moving average (ARIMA) models were developed using the iterative identification, estimation, and diagnosis strategy outlined by McCleary and Hay (1990). A step function was added to the model to estimate the magnitude and direction of change in alcohol-involved collision rates after the implementation of AALS. The analyses indicated a small reduction approaching significance that may be attributed to the AALS program (t = -1.67, p = .097). A similar reduction was not found in Saskatchewan (t = -0.06, p = .953)

Interestingly, an examination of the actual versus predicted incidence rates identified using the ARIMA model suggests that reductions were largely realized in the first year after the AALS legislation was introduced (see Figure 11).

Figure 11. Actual and Predicted Alcohol Involved Casualty Collision Numbers:
Alberta
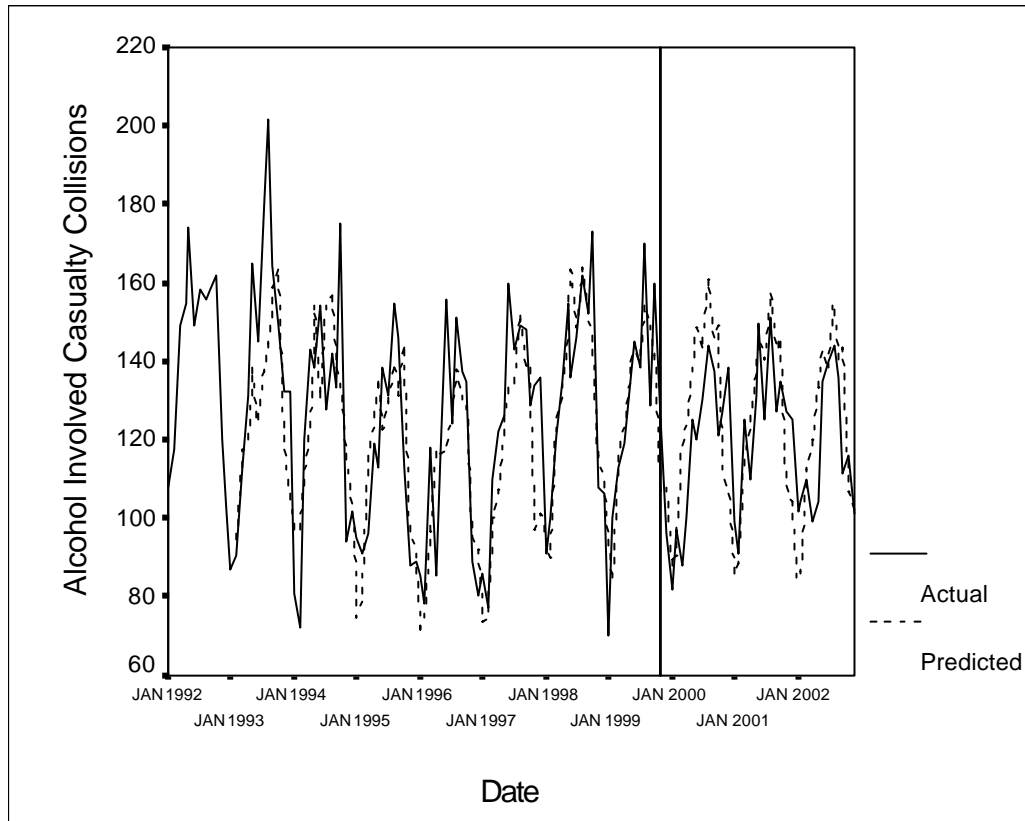
One reason for this non-significant result is that there has been a trend since
1992 of decreasing alcohol-involved collision rates which was accounted for in
the ARIMA analysis. In order to detect changes as a result of AALS
implementation a more profound reduction would have been required. Using a
seasonal decomposition procedure this 11-year trend was found to be significant
with an average reduction of 17.0 alcohol involved collisions per year (r = -.27,
p < .005).

Percentage of Casualty Collisions Involving Alcohol

In Figure 12, the percentage of casualty collisions that involved alcohol are
presented by year beginning in 1992. For comparison purposes similar data from
Saskatchewan are also presented.

In the three years prior to AALS introduction 8.9% of casualty collisions were
alcohol involved. In the three years following the introduction of AALS 7.4% were
alcohol involved, a 16.6% decrease over pre-AALS levels (p < .001 [15]).

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[15] Significance tested using binomial logistic regression.

Figure 12. Percentage of Casualty Collisions Involving Alcohol: Alberta and Saskatchewan

Percentage of Casualty Collisions That Were Alcohol Involved

In examining the two years pre and post AALS, Alberta saw a reduction from a rate of 9.0% to 7.7% (-14.5%, p < .001) while Saskatchewan saw a reduction from 11.3% to 10.4% (-10.3%, p < .01). There was no significant difference between changes in Alberta rates in comparison to Saskatchewan reducing the confidence with which these results can be attributed to the AALS program.

ARIMA analyses were also conducted on these monthly rates. A small non-significant reduction was found in Alberta (t = -1.19, p = .235) and a negligible increase was found in Saskatchewan (t = 0.06, p = .955).

The difficulty in finding effects that could be attributed to the AALS program could also be attributed to long-term trends toward reduced rates. A seasonal decomposition procedure this 11-year trend to be significant with the percentage of casualty collisions that are alcohol-involved decreasing by an average absolute amount of 0.57% per year (r = -.797, p < .001).

Number of Fatal Collisions

In Figure 13, the number of alcohol involved fatality collisions are presented by year beginning in 1992. For comparison purposes similar data from Saskatchewan are also presented.

Figure 13. Number of Fatal Collisions that Were Alcohol Involved: Alberta and Saskatchewan

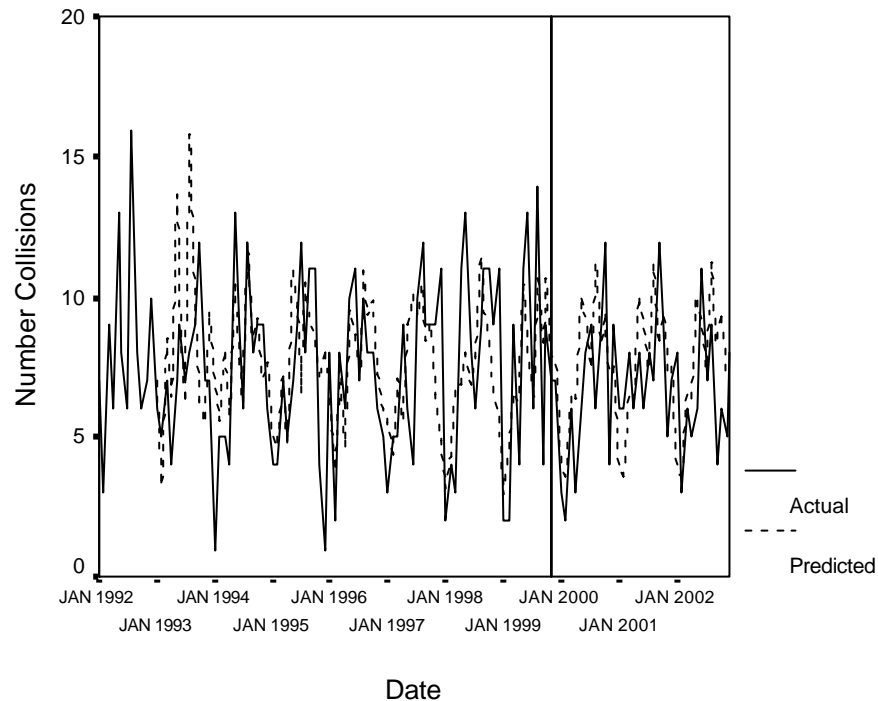**Number of Fatal Collisions That Were Alcohol Involved**
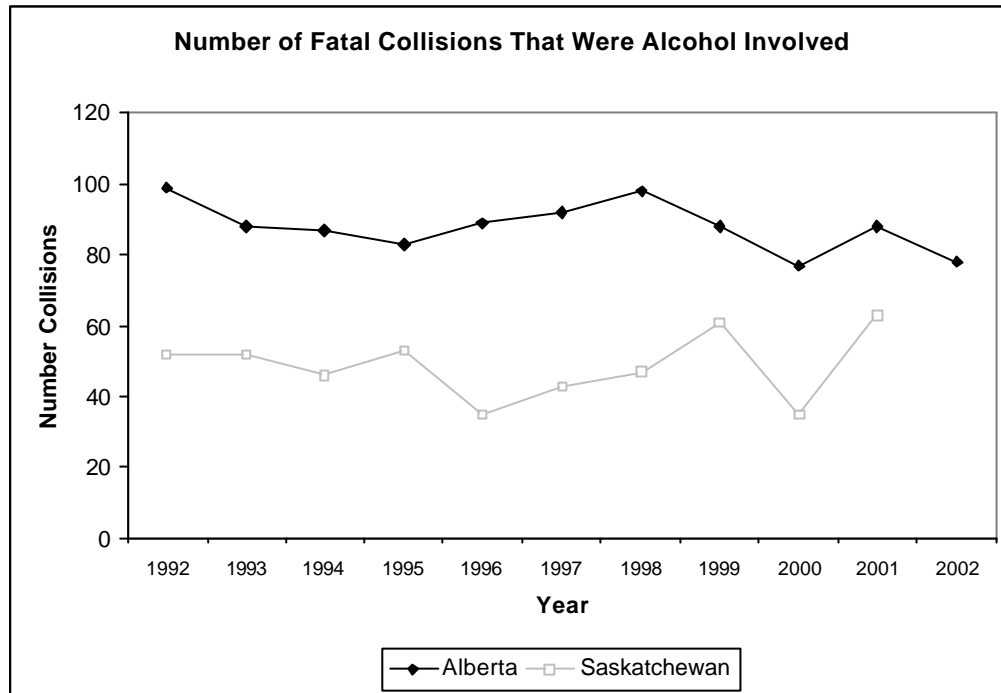
In the three years prior to the introduction of AALS there were 276 fatal collisions involving alcohol (7.7 per month). In the three-year period after the introduction of the AALS there were 242 (6.7 per month) fatal collisions involving alcohol, a 12.3% reduction. This reduction, however, was not statistically significant (p = .147).

In examining this reduction relative to Saskatchewan, Alberta saw a reduction from 190 (7.9 per month) to 165 (6.9 per month) a 13.2% (p = .203) reduction between two years pre and two years post AALS while Saskatchewan saw a reduction from 114 (4.7 per month) to 96 (4.0 per month) a 15.8%, (p = .241) reduction over the same time period. There was no significant difference between changes in Alberta rates in comparison to Saskatchewan (p = .860).

Given that with lower incidence rates the above analyses are not particularly powerful, long-term trend analyses were also conducted. The analyses indicated a significant reduction that may be attributed to the AALS program (t = -2.00, p < .05). A similar reduction was not found in Saskatchewan (t = 0.00, p = 1.00). The actual versus predicted incidence rates for Alberta identified using the ARIMA model are presented in Figure 14.

Figure 14. Number of Actual and Predicted Alcohol Involved Fatality Collisions: Alberta


Percentage of Fatal Collisions Involving Alcohol

In Figure 15, the percentage of fatal collisions that involved alcohol are presented by year beginning in 1992. For comparison purposes similar data from Saskatchewan are also presented.

In the three years prior to AALS introduction 27.0% of fatal collisions were alcohol involved. In the three years following the introduction of AALS 25.1% were alcohol involved, a 7.1% decrease over pre-AALS levels. This change was not significant (p = .334).

Figure 15. Percentage of Fatality Collisions Involving Alcohol: Alberta and Saskatchewan

Percentage of Fatal Collisions That Were Alcohol Involved
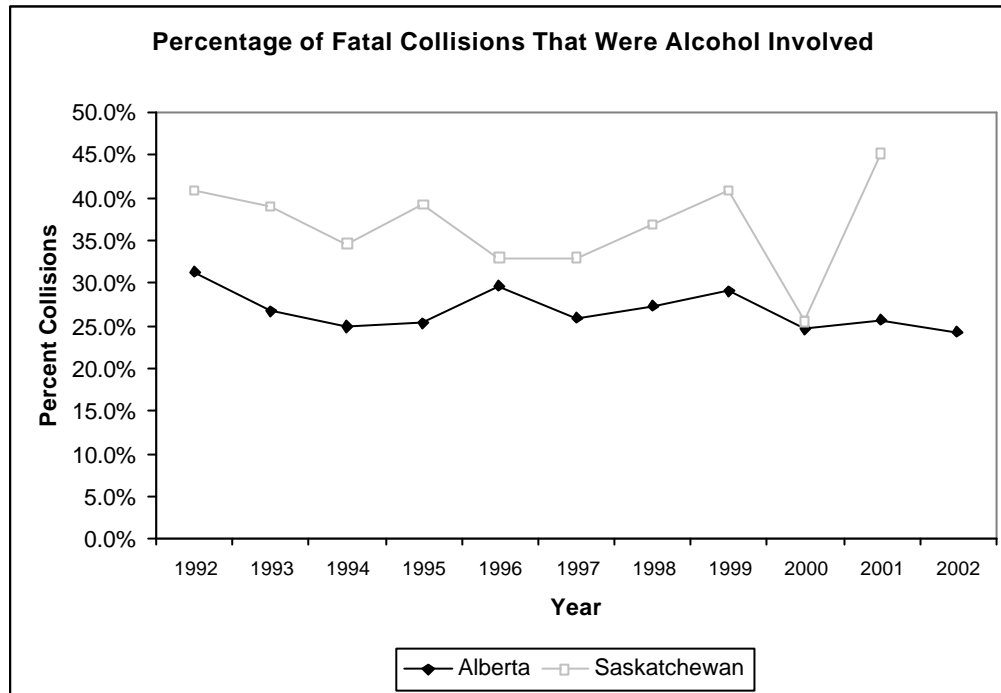
In examining the two years pre and post AALS, Alberta saw a reduction from a rate of 28.3% to 24.9% (-11.9%, p = .167) while Saskatchewan saw a reduction from 40.3 to 34.4 (-14.6%, p = .150). The difference between Alberta and Saskatchewan was not significant (p = .710).

Given that with lower incidence rates the above analyses are not particularly powerful, long-term trend analyses were also conducted. The analyses indicated a non-significant reduction in Alberta (t = -1.45, p = .149). A smaller non-significant reduction was found in Saskatchewan (t = -0.52, p = .603).

*Number of Nighttime Casualty Collisions*

In Figure 16, the number of nighttime[16] alcohol involved casualty collisions are presented by year beginning in 1992. For comparison purposes similar data from Saskatchewan are also presented.

In the three years prior to the introduction of AALS there were 2,213 nighttime casualty collisions involving alcohol (61.5 per month). In the three-year period after the introduction of the AALS there were 2,052 nighttime casualty collisions involving alcohol (57.0 per month). This represents a 7.3% (p < .05) reduction over pre-AALS levels.

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[16] Nighttime was defined as the period between 10pm and 4am (Belton et al., 2003)
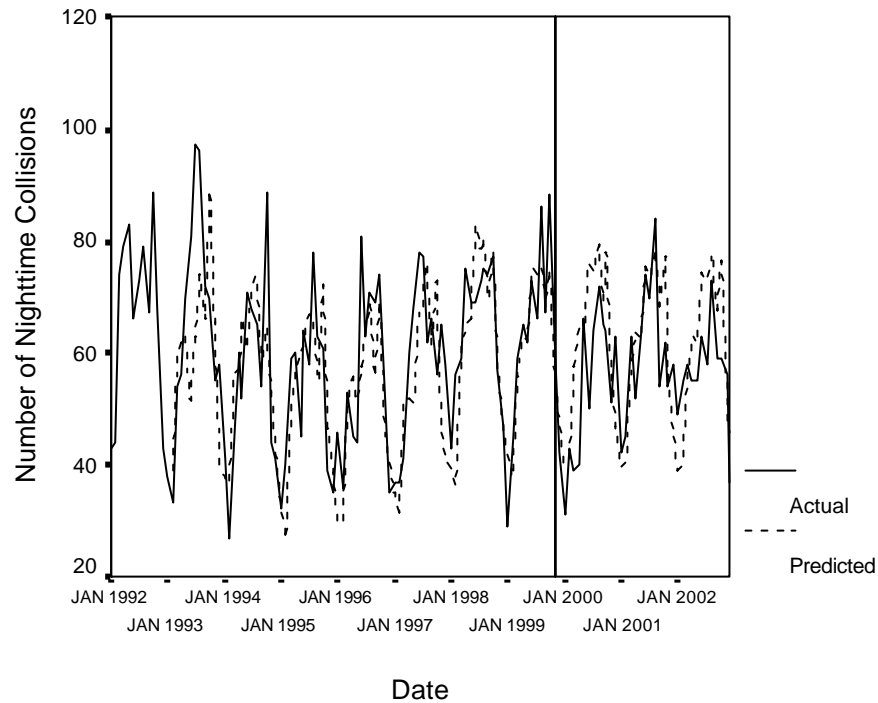
Figure 16. Number of Nighttime Casualty Collisions that Were Alcohol Involved: Alberta and Saskatchewan
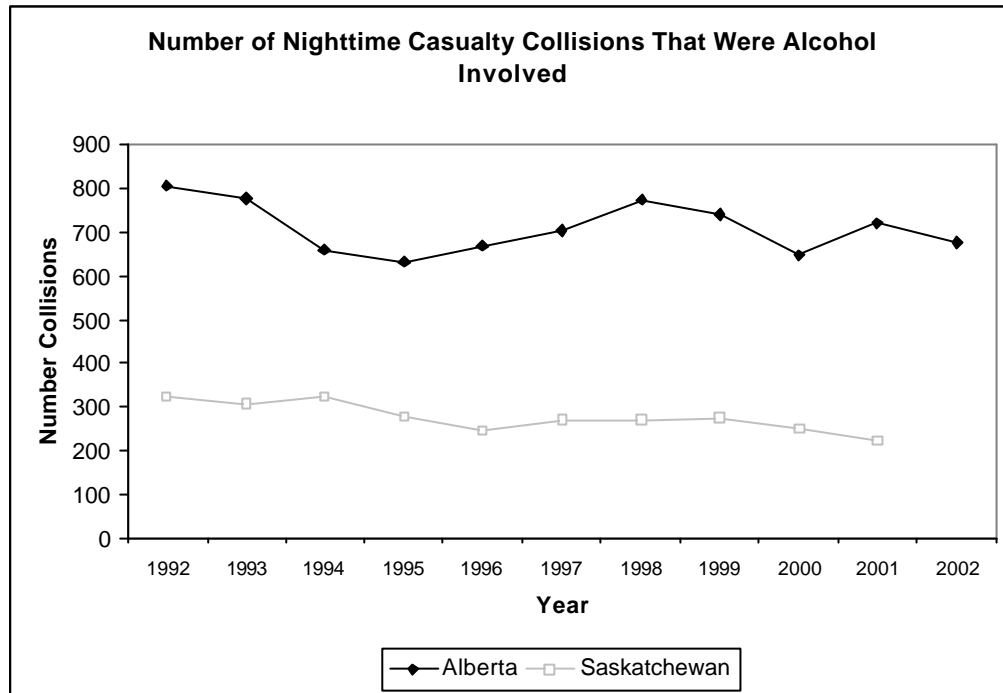
In examining this reduction relative to a comparison province such as Saskatchewan, Alberta saw a reduction from 1,531 (63.8 per month) to 1,354 (56.4 per month) an 11.6% (p < .005) reduction between two years pre and two years post AALS while Saskatchewan saw a reduction from 553 (23.0 per month) to 482 (20.1 per month) a 12.8% (p < .05) reduction over the same time period. There was no significant difference between changes in Alberta rates in comparison to Saskatchewan.

ARIMA analyses were also conducted on these monthly rates. A significant reduction was found in Alberta (t = -2.251, p < .05) and a negligible reduction was found in Saskatchewan (t = -0.19, p = .853). Interestingly, an examination of the actual versus predicted incidence rates identified using the ARIMA model suggests that reductions were largely realized in the first year after the AALS legislation was introduced (see Figure 17).

Figure 17. Number of Actual and Predicted Alcohol Involved Nighttime Casualty Collisions in Alberta
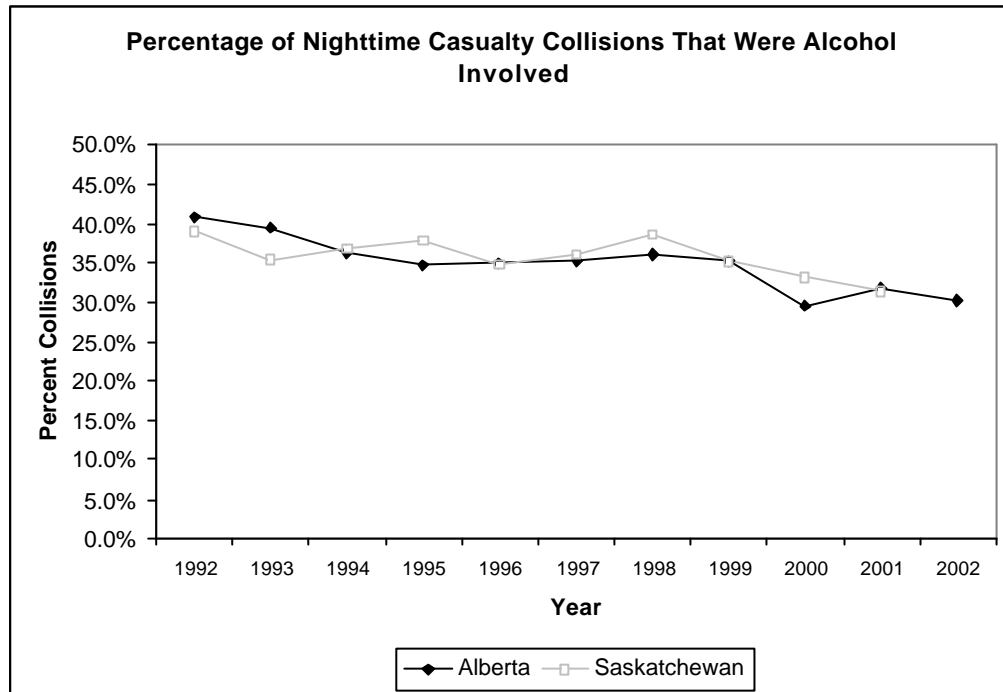

Percentage of Nighttime Casualty Collisions Involving Alcohol

In Figure 18, the percentage of nighttime casualty collisions that involved alcohol are presented by year beginning in 1992. For comparison purposes similar data from Saskatchewan are also presented.

In the three years prior to AALS introduction 35.5% of nighttime casualty collisions were alcohol involved. In the three years following the introduction of AALS, 30.8% were alcohol involved, a 13.2% decrease over pre-AALS levels (p < .001).
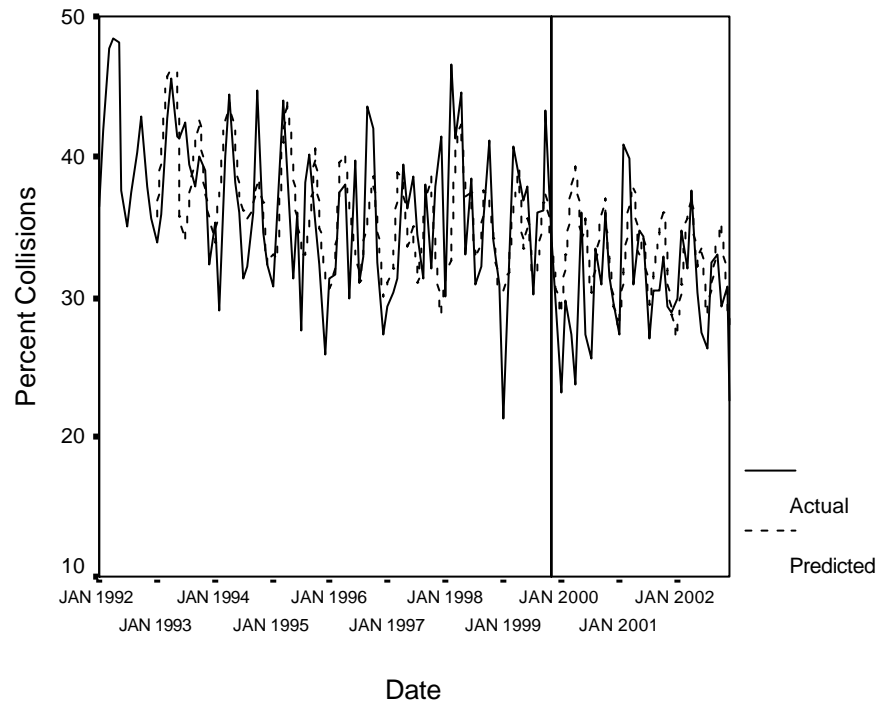
Figure 18. Percentage of Nighttime Casualty Collisions Involving Alcohol: Alberta and Saskatchewan

Percentage of Nighttime Casualty Collisions That Were Alcohol Involved

In examining nighttime casualty collisions in the two years pre and post AALS, Alberta saw a reduction from a rate of 36.0% to 30.8% (-14.5%, p < .001) while Saskatchewan saw a reduction from 37.1% to 32.6% (-12.3%, p < .05). The difference between Alberta and Saskatchewan was not significant

ARIMA analyses were also conducted on monthly rates. A significant reduction was found in Alberta (t = -2.55, p < .05) and a non-significant reduction was found in Saskatchewan (t = -0.84, p = .405). An examination of the actual versus predicted incidence rates identified using the ARIMA model suggests that reductions were largely realized in the first year after the AALS legislation was introduced (see Figure 19).

Figure 19. Percentage of Actual and Predicted Alcohol Involved Nighttime Casualty Collisions in Alberta

It should be noted that this effect was found despite a long-term trend towards reduced rates. A seasonal decomposition procedure of this 11-year trend was found to be significant with the percentage of nighttime casualty collisions that are alcohol involved decreasing by an absolute amount of 0.89% per year ($r = .58$, $p < .001$).

*Number of Alcohol-Involved Police Attended Property Damage Only Collisions*

A large proportion of property damage only collisions are not police attended. Since alcohol involvement is not captured on counter reported collisions these analyses are restricted to police attended property damage only collisions.[17] In Figure 20, the number of police attended property damage only collisions are presented by year beginning in 1992. For comparison purposes similar data from Saskatchewan are also presented.

In the three years prior to the introduction of AALS there were 6,122 (170.1 per month) police attended property damage only collisions involving alcohol. In the three year period after the introduction of the AALS there were 5,988 (166.3 per

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[17] In Alberta the scene code is less reliably captured than others (43.1% of the data is missing). Given that some services use the full collision report form for all reporting, the use of form types cannot be used as a substitute. For the purpose of these analyses, missing data for the scene visited field were recoded to scene visited unless the incident was reported on a counter report form or driver condition was not captured.

month) police attended property damage only collisions involving alcohol, a 2.2% reduction. This reduction was not statistically significant (p = .226).

Figure 20. Number of Property Damage Only Collisions that Were Alcohol Involved: Alberta and Saskatchewan
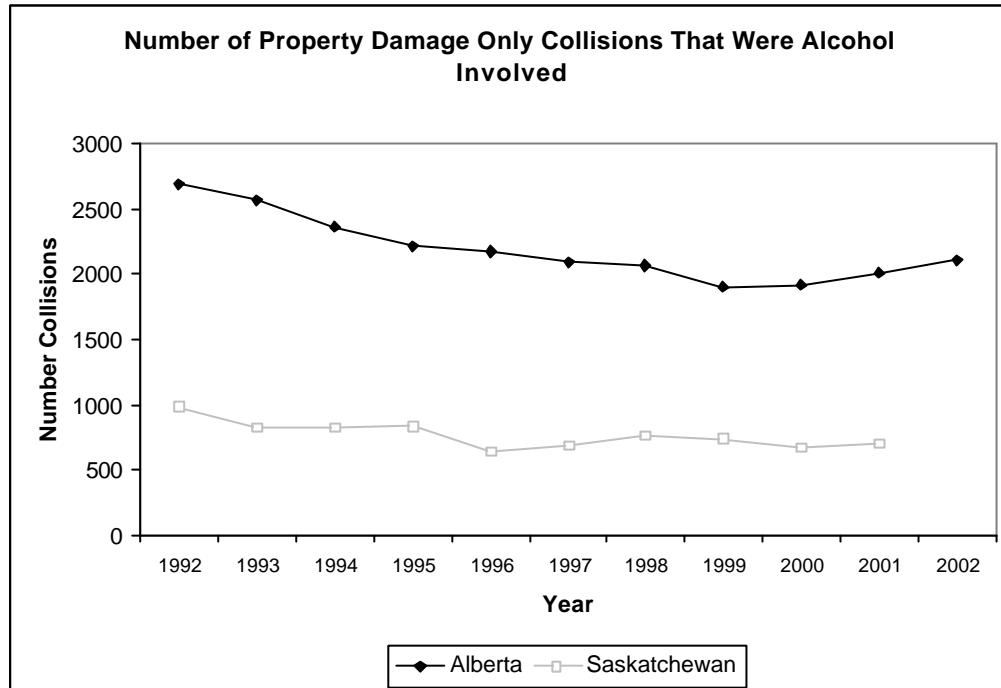
In examining this reduction relative to Saskatchewan Alberta saw a non-significant reduction from 3,994 (166.4 per month) to 3,905 (162.7 per month) a 2.23 % (p = .322) reduction between two years pre to two years post AALS while Saskatchewan saw a significant reduction from 1,514 (63.1 per month) to 1,374 (57.3 per month) a 9.25% reduction over the same time period (p < .01). The difference between changes in Alberta rates in comparison to Saskatchewan was approaching significance (p = .086).

ARIMA analyses were also conducted on these monthly rates. A small decrease over the predicted rate was found in Alberta (t = -0.42, p = .677) and a small decrease over the predicted rate was found in Saskatchewan (t = -0.64, p = .520).

As with previous analyses, a long-term trend towards reduced numbers made it difficult to find significant changes as a result of AALS. A seasonal decomposition procedure of this 11-year trend was found to be significant with the number of alcohol-involved police attended property damage only collisions decreasing by an average of 63.7 per year (r = -.66, p < .001).

Percentage Police Attended Property Damage Only Collisions that Involved Alcohol

In Figure 21, police attended property damage only collisions that involved alcohol are presented by year beginning in 1992. For comparison purposes similar data from Saskatchewan are also presented.

In the three years prior to AALS introduction 8.60% of police-attended property damage only collisions were alcohol involved. In the three years following the introduction of AALS 8.36% were alcohol involved, a 2.90% decrease over pre-AALS levels. This decrease was not is statistically significant (p = .227).

Figure 21. Percentage of Police Attended Property Damage Only Collisions Involving Alcohol: Alberta and Saskatchewan
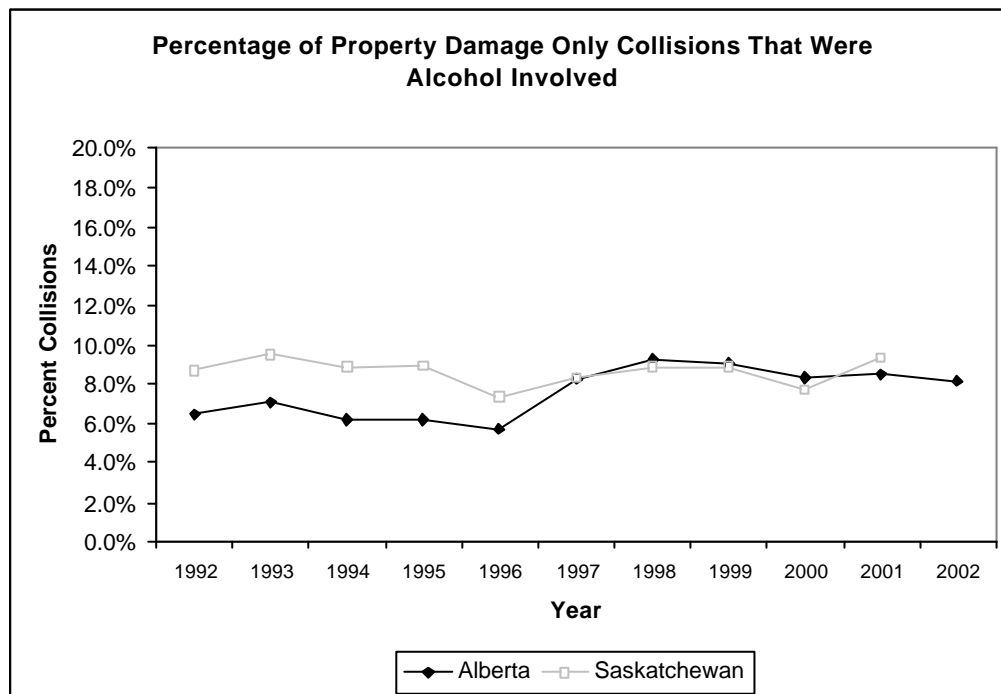
In examining the two years pre- and post-AALS, Alberta saw a reduction from a rate of 9.2% to 8.5% (-7.7%, p < .001) while Saskatchewan saw a reduction from 9.0% to 8.5% (-6.0%, p = .085). The difference between Alberta and Saskatchewan was not significant.

AALS legislation appears to have significantly reduced the number of alcohol involved fatal collisions and the number and percentage of alcohol involved nighttime casualty collisions. Reductions in alcohol involved collisions overall were approaching significance. An examination of trends over time suggest that much of the reductions occurred in the first year after AALS legislation came into effect and that rates returned to previous trajectories in the second and third years. AALS legislation did not appear to have an effect on police attended property damage only collisions.

5.3.2 Alcohol-Involved Drivers

KEY FINDING

Overall, the analyses indicate that there have been significant decreases in the number of alcohol-involved drivers in casualty collisions in Alberta in the 3 years after the introduction of AALS legislation. Decreases were found in all demographic groups except those in the 45-55 age group. Much of the decrease can be attributed to long-term trends toward reduced alcohol-involved casualty collisions, but there is some indication that some of this reduction, an amount approaching significance, may be a function of AALS legislation. This reduction appears to have occurred largely in the first year after the legislation was introduced. These effects were largely observed for males and those in the 18-24 age range

In examining the percentage of drivers involved in casualty collisions that were alcohol involved, the results paralleled those found above. The overall changes in the 3 years after the introduction of AALS were more robust, but further analyses revealed that these changes were largely a continuation of long-term trends towards reduced rates of alcohol involvement. Though the ARIMA analyses were not significant there is some indication that reduced rates as a function of AALS legislation are reported for males, those in the 18-24 age range, and those in the 55 and over age range.

Number of Drivers Involved In Casualty Collisions

The results for alcohol-involved drivers in casualty collisions parallel the findings at the collision level. In Figure 22, the number of alcohol-involved casualty collisions is presented by year beginning in 1992. For comparison purposes similar data from Saskatchewan are also presented. A breakdown by gender an age is presented in Figure 23.

Figure 22. Number of Drivers in Casualty Collisions that Were Alcohol Involved:
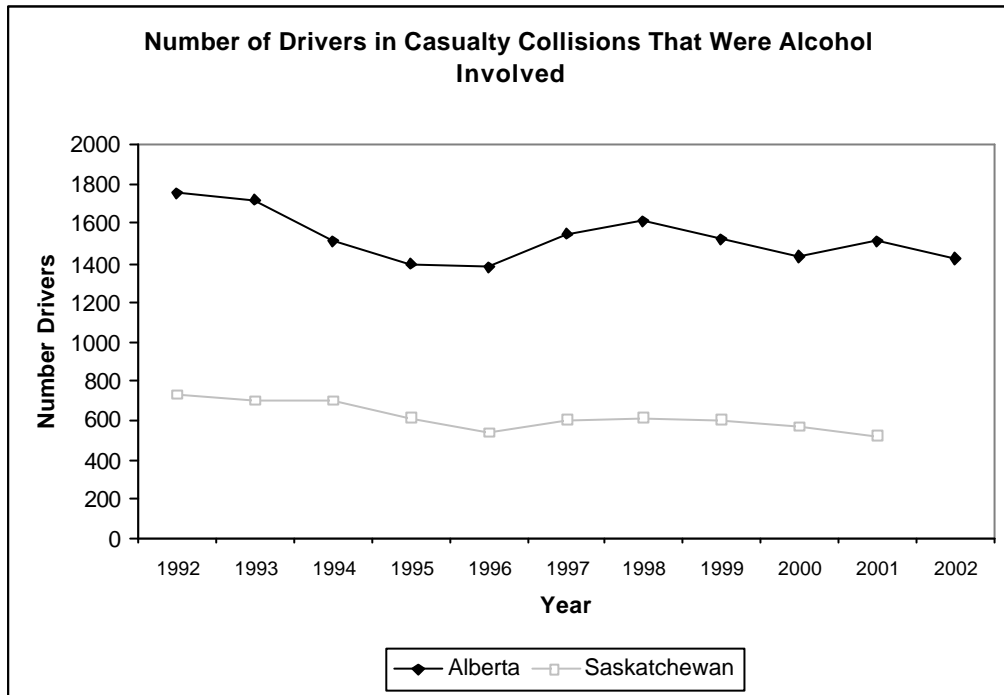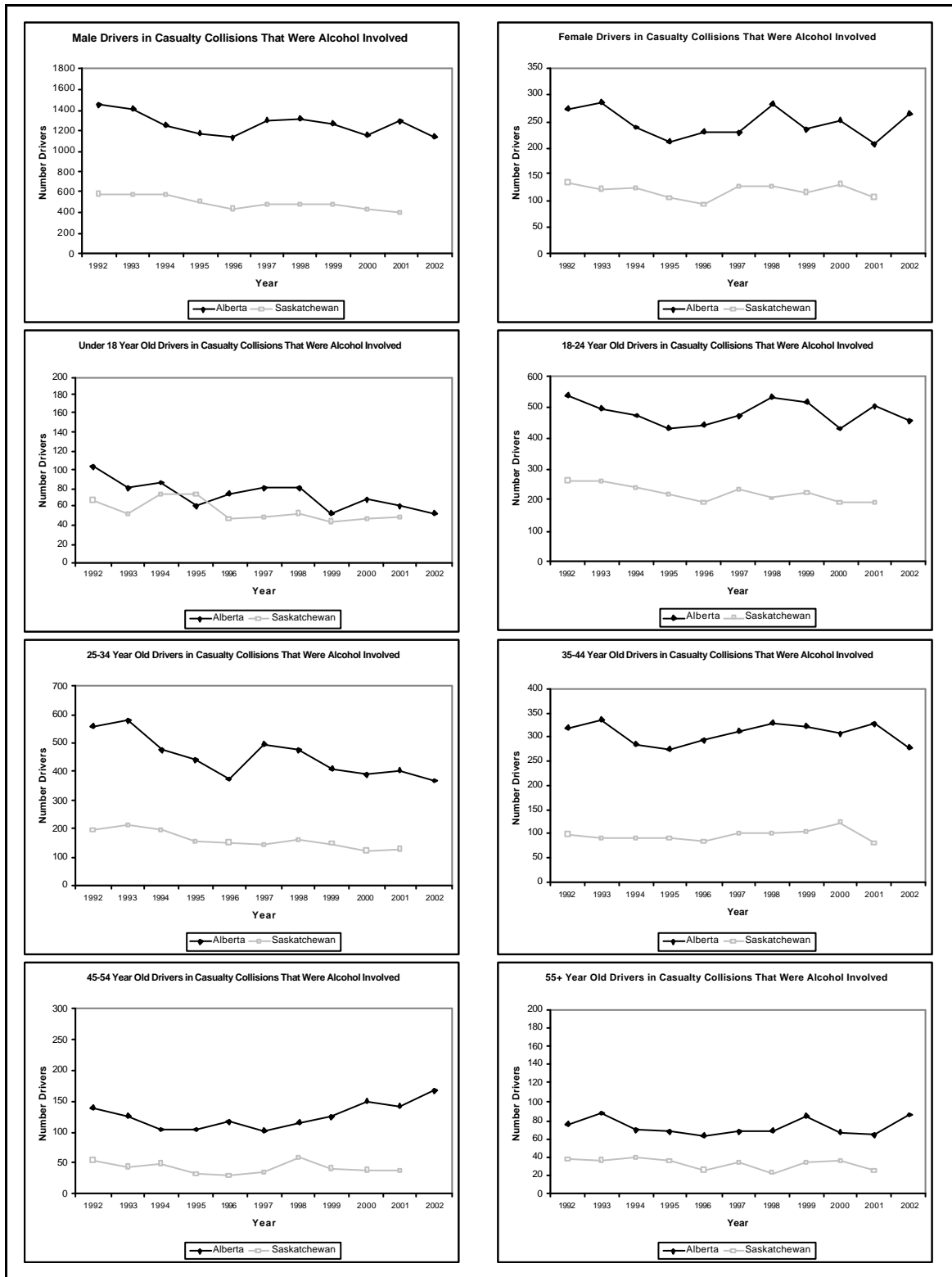Alberta and Saskatchewan

Figure 23. Number of Drivers in Casualty Collisions that Were Alcohol Involved: Alberta and Saskatchewan Broken Down By Gender and Age

ALBERTA THREE-YEAR PRE-POST COMPARISON: OVERALL NUMBER

In the three years prior to the introduction of AALS there were 4,674 alcohol involved drivers involved in casualty collisions (129.8 per month). In the three year period after the introduction of the AALS there were 4,370 alcohol involved drivers involved in casualty collisions (121.4 per month). This represents a 6.50% ($p < .005$) reduction over pre-AALS levels.

ALBERTA THREE-YEAR PRE-POST COMPARISON: NUMBER BREAKDOWN BY GENDER AND AGE

Analyses were repeated for males, females and various age categories separately. The results are presented in Table 5. As Table 5 indicates, significant decreases were reported in alcohol-involved casualty collisions three years pre to three years post-AALS for males and only those in the 25-34 age range. Reductions, approaching significance, were reported for those under 18. Interestingly, those in the 45-54 age range showed a significant increase in alcohol-involved collisions over this time period.

Table 5. Pre-Post Comparison of Alcohol Involved Drivers in Casualty Collisions as a Function of Gender and Age

	3 Years Pre AALS		3 Years Post AALS		% Change Over Baseline	Significance
	Total	Per Month	Total	Per Month		
Gender						
Males	3890	108.1	3594	99.8	-7.6%	$p < .001$
Females	748	20.8	724	20.1	-3.2%	$p = .548$
Age						
17 or less	216	6.0	179	5.0	-17.1%	$p = .070$
18-24	1486	41.3	1394	38.7	-6.2%	$p = .090$
25-34	1392	38.7	1166	32.4	-16.2%	$p < .001$
35-44	957	26.6	899	25.0	-6.1%	$p = .179$
45-54	343	9.5	451	12.5	31.5%	$p < .001$
55+	225	6.3	218	6.1	-3.1%	$p = .775$

TWO-YEAR PRE-POST COMPARISON WITH SASKATCHEWAN: OVERALL NUMBER

In examining this reduction relative to Saskatchewan, Alberta saw a reduction from 3,181 (132.5 per month) to 2,916 (121.5 per month) an 8.33% ($p < .001$) reduction between two years pre to two years post-AALS while Saskatchewan saw a reduction from 1,231 (51.3 per month) to 1,089 (45.4 per month) a 11.54% ($p < .005$) reduction over the same time period. There was no significant difference between changes in Alberta rates in comparison to Saskatchewan.

TWO-YEAR PRE-POST COMPARISON WITH SASKATCHEWAN : NUMBER BREAKDOWN BY GENDER AND AGE

Analyses were repeated for males, females and various age categories separately. The results are presented in Table 6. As seen in this table, a significant difference between provinces was only found in the 45-54 age group. In Alberta there was a 19.4% increase, whereas in Saskatchewan there was a 35.7% decrease.

Table 6. Pre-Post Provincial Comparison of Alcohol Involved Drivers in Casualty Collisions as a Function of Gender and Age

	Alberta				Saskatchewan				Significance of Provincial Comparison
	2 year Pre (per month)	2 Years Post (per month)	% Change Over Baseline	Sig.	2 year Pre (per month)	2 Years Post (per month)	% Change Over Baseline	Sig.	
Gender									
Males	109.9	101.3	-7.9%	p < .001	39.7	34.8	-12.2%	p < .01	p =.357
Females	21.8	18.9	-13.2%	p < .05	10.5	9.6	-9.1%	p =.316	p =.678
Age									
17 or less	5.9	5.3	-10.0%	p =.427	4.2	3.9	-6.9%	p =.667	p =.862
18-24	43.4	39.0	-10.3%	p<.05	18.2	15.4	-15.3%	p < .05	p =.488
25-34	37.7	32.5	-13.8%	p < .005	12.8	10.5	-18.2%	p < .05	p =.596
35-44	27.6	25.6	-7.4%	p =.179	8.5	8.5	0.9%	p =.960	p =.446
45-54	10.1	12.0	19.4%	p < .05	4.2	3.1	-25.7%	p = .059	p < .01
55+	6.5	5.5	-15.4%	p =.175	2.2	2.5	15.2%	p =.508	p =.164

ARIMA ANALYSES: OVERALL NUMBER

ARIMA analyses conducted on monthly rates indicated a decrease approaching significance in Alberta (t = -1.69, p =.094) and a negligible decrease in Saskatchewan (t = -0.25, p = .807).

As with the collision level analyses, an examination of the actual versus predicted incidence rates identified using the ARIMA model suggests that reductions were largely realized in the first year after the AALS legislation was introduced (see Figure 24).

Figure 24. Actual and Predicted Alcohol Involved Casualty Collision Numbers in Alberta
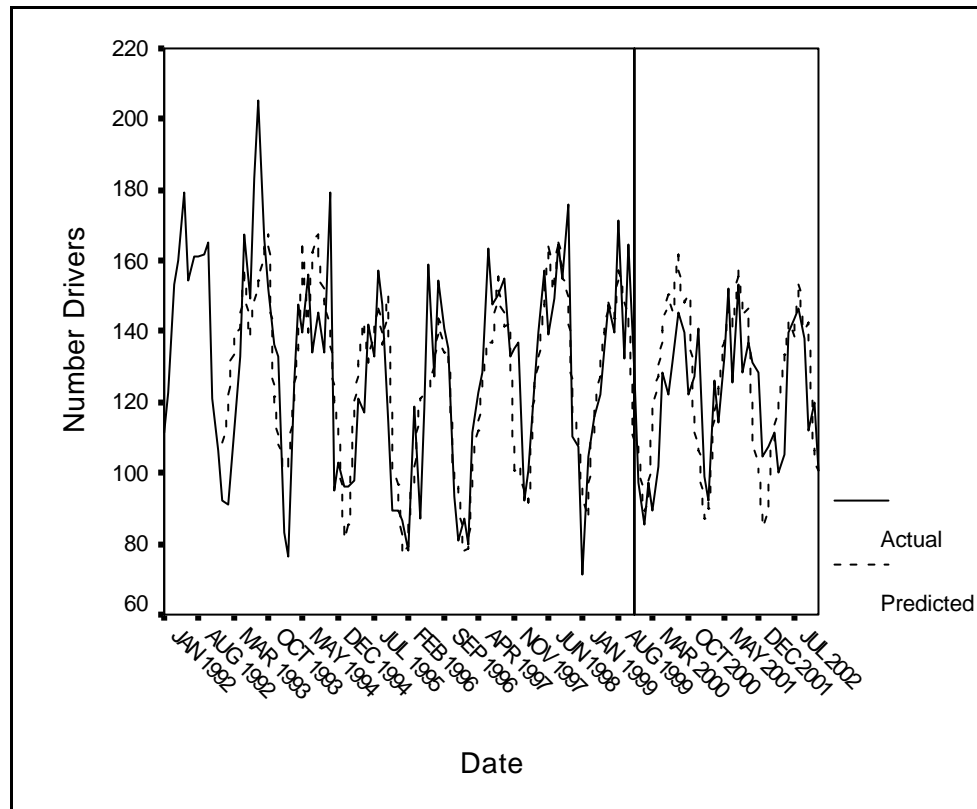
As with previous analyses, a long-term trend towards reduced numbers made it difficult to find significant changes as a result of AALS. A seasonal decomposition procedure of this 11-year trend was found to be significant with the number of alcohol involved drivers in casualty collisions decreasing by an average of 18.7 per year ($r = -.29$, $p < .001$).

ARIMA ANALYSES: NUMBER BY GENDER AND AGE

Given the instability of the incidences when broken down to this level of analyses, none of the ARIMA analyses revealed a significant effect for the AALS intervention. The intervention parameter was approaching significance for males ($t = -1.849$, $p = .067$). Higher, but non-significant parameters were found for those in the 18-24 age range ($t = -1.204$, $p = .230$), and those in the 45-55 age range ($t = 1.333$, $p = .182$). For both males and those in the 18-24 age range, an inspection of the actual versus predicted rates, indicated that reductions were largely realized in the first year after the AALS legislation was introduced. For those in the 45-55 age range, the ARIMA analysis confirmed an inflection toward higher incidences of alcohol-involved drivers in casualty collisions.

Percentage of Drivers Involved In Casualty Collisions

The results for the percentage of drivers involved in casualty collisions who were alcohol-involved parallels the findings at the collision level (Compare to Figure 12). In Figure 25, the percentage of total drivers involved in casualty collisions that were alcohol involved is presented by year beginning in 1992. For comparison purposes similar data from Saskatchewan are also presented. A breakdown by gender and age is presented in Figure 26.

Figure 25. Percentage of Total Drivers Involved in Casualty Collisions That Were Alcohol Involved: Alberta and Saskatchewan
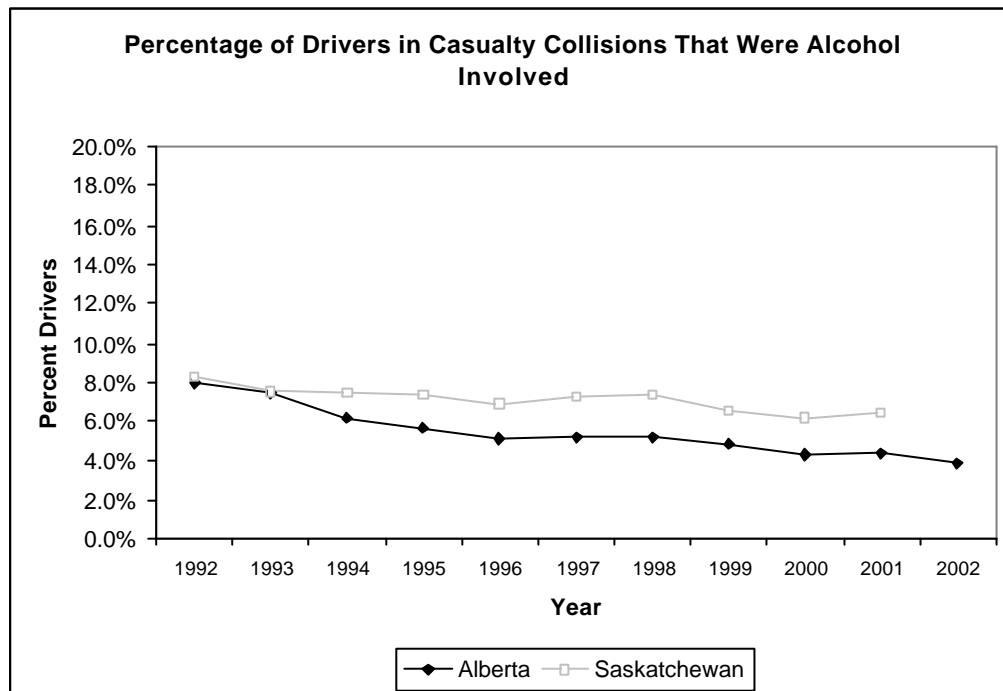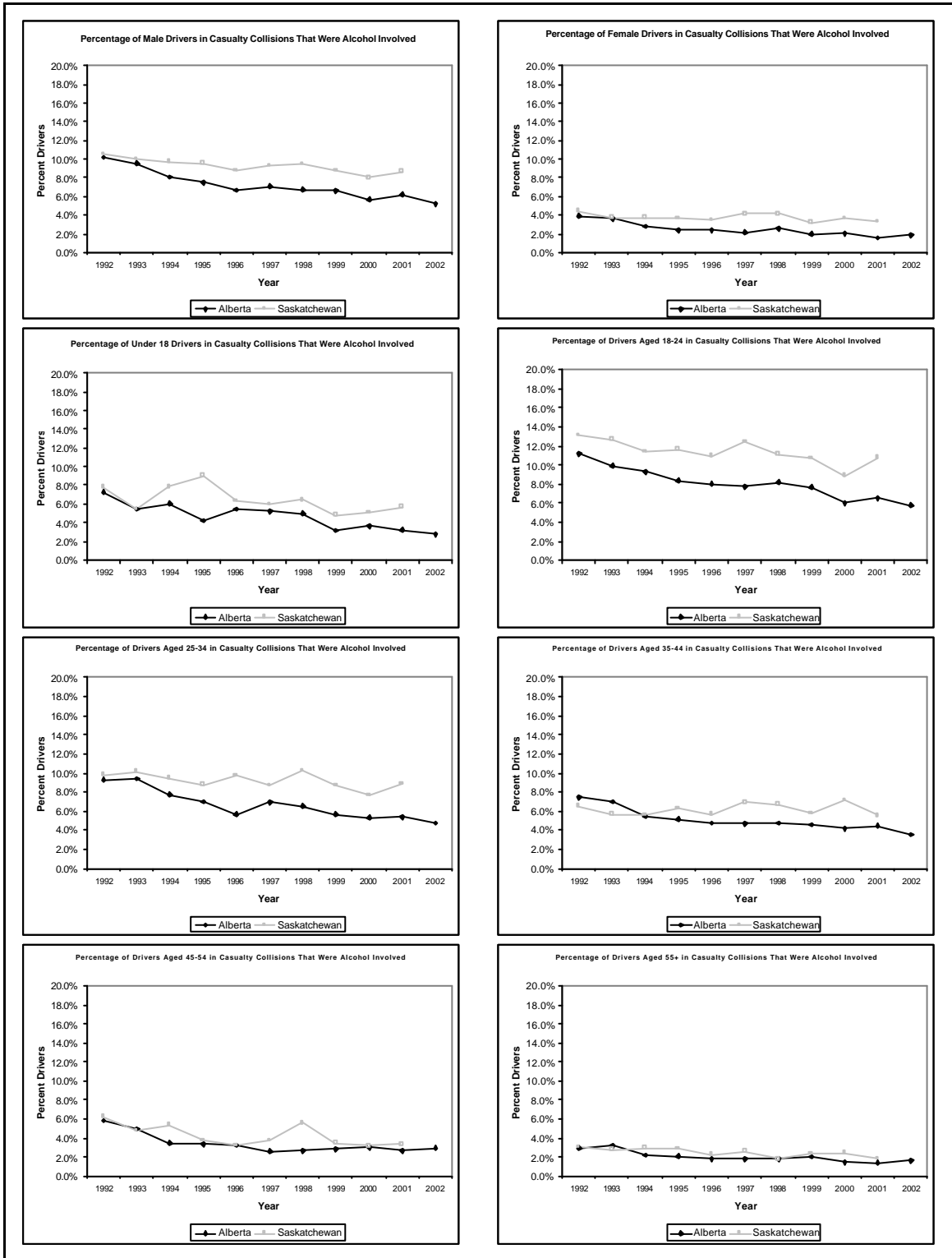
Figure 26. Percentage of Drivers in Casualty Collisions that Were Alcohol Involved: Alberta and Saskatchewan Broken Down By Gender and Age.

ALBERTA THREE-YEAR PRE-POST COMPARISON: OVERALL PERCENTAGE

In the three years prior to AALS introduction 5.1% of the drivers in casualty collisions were alcohol involved. In the three years following the introduction of AALS 4.2% were alcohol involved, a 17.0% decrease over pre-AALS levels (p = < .001).

ALBERTA THREE-YEAR PRE-POST COMPARISON: PERCENTAGE BREAKDOWN BY GENDER AND AGE

Analyses were repeated for males, females and various age categories separately. The results are presented in Table 7. As seen in this table, when viewed as a percentage of casualty collisions, alcohol involvement decreased significantly in all demographic categories except those in the 45-54 age range.

Table 7. Pre-Post Comparison of Percentage of Drivers in Casualty Collisions That Were Alcohol Involved as a Function of Gender and Age: Alberta

	Percentage of Casualty Collisions That Were Alcohol Involved		% Change Over Baseline	Significance
	3 Years Pre AALS	3 Years Post AALS		
Gender				
Males	6.8%	5.7%	-15.7%	p < .001
Females	2.2%	1.8%	-18.0%	p < .05
Age				
17 or less	4.5%	3.3%	-27.7%	p < .005
18-24	7.7%	6.2%	-19.8%	p < .001
25-34	6.4%	5.2%	-18.9%	p < .001
35-44	4.6%	4.1%	-12.8%	p < .005
45-54	2.8%	2.9%	4.9%	p = .495
55+	2.0%	1.6%	-18.1%	p < .05

TWO-YEAR PRE-POST COMPARISON WITH SASKATCHEWAN: OVERALL PERCENTAGE

In examining this reduction relative to Saskatchewan, Alberta saw a reduction from a rate of 5.1% to 4.3% (-14.8%, p < .001) while Saskatchewan saw a reduction from 7.0% to 6.3% (-9.9%, p < .01). The difference between Alberta and Saskatchewan was not significant (p = .657).

TWO-YEAR PRE-POST COMPARISON WITH SASKATCHEWAN: PERCENTAGE BREAKDOWN BY GENDER AND AGE

Analyses were repeated for males, females and various age categories separately. The results are presented in Table 8. As seen in this table, a significant difference between provinces was only found in the 45-54 age group. In Alberta there was a 2.7% increase, whereas in Saskatchewan there was a 28.5% decrease.

Table 8. Pre-Post Provincial Comparison of Percentage of Drivers in Casualty Collisions That Were Alcohol Involved as a Function of Gender and Age: Alberta

	Alberta				Saskatchewan				Significance Of Provincial Comparison
	2 Year Pre (%)	2 Years Post (%)	% Change Over Pre	Sig.	2 year Pre (%)	2 Years Post (%)	% Change Over Pre	Sig.	
Sex									
Males	6.8%	5.9%	-12.5%	p < .001	9.1%	8.4%	-7.9%	p = .070	p =.357
Females	2.3%	1.8%	-22.4%	p < .001	3.8%	3.3%	-12.7%	p =.129	p =.298
Age									
17 or less	4.3%	3.5%	-18.4%	p < .05	5.8%	5.4%	-7.4%	p =.580	p =.501
18-24	7.9%	6.4%	-19.3%	p < .001	11.0%	9.6%	-12.9%	p < .05	p =.376
25-34	6.2%	5.3%	-15.0%	p < .001	9.5%	8.2%	-13.6%	p =.071	p =.905
35-44	4.8%	4.3%	-10.4%	p < .05	6.3%	6.5%	2.3%	p =.816	p =.236
45-54	2.8%	2.9%	2.7%	p = .755	4.6%	3.3%	-28.5%	p < .05	p < .05
55+	2.0%	1.5%	-23.7%	p < .05	2.0%	2.2%	9.5%	p =.629	p =.103

ARIMA ANALYSES: OVERALL NUMBER

ARIMA analyses were also conducted on these monthly rates. A small non-significant reduction was found in Alberta (t = -1.105, p = .271) and a negligible decrease was found in Saskatchewan (t = -0.116, p = .907). As with the previous analyses, most of this reduction was found in the first year after AALS implementation

The difficulty in finding effects that could be attributed to the AALS program could be attributed to long-term trends toward reduced rates. A seasonal decomposition procedure this 11-year trend to be significant with the percentage of casualty collisions that are alcohol involved decreasing by an average absolute amount of 0.37% per year (r = -.808, p < .001).

ARIMA ANALYSES: PERCENTAGE BY GENDER AND AGE

Given the instability of the monthly proportions when broken down to this level of analyses, none of the ARIMA analyses revealed a significant effect for the AALS intervention. Higher, but non-significant parameters were found for males t = -1.277, p = .204) those in the 18-24 age range (t = -1.082, p = .230), those in the 45-55 age range (t = 1.062, p = .290), and those in the 55 and older age group (t = -1.535, p = .127. For males, those in the 18-24, and those in the 55 and older age range an inspection of the actual versus predicted rates, indicated that reductions were largely realized in the first year after the AALS legislation was introduced. For those in the 45-55 age range, the ARIMA analysis confirmed an inflection toward higher incidences of alcohol involved drivers in casualty collisions.

Overall, the analyses indicate that there have been significant decreases in the number of alcohol-involved drivers in casualty collisions in the three years after the introduction of AALS legislation. Decreases were found in all demographic groups except those in the 45-55 age group. Much of the decrease can be

attributed to long-term trends toward reduced alcohol-involved casualty collisions, but there is some indication that some of this reduction, an amount approaching significance, may be a function of AALS legislation. This reduction appears to have occurred largely in the first year after the legislation was introduced. These effects were largely observed for males and those in the 18-24 age range

In examining the percentage of drivers involved in casualty collisions that were alcohol involved, the results paralleled those found above. The overall changes in the three years after the introduction of AALS were more robust, but further analyses revealed that these changes were largely a continuation of long-term trends towards reduced rates of alcohol involvement. Though the ARIMA analyses were not significant there is some indication that reduced rates as a function of AALS legislation are reported for males, those in the 18-24 age range, and those in the 55 and over age range.

5.3.3 Blood Alcohol Levels

KEY FINDING

Overall, there is no evidence that AALS resulted in reduced incidences of BAC positive or BAC over .08 rates among fatally injured drivers. Results indicate that these rates actually increased among older drivers after AALS legislation

There is also no evidence to suggest that AALS resulted in reducing the average BAC level among those apprehended by police for impaired driving. In combination with previous results, AALS may have reduced the number of impaired drivers on Alberta highways, but likely did not reduce the level of impairment among those who choose to drink and drive. It should also be noted that AALS legislation and challenges to this legislation may have led to enhanced police service efficiencies in identifying and processing alcohol impaired drivers. This would have the effect of increasing not decreasing the average BAC levels.

Blood Alcohol Levels of Fatally Injured Drivers

BAC POSITIVE FATALITIES

A data file provided by the coroner determined BAC levels of all fatally injured drivers in Alberta between 1992 and 2002 inclusive was provided by the Traffic Injury Research Foundation.[18] The Number and percentage of BAC positive cases is presented by year in Figure 27.[19]

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[18] Bicyclists as well as those injuries that occurred on private property were not included in the analyses
[19] Year is defined in terms of date of vehicle collision.

Figure 27. BAC Positive Driver Fatalities by Year: Alberta
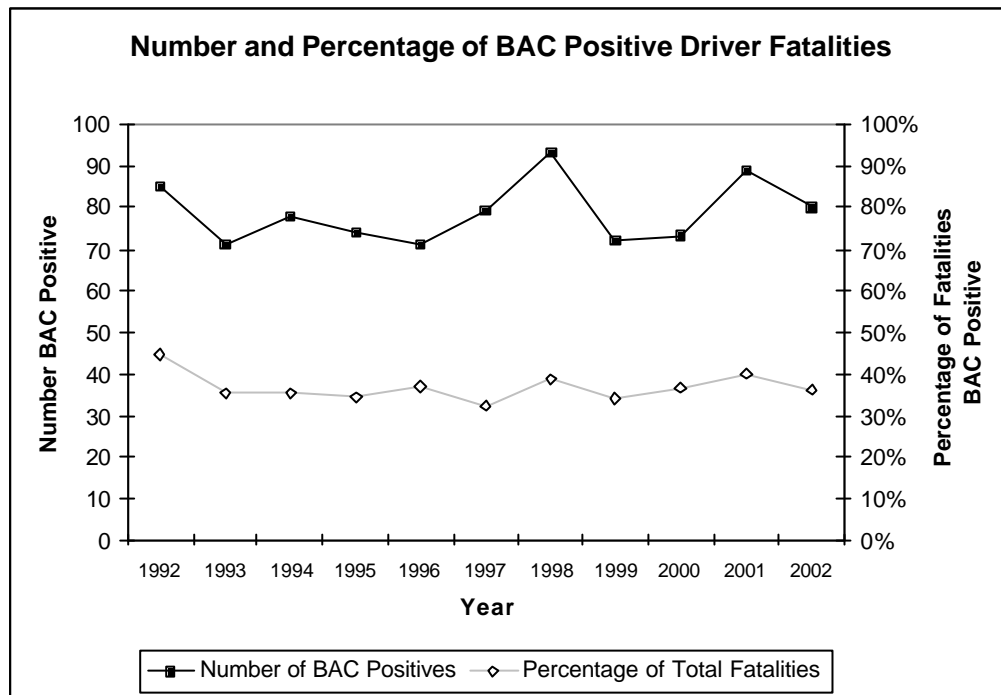
In comparison to the three years prior to AALS legislation, the number of BAC positive fatalities remained relatively constant rising from 243 to 245 in the three years following the legislation. This 0.8% increase over baseline was not statistically significant (p = .960). When viewed as a proportion of total fatalities in these time periods, there was a non-significant increase from 34.9% to 38.1%, a 9.0% increase over baseline (p = .124). ARIMA analyses of the number and proportions of BAC positive fatalities also indicated positive, but non-significant increases over predicted rates (t = 1.147, p = .252; and t = 1.031, p = .304 respectively).

The proportion of BAC positive fatalities as a function of overall fatalities was repeated by demographic group and is presented in Table 9. As Table 9 indicates the overall increase tended to be attributed to older drivers.

Table 9. Percentage of Driver Fatalities BAC Positive as a Function of Gender and Age

	Percentage of Driver Fatalities That Were BAC Positive		% Change Over Baseline	Significance
	3 Years Pre AALS	3 Years Post AALS		
Gender				
Males	39.7%	42.8%	7.8%	p = .270
Females	17.8%	21.3%	19.7%	p = .168
Age				
17 or less*				
18-24	49.7%	43.1%	-13.3%	p =.171
25-34	48.0%	43.2%	-10.0%	p =.247
35-44	35.8%	54.9%	53.4%	p < .005
45-54	27.9%	35.2%	26.2%	p =.178
55+	13.1%	20.6%	57.3%	p =.063

* sample size too small for comparison

BAC OVER .08 FATALITIES

The Number and Percentage of driver fatalities with BAC levels over .08 are presented in Figure 28.

The number of BAC over .08 fatalities rose from 203 to 210 in the three years following the legislation. This 3.5% increase over baseline was not statistically significant (p = .764). When viewed as a proportion of total fatalities in these time periods, there was an increase approaching significance from 29.2% to 32.7%, a 12.0% increase over baseline (p = .093). ARIMA analyses of the number, and proportions of BAC positive fatalities also revealed positive, but non-significant increases over predicted rates (t = 1.118, p = .265; and t = 1.1483, p = .141 respectively).

The proportion of BAC positive fatalities as a function of overall fatalities was repeated by demographic group and is presented in Table 10. As Table 10 indicates, the overall increase tended to be attributed to older drivers.

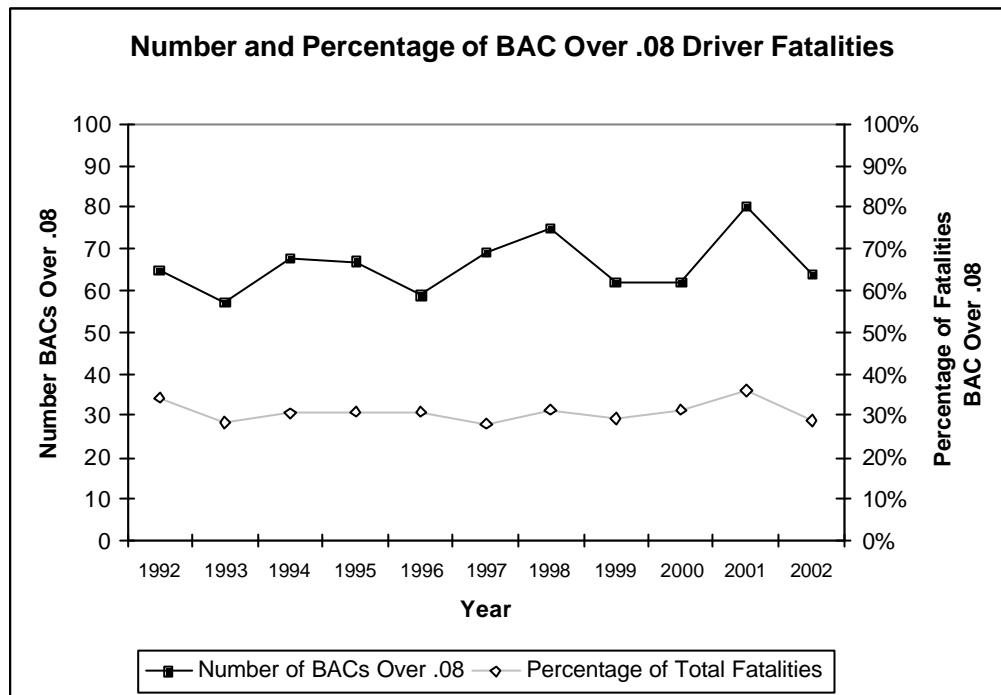Figure 28. BAC Over .08 Driver Fatalities by Year: Alberta

Table 10. Percentage of Driver Fatalities with BACs Over .08 as a Function of Gender and Age: Alberta

	Percentage of Driver Fatalities with BACs Over .08		% Change Over Baseline	Significance
	3 Years Pre AALS	3 Years Post AALS		
Gender				
Males	34.0%	37.3%	9.7%	p = .151
Females	11.8%	16.3%	38.1%	p = .175
Age				
17 or less*				
18-24	40.6%	37.1%	-8.6%	p =.319
25-34	41.2%	37.1%	-10.0%	p =.282
35-44	30.6%	48.7%	59.2%	p < .005
45-54	25.6%	31.5%	23.0%	p =.230
55+	8.3%	15.6%	88.0%	p <.05

* sample size too small for comparison

Overall, there is no evidence that AALS resulted in reduced incidences of BAC positive or BAC over .08 rates among fatally injured drivers. Results indicate that these rates actually increased among older drivers after AALS legislation

Blood Alcohol Levels Drivers Apprehended by Police

Intoxylizer data from Calgary, Camrose, Edmonton and the RCMP were prepared for analysis. Unfortunately, due to a software/download issue, there was an insufficient amount of data provided by the RCMP. As a result, it was determined that data sources could not be used in a sampling procedure to provide a provincial picture of blood alcohol levels. Data from Calgary, Camrose and Edmonton are therefore presented separately.

The following decision rules were used to compute a single BAC reading for individuals in the data sets:

1. All results were truncated to the second decimal place (i.e., .086 = .080).
2. All data based on a single BAC reading were removed.
3. When there were two BAC results both were selected.
4. When there were three or more BAC results the two closest in value were selected. The two lower values were selected in the event of equidistant values.
5. An average BAC level was computed when the two selected values were within .02 of each other.

CALGARY

Data between January 1995 and December 2002 inclusive were included in the analyses. Average BAC levels by year are presented in Figure 29. An independent t-test indicated a non-significant increase from 166.7 (n = 3532) in the three years prior to AALS to 164.7 (n = 3855) in the three years after AALS legislation was implemented (t = 1.899, p = .058). An ARIMA analysis of monthly rates beginning in January 1995 also indicated a non-significant increase in rates after AALS implementation (t = 1.05, p = .296). Age and gender breakdowns did not indicate significant changes among a particular demographic.
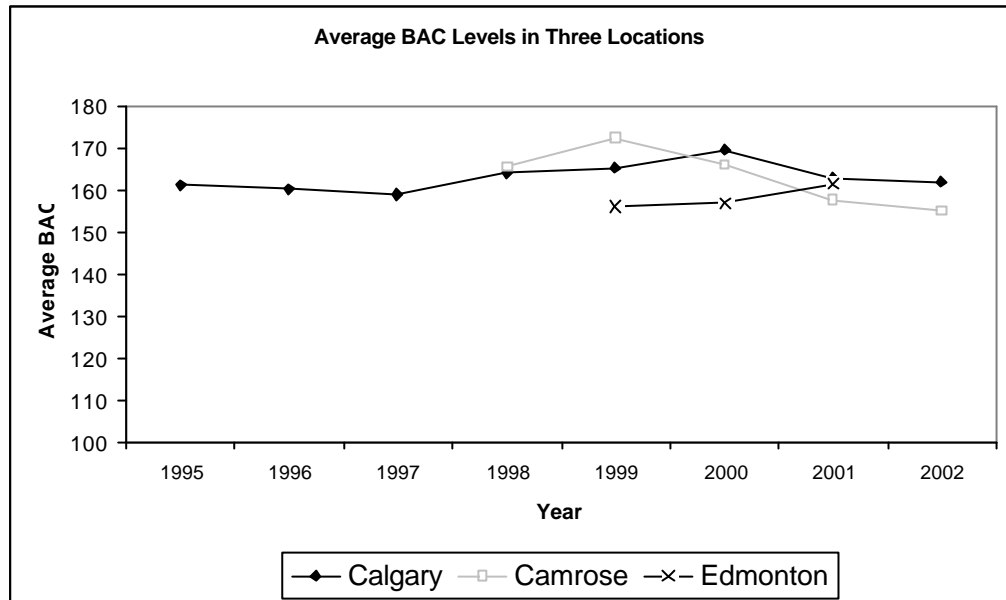
CAMROSE

Data between December 1996 and December 2002 inclusive were included in analyses. Average BAC levels by year are presented in Figure 29. An independent t-test indicated a non-significant decrease from 169.5 (n = 112) in the two years prior to AALS to 160.8 (n = 199) in the three years after AALS legislation was implemented (t = -1.588, p = .113). There were too few data points to conduct an ARIMA analysis. Age and gender breakdowns did not indicate significant changes among a particular demographic.

EDMONTON

Data between December 1998 and December 2002 inclusive were included in analyses. Average BAC levels by year are presented in Figure 29. An independent t-test indicated a non-significant increase from 156.7 (n = 1411) in the year prior to AALS to 158.7 (n = 2649) in the two years after AALS legislation was implemented (t = 1.197, p = .232). There were too few data points to conduct an ARIMA analysis. Age and gender breakdowns did not indicate significant changes among a particular demographic.

Figure 29. Average BAC Levels in Three Locations: Alberta

Average BAC Levels in Three Locations

[Line graph showing Average BAC (y-axis, ranging from 100 to 180) versus Year (x-axis, 1995 to 2002) for three locations: Calgary, Camrose, and Edmonton]

There is also no evidence to suggest that AALS resulted in reducing the average BAC level among those apprehended by police for impaired driving. In combination with previous results, AALS may have reduced the number of impaired drivers on Alberta highways, but likely did not reduce the level of impairment among those how choose to drink and drive. It should also be noted that AALS legislation and challenges to this legislation may have led to enhanced police service efficiencies in identifying and processing alcohol impaired drivers. This would have the effect of increasing not decreasing the average BAC levels.

5.3.4 Impaired Driving Charges

KEY FINDING

Overall, there is no evidence to suggest AALS legislation had an impact on the total number of charges laid. Although there was a significant change in the number of individuals charged with refusing to provide a breath sample, the trend toward increased rates preceded the introduction of AALS legislation.

Data on the number of impaired driving charges between 1992 and 2002 inclusive was provided by the Alberta Solicitor General - Policing Services and CCJS (Canadian Centre for Justice Statistics). Data were provided in summary format by calendar year. These data are presented as total charges as well as by charge type in Figure 30.

Table 11 presents a comparison of the number of charges between 1997 and 1999 inclusive to 2000 to 2002 inclusive. As Table 11 indicates there was no significant change in the total number of charges, but charges for failing to provide a breath sample increased significantly by 26%. An inspection of the long-term trend presented in Figure 30 suggests the increase in rate preceded AALS legislation, and therefore specifically attributing the change to AALS is questionable. Increases approaching significance were reported for the number of impaired causing death, and impaired causing injury charges. Inspection of long-term trends places these changes within chance normal variations in rates.

Table 11: Change in Number of Charges 1997-1999 Compared to 2000-2002: Alberta

	Number Charges 97-99	Number Charges 00-02	% Change Over Baseline	Significance
Total Charges	30396	30666	+0.9%	p = .274
Charge Type: Impaired Operation of Motor Vehicle - Causing Death	33	50	+ 51.5%	p = .062
Impaired Operation of Motor Vehicle - Causing bodily Harm	294	341	+16.0%	p = .063
Impaired Operation of Motor Vehicle or Over 80 mg.	29227	29222	-0.00%	p = .983
Fail or Refuse to Provide Breath Sample	816	1028	+26.0%	p < .001
Fail or Refuse to Provide Blood Sample	26	25	-3.8%	p = .889

Overall, there is no evidence to suggest AALS legislation had an impact on the total number of charges laid. Although there was a significant change in the number of individuals charged with refusing to provide a breath sample, the trend toward increased rates preceded the introduction of AALS legislation

Figure 30. Impaired Driving Charges in Alberta 1992-2002: Total and By Charge Type-Alberta.
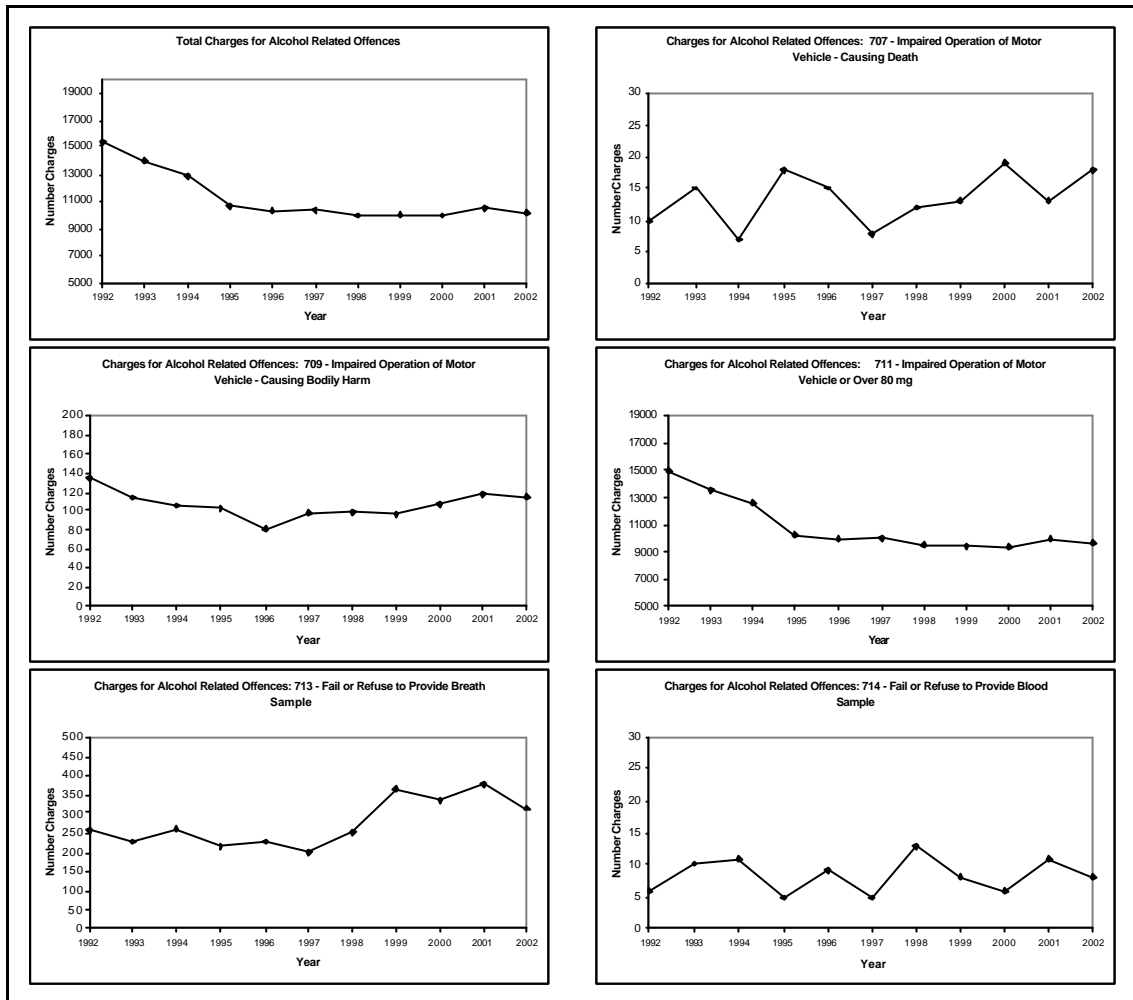
5.3.5 Impaired Driving Convictions

KEY FINDING

There was a significant increase in the number of convictions after the implementation of AALS. This increase, however, could not be conclusively attributed to AALS legislation.

Data from the Alberta Government Services - Registries, MOVES database was analyzed to determine any changes in the number of offender convictions over time. Only one alcohol-related conviction per offence date was included in the analyses.

All convictions that occurred between January 1, 1992, and December 31, 2002, inclusive, were included in the analyses. Results are presented by year of conviction in Figure 31.

Figure 31. Number of Persons Convicted For Alcohol Related Offences: Alberta 1992-2002

A comparison of the three years pre-AALS to three years post-AALS indicates an increase in the number of convictions from 23,995 to 24,612—a small yet significant, 2.6% increase ($p < .005$). An ARIMA analysis revealed an increase in rate after AALS implementation, but this step function was not significant ($t=1.38$, $p = .141$). This suggests that a large portion of this increase may have resulted from natural fluctuations.
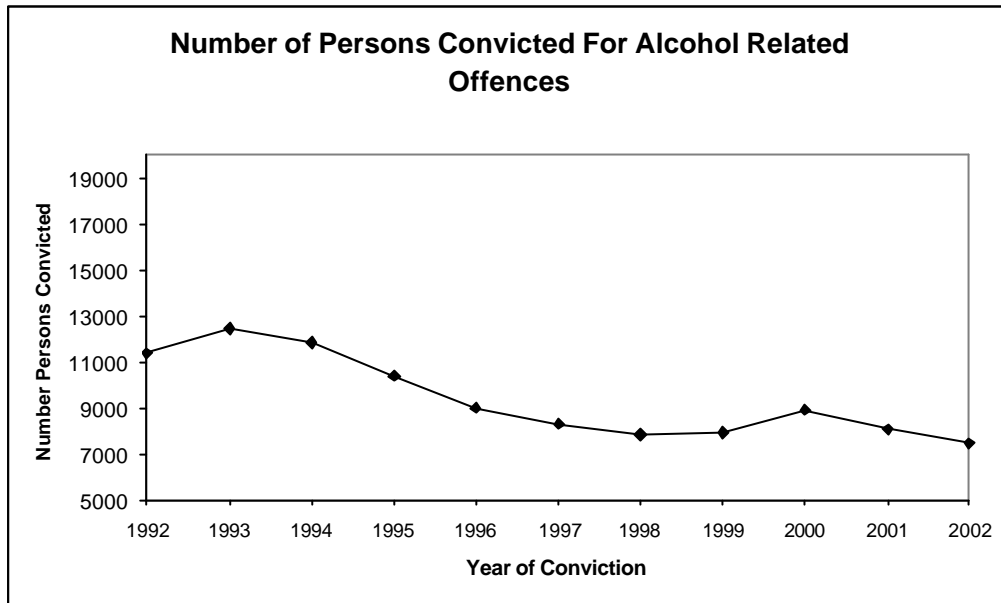
There was a significant increase in the number of convictions after the implementation of AALS. This increase, however, could not be conclusively attributed to AALS legislation

6. Stakeholder Perspectives

The independent evaluators conducted 11 stakeholder interviews, either in-person or by telephone. Interviewees included representatives from police agencies (RCMP, Edmonton Police Service, Calgary Police Service, Lethbridge Police), the Alberta Government (Alberta Health and Wellness, AADAC), Alberta Centre for Injury Control, and the legal profession.

6.1 Implementation of the AALS

6.1.1 Contributors to Program Effectiveness

Over half of respondents indicated that the Alberta Administrative Licence Suspension Program (AALS) had been implemented in a manner that would reduce the number of drunk drivers on Alberta roads. The ability of the program to remove impaired drivers from roads in an expedited fashion and the immediate loss of licence were cited as primary factors for program effectiveness.

Other components that respondents felt contributed to the effectiveness of the AALS in reducing the number of drunk drivers on Alberta roads included research that was conducted to examine the implementation of similar programs in other jurisdictions, consultations with stakeholders and government departments, and the fact that licence suspension is automatic.

6.1.2 Concerns About Implementation

Some respondents had concerns about various aspects of program implementation. One concern voiced by several respondents was related to the Appeals process and the importance of keeping the administrative hearing process separate from the court system:

> *"The purpose of the program was to separate itself from the court system…I think we need to better separate the two systems again."*

Other respondents felt that the 21-day grace period granted to individuals charged under the AALS before they lose their licence is too long—it was suggested that seven days may be a more appropriate length. It was also suggested that the program would benefit from a higher profile in the media, and that seizing vehicles in addition to licences may increase effectiveness.

One individual suggested that initially there were concerns around enforcement of the program and, specifically, consistency of enforcement between the RCMP and municipal police services. However, it was thought that these issues had been resolved.

6.1.3 Barriers to Implementation

Stakeholder responses relating to barriers to program implementation were varied. Two respondents felt that lack of media coverage was a barrier. One of these individuals was involved in making presentations about the program and felt that the number of people aware of the AALS had decreased steadily since 2001.

Other barriers that were highlighted by respondents included

- general apathy on the issue of drinking and driving;
- lack of monetary resources to sustain public awareness;
- lack of enforcement resources, especially in rural areas or geographically large jurisdictions;
- continuance of driving by individuals who had lost their licence as a result of the program, particularly in rural areas;
- officer discretion around the option of issuing a 24 hour licence suspension; and
- an increase in appeals that are based on expert evidence related to breathalyzer readings.

6.1.4 Facilitators to Implementation

Stakeholders pointed to a variety of factors that facilitated implementation of the AALS. The most common response related to the important role that stakeholder support played in facilitating implementation.

Other factors that respondents felt facilitated implementation included

- the impact on an individual of watching an officer cut up his or her driver's licence;
- the initial media campaign;
- support from enforcement agencies, the Driver Review Board, and the courts;
- the 21 day temporary permit (one respondent felt that this "grace period" helped the public to accept the program);
- the training package that was supplied to officers (two respondents indicated that training is ongoing with new officers);
- the ease of completing the required forms; and
- word of mouth.

6.2 Public Awareness of the AALS

6.2.1 Methods Used to Inform the Public of the AALS

Stakeholders were aware of three primary methods that were used to inform the public of the program: newspaper (seven respondents), radio (six respondents),

and television (four respondents). Two respondents were aware of other methods including brochures, posters, and inserts for motor vehicle renewals.

6.2.2 Media Coverage

Virtually all respondents agreed that the initial media launch for the program was good but that media coverage had declined substantially since program initiation. Several comments were made indicating that drivers are often surprised when they are pulled over and learn about the AALS, suggesting that many people are still unaware of the program:

> *"The public is not aware of the program; in the initial stages public awareness did act as some deterrent. With the public now being unaware of the program there is no deterrent."*

6.2.3 Strategies to Enhance Implementation

When asked "What other strategies do you think would have worked *better* to implement the program?" almost all respondents felt that increasing public awareness was key. Stakeholders felt that increased public awareness could be achieved through repeated media blitzes, increased sustained promotion, high impact advertising campaigns, and possibly an awareness campaign through drinking establishments such as clubs or bars.

6.3 Assumptions: Why the AALS Should Work

Respondents indicated that the key reason the AALS program should work is because of the immediate impact of the initial loss of licence. Stakeholders felt that this immediate consequence was appropriate to the offence and was the primary factor underlying program effectiveness.

> *"Everything we know about punishment fitting the crime and being immediate, it's there."*

Other factors that stakeholders felt should contribute to program success included the ability of the program to remove drunk drivers from the roads quickly and the fact that the AALS was based on research on best practices of similar programs in other provinces.

One respondent also suggested that the low number of successful appeals should contribute to program success.

6.4 Program Effectiveness

Several respondents felt that the AALS is primarily effective for those who have been caught once due to low program awareness among the general public.

Other respondents felt that the program could be effective if it had adequate resources for enforcement.

> *"Unless they've got the enforcement resources behind it, it's going to have a minimal impact on the number of drunks that are on the road."*

Respondents highlighted several indicators of program effectiveness including

- the program moves cases through the courts faster as there is no reason to delay the process,
- there has been a high number of suspensions issued,
- the appeal rate is low, and
- the program gets drunk drivers off the roads quickly.

6.4.1 Challenges to Program Effectiveness

One respondent questioned whether individuals who lost their licence as a result of the program actually refrained from driving, particularly in rural areas. Another respondent suggested that the initial implementation of the program was effective in deterring people from drinking and driving, but that the program's ability to serve as a deterrent has since declined due to a lack of publicity and public awareness.

It was also suggested that the program may be more effective in urban rather than rural settings due to increased availability of alternate forms of transportation in urban areas.

Appeals Process

Several respondents voiced concerns related to the AALS appeals process and the impact that it may have on program effectiveness. In particular, there were concerns among some respondents regarding keeping the administrative hearing process separate from the court system, some respondents felt that the Board was too lenient when hearing appeals, one respondent mentioned an increase in the number challenges related to breathalyzer readings, concern related to the fact that the appeals process allowed drivers charged under the AALS too much latitude.

6.4.2 Demographic Effected

The majority of stakeholders indicated that the AALS would be most effective with a specific demographic, or a combination thereof, as discussed below. One individual felt that the program would not target a particular group, but rather the general population as a whole.

Age Group

Respondents generally felt that young people, and in some cases males specifically, was the group most likely to be reached by the program. However, one respondent felt that the program would not be effective in reaching young people as they would not appreciate the consequences of their actions.

Drinking Habits

Respondents also indicated that, for the most part, the program would have more effect on occasional or social drinkers than on "hard core" or problem drinkers. It was generally agreed that chronic drinkers often drive without a licence, limiting the effectiveness of the program on this group. One respondent did feel that the program would target "hard core" drinkers.

Geographic Location

Responses were mixed as to whether urban or rural drivers would be more likely to change their behaviour as a result of the program. One respondent indicated that rural drivers would be less likely to change their behaviour than urban drivers as alternate forms of transportation are more readily accessible in urban areas.

Repeat Offenders

Stakeholder opinions varied as to whether the program would have a greater effect on first-time or repeat offenders.

6.5 Threats to Validity of Attributing Positive Results to the AALS Program

6.5.1 Factors Relating to the Prevention of Drinking and Driving

The AALS Program was regarded as an important component in the prevention of impaired driving. Most stakeholders felt that a number of factors contributed to reducing drinking and driving including

- loss of licence,
- criminal record,
- increased insurance cost,
- potential loss of employment,
- cost of a lawyer, and
- public embarrassment.

The AALS, along with other programs that target impaired driving, plays an important role in addressing these factors. It was recognized that the AALS does not operate in isolation and that to be effective, it needs the support of other programs related to impaired driving, such as drinking and driving awareness campaigns, check stop programs, and the graduated licence program.

Several other factors were highlighted by stakeholders as important elements for the prevention of drinking and driving. Drivers must perceive that there is a risk that they will be caught in order for the program to be effective. One respondent indicated that it is important for police to have a visual presence, primarily through check stops, in order to increase the perceived risk of penalty. Social acceptance of drinking and driving, or lack thereof, was viewed as another important factor. As one respondent expressed,

> *"It's a cultural issue that we're dealing with here…trying to change the way people think about impaired driving."*

6.5.2 A Comprehensive Program

According to respondents, a comprehensive program is the most effective and should include education, public awareness, effective media campaigns, appropriate legislation, and appropriate sanctions. Many of these elements are present in the AALS program, although stakeholders felt that improvements could be made in the areas of education, awareness, and media campaigns, as already noted.

6.5.3 Challenges to Measuring Program Effectiveness

One respondent did indicate that measuring the effectiveness of a program like the AALS is difficult from an enforcement perspective as the number of impaired drivers caught is dependent on the magnitude of enforcement resources available.

> *"How do we measure its success when I could go and yank impaired after impaired off the street?...Impaired-driving wise…we have an epidemic across the country."*

This comment suggests that officers will always be able to issue as many charges for impaired driving as there are resources available.

7. Assumptions of General Deterrence

An important assumption of deterrence theory is that individuals need to be aware of the consequences of their actions in order for a change in behaviour to occur. When it comes to specific deterrence, it is assumed that consequences become apparent upon the first offense. When it comes to general deterrence, it is assumed that the general public needs to become aware of the consequences through indirect means such as media coverage or word of mouth.

7.1 Media Coverage

A media scan was conducted to provide an indication of the amount of media coverage there was for the AALS program. An assumption of general deterrence is that the public needs to be aware of the legislation for it to have a deterrent effect. Media coverage is one of the means through which the public is informed of a program such as the AALS. The number of articles that mentioned AALS legislation from the Calgary Herald, Edmonton Journal, Lethbridge Herald, Medicine Hat News, Hanna Herald, and The Peace River Gazette are presented by six-month intervals in Figure 32. The articles were also coded in terms of whether or not AALS was a focus of the article. Though a convenience sampling technique was used, it is evident that substantially more media coverage occurred earlier in the program.

Figure 32. AALS Media Scan Results
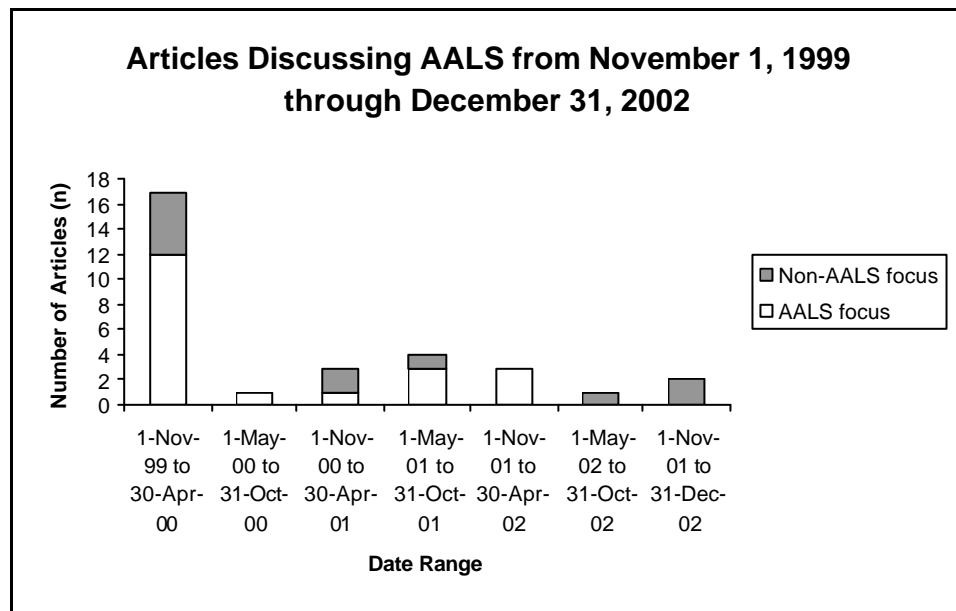
7.2 Knowledge and Awareness of AALS

KEY FINDING

There are indications that public awareness strategies were effectively implemented when AALS legislation was first introduced, but that awareness was not sustained over the long term. The overall effect of this was that public knowledge of AALS waned as a result. Indications that many of the general deterrence effects of the AALS program were limited to the first year of program introduction (described earlier) suggests that public awareness is necessary to achieve general deterrence outcomes. The relationships between change in knowledge of AALS and changes in rates of impaired driving indicators, though not significant due to sample sizes, are supportive of this conclusion.

Several population surveys were conducted by Criterion Research after the initial public awareness campaign of the AALS program (n = 800 each). Three questions were asked in each of three surveys (December 1999, September 2000, and November 2001). One question provided a scenario of someone who was caught by police driving with a blood alcohol level over .08. One of three response choices correctly identified the AALS legislation (knowledge of AALS). A second question simply asked respondents if they had heard about AALS (awareness – unprompted), and a third question described the legislation and then asked respondents if they had heard of the AALS (awareness – prompted). The percentage of individuals who responded in the affirmative to the each of the awareness questions and the percentage who correctly responded to the knowledge question is presented in Figure 33.

A fourth question that assessed the perceived risk associated with impaired driving was also posed. In this question a scenario is described in which an individual drinks just enough to be legally impaired and then drives a relatively short distance home. Respondents were then provided with several options on the likely outcome. Two outcomes described interactions with police, one described being involved in a collision, and one described getting home safely. As on overall indicator of perception of risk associated with impaired driving, the percentage who described a confrontation with police or involvement in a collision was computed for each survey administration. These results are also presented in Figure 33.

Figure 33. Population Indicators of Knowledge of AALS and Risks Associated With Impaired Driving
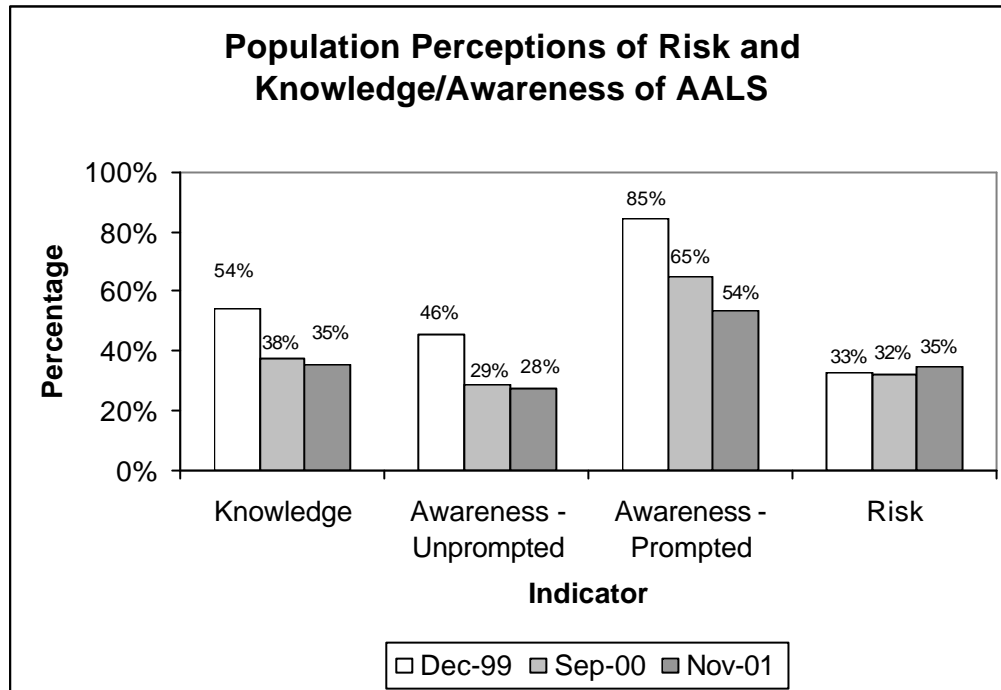
Though perception of risk remained relatively constant over the assessment periods with about 1/3 of the population viewing impaired driving as likely leading to negative consequences, there were large and significant drops in knowledge and awareness of AALS over time. Perhaps the most telling indicator is the percentage who correctly identified the consequences of AALS. This decreased from 54% (December 1999) of population who correctly identified the consequence of licence suspension to 35% (November 2001). It should be noted that 33% is the rate that would be expected if individuals were guessing at the answer.

7.3 Relationship Between Population Awareness and General Deterrence Outcomes

In order to examine the relationship between knowledge of AALS and risk of apprehension a novel meta-analytic approach was used. Rather than representing individuals, each data point in these analyses represented a non-overlapping demographic data cluster (e.g., females aged 25-29). Multiple regression analyses were used to regress knowledge of AALS, risk of apprehension, and the interaction of these terms upon collision statistics, Blood Alcohol Levels and convictions in the six-months following each survey administration.

A significant negative relationship between Knowledge of the AALS program and outcomes provides evidence to support the assumption that knowledge of AALS

legislation is a general deterrent of driving while impaired. A significant knowledge by risk of apprehension suggests that this relationship may only hold if the perceived risk of apprehension is high.

7.3.1 Demographic Cluster

Data were computed based on the demographic clusters described below. Each survey produced a meta-analytic sample size of 20 for a total of 60 data points (N=60).[20]

	Male	Female
18 to 19 years	C1	C11
20 to 24	C2	C12
25 to 29	C3	C13
30 to 34	C4	C14
35 to 39	C5	C15
40 to 44	C6	C16
45 to 49	C7	C17
50 to 54	C8	C18
55 to 64	C9	C19
65 years or older	C10	C20

7.3.2 Predictor Variables

Knowledge of AALS: The proportion of individuals within each of the selected demographic clusters who correctly identify the consequences of the AALS program.

Risk of Impaired Driving: The proportion of individuals within each of the selected demographic clusters who believed there would be negative consequences for an individual who drove while impaired.

Knowledge of AALS by Risk of Apprehension Interaction: Above predictors are standardized and multiplied.

7.3.3 Criterion Variables

Casualty Collisions: In order to ensure collision data were at the same unit of analyses, the proportion of alcohol-related casualty collisions as a function of total casualty collisions were calculated within each demographic data cluster. Collision rates were limited to the first six months after each population survey was administered.

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[20] Analyses were also conducted using a second demographic cluster that created more data points by incorporating regional characteristics (see Appendix B). A close examination of the variability of responses to the surveys within each cluster revealed that the data points obtained from the survey were of questionable reliability and, therefore, are not reported.

COBRA BAC Levels for Calgary: Averages within each demographic cluster were computed. Analyses were limited to the first six months after each population survey was administered.

Convictions: In order to ensure conviction data were at the same unit of analyses the proportion of convictions as a function of registered drivers (per 10,000 drivers) in each cluster were analyzed. Conviction numbers were limited to the first six months after each population survey was administered.

7.3.4 Results

The results of the regression analyses are presented in Table 12. Standardized regression weights are provided and interpreted similarly to a correlation coefficient.

Table 12. Relationships Between General Deterrence Outcomes, Risk of Apprehension, and Knowledge of AALS

Outcome	Risk	Knowledge	Risk X Knowledge
Casualty Collisions	-.230 (p = .078)	.281 (p < .05)	.042 (p = .744)
COBRA BAC Levels: Calgary Data	-.306 (p < .05)	.044 (p = .746)	.057 (p = .676)
Convictions per 10,000 drivers	-.242 (p =.062)	.318 (p < .05)	.042 (p = .752)

Given the small sample size and the correlational nature of the methodology employed the results should be interpreted cautiously. Not surprisingly, the negative relationships with risk indicate that those demographics that perceive higher risk of consequences had lower rates of impaired driving behaviour as defined by the selected indicators. Interestingly, rather than the expected negative relationships with knowledge of AALS, the relationships were positive. This indicates that those with more knowledge of AALS had higher rates of impaired driving behaviour as defined by the selected indicators.

Given that it is highly unlikely that knowledge of AALS prompted individuals to drink and drive, this result was likely an artifact of the cross-sectional nature of the analysis. These positive relationships could have been the result of effective targeting of the media campaigns early in AALS program implementation. In order to remove this effect, change in knowledge between successive surveys was regressed upon change in outcome rates.[21] Successive survey instruments were lagged resulting in sample sizes of 40 per analysis. As seen in Table 13 below the negative relationships, though not significant given the small sample size, are supportive of the conclusion that knowledge of AALS consequences may reduce the drinking driver behaviours.

Table 13. Relationships Between Change in General Deterrence Outcomes and Change in Knowledge of AALS

Outcome	Change In Knowledge
Change in Casualty Collision Rates	-.219 (p = .175)
COBRA BAC Levels: Calgary Data	-.199 (p = .231)
Convictions per 10, 000 Drivers	-.222 (p = .168)

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[21] Change in level of risk was not included as overall levels of risk did not change over the course of survey administration.

8. Conclusions and Recommendations

8.1 Conclusions

Overall, the AALS program appears to have been very effective in terms of primary deterrence (i.e., reducing recidivism of alcohol related offences), but somewhat less effective in terms of general deterrence (i.e., reducing rates of drunk driving in the general public). Much of the effect on the general public was limited to the first year after AALS implementation. The waning effectiveness after the first year is likely due to reduced public awareness of the consequences of driving under the influence as related to AALS legislation. Results from stakeholder interviews indicates this was a concern of some individuals as initial media coverage got off to a good start but declined over time. The media scan provided support for this assertion, and a decline in public awareness over time was identified in the public opinion survey as well. This suggests that the AALS program, while effective, can be more effective through enhanced and sustained public awareness efforts.

Key findings regarding process, the effects on the court system, specific deterrence outcomes, general deterrence outcomes, and assumptions have been discussed previously and are reiterated below and integrated with comments made by key stakeholders.

8.2 Process

Over half of stakeholders interviewed indicated that the Alberta Administrative Licence Suspension Program (AALS) had been implemented in a manner that would reduce the number of drunk drivers on Alberta roads. The ability of the program to remove impaired drivers from the roads in an expedited fashion and the immediate loss of licence were cited as primary factors for program effectiveness.

The appeal process appears to have become more efficient with the passage of time. The rate at which appeals to an AALS suspension resulted in the suspension being revoked increased after the full first year of the legislation. This appears to have stabilized at just over 52%. Several key stakeholders felt that the Board was too lenient when hearing appeals. Interviewees expressed concern that the appeals process gave drivers charged under the AALS too much latitude.

8.3 Effects on Court System

AALS legislation, or the challenge to AALS legislation, may have had some impacts on the court system. The number of non-trial guilty pleas increased by

3.3%, the number of guilty pleas on first appearance increased by 48%, and the number of cases that went to trial decreased by 26.0%. While the nature of the data make it difficult to confidently attribute these changes to AALS legislation, there is some evidence that AALS legislation may have reduced the burden on the court system. These changes were accompanied by a 52% reduction in the median time between first and last appearance, suggesting that the AALS legislation has reduced the tendency to delay court proceedings.

8.4 Specific Deterrence

Key stakeholders felt that the AALS program is primarily effective for those who have experienced the consequences of an AALS suspension. Evidence suggests that this may indeed be the case. A significant 24% reduction in the 2-year recidivism rate was found. Though caution is warranted in attributing all of this reduction to the AALS program given the absence of a comparison group, it is likely that the AALS program is at least partially responsible for this decline.

8.5 General Deterrence

Key stakeholders felt that the AALS is less effective among the general public due to low program awareness. Evidence suggests that while effective in the general public, the effects were more modest and may even have been temporary.

Findings suggest that AALS legislation may have reduced the number of alcohol-involved fatal collisions and the number and percentage of alcohol-involved nighttime casualty collisions. Reductions in alcohol-involved casualty collisions overall were approaching significance. An examination of trends over time suggest that much of the reductions occurred in the first year after AALS legislation came into effect and that rates returned to previous trends in the second and third years.

In examining alcohol-involved drivers in casualty collisions the pattern was also a reduction in rates approaching significance that was likely a function of AALS legislation. As with the collision rates, this reduction appears to have occurred largely in the first year after the legislation was introduced. These effects were largely observed for males and those in the 18-24 age range. Those in the 45-54 age demographic were the only ones to show a significant increase in alcohol-involved casualty collisions following AALS implementation.

There is no evidence that AALS resulted in reduced incidences of BAC positive or BAC over .08 rates among fatally injured drivers. Results indicate that these rates actually increased among drivers over 35 years of age after AALS legislation.

There is also no evidence to suggest that AALS resulted in reducing the average BAC level among those apprehended by police for impaired driving. In combination with previous results, AALS may have reduced the number of impaired drivers on Alberta highways, but likely did not reduce the level of

impairment among those how choose to drink and drive. It should also be noted that AALS legislation and challenges to this legislation may have led to enhanced police service efficiencies in identifying and processing alcohol impaired drivers. This would have the effect of increasing not decreasing the average BAC levels.

There is no evidence to suggest that AALS legislation had an impact on the total number of charges laid. As one key stakeholder pointed out, the number of impaired drivers caught is likely more dependent on the magnitude of enforcement resources rather than the number of impaired drivers. Although there was no change in the overall number of individuals charged, there was a significant increase in the number of those charged with refusing to provide a breath sample. Though this trend toward increased rates preceded the introduction of AALS legislation, the legislation may have contributed the continuation of this trend.

8.6 General Deterrence Assumptions

The evidence presented in this evaluation suggests public awareness and knowledge of AALS legislation has an impact on general deterrence outcomes and sustained public awareness campaigns are necessary to fully achieve these outcomes.

8.7 Recommendations

1. AALS legislation appears to have been an effective tool in reducing the prevalence of impaired driving on Alberta roads. This program should be continued.

2. Compelling evidence suggests that the full potential of the program has not yet been realized. We recommend that in order to realize this potential, a substantial and sustained public awareness and promotion campaign should be implemented. This campaign should highlight consequences of impaired driving in regards to the AALS legislation as well as the consequences of being convicted of impaired driving related offenses. The effectiveness of these campaigns will likely be enhanced by also highlighting the probability of apprehension. These campaigns should target those demographic groups that demonstrate a high incidence rate of impaired driving behavior (i.e., young males) as well as those in the 45-55 age demographic.

3. Though the rate at which AALS suspensions are appealed is currently very low (less than 2% approximately 118 per year). The rate at which Transportation Safety Board appeals are being allowed (i.e., suspension revoked) is over 50%. One factor that may influence this high percentage is that with the maturing of the AALS program, only those cases with the strongest merit are being brought forward to the Board for appeal. It is recommended that Alberta Infrastructure and Transportation review the appeal decision process to determine if any changes are required.

4. Once the full potential of the current legislation is realized, the following suggestions from key stakeholders should be considered with respect to strengthening the program:

   a) Increasing penalties for individuals who continue to drive after they have lost their licence,
   b) Reducing officer discretion with respect to the option of issuing a 24-hour licence suspension,
   c) Seizing vehicles of those given a licence suspension, and
   d) Reducing the length of the suspension grace period.

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Appendix A: AALS Program Notice of Suspension/Disqualification

Alberta
GOVERNMENT OF ALBERTA

Notice of Suspension/Disqualification
ALBERTA ADMINISTRATIVE LICENCE SUSPENSION
OR
NOVICE DRIVER - ZERO ALCOHOL TOLERANCE PROGRAM

A   Z

Police File No.

J 2731 Rev Apr 03

PLEASE PRINT

Occurrence Information

Occurrence Date

Year	Month	Day

at or about _____ Time (24 HR Clock)   at or near _____ Location   , in the Province of Alberta.

Driver Information

Name of Driver

Surname	First	Middle	Residence Phone	Business Phone

Address

Street	City, Town, Village	Province	Postal Code

Licence Information

AB or Other

☐ F
☐ M

Birth Date

Licence Expiry Date

Licence No.	Prov./State	Class	Cond.	Sex	Year	Month	Day	Year	Month	Day

Seized Alberta Operator's Licence

☐ Yes   ☐ No. If No, explain

M.V. I.D. No.

Notice and Order of Suspension/Disqualification
Effective immediately, your driving privileges are suspended for 24 hours from the date and time noted above followed by:

ADMINISTRATIVE LICENCE SUSPENSION PROGRAM

☐ 3 Month Term Starting in 21 Days
H T S 9 0 0

☐ 6 Month Term Starting in 21 Days
H T S 9 2 0

☐ 3 Month Term Effective Immediately
H T S 9 1 0

☐ 6 Month Term Effective Immediately
H T S 9 3 0

REASON:

☐ Breath or Blood exceeding 80 mg %

OR

☐ Refusal

Alcohol Related Offence Involving Bodily Harm or Death

☐ Bodily Harm or Death

NOVICE DRIVER - ZERO ALCOHOL TOLERANCE PROGRAM

☐ 1 Month Term Starting in 7 Days
H T S 7 0 0

☐ 1 Month Term Effective Immediately
H T S 7 1 0

REASON:

☐ Alcohol present in Breath Sample as indicated by

_____ on an approved device.

OR

☐ Refusal

Sample

Temporary Operator's Permit

Temporary Operator's Permit Issued ☐ Yes ☐ No. If no, explain _____

This Temporary Operator's Permit is **valid 24 hours from**

Year	Month	Day
Issue Date		

and the time stated above.

Signature of Driver _____

Signature of Peace Officer	Police Service	Badge No.	**Issue Date**			Faxed or Entered
			Year	Month	Day	

Particulars

☐ Operator's Licence Destroyed _____

Peace Officer _____

J 2731 Rev Apr 03

IMPORTANT INFORMATION ON REVERSE

Appendix B: AALS Evaluation Plan

Evaluation and Analysis Grid

1.	**WHAT ARE THE IMPACTS OF THE NEW AALS ON THE REDUCTION OF ALCOHOL RELATED TRAFFIC COLLISIONS IN ALBERTA?**		
	Evaluation Question	**Data Source**	**Analysis**
1a.	Has there been a reduction/change in the number of alcohol involved casualty collisions over time?	Alberta Traffic Collision Data 1992-2002 inclusive Saskatchewan Traffic Collision Data 1992-2002 inclusive	UNIT OF ANALYSIS 1a.1 – 1a.4: Number of Alcohol Involved Casualty Collisions • 1a.1 A comparison of casualty collisions 3 years pre and post AALS will be made using a binomial estimated probability calculation. Relative comparison to overall number of casualty collisions will also be made (i.e., percent alcohol involved relative to all collisions). Probability estimates will be based on both unadjusted and adjusted (adjusted for number of licenced drivers). • 1a.2 A comparison of casualty collisions in Alberta 2 years pre and post AALS will be made using expected probabilities based on Saskatchewan data. Relative comparison to overall number of casualty collisions will also be made. (Saskatchewan implemented ALS in March 02 requiring the reduction in time frame). Probability estimates will be based on both unadjusted and adjusted (adjusted for number of licenced drivers) will be reported. • 1a.3 Interrupted time series analysis using ARIMA modeling of casualty collision numbers in Alberta between January 1, 1992 and December 31, 2002. • 1a.4 Comparison of step intervention functions between Alberta and Saskatchewan data using: a) Interrupted time series analysis using ARIMA modeling of casualty collision numbers in Alberta between January 1, 1992 and February 28, 2002, b) Interrupted time series analysis using ARIMA modeling of casualty collision numbers in Saskatchewan between January 1, 1992 and February 28, 2002.

		UNIT OF ANALYSIS 1a.5 – 1a.8: Proportion of alcohol involved drivers involved in casualty collisions
		• 1a.5 See 1a.1 Analyses described repeated for % of alcohol involved drivers involved in casualty collisions as a function of total drivers involved in casualty collisions. Chi-square analysis will be used rather than binomial probabilities.
		• 1a.6 - See 1a.2 Analyses described repeated for % of alcohol involved drivers involved in casualty collisions as a function of total drivers involved in casualty collisions. Chi-square analysis will be used rather than binomial probabilities.
		• 1a.7 - See 1a.3 Analyses described repeated for % of alcohol involved drivers involved in casualty collisions as a function of total drivers involved in casualty collisions.
		• 1a.8 - See 1a.4 Analyses described repeated for % of alcohol involved drivers involved in casualty collisions as a function of total drivers involved in casualty collisions.
		UNIT OF ANALYSIS 1a.9 – 1a.10: number of repeat alcohol involved drivers involved in casualty collisions
		• 1a.9 A comparison of repeat alcohol involved drivers involved in casualty collisions 3 years pre and post AALS will be made using a binomial estimated probability calculation. Probabilty estimates will be based on both unadjusted and adjusted (adjusted for number of licenced drivers).
		• 1a.10 A comparison of repeat alcohol involved drivers involved in casualty collisions in Alberta 2 years pre and post AALS will be made using expected probabilities based on Saskatchewan data.

1b.	Has there been a reduction/change in the number of drinking driver fatal collisions?	Alberta Traffic Collision Data 1992-2002 inclusive Saskatchewan Traffic Collision Data 1992-2002 inclusive	UNIT OF ANALYSIS 1b.1 – 1b.4: Number of Alcohol Involved Fatal Collisions • 1b.1 - See 1a.1 Analyses described repeated for alcohol involved fatal collisions. • 1b.2 - See 1a.2 Analyses described repeated for alcohol involved fatal collisions. • 1b.3 - See 1a.3 Analyses described repeated for alcohol involved fatal collisions. • 1b.4 - See 1a.4 Analyses described repeated for alcohol involved fatal collisions.
1c.	Has there been a reduction/change in severity of alcohol related collisions?	Alberta Traffic Collision Data 1992-2002 inclusive Saskatchewan Traffic Collision Data 1992-2002 inclusive	UNIT OF ANALYSIS 1c.1 – 1c.4: Proportion of alcohol related fatal collisions • 1c.1 - See 1a.1 Analyses described repeated for % of alcohol related fatal collisions as a function of total fatal collisions. Chi-square analysis will be used rather than binomial probabilities. • 1c.2 - See 1a.2 Analyses described repeated for % of alcohol related fatal collisions as a function of total fatal collisions. Chi-square analysis will be used rather than binomial probabilities. • 1c.3 - See 1a.3 Analyses described repeated for % of alcohol related fatal collisions as a function of total fatal collisions. • 1c.4 - See 1a.4 Analyses described repeated for % of alcohol related fatal collisions as a function of total fatal collisions. UNIT OF ANALYSIS 1c.5 – 1c.8: Proportion of alcohol related casualty collisions • 1c.5 - See 1a.1 Analyses described repeated for % of alcohol related casualty collisions as a function of total casualty collisions. Chi-square analysis will be used rather than binomial

		probabilities.
		• 1c.6 - See 1a.2 Analyses described repeated for % of alcohol related casualty collisions as a function of total casualty collisions. Chi-square analysis will be used rather than binomial probabilities.
		• 1c.7 - See 1a.3 Analyses described repeated for % of alcohol related casualty collisions as a function of total casualty collisions.
		• 1c.8 - See 1a.4 Analyses described repeated for % of alcohol related casualty collisions as a function of total casualty collisions.
		UNIT OF ANALYSIS 1c.9 – 1c.12: Proportion of alcohol related police attended property damage only collisions
		• 1c.9 - See 1a.1 Analyses described repeated for % of alcohol related police attended property damage only collisions as a function of total scene attended property damage only collisions. Chi-square analysis will be used rather than binomial probabilities.
		• 1c.10 - See 1a.2 Analyses described repeated for % of alcohol related police attended property damage only collisions as a function of total scene attended property damage only collisions. Chi-square analysis will be used rather than binomial probabilities.
		• 1c.11 - See 1a.3 Analyses described repeated for % of alcohol related police attended property damage only collisions as a function of total scene attended property damage only collisions.
		• 1c.12 - See 1a.4 Analyses described repeated for % of alcohol related police attended property damage only collisions as a function of total scene attended property damage only collisions.

1d.	Has there been a reduction/change in the average monthly drinking driver fatal collisions?	Alberta Traffic Collision Data 1992-2002 inclusive Saskatchewan Traffic Collision Data 1992-2002 inclusive	UNIT OF ANALYSIS 1d.1 – 1d.2: Number of Alcohol Involved Casualty Collisions • 1d.1 - See 1a.1 Results reported as average per month • 1d.2 - See 1a.2 Results reported as average per month. • Analyses 1a.3 and 1a.4 already analyzed in terms of incidences per month
1e.	Has there been a reduction/change in overall/monthly nighttime vehicle crashes?	Alberta Traffic Collision Data 1992-2002 inclusive Saskatchewan Traffic Collision Data 1992-2002 inclusive Definition for Nighttime will be 10pm to 4am (Belton et al., 2003)	UNIT OF ANALYSIS 1e.1 – 1e.4: Number of Alcohol Involved Nighttime Casualty Collisions • 1e.1 - See 1a.1 Analyses described repeated for nighttime alcohol involved casualty collisions. • 1e.2 - See 1a.2 Analyses described repeated for nighttime alcohol involved casualty collisions. • 1e.3 - See 1a.3 Analyses described repeated for nighttime alcohol involved casualty collisions. • 1e.4 - See 1a.4 Analyses described repeated for nighttime alcohol involved casualty collisions
1f.	Has there been an age group that has shown a reduction/change in drinking driver casualty collisions?	Alberta Traffic Collision Data 1992-2002 inclusive Saskatchewan Traffic Collision Data 1992-2002 inclusive	UNIT OF ANALYSIS 1f.1 – 1f4: Number of Alcohol Involved Drivers in Each Age Category • 1f.1 - See 1a.1 Analyses described for alcohol involved drivers in casualty collisions for each of the following driver age groups: Under 17, 18-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-64, 65+. • 1f.2 - See 1a.2 Analyses described for alcohol involved drivers in casualty collisions for each of the following driver age groups: : Under 17, 18-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-64, 65+. • 1f.3 - See 1a.3 Analyses described for alcohol involved drivers in casualty collisions for each of the following driver age groups: 18-24, 25-34, 35-44, 45-54, 55+ (wider age bands required

		to allow for adequate monthly population sizes). • 1f.4 - See 1a.4 Analyses described for alcohol involved drivers in casualty collisions for each of the following driver age groups: 18-24, 25-34, 35-44, 45-54, 55+ (wider age bands required to allow for adequate monthly population sizes).
1g.	Has there been a gender group that has shown a reduction/change in drinking driver casualty collisions?	Alberta Traffic Collision Data 1992-2002 inclusive Saskatchewan Traffic Collision Data 1992-2002 inclusive	• UNIT OF ANALYSIS 1g.1 – 1g4: Number of Alcohol Involved Drivers For Both Genders • 1g.1 - See 1a.1 Analyses described for alcohol involved drivers in casualty collisions repeated for males and females separately. • 1g.2 - See 1a.2 Analyses described for alcohol involved drivers in casualty collisions repeated for males and females separately. • 1g.3 - See 1a.3 Analyses described for alcohol involved drivers in casualty collisions repeated for males and females separately. • 1g.4 - See 1a.4 Analyses described for alcohol involved drivers in casualty collisions repeated for males and females separately.
1h.	Has there been a reduction in the number of property damage only collisions? (if sample data is sufficient to accurately reflect any changes that may have occurred)	Alberta Traffic Collision Data 1992-2002 inclusive Saskatchewan Traffic Collision Data 1992-2002 inclusive	UNIT OF ANALYSIS 1h.1 – 1h4: Number of Alcohol Involved Police Attended Property Damage Only Collisions • 1h.1 - See 1a.1 Analyses described repeated for alcohol involved property damage only collisions (police attended collisions only). • 1h.2 - See 1a.2 Analyses described repeated for alcohol involved property damage only collisions (police attended collisions only). • 1h.3 - See 1a.3 Analyses described repeated for alcohol involved property damage only collisions (police attended collisions only). • 1h.4 - See 1a.4 Analyses described

		repeated for alcohol involved property damage only collisions (police attended collisions only)
		• NOTE: Caution in interpretation will be warranted as the AALS may have increased the proportion of counter reporting of property damage only collisions among drinking drivers. To test for this possibility:
		UNIT OF ANALYSIS 1h.5 – 1h8: Proportion of Alcohol Involved Police Attended Property Damage Only Collisions
		• 1h.5 - See 1a.1 Analyses described repeated for % of police attended property damage only collisions as a function of overall property only damage collisions (police attended + counter reported). Chi-square analysis will be used rather than binomial probabilities.
		• 1h.6 - See 1a.2 Analyses described repeated for % of police attended property damage only collisions as a function of overall property only damage collisions (police attended + counter reported). Chi-square analysis will be used rather than binomial probabilities.
		• 1h.7 - See 1a.3 Analyses described repeated for % of police attended property damage only collisions as a function of overall property only damage collisions (police attended + counter reported). Chi-square analysis will be used rather than binomial probabilities.
		• 1h.8 - See 1a.4 Analyses described repeated for % of police attended property damage only collisions as a function of overall property only damage collisions (police attended + counter reported). Chi-square analysis will be used rather than binomial probabilities.
*1i.	Are demographic variations in process (4f-4g) significantly related to demographic	Criterion Survey Data in combination with Alberta Collision Data	UNIT OF ANALYSIS 1i1: See Next Section of Evaluation Plan. • 1i1 Regression of Knowledge and risk

	variations in traffic collisions (1f-1g)?		of apprehension upon casualty collision rates (see next section of evaluation plan). • NOTE: Sample sizes insufficient to repeat with fatalities
2.	**What are the impacts of the new AALS on the driving records/behaviors of Albertans?**		
2a.	What is the change in Average Blood Alcohol Concentration (BAC) test results before and after the legislation?	Fatally injured BAC data file	UNIT OF ANALYSIS 2a.1-2a.2: Proportion of Fatally injured drivers over indicated BAC levels • 2a.1 A comparison of proportion of fatally injured drivers that are BAC positive 3 years pre and post AALS will be made using a chi-square (repeated using BAC > .08). • 2a.2 Interrupted time series analysis using ARIMA modeling of monthly number of drinking driver fatalities numbers in Alberta between January 1, 1992 and December 31, 2002. (Repeated using BAC > .08).
		Calgary Cobra Data (Data appears reliable January 1995 – March 2003)	UNIT OF ANALYSIS 2a.3– 2a.8: Average BAC levels • 2a.3 A comparison of average Calgary BAC levels 3 years pre and post AALS will be made using independent samples t-tests. • 2a.4 Interrupted time series analysis using ARIMA modeling of Calgary Monthly Averages between January 1, 1995 and December 31, 2002.
		Edmonton Cobra Data (Data appears reliable between November 1998 – May 2002)	• 2a.5 A comparison of average Edmonton BAC levels 1 year pre and 2 years post AALS will be made using independent samples t-tests.
		Camrose Cobra Data (Data available February 1997 – December 2003 –Data appear reliable – low sample sizes	• 2a.6 A comparison of average Camrose BAC levels 2 years pre and 3 years post AALS will be made using independent samples t-tests.
		RCMP Cobra Data (Data available August 1997 – December 2002 -Data is highly variable in frequency and of questionable reliability – very little data for 1997 and	• 2a.7 Seasonality function in Calgary data will be used to determine a monthly sampling procedure. A comparison of average RCMP BAC levels 2 years pre and 3 years post AALS will be made independent samples t-tests. Procedure will be repeated omitting 2000 data.

		2000)	NOTE: An alternate sampling methodology that will require manual collection of data will be developed and submitted as an addendum to this plan. FINAL NOTE: This analysis could not be conducted given the sporadic nature of the RCMP data. (see Appendix D)
		Weighted combination of Edmonton, Calgary and RCMP Cobra data	• 2a.8. The datafrom Calgary, Edmonton and the RCMP (sampling plan in 2a.6) will be combined and weighted according to the population of Calgary, Edmonton, and rural locations to provide an estimate of Alberta changes in BAC levels. Analyses 2a.6 will be repeated on this dataset. FINAL NOTE: This analysis could not be conducted given the sporadic nature of the RCMP data. (see Appendix D)
2b.	What is the change in the number of convictions for alcohol related offenses?	Conviction Data (January 1992 – Dec 2002 + Conviction dates for repeat offenders between January 1992 – July 2003)	UNIT OF ANALYSIS 2b.1– 2b.2: Number of convictions for alcohol related offences • 2b.1 A comparison of convictions 3 years pre and post AALS will be made using a binomial estimated probability calculation. • 2b.2 Interrupted time series analysis using ARIMA modeling of convictions between January 1, 1992 and July 31, 2003.
2c.	What is the change in the annual number of persons charged for alcohol related offences over time?	Summary Data CCJS (Canadian Centre for Justice Statistics)	UNIT OF ANALYSIS 2c.1– 2c.3: Number of persons charged for alcohol related offences • 2c.1 Descriptive analysis of total number of persons charged between 1992 and 2002. Also broken down by Impaired Operation of Motor Vehicle - Causing Death, Impaired Operation of Motor Vehicle - Causing Bodily Harm, Impaired Operation of Motor Vehicle or Over 80 mg, Fail or Refuse to Provide Breath Sample, Fail or Refuse to Provide Blood Sample. • 2c.2 A comparison of numbers charged 3 years pre and post AALS will be made using a binomial estimated probability calculation. Results based on unadjusted and adjusted (adjusted for number of licenced drivers) will be

		reported, Analyses repeated for specific charges described in 2e.1 • 2c.3 Descriptive comparison of rates across all provinces. Rates provided as charges per 1000 licenced drivers. Date of ALS introduction will be noted.
2d.	What is the change in the annual number of repeat offender convictions for alcohol related offences? Suggested change to question: What is the change in the annual number of repeat offenders who are reconvicted	Conviction Data (January 1992 – December 2002 + Conviction dates for repeat offenders between January 1992 – July 2003)	UNIT OF ANALYSIS 2d.1-2d.3: Number of repeat offenders who are reconvictred • 2d.1 The number of reconvicted individuals with more than one offence during the time period Dec 1, 1999 - November 30, 2002 compared to those with more than one offence between Dec 1, 1996 - November 30, 1999. Analyzed using a binomial estimated probability calculation. • 2d.2 Repeat 2d.1 using proportion of repeat offenders as a function of all offenders during these periods. Analyzed using chi –square. • 2d.3 Up to 2 year post conviction survival analyses (proportion of those who do not re-offend within 2 years) beginning in 1992 and repeated yearly to end of 2000. Primary focus will be on comparing 2000 with 1997 data.
2e.	What is the change in the annual number of persons charged for alcohol related offences over time?	NOTE: Repeated (see 2c)	NOTE: Repeated (see 2c)
*2f.	Are demographic variations in process (1f-1g) significantly related to demographic variations in driving records/behaviours (2a-2e)?	Criterion Survey Data in combination with Alberta BAC Data and Conviction Data	UNIT OF ANALYSIS 2f.1-2f.3: See next section of evaluation plan • 2f.1 Regression of Knowledge and risk of apprehension upon casualty BAC positive rates among fatalities (see next section of evaluation plan). • 2f. 2 Regression of Knowledge and risk of apprehension upon average BAC levels For Calgary data (Cluster 2 - see next section of evaluation plan). • 2f.3 Regression of Knowledge and risk of apprehension upon convictions (see next section of evaluation plan). • NOTE: Sample sizes insufficient to

			repeat with repeat offenders
3.	**What are the impacts of the new AALS on the court system in Alberta?**		
3a.	How many people charged and entered guilty pleas (at any time) for refusing to provide a breath sample, providing a breath or blood sample, over .08 and impaired before and after implementation of AALS?	Summary Data CCJS (Canadian Centre for Justice Statistics). Data begins 94/95 fiscal year. Summary Data on total number of individuals charged	• NOTE: Data Source Does not allow answer of question as stated: Can answer: How many people pled guilty before trial before and after implementation of AALS (Data is available by fiscal year, therefore 99/00 will be considered a transition year. Data is also not available by type of impaired charge) . UNIT OF ANALYSIS 3a.1-3a.2: Number of pre-trial guilty pleas • 3a1. Descriptive presentation of number pre-trial guilty pleas by fiscal year beginning 94-95. • 3a.2 A comparison of number of pre-trial guilty pleas 3 years pre transition year (97-98, 98-99), and 3 years post transition year (00-01, 01-02) will be made using a binomial estimated probability calculation. UNIT OF ANALYSIS 3a.3: Proportion of pre-trial guilty pleas • 3a.3 A comparison of proportion pre-trial guilty pleas 3 years pre transition year (96-97, 97-98, 98-99), and 3 years post transition year (00-01, 01-02, 02-03) will be made using a chi-square analyses. (Proportion of pre-trial guilty pleads relative to total charges.)
3b.	Has the number of guilty pleas or persons charged on alcohol related offences increased on: i) First appearance? ii) Second appearance? iii) Subsequent appearances?	CCJS Summary Data (Canadian Centre for Justice Statistics). Data begins 94/95 fiscal year. Summary Data on total number of individuals charged Second and Subsequent appearance data not available	• NOTE: Data Source Does not allow answer of question 3bii or 3biii: Data is available by fiscal year, therefore 99/00 will be considered a transition year. It is assumed that the number of cases for decision of guilty at first appearance = a guilty plea as there is never a trial on first appearance . UNIT OF ANALYSIS 3b.1-3b.2: Number of guilty pleas at first appearance • 3b.1 Descriptive presentation of number of guilty pleas at first appearance by fiscal year beginning 94-95.

			• 3b.2 A comparison of number of guilty pleas at first appearance 3 years pre transition year (96-97, 97-98, 98-99), and 3 years post transition year (00-01, 01-02, 02-03) will be made using a binomial estimated probability calculation.
			UNIT OF ANALYSIS 3b.3: Proportion of guilty pleas at first appearance
			• 3b.3 A comparison of proportion of guilty pleas at first appearance 2 years pre transition year (97-98, 98-99), and 2 years post transition year (00-01, 01-02) will be made using a chi-square analyses. (Proportion of pre-trial guilty pleas relative to total charges.)
3c.	Has there been a reduction in the number of trials <u>scheduled</u> for alcohol related offences?	This Data is Not Available	• Data not available
3d.	Has there been a reduction in the number of trials <u>heard</u> for alcohol related offences?	CCJS Summary Data (Canadian Centre for Justice Statistics). Data begins 94/95 fiscal year. Summary Data on total number of individuals charged	UNIT OF ANALYSIS 3d.1-3d.2: Number of trials heard • 3d1. Descriptive presentation of number of trials heard by fiscal year beginning 94-95 • 3d2 A comparison of number of trials heard 3 years pre transition year (96-97, 97-98, 98-99), and 3 years post transition year (06-97, 00-01, 01-02) will be made using a binomial estimated probability calculation. UNIT OF ANALYSIS 3d.1-3d.2: Proportion of trials heard. • 3d3 A comparison of proportion of number of trials heard 3 years pre transition year (96-97,97-98, 98-99), and 3years post transition year (00-01, 01-02, 02-03) will be made using a chi-square analyses. (Proportion of trials heard relative to total charges.)
4.	**Process**		
4a.	What was the average length of time between suspension and a Transportation Safety Board hearing date?	AALS Appeal Hearing Data	UNIT OF ANALYSIS 4a.1-4a.5: Average number of days and proportion within number of days

			• 4a.1 Average length of time (days) between suspension start date and hearing date (note: values can be negative if person begins the appeal process early) • 4a.2 Data will also be presented as a percentage within time periods (i.e., % within 7 days, 14 days, etc.) • 4a.3 Data will be split by Decision and analyses repeated • 4a.4 Analysis of change between year 1 and year 2 post AALS • 4a.5 Regression analysis for relationships with demographic characteristics (age, gender)
4b.	What was the average length of time between the Board receiving an AALS appeal and a hearing date?	AALS Appeal Hearing Data	UNIT OF ANALYSIS 4b.1-4b.5: Average number of days and proportion within number of days • 4b.1 Average length of time (days) between AALS appeal being received and hearing date (note: values can be negative if person begins the appeal process early) • 4b.2 Data will also be presented as a percentage within time periods (i.e., % within 10 days, 20 days, etc.) • 4b.3 Data will be split by Decision and analyses repeated. • 4b.4 Analysis of change between year 1, year 2, and year 3 post AALS. • 4b.5 In combination with 4a, partitioning of time between Suspension date and date appeal received date appeal received and date information requested, date information requested and date information received, date information received and hearing date, and hearing date and decision date
4c.	How many suspensions have been revoked by the Board (i.e., appeal allowed)?	AALS Appeal Hearing Data Summary Data on total number of individuals	UNIT OF ANALYSIS 4c.1-4c.5: Number of revoked suspensions • 4c.1 Overall number of revoked suspensions.

		charged	• 4c.2 % of suspensions revoked as a function number of appeals.
		Summary Data on total number of suspended individuals	• 4c.3 % of suspensions revoked as a function of total number of persons charged.
			• 4c.4 % of suspensions revoked as a function of total number suspensions.
			• 4c.5 Analysis of change between year 1, year 2 , and year 3 post AALS.
*4d.	How was the population informed about changes to the AALS?	• Project Documentation • Key Stakeholder Interviews • Media Scan	• 4d.1 Qualitative review of project documentation • 4d.2 Qualitative analyses of Stakeholder interview data • 4d.3 Media Scan of mention of the AALS will attempt to describe patterns over time as well as within four geographic clusters (Edmonton, Calgary, Other cities, Rural). Scan to include the period July 1, 1999 to December 31, 2002. Data will be examined quarterly and /or bi-annually depending on frequency of AALS coverage. Given availability of various data sources (See Appendix C), the following periodicals will be used as convenience samples: Calgary Herald, Edmonton Journal, Lethbridge Herald, Medicine Hat News, Hanna Herald and The Peace River Gazette: The following data elements will be gathered: Article date, page (prominence), length type of article (letter to the editor, editorial, article)
*4e.	What were the changes in enforcement capacity (e.g., officers per 1000 drivers, checkstops, etc.) over time?	Officers in Alberta: Statistics Canada Check Stop Program Documentation	• 4e.1 Data will be presented as contextual information by year. • 4e.2 Data Analyses will depend on level of detail provided by the Check Stop program. Minimum analysis will be descriptive by year. FINAL NOTE: Checkstop data could not be obtained
*4f.	To what extent is the population aware of AALS?	Criterion Surveys	• 4f.1 Descriptive Analysis of Consequences for Phil if Caught question responses over time (December 1999 item 4, January 2000 not asked, September 2000 item 9,

			November 2001 item 9).
			• 4f.2 Descriptive Analysis of Knowledge of AALS (unprompted) question responses over time (December 1999 item 6, January 2000 not asked, September 2000 item 10, November 2001 item 10).
			• 4f.3 Descriptive Analysis of Knowledge of AALS (prompted) question responses over time (December 1999 item 8, January 2000 not asked, September 2000 item 12, November 2001 item 12).
*4g.	What is the populations' perception about the risk of apprehension?	Criterion Surveys	• 4g.1 Descriptive Analysis of "Phil" question responses over time (December 1999 item 3, January 2000 item 14, September 2000 item 8, November 2001 item 8).
*4h.	What additional assumptions link AALS to changes in driver behaviour?	AALS Documents Peer Reviewed Literature Sources Stakeholders	• 4h.1 Qualitative review of project documentation. • 4h.2 Qualitative review of literature. • 4h.3 Qualitative analysis of stakeholder interviews.

* Added by Howard Research.

Relating Knowledge and Risk of Apprehension To Anticipated Outcomes

In order to examine the relationship between knowledge of the AALS and Risk of Apprehension to various anticipated outcomes a novel meta-analysis approach was used. Rather than representing individuals, each data point in these analyses represents a non-overlapping demographic data cluster (e.g., females aged 18-29 in a rural location). Multiple regression analyses was used to regress knowledge of the AALS, risk of apprehension, and the interaction of these terms upon collision statistics, BAC statistic, and convictions in the 6-months following each survey administration.

A significant relationship between knowledge of the AALS program and collision rates would provide evidence supporting the assumption that reductions in collisions may have occurred as the result of an awareness of potential consequences of driving under the influence. A significant knowledge by risk of apprehension interaction would suggest that this relationship only holds if the perceived risk of apprehension is high.

Predictor Variables

Knowledge of AALS: The proportion of individuals within each of the selected demographic clusters who correctly identify the consequences of the AALS program (unprompted).

Risk of Apprehension: The proportion of individuals within each of the selected demographic clusters who respond in the Phil scenario that Phil will either be stopped by police, stopped by police and charged, or involved in a traffic collision.

Knowledge of AALS by Risk of Apprehension Interaction: Above predictors are standardized and multiplied.

Criterion Variables

Casualty Collisions: In order to ensure collision data are at the same unit of analyses the proportion of alcohol-related casualty collisions as a function of total casualty collisions was analyzed within each demographic data cluster. Collisions were limited to those involving drivers, motorcycles, or other drivers and to those with an Alberta Licence. Collision numbers were also limited to the first six months after each population survey was administered.

BAC Positive Rates Among Driver Fatalities: Rates within each demographic cluster were analyzed. Analyses were limited to the first six months after each population survey was administered. Links with collision data established location of collision and allowed limiting of data to those with an Alberta Licence.

<u>COBRA BAC Levels For Calgary:</u> Averages within each demographic cluster were analyzed (Cluster Method 2 Only). Analyses were limited to the first six months after each population survey was administered.

<u>Convictions:</u> In order to ensure conviction data were at the same unit of analyses the proportion of convictions as a function of the population (per 1000 population in each cluster) were analyzed. Conviction numbers were limited to the first six months after each population survey was administered.

Demographic Clusters

Analyses were conducted based on two demographic clusters. The first used the cross-tabulation of age, sex, and location and has the advantage of more data points (40 data points per survey). The disadvantage was that location of collision was used as a proxy for location of residence on the criterion side of the regression analysis for several outcomes (the exception was for conviction data where location of residence was available). This reduced the reliability of the criterion variables.

The second cluster option used the cross-tabulation of age and sex only. This cluster had the advantage of more reliable data on the criterion side of the equation. The disadvantage was a less powerful analyses due to fewer data points (20 per survey).

CLUSTER 1

	AGE[22]	REGION			
		Edmonton	Calgary	Other cities	Rural
Male	18-24 years	C1	C11	C21	C31
	25 - 34 years	C2	C12	C22	C32
	35-44 years	C3	C13	C23	C33
	45-54 years	C4	C14	C24	C34
	55+years	C5	C15	C25	C35
Female	18-24 years	C6	C16	C26	C36
	25 - 34 years	C7	C17	C27	C37
	35-44 years	C8	C18	C28	C38
	45-54 years	C9	C19	C29	C39
	55+years	C10	C20	C30	C40

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[22] The age clusters were selected to ensure adequate representation on the predictor side of the equation.

CLUSTER 2

|	Male	Female
18 to 19 years	C1	C11
20 to 24	C2	C12
25 to 29	C3	C13
30 to 34	C4	C14
35 to 39	C5	C15
40 to 44	C6	C16
45 to 49	C7	C17
50 to 54	C8	C18
55 to 64	C9	C19
65 years or older	C10	C20

Survey Data – Outcome Data Location Definitions

In order to match survey location to anticipated outcome locations the decision rules identified in the table below were used. For collision data and sources linked to collision data, all police services serving these areas were coded to reflect the population survey definitions. In keeping with the Metropolitan area format, rural detachments for Edmonton, Calgary, and Other Cities were coded as part of these urban areas. For conviction data, the actual city, or town of residence were coded to the survey specifications.

| Definition	Survey	Outcomes
Edmonton	• Census Canada Metropolitan Area: See Figure	• For Collision data and Links to Collision Data: Police services in Metropolitan Area (including rural divisions). • For Conviction Data: Residence in Metropolitan area
Calgary	• Census Canada Metropolitan Area: See Figure	• For Collision data and Links to Collision Data: Police services in Metropolitan Area (including rural divisions). • For Conviction Data: Residence in Metropolitan area
Other Cities	• Camrose • Drumheller • Fort McMurray • Grande Prairie • Lethbridge • Lloydminster • Medicine Hat • Red Deer • Wetaskiwin.	• For Collision data and Links to Collision Data: Police services in cities identified left (including rural divisions). • For Conviction Data: Residence in cities identified left.
Rural	• All other locations not identified above	• All other locations not identified above

Edmonton
Census Metropolitan Area - Région métropolitaine de recensement
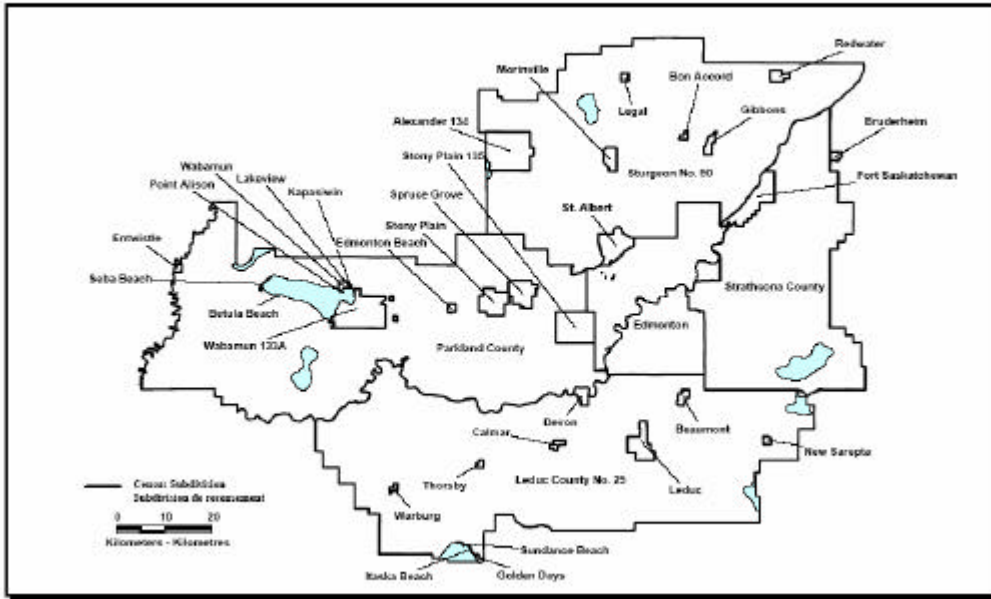
Calgary
Census Metropolitan Area - Région métropolitaine de recensement
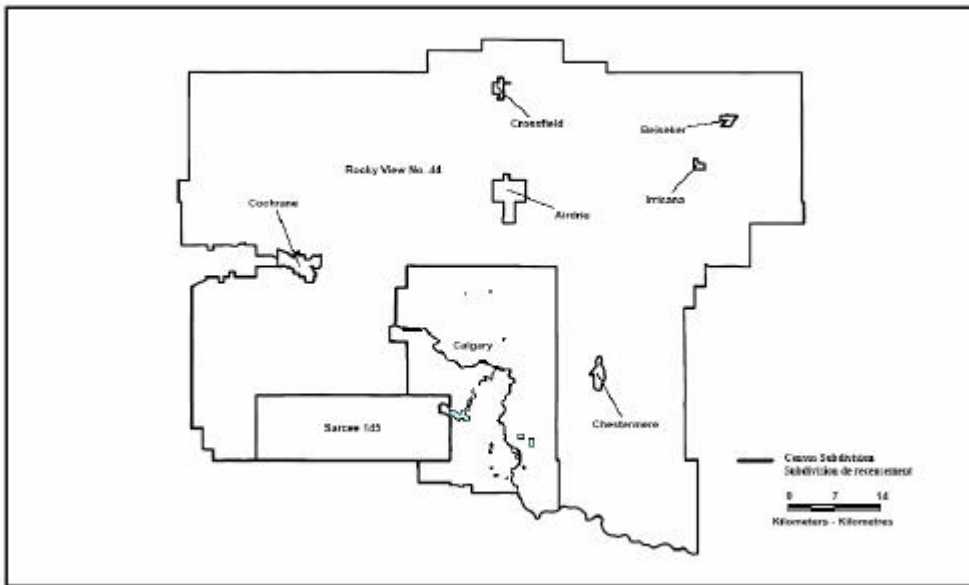
Appendix C: Media Scan of the AALS Program

Media Scan of Alberta Administrative Licence Suspension Program

A media scan of newspapers representing large urban, medium urban, and rural locations from July 31, 1999 to December 31, 2002 for the term "Alberta Administrative Licence Suspension Program," and variations.

Media Scan Results

Large Urban

Only the Edmonton Journal and Calgary Herald are available in a searchable, full-text format. The Edmonton and Calgary Suns are available through a fee-based, public research service (1-877-624-1463, research@sunpub.com).

Time Estimate: Maximum 0.25 days per paper
                   Estimate depends on output required (i.e., full texts, citations, etc.)

Medium Urban

The five smaller urban newspapers are available in microfilm/print. All are available for the dates requested through the Alberta Legislature Library.

Newspaper	Online availability	Paper availability
Grande Prairie Daily Herald-Tribune	Not online	last 6 mo at EPL; Legislature Library; Library of Parliament on microfilm
Fort McMurray Today	Not online	last 6 mo at EPL; Alberta Legislature Library;
Lethbridge Herald	Online	
Medicine Hat News	Online from April 1999	Last 6 mo at EPL; Alberta Legislature Library
Red Deer Advocate	Appears to have past 6 months online	last 6 mo at EPL; Alberta Legislature Library

Each newspaper is approximately the same size as one section of a large urban newspaper (e.g., Edmonton Journal, Calgary Herald). All five newspapers are dailies. Estimate 5 minutes to scan each daily newspaper.

Time Estimates Not Online: 0.083 hrs/paper x 852 issues = 9 days

Time Estimate Online: Maximum 0.25 days per paper
                             Estimate depends on output required (i.e., full texts, citations, etc.)

<u>Rural</u>

A number of rural newspapers are available online. The following rural newspapers are members of the Bowes Publishing Group and have online archives from the dates identified to the present (NOTE: dates are approximate):

Newspaper	Web site	Dates
Airdrie Echo	http://www.airdrieecho.com/	06-2002
Banff Crag & Canyon	http://www.banffcragnewspaper.com/	07-2002
Camrose Canadian	http://www.camrosecanadian.com	06-2002
Canmore Leader	http://www.canmoreleader.com/	08-2002
Cochrane Times	http://www.cochranetimes.com/	05-2002
Drayton Valley Western Review	http://www.draytonvalleywesternreview.com/	04-2003
Fairview Post	http://www.fairviewpost.com/	06-2003
Fort Saskatchewan Record	http://www.fortsaskatchewanrecord.com/	12-2002
Hanna Herald	http://www.hannaherald.com/	08-2002
Hinton Parklander	http://www.hintonparklander.com/	02-2003
Jasper Booster	http://www.jasperbooster.com/	03-2003
Leduc Representative	http://www.leducrep.com/	03-2002
Lloydminister Meridian Booster	http://www.meridianbooster.com/	08-2002
Mayerthorpe Freelancer	http://www.mayerthorpefreelancer.com/	10-2001
Nanton News	http://www.nantonnews.com/	07-2002
Peace River Record Gazette	http://www.prrecordgazette.com/	07-2003
Pincher Creek Echo	http://www.pinchercreekecho.com/	07-2003
Rocky View Times	http://www.rockyviewtimes.com/	06-2002
Sherwood Park News	http://www.sherwoodparknews.com/	07-2002
Strathmore Standard	http://www.strathmorestandard.com/	08-2002
Vulcan Advocate	http://www.vulcanadvocate.com/	10-2002

Each newspaper is much smaller than one section of a large urban newspaper (e.g., Edmonton Journal, Calgary Herald). All newspapers are weeklies. None of the online rural newspapers covers the appropriate date range. Therefore part of the scan must include microfilm/print scans. These should be available through the Alberta Legislature Library. Estimate 3 minutes to scan each daily newspaper.

Time Estimates per paper

0.05 hrs/paper x 177 issues = 1.25 days

Recommended

Given availability of various data sources, the following periodicals will be used as convenience samples: Calgary Herald, Edmonton Journal, Lethbridge Herald, Medicine Hat News, Hanna Herald and The Peace River Record Gazette: The following data elements will be gathered: Article date, page (prominence), length type of article (letter to the editor, editorial, article).

Appendix D: Interview Guide

Stakeholder Interview Questions

Implementation Strategy

1. Has the Alberta Administrative Licence Suspension Program been implemented in a way that will lead to reducing the number of drunk drivers on Alberta roads? Why or why not?

2. Can you describe all the ways you are aware of that the public was informed of the AALS?

Barriers/Facilitators to Implementation

3. What barriers has the program encountered that may keep it from reaching the greatest number of drivers/the public?

4. What factors have helped to successfully implement the program?

5. What other strategies do you think would have worked better to implement the program?

Assumptions Underlying Implementation/Impact

6. Please complete this sentence: The Alberta Administrative Licence Suspension Program should work because….

Perceptions of Program Effectiveness

7. From your perspective, how effective do you think the Alberta Administrative Licence Suspension Program is/has been in reducing the number of drunk drivers on Alberta roads?

8. Is there a demographic that you feel was more likely to change behavior as a function of legislation like the AALS. Which ones? Why do you feel this way?

Threats to Validity of Attributing Positive Results to AALS

9. Do you think that drivers will stop driving drunk primarily because of the program or because of some other factors? What might those other factors be? How does the AALS link to these other factors?