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2007.1 RR IBC.1.1 Reference: Exhibit B-1-1, Chapter 5, Update on ICBC Response to Bodily Injury Claims Costs, p.5-2, paragraph 7

Please provide the calculation showing how the general damages exposures have increased by 6%.

Response:

The 6% increase in general damage exposures closed in 2006 with payment made in 2006 referenced in paragraph 7 on page 5-2 of Chapter 5 was calculated by comparing the number of general damage exposures closed in 2005 with payment made in 2005 to the number of general damage exposures closed in 2006 with payment made in 2006 and calculating the percent increase:

General damage exposures closed in 2005 with payment made in 2005: 38,181

General damage exposures closed in 2006 with payment made in 2006: 40,318

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2007.1 RR IBC.2.1 Reference: Exhibit B-1-1, Chapter 5, Update on ICBC Response to Bodily Injury Claims Costs, p.5-2, Figure 5.1, Footnote 2

Please explain why some claims over \$200,000 were not excluded in the calculations.

Response:

Some claims over \$200,000 were included because the data includes all claims handled through the regional claim centres. A small number of claims in regional claim centres resolve over the \$200,000 threshold.

2007.1 RR IBC.2.2 Reference: Exhibit B-1-1, Chapter 5, Update on ICBC Response to Bodily Injury Claims Costs, p.5-2, Figure 5.1, Footnote 2

Please indicate the average value of claims that are included in these calculations.

Response:

Based on the reference to footnote 2 in this information request, ICBC understands this information request to request the average value of the exposures included in the payment totals on account of general damages, future wage loss and legal costs for 2005 and 2006 set out in Figure 5.1 on page 5-2 in Chapter 5 of the 2007 Revenue Requirements Application.

Set out in Figure 1 below are is the average payment for the bodily injury exposures included in the totals set out in Figure 5.1:

	Average Payment per Bodily Injury Exposure - 2005	Average Payment per Bodily Injury Exposure - 2006
General Damages	\$9,391	\$9,863
Future Wage Loss	\$22,463	\$22,824
Legal Costs	\$2,667	\$2,827

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2007.1 RR IBC.3.1 Reference: Exhibit B-1-1, Chapter 5, Update on ICBC Response to Bodily Injury Claims Costs, p.5-3, third bullet and C.3 Legal Environment pp.5-9 and 5-10

Please cite the new precedent setting cases that have contributed to the increased cost of bodily injury claims.

Response:

Occasionally, a single case will establish a precedent sufficient enough to increase claims costs. However, it is the cumulative effect of precedent setting cases, incrementally, over a period of time that can impact claims costs. For example, judgements which have lowered the evidentiary threshold to awards for loss of past and future income include: *Wepruk v. McGarva and Butt* , 2006 BCCA 107, and *Lines v. Gordon et al* , 2006 BCSC 1929.

These judgments are a matter of public record.

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2007.1 RR IBC.3.2 Reference: Exhibit B-1-1, Chapter 5, Update on ICBC Response to Bodily Injury Claims Costs, p.5-3, third bullet and C.3 Legal Environment pp.5-9 and 5-10

Please cite all relevant legislation that impacts bodily injury claims costs.

Response:

Relevant legislation that impacts bodily injury claims costs include:

- *Insurance (Vehicle) Act* (formerly the *Insurance (Motor Vehicle) Act*)
- *Insurance (Vehicle) Regulation* (formerly the *Revised Regulation (1984) Under the Insurance (Motor Vehicle) Act*)
- *Motor Vehicle Act*
- *Motor Vehicle Act Regulations*
- *Negligence Act*
- *Limitations Act*
- *Medical Services Act Regulations*
- *Infants Act*
- *Public Guardian and Trustee Act*
- *Court Rules Act*
- *Small Claims Act*
- *Transportation Act*
- *Commercial Transport Act*
- *Industrial Roads Act*
- *Forests Act*
- *Commercial Arbitration Act*
- *Family Compensation Act*
- *Law and Equity Act*
- *Workers' Compensation Act*

2007.1 RR IBC.4.1 Reference: Exhibit B-1-1, Chapter 5, Update on ICBC Response to Bodily Injury Claims Costs, p.5-3, paragraph 11

Please indicate the average length of claim settlement for each of the following range of claims.

- \$0 - \$6,500**
- \$6,500 - \$10,000**
- \$10,000 - \$15,000**
- \$15,000 - \$20,000**
- \$20,000 - \$50,000**
- \$50,000 - \$100,000**
- \$100,000 - \$200,000**

Response:

The average lengths of time in days, from date opened to date closed for bodily injury exposures arising from all years of loss that were closed in calendar year 2006, by each range requested, is set out in Figure 1 below. The range amounts include both the loss payments and any expenses incurred.

Figure 1

Incurred Dollar Range	Average Time Open, In Days
\$0 to \$6,500	247
>\$6,500 to \$10,000	431
>\$10,000 to \$15,000	565
>\$15,000 to \$20,000	677
>\$20,000 to \$50,000	920
>\$50,000 to \$100,000	1,203
>\$100,000 to \$200,000	1,402

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2007.1 RR IBC.5.1 Reference: Exhibit B-1-1, Chapter 5, Update on ICBC Response to Bodily Injury Claims Costs, p.5-4, paragraph 12

Please provide the studies and or any supporting documentation that resulted in the implementation of changes to claims handling process.

Response:

Please see the response to information request 2007.1 RR BCOAPO.1-6.3.

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2007.1 RR IBC.5.2 Reference: Exhibit B-1-1, Chapter 5, Update on ICBC Response to Bodily Injury Claims Costs, p.5-4, paragraph 12

Since these strategies were implemented in mid 2006 please explain how ICBC can determine that their implementation will have a positive impact on bodily injury claim costs.

Response:

As described in the response to information request 2007.1 RR IBC.15.1, ICBC is tracking the progress of these strategies through monthly reviews of statistics relating to open files, negated files, pending files, claims closed, representation rate and represented exposures, aged exposures (older than 18 months and older than 24 months), severity, allocated expenses and closed to open ratio. Progress of the strategies is also being tracked through regular follow up meetings between senior claims management and claim centre management at each claim centre. Since the changes were instituted in mid-2006, insufficient time has elapsed to complete a full analysis of their impact, but as stated in paragraph 29 of Chapter 5, early indications suggest that there has been a higher claims closure rate in 2006 and that the levels of pending claims and claim file open time have been reduced.

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2007.1 RR IBC.6.1-3 Reference: Exhibit B-1-1, Chapter 5, Update on ICBC Response to Bodily Injury Claims Costs, p.5-7, first bullet

ICBC has stated numerous times that the increase in claim costs is due to higher severity. However, in the second bullet of paragraph 15, ICBC is suggesting that some claims costs are impacted by bodily injury claims being settled outside of "acceptable ranges".

6.1 What are the acceptable ranges?

6.2 What has been the impact in terms of claims costs of files reviewed that are outside the acceptable ranges?

6.3 Is ICBC suggesting that some of the cost drivers do not pertain to the higher frequency of claims, but rather are the result of higher claim settlements due to adjusting practices?

Response:

As a result of the trends noticed early in 2006, ICBC initiated a corporate wide file review on a very specific segment of bodily injury claims from the regional claim centers. The files reviewed were closed files from specific dates of loss and closed within the \$40,000-\$200,000 ranges.

Each claim file turns on its unique set of facts and is dependant on many interrelated components such as: injury type, disability duration, liability, contributory negligence, court precedents and litigation. Therefore, the acceptable range for settlement amounts would be dependant on the file information, investigation and evaluation. The reviewers used their best judgment to determine if the settlement ranges were commensurate with the investigation, evaluation and negotiations that were on the file.

While ICBC did note some settlements outside of expected ranges, ICBC did not calculate what the claims costs were for files outside the acceptable ranges since the assessment of what an acceptable range for a claim file cannot be done with mathematical precision. Instead, the purpose of the review from this perspective was to provide information to the claims managers on the quality of investigations, evaluations and settlements.

The increase in claims costs is due to a number of factors. However, it is possible that some of the settlements in the \$40,000 -\$200,000 could be impacted by adjusting practices. It is for that reason that ICBC instituted the risk assessment process and is enhancing the bodily injury

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adjusting practices with better training, better recruitment and selection criteria and increased the frequency and type of file reviews.

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2007.1 RR IBC.7.1 Reference: Exhibit B-1-1, Chapter 5, Update on ICBC Response to Bodily Injury Claims Costs, p.5-7, second bullet

Please quantify what the impact of increased managerial review has been thus far.

Response:

The managerial reviews referred to in the second bullet at the top of page 5-7 of Chapter 5 in the 2007 Revenue Requirements Application are with respect to bodily injury adjuster settlement authority levels. The purpose of these reviews is to match an adjuster's settlement authority with their competencies and to increase settlement authority where appropriate or to decrease it should training issues develop. It is not possible to identify or quantify financial impacts resulting from these reviews. However, ICBC expects that the review will improve efficiency in claims handling where increased authorities are granted and improve claims handling through training opportunities.

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2007.1 RR IBC.8.1 Reference: Exhibit B-1-1, Chapter 5, Update on ICBC Response to Bodily Injury Claims Costs, p.5-7, paragraph 18

ICBC refers to "the changing bodily injury claims environment". Please explain what this is referring to.

Response:

The "changing bodily injury claims environment" in paragraph 18 on page 5-7 of Chapter 5 in the 2007 Revenue Requirements Application refers to the recent increases in bodily injury claims costs and the factors as set out in paragraph 6.

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2007.1 RR IBC.9.1 Reference: Exhibit B-1-1, Chapter 5, Update on ICBC Response to Bodily Injury Claims Costs, p.5-11, paragraph 29

Please outline how ICBC has calculated the 0.5 percentage discount as result of claims handling changes outlined in Chapter 5. Please provide all documentation and studies done that have lead ICBC to these conclusions.

Response:

In accordance with the Commission's Order G-48-07, issued April 27, 2007, intervenors were directed to submit actuarial questions in Intervenor IR No. 2 (actuarial and non-actuarial), due Tuesday, June 12, 2007. This information request relates to the actuarial rate level indication and will be answered in Intervenor IR No. 2 (actuarial and non-actuarial) only.

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**2007.1 RR IBC.10.1 Reference: Exhibit B-1-2, Chapter 7.1 Operating Expenses:
Introduction, p. 7.1-2, paragraph 5**

If ICBC's vision includes being British Columbia's "preferred auto insurer", how does that aspect of the vision apply to the Basic insurance which is a mandatory coverage in respect of which ICBC has a monopoly?

Response:

Please see the response to information request 2007.1 RR BCUC 44.1.

2007.1 RR IBC.11.1 Reference: Exhibit B-1-2, Chapter 7.1 Operating Expenses: Introduction, p. 7.1-2, paragraph 8

What accounts for the increase in the Basic insurance expense ratio to 10.0% from a 2004 expense ratio of 9.3% and forecasted expense ratios of 9.5% for 2005 and 9.6% for 2006 (as per the August 22, 2005 filing at p. 7.3)?

Response:

The increase in the 2006 Basic insurance expense ratio to 10.0% from a 2004 expense ratio of 9.3% and forecasted expense ratios of 9.5% for 2005 and 9.6% for 2006 (as per the August 22, 2005 filing at p. 7.3) is primarily due to the reclassification of certain operating expenses related to service fees, as described in Chapter 8, Figure 8.12 of the 2007 Revenue Requirements Application. The 2006 ratio is calculated on the basis of excluding service fee income. As the decision to reclassify service fees was made after the August 22, 2005 filing, the ratios presented for 2004 and forecast for 2005 and 2006 are not on a comparative basis. The 2006 Basic insurance expense ratio of 10.0% decreased from the restated actual expense ratio for 2004 as well as the restated forecast expense ratios for 2005 and 2006.

The Basic insurance expense ratios referenced in this information request are presented on a restated basis in the table below.

Year	August 2005 Filing As Originally Reported	August 2005 Filing Restated	March 2007 Revenue Requirements Application
2004	9.3% (actual)	10.4% (actual)	n/a
2005	9.5% (forecast)	10.8% (forecast)	10.4% (actual)
2006	9.6% (forecast)	11.1% (forecast)	10.0% (actual)

The actual year over year changes are described in Chapter 8, page 8-13 of the 2007 Revenue Requirements application in more detail.

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2007.1 RR IBC.12.1 Reference: Exhibit B-1-2, Chapter 7.1 Operating Expenses: Introduction, p. 7.1-7, Figure 7.1.2

It is assumed, as stated in the August 22, 2005 filing at p. 7.8 the Divisions continue to have accountability for their total divisional costs, which include costs for Basic, Non-Insurance and Optional insurance.

Please provide a breakdown of the 2006 Actual and 2007 Forecast in Figure 7.1.2 as among Basic, Non-Insurance and Optional for each Division.

Response:

Please refer to Attachment A - Operating Expenses: Basic, Non-insurance and Optional for 2006 Actual and 2007 Forecast.



2007.1 RR IBC.12.1 - Attachment A – Operating Expenses: Basic, Non-insurance and Optional for 2006 Actual and 2007 Forecast

Operating Expenses: Basic, Non-insurance and Optional

Description	2006 Actual (\$ millions)			Total
	Basic	Non- insurance	Optional	
Operations	\$172.1	\$36.2	\$90.3	\$298.6
Insurance	12.7	6.2	14.2	33.1
Finance	31.0	15.2	26.8	73.0
Human Resources & Corp. Law	6.1	1.9	6.0	14.0
Information Services (ISD)	34.5	11.6	28.0	74.1
Corporate Costs	7.3	7.0	4.9	19.2
Total Operating Expenses	\$263.7	\$78.1	\$170.2	\$512.0

Operating Expenses: Basic, Non-insurance and Optional

Description	2007 Forecast (\$ millions)			Total
	Basic	Non- insurance	Optional	
Operations	\$175.3	\$35.0	\$91.5	\$301.8
Insurance	13.5	6.5	15.0	35.0
Finance	32.7	15.0	28.4	76.1
Human Resources & Corp. Law	6.6	2.1	6.5	15.2
Information Services (ISD)	35.0	10.9	29.0	74.9
Corporate Costs	11.2	3.2	10.6	25.0
Total Operating Expenses	\$274.3	\$72.7	\$181.0	\$528.0

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2007.1 RR IBC.13.1-2 Reference: Exhibit B-1-2, Chapter 7.2 Operations, A.3 Drivers of Divisional Operating Expense, p. 7.2-4, paragraph 13 and p. 7.2-6, paragraph 20

13.1 What percentage of the claims handled by the Litigation Centre are Bodily Injury claims?

13.2 What percentage of these claims exceeds \$200,000?

Response:

All claims handled by the Litigation Centre are bodily injury claims. The Litigation Centre has been in full operation for approximately 6 months. In that time fewer than 1% of the files closed have exceeded \$200,000.

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2007.1 RR IBC.14.1 Reference: Exhibit B-1-2, Chapter 7.2, Operations, p.7.2-4, paragraph 16

What is meant by "streamlined handling"?

Response:

The Customer Service Centre model of streamlined claims was developed to improve effectiveness and efficiency of ICBC injury claims handling and to provide more convenient service options for those claimants whose claims qualify for handling by the Customer Service Centre. The Customer Service Centre has streamlined the bodily injury claims handling process as follows: When the Customer Service Centre qualified claims are reported to the Telephone Claims Department, the claimant's call is immediately transferred to a bodily injury adjuster and does not require an appointment to be booked at a later date at a claim centre to see a bodily injury adjuster. There is no need for an injured claimant to attend the claim centre to see a bodily injury adjuster; the interaction related to the injury claim can happen over the telephone and by email. These claims are handled in team environments allowing for claimants to interact with any adjuster on their team. The injury call centre regular hours of operation are beyond those in the regional claim centres allowing for extended access.

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2007.1 RR IBC.14.2 Reference: Exhibit B-1-2, Chapter 7.2, Operations, p.7.2-4, paragraph 16

What are the demonstrated reductions in both claims costs and administrative costs?

Response:

The Customer Service Centre expanded to a provincial basis in June 2006 and became fully operational at the end of 2006. The claims cost savings for 2006 are estimated at \$3.2 million and the total claims cost savings since the 2003 inception of the Customer Service Centre Pilot Project are estimated at \$5.9 million. These claims cost savings are the current estimates and will be verified during the completion of the full project evaluation of the Customer Service Centre currently being conducted.

The operational cost savings reflected in the Operations Division 2007 forecast are \$260,000 which is the equivalent of four FTEs. This represents 20% of the 20.6 staff budgeted in the Customer Service Centre for 2007.

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2007.1 RR IBC.15.1 Reference: Exhibit B-1-2, Chapter 7.2, Operations, p.7.2-5, paragraphs 17-18

What are the short term, and mid term strategies referred to? And what are the immediate and mid term impacts ICBC has experienced.

Response:

ICBC developed and implemented short-term and mid-term strategies in direct response to the rising bodily injury claims costs. These strategies are described in paragraphs 17 to 21 of Chapter 7.2 of the 2007 Revenue Requirements Application.

The short-term strategies set out are:

- Increased quality and frequency of contact with claimants
- Promotion of earlier settlement offers
- The establishment of a risk assessment committee approval process
- Increased management involvement in providing technical direction to adjusters and reviewing higher-risk claims to identify whether a specialized high-risk claims handling process is required.

The mid-term strategies set out are:

- The establishment of a Litigation Centre supported by adjusters with the corresponding skills to deal with higher-risk and higher-complexity represented and litigated claims
- Refinement to existing ICBC programs.

ICBC is tracking the progress of these strategies through monthly reviews of statistics relating to open files, negated files, pending files, claims closed, representation rate and represented exposures, aged exposures (older than 18 months and older than 24 months), severity, allocated expenses and closed to open ratio. Progress of the strategies is also being tracked through regular follow up meetings between senior claims management and claim centre management at each claim centre. Since the changes were instituted in mid-2006, insufficient time has elapsed to complete a full analysis of their impact, but as stated in paragraph 29 of Chapter 5, early indications suggest that there has been a higher claims closure rate in 2006 and that the levels of pending claims and claim file open time have been reduced.

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2007.1 RR IBC.15.2 Reference: Exhibit B-1-2, Chapter 7.2, Operations, p.7.2-5, paragraphs 17-18

What are the average settlement offers before and after the implementation of the short-term strategies?

Response:

ICBC does not track settlement offers. Only final settlement amounts are recorded as they are the amounts relevant to ultimate claims costs.

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2007.1 RR IBC.15.3 Reference: Exhibit B-1-2, Chapter 7.2, Operations, p.7.2-5, paragraphs 17-18

How many claims have been handled this way?

Response:

ICBC considers that bodily injury claim exposures in the regional claims centres pending as of June 1, 2006 or received subsequent to June 1, 2006 (other than those closed between June 1, 2006 and September 30, 2006) have been handled subject to the claims handling initiatives set out in paragraphs 17 and 18 of Chapter 7.2. On that basis, between June 1, 2006 and April 30, 2007, approximately 90,000 new and existing bodily injury exposures have been handled in accordance with the short-term strategies for bodily injury claims handling described in paragraphs 17 and 18 of Chapter 7.2 of the 2007 Revenue Requirements Application.

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2007.1 RR IBC.15.4 Reference: Exhibit B-1-2, Chapter 7.2, Operations, p.7.2-5, paragraphs 17-18

Of those claims, how many have been the object of litigation?

Response:

As noted in the response to information request 2007.1 RR IBC.15.3, ICBC considers that bodily injury claim exposures pending as of June 1, 2006 or received subsequent to June 1, 2006 (other than those closed between June 1, 2006 and September 30, 2006) have been handled subject to the claims handling initiatives set out in paragraphs 17 and 18 of Chapter 7.2.

ICBC does not track bodily injury tort litigation by bodily injury exposures. As a result, ICBC does not have data on how many of the bodily injury exposures handled in accordance with the with the claims handling initiatives set out in paragraphs 17 and 18 of Chapter 7.2 have been the subject of litigation.

ICBC can advise that it received over 10,000 writs between June 1, 2006 and April 30, 2007. A single writ may be used for multiple plaintiffs or multiple accidents and may relate to claims handled in claims handling areas other than the regional claims centres. ICBC also does not distinguish bodily injury writs from property damage writs. In addition, a writ received in the June 2006 to September 2006 timeframe will more likely relate to a bodily injury exposure handled prior to the inception of the claims handling initiatives, rather than a newly opened bodily injury exposure dealt with under the bodily injury claims handling initiatives. As a result, the number of writs does not accurately capture the subset of bodily injury exposures.

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2007.1 RR IBC.16.1 Reference: Exhibit B-1-2, Chapter 7.2, Operations, p.7.2-5, paragraph 19

Is the determination of a claim being categorized as "high-risk" based solely on the \$40,000 threshold? If no, please provide more information as to how the determination is arrived at, including the working definition of "high risk".

Response:

Please see the response to information request 2007.1 RR BCOAPO.1-12.1-4.

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2007.1 RR IBC.16.2 Reference: Exhibit B-1-2, Chapter 7.2, Operations, p.7.2-5, paragraph 19

How many claims have been deemed to be high-risk in 2005 and 2006?

Response:

As set out in the response to information request 2007.1 RR BCOAPO.1-12.1-4, ICBC cannot determine with precision the number of bodily injury exposures that are considered to be high risk. As a rough guide, ICBC can provide the number of closed bodily injury exposures with total incurred costs between \$40,000 and \$200,000 as follows:

- 2005: 4,804 closed bodily injury exposures
- 2006: 5,166 closed bodily injury exposures.

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2007.1 RR IBC.16.3 Reference: Exhibit B-1-2, Chapter 7.2, Operations, p.7.2-5, paragraph 19

How many settlement proposals over \$40,000 are below \$200,000 and how many are over \$200,000?

Response:

ICBC does not track all settlement proposals or offers made. Final settlement amounts are recorded.

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2007.1 RR IBC.17.1 Reference: Exhibit B-1-2, Chapter 7.2, Operations, p.7.2-8, Figure 7.2.3 – Loss Management Operating Expenses and FTEs

Please explain the discrepancy between the 2005 Actual Total Operating Expenses of \$46.3 million in figure 7.2.3 and the 2005 actual cost of \$47,486 million in the Loss Management section of Appendix 1B, p. 7.8-11

Response:

Corporate allocated expenses were included in the Loss Management section of Appendix 1B, p.7.8-11, but were not included in the Operations Division Loss Management table (figure 7.2.3).

The difference is \$1.146 million, of which \$389,000 is building expenses, \$849,000 is an allocation from Information Services for infrastructure environments, and \$92,000 is a credit for miscellaneous items (such as a compensation accrual reversal).

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2007.1 RR IBC.18.1 Reference: Exhibit B-1-2, Chapter 7.2, Operations, p.7.2-8, paragraph 28, and Appendix 1B, and p. 7.8-11

For loss management expenditures please provide a breakdown of all initiatives and activities and their respective cost and whether they fall in a) road safety initiatives, b) fraud management, c) regional loss prevention, d) auto crime initiatives and e) road safety project operations.

Response:

The following Figure breaks down the Loss Management expenses in Chapter 7.8, Appendix 1B, p.7.8-11 into the following categories: Road Safety, Regional Loss Prevention, Auto Crime Prevention, Fraud Prevention, and Road Safety Project Allocations.

2005 Actuals

Line No.	Description	Road Safety	Regional Loss Prevention	Auto Crime	Fraud	R/S Project Allocation
		Actual	Actual	Actual	Actual	Actual
1	Aggressive Driving	\$ 8,109	\$ 842			
2	Aging Drivers	135	50			
3	Child Passenger Safety	204	94			
4	Cycling Safety	10	0			
5	Distractions	22	0			
6	Driver Fatigue	5	0			
7	IMPACT	1,770	0			
8	Impaired Driving	4,142	378			
9	Motorcycle Safety	14	0			
10	Multi-issue Programs	1,724	489			
11	Pedestrian Safety	135	240			
12	Road Improvements	9,893	0			
13	Seat Belts	4,996	158			
14	Youth Safety	636	405			
15	Road Safety Subtotal	31,795	2,656	0	0	0
16	Auto Crime Advertising & Community Programs	20		1,108		
17	Bait Car			496		
18	Regional Auto Crime		597			
19	Auto Crime Subtotal	20	597	1,604	0	0
20	Fraud Prevention				7,239	
21	Corporate Allocated Exp	608			266	273
22	Research and Administration	2,429				
23	Total Operating Expenses	\$34,852	\$3,253	\$1,604	\$7,505	\$273

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2007.1 RR IBC.19.1 Reference: Exhibit B-1-2, Chapter 7.2, Operations, p.7.2-15, paragraph 51

What leads ICBC to believe that the Enhanced Express Repair program will generate efficiencies in 2007 when the number of FTEs for 2006 was higher than the 2006 forecast?

Response:

While the overall number of FTEs in Regional Claims Operations was higher in 2006 than forecast, paragraph 51 notes a decrease in estimators.

The Enhanced Express Repair program was fully implemented in December 2006. The program introduced business process and system changes which will increase the volume of claims being estimated by qualified repair shops. This shift in volume will reduce the level of estimating provided by Regional Claims Operations. The reduction of estimating requirements by Regional Claims Operations will provide for the gradual reduction of FTEs which will be achieved through attrition and promotion.

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2007.1 RR IBC.20.1 Reference: Exhibit B-1-2, Chapter 7.2 Operations, B.5 Specialized Claims, p. 7.2-16

What percentage of the claims handled by Specialized Claims in a given period are Bodily Injury claims and what percentage of those exceed \$200,000?

Response:

28% of the total exposures closed by Specialized Claims in 2006 were bodily injury exposures and of those 23% had incurred costs greater than \$200,000.

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2007.1 RR IBC.21.1 Reference: Exhibit B-1-2, Chapter 7.2 Operations, B.5 Specialized Claims, p. 7.2-17

With regards to the collision and glass repair industry relationships and the other relationships described in the second bullet in paragraph 56:

Why are these not part of the Business Support Division, which handles relationships with the Public Guardian and Trustee, the BC Medical Association and others and has a Material Damages Services area (paragraphs 65 and 66).

Response:

“Business Support” is not a division within the Operations Division, but only a functional grouping of the support services housed throughout the Operations Division for the purposes of providing an overview of the Operations Division and its operating expenses (please see paragraph 2 on page 7.2-1 of Chapter 7.2 of the 2007 Revenue Requirements Application). For the purposes of the next revenue requirements application, ICBC will look at the grouping of the areas identified in this information request to determine whether there can be a clearer grouping of them.

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2007.1 RR IBC.21.2 Reference: Exhibit B-1-2, Chapter 7.2 Operations, B.5 Specialized Claims, p. 7.2-17

With regards to the collision and glass repair industry relationships and the other relationships described in the second bullet in paragraph 56:

In the August 22, 2005 Filing at pp. 7-37 ICBC explained that the Material Damage Services was seeking to introduce performance compensation into British Columbia's collision repair industry. Has this taken place?

Response:

Performance compensation has been introduced through the Collision Repair Industry Agreement. ICBC and the collision repair industry reached an agreement in principle in March 2005 and the Collision Repair Industry Agreement was entered into in September 2005.

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2007.1 RR IBC.21.3 Reference: Exhibit B-1-2, Chapter 7.2 Operations, B.5 Specialized Claims, p. 7.2-17

With regards to the collision and glass repair industry relationships and the other relationships described in the second bullet in paragraph 56:

What is the impact of the Collision Repair Industry Agreement on basic rates given that a portion of at fault costs will be ultimately paid by basic?

Response:

Because the Collision Repair Industry Agreement (CRIA) affects only material damage claims and the primary material damage coverage within Basic insurance is third party liability property damage (PD), CRIA would affect Basic insurance primarily through the property damage coverage. Manual Basic insurance includes the material damage coverages of collision and specified perils as well, although those coverages make up a very small portion (about 0.4%) of the material damage Basic insurance claims costs.

For the purpose of the revenue requirements analysis, ICBC actuaries developed a PD claim severity trend model (refer to Chapter 4, Exhibit D.4 of the 2007 Revenue Requirements Application). In the development of this model, the ICBC actuaries tested for the effect of CRIA by introducing the effective CRIA labour rate, which measures average hourly payments to suppliers, as the explanatory variable. It was found that the effect of CRIA through this variable on property damage severity is not statistically significant. ICBC actuaries therefore have concluded that CRIA does not have a statistically significant impact on Basic rates.

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2007.1 RR IBC.22.1 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, p.7.3-2, paragraph 10, 3rd bullet

Is the pricing model being developed solely for basic insurance?

Response:

Pricing model changes for Basic insurance will better reflect customers' actual risk as can be seen in the new Driver Risk Premium program and Other Operator rating variable outlined in ICBC's Rate Design Application.

As an integrated company, ICBC is always looking for synergies to contain costs. As ICBC moves forward, segments of the pricing model will apply to Basic insurance only, Basic insurance and Optional insurance or Optional insurance only.

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2007.1 RR IBC.23.1 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, pp.7.3-2 and 7.3-3, paragraph 10, 4th bullet

What is meant by "differentiating ICBC's products"?

Response:

It means helping customers understand the value they receive in the products they buy or can buy from ICBC.

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2007.1 RR IBC.23.2 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, pp.7.3-2 and 7.3-3, paragraph 10, 4th bullet

Does the "integrated marketing approach" cover both the Basic and Optional insurance products?

Response:

Yes. There are efficiencies realized by developing a coordinated and holistic plan or approach to communicate issues and activities to customers and/or brokers.

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2007.1 RR IBC.23.3 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, pp.7.3-2 and 7.3-3, paragraph 10, 4th bullet

Please explain how ICBC is allocating costs in the context of its efforts to ensure that its messaging is consistent at customer touch points? Could you please provide examples of that consistency?

Response:

ICBC allocates costs in accordance with the principles of cost causality and follows the methodology for cost allocation as previously agreed to with the Commission. For example the Driving Tips campaign, managed by the Strategic Marketing area, is sponsored by ICBC Optional insurance and is allocated 100% to Optional.

ICBC ensures the consistency of messaging at customer touch points by centralizing the responsibility for the development and review of customer messaging within the Strategic Marketing area. An example is messaging about proposed rate changes. Such a message needs to be communicated to all customers being affected. It is Strategic Marketing's responsibility to identify the various methods and touch points of communicating this message. In this particular example, ICBC would deliver the message about the proposed rate change through touch points including the Notice to Renew, icbc.com, customer contact, as well as brokers.

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2007.1 RR IBC.23.4 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, pp.7.3-2 and 7.3-3, paragraph 10, 4th bullet

What is the division's business vision and what are its objectives?

Response:

The division's business vision and objectives are to support all aspects of the sale and distribution of Basic and Optional insurance and the vehicle registration and licensing functions. (see Chapter 7.3, p. 7.3-1, paragraph 2)

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2007.1 RR IBC.24.1 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, p.7.3-3, paragraph 11

Please provide a table that shows: cost centres and relevant responsibilities, expenses, FTEs before reorganization and for each where they now fit in the new divisional organization.

Response:

See Attachment A, Insurance, Underwriting & Marketing Division – 2007 Forecast for Expenses before and after structure change. The table in Attachment A shows the expenses and FTEs before and after the reorganization. ICBC organizes FTEs at a departmental level so this information is provided at a departmental level.



2007.1 RR IBC.24.1– Attachment A – Insurance, Underwriting & Marketing Division - 2007 Forecast for Expenses before and after Structure Change

Insurance, Underwriting & Marketing Division
2007 Forecast for Expenses before and after Structure Change
 (\$'000's)

Old Structure	2007 Forecast
Broker Support	15,494
Insurance Division Non-Insurance	5,331
Insurance Governance & Planning	2,086
Insurance Support	4,456
Product Support	7,624
Total Insurance	34,992

New Structure				
Broker Relations & Sales	Strategic Marketing	Regulatory Insurance & Planning	Underwriting	
10,698	4,795			
		2,086	5,331	
	1,121	3,335		
	325		7,300	
10,698	6,241	5,421	12,631	

2007 Forecast Re-Allocated
15,494
5,331
2,086
4,456
7,625
34,992

Insurance, Underwriting & Marketing Division
2007 Forecast for FTEs before and after Structure Change

Old Structure	2007 Forecast
Broker Support	92
Insurance Division Non-Insurance	84
Insurance Governance & Planning	20
Insurance Support	55
Product Support	74
Total Insurance	324

New Structure				
Broker Relations & Sales	Strategic Marketing	Regulatory Insurance & Planning	Underwriting	
77	15	-	-	
-	-	-	84	
-	-	20	-	
-	11	44	-	
-	3	-	71	
77	29	63	155	

2007 Forecast Re-Allocated
92
84
20
55
74
324

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2007.1 RR IBC.24.2 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, p.7.3-3, paragraph 11

Please advise what cost centres were realigned and how.

Response:

Please see the response to information request 2007.1 RR IBC.24.1.

2007.1 RR IBC.24.3 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, p.7.3-3, paragraph 11

Please advise what the "several new cost centres" are and how those have been allocated.

Response:

As a result of the Insurance Division reorganization in 2006, several new centres were created.

They have been allocated as shown in the table below -

2006 Reorganization – Additions	Appendix 1B grouping * under Insurance Services	Allocator
VP Strategic Marketing	Insurance Business Support	Weighted Average – Cost Centres
VP Underwriting	Insurance Business Support	Weighted Average – Cost Centres
Director Regulatory Affairs	Insurance Business Support	Weighted Average – Cost Centres
Driving Tips	Optional Coverage	Directly Attributable to Optional
Marketing Planning	Optional Coverage	Directly Attributable to Optional
Manager Insurance and Registration Support	Insurance Support (Autoplan)	Weighted Average – Cost Centres

* Please see information request 2007.1 RR IBC.45.1 – Attachment A – Appendix 1 B – 2006 Approved Allocators Using 2006 Actual Cost Detail

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2007.1 RR IBC.25.1 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, p.7.3-4, paragraph 16

How many FTEs and related added costs were due to changes arising from Bill 93?

Response:

Paragraph 16 in its entirety reads as follows:

16. In addition to the general compensation increases, higher compensation expenditures are also due to staffing changes arising from the divisional reorganization, which were necessary in order to perform the additional work undertaken by the division including: rate design initiatives, insurance business changes arising from *Insurance (Motor Vehicle) Amendment Act, 2003 (Bill 93)*, developing a strategic marketing plan and direction, and increased sales support. These activities are described in more detail in the sections that follow.

As can be seen, the references to FTE's and related added costs for the Underwriting Division result from several items, of which *Bill 93* is just one. With respect to *Bill 93* work, the reference in paragraph 16 relates to costs incurred by Underwriting to support the project that were not billed back to the project. There were no specific FTE's added and the reference to additional costs reflects the payment of a small amount of overtime to allow staff that assisted the project, and/or staff that filled in for those working on *Bill 93*, to maintain their typical daily work standards on matters not relating to *Bill 93*.

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2007.1 RR IBC.25.2 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, p.7.3-4, paragraph 16

Are these going to be permanent? If yes, why?

Response:

No FTE's were added and the overtime is not permanent.

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2007.1 RR IBC.26.1-2 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, p.7.3-5, paragraph 19, 1st bullet

26.1 Non-insurance services also include driver licensing. Is Underwriting only involved in the Non-insurance services of vehicle licensing and registration services?

26.2 If so, why is this?

Response:

Although Underwriting is a separate department and performs a distinct function from driver licensing, there have been occasions where the services and expertise housed in Underwriting have supported driver licensing issues.

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2007.1 RR IBC.26.3 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, p.7.3-5, paragraph 19, 1st bullet

What is the rationale for having the underwriting functions combined with the non-insurance services?

Response:

Vehicle licensing and registration services are included in Underwriting because of the synergies involved. It is one transaction for policyholders when purchasing their Basic Insurance policy and their annual vehicle decal. Consequently, it is important to ensure that the transaction of the Basic Insurance policy and the associated vehicle licensing and registration functions are managed in a coordinated and integrated manner for the customer. ICBC also believes there is a great benefit associated with linking licence plates, decals and insurance in terms of giving BC very favourable rates of uninsured motorists.

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2007.1 RR IBC.27.1 Reference: Exhibit B-1-2, Chapter 7.3 Insurance Marketing and Underwriting, A. Overview, paragraph 4

In paragraph 4 ICBC states that compensation increases are in part due to "incremental staffing requirements arising from the divisional reorganization".

What staffing positions were added?

Response:

The additional staffing positions are primarily comprised of a VP Strategic Marketing, Director of Regulatory Affairs, Manager of Marketing Strategy, Manager of Insurance Planning and Business Support, Senior Business Analysts, and support staff. In addition the position of VP Insurance Operations and Statistical Research was eliminated and the FTE was converted to VP, Underwriting.

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2007.1 RR IBC.28.1 Reference: Exhibit B-1-2, Chapter 7.3 Insurance, Marketing and Underwriting, A.1 New Divisional Structure, paragraph 9

ICBC states that the division was organized into five business areas (Product Support, Broker Support Services, Non-Insurance Services, Governance and Planning, and Insurance Support) and then after the divisional reorganization these business areas were recast into four business areas (Underwriting, Broker Relations and Sales, Insurance Planning and Business Support and Strategic Marketing).

Please provide details as to how the job functions within the five areas were reassigned.

Response:

Job functions were reassigned in order to consolidate them into their applicable business areas. For example, the Underwriting area has consolidated similar business functions such as special coverages and vehicle registration, which previously resided in other areas. The Strategic Marketing area consolidated the corporate research department and corporate marketing. Broker Relations and Sales consolidated regional broker support with provincial broker management. And Regulatory, Insurance Planning and Business Support consolidated regulatory affairs with insurance planning and analyst support.

These changes allow for a more efficient and logical structure to enable the Insurance, Marketing and Underwriting Division to effectively meet its goals.

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2007.1 RR IBC.29.1 Reference: Exhibit B-1-2, Chapter 7.3 Insurance, Marketing and Underwriting, p. 7.3-4, paragraph 18

Please advise as to what the "increases in marketing expenditures" include.

Response:

Please see the response to information request 2007 IR BCOAPO.1-25.2.

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2007.1 RR IBC.29.2 Reference: Exhibit B-1-2, Chapter 7.3 Insurance, Marketing and Underwriting, p. 7.3-4, paragraph 18

Please advise what "insurance bureau fees" are.

Response:

The insurance bureau fees are for usage of the Vehicle Information Centre of Canada services which are 100% allocated to Optional insurance.

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2007.1 RR IBC.30.1-2 Reference: Exhibit B-1-2, Chapter 7.3 Insurance, Marketing and Underwriting, C.1 Underwriting, p. 7.3-6, paragraph 24 and Chapter 7.3A Distribution Costs, D.1 Insurance System, p. 7.3A-6, paragraphs 20-22

In paragraph 24 at page 7.3-6 ICBC refers to the work arising from the Insurance (Motor Vehicle) Amendment Act, 2003 (Bill 93) which will come into force June 1, 2007. Pursuant to the Public Safety and Solicitor General Statutes Amendment Act, 2006 (Bill 31), section 41 of Bill 93 as it enacts Section 63 was amended so as to allow delivery of policies by posting the wordings on a website.

30.1 Did ICBC request that the government make this change?

30.2 If so, why?

Response:

30.1 ICBC, along with other stakeholders, such as the Insurance Bureau of Canada, were consulted by government to provide feedback on *Insurance (Motor Vehicle) Amendment Act, 2003 (Bill 93)*. As part of this governmental process, ICBC provided comments and feedback on all aspects of *Bill 93*, including the ability to allow delivery of policies by posting the wordings on a website.

30.2 As indicated in the above response to information request 2007.1 RR IBC 30.1, ICBC provided comments and feedback to government on all aspects of *Bill 93*.

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2007.1 RR IBC.31.1 Reference: Exhibit B-1-2, Chapter 7.3 Insurance, Marketing and Underwriting, C.1 Underwriting, pp. 7.3-6 and 7.3-7, paragraph 25

ICBC describes certain of the tasks undertaken by the team implementing the Bill 93 changes.

How are the costs of implementing the changes, including compensation, allocated?

Response:

The Bill 93 Phase 2 corporate project is allocated at 100% Optional.

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2007.1 RR IBC.32.1 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, p.7.3-8, paragraph 31, figure 7.3.3

Please explain how it is that compensation expenses will stay the same in 2007 from 2006 when the number of FTEs is forecast to increase by four (4)?

Response:

In 2006 professional services for broker related work were incorrectly allocated to contractor services within compensation instead of general expenses.

If the 2006 professional services had been included in general expenses the net compensation increase between 2006 and 2007 would have been approximately \$235,000.

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2007.1 RR IBC.33.1 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, p.7.3-9, paragraph 33

Please provide a breakdown of general expenses specifically relating to advertising and corporate promotions, and a list of the different initiatives.

Response:

General expenses specifically relating to advertising and corporate promotion predominantly relate to supporting the sale of ICBC's Optional insurance, however some activities undertaken by Broker Relations and Sales staff may also relate to Basic insurance, including performance recognition or attendance at annual broker association events. Advertising and corporate promotions costs are predicted to increase from \$740,000 in 2006 to a forecast of \$877,000 in 2007 due to the realignment of expenses as a result of the reorganization, and also due to under spending in this area in 2006.

Based on the Commission's approved allocation methodology, advertising and corporate promotion expenses in Broker Relations and Sales are not currently allocated predominantly to Optional but are allocated approximately equally between Basic and Optional insurance. This is based on approved allocation methodology which allocates expenses at a more general level than at the specific expense level. The allocation impact is an understatement of approximately \$265,000 in Optional expense. As Basic premium is \$2 billion, a \$265k impact is 0.013% of Basic premium and is not material to Basic rate indication.

As part of ICBC's internal financial allocation governance process, ICBC reviews the appropriateness of its allocators on an ongoing basis. If required, any material changes to the allocators would be proposed to the Commission.

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2007.1 RR IBC.33.2 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, p.7.3-9, paragraph 33

With respect to the breakdown, please also indicate which ones affect Basic insurance and which ones affect Optional insurance.

Response:

Please see the response to information request 2007.1 RR IBC.33.1.

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2007.1 RR IBC.33.3 Reference: Exhibit B-1-2, Chapter 7.3, Insurance, Marketing and Underwriting, p.7.3-9, paragraph 33

Are any business cases made for the decisions related to advertising and corporate promotions? If yes, could you please provide a copy of each?

Response:

There are no business cases made for decisions relating to advertising and corporate promotions within the Broker Relations and Sales area.

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2007.1 RR IBC.34.1 Reference: Exhibit B-1-2, Appendix 7.3A, Distribution Costs, p. 7.3 A-3, paragraph 10

Please inform us as to how ICBC reconciles the statement that "ICBC believes that incremental improvements, rather than transformational change, provide the best opportunity to control costs" with the statement in paragraph 14 (p.7.3A-5) that "it is difficult to quantify the exact benefits."?

Response:

ICBC feels the two statements are congruous. ICBC has indicated a number of low cost systemic improvements in paragraph 13 (page 7.3 A-5) that point to cost efficiencies and time savings for brokers and customers. ICBC has also indicated that the present distribution system is efficient, cost effective, and represents good value to customers. Therefore incremental improvements, while difficult to quantify, provide better value for the Basic customer than the risk of high cost transformational change.

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2007.1 RR IBC.35.1 Reference: Exhibit B-1-2, Appendix 7.3A, Distribution Costs, p. 7.3 A-3, paragraph 21

What research has ICBC undertaken since the August 2005 Application that leads it to conclude that "little additional evidence has been found that would change that estimate"?

Response:

ICBC conducted research of relevant proprietary subscription databases, and internet resources. Internet searches were done and market research suppliers such as Celent, Forrester, and Claritas were contacted by phone. No evidence was found in this research that would indicate the potential of a higher level of on-line uptake than that indicated in the August 2005 Application.

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2007.1 RR IBC.35.2 Reference: Exhibit B-1-2, Appendix 7.3A, Distribution Costs, p. 7.3 A-3, paragraph 21

What "additional evidence" has ICBC examined regarding estimates of uptake for insurance transactions?

Response:

As stated in paragraph 21, there is little evidence of uptake in on-line insurance transactions in Canada. A few direct writers in Canada are known to offer on-line insurance, however no figures are available for on-line insurance activity.

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2007.1 RR IBC.36.1 Reference: Exhibit B-1-2, Appendix 7.3A, Distribution Costs, p. 7.3 A-6, paragraph 22

For a mandatory product like Basic automobile insurance, for which consumers cannot negotiate the coverage, what are the specific challenges to the practicability of on-line distribution?

Response:

ICBC has outlined a number of specific challenges to the practicability of on-line distribution, including higher costs, the additional expense and challenge of secure decal delivery, low potential uptake, signature requirements, the potential for fraud, and a higher incidence of uninsured motorists.

Also of significance are the rating questions that the customer must address. For example, many questions can arise with respect to the declaration of principal operator, the appropriate rate class of the vehicle, and driving history. Improper coverage resulting from incorrect statements or assumptions by the customer can lead to breach in event of a claim and have severe financial consequences for the customer. The broker, through face to face interaction with the customer, is in the best position to ensure that the proper answers are provided and coverage is adequate for the customer.

Insurance Bureau of Canada Information Request No. 2007.1 RR IBC.36.2-3 Dated 04 May 2007 Insurance Corporation of British Columbia Response Issued 01 June 2007	Page 1 of 1
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2007.1 RR IBC.36.2-3 Reference: Exhibit B-1-2, Appendix 7.3A, Distribution Costs, p. 7.3 A-6, paragraph 22

36.2 Has ICBC undertaken any study of on-line distribution that supports its comments about the risk associated with on-line distribution?

36.3 If the answer to 27.2 is yes, please provide a copy.

Response:

ICBC has not undertaken further study about the risks of on-line distribution. ICBC has already concluded that establishing parallel methods or channels of distribution would result in higher costs and redundancies in the system. In addition, due to the importance of the proper selection of coverage, the development of a comprehensive and usable on-line system for customers will likely result in a lengthier transaction than at a broker's office. ICBC believes customers are well served by an extensive and readily accessible network of 900 broker locations throughout the province who deliver the product efficiently and at low cost.

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2007.1 RR IBC.36.4 Reference: Exhibit B-1-2, Appendix 7.3A, Distribution Costs, p. 7.3 A-6, paragraph 22

Please advise what the risk of inadequate insurance coverage due to misrepresentation is and how it arises.

Response:

There is a fundamental expectation that all customers' declarations are accurate and honest. Any material misdeclaration can put the customer into a situation where insurance coverage is breached.

What this means is that if a correct declaration would have incurred a higher premium the coverage is not in force.

The effect is that the injured party can still recover under the principle of absolute liability, but ICBC can recover all amounts from the policyholder and/or driver.

Insurance Bureau of Canada Information Request No. 2007.1 RR IBC.36.5 Dated 04 May 2007 Insurance Corporation of British Columbia Response Issued 01 June 2007	Page 1 of 1
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2007.1 RR IBC.36.5 Reference: Exhibit B-1-2, Appendix 7.3A, Distribution Costs, p. 7.3 A-6, paragraph 22

Please advise what the risk of inadequate insurance coverage due to signature requirements is and how it arises.

Response:

The intent of paragraph 22 is not to say that there is a risk of inadequate insurance as a result of the three factors. It is intended to be read as there are three challenges:

1. inadequate insurance due to misrepresentation;
2. signature requirements; and
3. potential for fraud.

Signature requirements is one of the three challenges that ICBC has identified in developing on-line insurance.

Insurance Bureau of Canada Information Request No. 2007.1 RR IBC.36.6 Dated 04 May 2007 Insurance Corporation of British Columbia Response Issued 01 June 2007	Page 1 of 1
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2007.1 RR IBC.36.6 Reference: Exhibit B-1-2, Appendix 7.3A, Distribution Costs, p. 7.3 A-6, paragraph 22

Please advise what the risk of inadequate coverage due to the potential for fraud is and how it arises.

Response:

The intent of paragraph 22 is not to say that there is a risk of inadequate insurance as a result of the three factors. It is intended to be read as there are three challenges:

1. inadequate insurance due to misrepresentation;
2. signature requirements; and
3. potential for fraud.

The potential for fraud is one of the three challenges that ICBC has identified in developing on-line insurance.

2007.1 RR IBC.37.1 Reference: Exhibit B-1-2, Appendix 7.3B, Basic Insurance Information Sharing Exhibits, Appendix B, Basic Insurance Total

Could you please provide for each of 2002, 2003, 2004, 2005, 2006 and 2007 (forecast) the number of drivers that have had to pay a Driver's Penalty Point Premium?

Response:

The following figure illustrates the number of drivers who were billed for Driver Penalty Point Premiums in the years requested.

Driver Penalty Point Premiums

	2002	2003	2004	2005	2006	2007 (Forecast)
Number of drivers	53,413	38,678	31,392	38,531	46,715	45,000

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2007.1 RR IBC.37.2 Reference: Exhibit B-1-2, Appendix 7.3B, Basic Insurance Information Sharing Exhibits, Appendix B, Basic Insurance Total

How does ICBC explain the drop in Driver's Penalty Point Premiums from \$21,456,000 in 2002 to \$17,465,610 in 2006 considering that ICBC's recent media release of March 13, 2007 titled "Better rates for ICBC's best customers" (attached to these IR's) on rate design suggests that high-risk drivers have a significant impact on rising bodily injury claims costs?

Response:

The volume of Driver Penalty Point premium billings is directly proportional to the number of violation tickets issued by law enforcement agencies throughout the province and the subsequent convictions related to those violations. The drop in Driver Penalty Point premium billings between 2002 and 2006 is attributable to a drop in violation tickets served. The "Better rates for ICBC's best customers" media release in March referenced research that shows that drivers with a greater number of Driver Penalty Points represent a higher financial risk to ICBC than drivers with no Driver Penalty Points.

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2007.1 RR IBC.38.1-3 Reference: Exhibit B-1-2, Appendix 7.6 A, IT Strategic Plan, p. 7.6 A-18, paragraph 87

38.1 Please explain how ICBC "targets policy and programs to reduce risk associated with certain groups of drivers that are known to be at higher risk"?

38.2 Please provide examples of such policies and programs

38.3 What have been the results of these to this day? Please provide any evaluation that has been undertaken.

Response:

ICBC understands this information request to relate to driver licensing policy and programs to reduce risk associated with certain groups of drivers who are known to be at higher risk. In addition to the policies and programs described in this response, ICBC addresses higher risk drivers through road safety programs and its rate design proposals set out in Chapter 16.1 of the 2007 Rate Design Application.

High risk drivers in BC are identified to be those drivers who show a higher probability of being involved in collisions and/or their collisions resulting in higher rates of fatalities and/or serious injuries. Driver licensing based policy and program changes aimed at high risk drivers start with analyzing crash data and following up on issues identified by ICBC or brought to ICBC's attention from various sources such as the public, police and safety groups. Data helps to identify the major causes of traffic crashes and the groups who are experiencing high numbers of crashes. After issues have been identified, further research, analysis and consultation are conducted to determine strategies to address them.

Two major high risk driver groups based on consistent dangerous driving behaviours are young and inexperienced drivers and individuals that drive while impaired. Other groups of drivers are also identified as being higher risk from a driver licensing perspective primarily because of the types of vehicles they drive, such as motorcyclists and commercial vehicles.

ICBC's approach to developing policies and programs often involves the Office of the Superintendent of Motor Vehicles given its responsibility to regulate drivers to help ensure the safe and responsible operation of motor vehicles in British Columbia. ICBC, in partnership with the Office of the Superintendent of Motor Vehicles, has made substantive, comprehensive

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program changes to help lower the number and frequency of crash rates for the inexperienced driver and impaired driver high-risk groups. These program changes are:

- Graduated Licensing Program (GLP) for new drivers.
- Drinking and Driving Programs, including Ignition Interlock.

ICBC constantly monitors and evaluates programs, such as GLP, and the evaluation results are an integral part of new program planning and problem identification. GLP has been successful in reducing crashes among new drivers as evidenced by the findings in the GLP Year 6 Evaluation Report attached as Attachment A. ICBC also filed the Graduated Licensing Program – Interim Evaluation Report – Year 3 as Attachment A to the response to information request BCUC.57.1 with respect to the July 2004 Application.

The Office of the Superintendent of Motor Vehicles is the lead agency on the Drinking and Driving Programs. ICBC has not yet received any information on their program evaluation plans.

Policy and operational changes are often used to implement smaller changes to help improve the skills of drivers in high-risk groups. These changes, including requiring new commercial vehicle drivers use a loaded (weighed down) vehicles during road tests and motorcycle riders to re-test in order to renew their learner's licence, are often made based on road safety research, best practices from other jurisdictions and/or advice from road safety groups. Evaluation information on the crash reduction impact of these changes are generally not generated as there is often no reasonable methodology available to control for the impact of the small change on the overall driving behaviours of the driving group.



2007.1 RR IBC.38.1-3 – Attachment A –
Evaluation of the Graduated Licensing
Program in British Columbia (1999 - 2004);
GLP Evaluation in BC Appendix A; GLP
Evaluation in BC Appendix B.



**EVALUATION OF THE
GRADUATED LICENSING PROGRAM
IN BRITISH COLUMBIA
(1999 - 2004)**

***SHORT- AND LONGER-TERM EFFECTS ON NEW DRIVER
CRASH RATES, SPECIFIC COMPONENT EFFECTS, AND
EARLY EFFECTS OF OCTOBER 2003 ENHANCEMENTS (GLPe)***

December 2006

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EXECUTIVE SUMMARY

Background

It is well known that new drivers are at a higher risk of crash involvement than are experienced drivers. British Columbia (BC)'s Graduated Licensing Program (GLP) was implemented in three releases between August 1998 and December 2000. The program applies to new drivers of all ages and includes an extended Learner stage, a restricted Novice (or intermediate) stage, and an exit test for graduation to Full Privilege licensure. A comprehensive driver education curriculum was also developed and implemented in conjunction with GLP, and drivers who successfully complete an approved course may submit a Declaration of Completion (DOC) to ICBC and apply to have the GLP Learner stage reduced by up to 3 months (90 days).

An interim evaluation (year 3) of BC's GLP (Wiggins, 2004) found that it had successfully reduced the crash involvement rates of the new drivers who entered the program during its first year of operation. However, the evaluation also revealed potential weaknesses in the program: no evidence was found of a positive program effect once drivers reached the Novice stage of licensure, and the time incentive offered to those who completed an approved driver education course was identified as a possible concern. The beneficial effects of GLP were attributed primarily to the extension of the Learner stage.

Based on the findings of the interim evaluation and on the accumulation of evidence from other jurisdictions, several changes were implemented in October 2003 in an effort to enhance the program's effectiveness. These changes included: increasing the length of the Learner and Novice stages by 6 months, adding a passenger restriction to the Novice stage, and requiring that Novice drivers remain prohibition-free for a total of 24 consecutive months before becoming eligible to take their exit road test.

The enhanced GLP (GLPe) did not, however, include removal of the Learner stage time incentive offered to drivers who completed an approved driver education course. There were several reasons for this decision. Firstly, as noted above, the concerns that were emerging about the time incentive were based on findings from an early GLP cohort. Due to the staged release of the program none of these drivers had been exposed to a fully implemented version of GLP. Secondly, the approved driver education curriculum was still being implemented and was not widely available to the drivers included in the early evaluations. Like GLP, the approved driver education curriculum had continued to be developed and implemented throughout 1999 and 2000. Finally, it was unknown to what extent the 6-month extension of the Learner stage implemented with GLPe, in October 2003, might attenuate the effect observed with GLP.

Objectives

The evaluation had the following objectives:

- 1 To assess the magnitude and consistency of the effects of GLP on the short-term (one- and two-year) and longer-term (three- and four-year) crash involvement rates of GLP New drivers.
- 2 To assess the relative contributions of the GLP Learner and Novice stage restrictions and conditions to the overall effect.

- 3 To compare the short- and longer-term effects of GLP on crash rates for New drivers who entered GLP before (1999-2000) and after (2001-2002)¹ it was fully implemented,
- 4 To determine whether the higher crash rates previously reported (Wiggins, 2004) for Novice drivers who had completed an ICBC-approved driver education course and applied for early Novice licensure would be observed in subsequent cohorts of drivers and, in particular, among drivers who entered the system after GLP was fully implemented,
- 5 To explore the potential predictive value of the GLP knowledge and road tests (Class 7 and 5 only),
- 6 To investigate whether a 6-month extension of the Learner stage (as introduced with GLPe) might be sufficient to neutralize the negative impact on crash rates that has been observed (Wiggins, 2004; Mayhew et al., 2003; Boase and Tasca, 1999) when early Novice licensure is made available to drivers who complete an approved driver education course.

Method and Scope

This evaluation was conducted in three studies:

Study 1 was conducted primarily to provide historical context, to ensure that the results of the year 3 interim evaluation were not an artefact of the selected study groups, to examine the impact of the fully implemented program on New driver crash involvement rates, to assess the effect of the extended GLP Learner stage and its components on the crash involvement rates of Learner drivers, to explore the relative contributions of the Learner and Novice stage components in the overall effect of GLP on New driver crash rates, and to investigate the effect of completing an ICBC-approved driver education course on Learner driver crash rates.

Study 2 was conducted to examine the impact of GLP on the short- and longer-term crash involvement rates of drivers in the Novice stage of licensure, to explore the predictive validity of the GLP testing processes (knowledge and road) and associations between performance on the tests and crash involvement rates, and, finally, to examine relationships between completing an ICBC approved driver education course, early Novice licensure, and performance on the Class 7 knowledge and road tests.

Study 3 was a preliminary study designed primarily to explore the early impact of the extended Learner stage introduced with the October GLP enhancements (GLPe) on New driver and Novice driver crash rates.

All three studies were conducted using quasi-experimental prospective designs and data collected from secondary sources. The scope of the evaluation was limited to an assessment of crash impacts. Violations and other indicators of driver behaviour were not included.

¹ To maximize the comparability of risk within the GLP cohorts, drivers who had not obtained their first Learner (or Novice) licence in time to be able to accumulate a full three- or four-years of licensure by June 30, 2005 (the cut-off date for the evaluation) were excluded from the analyses of long-term crash involvement rates. This exclusion process affected the 2001 and 2002 GLP New driver cohorts and all of the Novice driver cohorts. Hence, the long-term results presented for these groups must be considered preliminary until more complete data is available for these groups.

Definitions

In this report, reference is made to three categories of drivers: New drivers, Learner drivers, and Novice drivers. In many jurisdictions the terms “New driver” and “Novice driver” are used interchangeably. Here, however, they are not. Instead, the term “Novice driver” refers only to the subset of drivers who have advanced from the Learner stage to their first solo (unsupervised) licence. The term “New driver” refers to drivers in the early stages of the licensing process but who may hold either a Learner or “Novice”² licence.

Key Findings

1. GLP has successfully reduced the short- and longer-term crash involvement rates of New drivers. Compared to Pre-GLP New drivers, the GLP 1-year crash rate declined from 17.8 to 13.1 per 100 licensed driver years, a reduction of 26%. The estimated magnitude of the impact of GLP declined as the length of licensure increased, but remained at about 12-13% when the first four years of licensure was assessed. The impact of the program was also reduced when the assessment was restricted to drivers who advanced to Novice licensure within each period of licensure. When restricted in this way, the estimated crash rate reductions were found to be about 14% for the first year of licensure, and about 9% for the first four years. No reduction in crash rates was observed for Experienced driver groups when compared over the same time periods as the New driver groups. It is likely, therefore, that the observed changes are attributable to the program. These results are consistent with the results reported in the year 3 interim report.
2. The age at which New drivers obtained their first Learner licence declined after implementation of GLP. This shift reduced the effectiveness of GLP by approximately 5-6 percentage points. For example, once age and gender were taken into account the percentage reduction for the first year of licensure increased from 26% to 32%; for the first four years of licensure it went from 12% to about 17-18% (depending upon the GLP cohort used in the analysis).
3. Consistent with the year 3 interim report, Novice drivers in GLP who completed an approved driver education course and submitted a DOC were estimated to have a 26% higher crash rate during their first year of Novice licensure than those who did not (year 3 evaluation estimate was also 26%). This effect was obtained after removing the influence of group differences in age and gender. The effect was reduced to 24% after GLP was fully implemented in 2000. An important factor confounding the results of these analyses was the time incentive offered to the drivers who completed the approved course. Drivers who spend less time in the Learner stage tend to have higher crash rates than those who spend more time in the Learner stage. Due to the time incentive, drivers who completed the approved course spent less time in the Learner stage than drivers in the comparison group. This confounding effect makes it difficult to evaluate the effectiveness of the approved course. It is clear that some if not all of the DOC effect is due to the shorter time these drivers spend in the Learner stage. However, until this confounding factor has been removed, the extent to which the higher crash rates of the DOC group are attributable to the course itself, to the time incentive, or to other factors, will remain unclear.
4. Inconsistent effects were detected with respect to the impact of GLP on all Novice driver crash rates. Some reductions in crash rates were observed for GLP compared to Pre-GLP drivers, but only in their third and fourth years of solo licensure. And the impact was not strong enough to counteract the higher crash rates observed for GLP Novices during their first two years of licensure. All of the possible reasons for the higher GLP Novice driver rates are not known. However, the early licensure

² Prior to GLP, new drivers advanced from the Learner stage to a Full Privilege licence. For the purposes of this evaluation Pre-GLP drivers who obtained their first Full Privilege licence during the study period are referred to as “Novice” drivers.

and higher crash involvement rates of drivers who completed an approved driver education course were identified as key factors. Compliance during the early years may also be an issue. An important factor identified as having a positive influence on the crash rates of Novice drivers was the extension of the GLP Learner stage. A longer Learner stage helps to minimize the differences between the GLP and Pre-GLP Novice driver crash rates. More research is needed in order to determine the optimal time for the Learner stage, but the results from the Novice driver study suggest that 12 months may be sufficient.

5. Drivers who submitted a DOC prior to taking their first road test were more likely to pass the test on their first attempt than a comparison group of drivers who did not submit a DOC. When performance on the test was taken into account in modelling crash involvement rates of Novice drivers the relative risk for DOC versus No DOC drivers declined from 1.14 to 1.08. The effect was not strong enough, however, to neutralize the impact of early Novice licensure.
6. Although GLP was introduced to BC in 1998, the original components of the program were not fully implemented until the end of 2000. Several documentation changes were made at that time and an enhanced knowledge and a new level 1 road test were introduced. Results from comparing the overall impact of the fully implemented program (GLP 2001-2002) versus the early years of GLP (GLP 1999-2000) were inconsistent. Some reductions in crash rates were observed following full implementation of the program, but most of the observed reductions in rates were small in magnitude and tended not to fall in the expected periods of licensure. The results were difficult to interpret but may have been due to the testing processes introduced at the end of 2000.
7. Little evidence was found to suggest that the knowledge test had predictive validity for crash involvement in the Learner stage. Nor was there strong evidence of an association between the Class 7 road test and Novice crash involvement, at least not during the early months of Novice licensure. Lower crash rates were observed for Novice drivers before and after taking the Class 5 road test. However, the lack of an appropriate comparison group made interpretation difficult. The ease with which drivers passed the tests was found to be associated with crash involvement rates; drivers who passed on the first or second attempt had lower rates than drivers who took three or more attempts.
8. In October 2003, GLP was enhanced in an effort to increase the program's effectiveness. Early findings associated with the enhanced program (GLPe) suggest that it is reducing the short-term New driver crash involvement rate. Based on a 1.5-year follow-up period (producing an average of 10 months of follow-up per driver), overall crash rates (after adjustment for age and gender) were found to be about 64% lower for GLPe compared to GLP New drivers. These results are very early and are weighted heavily by the fact that most of the GLPe drivers were in the Learner stage for the entire study period. More follow-up will be required before the impact of GLPe Novice driver restrictions on Novice driver crash rates can be reliably assessed.
9. During the first 90-days of Novice licensure, the relative risk of crash involvement for Novice drivers in GLPe who submitted a DOC compared to those who did not was found to be about half the relative risk observed for GLP Novice drivers (1.24 and 1.40, respectively). Thus, although the DOC effect was lower for GLPe Novice drivers, it was not negated. Despite the extension of the Learner stage in GLPe, permitting drivers who submit a DOC to leave the Learner stage early remains problematic.

Recommendations

1. Continue to monitor and evaluate the effectiveness of GLPe in reducing the crash involvement rates of New drivers, with particular emphasis on the impact of the Novice stage components.
2. Assess compliance with GLPe Novice restrictions, and continue to investigate new ways to effect crash reductions among drivers in the Novice stage of licensure.
3. Review and evaluate the approved driver education curriculum and determine to what extent standards for implementation and delivery have been achieved. Investigate alternative driver education models, including the potential benefits of adding an advanced component during the Novice stage.
4. Remove the learner time incentive offered to new drivers who complete an approved driver education course. This would best be done in a way that mitigates any unintended consequences, such as the dissolution of the approved course, without having a confounding influence on crash rates.
5. Review the role and content of the Class 5 exit test for New drivers.

1. Introduction and Background

It is well known that new drivers are at a higher risk of crash involvement than experienced drivers. Since the early 1970's, jurisdictions in North America and elsewhere have been trying to find ways to reduce this risk and reduce the frequency of new driver crashes (Waller, 2003). Graduated licensing is one of the strategies that emerged from these efforts. Graduated licensing is a process that "provides new drivers with the opportunity to gain driving experience under conditions that minimize the exposure to risk" (Simpson, 2003, p. 27).

The first jurisdiction to adopt a graduated licensing program was New Zealand. It introduced a three-stage licensing process that included an extended Learner stage, a new restricted or Novice stage (with both night driving and passenger restrictions and a blood alcohol limit of 0.03% throughout) and a Full Privilege stage. Evaluations of the program's impact on crashes were promising (Langley, et. al, 1996) and, in the years following the publication of the results, many jurisdictions began to develop and implement graduated licensing systems. Initially, the New Zealand program was applied only to 15-24 year old drivers. However, in 1999 it was extended to drivers of all ages – although different features applied to the younger and older drivers (Simpson, 2003).

In North America there has been a split between the United States (US) and Canada with respect to participation in graduated licensing. In the US, most of the jurisdictions that have implemented graduated licensing programs have restricted their application to young drivers, while all of the Canadian jurisdictions with graduated licensing programs have targeted new drivers, regardless of age. Ontario was the first province to introduce graduated licensing, followed shortly thereafter by Nova Scotia. Both provinces implemented their programs in 1994. BC's program (GLP) was implemented in 1998. Now most of the provinces, as well as the Yukon Territory, have or are in the process of implementing some form of graduated licensing.

Evaluations of graduated licensing programs have been undertaken by several jurisdictions in Canada, the United States and elsewhere. While the estimated magnitude of the effects have varied from jurisdiction to jurisdiction, and program to program, all but one of the evaluations conducted to date have reported reductions in the crash involvements of new drivers following implementation (Simpson, 2003), including a preliminary evaluation of BC's program (Wiggins, 2004). The one evaluation that did not was conducted in California (Masten & Hagge, 2004) and was based on a program that did not include a delay of licensure component. Delay of licensure has been shown repeatedly to be an important component of successful graduated licensing systems. Moreover, although no overall effect was detected, significant crash reductions were reported in association with the program's passenger and night-time driving restrictions.

British Columbia (BC)'s Graduated Licensing Program (GLP) was implemented in three releases between August 1998 and December 2000. As with other Canadian jurisdictions the program applies to new drivers of all ages and includes an extended Learner stage, a restricted Novice (or intermediate) stage, and an exit test for graduation to Full Privilege licensure. A comprehensive driver education curriculum was also developed and implemented in conjunction with GLP, and drivers who successfully complete an approved course can submit a Declaration of Completion (DOC) to ICBC and apply to have the GLP Learner stage reduced by up to 3 months (90 days).

Between 2000 and 2004, a series of preliminary evaluations of GLP were conducted. The Year 1 (Potentier and Wiggins, 2000) and Year 2 (Potentier and Wiggins, 2001) evaluations monitored and documented the implementation of the program, and provided very early assessments of the program's impact on new driver crashes. The Year 2 evaluation also provided a preliminary assessment of the approved driver education curriculum (Potentier and Zellinsky, 2000) that was developed and introduced in tandem with GLP. The more recently completed Year 3 Interim Evaluation (Wiggins, 2004) provided the first comprehensive assessment of the early impacts of GLP on new driver violations and crashes. It also investigated the effectiveness of the

approved driver education curriculum in reducing the Novice driver crash rate. The results provided evidence that GLP had achieved some success. The new driver crash rate was found to have been reduced by about 16% (over a maximum 3.4 year follow-up period). However, this success was attributed almost entirely to the GLP extended Learner stage. Neither the approved driver education course nor the Novice stage restrictions were found to have had a positive impact on drivers once they left the supervised Learner stage. Although all of the reasons for the poorer crash outcomes of the drivers who completed the approved driver education course are not yet fully understood, one important factor was that they spent less time in the low risk Learner stage than drivers who did not complete the course. Consequently, the year 3 evaluation report recommended that the time incentive be considered for removal. The results of the year 3 evaluation also suggested that more needed to be done to enhance the effectiveness of the Learner and Novice stage conditions and restrictions. As well, it suggested that additional work was required to evaluate the approved driver education curriculum and to determine the factors, other than the time incentive, that may have been contributing to the higher crash rates associated with it.

Although discussions concerning the approved driver education curriculum and, specifically, the role of the Learner stage time credit are ongoing, other recommended program enhancements were implemented in October 2003. These enhancements came about in response to the recommendations of the year 3 report, the recent occurrence of a number of high-profile new driver crashes in BC, and the results of research and evaluation studies in other jurisdictions. For ease of reference in the remainder of this report, this enhanced program will be referred to as GLPe. The original program will continue to be referred to as GLP.

The following program changes were made with the implementation of GLPe (October 6, 2003):

- 1) the minimum length of the Learner stage was increased by 6 months for all new drivers (although the 3-month time incentive was retained for drivers who completed an approved driver education course). Thus, the minimum Learner stage was increased to 9 months for drivers who submit a DOC and to 12 months for those who do not,
- 2) a passenger restriction was introduced into the Novice stage,
- 3) the Novice stage was increased from 18 months (total accumulated time) to 24 months (consecutive, prohibition-free time), and
- 4) drivers taking an approved driver education course are required to log 60 hours of practice time rather than the 30 hours required under GLP.

Due to the recency of the implementation of GLPe, and the length of time it will take drivers to progress through the new program, it will not be possible to fully evaluate the effectiveness of the enhanced program for a number of years. In the meantime, it is important to continue to investigate and monitor GLP impacts and to begin to document the implementation and early effects of the 2003 program enhancements. This will provide important information for decision-makers in the short-term and will lay the groundwork for subsequent evaluations.

One of the limitations of the previous GLP evaluations is that they were based on the experiences of only one cohort of drivers: those who entered the program during its first year of operation, between August 1, 1998 and July 31, 1999. Due to the staged implementation of GLP, these drivers were not exposed to any of the program components introduced in November and December, 2000. Consequently, one of the objectives of this evaluation will be to determine whether the addition of these later components impacted the overall effectiveness of GLP.

A second limitation of the Year 3 Evaluation was that it was based on a 3.4 year study period (from the start date of GLP). Due to the sequential nature of licensing (new drivers enter the system every day), this means that the drivers in the study were observed for different lengths of time. This variation in follow-up time was dealt with by using driver-time in the rate denominators. However, an assumption underlying the use of

person-time denominators in rate calculations is that the risk of the outcome being measured remains constant over the time period studied (Mausner & Bahn, 1974). In the case of new driver crashes this assumption has limited validity. The crash risk of new drivers is low and relatively constant during the Learner stage, but it increases substantially at the beginning of the Novice stage, and then gradually decreases as the new driver gains experience. Consequently, to check the impact of this changing risk on past rate comparisons, the impact of GLP will be reassessed using equal amounts of driver-time for all drivers in the study groups (for example, all Novice drivers with one or two years of licensure). Although such rates were included in the Year 3 evaluation, they were not highlighted at that time due to the relatively small percentage of drivers from the GLP cohort who had accumulated more than 1 year of time in the Novice stage.

The evaluation described in this report had several objectives. It was designed primarily to assess the short-term (1-2-year) and longer-term (3-4 year) effects of GLP on new driver crash rates, and to establish baseline measures for assessing the effects of October 2003 enhancements (GLPe). A second purpose was to determine whether there had been any incremental effects attributable to the full implementation of GLP (at the end of 2000), and to examine the effects and predictive value of the GLP knowledge and road tests with respect to the crash involvement rates of new drivers. It was also of interest to determine whether previously reported findings concerning the relationship between crash involvement rates and completion of an ICBC-approved driver education course would be upheld within the context of the fully implemented GLP, and to examine the early effects of GLPe on the crash rates of Novice drivers who had completed an approved course.

The results of the evaluation are reported in the following sections:

- Section 2 provides a description of the program including the enhancements introduced in 2003.
- Section 3 provides a general description of the evaluation and its scope.
- Section 4 describes the study undertaken to assess the short- and long-term effects of GLP on all New driver (Learner and Novice combined) and Learner only crash involvement rates. An effort is made to examine not only overall effects, but specific effects of the Learner stage components, including the enhanced knowledge test, Class 7 (or 8) road test, and completion of an ICBC-approved driver education course.
- Section 5 describes the study conducted to assess the short- and longer-term effects of GLP on Novice driver crash involvements, including an assessment of any incremental benefits from the fully implemented program, the effect and possible predictive value of GLP testing procedures, and the impact of the ICBC approved driver education course and early Novice licensure on GLP Novice crash involvement rates.
- Section 6 describes the study undertaken to assess the early impact of GLPe on New driver crash rates and to ascertain what, if any, effect was obtained by adding six months to the Learner stage. Of particular interest was the impact that the extension of the Learner stage might have had on the association between Novice driver crash rates and completion of an approved driver education course.
- Section 7 discusses the findings from the three studies, and concludes with recommendations for future consideration.

2. Program Description

2.1 Program Goal and Objectives

British Columbia introduced its graduated licensing program in August 1998. The primary goal of the program is to reduce the frequency of New driver crash involvements. It aims to achieve this goal by assisting drivers to develop better driving skills, by encouraging the development of safe driving attitudes, and by reducing the amount of risk to which drivers are exposed while they are learning to drive and while they are gaining the experience, maturity, and judgement they need to drive safely. The program consists of two stages (a Learner stage and a Novice stage), each of which has specific restrictions and requirements, and each of which is completed with the passing of a road test. Once the second (exit) road test has been passed, a Full Privilege licence can be obtained. BC's GLP targets all new passenger vehicle drivers and motor cycle riders, regardless of their age.

Due to the differences in licensing processes across jurisdictions, there is considerable variability in the definitions that are used to refer to licensing stages and drivers. In many jurisdictions drivers are not referred to as 'licensed' until they have passed a road test and have been issued a licence (intermediate or full privilege) that allows them to drive unsupervised. In other jurisdictions, 'licensed' drivers include those who hold a Learner's permit. In this evaluation, the following definitions apply:

Licensed driver – any driver who holds a valid BC driver's licence (Learner, Novice, or Full Privilege).

Learner licence – a Pre-GLP Class 5L (passenger vehicle) or 6L (motorcycle) licence, a GLP Class 7L (passenger vehicle) or Class 8L (motorcycle) licence.

Novice licence – a GLP or GLPe (Class 7/8) licence. This is the first solo (unsupervised) licence issued to GLP drivers.

Full Privilege licence – a (Class 5/6) licence. This is the first solo (unsupervised) licence issued to Pre-GLP drivers, and the first unrestricted (with respect to GLP restrictions) licence issued to GLP drivers.

New Pre-GLP, GLP, or GLPe driver – a driver who is in the first six years of licensure (from the issue date of their first Learner licence).

Learner driver – any New GLP, GLPe, or Pre-GLP driver who holds a Learner licence.

Novice driver – any New GLP or GLPe driver who has been issued their first Novice licence and any New Pre-GLP driver who has been issued their first Full Privilege licence. Both GLP and Pre-GLP drivers will be referred to as Novice drivers until they have accumulated four years of unsupervised licensure (on either a Novice or Full Privilege licence or both).

Solo Licence – any licence that permits a New driver to drive (at least some of the time) without supervision. As used in this document Pre-GLP Full Privilege, GLP Novice and Full Privilege, and GLPe Novice and Full Privilege licences are all considered solo licenses.

2.2 Program Description and Implementation Process

Prior to GLP, New drivers were required to remain in the Learner stage a minimum of thirty days and had to pass a 30 minute road test prior to receiving a Full Privilege two-year probationary licence. During this probationary period a New driver might be prohibited from driving after receiving three violation tickets.

With the introduction of GLP in August 1998, New drivers were required to remain in the Learner stage for a minimum of 6 months unless they completed an ICBC-approved driver education course. Drivers who completed

such a course were able to reduce the minimum Learner time by up to 3 months. New drivers were also required to complete an 18-month Novice stage, which they could enter after completing the minimum Learner time and passing their first road test. After the 18-month Novice stage, drivers were required to pass a second, more advanced road test (Class 5/6) in order to graduate to a Full Privilege licence. During both the Learner and Novice stages drivers could be prohibited from driving after receiving two violation tickets. They were also not permitted to drive with a Blood Alcohol Content (BAC) greater than zero.

When GLPe was implemented in October 2003, the Learner and Novice stages were both extended by six months, and a passenger restriction and prohibition-free requirement were added to the Novice stage.

The development and timing of the implementation of the specific components of GLP and GLPe was done in four phases as described below and depicted in Figure 1.

GLP Transition Phase

May 4 to July 31, 1998 was a transition phase. Anyone receiving a Learner licence during this period was required to spend a minimum of three months as a Learner. The earliest exam date for these drivers was August 1, 1998 and upon passing the Class 7 or 8 road test they received a GLP Novice licence rather than a Full Privilege licence.

August 1, 1998 – GLP Release 1

Implementation of GLP entry requirements for all New drivers took place during this release. GLP Learner and Novice restrictions were imposed, as were enhanced adjudication sanctions. In addition, driving schools began offering the newly developed curriculum for the ICBC-approved driver education. New drivers successfully completing an ICBC-approved GLP driver education course could apply to have their Learner stage reduced by three months.

A five-day training course for driver-training instructors wishing to teach GLP driver education was developed, and the first course was offered in July 1998. Driver-training instructors however, were not required to have completed the five-day course in order to teach an ICBC-approved GLP course until February 1, 1999.

A practice guide was published titled *Tuning Up, a manual for new drivers and their co-pilots*, and was included in the toolkits provided to GLP drivers when they received their Learner licences.

January 24, 2000 – GLP Release 2.1

Release 2.1 included the development and implementation of the advanced (Class 5/6) road test. All GLP drivers must pass this test to obtain a Full Privilege licence.

Fall, 2000 – GLP Release 2.2

This release brought about the publication of new safe driving guides for passenger vehicle drivers; *RoadSense for Drivers*, and motorcycle riders, and *RoadSense for Riders*, both available as of September 2000. The new guides are more detailed than the previous *Safe Driving* or *Safe Riding Guides* and provide a systematic “see-think-do” approach. The aim of the guides is to present drivers with common-sense strategies to deal with the various problems they are likely to encounter on the road and thereby produce a thinking driver.

Implementation of the enhanced Knowledge Tests (passenger vehicle and motorcycle), took place on October 16, 2000, reflecting the content and approach of the *RoadSense* guides. Decision-making, rather than rote memory is required in order to pass the new tests.

As of November 27, 2000, drivers from out-of-province with less than 18 months of driving experience were required to enter GLP. In addition, the new Class 5/6 road tests became the entry test for anyone applying for

a Class 5 passenger vehicle licence or a Class 6 motorcycle licence, not just GLP drivers. Enhanced Class 7 and 8 road tests were developed and implemented as the entry tests for Class 7 and Class 8 licences. In addition, there was an implementation of a revised motorcycle skills test.

The publishing and distribution of *Tuning Up for Riders* took place in December 2000.

With Release 2.2 all of the development work needed for GLP was completed and by December 2000 all components of the program had been implemented. Transition from project development to ongoing operational support, including driver examiner motorcycle road test training, was completed by June 2001.

October 6, 2003 – GLPe Implementation

The following program enhancements were introduced on October 6, 2003:

The Learner stage was extended. GLPe drivers are required to complete a minimum of 180 days more in the Learner stage than GLP drivers. Thus, GLPe drivers who complete an approved driver education course must complete a minimum of 270 days in the Learner stage, compared to a minimum of 90 days for GLP drivers; and GLPe drivers who do not complete an approved driver education course must complete a minimum of 360 days in the Learner stage, compared to 180 days for GLP drivers.

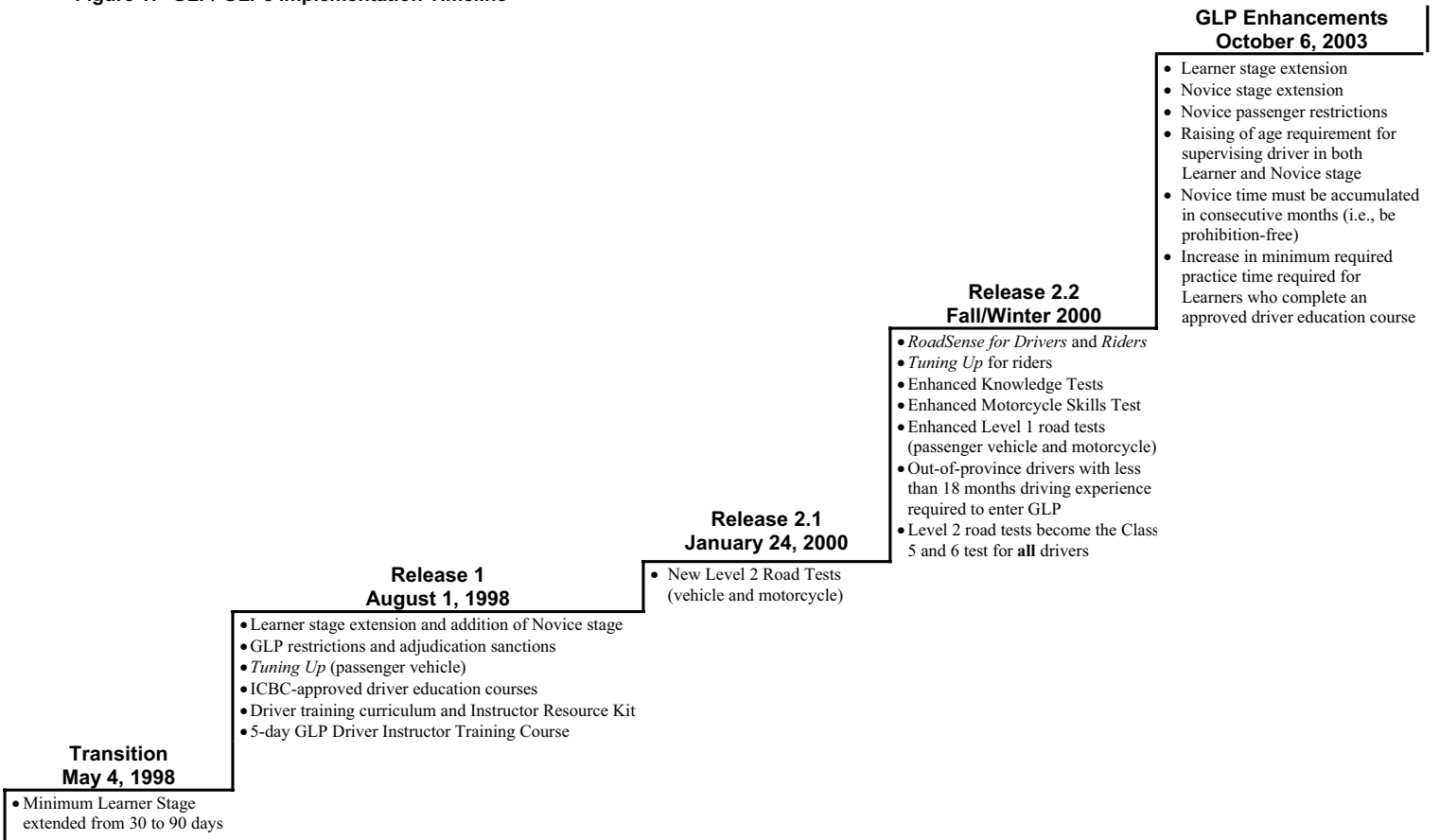
Additional practice time was added to the requirements for completion of an approved driver education course. GLPe drivers who complete an approved driver education course are required to log an 60 hours of practice time, compared to the 30 hours required of GLP drivers.

The Novice stage was extended and changed to continuous (prohibition-free) rather than total accumulated time. GLPe drivers are required to complete a minimum of 24 consecutive months in the Novice stage before applying to take the exit road test and attempting to graduate to a Full Privilege licence. GLP drivers were required to complete a minimum of 18 months in the Novice stage and there was no requirement that the time be accumulated consecutively.

While in the Novice stage, GLPe drivers are not permitted to carry multiple passengers. Under GLPe rules, Novice drivers may only carry one passenger unless there is a supervising adult in the vehicle. An exemption for immediate family members is provided. GLP Novice drivers did not have a passenger restriction.

The minimum age of a supervising adult was changed from 19 to 25 years. The minimum age requirement was applied to both the Learner and Novice stage of GLPe.

Figure 1: GLP/ GLPe Implementation Timeline



2.3 Status of the Implementation Process

GLP has been fully operational since December 2000. Program implementation was closely monitored until that time and a full description and assessment of the implementation process was provided in the Year 2 Interim Evaluation (Potentier and Wiggins, 2001). A preliminary, qualitative review of the implementation of the ICBC-approved driver education course was completed in 2000 (Potentier and Zellinsky, 2000). Although the licensing components of GLP were successfully implemented, some concerns were raised relative to the effectiveness of the implementation of the approved driver education course. In particular it was noted that there were inconsistencies in the extent to which schools were adhering to the curriculum. Since then, the ICBC Driver Training and Assessment Standards unit has continued to work with the Driver Training industry in an effort to improve the level and consistency with which the curriculum is taught. However, a subsequent evaluation of the implementation of the curriculum has not yet been undertaken. Currently, the future of the approved course, and of ICBC's role in its delivery and in the regulation of the driver training industry is under review. Consultations are ongoing and until the future of the course has been determined no further evaluations will be undertaken.

GLPe was implemented and became fully operational on October 6, 2003. As all of the steps needed to ensure the successful implementation of the enhancements had to be completed prior to the October launch date, no formal evaluation of the GLPe implementation process has been undertaken. A description of the implementation process and an assessment of the extent to which the new rules and restrictions are being applied, followed and enforced will be included in the first formal evaluation of GLPe (targeted for 2007).

2.4 Program Participation

Between August 1, 1998 and December 31, 2004, a total of 341,915 BC residents entered the GLP (or GLPe) Learner stage as first-time licence holders. A count of new Learners by intake year is shown in Table 1. The number of new Learners per month, in each period, is also shown

In 1996, 1997, and the early part of 1998 (before GLP), the number of drivers entering the licensing system for the first time was considerably higher than it was after GLP was implemented (Table 1). News of licensing changes in BC prompted a large increase in the number of people obtaining a Learner's licence in the months prior to the implementation of GLP (January to July 1998). A slight increase was observed in the months leading up to the implementation of GLPe (January to October 5, 2003) but it is not likely that this was related to the onset of GLPe. No advance notification had been provided prior to the GLPe implementation date.

Table 1: Learner Licences obtained by New Drivers*

Year	Licensing Program	Number	Number per Month
1996	Pre-GLP	60,174	5,014
1997	Pre-GLP	77,924	6,494
1998	Pre-GLP, GLP Transition, GLP	78,506	6,542
1999	GLP	52,204	4,350
2000	GLP	55,193	4,599
2001	GLP	50,808	4,234
2002	GLP	56,499	4,708
2003	GLP, GLPe	56,316	4,693
2004	GLPe	54,903	4,575

*Drivers who had never previously held a licence or Learner's permit (in BC or any other jurisdiction)

3. Evaluation Overview

3.1 Purpose and Scope of the Evaluation

The evaluation described in this report is limited in scope. It is a transitional evaluation; designed primarily to document the short- and longer-term effects of GLP on New driver crash rates and to lay the foundation for future evaluations of the changes implemented with GLPe. It explores the effects and predictive value of the GLP knowledge and road tests and is designed to replicate and further investigate relationships between Novice driver crash rates, completion of an ICBC-approved driver education course, the provision of a Learner stage time incentive, and the early effects of the extended Learner stage introduced with GLPe. A more comprehensive evaluation of GLPe will be undertaken when more drivers have had sufficient time to progress through the enhanced program.

The primary objectives of the evaluation are:

1. To assess the magnitude and consistency of the effects of GLP on the short-term (one- and two-year) and longer-term (three- and four-year) crash involvement rates of GLP New drivers.
2. To assess the relative contributions of the GLP Learner and Novice stage restrictions and conditions to the overall effect.
3. To compare the short- and longer-term effects of GLP on crash rates for New drivers who entered GLP before (1999-2000) and after (2001-2002)³ it was fully implemented,
4. To determine whether the higher crash rates previously reported (Wiggins, 2004) for Novice drivers who had completed an ICBC-approved driver education course and applied for early Novice licensure would be observed in subsequent cohorts of drivers and, in particular, among drivers who entered the system after GLP was fully implemented,
5. To explore the potential predictive value of the GLP knowledge and road tests (Class 7 and 5 only),
6. To investigate whether a 6-month extension of the learner stage (as introduced with GLPe) might be sufficient to neutralize the negative impact on crash rates that has been observed (Wiggins, 2004; Mayhew et al., 2003; Boase and Tasca, 1999) when early novice licensure is made available to drivers who complete an approved driver education course.

To meet these objectives, three studies were undertaken: Study 1 examines the impact of GLP on the crash involvement rates of all New Drivers and on drivers in the Learner stage of licensure, Study 2 evaluates the impact of GLP on the crash involvement rates of drivers in the Novice stage of licensure, and Study 3 explores the early effects of GLPe on the crash involvement rates of all New drivers and of Novice drivers who did or did not submit a DOC.

³ To maximize the comparability of risk within the GLP cohorts, drivers who had not obtained their first Learner (or Novice) licence in time to be able to accumulate a full three- or four-years of licensure by June 30, 2005 (the cut-off date for the evaluation) were excluded from the analyses of long-term crash involvement rates. This exclusion process affected the 2001 and 2002 GLP New driver cohorts and all of the Novice driver cohorts. Hence, the long-term results presented for these groups must be considered preliminary until more complete data is available for these groups.

3.2 Important Terms and Definitions

A number of terms with meanings specific to the evaluation are used throughout the report. For ease of reference the definitions of these terms are provided below:

Years of Licensure – unless otherwise indicated whenever years of licensure are referred to in this document (e.g., first year of licensure, first two years of licensure) it means the amount of time that has passed since the driver obtained his or her first Learner licence. It does not necessarily mean that the individual was actively licensed for the entire period of time. For ease of reference in rate calculations these periods of time are referred to simply as ‘driver-years’. Within each period (first year, first two years), actively licensed time is referred to as ‘licensed driver-years’. Licensed driver-years exclude periods of time when the driver was unlicensed (due to a licence cancellation, expiration, surrender or, in some cases, because a driver had died).

Evaluation or Study Period – this is the time period used to examine the driving records of the drivers included in the study. For example, in the present study, GLP drivers’ records were examined during their first year, first two years, first three years, and first four years of licensure (from the issue date of their first Learner license). They were also examined during their first year, first two years, first three years and first four years of Novice licensure (from the issue date of their first Novice license), and during the first six months after the issue date of their first Full Privilege licence.

Cohort – a cohort is a group of individuals defined by some common characteristic and who remain part of a group over an extended period of time. In this evaluation, the cohorts are defined by the licensing process (Pre-GLP, GLP, or Pre-GLP) experienced by the driver and by their year of entry into the process (1996, 1997, 1999, 2000, 2001, or 2002).

Study group – a group of individuals selected for inclusion into a study. For present purposes the study groups may be the cohorts described above, or they may be sub-groups defined within the cohorts (e.g., drivers who did or did not successfully complete an ICBC-approved driver education course).

Intake period – this is the period of time during which participants are accepted into a study. Unless otherwise indicated, the intake period used for this evaluation was the calendar year in which a driver’s first Learners licence was obtained.

Validity period – this is the length of time for which a licence is issued. For Pre-GLP Learner drivers the validity period was 6 months, for GLP Learners it was initially 1 year but was increased to 2 years when GLPe was implemented. Pre-GLP drivers who passed their first road test were issued a 2-year probationary licence after which they could pay a renewal fee and obtain a 5-year Full Privilege licence; GLP drivers who passed their first road test were issued a 5-year Novice licence. At the end of each term, drivers must renew their licence in order for it to remain valid. Prior to GLPe there were no requirements for Learner drivers to retake their knowledge test prior to renewing their Learner licence. As well, motorcycle riders were not required to retake their motorcycle skills test (MST). This was changed with the implementation of GLPe and now both groups must be retested before renewal.

ICBC-approved driver education – based on the *Mapping a Safe Course* curriculum, this is a 32-hour course which consists of a minimum of 16 hours of in-class instruction, 12 hours of in-car instruction and 4 hours of discretionary time. Driver training schools must have their GLP course approved by ICBC before offering it to students. Driver-training instructors must complete a 5-day course in order to have a GLP designation on their instructor licence, and to teach an approved course. GLP drivers who complete this course must also log 30 hours of practice time (60 hours for GLPe driver) in order to obtain a Declaration of Completion.

Declaration of Completion (DOC) – a DOC is the certificate that students receive when they complete an approved driver education course. Upon submission of the DOC to an ICBC driver services centre students can have their Learner stage reduced by up to 3 months.

Confounders or Confounding Factors – confounding factors (confounders) are variables that contribute to results that are misleading. For example, age and crash involvement are known to be highly related. If the crash rates of populations from different geographic regions are to be compared, but one population is much younger than the other, the association between area and crash risk will be confounded by the association between age and crash risk. In order to provide a clearer picture of the association between area and crash risk, the differences in the age distributions of the two populations must be taken into account.

Cut-off Date – this is the date selected for ending all counting processes. For the purposes of this evaluation the selected cut-off date for the GLP cohorts was June 30, 2005. This provided a maximum timeline of six and a half years for the 1999 cohort, and a maximum of three and a half years for the 2002 cohort. For comparability with the 1999 group, the cut-off date for the 1996 Pre-GLP cohort was set to June 30, 2002, and for the 1997 cohort it was set to June 30, 2003.

3.3 Definition and Calculation of Crash Involvement Rates

In this evaluation there are three primary outcome variables of interest: New driver crash involvement rates, Learner crash involvement rates, and Novice crash involvement rates. The numerators for the short-term rates were obtained using crash involvement counts accumulated by each driver during their first year of licensure (from the first Learner and from the first Novice licence issue dates) and the first two years of licensure; longer-term rates were based on the first three and four years of licensure (again from the first Learner and first Novice issue dates). Crash involvement counts, not crash incidents, were used as the numerator in all rate calculations. Thus, the counts reflect all New driver-crashes, even when more than one New driver was involved in the same incident, or when one New driver was involved in more than one crash.

The denominators used in the crash involvement rates were calculated in two ways. First, they were calculated using simple driver counts multiplied by the number of years during which crashes were counted (i.e., 1, 2, 3, or 4 years). These are the types of denominators often used in other jurisdictions for rate calculations and are referred to simply as *per driver-year* rates. They are included in this report for descriptive purposes only. The rates of primary interest in this evaluation were calculated using licensed driver-time denominators. These are referred to as *per licensed driver-year* rates. A licensed driver-year includes all of the time in a given year when a driver held a valid BC licence. It excludes any periods of time when a driver's licence was suspended, cancelled, or expired. For most of the drivers, their licensed driver-time was counted from the issue date of their first licence (Learner or Novice) until the end of the particular period of interest (first year, second year, third year, or fourth year of licensure). For some drivers, however, it was necessary to assign an early termination date. These were drivers who, for the reasons cited below, did not hold a valid BC driver's license at the end of each targeted year of licensure. For these drivers, crashes and licensed-driver time were censored (i.e., counted to the early termination date rather than to the end of the full study period). The first of the following events was used to establish an early termination date.

- A license surrender date – a driver could have surrendered a licence for a number of reasons. Commonly, drivers surrender their license when they move to another jurisdiction. Due to the possibility of exposure to a different licensing system, surrender dates that preceded the study end date were used as early termination dates.
- A date of death – unfortunately some drivers died during the evaluation periods and consequently their study end date was amended to reflect their date of death.
- A licensing transition date – some drivers started their licensing process in one system but later transitioned into another (e.g., a Pre-GLP driver who subsequently obtained a GLP licence, a GLP driver who subsequently obtained a GLPe licence, or a Pre-GLP or GLP driver who subsequently obtained a commercial class licence). For these drivers their transition date was used as an early

termination date in order to ensure that calculated crash rates were relevant to the particular licensing program of interest.

- A license cancellation or expiration date – if the licence remained cancelled or expired and a new or renewal licence had not been issued by the end of the period of interest the termination date was amended to reflect the last day of valid licensure. With respect to expired licences, only those that were not renewed within 30 days of the expiration date were considered to be ‘expired’ for present purposes.

One further adjustment was made to the rate denominators for Pre-GLP drivers who never advanced beyond their first Learner licence. Prior to GLP, the validity term for a Learner licence was six months. At the end of that time the driver had to renew his or her licence or it would expire. When GLP was introduced the validity term was increased to one year in order to give GLP drivers time to take their first road test before having to renew their Learner licence. There were, however, drivers in both licensing programs that did not advance beyond their first licence. As a result of the change in validity term, GLP drivers in this group were credited with one year of driver-time while Pre-GLP drivers were only credited for six months. It is unlikely, however, that the drivers in the GLP group who let their first Learner licence expire at the end of its first validity term were that much different from their counterparts in the Pre-GLP system in terms of their actual driving exposure. The majority of rate calculations and comparisons used in this evaluation were based on the drivers who did advance beyond the Learner stage and, therefore, these rates were not influenced by the change in validity term. However, for the few New driver rate calculations that included these drivers, the amount of driver-time credited to them was adjusted so that both the GLP and Pre-GLP drivers in this group were credited with one licensed driver-year.

3.4 Statistical Analysis

Crashes were analyzed in a series of steps. Basic summary statistics were computed (e.g., medians, counts, percentages, and rates) to describe driver and crash characteristics and relationships between these characteristics and study group membership were assessed using Chi-square tests of association. To compare crash involvement rates between the study groups, and to test for statistical significance, relative risks (e.g., the crash rate for GLP drivers divided by the crash rate for Pre-GLP drivers) were estimated and compared using Poisson regression (Kleinbaum, Kupper, and Muller, 1998) analysis. Poisson regression analysis is appropriate for data involving counts (e.g., number of crashes) and can take into account the varying lengths of follow-up time that each individual contributes to the rate denominator (i.e., licensed driver-years). Poisson regression also permits the inclusion of more than one predictor variable in the analysis model enabling adjustment for potential covariates or confounders such as age, gender, and amount of Learner time.

In analyses involving potential covariates or confounders, adjusted rates and relative risks were computed from the results of the Poisson regression models. The mean values of each of the independent variables included in the final models were used to calculate the adjusted rates. Likelihood ratio-based 95% Confidence intervals were computed for the relative risks, and approximate 95% Confidence intervals were computed for both the crude and adjusted rates (Public Health Network, 2003). When necessary, Likelihood Ratio Chi Square statistics were used to test for the statistical significance of linear contrasts. These contrasts were used to test for differences between pairs of groups when more than two groups were included in the regression model. All of the analyses were conducted using SAS Version 8 (1999) statistical software.

Determination of statistical significance was based on the following criteria: $P < 0.0001$ = statistically significant; $P > 0.0001$ and $P < 0.005$ = moderately significant; $P > 0.005$ and $P < 0.05$ = marginally significant; $P > 0.05$ = not significant. These criteria are fairly stringent but were selected due to the number of analyses conducted (which increases the probability of spurious findings) and the use of large sample sizes (which increases the likelihood of detecting very small differences that may be of little practical significance).

3.5 Data Sources

Five automated data systems from the Insurance Corporation of British Columbia (ICBC) were used to construct the study databases used in the evaluation. The Driver Licensing System (DLS) was used: to identify drivers for inclusion in the study, in specifying the variables to use in describing the characteristics of the New driver cohorts, and to identify driving prohibitions and suspensions. The Driver Training School System (DTSS) was used to identify drivers who submitted a Declaration of Completion (DOC). The Traffic Accident System (TAS) and the ICBC Business Information Warehouse Claims (BIWC) were used to identify crashes in which the New drivers had been involved, as well as the benefits paid out for their crash claims. The crash data identified from these two sources were each analyzed separately.

Driver Licensing System (DLS)

The Driver Licensing System is a relational database that stores information on every driver licensed in the province of British Columbia. It includes information on licences issued, the status of drivers' licences (e.g., normal, suspended, on hold, etc.), as well as information on any tests taken, the types of licences issued, and the nature and time-lines of any driving prohibitions or licence suspensions. The driver-related variables extracted from the DLS for use in the present study included the following driver information: birth date, gender, licence number, date of obtaining a first Learner licence, and the date of passing a first road test. Additional extracted information included, in the case of the Pre-GLP group or an Novice driver, for the GLP cohort, the date of becoming Full Privilege driver. Driving prohibition or suspension data extracted included: suspension cause, start date, and reinstatement date.

Driver Training School System (DTSS)

This system includes driving school data and DOC data. DOC's are submitted by drivers who successfully complete an ICBC-approved driver education course. The name of the driving school and the date of DOC submission are included in the system.

Business Information Warehouse - Traffic Accident System (TAS)

TAS contains police-reported crash data. Motor vehicle collisions are reportable in British Columbia if they result in: personal injury or death, or aggregate property damage in excess of \$1,000 (\$600 in the case of a motorcycle). However, crashes involving property damage only are determined to be reportable based primarily on police estimates of the amount of damage, which may not be accurate. Moreover, in 1996, many police agencies changed their standards or practices for collision reporting. This has resulted in fewer reported collisions, particularly those involving only property damage or minor injuries. Consequently, the number of New driver collisions reported from TAS will likely underestimate the actual number of crashes experienced by drivers. TAS is however, the primary data source for information concerning fatal crashes.

Business Information Warehouse – Claims (BIWC)

Due to the under-reporting of non-fatal crashes in TAS, claims crash incident data was extracted from the BIWC. This data provided a primary source for identifying New driver crashes, particularly those not involving a fatality. These incidents have been compiled from insurance claims reports. Consequently, although more crashes, specifically more minor crashes, are reported as a claim than those reported by police, the self-reported data might not be as reliable. The claimant might not accurately remember all the details of the crash or, the claimant may even alter details somewhat in order to present their case in a more favourable

light. In addition, some details of the crash reported in TAS (such as the number and age of passengers in the vehicle and if alcohol was involved) are not captured in the claims reports.

Unfortunately, although more crashes are reported in BIWC than in TAS, it still does not provide a complete census of crashes. Individuals involved in crashes may elect not to report a claim, in order to avoid an increase in insurance premiums or other potential repercussions. Consequently, and because more detailed information is available from TAS, both data sources were used in analysis of the crashes. This provides a more complete picture of the total crash experience of New drivers than would be possible if utilizing only one source.

The BIWC data were used to identify which drivers were determined to be responsible for their crashes. In multiple vehicle crashes, 100% responsibility is assigned: when it is clear that one of the drivers failed to comply with a section of the Motor Vehicle Act, and there is no evidence that there was contributory negligence by the other driver(s). In cases where there is evidence that more than one driver was negligent, the division of responsibility may be determined by reference to case law for similar fact crashes. In single vehicle crashes, responsibility is almost always assigned to the driver. For the purposes of the present study, drivers assigned 50% or more responsibility for a crash were categorized as “liable”.

All of the crash data (BIWC and TAS) used in the evaluation were extracted from the Business Information Warehouse on October 11, 2005. This extraction date provided a minimum lag-time of three months for the reporting of crashes. Although the vast majority of crashes are reported within the first few months of their occurrence, some are not. Consequently, crash counts obtained for time periods that included 2003 through 2005 may not be complete.

4. Study 1 - GLP Impact on New Driver Crash Rates

The study described in this section was designed to address the following evaluation objectives:

- 1 Estimate the magnitude and consistency of the GLP effect on the short-term (one- and two-year) and longer-term (three- and four-year) crash involvement rates of GLP New drivers.
- 2 Determine whether the full implementation of the program (Release 2.2 at the end of the year 2000, see Figure 1) had an incremental effect on the GLP New driver crash rate.
- 3 Assess the impact and relative contributions of the GLP Learner and Novice effects to the overall short- and longer-term New driver crash rates,
- 4 Evaluate the overall impact of the GLP Learner stage components, including the enhanced knowledge and Class 7 (or 8) road tests, on Learner crash involvement rates and explore whether performance on these tests may be related to Learner driver crash involvement.
- 5 Explore relationships between completion of an ICBC-approved driver education course, Learner driver crash involvement rates, and performance on the Class 7 road test.

4.1 Methods

4.1.1 Design

A quasi-experimental prospective study design was used to evaluate the effectiveness of GLP in reducing New driver crash rates. A quasi-experimental design attempts to test and estimate the effect of a program, or other intervention, when the investigator does not have complete control over all factors that may threaten the validity of the study. Instead, the investigator attempts to control, either by the design of the study or through statistical adjustment, as many potentially confounding factors as possible.

Due to the province-wide implementation of GLP, it was not possible to conduct the study using a true experimental design (in which the treatment is applied to a randomly selected group of New drivers and withheld from a concurrent group of randomly selected New drivers). Instead, all New drivers exposed to GLP were included in the treatment groups and all New drivers who entered the BC licensing system prior to GLP were included in the non-treatment group. Although historical comparison groups are useful in controlling for some potentially confounding variables, they do not provide any control for factors such as changes in road safety initiatives (unrelated to GLP), enforcement, or other social or economic factors that, in addition to GLP, could be influencing crash rates over the time period studied. Therefore, to take into account the potentially confounding effects of such non-GLP factors, the crash rates of experienced driver groups (who were not exposed to GLP) were computed and compared for the same time periods before and after the implementation of GLP.

4.1.2 Sample Selection Criteria

The drivers initially selected for inclusion in the evaluation were BC residents who had obtained their very first Learner licence between January 1, 1996 and December 31, 2002 (Table 1). Individuals who held an out-of-province licence prior to obtaining their first Learner licence in BC were excluded.

From this group six study cohorts were formed: two Pre-GLP groups (with intake periods in 1996 and 1997) and four GLP groups (with intake periods in 1999, 2000, 2001, and 2002). All of these cohorts were selected using a January to December intake period to ensure comparability and to avoid the potentially confounding effects of seasonal variations in crash rates. Drivers who entered the licensing system in 1998 were excluded

due to the implementation of GLP part way through the year. Drivers were aggregated into three groups according to the specific program components to which they were exposed (Pre-GLP 1996 and 1997, Early GLP 1999 and 2000, Full-GLP 2001 and 2002).

The specific inclusion and exclusion criteria used to identify the sample cohorts are given below:

New GLP Drivers All BC drivers who obtained their first Learner licence between January 1, 1999 and December 31, 2002 (See Table 1)

From this group the following drivers were excluded:

- Drivers who were identified as having held an out-of-province licence at any point after their entry into GLP;
- Drivers who did not meet the minimum time requirements for completion of the GLP Learner and / or Novice stages;

New Pre-GLP Drivers All BC drivers who obtained their first Learner licence between January 1, 1996 and December 31, 1997 (See Table 1).

From this group the following drivers were excluded:

- Drivers who were identified as having held an out-of-province licence either at any time after their entry into the BC licensing system;
- Any driver who did not meet the minimum time requirement for completion of the Pre-GLP Learner stage;
- Any driver who received a commercial vehicle licence (class 1 to 4) as their first licence;

In addition to the GLP and Pre-GLP samples included in the study, time-matched groups of experienced drivers were selected. The experienced driver groups were used to assess general trends in crash rates during the periods of time used in the evaluation of GLP drivers. The criteria used in the selection of the experienced drivers were:

Experienced Drivers All BC drivers who were between 25 and 54 years of age on their birth date in each of the Pre-GLP and GLP intake years (1996, 1997, 1999 through 2002) and who, by that birth date, had accumulated at least 4 years (1440 days) of licensure (on a Class 5 or 6 licence).

Drivers with out-of-province driving experience and drivers who obtained a commercial vehicle licence (Class 1 to 4) during the years of interest were excluded from the experienced driver groups.

4.2 Results

4.2.1 New Driver Characteristics

A total of 352,802 drivers from the six annual cohorts were included in the evaluation of the short- and longer-term effects of GLP on New driver crash rates. Of these, 138,098 (39.1%) entered the licensing process prior to GLP (the Pre-GLP group), 107,397 (30.4%) entered during the early years (1999-2000) of GLP (the Early GLP group), and 107,307 (30.4%) entered the program in 2001 and 2002, after Release 2.2 (the Full GLP group). The age and gender distributions for each of the New driver cohorts are described below.

Table 2: Age Distribution at First Learner Licence by Licensing Year and Program

Age (in years)	Pre-GLP						Early GLP						Full GLP					
	1996		1997		1996-1997		1999		2000		1999-2000		2001		2002		2001-2002	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
16	28,515	47.4	38,530	49.5	67,045	48.5	34,823	66.7	35,204	63.8	70,027	65.2	32,745	64.5	34,160	60.5	66,905	62.3
17	5,001	8.3	7,364	9.5	12,365	9.0	4,057	7.8	5,780	10.5	9,837	9.2	4,847	9.5	6,480	11.5	11,327	10.6
18	3,022	5.0	4,205	5.4	7,227	5.2	2,094	4.0	2,629	4.8	4,723	4.4	2,750	5.4	3,589	6.4	6,339	5.9
19-21	5,025	8.4	5,942	7.6	10,967	7.9	3,356	6.4	3,584	6.5	6,940	6.5	3,346	6.6	4,701	8.3	8,047	7.5
22-24	3,040	5.1	3,410	4.4	6,450	4.7	1,626	3.1	1,647	3.0	3,273	3.0	1,617	3.2	1,818	3.2	3,435	3.2
>= 25	15,571	25.9	18,473	23.7	34,044	24.7	6,248	12.0	6,349	11.5	12,597	11.7	5,503	10.8	5,751	10.2	11,254	10.5
Total	60,174	100.0	77,924	100.0	138,098	100.0	52,204	100.0	55,193	100.0	107,397	100.0	50,808	100.0	56,499	100.0	107,307	100.0

Age by Year: Chi-Square = 14,900.1; df = 25; P<0.0001 Age by Program: Chi Square= 14,036.2; df = 10; P<0.0001

Table 3: Gender Distribution at First Learner Licence by Licensing Year and Program

Gender	Pre-GLP						Early GLP						Full GLP					
	1996		1997		1996-1997		1999		2000		1999-2000		2001		2002		2001-2002	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Male	28,760	48.8	36,919	47.4	65,679	47.6	25,613	49.1	26,825	48.6	52,438	48.8	25,365	49.9	27,376	48.5	52,741	49.2
Female	31,410	52.2	41,001	52.6	72,411	52.4	26,586	50.9	28,366	51.4	54,952	51.2	25,439	50.1	29,121	51.5	54,560	50.8
N/A*	4	0.0	4	0.0	8	0.0	5	0.0	2	0.0	7	0.0	4	0.0	2	0.0	6	0.0
Total	60,174	100.0	77,924	100.0	138,098	100.0	52,204	100.0	55,193	100.0	107,397	100.0	50,808	100.0	56,499	100.0	107,307	100.0

* N/A = Not available. Gender by Year Chi-Square = 98.8; df = 5; P<0.0001 Gender by Program Chi Square = 70.9; df=2; P<0.0001 (missing cases excluded from both analyses)

Age and Gender at First Learner's Licence. With the implementation of GLP, there was a shift in the age distribution of the New driver groups (Table 2). A higher percentage of New drivers entered GLP at 16 and 17 years of age than prior to GLP (about 73% versus 60%), and a lower percentage of GLP (11%) than Pre-GLP (25%) drivers were over 24 years when they obtained their first Learner's licence ($P < 0.0001$). As noted previously, in 1997 and the early part of 1998, a number of age-eligible New drivers chose to obtain their first Learner's licence prior to the introduction of GLP. The program's implementation dates had been advertised in advance. Therefore, age-eligible drivers were able to avoid GLP's more restrictive conditions by obtaining their permit before implementation began. This action likely explains some of the shift in the distribution, particularly in the early program years (1999-2000). Many of the older drivers who might otherwise have been in GLP had become Pre-GLP Learners. It is also possible, however, that GLP prompted more people to enter the licensing process at a younger age. The lengthy time requirement for completing GLP may be an important factor contributing to this trend, and finding that the percentage of young New drivers has remained high in 2001 and 2002 suggests that, although there may have been some transitional impact of program implementation on the pool of age-eligible drivers in the early years, younger licensure has become a fairly stable, albeit unintended, consequence of GLP. It will be interesting to see if this trend continues after the introduction (in 2003) of the even longer GLPe Learner stage.

In contrast to the findings with respect to age, no major differences were found between the cohorts with respect to gender. Approximately 51% of the New drivers in all of the study groups were female (Table 3).

Stages of Licensure. Table 4 shows the frequency and timing with which drivers in each of the cohorts progressed through the first stage of their licensing process – from a Learner licence to their first solo licence. As expected, given the longer learner stage of GLP drivers, a much higher percentage of the Pre-GLP (about 78%) than GLP (about 66%) drivers obtained their first solo licence within one year after obtaining their Learner's licence. The percentage remained higher, although less dramatically so, through the second year of licensure. By the end of the second year, approximately 86% of the Pre-GLP drivers and 80% of the GLP drivers had graduated out of the Learner stage. By the end of their third year, the percentages of Pre-GLP and GLP drivers who had advanced to a solo licence had become even more similar, although the percentage of Learner-stage graduates still remained slightly elevated for the Pre-GLP groups (about 89% and 86%, respectively). One exception occurred with the GLP 2002 cohort; only 82% of this group had graduated to their Novice licence by the end of their third year of licensure. However, less than half of this cohort had completed a full 3 years of licensure and none had completed four years when the count was taken. Consequently, the tabled percentages for these drivers are likely to increase when more follow-up data has been obtained. Nonetheless, it is clear that most New drivers – whether GLP or Pre-GLP – obtain their first solo licence within three years after obtaining their first Learner licence. Of the 10-15% of drivers who had not progressed by the end of their fourth year, most had allowed their Learner licence to expire without renewal (Table 5) while another substantial group still held a Learner licence. Detailed examination of the records of these drivers revealed that most of these drivers had long periods of time where their Learner licence was expired, and then renewed at a later date. Due to the time lag involved, the renewal of these Learner licences resulted in the drivers transitioning into a different licensing process. This affected all of the Pre-GLP drivers who still held a Learner licence after four years and some (1,143) of the GLP drivers.

Table 4: Timing of Advancement to a First Solo Licence for Pre-GLP and GLP Learner Drivers

First Solo (Novice) Licence Obtained During:	Pre-GLP				Early GLP				Full GLP			
	1996		1997		1999		2000		2001		2002	
	N	%	N	%	N	%	N	%	N	%	N	%
1 st Year After Learner's	45,985	76.4	62,867	80.7	36,068	69.1	33,356	62.7	33,735	66.4	36,449	64.5
2 nd Year After Learner's	5,605	9.3	4,938	6.3	6,027	11.6	9,443	17.8	7,573	14.9	8,096	14.3
3 rd Year After Learner's	1,680	2.8	1,410	1.8	2,393	4.6	3,007	5.5	2,319	4.6	2,029*	3.6
4 th Year After Learner's	625	1.0	715	0.9	1,169	2.2	1,446	2.6	775*	1.5	114*	0.2
Total by end of 4th Year:	53,895	89.6	69,932	89.7	45,657	87.5	47,252	85.6	44,402*	87.4	46,688*	82.6
No Original (Novice) licence Issued by the End of 4th Year	6,279	10.4	7,992	10.3	6,547	12.5	7,941	14.4	6,406*	12.6	9,811*	17.4
Number of Drivers in Cohort	60,174	100.0	77,924	100.0	52,204	100.0	53,193	100.0	50,808	100.0	56,499	100.0

* These counts are incomplete. Only 27,671 (54.5%) of the 2001 cohort had obtained their first Learner licence soon enough to accumulate four full years of licensure by the evaluation cut-off date (June 30, 2005); only 30,588 (54.1%) of the drivers in the 2002 cohort were able to accumulate three full years, and none had accumulated four full years..

Table 5: Licence Status of Drivers who were Not Issued their First Solo Licence within Four Years after Obtaining their First Learner Licence

Licence Status	Pre-GLP				Early GLP				Full GLP			
	1996		1997		1999		2000		2001		2002	
	N	%	N	%	N	%	N	%	N	%	N	%
Learner Surrendered	49	0.8	38	0.5	169	2.6	206	2.6	172	2.7	172	1.8
Learner Cancelled (Driver Died)	8	0.1	5	0.1	19	0.3	19	0.2	17	0.3	16	0.2
Learner Cancelled with no Reinstatement prior to end of 4th year	0	0.0	5	0.1	179	2.7	242	3.0	90	1.4	0	0.0
Learner Expired with no Renewal prior to end of 4th year	4,911	78.2	5,337	66.8	3,732	57.0	5,309	66.9	2,482	38.7	0	0.0
Learner still held*	1,311	20.9	2,607	32.6	2,448	37.4	2,165	27.3	647	10.1	0	0.0
Follow-up Incomplete – 4-year status not yet known	0	0	0	0	0	0	0	0	2,998	46.8	9,623	98.0
Total count of drivers who had not obtained a Novice Licence within 4 Years After Learner	6,279	100.0	7,992	100.0	6,547	100.0	7,941	100.0	6,406	100.0	9,811	100.0

*All of the Pre-GLP drivers who still held a Learner licence after four years had transitioned into GLP and 1,145 of the GLP drivers (3 from 1999, 498 from 2000, and 644 from 2001) had transitioned into GLPe.

To exit the Novice stage and obtain a Full Privilege licence, GLP drivers had to remain in the Novice stage for a minimum of 18 months and then pass an advanced road test. Only 62,034 (28.9%) of the 214,704 GLP New drivers graduated to a Full Privilege licence within four years after obtaining their first Learner licence. Interestingly, the data shown in Table 6 suggest that drivers in the 2001 and 2002 GLP cohorts were starting to graduate out of the program sooner than those in the 1999 and 2000 cohorts. This may be a response to the implementation of GLPe in 2003. It should be noted, however, that only about half of the 2001 cohort had completed their fourth year of licensure and only about half of the 2002 cohort had completed their third year of licensure at the time of the study, and none of the 2002 cohort had completed a full four years. Thus, the percentages computed for these drivers may change as more follow-up data becomes available. Any conclusions concerning the potential impact of GLPe on the progression decisions of GLP drivers must, therefore, be considered preliminary.

Table 6: Timing of Advancement to a Full Privilege licence for GLP Drivers

First Full Privilege Licence Obtained During:	Early GLP				Full GLP			
	1999		2000		2001		2002	
	N	%	N	%	N	%	N	%
1 st Year After Learner's	-	-	-	-	-	-	-	-
2 nd Year After Learner's	773	1.5	1,077	2.0	1,744	3.4	2,402	4.3
3 rd Year After Learner's	7,715	14.8	9,135	17.2	11,284	22.2	4,759*	8.4
4 th Year After Learner's	5,903	11.3	7,567	14.2	4,648*	9.1	5,027*	8.9
Total by end of 4th Year:	14,391	27.6	17,779	33.4	17,676*	34.8	12,188*	21.6
No Full Privilege licence Issued by the End of 4th Year	37,813	72.4	35,414	66.6	33,132*	65.2	44,311*	78.4
Number of Drivers in Cohort	52,204	100.0	53,193	100.0	50,808	100.0	56,499	100.0

* These counts are incomplete. Only 27,671 (54.5%) of the 2001 cohort had obtained their first Learner licence soon enough to accumulate four full years of licensure by the evaluation cut-off date (June 30, 2005); only 30,588 (54.1%) of the drivers in the 2002 cohort were able to accumulate three full years, and none had accumulated four.

Table 7 shows the average amount and percentage of time spent by GLP and Pre-GLP drivers in each of their licence stages and within each total period of licensure. Only those drivers who entered the study early enough to accumulate each period of licensure were included in the data summarized in Table 7. As expected, the amount of time spent in the Learner stage by GLP drivers was considerably longer than the time spent in that stage by Pre-GLP drivers. During their first year of licensure, GLP drivers spent approximately 72% of their time in the Learner stage compared to only 47% for Pre-GLP drivers; and, although the percentage of Learner-time decreased for all groups as the total period of licensure increased, the percentage of Learner-time remained higher for the GLP groups throughout.

Of the drivers who were able to accumulate three or four full years of licensure by the study cut-off date, those in the GLP 2001 and 2002 cohorts spent a higher percentage of their total licensed driver-time in the Full Privilege stage than those in the GLP 1999 or 2000 cohorts. This is consistent with the earlier finding (Table 6) that the 2001 and 2002 drivers appeared to be graduating out of GLP sooner than the earlier GLP groups.

Table 7: The First Four Years of Licensure: Time Spent in Each Licence Stage by New Driver Cohorts

New Driver Cohort		Years of Licensure (from first Learner):			
		One Year	Two Years	Three Years	Four Years
Pre-GLP 1996 (N=60,174)	Median Learner Months	4.4	4.4	4.4	4.4
	Median Novice Months	7.6	19.4	31.6	42.5
	Learner Licensed-Years (% of Total)*	27,687.5 (47.2)	28,287.4 (26.4)	28,580.5 (18.4)	28,583.7 (14.1)
	Full Privilege Licensed-Years (% of Total) *	30,942.4 (52.8)	78,931.6 (73.6)	126,784.1 (81.6)	173,558.0 (85.9)
	Total Licensed-Years*	58,629.9	107,219.0	155,364.6	202,141.7
Pre-GLP 1997 (N=77,924)	Median Learner Months	4.5	4.5	4.5	4.5
	Median Novice Months	7.5	19.3	31.5	42.5
	Learner Licensed-Years (% of Total) *	35,464.0 (46.6)	35,975.1 (25.8)	35,979.1 (18.1)	35,980.2 (14.0)
	Full Privilege Licensed-Years (% of Total) *	40,649.4 (53.4)	103,494.9 (74.2)	162,660.2 (81.9)	220,390.6 (86.0)
	Total Licensed-Years*	76,113.4	139,470.0	198,639.3	256,370.8
GLP 1999 (N=52,204)	Median Learner Months	8.0	8.0	8.0	8.0
	Median Novice Months	4.0	15.5	25.9	31.8
	Median Full Privilege Months	not applicable	0.0	0.0	0.0
	Learner Licensed-Years (% of Total)	36,496.2 (70.3)	43,489.3 (44.5)	47,705.2 (33.4)	50,470.5 (26.9)
	Novice Licensed-Years (% of Total)	15,418.8 (29.7)	54,238.7 (55.4)	90,650.7 (63.4)	121,173.1 (64.6)
	Full Privilege-Licensed-Years (% of Total)	not applicable	88.6 (0.1)	4,683.5 (3.3)	15,837.9 (8.5)
	Total Licensed-Years	51,915.0	97,816.6	143,039.4	187,481.5
GLP 2000 (N=55,193)	Median Learner Months	9.3	9.3	9.4	9.3
	Median Novice Months	2.5	14.1	23.9	28.0
	Median Full Privilege Months	not applicable	0.0	0.0	0.0
	Learner Licensed-Years (% of Total)	40,714.2 (74.2)	50,671.8 (49.2)	56,004.3 (37.1)	58,911.6 (30.0)
	Novice Licensed-Years (% of Total)	14,185.7 (25.8)	52,323.6 (50.7)	89,061.6 (59.1)	117,700.7 (60.0)
	Full Privilege-Licensed-Years (% of Total)	not applicable	135.9 (0.1)	5,726.9 (3.8)	19,537.2 (10.0)
	Total Licensed-Years*	54,899.9	103,131.2	150,792.8	196,149.5
GLP 2001 Year1–Year3: (N=50,808) Year 4: (N=27,671)**	Median Learner Months	8.4	8.4	8.5	8.4
	Median Novice Months	3.5	15.1	23.9	26.5
	Median Full Privilege Months	not applicable	0.0	0.0	0.0
	Learner Licensed-Years (% of Total)	35,974.8 (71.2)	43,602.0 (45.5)	46,852.1 (33.8)	25,797.6 (26.6)
	Novice Licensed-Years (% of Total)	14,579.9 (28.8)	51,959.3 (54.3)	83,6834.0 (60.4)	58,313.2 (60.0)
	Full Privilege-Licensed-Years (% of Total)	not applicable	213.2 (0.2)	7,998.3 (5.8)	13,061.7 (13.4)
	Total Licensed-Years*	50,554.7	95,774.6	138,534.4	97,172.5
GLP 2002 Year1–Year2: (N=56,499) Year 3: (N=30,588)** Year 4: (N=0)**	Median Learner Months	8.7	8.6	8.6	Not available
	Median Novice Months	3.2	14.7	23.4	
	Median Full Privilege Months	not applicable	0.0	0.0	
	Learner Licensed-Years (% of Total)	40,453.7 (72.1)	47,313.2 (47.2)	26,862.9 (34.5)	
	Novice Licensed-Years (% of Total)	15,676.7 (27.9)	52,652.9 (52.5)	46,087.4 (59.2)	
	Full Privilege-Licensed-Years (% of Total)	not applicable	318.0 (0.30.3)	4,964.4 (6.4)	
	Total Licensed-Years	56,130.4	100,284.1	77,914.7	

*Based on licensed driver-years and adjusted for the shorter validity period for Pre-GLP drivers (where applicable).

**Includes only those drivers who completed the full period of licensure.

4.2.2 Characteristics of the Crash involvements of New Drivers During their First Four Years of Licensure

Approximately 25% of the GLP New driver cohorts were involved in at least one crash (based on claims data) during the first 2 years after obtaining their Learner's licence, and about 44% were involved in at least one crash during their first four years of licensure. This compares to about 28% and 44% of the Pre-GLP cohorts, respectively. Although the percentage was lower for GLP drivers ($P < 0.0001$) during their first two years, the magnitude of the difference was small and disappeared by the end of four years of licensure. GLP drivers were also found, however, to have a significantly lower number of crashes per driver than the Pre-GLP comparison group, through all years of licensure ($P < 0.0001$ in all cases). For example, during their first two years of licensure, GLP drivers reported 0.33 (SE = ± 0.0014) crash involvements per driver while Pre-GLP drivers reported 0.38 crashes (SE = ± 0.002). After four years of licensure GLP drivers were found to have had 0.71 (SE = ± 0.003) crashes while Pre-GLP drivers reported 0.76 (SE = ± 0.003). It should be noted that, while these findings may be suggestive of a GLP effect, they do not take into account any differences between the driver groups with respect to factors such as their exposure to risk (in terms of licensed driver-time), their age or gender distributions. Until the potentially confounding influence of such factors are examined and controlled, it is not possible to draw conclusions about the effectiveness of GLP. These data are reported here for descriptive purposes only.

Liability and severity. Tables 8 and 9 show the distribution of New driver crash involvements by length of licensure, crash type and the stage of licensure during which the crashes occurred. Although GLP was designed to reduce all New driver crash involvements, within that group there are several sub-categories of crashes which are of particular interest. For instance, 'at-fault' or 'liable' crashes – those for which the driver is deemed to be at least 50% responsible – are of interest because they reflect the impact of GLP on behaviours that lead New drivers to cause a crash. In contrast, non-labile crashes are more likely a consequence of driving exposure; New drivers who are on the road more, or under more difficult circumstances, are more likely to be involved in a crash caused by someone else than are drivers who drive less or under less difficult circumstances. Thus, while a change in the incidence of all New driver crashes is an important indicator of the overall impact of GLP (because the program is intended to impact both risk exposure and behaviour), it is also informative to separate out the program's effect on New driver 'liable' crashes. Similarly, to determine whether GLP had an impact on crash severity, casualty crashes (those involving at least one injury or fatality) were examined separately from crashes involving material (property) damage only. Although shown separately in Table 9, fatal crashes were not examined separately from casualty crashes due to the small number of these events in the study cohorts.

As shown in Tables 8 and 9, the percentages of liable and casualty crash involvements were relatively stable across all three driver cohorts and in each of the follow-up periods, particularly for Learner crashes. However, there were some patterns detected in the differences. A slightly higher percentage of the GLP than Pre-GLP driver crash involvements were deemed liable. For Learner crash involvements, the percentage of casualty crashes was lowest for the Full GLP group and differed little between the Early GLP and Pre-GLP groups. For Novice crash involvements, the percentage of casualty crashes was significantly lower ($P < 0.0001$) for both GLP groups compared to the Pre-GLP group.

Although the magnitudes of the differences were small, the higher percentage of liable crash involvements found for GLP Novice drivers may reflect a change in the claims adjusting process or it could reflect an actual increase in the percentage of New drivers who cause crashes. It is not possible to tell from the available data what might have prompted the shift in liability. In contrast, the reduction in the percentage of casualty crash involvements for GLP drivers is not likely to have been due to any procedural changes. The same process for identifying casualty crashes was applied to all of the crashes.

Whether the small percentage differences discussed above represent meaningful changes in the frequency of New driver crash involvements will be discussed in a later section. The differences observed here will be revisited in the section of the report that describes the analysis of crash involvement rates. Rates permit adjustment for factors not taken into account when comparing differences in percentages (for example, differences between the groups in age, gender and licensed driver-time).

Table 8: Number (%) of New Driver Crash Involvements by the Licence Stage of the New Drivers Involved in the Crash, their Years of Licensure at the Time of the Crash, and their Assigned Liability* for the Crash

Study Period	Licence Stage	Liability	Pre-GLP		Early GLP		Full GLP	
			1996	1997	1999	2000	2001	2002
First Year of Licensure	Learner	Liable	641 (67.0)	844 (65.0)	795 (67.2)	894 (69.3)	789 (67.5)	845 (69.2)
		Non-Liable	316 (33.0)	451 (35.8)	385 (33.5)	390 (30.2)	383 (32.3)	356 (29.2)
		Liability not Assigned	0 (0.0)	2 (0.2)	4 (0.3)	7 (0.5)	14 (1.2)	20 (1.6)
		Total	957 (100)	1297 (100)	1,184 (100)	1,291 (100)	1,186 (100)	1,221 (100)
	Novice	Liable	6,468 (66.0)	7,967 (66.7)	4,047 (68.7)	3,876 (68.7)	3,966 (69.4)	4,092 (69.5)
		Non-Liable	3,372 (34.0)	3,960 (33.2)	1,830 (31.0)	1,741 (30.9)	1,686 (29.5)	1,672 (28.4)
		Liability not Assigned	1 (0.0)	10 (0.1)	16 (0.3)	25 (0.4)	63 (1.1)	122 (2.1)
		Total	9,796 (100)	11,937 (100)	5,893 (100)	5,642 (100)	5,715 (100)	5,886 (100)
First 2 Years of Licensure	Learner	Liable	722 (66.7)	876 (65.3)	900 (66.5)	1,114 (68.9)	927 (66.3)	948 (68.3)
		Non-Liable	360 (33.3)	464 (34.6)	450 (33.2)	493 (30.5)	453 (32.4)	418 (30.0)
		Liability not Assigned	0 (0.0)	2 (0.1)	4 (0.3)	10 (0.6)	19 (1.4)	23 (1.7)
		Total	1,082 (100)	1,342 (100)	1,354 (100)	1,617 (100)	1,399 (100)	1,389 (100)
	Novice	Liable	13,827 (61.1)	17,043 (61.9)	10,569 (63.5)	10,897 (63.2)	10,482 (64.7)	10,290 (64.9)
		Non-Liable	8,767 (38.8)	10,465 (38.0)	6,022 (36.1)	6,231 (36.1)	5,495 (33.9)	5,148 (32.5)
		Liability not Assigned	13 (0.1)	34 (0.1)	61 (0.4)	124 (0.7)	230 (1.4)	408 (2.6)
		Total	22,607 (100)	27,542 (100)	16,653 (100)	17,252 (100)	16,207 (100)	15,846 (100)
First 3 Years of Licensure	Learner	Liable	736 (66.7)	876 (65.3)	983 (66.2)	1,206 (68.6)	978 (66.5)	537 (66.4)
		Non-Liable	367 (33.3)	464 (34.6)	495 (33.3)	539 (30.7)	474 (32.2)	260 (32.1)
		Liability not Assigned	0 (0.0)	2 (0.1)	8 (0.5)	12 (0.7)	19 (1.3)	12 (1.5)
		Total	1,103 (100)	1,342 (100)	1,486 (100)	1,757 (100)	1,471 (100)	809 (100)
	Novice	Liable	20,535 (58.3)	24,921 (58.9)	16,624 (60.7)	16,957 (61.1)	15,829 (62.1)	8,543 (62.2)
		Non-Liable	14,647 (41.6)	17,361 (41.0)	10,633 (38.8)	10,486 (37.8)	9,190 (36.0)	4,770 (34.7)
		Liability not Assigned	28 (0.1)	64 (0.1)	148 (0.5)	291 (1.1)	492 (1.9)	427 (3.1)
		Total	35,210 (100)	42,346 (100)	27,405 (100)	27,734 (100)	25,511 (100)	13,740 (100)
First 4 Years of Licensure	Learner	Liable	736 (66.7)	876 (65.3)	1,027 (66.3)	1,256 (68.5)	571 (65.3)	-
		Non-Liable	367 (33.3)	464 (34.6)	513 (33.1)	566 (30.8)	296 (33.9)	-
		Liability not Assigned	0 (0.0)	2 (0.1)	10 (0.6)	13 (0.7)	7 (.8)	-
		Total	1,103 (100)	1,342 (100)	1,550 (100)	1,835 (100)	874 (100)	-
	Novice	Liable	26,299 (56.2)	31,870 (56.7)	21,613 (58.7)	22,091 (59.3)	11,299 (60.3)	-
		Non-Liable	20,480 (43.7)	24,231 (43.1)	14,944 (40.5)	14,568 (39.1)	6,957 (37.1)	-
		Liability not Assigned	48 (0.1)	123 (0.2)	294 (0.8)	580 (1.6)	495 (2.6)	-
		Total	46,827 (100)	56,224 (100)	36,851 (100)	37,239 (100)	18,751 (100)	-

*Liability is assigned to a driver who is found (by a claims adjuster) to be at least 50% responsible for the crash

Table 9: Number (%) of New Driver Crash Involvements by the Licence Stage of the Drivers involved in the Crash, their Years of Licensure at the Time of the Crash, and the Severity of the Crash

Study Period	Licence Stage	Severity	Pre-GLP		Early GLP		Full GLP	
			1996	1997	1999	2000	2001	2002
First Year of Licensure	Learner	Fatal	1 (0.1)	2 (0.2)	4 (0.3)	2 (0.2)	3 (0.3)	5 (0.4)
		Injury	288 (30.1)	374 (28.8)	363 (30.7)	380 (29.4)	322 (27.2)	325 (26.6)
		Material Damage Only	668 (69.8)	921 (71.0)	817 (69.0)	909 (70.4)	861 (72.6)	891 (73.0)
		Total	957 (100)	1,297 (100)	1,184 (100)	1,291 (100)	1,186 (100)	1,221 (100)
	Novice	Fatal	13 (0.1)	18 (0.2)	8 (0.1)	8 (0.1)	11 (0.2)	5 (0.1)
		Injury	2,998 (30.6)	3,654 (30.6)	1,650 (28.0)	1,556 (27.6)	1,541 (27.0)	1,696 (28.8)
Material Damage Only		6,785 (69.3)	8,265 (69.2)	4,235 (71.9)	4,087 (72.3)	4,163 (72.8)	4,185 (71.1)	
Total	9,796 (100)	11,937 (100)	5,893 (100)	5,642 (100)	5,715 (100)	5,886 (100)		
First 2 Years of Licensure	Learner	Fatal	1 (0.1)	2 (0.2)	4 (0.3)	3 (0.2)	6 (0.4)	5 (0.4)
		Injury	334 (30.9)	386 (28.8)	422 (31.2)	488 (30.2)	384 (27.5)	379 (27.3)
		Material Damage Only	747 (69.0)	954 (71.0)	928 (68.5)	1,126 (69.6)	1,009 (72.1)	1,005 (72.3)
		Total	1,082 (100)	1,342 (100)	1,354 (100)	1,617 (100)	1,399 (100)	1,389 (100)
	Novice	Fatal	28 (0.1)	34 (0.1)	24 (0.1)	22 (0.1)	21 (0.1)	20 (0.1)
		Injury	7,000 (31.0)	8,387 (30.5)	4,784 (28.7)	4,801 (27.8)	4,565 (28.2)	4,581 (28.9)
Material Damage Only		15,579 (68.9)	19,121 (69.4)	11,844 (71.1)	12,429 (72.0)	11,621 (71.7)	11,245 (71.0)	
Total	22,607 (100)	27,542 (100)	16,652 (100)	17,252 (100)	16,207 (100)	15,846 (100)		
First 3 Years of Licensure	Learner	Fatal	1 (0.1)	2 (0.1)	4 (0.3)	4 (0.2)	7 (0.5)	3 (0.4)
		Injury	344 (31.2)	386 (28.8)	472 (31.7)	537 (30.6)	400 (27.2)	221 (27.3)
		Material Damage Only	758 (68.7)	954 (71.1)	1,010 (68.0)	1,216 (69.2)	1,064 (72.3)	585 (72.3)
		Total	1,103 (100)	1,342 (100)	1,486 (100)	1,757 (100)	1,471 (100)	809 (100)
	Novice	Fatal	47 (0.1)	52 (0.1)	42 (0.2)	37 (0.1)	36 (0.1)	13 (0.1)
		Injury	10,957 (31.1)	12,811 (30.3)	7,888 (28.8)	7,964 (28.7)	7,273 (28.5)	3,964 (28.9)
Material Damage Only		24,206 (68.8)	29,483 (69.6)	19,475 (71.0)	19,733 (71.2)	18,202 (71.4)	9,763 (71.0)	
Total	35,210 (100)	42,346 (100)	27,405 (100)	27,734 (100)	25,511 (100)	13,740 (100)		
First 4 Years of Licensure	Learner	Fatal	1 (0.1)	2 (0.2)	4 (0.3)	4 (0.2)	4 (0.5)	-
		Injury	344 (31.2)	386 (28.8)	497 (32.1)	563 (30.7)	251 (28.7)	-
		Material Damage Only	758 (68.7)	954 (71.0)	1,049 (67.6)	1,268 (69.1)	619 (70.8)	-
		Total	1,103 (100)	1,342 (100)	1,550 (100)	1,835 (100)	874 (100)	-
	Novice	Fatal	61 (0.1)	70 (0.1)	56 (0.1)	50 (0.1)	26 (0.1)	-
		Injury	14,557 (31.1)	16,719 (29.7)	10,722 (29.1)	10,712 (28.8)	5,377 (28.7)	-
Material Damage Only		32,209 (68.8)	39,435 (70.2)	26,073 (70.8)	26,477 (71.1)	13,348 (71.2)	-	
Total	46,827 (100)	56,224 (100)	36,851 (100)	37,239 (100)	18,751 (100)	-		

Compliance among the crash-involved. With the introduction of GLP several restrictions were placed on Learner drivers. They were prohibited from driving between midnight and 5:00am, and were not permitted to drive with more than 2 passengers in the vehicle (one of whom had to be an adult supervisor). Learner and Novice drivers are also not permitted to drink and drive (zero blood alcohol content). Although self-reported support for and compliance with the rules and conditions of graduated licensing tends to be quite high both in BC (Wiggins, 2004) and in other jurisdictions (Hedlund, et. al., 2003), actual compliance has not been well documented. To explore this issue the relative frequency of certain crash characteristics were examined. Thus, for example, if GLP Learner drivers are 100% compliant with GLP rules then crashes involving drinking and driving, multiple passengers, and that occur between midnight at 5:00am would be non-existent. Similarly, there would be no Novice crashes involving a drinking Novice driver. Although it is not possible to calculate crash rates for each of these conditions (appropriate denominators are not available) the relative frequency of crashes in the Pre-GLP and GLP cohorts may suggest whether there has been an impact on crashes in the expected directions.

As noted in an earlier section of this report, the ICBC Claims (BIWC) data system (which was used to obtain the crash involvement counts provided in Tables 8 and 9) provides limited or no information concerning the occupants of the vehicles involved in crashes, the time when the crash occurred and the likelihood of alcohol impairment on the part of the driver. To obtain this kind of information, it is necessary to examine the characteristics of crashes reported through the Traffic Accident System (TAS). Due to changes in police reporting practices, the number of crashes reported in TAS are much smaller than those reported through the ICBC Claims system. Consequently, TAS data cannot be used for estimating crash involvement rates. However, they do permit calculation of the relative frequency of crashes that occur under the restricted conditions of GLP and, hence, can serve as an indicator of compliance among crash-involved New drivers.

Tables 10 through 12 show the frequency distribution of Learner and Novice driver crash involvements by whether or not alcohol was reported by police as a contributing factor (on the part of the Learner or Novice driver) to the crash, by the time of day when they occurred, and by the number and ages of any passengers in the vehicle at the time, and. The results shown in these tables indicate that, among the drivers who were involved in crashes, there was at least some non-compliance with GLP restrictions and conditions. Although not common amongst New drivers, crashes involving drinking and driving were not eliminated after the introduction of GLP, a fairly consistent percentage of the crash involvements of Learner drivers occurred during the restricted hours of midnight to 5:00 AM, and more than half of the Learner crashes occurred when the driver was in violation of the Learner passenger restrictions.

Although the findings concerning the characteristics of Learner and Novice driver crashes are interesting, they are limited. The data provide no information about GLP drivers who were not involved in crashes, nor do they provide an indication as to the extent of non-compliant behaviour among the crash involved. For that, information about the amount of driving being done under the restricted conditions would be required. Such information was not available for this study. However, in a recent survey of young (16-17 year old) BC Novice drivers and their parents (Mayhew et. al., 2006), about 90% of both groups indicated that, as Learners, the young drivers had never breached the requirement to drive only with a supervising adult in the vehicle. Moreover, no differences in percentage compliance were found between the crash-free and crash-involved groups with respect to this condition. Similarly, no differences were found between the crash-free and crash-involved young drivers with respect to the percentage who reported always displaying their "N" sign. Compliance for both groups was reported to be about 80%. While not a complete assessment of compliance with GLP conditions, these self-report data do suggest that compliance may be reasonably high during the Learner stage. This is assuming, of course, that compliance with all of the Learner stage conditions would be achieved while the supervising driver was in the vehicle. The data also suggest that there may not be major differentials in compliance between Novice drivers who are crash involved and those who are not. However, more research in this area is required.

Table 10: Number (%) of Driver Crash Involvements* by the Licence Stage of the New Drivers involved in the Crash, their Years of Licensure when the Crash occurred, and whether or not Police identified Alcohol as a New Driver Contributing Factor

Study Period	Licence Stage	Alcohol Involvement	Pre-GLP		Early GLP		Full GLP	
			1996	1997	1999	2000	2001	2002
First Year of Licensure	Learner	Yes	11 (3.1)	15 (4.5)	31 (9.1)	33 (9.0)	25 (7.8)	38 (10.2)
		No	339 (96.9)	321 (95.5)	310 (90.9)	332 (91.0)	294 (92.2)	335 (89.8)
		Total	350 (100)	336 (100)	341 (100)	365 (100)	319 (100)	373 (100)
	Novice	Yes	92 (3.4)	103 (3.5)	33 (2.2)	49 (3.3)	34 (2.1)	46 (2.6)
		No	2,647 (96.6)	2,868 (96.5)	1,472 (97.8)	1,434 (96.7)	1,561 (97.9)	1,750 (97.4)
		Total	2,739 (100)	2,971 (100)	1,505 (100)	1,483 (100)	1,595 (100)	1,796 (100)
First 2 Years of Licensure	Learner	Yes	13 (3.4)	16 (4.6)	40 (9.9)	45 (9.6)	27 (7.0)	41 (9.8)
		No	373 (96.6)	330 (95.4)	362 (90.1)	423 (90.4)	358 (93.0)	378 (90.2)
		Total	386 (100)	346 (100)	402 (100)	468 (100)	385 (100)	419 (100)
	Novice	Yes	214 (4.0)	258 (4.2)	130 (3.2)	158 (3.6)	155 (3.6)	153 (3.4)
		No	5,185 (96.0)	5,914 (95.8)	3,934 (96.8)	4,217 (96.4)	4,134 (96.4)	4,380 (96.6)
		Total	5,399 (100)	6,172 (100)	4,064 (100)	4,375 (100)	4,289 (100)	4,533 (100)
First 3 Years of Licensure	Learner	Yes	13 (3.3)	16 (4.6)	43 (9.7)	48 (9.3)	31 (7.7)	26 (11.4)
		No	379 (96.7)	330 (95.4)	401 (90.3)	471 (90.7)	373 (92.7)	203 (88.6)
		Total	392 (100)	346 (100)	444 (100)	519 (100)	404 (100)	229 (100)
	Novice	Yes	346 (4.5)	438 (4.9)	268 (4.2)	329 (4.8)	270 (4.1)	156 (4.2)
		No	7,346 (95.5)	8,472 (95.1)	6,165 (95.8)	6,540 (95.2)	6,270 (95.9)	3,605 (95.8)
		Total	7,692 (100)	8,910 (100)	6,433 (100)	6,869 (100)	6,540 (100)	3,761 (100)
First 4 Years of Licensure	Learner	Yes	13 (3.3)	16 (4.6)	45 (9.7)	53 (9.7)	20 (8.6)	-
		No	379 (96.7)	330 (95.4)	418 (90.3)	494 (90.3)	213 (91.4)	-
		Total	392 (100)	346 (100)	463 (100)	547 (100)	233 (100)	-
	Novice	Yes	513 (5.3)	648 (5.7)	431 (5.1)	507 (5.7)	218 (4.7)	-
		No	9,151 (94.7)	10,669 (94.3)	8,023 (94.9)	8,454 (94.3)	4,377 (95.3)	-
		Total	9,664 (100)	11,317 (100)	8,454 (100)	8,961 (100)	4,595 (100)	-

*Crash counts reported here differ from those in Tables 8 and 9 because they were taken from the Traffic Accident System rather than from ICBC Claims.

Table 11: Number (%) of New Driver Crash Involvements* by the Licence Stage of the New Drivers involved in the Crash, their Years of Licensure when the Crash occurred, and the Time of Day

Study Period	Licence Stage	Time of Crash	Pre-GLP		Early GLP		Full GLP	
			1996	1997	1999	2000	2001	2002
First Year of Licensure	Learner	Midnight – 5:00 am	20 (5.7)	32 (9.5)	33 (9.7)	31 (8.5)	33 (10.3)	38 (10.2)
		5:00 am – 5:00 pm	201 (57.4)	172 (51.2)	157 (46.0)	175 (48.0)	161 (50.5)	182 (48.8)
		5:00 pm – Midnight	124 (35.4)	126 (37.5)	145 (42.5)	152 (41.6)	108 (33.9)	143 (38.3)
		Unknown	5 (1.4)	6 (1.8)	6 (1.8)	7 (1.9)	17 (5.3)	10 (2.7)
		Total	350 (100)	336 (100)	341 (100)	365 (100)	319 (100)	373 (100)
	Novice	Midnight – 5:00 am	197 (7.2)	230 (7.7)	123 (8.2)	125 (8.4)	104 (6.5)	157 (8.7)
		5:00 am – 5:00 pm	1,375 (50.2)	1,441 (48.5)	683 (45.4)	710 (47.9)	750 (47.0)	880 (49.0)
		5:00 pm – Midnight	1,129 (41.2)	1,239 (41.7)	672 (44.6)	619 (41.7)	705 (44.2)	718 (40.0)
		Unknown	38 (1.4)	61 (2.1)	27 (1.8)	29 (2.0)	36 (2.3)	41 (2.3)
		Total	2,739 (100)	2,971 (100)	1,505 (100)	1,483 (100)	1,595 (100)	1,796 (100)
First 2 Years of Licensure	Learner	Midnight – 5:00 am	26 (6.7)	33 (9.5)	43 (10.7)	42 (9.0)	41 (10.6)	40 (9.6)
		5:00 am – 5:00 pm	220 (57.0)	177 (51.2)	183 (45.5)	230 (49.1)	194 (50.4)	209 (49.9)
		5:00 pm – Midnight	134 (34.7)	130 (37.6)	170 (42.3)	189 (40.4)	132 (34.3)	159 (37.9)
		Unknown	6 (1.6)	6 (1.7)	6 (1.5)	7 (1.5)	18 (4.7)	11 (2.6)
		Total	386 (100)	346 (100)	402 (100)	468 (100)	385 (100)	419 (100)
	Novice	Midnight – 5:00 am	474 (8.8)	571 (9.2)	402 (9.9)	396 (9.0)	374 (8.7)	419 (9.2)
		5:00 am – 5:00 pm	2,645 (49.0)	3,047 (49.4)	1,906 (46.9)	2,126 (48.6)	2,098 (48.9)	2,271 (50.1)
		5:00 pm – Midnight	2,194 (40.6)	2,425 (39.3)	1,682 (41.4)	1,754 (40.1)	1,718 (40.1)	1,745 (38.5)
		Unknown	86 (1.6)	129 (2.1)	74 (1.8)	99 (2.3)	99 (2.3)	98 (2.2)
		Total	5,399 (100)	6,172 (100)	4,064 (100)	4,375 (100)	4,289 (100)	4,533 (100)
First 3 Years of Licensure	Learner	Midnight – 5:00 am	26 (6.6)	33 (9.5)	49 (11.0)	45 (8.7)	43 (10.6)	24 (10.5)
		5:00 am – 5:00 pm	224 (57.1)	177 (51.2)	207 (46.6)	258 (49.7)	204 (50.5)	119 (52.0)
		5:00 pm – Midnight	136 (34.7)	130 (37.6)	180 (40.6)	209 (40.3)	139 (34.4)	79 (34.5)
		Unknown	6 (1.5)	6 (1.7)	8 (1.8)	7 (1.3)	18 (4.5)	7 (3.0)
		Total	392 (100)	346 (100)	444 (100)	519 (100)	404 (100)	229 (100)
	Novice	Midnight – 5:00 am	733 (9.5)	916 (10.3)	696 (10.8)	689 (10.0)	635 (9.7)	347 (9.2)
		5:00 am – 5:00 pm	3,776 (49.1)	4,407 (49.5)	3,146 (48.9)	3,385 (49.3)	3,240 (49.5)	1,875 (49.8)
		5:00 pm – Midnight	3,059 (39.8)	3,413 (38.3)	2,469 (38.4)	2,633 (38.3)	2,518 (38.5)	1,465 (39.0)
		Unknown	124 (1.6)	174 (1.9)	122 (1.9)	162 (2.4)	147 (2.3)	74 (2.0)
		Total	7,692 (100)	8,910 (100)	6,433 (100)	6,869 (100)	6,540 (100)	3,761 (100)
First 4 years of Licensure	Learner	Midnight – 5:00 am	26 (6.6)	33 (9.5)	50 (10.8)	50 (9.1)	29 (12.5)	-
		5:00 am – 5:00 pm	224 (57.1)	177 (51.2)	218 (47.1)	277 (50.7)	120 (51.5)	-
		5:00 pm – Midnight	136 (34.7)	130 (37.6)	187 (40.4)	213 (38.9)	78 (33.5)	-
		Unknown	6 (1.5)	6 (1.7)	8 (1.7)	7 (1.3)	6 (2.5)	-
		Total	392 (100)	346 (100)	463 (100)	547 (100)	233 (100)	-
	Novice	Midnight – 5:00 am	1,030 (10.6)	1,296 (11.5)	977 (11.6)	981 (10.9)	459 (10.0)	-
		5:00 am – 5:00 pm	4,763 (49.3)	5,601 (49.5)	4,131 (48.9)	4,416 (49.3)	2,275 (49.5)	-
		5:00 pm – Midnight	3,726 (38.6)	4,210 (37.2)	3,184 (37.6)	3,365 (37.6)	1,748 (38.0)	-
		Unknown	145 (1.5)	210 (1.8)	162 (1.9)	199 (2.2)	113 (2.5)	-
		Total	9,664 (100)	11,317 (100)	8,454 (100)	8,961 (100)	4,595 (100)	-

*Crash counts reported here differ from those in Tables 8 and 9 because they were taken from the Traffic Accident System rather than from ICBC Claims.

Table 12: Number (%) of New Driver Crash Involvements* by the Licence Stage of the Drivers involved in the Crash, their Years of Licensure when the Crash occurred, and the Number and Ages of Passengers

Study Period	Licence Stage	Passengers in Vehicle	Pre-GLP		Early GLP		Full GLP	
			1996	1997	1999	2000	2001	2002
First Year of Licensure	Learner	No more than 2 – at least 1 of whom was 19 or older	161 (46.3)	157 (47.3)	153 (44.9)	153 (41.9)	159 (49.8)	155 (41.6)
		None (and no supervisor)	115 (33.1)	106 (31.9)	91 (26.7)	125 (34.3)	98 (30.7)	144 (38.6)
		1 or more – all under 19	36 (10.3)	39 (11.8)	67 (19.7)	61 (16.7)	47 (14.7)	50 (13.4)
		Unknown	36 (10.3)	30 (9.0)	30 (8.8)	26 (7.1)	15 (4.7)	24 (6.4)
		Total	348 (100)	332 (100)	341 (100)	348 (100)	319 (100)	373 (100)
	Novice	No more than 2 – at least 1 of whom was 19 or older	366 (13.4)	345 (11.6)	118 (7.8)	111 (7.5)	127 (8.0)	126 (7.0)
		None (and no supervisor)	1,284 (46.9)	1,473 (49.6)	680 (45.2)	668 (45.0)	770 (48.3)	1,008 (56.1)
		1 or more – all under 19	897 (32.7)	956 (32.2)	616 (40.9)	614 (41.4)	609 (38.2)	589 (32.8)
		Unknown	192 (7.0)	197 (6.6)	91 (6.0)	90 (6.1)	87 (5.5)	73 (4.1)
		Total	2,739 (100)	2,971 (100)	1,505 (100)	1,483 (100)	1,593 (100)	1,796 (100)
First 2 Years of Licensure	Learner	No more than 2 – at least 1 of whom was 19 or older	183 (47.4)	163 (47.1)	176 (43.8)	204 (43.6)	178 (46.2)	169 (40.3)
		None (and no supervisor)	123 (31.9)	111 (32.1)	114 (28.4)	161 (34.4)	124 (32.2)	165 (39.4)
		1 or more – all under 19	41 (10.6)	41 (11.8)	77 (19.1)	70 (15.0)	58 (15.1)	57 (13.6)
		Unknown	39 (10.1)	31 (9.0)	35 (8.7)	33 (7.0)	25 (6.5)	28 (6.7)
		Total	386 (100)	346 (100)	402 (100)	468 (100)	385 (100)	419 (100)
	Novice	No more than 2 – at least 1 of whom was 19 or older	727 (13.5)	807 (13.1)	405 (10.0)	379 (8.7)	371 (8.7)	424 (9.4)
		None (and no supervisor)	2,718 (50.3)	3,185 (51.6)	2,048 (50.4)	2,248 (51.4)	2,407 (56.1)	2,630 (58.0)
		1 or more – all under 19	1,591 (29.5)	1,777 (28.8)	1,387 (34.1)	1,521 (34.8)	1,320 (30.8)	1,325 (29.2)
		Unknown	363 (6.7)	403 (6.5)	224 (5.5)	227 (5.2)	191 (4.4)	153 (3.4)
		Total	5,399 (100)	6,172 (100)	4,064 (100)	4,375 (100)	4,289 (100)	4,533 (100)
First 3 Years of Licensure	Learner	No more than 2 – at least 1 of whom was 19 or older	188 (48.0)	163 (47.1)	195 (43.9)	229 (44.1)	185 (45.8)	93 (40.6)
		None (and no supervisor)	124 (31.6)	111 (32.1)	131 (29.5)	181 (34.9)	134 (33.2)	90 (39.3)
		1 or more – all under 19	40 (10.2)	41 (11.8)	79 (17.8)	69 (13.3)	57 (14.1)	31 (13.5)
		Unknown	40 (10.2)	31 (9.0)	39 (8.8)	40 (7.7)	28 (6.9)	15 (6.6)
		Total	392 (100)	346 (100)	444 (100)	519 (100)	404 (100)	229 (100)
	Novice	No more than 2 – at least 1 of whom was 19 or older	1,142 (14.8)	1,351 (15.2)	751 (11.7)	757 (11.0)	739 (11.3)	415 (11.0)
		None (and no supervisor)	4,102 (53.3)	4,819 (54.1)	3,524 (54.8)	3,889 (56.6)	3,839 (58.7)	2,283 (60.7)
		1 or more – all under 19	1,952 (25.4)	2,220 (24.9)	1,835 (28.5)	1,916 (27.9)	1,709 (26.1)	944 (25.1)
		Unknown	496 (6.5)	520 (5.8)	323 (5.0)	307 (4.5)	253 (3.9)	119 (3.2)
		Total	7,692 (100)	8,910 (100)	6,433 (100)	6,869 (100)	6,540 (100)	3,761 (100)
First 4 Years of Licensure	Learner	No more than 2 – at least 1 of whom was 19 or older	188 (48.0)	163 (47.1)	201 (43.4)	237 (43.3)	111 (47.6)	-
		None (and no supervisor)	124 (31.6)	111 (32.1)	142 (30.7)	197 (36.0)	70 (30.0)	-
		1 or more – all under 19	40 (10.2)	41 (11.8)	80 (17.3)	71 (13.0)	33 (14.2)	-
		Unknown	40 (10.2)	31 (9.0)	40 (8.6)	42 (7.7)	19 (8.2)	-
		Total	392 (100)	346 (100)	463 (100)	547 (100)	233 (100)	-
	Novice	No more than 2 – at least 1 of whom was 19 or older	1,583 (16.4)	1,915 (16.9)	1,177 (13.9)	1,251 (14.0)	593 (12.9)	-
		None (and no supervisor)	5,358 (55.4)	6,348 (56.1)	4,878 (57.7)	5,240 (58.5)	2,804 (61.0)	-
		1 or more – all under 19	2,139 (22.1)	2,429 (21.5)	2,003 (23.7)	2,108 (23.5)	1,026 (22.3)	-
		Unknown	584 (6.1)	625 (5.5)	396 (4.7)	362 (4.0)	172 (3.7)	-
		Total	9,664 (100)	11,317 (100)	8,454 (100)	8,961 (100)	4,595 (100)	-

*Crash counts reported here differ from those in Tables 8 and 9 because they were taken from the Traffic Accident System rather than from ICBC Claims.

4.2.3 New Driver Crash Involvement Rates

New driver crash involvement rates were calculated for all four GLP cohorts (intake years 1999, 2000, 2001, and 2002) and the two Pre-GLP cohorts (intake years 1996, 1997), as well as for the aggregated Pre-GLP (1996-1997), Early GLP (1999-2000) and Full GLP (2001-2002) groups. Within each group, short-term (first year of licensure and first two years of licensure) and longer-term (first three and four years of licensure) rates were calculated as follows:

- 1) for all New drivers regardless of their progress through the licensing system within each stated period of licensure,
- 2) for only those New drivers who progressed to the Novice stage (or to their first solo licence) within each stated period of licensure,
- 3) for only those GLP drivers who completed all of the required GLP components and graduated out of the program within each stated period of licensure.

The rates for all New drivers were calculated in two ways. First, using driver counts in the denominators and second, using licensed driver-years adjusted for the shorter validity term of Pre-GLP Learner licences. As noted in Section 3.3, the rates based on driver counts are provided for descriptive purposes only as they do not take into account differences between the groups in the amount of actual licensed driver-time contributed. However, they are commonly used denominators in other jurisdictions and are provided here for comparative purposes. As would be expected, rates calculated using denominators adjusted for unlicensed-time (Table 14) are slightly higher than those based solely on driver counts (Table 13).

The rates summarized in Tables 13 and 14 show the overall impact of GLP on New driver crash rates over time. The drivers included in the rate calculations may have been exposed to all components of licensing process, to the Learner stage only, or to only the Learner and early Novice stage components. Thus, the drivers included in each group may be at quite different levels of exposure and crash risk. To minimize some of these differences, Table 15 shows the rates after they were recalculated using only those drivers who had progressed to the Novice (or solo licence) stage during each of the four specified time periods and Table 16 shows the rates calculated for GLP program graduates. It is these rates that provide a measure of the overall impact of GLP on New driver crash involvement rates. However, the data for these drivers are limited by the fact that only a small percentage (less than 30%) of the GLP cohorts obtained their Full Privilege licence by the end of the study, and those who did were motivated to move through the system quickly. These drivers may not be representative of the full complement of drivers in the cohorts and, consequently, their rates may not provide an accurate estimate of each group's rates. For this reason, the rates calculated for program graduates must be considered preliminary.

Table 13 shows the rates calculated for each intake driver group as well as for each licensing program (Pre-GLP, Early GLP, Full GLP). As can be seen, when total crash rates were compared, the average 1-year rates was about 17.4 per 100 Pre-GLP drivers and about 13.0 per 100 Early and Full GLP drivers; the average 2-year rates were about 19.4 per 100 Pre-GLP drivers, 17.2 per 100 Early GLP drivers and about 16.7 per 100 Full GLP drivers. There was some variability across the annual intake years but in no case did the rates differ by more than 1 crash involvement per 100 drivers and, in many cases, the difference was much less. A similar pattern was observed across the groups when the crash involvements were limited to liable crashes, casualty, and material damage only crashes.

Table 13: New Driver Crash Involvement Rates (per 100 drivers) and 95% Confidence Intervals (CI) by Intake Year, Program, and Years of Licensure

Crash Type by Years of Licensure	Pre-GLP Intake Year			Early GLP Intake Year			Full GLP Intake Year		
	1996	1997	1996-1997	1999	2000	1999-2000	2001	2002	2001-2002
	Rate (95% CI) (N=60,174)	Rate (95% CI) (N=77,924)	Average Rate (95% CI) (N=138,098)	Rate (95% CI) (N=52,204)	Rate (95% CI) (N=55,193)	Average Rate (95% CI) (N=107,397)	Rate (95% CI) (N=50,808)	Rate (95% CI) (N=56,499)	Average Rate (95% CI) (107,307)
All Crashes:									
1 st Year	17.87 (17.53– 18.21)	16.98 (16.69 – 17.27)	17.37 (17.15 – 17.59)	13.56 (13.24– 13.88)	12.56 (12.26 – 12.86)	13.05 (12.83 – 13.27)	13.58 (13.26 – 13.90)	12.58 (12.29 – 12.87)	13.05 (12.83– 13.27)
1 st Two Years	19.69 (19.44 – 19.94)	18.53 (18.32 – 18.74)	19.04 (18.88 – 19.20)	17.25 (17.00 – 17.50)	17.09 (16.85 – 17.28)	17.17 (16.99 – 17.35)	17.33 (17.07 – 17.59)	15.25 (15.02– 15.48)	16.24 (16.07– 16.41)
1 st Three Years	20.12 (19.91-20.33)	18.69 (18.51-18.87)	19.31 (19.18-19.44)	18.45 (18.24-18.66)	17.81 (17.61-18.01)	18.12 (17.97-18.27)	17.70 (17.49-17.91)	15.86 (15.60-16.12)	17.01 (16.85-17.17)
1 st Four Years	19.91 (19.73-20.09)	18.47 (18.32-18.62)	19.10 (18.98-19.22)	18.39 (18.21-18.57)	17.70 (17.52-17.88)	18.04 (17.91-18.17)	17.73 (17.48-17.98)	-	-
Liabile Crashes:									
1 st Year	11.81 (11.54 – 12.08)	11.31 (11.07– 11.55)	11.53 (11.35 – 11.71)	9.28 (9.02 – 9.54)	8.64 (8.39 – 8.89)	8.95 (8.77 – 9.13)	9.36 (9.09 – 9.63)	8.74 (8.50 – 8.98)	9.03 (8.85 – 9.21)
1 st Two Years	12.09 (11.89 – 12.29)	11.50 (11.32 – 11.66)	11.76 (11.63– 11.89)	10.99 (10.79 – 11.19)	10.88 (10.69 – 11.07)	10.93 (10.79 – 11.07)	11.23 (11.02 – 11.44)	9.95 (9.77 – 10.13)	10.55 (10.41 – 10.69)
1 st Three Years	11.78 (11.62-11.94)	11.04 (10.90-11.17)	11.36 (11.26-11.46)	11.24 (11.07-11.41)	10.97 (10.81-11.13)	11.10 (10.98-11.22)	11.03 (10.86-11.20)	9.90 (9.70-10.10)	10.60 (10.47-10.73)
1 st Four Years	11.23 (11.10-11.36)	10.51 (10.40-10.62)	10.82 (10.73-10.91)	10.84 (10.70-10.98)	10.58 (10.44-10.72)	10.71 (10.61-10.81)	10.72 (10.53-10.91)	-	-
Casualty Only:									
1 st Year	5.48 (5.29 – 5.67)	5.20 (5.04 – 5.36)	5.32 (5.20 – 5.44)	3.88 (3.71 – 4.05)	3.53 (3.37 – 3.69)	3.70 (3.58 – 3.82)	3.69 (3.52 – 3.86)	3.59 (3.43 – 3.75)	3.64 (3.53 – 3.75)
1 st Two Years	6.12 (5.98 – 6.26)	5.65 (5.53 – 5.77)	5.86 (5.77 – 5.95)	5.01 (4.87 – 5.15)	4.81 (4.68 – 4.94)	4.91 (4.82 – 5.00)	4.90 (4.76 – 5.04)	4.41 (4.29 – 4.53)	4.64 (4.55 – 4.73)
1 st Three Years	6.29 (6.17-6.41)	5.67 (5.57-5.77)	5.94 (5.87-6.01)	5.37 (5.26-5.48)	5.16 (5.05-5.27)	5.26 (5.18-5.34)	5.06 (5.05-5.27)	4.58 (4.44-4.72)	4.88 (4.79-4.97)
1 st Four Years	6.22 (6.12-6.32)	5.51 (5.43-5.59)	5.82 (5.76-5.88)	5.40 (5.30-5.50)	5.13 (5.04-5.22)	5.26 (5.19-5.33)	5.11 (4.98-5.24)	-	-
Material Damage:									
1 st Year	12.39 (12.11 – 12.67)	11.79 (11.55 – 12.03)	12.05 (11.87 – 12.23)	9.68 (9.41 – 9.95)	9.04 (8.79 – 9.29)	9.35 (9.17 – 9.53)	9.89 (9.62 – 10.16)	8.98 (8.73 – 9.23)	9.41 (9.23 – 9.59)
1 st Two Years	13.57 (13.36 – 13.78)	12.88 (12.70 – 13.06)	13.18 (13.04– 13.32)	12.23 (12.02 – 12.44)	12.28 (12.07 – 12.49)	12.26 (12.11 – 12.41)	12.43 (12.21 – 12.65)	10.84 (10.65 – 11.03)	11.59 (11.45 – 11.73)
1 st Three Years	13.83 (13.66-14.00)	13.02 (12.87-13.17)	13.37 (13.26-13.48)	13.08 (12.90-13.26)	12.65 (12.48-12.82)	12.86 (12.74-12.98)	12.64 (12.46-12.82)	11.28 (11.96-11.50)	12.13 (11.99-12.27)
1 st Four Years	13.70 (13.55-13.85)	12.96 (12.83-13.09)	13.28 (13.18-13.38)	12.99 (12.84-13.14)	12.57 (12.42-12.72)	12.77 (12.66-12.88)	12.62 (12.41-12.83)	-	-

Table 14 summarizes the crash involvement rates for New driver after adjusting the denominators for unlicensed time and for the shorter validity period of the Pre-GLP Learner licence. The adjustment for unlicensed time tends to increase the crash rate while the adjustment for the Pre-GLP Learner validity period reduces the rate somewhat for Pre-GLP drivers. The net effect of both adjustments resulted in slightly higher rates across all the groups. Within each licensing program, the variability across intake years was again less than 1 crash per 100 licensed driver-years.

Table 14: New Driver Crash Involvement Rates (per 100 licensed driver-years) and 95% Confidence Intervals (CI) by Intake Year, Program, and Years of Licensure

Crash Type by Years of Licensure	Pre-GLP Intake Year			Early GLP Intake Year			Full GLP Intake Year		
	1996	1997	1996-1997	1999	2000	1999-2000	2001	2002	2001-2002
	Rate (95% CI) (N=60,174)	Rate (95% CI) (N=77,924)	Average Rate (95% CI) (N=138,098)	Rate (95% CI) (N=52,204)	Rate (95% CI) (N=55,193)	Average Rate (95% CI) (N=107,397)	Rate (95% CI) (N=50,808)	Rate (95% CI) (N=56,499)	Average Rate (95% CI) (107,307)
All Crashes:									
1 st Year	18.34 (17.99-18.69)	17.39 (17.09-17.69)	17.80 (17.57-18.03)	13.63 (13.31-13.95)	12.63 (12.33-12.93)	13.12 (12.90-13.34)	13.65 (13.33-13.97)	12.66 (12.37-12.95)	13.13 (12.91-13.35)
1 st Two Years	22.10 (22.82-22.38)	20.71 (20.47-20.95)	21.31 (21.13-21.49)	18.41 (18.14-18.68)	18.30 (18.04-18.56)	18.35 (18.16 - 18.54)	18.38 (18.11-18.65)	17.19 (16.93-17.45)	17.77 (17.58-17.96)
1 st Three Years	23.37 (23.13-23.61)	21.99 (21.78-22.2)	22.60 (22.44-22.76)	20.20 (19.97-20.43)	19.56 (19.34-19.78)	19.87 (19.71-20.02)	19.48 (19.25-19.71)	18.67 (18.37-18.97)	19.19 (19.01-19.37)
1 st Four Years	23.71 (23.50-23.92)	22.45 (22.27-22.63)	23.01 (22.87-23.15)	20.48 (20.28-20.68)	19.92 (19.72-20.12)	20.20 (20.06-20.34)	20.20 (19.92-20.48)	-	-
Liabile Crashes:									
1 st Year	12.13 (11.85 - 12.40)	11.57 (11.33 - 11.81)	11.82 (11.64 - 12.00)	9.33 (9.13 - 9.53)	8.69 (8.44 - 8.94)	9.00 (8.82 - 9.18)	9.41 (9.14 - 9.68)	8.80 (8.55 - 9.05)	9.09 (8.91 - 9.27)
1 st Two Years	13.57 (13.35 - 13.79)	12.84 (12.66 - 13.04)	13.16 (13.02 - 13.3)	11.73 (11.52 - 11.94)	11.65 (11.44 - 11.86)	11.69 (11.54 - 11.84)	11.91 (11.69 - 12.13)	11.21 (11.00 - 11.42)	11.55 (11.40 - 11.70)
1 st Three Years	13.69 (13.51-13.87)	12.99 (12.83-13.15)	13.30 (13.18-13.42)	12.31 (12.13-12.49)	12.04 (11.86-12.22)	12.17 (12.04-12.30)	12.13 (11.95-12.31)	11.65 (11.41-11.89)	11.96 (11.81-12.11)
1 st Four Years	13.37 (13.21-13.53)	12.77 (12.63-12.91)	13.04 (12.94-13.14)	12.08 (11.92-12.24)	11.90 (11.75-12.05)	11.99 (11.88-12.10)	12.22 (12.00-12.44)	-	-
Casualty Only:									
1 st Year	5.63 (5.44 - 5.82)	5.32 (5.16 - 5.48)	5.45 (5.33 - 5.57)	3.90 (3.73 - 4.07)	3.54 (3.38 - 3.70)	3.72 (3.60 - 3.84)	3.71 (3.54 - 3.88)	3.62 (3.46 - 3.78)	3.66 (3.55 - 3.77)
1 st Two Years	6.87 (6.71 - 7.03)	6.32 (6.19 - 6.45)	6.56 (6.46 - 6.66)	5.35 (5.21 - 5.49)	5.15 (5.01 - 5.29)	5.25 (5.15 - 5.35)	5.20 (5.06 - 5.34)	4.97 (4.83 - 5.11)	5.08 (4.98 - 5.18)
1 st Three Years	7.30 (7.17-7.43)	6.67 (6.56-6.78)	6.95 (6.86-7.04)	5.39 (5.23-5.55)	5.66 (5.54-5.78)	5.77 (5.68-5.86)	5.57 (5.45-5.69)	5.39 (5.23-5.55)	5.51 (5.41-5.61)
1 st Four Years	7.40 (7.28-7.52)	6.71 (6.61-6.81)	7.01 (6.93-7.09)	6.02 (5.91-6.13)	5.78 (5.67-5.89)	5.89 (5.81-5.97)	5.82 (5.67-5.97)	-	-
Material Damage:									
1 st Year	12.71 (12.42 - 13.00)	12.07 (11.82 -12.32)	12.35 (12.16 - 12.54)	9.73 (9.46 - 10.00)	9.08 (8.83 - 9.33)	9.40 (9.22 - 9.58)	9.94 (9.67 - 10.21)	9.04 (8.79 - 9.29)	9.47 (9.29 - 9.65)
1 st Two Years	15.23 (15.00 - 15.46)	14.39 (14.19 - 14.59)	14.76 (14.61 - 14.91)	13.06 (12.83 - 13.29)	13.14 (12.92 - 13.36)	13.10 (12.94 - 13.26)	13.19 (12.96 - 13.42)	12.22 (12.00-12.44)	12.69 (12.53 - 12.85)
1 st Three Years	16.07 (15.87-16.27)	15.32 (15.15-15.49)	15.65 (15.52-15.78)	14.32 (14.12-1452)	13.89 (13.70-14.08)	14.10 (13.96-14.24)	13.91 (13.71-14.11)	13.28 (13.02-13.54)	13.68 (13.52-13.84)
1 st Four Years	16.31 (16.13-16.49)	15.75 (15.60-15.90)	16.00 (15.90-16.1)	14.47 (14.30-14.64)	14.14 (13.97-14.31)	14.30 (14.18-14.42)	14.37 (14.13-14.61)	-	-

Table 15 shows the New driver crash rates obtained when only the drivers who had advanced to the Novice stage were included in their calculation. As would be expected (by excluding drivers who remained in the low-risk, low-exposure Learner stage throughout the study period), the rates computed for these drivers were higher than those calculated for all New drivers (Table 14). As well, there was slightly more variability in the rates obtained for Pre-GLP drivers by intake year.

Table 15: New Driver Crash Involvement Rates (per 100 licensed driver-years) and 95% Confidence Intervals (CI) – by Intake Year, Program, and Years of Licensure – for Drivers who Advanced to the Novice stage during the Specified Period of Licensure

Crash Type by Years of Licensure	Pre-GLP Intake Year			Early GLP Intake Year			Full GLP Intake Year		
	1996	1997	1996-1997	1999	2000	1999-2000	2001	2002	2001-2002
	Rate (95% CI)	Rate (95% CI)	Average Rate (95% CI)	Rate (95% CI)	Rate (95% CI)	Average Rate (95% CI)	Rate (95% CI)	Rate (95% CI)	Average Rate (95% CI)
All Crashes:									
1 st Year	23.90 (22.46–23.34)	20.88 (20.52 – 21.24)	21.74 (21.46 – 22.02)	18.21 (17.77 – 18.65)	18.82 (18.35 – 19.29)	18.50 (18.18 – 18.82)	18.92 (18.46–19.38)	18.40 (17.95– 18.85)	18.65 (18.33 – 18.97)
1 st Two Years	23.80 (23.50 – 24.10)	22.56 (22.30 – 23.82)	23.10 (22.90 – 23.30)	21.26 (20.95 – 21.57)	21.76 (21.44 – 22.08)	21.51 (21.29 – 21.73)	21.19 (20.87 – 21.51)	21.54 (21.21– 21.87)	21.36 (21.13 – 21.59)
1 st Three Years	24.51 (24.24 – 24.76)	23.35 (23.13 – 23.57)	23.86 (23.69 – 24.03)	22.12 (21.87 – 22.39)	21.83 (21.58 – 22.08)	21.98 (21.80-22.16)	21.69 (21.43 – 21.95)	21.65 (21.29 – 21.01)	21.67 (21.46 -21.88)
1 st Four Years	24.59 (24.37 – 24.81)	23.51 (23.32 – 23.70)	23.99 (23.84 – 24.14)	21.92 (21.70 – 22.14)	21.79 (21.57 – 22.01)	21.85 (21.70 – 22.00)	21.86 (21.55 – 22.17)	- -	- -
Liabile Crashes:									
1 st Year	15.05 (14.69–15.41)	13.84 (13.55 – 14.13)	14.36 (14.13 – 14.59)	12.32 (11.96 – 12.68)	12.84 (12.45– 13.23)	12.57 (12.31 – 12.83)	12.97 (12.59 – 13.35)	12.66 (12.29 – 13.03)	12.81 (12.54 – 13.08)
1 st Two Years	14.57 (14.33 – 14.81)	13.96 (13.75 – 14.17)	14.23 (14.07 – 14.39)	13.47 (13.22 – 13.72)	13.76 (13.51 – 14.01)	13.62 (13.44 – 13.80)	13.68 (13.43 – 13.93)	13.96 (13.70 – 14.22)	13.81 (13.63 – 13.99)
1 st Three Years	14.32 (14.12 – 14.51)	13.75 (13.58 – 13.92)	14.00 (13.87 – 14.13)	13.43 (13.23 – 13.63)	13.39 (13.19 – 13.59)	13.41 (13.27 – 13.55)	13.46 (13.25 – 13.67)	13.45 (13.17 – 13.73)	13.46 (13.29 – 13.63)
1 st Four Years	13.84 (13.67 – 14.01)	13.35 (13.20 – 13.50)	13.56 (13.45 – 13.67)	12.87 (12.70 – 13.04)	12.97 (12.80 – 13.14)	12.92 (12.80 – 13.04)	13.19 (12.95 – 13.43)	- -	- -
Casualty Only:									
1 st Year	7.03 (6.79–7.27)	6.39 (6.19 – 6.59)	6.66 (6.51 – 6.81)	5.11 (4.88 – 5.34)	5.20 (4.95 – 5.45)	5.15 (4.98 – 5.32)	5.11 (4.87 – 5.35)	5.27 (5.03 – 5.51)	5.19 (5.02– 5.36)
1 st Two Years	7.39 (7.22– 7.56)	6.88 (6.74 – 7.02)	7.11 (7.00 – 7.22)	6.13 (6.00 – 6.30)	6.10 (5.93 – 6.27)	6.11 (5.99 – 6.23)	6.00 (5.81 – 6.15)	6.23 (6.05 – 6.41)	6.10 (5.98– 6.22)
1 st Three Years	7.66 (7.52- 7.80)	7.08 (6.96 – 7.20)	7.34 (7.25 – 7.43)	6.41 (6.27 – 6.55)	6.30 (6.16 – 6.44)	6.35 (6.25 – 6.45)	6.20 (6.06 – 6.34)	6.25 (6.06 – 6.44)	6.22 (6.11 – 6.32)
1 st Four Years	7.67 (7.55 – 7.79)	7.01 (6.91 – 7.12)	7.30 (7.22 – 7.38)	6.41 (6.29 – 6.53)	6.30 (6.18 – 6.42)	6.35 (6.27 – 6.43)	6.30 (6.13 – 6.47)	- -	- -
Material Damage:									
1 st Year	15.87 (15.50–16.24)	14.49 (14.19 – 14.79)	15.08 (14.85 – 15.31)	13.10 (12.73 – 13.47)	13.62 (13.23 – 14.02)	13.35 (13.08 – 13.62)	13.80 (13.40 – 14.20)	13.13 (12.75 – 13.51)	13.46 (13.19 – 13.73)
1 st Two Years	16.40 (16.15 – 16.65)	15.68 (15.46 – 15.90)	16.00 (15.83 – 16.17)	15.13 (14.86 – 15.40)	15.66 (15.39 – 15.93)	15.40 (15.21 – 15.59)	15.21 (14.94 – 15.48)	15.31 (15.03 – 15.59)	15.26 (15.07 – 15.45)
1 st Three Years	16.85 (16.64 – 17.06)	16.27 (16.09 – 16.45)	16.52 (16.38 – 16.66)	15.72 (15.50 – 15.94)	15.53 (15.32 – 15.74)	15.63 (15.48 – 15.78)	15.48 (15.26 – 15.70)	15.40 (15.1 – 15.7)	15.45 (15.27 – 15.63)
1 st Four Years	16.91 (16.73 – 17.09)	16.50 (16.34 – 16.66)	16.68 (16.56 – 16.80)	15.51 (15.32 – 15.70)	15.49 (15.31 – 15.67)	15.50 (15.37 – 15.63)	15.56 (15.30 – 15.82)	- -	- -

Table 16 summarizes the New driver crash rates obtained for GLP drivers who graduated to a Full Privilege licence during the specified period of licensure. These are the first drivers to complete all of the Learner and Novice stage requirements, including the final exit road test. As noted earlier, however, the rates obtained for these drivers may not be representative because they are based on incomplete groups (not everyone in the GLP 2001 and 2002 was able to complete three or four years of licensure by the study cut-off date), and on drivers who were motivated to move through GLP quickly. Consequently they might have higher levels of driving exposure than the other Novice drivers in their cohort groups. The likelihood of exposure issues is particularly apparent for drivers who obtained their Full Privilege licence before the end of their second year. The crash involvement rates for these GLP drivers are very high relative to the rates reported in Table for the GLP and Pre-GLP who had progressed to their first solo licence.

Table 16: New Driver Crash Involvement Rates (per 100 licensed driver-years) and 95% Confidence Intervals (CI) – by Intake Year, Program, and Years of Licensure – for GLP Drivers who Graduated to a Full Privilege Licence during the Specified Period of Licensure

Crash Type by Years of Licensure	Early GLP Intake Year			Full GLP Intake Year		
	1999	2000	1999-2000	2001	2002	2001-2002
	Rate (95% CI)	Rate (95% CI)	Average Rate (95% CI)	Rate (95% CI)	Rate (95% CI)	Average Rate (95% CI)
All Crashes:						
1 st Two Years	28.77 (26.09 – 31.45)	31.76 (29.38 – 34.144)	30.51 (28.73 – 32.29)	29.73 (27.92–31.54)	28.79 (27.27–30.31)	29.19 (28.03 – 30.35)
1 st Three Years	26.08 (25.45 – 26.71)	25.82 (25.25– 26.39)	25.94 (25.52 – 26.36)	24.68 (24.19 – 25.17)	23.74 (23.09 – 24.39)	24.35 (23.96 – 24.74)
1 st Four Years	25.41 (24.99 – 25.83)	25.00 (24.63 – 25.37)	25.19 (24.91 – 25.47)	23.87 (23.39 – 24.35)	- -	- -
Liabile Crashes:						
1 st Two Years	16.63 (14.59 – 18.67)	17.88 (16.09– 19.67)	17.36 (16.02 – 18.70)	16.73 (15.37 – 18.09)	17.30 (16.12 – 18.48)	17.06 (16.17 – 17.95)
1 st Three Years	14.67 (14.20 – 15.14)	14.80 (14.37 – 15.23)	14.74 (14.42 – 15.06)	14.47 (14.09 – 14.85)	13.69 (13.19 – 14.19)	14.20 (13.90 – 14.50)
1 st Four Years	14.15 (13.84 – 14.46)	14.10 (13.82– 14.38)	14.12 (13.91 – 14.33)	13.76 (13.39 – 14.13)	- -	- -
Casualty Only:						
1 st Two Years	6.75 (5.45 – 8.05)	7.45 (6.30 – 8.60)	7.16 (6.30 – 8.02)	7.62 (6.70 – 8.54)	7.78 (6.99– 8.57)	7.71 (7.11– 8.31)
1 st Three Years	6.79 (6.47 – 7.11)	6.89 (6.59– 7.19)	6.85 (6.63 – 7.07)	6.59 (6.33 – 6.85)	6.50 (6.16 – 6.84)	6.56 (6.36– 6.76)
1 st Four Years	6.85 (6.63– 7.07)	6.81 (6.62– 7.00)	6.83 (6.69 – 6.97)	6.55 (6.30 – 6.80)	- -	- -
Material Damage:						
1 st Two Years	22.02 (19.68– 24.36)	24.31 (22.22 – 26.40)	23.35 (21.79 – 24.91)	22.11 (20.55 – 23.67)	21.02 (19.72 – 22.32)	21.48 (20.48 – 22.48)
1 st Three Years	19.29 (18.75 – 19.83)	18.93 (18.44– 19.42)	19.10 (18.74 – 19.46)	18.09 (17.67 – 18.51)	17.24 (16.68 – 17.80)	17.78 (17.44 – 18.12)
1 st Four Years	18.56 (18.20 – 18.92)	18.19 (17.87– 18.51)	18.36 (18.12 – 18.60)	17.31 (16.90 – 17.72)	- -	- -

The detailed crash involvement rates reported in Tables 13 through 16 have been provided primarily for background information and to establish a context for future evaluations of GLPe. The most striking feature of the data shown in the tables is that, despite some year-to-year variation, the rates computed for GLP drivers are consistently lower than the rates computed for Pre-GLP drivers. Previously, it was not known to what

extent estimates of GLP effectiveness might vary depending upon which driver cohorts were included in the analysis. Although the amount of variability observed was relatively small, it is sufficient to warrant using only the average rates for each licensing program in the analysis of GLP impact, rather than those computed by intake year. Using the average rates will smooth out some of the variability and provide a more accurate estimate of the GLP program effect. Although the GLP rates could be aggregated across all four intake years, the distinction between the Early and Full program years was retained so that the incremental effects of full implementation could be assessed. The results of these analyses are detailed below.

4.2.4 Analysis of GLP Effects on New Driver Crash Involvement Rates

To evaluate the impact of GLP on New driver crash rates, several analyses were undertaken. Firstly, short- and long-term crash rates were compared by program (Pre-GLP, Early GLP, and Full GLP). All New drivers who had been licensed for the specified periods of time (1 year, 2 years, 3 years and 4 years) were included in these analyses, regardless of their rate of progression through the respective licensing stages. These analyses were conducted to obtain an overall estimate of the effectiveness of the program within a specified period of licensure. They do not, however, provide an estimate of the total program impact. As noted previously, even after four years of licensure many of the GLP New drivers had not progressed, or been exposed to, all of the components of GLP. Consequently, two further sets of analyses were undertaken: one to assess the impact of the program on drivers who had, at a minimum, passed their first road test and entered the Novice stage, and a second to estimate the impact of GLP on drivers who had been exposed to the full Novice stage component, had passed the exit test and graduated to a Full Privilege licence. The analyses were done in this hierarchical manner due to the dynamic nature of the licensing process, the length of time it takes drivers to move through GLP and the finding that, even after four years, only about 30% of the GLP cohorts had been exposed to all of the program components. By doing a staged analysis, it was possible to retain the majority of each cohort in the models designed to estimate the impact of the Learner and early Novice stage components, and reserving the small subset of program graduates for only those analyses designed to estimate the total program effect. Clearly, however, these latter analyses must be considered preliminary until a larger percentage of the drivers have completed the final road test and obtained their Full Privilege licence.

The short- and longer-term effects of GLP on New driver crash involvement rates were assessed in five steps:

- Firstly, Poisson regression models (see section 3.4) were used to compare the crude crash involvement rates of the GLP and Pre-GLP driver. Crude rates provide an estimate of the magnitude of a given event in a particular population at risk during a specified time period. They were used to assess the global effect of GLP on New driver crash rates, including any effect the program might have had on the age at which New drivers applied for their first Learner licence.
- Secondly, Poisson models were used to compare the crude rates of the New driver groups with those of experienced driver groups (see section 4.1.2). This was done to determine to what extent any changes observed in the New driver crash involvement rates over time might be attributable to factors other than GLP.
- Thirdly, Poisson models were used to compare the crash involvement rates of the GLP and Pre-GLP groups after adjustment for age and gender. This was done to determine to what extent the age and gender differences observed (section 4.2.1) between the GLP and Pre-GLP groups might be influencing the global effects detected with the analysis of the crude rates.
- Fourthly, the relative effects of the GLP Learner and Novice stages on New driver rates were assessed.
- Finally, the overall effects of GLP Learner stage components on Learner driver crash rates, the influence of completing an approved driver education course during the Learner stage, and the effect of performance on the enhanced knowledge and Class 7 (or 8) road tests were assessed.

Tables 17-19 summarize the results of the first set of the Poisson regression analyses done to compare the crude (unadjusted) crash involvement rates of the GLP and Pre-GLP groups. Table 17 shows the results when all drivers were included in the model; Table 18 shows the results when the analyses were restricted to drivers who obtained their Novice licence during the time period specified; and Table 19 shows the results for drivers who progressed through all of the GLP components and graduated to a Full Privilege licence in the specified period. In each analysis, the impact of study group membership (Full GLP, Early GLP, or Pre-GLP) was modelled for all crashes, liable (“at-fault”) crashes only, casualty crashes, and material damage only crashes. Relative risks were computed using the Pre-GLP as the reference category for analyses involving all three program groups. Contrasts generated by the regression procedures were used to test for significant differences between the Full and Early GLP groups.

With the exception of the results shown in Table 19, GLP New drivers were found to have consistently lower crash involvement rates than Pre-GLP drivers, regardless of the specific GLP program to which they were exposed, or the type of crash included in the rate calculation. When all crashes and all drivers were included, the 1-year New driver crash involvement rates for GLP drivers were about 27% lower than the Pre-GLP rates, the 2-year rates were about 16-18% lower, the 3-year rates were about 12-15% lower, and the 4-year rates were about 12% lower. When the analyses included only those drivers who advanced to the Novice stage in the time period of interest, the 1-year rates were about 14-15% lower for GLP compared to Pre-GLP drivers. The percentage reduction declined to about 9% for the comparison of 4-year rates.

The magnitude of the percentage differences observed in Table 17 between the Early and Full GLP New driver crash involvement rates were small, and the direction of the effect was inconsistent. Across all categories of crashes, no significant differences were observed for drivers in their first year of licensure. During the second and third years of licensure, however, significantly lower crash rates were obtained for the Full GLP group in several of the crash categories. Significant differences were not obtained, however, when the comparisons of the Early and Full GLP groups were repeated using only those drivers who advanced to the Novice stage during each period of licensure (Table 18). This suggests that the results shown in Table 17 were likely due to differences between the characteristics or exposures of the drivers who failed to progress beyond the Learner stage in the two groups, and not to the implementation of the final GLP components. In a later section of the evaluation, GLP implementation effect will be re-examined after the potentially confounding effects of age and gender differences between the groups have been taken into account.

The results of the analysis of GLP drivers who progressed through all components of the program during each period of licensure (GLP program graduates) are shown in Table 19. As can be seen, when comparing the rates of these drivers to those of the Pre-GLP drivers, the computed relative risks were all significantly greater than one. As mentioned earlier, however, to be included in these analyses, the GLP drivers had to move through the program fairly quickly. But fewer than 30% had graduated even after four years of licensure. . Until the majority of the GLP cohorts have graduated out of the program, the rates calculated for the program graduates will, like these, be based on those most motivated to progress through the system. It is possible that such motivated drivers would have been driving more, and perhaps under more risky conditions, than the drivers who remained in the Novice stage throughout their first four years of licensure. Unfortunately, there was no way to identify a similar group of highly motivated Pre-GLP drivers to include in the comparison. Therefore, the overall impact of GLP on New driver crash rates cannot yet be accurately assessed. Consequently, no further analyses of these drivers will be included in this evaluation.

Although the findings reported thus far are interesting and suggestive, it is possible that factors other than GLP could be influencing the results. For example, factors external to GLP, such as changes in road safety measures, socioeconomic, police enforcement, or other societal factors could influence crash rates over time. To explore this possibility, experienced driver rates were computed and compared to the New driver rates. The next section describes the results of these analyses.

Table 17: Relative Risks of Crash Involvement for All New Drivers (Rates shown in Table 14)

Period of Licensure When Crashes Occurred (by Study Group)	All Crashes		Liabile Crashes Only		Casualty Crashes Only		Material Damage Only	
	Relative Risk (95% CI) ¹	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)
1st Year of Licensure								
Full GLP (2001-2002)	0.74 (0.72, 0.75)	-26%*	0.77 (0.75, 0.79)	-23%*	0.67 (0.65, 0.70)	-33%*	0.77 (0.75, 0.79)	-23%*
Early GLP (1999-2000)	0.74 (0.72, 0.75)	-26%*	0.76 (0.74, 0.78)	-24%*	0.68 (0.66, 0.71)	-32%*	0.76 (0.74, 0.78)	-24%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	1.00 (0.98, 1.02)	0%	1.01 (0.98, 1.04)	+1%	0.98 (0.94, 1.03)	-2%	1.01 (0.98, 1.04)	+1%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 2 Years of Licensure								
Full GLP (2001 – 2002)	0.83 (0.82, 0.85)	-17%*	0.88 (0.86, 0.89)	-12%*	0.78 (0.76, 0.79)	-22%*	0.86 (0.85, 0.87)	-14%*
Early GLP (1999 – 2000)	0.86 (0.85, 0.87)	-14%*	0.89 (0.87, 0.90)	-11%*	0.80 (0.78, 0.82)	-20%*	0.89 (0.87, 0.90)	-11%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	0.97 (0.95, 0.98)	-3%*	0.99 (0.97, 1.01)	-1%	0.97 (0.95, 1.00)	-3%	0.97 (0.96, 0.99)	-3%***
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 3 Years of Licensure								
Full GLP (2001-2002)	0.85 (0.84,0.86)	-15%*	0.90 (0.89,0.91)	-10%*	0.79 (0.78,0.81)	-21%*	0.87 (0.86,0.89)	-13%*
Early GLP (1999-2000)	0.88 (0.87,0.89)	-12%*	0.92 (0.90,0.93)	-8%*	0.83 (0.81,0.85)	-17%*	0.90 (0.89,0.91)	-10%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.0 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
Contrast:								
Full GLP (2001-2002)	0.97 (0.95,0.98)	-3%*	0.98 (0.97,1.00)	-2%	0.95 (0.93,0.98)	-5%*	0.97 (0.96,0.98)	-3%*
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 4 Years of Licensure								
Full GLP (2001)	0.88 (0.86,0.89)	-12%*	0.94 (0.92,0.96)	-6%*	0.83 (0.81,0.85)	-17%*	0.90 (0.88,0.91)	-10%*
Early GLP (1999 – 2000)	0.88 (0.87,0.88)	-12%*	0.92 (0.91,0.93)	-8%*	0.84 (0.83,0.86)	-16%*	0.89 (0.88,0.90)	-11%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
Contrast:								
Full GLP (2001)	1.00 (0.98,1.02)	-0%	1.02 (1.00,1.04)	2%	0.99 (0.96,1.02)	-1%	1.00 (0.99,1.02)	1%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-

*P < 0.0001 **P < 0.001 ***P<0.01

¹CI=Confidence Interval

Table 18: Relative Risks of Crash Involvement for New Drivers who Advanced to the Novice stage Within each Period of Licensure (Rates shown in Table 15)

Period of Licensure When Crashes Occurred (by Study Group)	All Crashes		Liabile Crashes Only		Casualty Crashes Only		Material Damage Only	
	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)
1st Year of Licensure								
Full GLP (2001-2002)	0.86 (0.84, 0.88)	-14%*	0.89 (0.87, 0.92)	-11%*	0.78 (0.75, 0.81)	-22%*	0.89 (0.87, 0.92)	-11%*
Early GLP (1999-2000)	0.85 (0.83, 0.87)	-15%*	0.88 (0.85, 0.90)	-12%*	0.77 (0.74, 0.81)	-23%*	0.89 (0.86, 0.91)	-11%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	1.01 (0.98, 1.03)	1%	1.02 (0.99, 1.05)	2%	1.01 (0.96, 1.06)	1%	1.01 (0.98, 1.04)	1%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 2 Years of Licensure								
Full GLP (2001 – 2002)	0.92 (0.91, 0.94)	-8%*	0.97 (0.95, 0.99)	-3%**	0.86 (0.84, 0.88)	-14%*	0.95 (0.94, 0.97)	-5%*
Early GLP (1999 – 2000)	0.93 (0.92, 0.94)	-7%*	0.96 (0.94, 0.97)	-4%*	0.86 (0.84, 0.88)	-14%*	0.96 (0.95, 0.98)	-4%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	0.99 (0.97, 1.01)	-1%	1.01 (0.99, 1.03)	2%	1.00 (0.97, 1.03)	0%	0.99 (0.97, 1.01)	-1%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 3 Years of Licensure								
Full GLP (2001-2002)	0.91 (0.90,0.92)	-9%*	0.96 (0.95,0.98)	-4%*	0.85 (0.83,0.87)	-15%*	0.94 (0.92,0.95)	-7%*
Early GLP (1999-2000)	0.92 (0.91,0.93)	-8%*	0.96 (0.94,0.97)	-4%*	0.87 (0.84,0.85)	-13%*	0.95 (0.93,0.96)	-5%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
Contrast:								
Full GLP (2001-2002)	0.99 (0.97,0.1.00)	-1%	1.00 (0.99,1.02)	0%	0.98 (0.96,1.00)	-2%	0.99 (0.97,1.00)	-1%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 4 Years of Licensure								
Full GLP (2001)	0.91 (0.90,0.93)	-9%*	0.97 (0.95,0.99)	-3%***	0.86 (0.84,0.89)	-14%*	0.93 (0.92,0.95)	-7%*
Early GLP (1999 – 2000)	0.91 (0.90,0.92)	-9%*	0.95 (0.94,0.96)	-5%*	0.87 (0.85,0.88)	-13%*	0.93 (0.92,0.94)	-7%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
Contrast:								
Full GLP (2001)	1.00 (0.98,1.02)	0%	1.02 (1.00,1.04)	2%	0.99 (0.96,1.02)	-1%	1.00 (0.99,0.102)	0%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-

*P < 0.0001 **P < 0.001 ***P<0.05 ¹CI=Confidence Interval

Table 19: Relative Risks of Crash Involvement for GLP New Drivers who Advanced to the Full Privilege stage Within each Period of Licensure Compared to Pre-GLP New Drivers (Rates shown in Table 16)

Period of Licensure When Crashes Occurred (by Study Group)	All Crashes		Liabile Crashes Only		Casualty Crashes Only		Material Damage Only	
	Relative Risk (95% CI) ¹	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)
1st 2 Years of Licensure								
Full GLP (2001 – 2002)	1.26 (1.21, 1.31)	26%*	1.20 (1.14, 1.26)	20%*	1.08 (1.00, 1.17)	9%	1.34 (1.28, 1.41)	34%*
Early GLP (1999 – 2000)	1.32 (1.24, 1.40)	32%*	1.22 (1.13, 1.32)	22%*	1.01 (0.89, 1.14)	1%	1.46 (1.36, 1.56)	46%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	0.96 (0.89, 1.03)	-4%	0.98 (0.90, 1.08)	-2%	1.08 (0.94, 1.24)	8%	0.92 (0.85, 1.00)	-8%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 3 Years of Licensure								
Full GLP (2001-2002)	1.02 (1.00, 1.04)	2%	1.01 (0.99, 1.04)	1%	0.89 (0.86, 0.92)	-11%*	1.08 (1.05, 1.10)	8%*
Early GLP (1999-2000)	1.09 (1.07, 1.11)	9%*	1.05 (1.03, 1.08)	5%*	0.93 (0.90, 0.97)	-7%*	1.16 (1.13, 1.18)	16%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	0.94 (0.92, 0.96)	-6%*	0.96 (0.93, 0.99)	-4%	0.96 (0.92, 1.00)	-4%	0.93 (0.91, 0.96)	-7%*
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 4 Years of Licensure								
Full GLP (2001)	0.99 (0.97, 1.02)	-1%	1.01 (0.99, 1.04)	1%	0.90 (0.86, 0.93)	-10%*	1.04 (1.01, 1.06)	4%***
Early GLP (1999 – 2000)	1.05 (1.04, 1.06)	5%*	1.04 (1.02, 1.06)	4%*	0.93 (0.91, 0.96)	-7%*	1.10 (1.08, 1.12)	10%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001)	0.95 (0.93, 0.97)	-5%*	0.98 (0.95, 1.01)	-2%	0.96 (0.92, 1.01)	-4%	0.95 (0.92, 0.97)	-6%*
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-

*P < 0.0001 **P < 0.001 ***P<0.01 ¹CI=Confidence Interval

Comparison of New Driver and Experienced Driver Crash Involvement Rates. As mentioned previously, due to the province-wide implementation of GLP in 1998 it was not possible to identify concurrent comparison groups to use in the evaluation. Instead, historical groups were used (the Pre-GLP groups). When using such historical comparison groups, it is possible that any differences observed between the groups may be due to factors other than the program of interest – in this case GLP. Economic, social, road safety or other factors may have been influencing crash rates over the period of time included in the evaluation. In order to assess to what extent such factors may have been influencing the New driver crash rates described above, samples of experienced drivers were selected from each of the Pre-GLP and GLP intake years. The sample selection criteria for the experienced driver groups were described in section 4.1.2.

A total of 6,681,541 experienced drivers were selected for inclusion in the study with about 33% forming each of the 1996-1997 (n=2,252,224), 1999-2000 (n=2,212,718), and 2001-2002 (n=2,216,599) Pre-GLP and GLP time-matched comparison groups. One-year, two-year, three-year and four-year crash involvement rates were calculated for the experienced driver groups and these were compared to the one- through four-year crash involvement rates of the Pre-GLP and GLP New driver groups. For these analyses, *per driver* rates were used as licensed driver-time was not available for the experienced drivers. Although the New driver rates tended to decline as their periods of licensure increased, the experienced driver rates remained relatively stable (for example, the experienced driver group matched in time to the Early Pre-GLP group had total crash involvement rates that were between 12.50 and 13.00 regardless of the time frame used for the rate calculation. Thus, only the results of the analyses done using the four-year rates are shown in Table 20.

Table 20: Four-year Crash Involvement Rates¹, Relative Risks, and 95% Confidence Intervals (CI) for New and Experienced Drivers

Crash Type by Study Group ²	New Drivers			Experienced Drivers		
	Crash Rate (95% CI)	Relative Risk (95% CI)	% Difference (from REF Group)	Crash Rate ³ (95% CI)	Relative Risk (95% CI)	% Difference (from REF Group)
All Crashes						
Full GLP (2001)	17.73 (17.48-17.98)	0.93 (0.91,0.94)	-7%*	12.67 (12.64-12.70)	1.05 (1.04,1.05)	+5%*
Early GLP (1999 – 2000)	18.04 (17.91-18.17)	0.94 (0.94,0.95)	-6%*	12.60 (12.58-12.62)	1.04 (1.04,1.04)	+4%*
Pre-GLP (1996 – 1997)	19.10 (18.98-19.22)	1.00 (REF)	-	12.12 (12.10-12.24)	1.00 (REF)	-
Liabile Only						
Full GLP (2001)	10.72 (10.53-10.91)	0.99 (0.97,1.01)	-1%	5.48 (5.46-5.50)	1.08 (1.07,1.08)	+8%*
Early GLP (1999 – 2000)	10.71 (10.61-10.81)	0.99 (0.98,1.00)	-1%	5.36 (5.34-5.38)	1.05 (1.05,1.06)	+5%*
Pre-GLP (1996 – 1997)	10.82 (10.73-10.91)	1.00 (REF)	-	5.08 (5.07-5.09)	1.00 (REF)	-
Casualty Only						
Full GLP (2001)	5.11 (4.98-5.24)	0.88 (0.85,0.90)	-12%*	3.08 (3.06-3.10)	0.97 (0.96,0.98)	-3%*
Early GLP (1999 – 2000)	5.26 (5.19-5.33)	0.90 (0.89,0.92)	-10%*	3.11 (3.10-3.12)	0.98 (0.97,0.98)	-2%*
Pre-GLP (1996 – 1997)	5.82 (5.76-5.88)	1.00 (REF)	-	3.18 (3.17-3.19)	1.00 (REF)	-
Material Damage Only						
Full GLP (2001)	12.62 (12.41-12.83)	0.95 (0.93,0.97)	-5%*	9.60 (9.57-9.63)	1.07 (1.07,1.08)	+7%*
Early GLP (1999 – 2000)	12.77 (12.66-12.88)	0.96 (0.95,0.97)	-4%*	9.48 (9.46-9.50)	1.06 (1.06,1.06)	+6%*
Pre-GLP (1996 – 1997)	13.28 (13.18-13.38)	1.00 (REF)	-	8.94 (8.92-8.96)	1.00 (REF)	-

*P < 0.0001 **P < 0.001 ***P < 0.05

¹ Rates were calculated per 100 drivers (licensed driver-time was not available for the experienced driver groups).

² Study group membership was defined by the year in which New drivers obtained their Learner licence. Experienced drivers were time-matched to the study groups using their birth date, rather than a licence issue date, as their intake date.

The data in Table 20 show that, in contrast to the pattern observed for the comparison of the New driver groups (GLP drivers having *lower* crash involvement rates than Pre-GLP drivers), both of the GLP time-matched Experienced driver groups had *higher* crash rates than the Pre-GLP time-matched group - in every category of crashes except that involving casualty crashes. And even for casualty crashes, the differences between the rates observed for the GLP to Pre-GLP comparisons were larger (by 8-9 percentage points) than those observed between the relevant Experienced driver groups. These results suggest that although there may have been some influence of factors other than GLP on the casualty crash rates of New drivers, the effects of such factors would have been small and in most cases would likely have had a negative rather than positive effect on the observed New driver rates. Therefore, to the extent that the experienced driver crash involvement rates are a valid indicator of the influence of these other factors, it can be concluded that they have not played an important role in contributing to the reductions in the crash rates observed for GLP New drivers relative to the Pre-GLP comparison group.

In the next section, two other factors that could influence the results of comparisons between GLP and Pre-GLP crash rates are examined: age at licensure and gender. As noted previously, both age and gender are known risk factors for collisions, with males and younger drivers tending to have higher crash rates than older and female drivers. Although most of the drivers in both the GLP and Pre-GLP cohorts are young drivers (aged 16 to 24), a higher percentage of drivers obtained their Learner licence at the age of 16 in the GLP cohorts, and a higher percentage of drivers obtained their Learner licence when they were over 24 in the Pre-GLP cohorts. Likewise, the GLP cohorts had slightly higher percentages of males than females. Due to their strong associations with crash involvement, these differences in the age and gender distributions could be attenuating the estimated GLP effect. Therefore, even though the shifts observed in the age and gender distributions could be unintended negative consequences associated with the implementation of GLP (in the sense that GLP is prompting more young males to obtain their licences sooner than they might have if GLP had not been implemented), it is important to exclude their effect in order to estimate more precisely the impact of the GLP program components.

Age and Gender Effects on New Driver Crash Involvement Rates. Table 21 shows the estimated relative risks (and their 95% confidence intervals) for the short-term and longer-term New driver crash involvement rates after adjustment for differences between the driver cohorts in their age and gender distributions. As anticipated, adjusting for age and gender differences between the groups enhanced the GLP effect. For example, before adjustment, when all crashes were included in the analysis, the GLP groups were found to have crash involvement rates that were about 26% lower during their first year of licensure than the Pre-GLP comparison group and about 12% lower during the first four years of licensure. After adjustment, these same comparisons resulted in estimated rates that were 32% lower for GLP drivers during their first year of licensure and about 17-18% lower during their first four years of licensure. This suggests that about 5% of the overall GLP effect was being masked by the confounding influence of age and gender differences between the study groups.

The results presented in Table 21 were based on the inclusion of all of the drivers in each cohort, regardless of their progression through the licensing process. As discussed in the previous section, however, an important aim of this evaluation is to estimate the impact that GLP has on the crash rates of drivers who have been exposed to all of the program elements. Unfortunately, at the time the study was undertaken, fewer than 30% of the GLP drivers had progressed beyond the Novice stage to Full privilege licensure (Table 6). Consequently, it was not possible to assess the full impact of GLP on New driver crash rates. However an analysis was undertaken to assess the impact of GLP on the crash involvement rates of drivers who had at least progressed to the Novice stage (some of whom would also have obtained their Full Privilege licence during the specified periods of licensure). Table 22 shows the results of these analyses.

Table 21: Estimate Age and Gender-Adjusted Relative Risks of Crash Involvement for All New Drivers by Period of Licensure

Period of Licensure When Crashes Occurred (by Study Group)	All Crashes		Liabile Crashes Only		Casualty Crashes Only		Material Damage Only	
	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)
1st 1 Year of Licensure								
Full GLP (2001-2002)	0.68 (0.67, 0.70)	-32%*	0.70 (0.68, 0.72)	-34%*	0.62 (0.59, 0.64)	-38%*	0.71 (0.69, 0.73)	-29%*
Early GLP (1999-2000)	0.68 (0.67, 0.70)	-32%*	0.69 (0.67, 0.71)	-31%*	0.63 (0.60, 0.65)	-37%*	0.70 (0.69, 0.72)	-30%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
Contrast:								
Full GLP (2001-2002)	1.00 (0.98, 1.03)	0%	1.01 (0.98, 1.04)	+1%	0.98 (0.94, 1.03)	-2%	1.01 (0.98, 1.04)	+1%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 2 Years of Licensure								
Full GLP (2001 – 2002)	0.78 (0.77, 0.79)	-22%*	0.81 (0.79, 0.82)	-19%*	0.72 (0.70, 0.74)	-28%*	0.80 (0.79, 0.82)	-20%*
Early GLP (1999 – 2000)	0.81 (0.80, 0.82)	-19%*	0.82 (0.80, 0.83)	-18%*	0.75 (0.73, 0.77)	-25%*	0.83 (0.82, 0.85)	-17%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
Contrast:								
Full GLP (2001-2002)	0.97 (0.95, 0.98)	-3%*	0.99 (0.97, 1.00)	-1%	0.96 (0.94, 0.99)	-4%**	0.97 (0.95, 0.98)	-3%*
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 3 Years of Licensure								
Full GLP (2001-2002)	0.80 (0.79,0.81)	-20%*	0.83 (0.82,0.84)	-17%*	0.73 (0.72,0.75)	-26%*	0.82 (0.81,0.83)	-18%*
Early GLP (1999-2000)	0.83 (0.82,0.84)	-17%*	0.85 (0.84,0.86)	-15%*	0.78 (0.76,0.79)	-22%*	0.85 (0.84,0.86)	-15%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
Contrast:								
Full GLP (2001-2002)	0.97 (0.95,0.97)	-4%*	0.98 (0.96,0.99)	-2%**	0.95 (0.93,0.97)	-5%*	0.97 (0.95,0.98)	-3%*
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 4 Years of Licensure								
Full GLP (2001)	0.82 (0.81,0.84)	-18%*	0.87(0.85,0.88)	-13%*	0.77 (0.76,0.80)	-22%*	0.84 (0.83,0.86)	-16%*
Early GLP (1999 – 2000)	0.83 (0.82,0.84)	-17%*	0.86 (0.85,0.87)	-14%*	0.79 (0.78,0.81)	-20%*	0.84 (0.84,0.86)	-15%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
Contrast:								
Full GLP (2001)	0.99 (0.98,1.01)	-1%	1.01 (0.99,1.02)	1%	0.98 (0.95,1.01)	-2%	1.00 (0.98,1.01)	0%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-

*P < 0.0001 **P < 0.005 ¹CI = Confidence Interval

Table 22: Estimated Age- and Gender-Adjusted Relative Risks of Crash Involvement for New Drivers who Advanced to the Novice Stage within each Period of Licensure

Period of Licensure When Crashes Occurred (by Study Group)	All Crashes		Liabile Crashes Only		Casualty Crashes Only		Material Damage Only	
	Relative Risk (95% CI) ¹	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)
1st Year of Licensure								
Full GLP (2001-2002)	0.80 (0.78, 0.82)	-20%*	0.81 (0.79, 0.83)	-19%*	0.72 (0.69, 0.75)	-28%*	0.83 (0.81, 0.86)	-17%*
Early GLP (1999-2000)	0.80 (0.78, 0.82)	-20%*	0.80 (0.77, 0.82)	-20%*	0.72 (0.69, 0.75)	-28%*	0.83 (0.81, 0.86)	-17%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	1.00 (0.98, 1.03)	0%	1.00 (0.98, 1.04)	0%	1.00 (0.95, 1.05)	0%	1.00 (0.97, 1.03)	0%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 2 Years of Licensure								
Full GLP (2001 – 2002)	0.87 (0.85, 0.88)	-13%*	0.89 (0.87, 0.91)	-11%*	0.80 (0.78, 0.82)	-20%*	0.90 (0.88, 0.91)	-10%*
Early GLP (1999 – 2000)	0.88 (0.87, 0.89)	-12%*	0.88 (0.87, 0.90)	-12%*	0.81 (0.79, 0.83)	-19%*	0.91 (0.90, 0.93)	-9%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	0.98 (0.97, 1.00)	-2%**	1.01 (0.99, 1.03)	+1%	0.99 (0.96, 1.02)	-1%	0.98 (0.97, 1.00)	-2%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 3 Years of Licensure								
Full GLP (2001-2002)	0.85 (0.84,0.86)	-17%*	0.89 (0.87,0.90)	-11%*	0.79 (0.78,0.81)	-21%*	0.88 (0.87,0.89)	-12%*
Early GLP (1999-2000)	0.87 (0.86,0.88)	-13%*	0.89 (0.88,0.90)	-11%*	0.82 (0.80,0.83)	-18%*	0.90 (0.89,0.91)	-10%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
Contrast:								
Full GLP (2001-2002)	0.98 (0.97,0.99)	-2%**	1.00 (0.98,1.01)	0%	0.97 (0.95,0.99)	-3%**	0.98 (0.97,1.00)	-2%**
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 4 Years of Licensure								
Full GLP (2001)	0.86 (0.85,0.87)	-14%*	0.90 (0.88,0.92)	-10%*	0.81 (0.79,0.83)	-19%*	0.88 (0.86,0.90)	-12%*
Early GLP (1999 – 2000)	0.87 (0.86,0.87)	-14%*	0.89 (0.88,0.90)	-11%*	0.82 (0.81,0.84)	-18%*	0.88 (0.87,0.89)	-12%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
Contrast:								
Full GLP (2001)	0.99 (0.98,1.01)	-1%	1.01 (0.99,1.03)	1%	0.98 (0.96,1.01)	-2%	1.00 (0.98,1.04)	-0%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-

*P < 0.0001 ** P<0.05

¹ CI = Confidence Interval

The results shown in Tables 21 and 22, in combination with the findings of the comparison to Experienced driver crash rates, and the analysis of unadjusted New driver rates (Tables 17 and Table 18), suggest three things: 1) that GLP had a strong and positive impact on the crash rates of New drivers, 2) that the effect remained, although its magnitude was reduced, when the analyses were restricted to drivers who progressed to the Novice stage during each period of licensure, and 3) that about 5-6% of the estimated size of the GLP program effect was attributable to the higher percentage of young male drivers in the GLP cohorts.

With respect to the comparison of the Full and Early GLP program, the estimated relative risks for the first two and three years of licensure were found to be significantly lower (by about 2-5%) for the Full GLP group when all New drivers were included in the analyses (Table 21). The effects disappeared or were reduced in magnitude when only those drivers who advanced to the Novice stage were included (Table 22). No significant differences were found for either group during the first year of licensure or first four years of licensure. As the primary components added at the end of 2000 were the enhanced knowledge and Class 7 (and 8) road tests, it is possible that the effects may be more pronounced when the analyses are examined by stage of licensure (Learner and Novice stages analysed separately). However, the lack of an effect during the first year of licensure suggests that the implementation of the enhanced knowledge test may have had a limited impact. Nonetheless, the findings reported here may be confounded by the inclusion of drivers who obtained their Novice licence during this period. Similarly, to determine whether the addition of the level 1 road test had an impact it is important to examine the crash rates of Novice drivers alone.

Relative Impact of the GLP Learner and Novice Stage Conditions and Restrictions on GLP New Driver Crash Rates. In the previous section the impact of GLP on the short- and longer-term crash involvement rates of all New drivers was examined. All of the New driver crash involvements occurring within the first four years of licensure were used to compute and compare crash rates across the study groups. No distinction was made based on whether a crash occurred while a driver held a Learner or Novice⁴ licence. As was shown in Table 7, however, the percentage of time spent in the Learner stage was much higher for GLP drivers than for Pre-GLP drivers. And, although the percentage of Learner-time did decline over time, it remained higher for GLP drivers throughout their first four years of licensure.

Given this imbalance in Learner-time it would be expected that New drivers' experiences during the Learner stage would have more of an influence on GLP New driver crash rates than on Pre-GLP rates. The extent of the effect is reflected in Table 23 which shows the association between the length of time drivers spent in the Learner stage and the New driver crash involvement rates observed in each period of licensure. The observed relationship is strong and negative indicating that the more time New drivers spend in the supervised Learner stage, the less likely they are to be involved in a crash. This is not a surprising result. It is mandatory for Learner drivers to be accompanied by a supervising adult at all times. Consequently, the Learner stage tends to be a time when New drivers are at a low risk of crash involvement. This is exemplified in Table 24 which shows the Learner driver crash rates, by program, for New drivers who graduated to the Novice stage within their first four years of licensure. The magnitudes of the Learner crash rates are much smaller than the New driver rates shown in Table 14, and the difference is even more dramatic when compared to the Novice crash rates shown in Table 24. The low risk associated with the Learner stage is one of the main reasons the minimum period was extended with the introduction of GLP and then further extended with GLPe.

⁴ For the purposes of these analyses, GLP and Pre-GLP Novice driver crash rates were computed using crashes that occurred after the drivers obtained their first solo licence. For GLP drivers, some of these crashes occurred after they obtained their Full Privilege licence. Due to the small percentage of GLP New drivers who progressed to Full Privilege licensure during the study period, no separate analysis of GLP Novice and Full Privilege crash rates was included here.

Table 23: Percentage Change in New Driver Crash Involvement Rates by the Number of Months Spent in the Learner Stage - for Drivers who Advanced to the Novice Stage within each Period of Licensure

Period of Licensure	Length of Learner Stage	% Change in Crash Involvement Rate (from Reference Group)
First Year of Licensure (All New Driver Crash Involvements)	9 months or more	-76%*
	6 - <9 months	-43%*
	3 - <6 months	-17%*
	less than 3 months	(Ref)
First Two Years of Licensure (All New Driver Crash Involvements)	18 months or more	-78%*
	12 - <18months	-55%*
	9 - <12 months	-43%*
	6 - <9 months	-22%*
	3 - <6 months	-9%*
less than 3 months	(Ref)	
First Three Years of Licensure (All New Driver Crash Involvements)	24 months or more	-73%*
	18 -24 months	-57%*
	12 - <18months	-42%*
	9 - <12 months	-35%*
	6 - <9 months	-19%*
	3 - <6 months	-10%*
less than 3 months	(Ref)	
First Four Years of Licensure (All New Driver Crash Involvements)	24 months or more	-63%*
	18 -24 months	-47%*
	12 - <18months	-35%*
	9 - <12 months	-30%*
	6 - <9 months	-16%*
	3 - <6 months	-10%*
less than 3 months	(Ref)	

Interestingly, as shown in Table 24, the Novice crash rates obtained for GLP drivers during each of the periods examined were higher than those obtained for the comparison group of Pre-GLP drivers. It should be noted, however, that just as GLP drivers spent more of each period of licensure in the Learner stage, they spent less time in the Novice stage. It is well known that New drivers are at their highest risk of crash involvement during the first few months of unsupervised driving (Wiggins, 2004; Mayhew, et. al., 2003). Over time, the risk begins to decline as the drivers gain experience and maturity. Consequently, the GLP Novice rates shown in Table 24 may simply reflect that GLP Novice drivers spent less of their total period of licensure in the Novice stage and were, therefore still at a greater risk of crash involvement than their Pre-GLP counterparts. In chapter 5, this possibility is explored further by examining the crash involvement rates of GLP and Pre-GLP drivers matched on Novice driver-time, rather than on total driver-time.

Table 24: Learner and Novice Driver Crash Involvement Rates¹ (per 100 licensed years) for New Drivers who Advanced to the Novice stage within each Period of Licensure

Crash Type by Licence Stage and Years of Licensure	Pre-GLP 1996-1997	Early GLP 1999-2000	Full GLP 2001-2002
LEARNER STAGE:			
All Crashes:			
1 st Year	4.36 (4.14-4.58)	3.19 (3.01-3.37)	3.32 (3.14-3.50)
1 st Two Years	4.26 (4.05-4.45)	3.18 (3.04-3.32)	3.22 (3.07-3.37)
1 st Three Years	4.26 (4.07-4.45)	3.14 (3.01-3.27)	3.26 (3.09-3.43)
1 st Four Years	4.26 (4.07-4.45)	3.12 (2.99-3.25)	3.53 (3.25-3.81)
Liable Crashes:			
1 st Year	2.65 (2.60-2.68)	1.96 (1.92-2.00)	2.05 (2.01-2.09)
1 st Two Years	2.64 (2.61-2.67)	2.00 (1.97-2.03)	2.00 (1.97-2.03)
1 st Three Years	2.65 (2.63-2.67)	2.01 (1.99-2.03)	2.02 (2.00-2.04)
1 st Four Years	2.65 (2.63-2.67)	1.99 (1.97-2.01)	2.19 (2.15-2.23)
Casualty Crashes:			
1 st Year	1.27 (1.15-1.39)	0.86 (0.77-0.95)	0.86 (0.77-0.95)
1 st Two Years	1.26 (1.15-1.37)	0.90 (0.82-0.98)	0.86 (0.78-0.94)
1 st Three Years	1.26 (1.15-1.37)	0.91 (0.84-0.98)	0.86 (0.77-0.95)
1 st Four Years	1.26 (1.15-1.37)	0.91 (0.84-0.98)	1.02 (0.87-1.17)
Material Damage Only Crashes:			
1 st Year	3.09 (2.91-3.27)	2.33 (2.18-2.48)	2.45 (2.29-2.61)
1 st Two Years	3.00 (2.84-3.16)	2.28 (2.16-2.40)	2.36 (2.23-2.49)
1 st Three Years	3.00 (2.84-3.16)	2.23 (2.12-2.34)	2.37 (2.23-2.51)
1 st Four Years	3.00 (2.84-3.16)	2.21 (2.10-2.32)	2.51 (2.27-2.75)
NOVICE STAGE:			
All Crashes:			
1 st Year	30.36 (29.96-30.76)	38.67 (37.96-39.38)	38.34 (37.64-39.04)
1 st Two Years	27.49 (27.25-27.73)	31.75 (31.41-32.09)	30.48 (30.16-30.82)
1 st Three Years	26.80 (26.61-26.99)	29.00 (28.76-29.24)	27.50 (27.23-27.77)
1 st Four Years	26.16 (26.00-26.32)	27.02 (26.83-27-21)	26.27 (25.89-26.65)
Liable Crashes:			
1 st Year	20.16 (19.83-20.49)	26.76 (26-17-27.35)	26.63 (26.05-27.21)
1 st Two Years	16.92 (16.73-17.11)	20.10 (19.83-20.37)	19.76 (19.49-20.03)
1 st Three Years	15.70 (15.56-15.84)	17.66 (17.47-17.85)	17.08 (16.87-17.29)
1 st Four Years	14.77 (14.65-14.89)	15.93 (15.78-16.08)	15.83 (15.54-16.12)
Casualty Crashes:			
1 st Year	9.34 (9.12-9.56)	10.88 (10.50-11.26)	10.75 (10.38-11.12)
1 st Two Years	8.47 (8.34-8.60)	9.02 (8.84-9.20)	8.74 (8.56-8.92)
1 st Three Years	8.25 (8.15-8.35)	8.38 (8.25-8.51)	7.91 (7.76-8.06)
1 st Four Years	7.97 (7.88-8.06)	7.85 (7.75-7.95)	7.57 (7.37-7.77)
Material Damage Only Crashes:			
1 st Year	21.02 (20.68-21.36)	28.08 (27.48-28.68)	27.59 (27.00-28.18)
1 st Two Years	19.02 (18.82-19.22)	22.73 (22.44-23.02)	21.75 (21.47-22.03)
1 st Three Years	18.55 (18.39-18.71)	20.62 (20.42-20.82)	19.59 (19.36-19.82)
1 st Four Years	18.18 (18.05-18.31)	19.16 (19.00-19.32)	18.70 (18.38-19.02)

¹ Rates were calculated as the number of Learner, or Novice, crashes divided by the amount of licensed Learner, or Novice, licensed-years accumulated during each period of licensure.

4.2.5 GLP Effects on Learner Crash Involvement Rates

In this section, the effectiveness of the GLP Learner stage components and of the full implementation of GLP (which included the enhanced knowledge and Class 7 and 8 road tests) on Learner crash involvement rates are examined. As mentioned above, due to the need to time match the amount of Novice licensure to ensure more equal levels of risk, the evaluation of the effectiveness of the GLP Novice stage components will be presented in chapter 5.

Table 25 shows the results of the Poisson regression analyses undertaken to assess the impact of the GLP Learner stage components on Learner driver crash rates. For these analyses only those drivers who advanced to the Novice stage (i.e., who completed all of the Learner stage components including their first road test) during the specified period of licensure were included. As well, only the results obtained after adjustment for the known confounders of age- and gender are presented.

The relative risk ratios shown in Table 25 indicate that, after controlling for age and gender differences between the groups, GLP Learner drivers had crash rates that were consistently lower than those of Pre-GLP Learners and the difference was statistically significant in almost every category examined. GLP Learners who advanced to the Novice stage within their first year of licensure had Learner crash rates that were from 8% to 24% lower than their Pre-GLP counterparts; and GLP Learners who advanced to the Novice stage within their first two years of licensure had Learner crash rates that were from 14% to 26% lower than their Pre-GLP counterparts.

The comparison of Early to Full GLP Learner crash rates provided no clear evidence to suggest that the effectiveness of GLP improved after the addition of the enhanced knowledge and Class 7 (or 8) road tests (the main components added at the end of 2000). Across most categories of crashes and timelines, Learner drivers in the Full GLP group had slightly higher crash rates than those in the Early GLP group. However, none of the differences were statistically significant.

Learner Drivers and the Enhanced Knowledge and Level 1 Road Test. The analyses described above provided no evidence that full implementation of GLP, including the introduction of the enhanced knowledge and class 7 and 8 road tests, was associated with lower crash involvement rates for GLP Learner drivers. Although it is probably not surprising that no particular road safety benefit was found to be associated with the introduction of the Class 7 (or 8) road test (since it comes at the end of the Learner stage), a positive association might have been anticipated from the introduction of the enhanced knowledge test – at least during the first year of licensure. Knowledge tests are generally designed to assess knowledge and awareness of the rules of the road and basic standards of road safety. The old test (taken by the Early GLP group) consisted of 20 multiple-choice questions, many of which were taken verbatim from the driver guides. The enhanced test was designed to be more closely aligned with the goals of GLP and, although based on information in the guide, did not extract items verbatim. It was designed to emphasize the ‘thinking driver’. The new Class 7 knowledge test contains 50 multiple-choice questions; the Class 8 test contains 40 items. Internal consistency measures were computed during field trials of the test and were found to be 0.84 for the Class 7 test items and 0.83 for the Class 8 items. A report summarizing the development of the knowledge test and describing the field trials is included in Appendix A. No attempt was made in the field trials to assess whether the new test had more predictive validity for Learner driver crash involvements than the old test. However, the results obtained in this study suggest that passing the knowledge test is not predictive for crashes. This does not mean that it has no predictive validity. It only indicates that it does not appear to predict crash involvement. It may predict ‘thinking drivers’ but this was not assessed.

Table 25: Estimated Age and Gender- Adjusted Relative Risks of Learner Crash Involvement for Drivers who Advanced to the Novice stage within each Period of Licensure

Period of Licensure When Crashes Occurred (by Study Group)	All Crashes		Liabile Crashes Only		Casualty Crashes Only		Material Damage Only	
	Relative Risk (95% CI) ¹	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)
1st Year of Licensure								
Full GLP (2001-2002)	0.87 (0.80, 0.94)	-13%**	0.86 (0.78, 0.94)	-14%*	0.76 (0.66, 0.88)	-24%**	0.91 (0.83, 1.00)	-9%
Early GLP (1999-2000)	0.85 (0.79, 0.92)	-15%*	0.84 (0.76, 0.92)	-16%*	0.77 (0.67, 0.90)	-23%**	0.88 (0.80, 0.96)	-12%
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	1.02 (0.94, 1.10)	2%	1.03 (0.93, 1.13)	3%	0.98 (0.84, 1.14)	-2%	1.04 (0.95, 1.14)	4%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 2 Years of Licensure								
Full GLP (2001 – 2002)	0.85 (0.79, 0.91)	-15%*	0.83 (0.76, 0.91)	-17%*	0.77 (0.67, 0.87)	-23%*	0.88 (0.82, 0.96)	-12%***
Early GLP (1999 – 2000)	0.85 (0.79, 0.90)	-15%*	0.85 (0.78, 0.92)	-15%*	0.81 (0.72, 0.92)	-19%*	0.86 (0.79, 0.93)	-14%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	1.00 (0.94, 1.07)	0%	0.98 (0.90, 1.07)	-2%	0.94 (0.83, 1.07)	-6%	1.02 (0.94, 1.10)	2%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 3 Years of Licensure								
Full GLP (2001-2002)	0.85 (0.79, 0.91)	-15%*	0.83 (0.76, 0.91)	-17%*	0.78 (0.69, 0.89)	-22%**	0.88 (0.81, 0.95)	-12%***
Early GLP (1999-2000)	0.82 (0.77, 0.88)	-18%*	0.83 (0.77, 0.90)	-17%*	0.81 (0.72, 0.91)	-19%**	0.83 (0.77, 0.89)	-17%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	1.03 (0.96, 1.10)	3%	1.00 (0.92, 1.09)	-0%	0.97 (0.85, 1.09)	-3%	1.06 (0.98, 1.14)	6%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 4 Years of Licensure								
Full GLP (2001) ²	0.91 (0.82,1.00)	-9%	0.89 (0.79,1.00)	-11%	0.89 (0.74,1.05)	-12%	0.92 (0.82,0.103)	-8%
Early GLP (1999 – 2000)	0.81 (0.76,0.86)	-19%*	0.81 (0.76,0.88)	-18%*	0.80 (0.71,0.90)	-20%*	0.81 (0.76,0.88)	-19%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
Contrast:								
Full GLP (2001) ²	1.12 (1.02, 1.22)	12%	1.09 (0.97, 1.22)	9%	1.11 (0.93, 1.30)	11%	1.13 (1.01, 1.25)	13%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-

*P < 0.0001 **P < 0.001 ***P<0.01 ¹ CI = Confidence Interval ²Small sample size

A second question of interest for the evaluation was to what extent performance on the knowledge test may have influenced the crash rates of drivers in the Learner stage? Were drivers who passed the test on the first or second attempt more or less likely to be crash-involved once they obtained their Learner's licence? Unfortunately, due to system changes that were made when the enhanced knowledge test was introduced (Release 2.2) it was not possible to compare performance on the old and new test. The number of attempts taken to pass the test was only available for drivers who took the enhanced test. Thus, the analysis described below does not provide insights into the relative merits of the old versus the new test. However it does permit an exploration of relationships between performance on the test and crash involvements among Learner drivers.

To determine whether Learner crash involvement rates were associated with test performance a Poisson regression analysis was undertaken. Drivers were categorized according to whether they passed the knowledge test on the first attempt, second attempt, or whether it took them three or more attempts to pass. For these analyses, only the crashes that occurred during the first year of Learner driving were included. All Learner crashes were used regardless of liability or severity. Age and gender were included in the regression model to take into account their potentially confounding effects.

A total of 107,122 drivers from the Full GLP Learner cohort were used in the analysis. All of these drivers took the Class 7 Knowledge test. A further 185 completed the Class 8 test but, due to the small numbers, were excluded from the analysis. Of the drivers included, 57,516 (53.7%) passed the knowledge test on the first attempt, 29,070 (27.1%) passed on the second attempt, and the remaining 20,536 (19.2%) took three or more attempts. The range of attempts was from 1 to 29, with 286 people taking 10 or more attempts to pass.

After adjustment for age and gender, it was found that drivers who passed on the first attempt, or on the second attempt, had Learner crash involvement rates that were significantly lower ($P < 0.001$) lower than the rate estimated for drivers who took three or more attempts. The estimated relative risks and their 95% confidence intervals were 0.79 (0.69, 0.91) and 0.76 (0.65, 0.89), respectively. Only crashes that occurred during the Learner stage in the drivers' first year of licensure were used in the analysis. Similar results were obtained whether all Learner crashes were used, Learner liable crashes only, Learner casualty crashes or material damage only crashes.

Although interesting, these findings are simply associations. It is not possible at this point to conclude that the ease with which drivers pass the knowledge test is causally related to their involvement in crashes during the Learner stage. Many other factors may explain the association. There could be socio-cultural issues, socio-economic issues, or exposure issues – to name a few. More research will be required to understand the mechanisms and factors that may be contributing to the identified association.

One of the potentially confounding factors that will be explored in this study is participation in an approved driver education course. This factor was not included in the regression models described above. But, if found to be associated with the crash risks of Learner drivers and with their performance on the knowledge test (in the sense that more drivers who did well or poorly on the knowledge test participated in the course), it could be a factor influencing the results reported above. Possible associations between performance on the knowledge test, completion of an ICBC approved driver education course, and Learner driver crash rates will be explored further below.

ICBC-Approved Driver Education and the Crash Involvement Rates of Learner Drivers. Although not a true component of GLP, the ICBC-approved driver education course was developed and implemented concurrently with GLP and plays an important role in the driver licensing process. It is also intrinsically linked with GLP as a result of the incentive used to promote participation in the course; drivers who complete the course, and submit a declaration of completion (DOC) to ICBC, become eligible to attempt their level 1 road test and exit the Learner stage up to three months sooner than other GLP Learner drivers.

Relationships between the approved driver education course, early Novice licensure, and the crash rates of Novice drivers will be examined in more detail in the next section of this report (chapter 5). Here, attention is limited to an exploration of relationships between performance on the knowledge test, participation in an approved driver education course and Learner crash involvement rates in the first year of licensure. In essence, the analysis is attempting to investigate whether there is any evidence of self-selection into the course based on knowledge test performance.

Approximately 31% (43,117) of the 138,770 Learner drivers who advanced to the Novice stage within their first year of licensure submitted a DOC and applied for early Novice licensure. Table 26 shows the estimated relative risks of Learner crash involvement for these drivers when compared to those who did not submit a DOC. The relative risks shown in Table 26 were obtained after taking into account the effects of age, gender, and the particular version of the GLP program to which the drivers were exposed (Early versus Full). As can be seen, the estimated relative risks are significantly greater than one indicating a higher rate of crash involvement for DOC Learner drivers than No DOC Learner drivers.

Table 26: Estimated Relative Risks of Learner Crash Involvement for New Drivers who Advanced to the Novice stage within their First Year of Licensure by DOC⁺ Status – Adjusted for Age, Gender, and GLP Program (Early versus Full).

DOC Status	All Crashes		Liabile Crashes		Casualty Crashes		Material Damage Only Crashes	
	RR (95% CI ¹)	% Difference (from REF)	RR (95% CI)	% Difference (from REF)	RR (95% CI)	% Difference (from REF)	RR (95% CI)	% Difference (from REF)
DOC	1.57 (1.44-1.71)	57%*	1.60 (1.43-1.79)	60%*	1.41 (1.18-1.68)	41%*	1.63 (1.47-1.80)	63%*
No DOC	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-

*P<0.0001

⁺DOC = Declaration of Completion certificate

¹CI=Confidence Interval

The finding of a significant association between DOC status and Learner crash involvement rates is interesting but needs to be interpreted with caution. Due to the time incentive offered to promote participation, the drivers in the DOC group moved through the Learner stage much more quickly than those in the No DOC group. As indicated in the Year 3 evaluation, many of these drivers took the approved course specifically so that they could obtain their Novice licence sooner. Consequently, their motivation and, possibly, their driving exposures may have been different from those in the No DOC group, and these differences may have put them at greater risk of crash involvement. In an effort to minimize some of the exposure differences between the two groups, the analysis reported here was limited to drivers who obtained their Novice licence during their first year of licensure. Thus, the No DOC group would have been limited to drivers who were also motivated to move to the Novice stage fairly quickly. However, this was unlikely to remove all exposure related differences between the two groups.

The issue of exposure, in relation to driver education in the Learner stage is important, although to date it remains unclear. A recent study conducted in Ontario (Zhao, et al., 2006) reported similar findings for the association between learner crash rates and driver education. But after controlling for exposure the authors reported that the relationship reversed; drivers who took driver education had lower Learner crash rates than those who did not. However, no association was observed between DOC status and Learner driver exposure in the year 3 evaluation, nor in a more recent study conducted in BC and Oregon (Mayhew, et. al., 2006) in which teen drivers who took driving lessons or a traffic safety education course had significantly fewer hours of driving practice in the Learner stage than teens who did not. More research on the role of

exposure in the Learner stage and its relationship to driver education and Learner crash involvement rates is needed.

To explore associations with performance on the knowledge test, drivers in the DOC group were compared to drivers in the No DOC group according to whether or not they passed the test on the first or second attempt, or whether it took them 3 or more attempts. About 57% of the DOC group passed on the first attempt compared to 53% of the No DOC group; 26% of the DOC group passed on the second attempt compared to 27% of the No DOC group; and 17 % of the DOC group took three or more attempts compared to 20% of the No DOC groups. Although the percentages were similar for the two groups, they were found to be statistically significantly different (Chi Square = 83.7, df=2, P<0.0001). Although the sample sizes used in this assessment were large, making this a powerful test statistically, the magnitude of the differences in percentages may still reflect a small selection bias differentiating between DOC and No DOC drivers.

To determine whether the association between DOC status and performance on the knowledge test was strong enough to confound the previously observed relationship between test performance and Learner driver crash involvements, a second series of Poisson regression models was analyzed using DOC status (DOC, No DOC) as a control variable. As noted earlier, only the drivers from the Full GLP cohort could be included in this analysis because the number of attempts at both knowledge and road tests were not retained in the driver system after December 1, 2000. An examination of the Full GLP group revealed that 34% of the drivers in that group submitted a DOC compared to 31% of the drivers from the Full and Early GLP groups combined. Thus, the composition of the two groups, with respect to their DOC status, was similar.

With DOC status included in the models, the estimated relative risks of Learner crash involvement by the number of attempts at the road test were found to be the same as those obtained from the models in which DOC status was not included. For example, when DOC status was not included in the model (see page 58) the relative risk for Learner crash involvement for those who passed the knowledge test on the first attempt was estimated to be 0.79, indicating a 21% lower rate than those who took three or more tries. After adding DOC status to the model the relative risk was still 0.79 (95% Confidence interval: 0.69, 0.90). A similar result was obtained with drivers who passed on the second attempt. Both before and after adjusting for DOC status, this group's Learner crash rate remained 24% lower than that obtained for those who took three or more attempts (Relative Risk = 0.76 with 95% Confidence interval of 0.65, 0.89). Thus despite a significant association between DOC status and Learner crash involvement rates, DOC status was not found to be an important confounder in the association between performance on the knowledge test and the crash involvement rates of Learner drivers. The relationship appears to be consistent for both sets of drivers (DOC and No DOC) and, consequently, there doesn't appear to have been any self-selection into an approved course by drivers who had an easy or difficult time passing the test.

4.3 Summary

This study showed that GLP has successfully reduced the crash involvement rates of New drivers during their first four years of licensure. The reduction was greatest in the first year of licensure (when the impact of the GLP extended Learner stage was greatest) but remained present and statistically significant throughout the first four years. The estimated magnitude of the effect ranged from about 26% during the first year of licensure to about 12% during the first four years of licensure. These findings could not be explained by factors external to GLP. Time-matched Experienced driver groups were generally found to have higher crash involvement rates when compared over the same periods as the GLP and Pre-GLP drivers. Thus, the effects observed for GLP drivers are most likely attributable to the program.

In the preliminary Year 3 evaluation report (Wiggins, 2004), the New driver crash rate reduction attributed to GLP was reported to be about 16%. The crash rate comparison was based on the first group of drivers to participate in GLP and was based on a maximum of 3.4 years of follow-up and an average of 2.5 years of licensed-time per driver. To determine whether the results of the present evaluation would be consistent with those reported in the Year 3 evaluation, the data from the present study were reanalyzed using the same computational methods as were used previously. When computed in this way, and compared to the 1997 Pre-GLP rates, the overall age- and gender-adjusted crash rates for the 1999, 2000, and 2001 GLP driver cohorts were lower by about 13%, 16%, and 16% respectively. When compared to the rates of the 1996 Pre-GLP cohort, the GLP rates were lower by about 20%, 24%, and 23% respectively – producing an average reduction of about 17% across all groups. Clearly, the success of GLP has been enduring and stable.

As in the year 3 evaluation, the relative contributions of the Learner and Novice stages were investigated here. And, as reported in the preliminary evaluation, the primary factor contributing to the crash rate reduction associated with GLP was its longer Learner stage. Not unexpectedly, the extended Learner stage was found to have had the most significant impact on the overall New driver crash involvement rates during the first three years of licensure. By the end of the third year, most of the drivers in the GLP cohorts had progressed to the Novice stage, and the impact of the long learner stage had begun to diminish.

The GLP effect on the New driver crash rates was not, however, solely due to the impact of the extended Learner stage. Lower crash involvement rates were also obtained for GLP drivers while they were in the Learner stage. This suggests that the GLP Learner stage restrictions and conditions may also be having an impact. Issues relating to compliance were also apparent, however, and if successfully addressed suggest that even further crash rate reductions may be obtained.

A comparison of the crash involvement rates computed using crashes that occurred after drivers moved into the Novice stage revealed higher rates for the GLP than Pre-GLP Novice driver groups. However, due to the longer GLP Learner stage, the comparisons of GLP and Pre-GLP Novice rates calculated in this manner were confounded by the fact that the GLP drivers had spent less of each total period of licensure in the Novice stage. As noted earlier, previous research has shown that drivers are at their highest risk during the first few months of solo licensure. Consequently, by comparing the Novice driver rates using time-frames defined by the total period of licensure (from when they obtained their first Learner), the actual driver risks for Pre-GLP and GLP Novice drivers were quite different. Therefore, to more accurately estimate the impact of GLP on Novice drivers, a more detailed evaluation of the effects of the GLP Novice stage components and restrictions was conducted and is described in the next chapter (Study 2). The information on Novice drivers included here was provided for descriptive purposes only and is not intended to reflect the effectiveness, or lack thereof, of the GLP Novice stage.

Another interesting finding of this study was that the implementation of GLP appeared to have shifted the age of licensure downwards. Although there was only a minor shift in the gender distribution, a higher percentage of younger drivers obtained their Learner's licence in the GLP groups than in the Pre-GLP groups, and a higher percentage of older drivers obtained their Learner's in the Pre-GLP groups than in the GLP groups. In the early years of GLP some of this effect may have been due to age-eligible individuals entering the Pre-GLP system in an effort to avoid the restrictions of the new program. However, the shift was still apparent for drivers who obtained their licence in 2002. This suggests that the length of the licensing process may be prompting some drivers to get started sooner. The younger age of drivers in GLP was found to counteract the benefits of GLP by about 5 or 6%. Thus, for example, after adjusting for age (and gender) the estimated New driver crash involvement rate for GLP drivers in their first year of licensure was about 32%, 6 percentage points higher than the difference observed before adjustment.

Although interesting, the evaluation results based on the first four years of licensure for all New drivers do not provide an estimate of the program's effect for drivers who have completed all of its components. To fully evaluate the program's impact, drivers who have progressed through the Novice stage and into Full Privilege licensure are required. The assessment of this total program effect was conducted in stages. First, drivers who had obtained their Novice licence within each period of licensure (first year through first four years) were identified and assessed. Then, GLP drivers who had progressed to Full Privilege licensure were identified and assessed.

When limited to only those drivers who obtained a Novice licence during each period of licensure, the GLP effect was less pronounced than when all New drivers were used. For example, there was only about a 20% (Table 22) reduction in the age- and gender-adjusted one-year total crash involvement rate for GLP New drivers who got their Novice licence within their first year of licensure. This compares to the 32% (Table 21) reduction observed for all New drivers within the same period. The lowering of the program's road safety benefit during the first year of licensure is directly attributable to the reduced impact of the GLP Learner stage. Drivers who obtained their Novice licence in their first year of licensure simply spent less time in the Learner stage than drivers who obtained their Novice licence in their second, third, or fourth years of licensure. As the length of Learner time increased, the impact of obtaining a Novice licence decreased. Thus, when all New drivers with four years of licensure were included in the analyses, the reduction in the overall New driver crash rate was about 17% (Table 21); when the analysis was limited to those who got their Novice licence in that same period the reduction in crash rates was 14% (Table 22) - a difference of only 3 percentage points. During the first year of licensure the difference was 12 percentage points (20% - 32%). This dynamic nature of the licensing process makes it difficult to come up with a single measure of program effectiveness.

The time-dependency of the crash rate analysis was further highlighted when it was limited to GLP drivers who obtained their Full Privilege licence during the study period. Due to the time frame used for the evaluation only those drivers who progressed through the GLP licensing process the most quickly could be included. It soon became clear, however, that the percentage of the driver cohorts who had successfully progressed through the entire program was too small to provide an accurate estimate of the overall program impact. With only about 30% of the study cohorts graduating to full privilege licensure during the study period, the results obtained were relevant only to the most highly motivated drivers. These drivers may also be the ones who tend to drive more and, perhaps, under riskier conditions. Unfortunately, it was not possible to identify a similarly motivated group of drivers from the Pre-GLP cohort. Therefore, the comparisons between the GLP and Pre-GLP cohorts may have been confounded by these potential differences. This could result in the GLP drivers appearing to have higher New driver crash rates than will be observed when sufficient time has passed to include a higher percentage of program graduates. It was concluded, therefore, that it was too soon to estimate the overall program effect for GLP drivers who have experienced all of its components. Given current progression rates, an accurate estimate of the full program impact may not be obtainable until the majority of GLP drivers have completed at least six years of licensure.

In addition to assessing general GLP effects, this study also sought to explore effects associated with the program's stages of implementation (Full GLP and Early GLP). Unfortunately, the results from these analyses were mixed and difficult to interpret. Some positive effects were detected during the first two and three years of licensure when all New drivers were included in the analysis. However, no significant differences in crash rates were observed between the Full GLP and Early GLP groups when the analyses were restricted to Learner drivers. Although several documentation and system changes were made as part of the final release of GLP, only two components were added that might have been expected to have an impact New driver crash rates: the enhanced knowledge test that drivers had to pass to obtain their Learner licence, and the enhanced road test that Learner drivers had to pass to obtain their Novice licence. The lack

of an effect for Learner drivers suggests that at least one of the added components, the enhanced knowledge test, did not impact the New driver crash rates. However, it is possible that the positive effects observed for New drivers during the second and third years of licensure may have been due to the addition of the Novice road test. This possibility is explored in the next chapter of this report. It should be noted, that the lack of a knowledge test effect on the crash rates of Learner drivers does not mean that the test is not a valid, reliable, or useful tool. The knowledge test was designed to identify 'thinking drivers' and it may do that quite well. This objective of the knowledge test was not assessed. And, although passing the road test was not found to be associated with the crash involvement rates of Learner drivers, an association was found with the number of attempts it took to pass it; drivers who passed on the first or second attempt were estimated to have Learner crash rates that were about 21-24% lower than drivers who took three or more attempts to pass.

Finally, although a full assessment of the ICBC-approved driver education course was not included in this study, participation in an ICBC-approved driver education course was found to be associated with higher Learner crash rates. As discussed previously, however, this may have been due to unaccounted for differences in driving practice, exposure, or other motivational factors between the groups of drivers who submitted a DOC and those who did not. No evidence was obtained to indicate that the DOC group contained a higher percentage of drivers who had difficulty passing the knowledge test than were in the No DOC group.

5. Study 2 - GLP Impact on Novice Driver Crash Rates

The previous chapter described the results of a study undertaken to determine whether or not GLP had successfully reduced the crash involvement rates of New drivers during their first four years of licensure. The study described here is similar except that it was designed to evaluate the impact of GLP on the crash involvement rates of drivers once they had graduated from the supervised Learner stage and obtained their first solo licence.

One of the findings reported in the previous chapter was that most of the road safety benefit associated with GLP was due to the extension of the Learner stage. No crash rate reductions were observed for drivers once they entered the Novice stage. However, as was discussed in that section, the comparison of Novice driver rates may have been confounded by the differences in the minimum Learner driver times required for GLP and Pre-GLP drivers and the impact these differences had on the crash risks of the drivers during each period of licensure.

As in the previous study, the cohorts used in the present study were aggregated according to whether or not they had entered the licensing process during the Pre-GLP years, the Early GLP years, or the Full GLP years.

The purpose of the Novice Driver study was fourfold:

1. to assess the overall impact of GLP Novice driver restrictions and conditions on the crash involvement rates of Novice drivers,
2. to determine whether the full implementation of GLP (in particular the introduction of the enhanced Class 7 (or 8) road test) had an incremental impact on the effectiveness of GLP,
3. to investigate whether passing the Class 5 (or 6) exit road test had a detectable effect on GLP Novice or Full Privilege driver crash involvements, and
4. to determine whether the higher crash rates previously reported for novice drivers (Wiggins, 2004) who had completed an ICBC-approved driver education course and applied for early novice licensure was still apparent for new cohorts of novice drivers, and, in particular, for those who entered GLP after it was fully implemented

5.1 Methods

5.1.1 Design

As in the study of the impact of GLP on New driver crash involvement rates, this study used a before-after quasi-experimental, prospective research design with both historical and concurrent comparison groups.

5.1.2 Sample Selection Criteria

The focus of this chapter is on specific program effects (Early GLP, Full GLP and Pre-GLP). Therefore, only those Novice drivers who obtained both of their Learner and Novice licences in the same licensing program (Pre-GLP, Early GLP or Full GLP) were included. This was done to ensure consistency in the program components to which each Novice driver was exposed. It meant, however, that GLP drivers who obtained their Novice licence in 2001 or 2002 (Full GLP) but who obtained their Learner licence prior to 2001 (Early GLP) were excluded.

The following are the specific criteria that were used to create the GLP and Pre-GLP Novice driver samples:

GLP Novice Drivers Drivers from the GLP New driver cohorts who had obtained their first Novice licence in 1999 through 2002 and who had accumulated at least one and up to four years of solo licensure by the study cut-off date (June 30th, 2005). To ensure consistency in the licensing program to which GLP drivers were exposed, those who obtained their Novice licence during the Full GLP (2001, 2002) program years and their Learner licence during the Early GLP (1999, 2000) years were excluded.

Pre-GLP Novice Drivers Drivers from each of the Pre-GLP New driver cohorts who had obtained their first Full Privilege licence in 1996 or 1997 and who had accumulated at least one and up to four years of solo licensure by June 30th, 2002 (for the 1996 cohort) or June 30th 2003 (for the 1997 cohort).

5.1.3 Rate Calculations

For this study, the years of licensure used for the calculation of crash involvement rates were based on the total amount of licensed driver-time accumulated between the issue date of each driver's first solo licence (Full Privilege for Pre-GLP, Novice for GLP) and the end of each period of interest (first year, first two years first three years, first four years). During the second through fourth years of licensure, some GLP drivers advanced to a Full Privilege licence. In order to compare crash rates between the GLP and Pre-GLP drivers during these time periods, all crash involvements and licensed driver-time accumulated were counted, regardless of the driver's stage of licensure (Novice or Full Privilege) at the time of the crash. Thus, in this study, the word "Novice" is used to refer to a new "solo" driver; its use is not restricted to only those drivers who held a GLP "Novice" (Class 7 or 8) licence.

5.2 Results

5.2.1 Novice Driver Characteristics

Using the methods described in section 5.1.2, a total of 200,295 drivers were selected for inclusion in this study: 89,296 (44.6%) into the Pre-GLP Novice group, 55,856 (27.9%) into the Early GLP Novice group, and 55,143 (27.5%) into the Full GLP Novice group. The age and gender distributions of the three groups, as well as other driver characteristics, are described below.

Age and Gender at First Solo Licence. Tables 27 and 28 summarize the age and gender distributions for each of the Novice driver cohorts by the year in which they obtained their first solo licence, and by their licensing program (Pre-GLP, Early GLP or Full GLP). The pattern observed in the age distribution of these Novice drivers is similar to that found with the New driver cohorts (Table 2) except that there is a smaller percentage of 16 year old Novice drivers and a higher percentage of 17 year olds in the GLP cohorts than seen previously. The differences between the groups were found to be statistically significant ($P < 0.0001$).

In contrast to the gender distributions observed for the New driver cohorts (Table 3), all of the Novice driver groups had a slightly higher percentage of males than females (Table 28). Though not a strong effect this suggests that males tend to move through their Learner stage somewhat more quickly than females. In addition, like the New driver cohorts, the total percentage of males increased after implementation of GLP. About half of the Pre-GLP Novice drivers were male compared to slightly more than half of the GLP drivers. Although the observed differences were small they were statistically significant ($P < 0.0001$).

Table 27: Age Distribution at First Solo Licence by Licensing Year and Program

Age (in years)	Pre-GLP		Early GLP		Full GLP	
	1996-1997		1999-2000		2001-2002	
	N	%	N	%	N	%
16	37,291	41.8	26,163	46.8	24,148	43.8
17	13,413	15.02	16,159	28.9	16,667	30.2
18	6,101	6.8	4,007	7.2	4,710	8.5
19-21	7,619	8.5	3,556	6.4	4,359	7.9
22-24	3,717	4.2	1,287	2.3	1,242	2.3
>= 25	21,159	23.7	4,684	8.4	4,017	7.3
Total	89,296	100.0	55,856	100.0	55,143	100.0

Chi Square= 14,042.2; df= 10; P<0.0001

Table 28: Gender Distribution at First Solo Licence by Licensing Year and Program

Gender	Pre-GLP		Early GLP		Full GLP	
	1996-1997		1999-2000		2001-2002	
	N	%	N	%	N	%
Male	44,803	50.2	28,924	51.8	29,142	52.9
Female	44,488	49.8	26,927	48.2	25,999	47.2
N/A*	5	0.0	5	0.0	2	0.0
Total	89,296	100.0	55,856	100.0	55,143	100.0

** N/A = Not available. Chi Square =103.2; df=2; P<0.0001 (missing cases excluded)*

Length of time Spent in the Learner Stage by the Novice Driver Cohorts. Table 29 provides a summary of the amount of time spent in the Learner stage by the Pre-GLP and GLP Novice driver groups. As expected, given the extended Learner stage requirement for GLP drivers, drivers in the GLP Novice driver cohorts spent, on average, several more months in the Learner stage than their Pre-GLP counterparts. It should be noted, however, that the total amount of Learner-time that could be accumulated by these groups was limited to some extent by the method used to select Novice drivers into the study. Only drivers who obtained their first solo licence early enough to accumulate one, two, three and four years by the study cut-off date were considered for inclusion, and only those who obtained their first Learner licence in the same program as their first solo licence were selected. Based on these criteria, only 35,698 (65%) of the 55,143 drivers in the 2001-2002 cohort were able to accumulate three years, and only 2,684 (5%) were able to accumulate four years by the study cut-off date. The amount of Learner time shown in Table 29 does not, therefore, provide an estimate of the total Learner-time accumulated by GLP or Pre-GLP drivers. That estimate was provided in chapter 4 (Table 7). In that chapter it was shown that the average Learner times are between 8 and 9 months, for GLP drivers, and about 4.5 for Pre-GLP drivers. In this study, the Novice driver cohorts consist of drivers who progressed through the Learner stage more quickly and, consequently, they may not be

representative of all Novice drivers. This was particularly true for the subset of drivers in the four-year Full GLP group. The median Learner time for these drivers was only 3.5 months and the maximum was only 6.6 months. The drivers in this group clearly obtained their Novice licence as soon as they were eligible and many must have taken advantage of the opportunity for early licensure by completing an ICBC-approved driver education course. A further investigation of this group revealed that, in fact, 91% had submitted a DOC when they applied for Novice licensure. This compared to about 35% for the entire Full GLP group (which increased to 38% for the subset of this group with three years of solo licensure), and to about 31% of the Early GLP group. Due to the small number of drivers available in the four-year Full GLP group, and the over-representation of DOC drivers, this group was dropped from further consideration in this study.

Table 29: Licensed Driver-time Spent in the Learner Stage by Novice Driver Cohorts

Novice Driver Cohort	Months Spent in the Learner Stage :		
	Minimum	Maximum	Median
Pre-GLP 1996-1997 (N=89,296)	0.1	21.1	3.3
Early-GLP 1999-2000 (N=55,856)	2.9	23.9	6.5
Full-GLP 2001-2002			
Year1–Year2: (N=55,143)	2.9	24.0	6.5
Year 3: (N=35,698)*	2.9	18.3	6.3
Year 4: (N=2,684)*	2.9	6.6	3.5

*Includes only those drivers who completed the full period of licensure.

Progression through the Novice stage for GLP Drivers. Table 30 shows the number and percentage of drivers in the Early and Full GLP cohorts who advanced to a GLP Full Privilege licence by the study cut-off date (June 30, 2005). As all GLP New drivers are required to spend at least 18 months in the Novice stage, no drivers graduated to a Full Privilege licence within the first year of obtaining their GLP Novice licence.

Table 30: Timing of Advancement to a Full Privilege Licence: GLP Novice Drivers Only

Obtained First Full Privilege Licence In:	Early GLP		Full GLP	
	1999 - 2000		2001- 2002	
	N	%	N	%
1st Year After First Novice Licence*	0	0.0	0	0.0
2nd Year After First Novice Licence	8,212	14.7	14,414	26.1
3rd Year After First Novice Licence	10,032	18.0	9,098 [#]	16.5
4th Year After First Novice Licence	7,710	13.8	1,300 [#]	2.4
Total by end of 4th Novice Year:	25,954	46.5	24,812 [#]	45.0
No Full Privilege Licence Issued by the End of 4th Novice Year**	29,902	53.5	30,331 [#]	55.0
Number of Drivers in Cohort	55,856	100.0	55,143	100.0

*The minimum time requirement in the Novice stage is 18 months so no drivers could obtain their solo licence in the first year.

[#] Counts are incomplete. Only a subset of the cohort was able to accumulate the full period of licensure by the end of the study.

Of interest in Table 30, is the higher percentage of drivers in the Full GLP who graduated out of GLP within their first 2 years of solo licensure (26.1% and 14.7%, respectively). Due to diminishing numbers of drivers in the Full GLP group, progression rates beyond the second year of licensure are limited. However, even with only about 65% of this group completing their third year, the percentage who had graduated out of GLP by the end of that year was almost as high as the percentage of Early GLP third-year graduates. This suggests that once all of the Full GLP drivers have completed their third year of solo licensure, the percentage of graduates may well exceed that seen in the Early GLP group.

While the reasons for the more rapid progression through the Novice stage of the Full GLP group are not known, it is possible that the implementation of GLPe in October 2003 had an impact. Prior to GLPe there were few reasons for GLP Novice drivers to apply to take their exit road test and obtain their Full Privilege licence. The restrictions in the Novice stage were minimal and, consequently, many drivers chose not progress. This changed, however, with the advent of GLPe, and the addition of a passenger restriction and prohibition-free requirement to the Novice stage. The possibility of being faced with such restrictions was not present for any of the Early GLP group while they were in their second or third years of licensure, and many had even completed their fourth year of licensure before GLPe was implemented. Thus, even though the changes in rules didn't apply to the drivers in the Full GLP cohort (unless they had to renew or apply to have their Novice licence reissued after the implementation date), the possibility of having to abide by the new rules may have been sufficient to prompt more drivers to make an effort to leave GLP as soon as possible. As time passes, and the data for both groups of drivers is updated, it is likely that the percentage of graduates in both groups will increase – during the third and fourth years of licensure for the Full GLP group, and as soon as their licence renewal means transition into GLPe for the Early for the Early group.

The counts presented in Table 30 were included to provide an estimate of the rate of progression from the issuance of the first Novice licence to when GLP drivers started to graduate out of the program. They do not necessarily reflect the number of drivers who were included in the calculation of rates or in the analysis of rates used to evaluate the program's impact on Novice drivers. The data contained in Table 30 were based on information obtained from all drivers whether or not they completed each period of licensure. For example, although a total of 24,812 drivers had obtained their Full privilege licence during the four year period after their Novice licence was issued, not all of those drivers had actually completed a full four years of licensure; they got their Full Privilege licence during their fourth year. For the evaluation of program impact, only those drivers who had accumulated a full one year, two years, three years or four years of licensure were included. As noted above, however, the small group of Full GLP drivers who were able to accumulate four years of licensure (N=2,684) were determined to be too different from the larger group to warrant inclusion and were dropped.

Table 31 shows the amount of licensed-driver-time accumulated by each of the study cohorts from the issue date of their first solo licence. As well, for GLP drivers, the amount and percentage of the total time that was accumulated on a Novice or Full Privilege licence is provided. Of the drivers who completed each period of licensure, only 26% of the Full GLP group and 15% of the Early GLP group had obtained their Full Privilege licence by the end of their second year of licensure; 38% of the Full GLP and 28% of the Early GLP group had obtained their Full Privilege licence by the end of their third year of solo licensure; and 46% of the Early group had obtained their Full privilege licence by the end of their fourth year of solo licensure. To ensure that crash rate calculations would be comparable between the GLP and Pre-GLP cohorts, the total licensed time accumulated from the issue date of the first solo licence was used, for all groups, in the calculation of the Novice driver crash involvement rates. The influence of obtaining a Full Privilege licence in GLP was explored by restricting the study groups to those who obtained their Full Privilege licence within each of the periods of licensure examined.

Table 31: Distribution of Licensed Driver-Time for GLP and Pre-GLP Novice Cohorts from the Issue Date of Their First Solo Licence by Years of Licensure

Novice Driver Cohort		Years of Licensure (from first solo Licence):			
		1 st Year	1 st Two Years	1 st Three Years	1 st Four Years
Pre-GLP 1996-1997	Total Licensed-Years (from first Novice licence)	89,078.84	174,609.0	254,193.4	333,974.4
Early-GLP 1999-2000 (N=55,856)	Novice Licensed-Years (% of Total)	55,090.0 (100)	105,835.0 (97.9)	144,421.7 (90.3)	173,369.4 (82.5)
	Full Privilege Licensed-Years (% of Total)	0.0 (0)	2,327.3 (2.1)	15,576.6 (9.7)	36,808.8 (17.5)
	Total	55,090.0	108,153.8	159,998.3	210,178.2
	Number (%) who got Full Privilege	0	8,212 (14.7)	18,229 (32.6)	25,684 (46.0)
Full-GLP 2001-2002 Year1-Year2: (N=55,143) Year 3: (N=35,698)*	Novice Licensed-Years (% of Total)	54,502.8 (100)	103,013.4 (95.8)	85,474.2 (84.2)	Not available
	Full Privilege Licensed-Years (% of Total)	0 (0)	4,571.7 (4.2)	16,082.1 (15.8)	
	Total	54,502.8	107,563.7	101,556.3	
	Number (%) who got Full Privilege	0	14,414 (26.1)	16,214 (29.4)	

*Only drivers who completed the full period of licensure have been included in this table.

5.2.2 Characteristics of the Crash Involvements of Novice Drivers in their First Four Years of Solo Licensure

Approximately 27% of GLP Novice drivers and 24% of Pre-GLP Novice drivers were found to have been involved in at least one crash during their first year of solo licensure and up to 53-54% in both groups had been involved in at least one crash by the end of their fourth year of solo licensure. The average number of crashes per driver was found to be significantly ($P < 0.0001$) higher for GLP than Pre-GLP drivers during their first three years of licensure but was about the same for drivers with four years of licensure (0.95 ± 0.004 per driver, respectively). At the end of the first year, the mean number of crash involvements reported by GLP Novices was 0.34 ($SE = \pm 0.002$) and for Pre-GLP drivers it was 0.30 ($SE = \pm 0.002$); at the end of the second year it was 0.59 ($SE = \pm 0.003$) and 0.55 ($SE = \pm 0.003$) respectively; and at the end of three years it was 0.77 ($SE = \pm 0.003$) and 0.75 ($SE = \pm 0.003$) respectively. Although these results are opposite to what would be predicted if GLP was effective in reducing the crash involvements of Novice drivers, a more appropriate analysis that takes into account amount of licensed driver-time and other potentially confounding factors is needed before any such conclusions can be drawn. For this crash involvement rates are needed. The impact of GLP on Novice crash involvement rates will be examined shortly. First some of the characteristics of the GLP and Pre-GLP Novice driver crash involvements are described.

Liability and Severity. Table 32 shows the breakdown of Novice driver crash involvements by whether or not the driver was deemed by a claims adjuster to have been held at least 50% liable for the crash. The results show that, across all three programs, about 65% of drivers were found to be liable for their crash involvements during their first year of solo licensure. This percentage went down as the length of licensure increased, resulting in only about 56% of the drivers being found liable for their crash involvements when considered over four years of licensure. The differences across programs were small, although the Pre-GLP

cohort was consistently found to have a slightly lower percentage of liable crash involvements than the GLP cohorts.

Table 32: Number (%) of Driver Crash Involvements by the Period of Solo Licensure and the Driver's Assigned Liability* for the Crash

Period of Licensure	Liability	Pre-GLP	Early GLP	Full GLP
		1996 - 1997	1999 - 2000	2001 - 2002
1 st Year	Liable	16,757 (64.5)	11,727 (65.6)	11,844 (66.7)
	Non-Liable	9,207 (35.5)	6,061 (34.0)	5,641 (31.8)
	Liability not Assigned	11 (0.0)	67(0.4)	275 (1.5)
	Total	25,975 (100.0)	17,855 (100.0)	17,760 (100.0)
1 st Two Years	Liable	28,989 (60.3)	20,048 (61.6)	19,747 (63.1)
	Non-Liable	19,087 (39.6)	12,288 (37.8)	10,922 (34.9)
	Liability not Assigned	38 (0.1)	194 (0.6)	646 (2.0)
	Total	48,114 (100.0)	32,530 (100.0)	31,315 (100.0)
1 st Three Years	Liable	39,370 (57.3)	26,655 (59.2)	17,069 (60.5)
	Non-Liable	29,064 (42.6)	17,973 (39.9)	10,445 (37.0)
	Liability not Assigned	73 (0.1)	377 (0.9)	690 (2.5)
	Total	68,507 (100.0)	45,005 (100.0)	28,204 (100.0)[†]
1 st Four Years	Liable	48,667 (55.5)	31,949 (57.4)	-
	Non-Liable	38,915 (44.4)	23,025 (41.4)	-
	Liability not Assigned	127 (0.1)	683 (1.2)	-
	Total	87,709 (100.0)	55,657 (100.0)	-

*Liability is assigned to a driver who is found (by a claims adjuster) to be at least 50% responsible for the crash

[†]Based on the subset (N=35,698) of cohort (N=55,143) with three full years of solo licensure.

Table 33 shows the breakdown of Novice crash involvements by the severity of the crash. Although there were more fatal crashes observed in the Novice driver groups than in the New driver groups, the numbers were still quite small. Consequently, in subsequent rate calculations and comparative analyses, only the aggregated category of casualty (fatal plus injury) crashes will be used. As shown in Table 33, the relative frequency of injury and material damage only crashes remained very consistent, regardless of the period of licensure examined. About 28-30% of all Novice driver crash involvements were found to involve an injury.

Alcohol, Time of day and Passenger involvement in Novice driver crashes.. The rules and conditions in GLP for Novice drivers are less restrictive than for GLP Learner drivers. Before the implementation of GLPe in 2003, the primary restriction on Novices was that they had to maintain a Zero Blood Alcohol level at all times while driving. The relative frequency of crash involvements in which GLP Novice drivers were reported by police to have alcohol as a contributing factor is presented in Table 34. As can be seen, although alcohol involvement was a relatively infrequent contributing factor in the crash involvements of Novice drivers, the percentages increased steadily as the length of the period of solo licensure increased. Thus, in the first year of solo licensure only about 3-4% of drivers were reported to have alcohol as a contributing factor, but over the first four years this percentage increased to 5-6%. The magnitude of the differences in percentages across the program groups was small and suggests that alcohol involvement as a contributing factor in Novice driver crashes has remained relatively stable.

Table 33: Number (%) of Driver Crash Involvements by the Period of Solo Licensure and Severity of the Crash

Period of Licensure	Severity	Pre-GLP	Early GLP	Full GLP
		1996 - 1997	1999 - 2000	2001 - 2002
1 st Year	Fatal	35 (0.1)	24 (0.1)	20 (0.1)
	Injury	8,038 (31.0)	5,078 (28.4)	5,035 (28.4)
	Material Damage Only	17,902 (68.9)	12,753 (71.5)	12,705 (71.5)
	Total	25,975 (100)	17,855 (100)	17,760 (100)
1 st Two Years	Fatal	64 (0.1)	50 (0.2)	41 (0.1)
	Injury	14,742 (30.6)	9,249 (28.4)	8,930 (28.5)
	Material Damage Only	33,308 (69.2)	23,231 (71.4)	22,344 (71.4)
	Total	48,114 (100)	32,530 (100)	31,315 (100)
1 st Three Years	Fatal	87 (0.1)	69 (0.1)	38 (0.1)
	Injury	20,794 (30.4)	12,850 (28.6)	7,963 (28.2)
	Material Damage Only	47,626 (69.5)	32,086 (71.3)	20,203 (71.6)
	Total	68,507 (100)	45,005 (100)	28,204 (100)⁺
1 st Four Years	Fatal	108 (0.1)	82 (0.1)	-
	Injury	26,291 (30.0)	15,840 (28.5)	-
	Material Damage Only	61,310 (69.9)	39,726 (71.4)	-
	Total	87,709 (100)	55,657 (100)	-

⁺Based on the subset (N=35,698) of cohort (N=55,143) with three full years of solo licensure.

Table 34: Number (%) of Driver Police-Reported Crash Involvements* by the Period of Solo Licensure and Whether or not Police identified Alcohol as a Novice Driver Contributing Factor

Period of Licensure	Alcohol Involvement	Pre-GLP	Early GLP	Full GLP
		1996 - 1997	1999 - 2000	2001 - 2002
1 st Year	Yes	232 (3.6)	133 (3.0)	160 (3.2)
	No	6,298 (96.5)	4,318 (97.0)	4,790 (96.8)
	Total	6,530 (100.0)	4,451 (100.0)	4,950 (100.0)
1 st Two Years	Yes	459 (4.3)	304 (3.9)	334 (4.0)
	No	10,303 (95.7)	7,481 (96.1)	8,008 (96.0)
	Total	10,762 (100.0)	7,785 (100.0)	8,342 (100.0)
1 st Three Years	Yes	705 (4.9)	515 (5.0)	316 (4.5)
	No	13,695 (95.1)	9,898 (95.1)	6,684 (95.5)
	Total	14,400 (100.0)	10,413 (100.0)	7,000 (100.0)⁺
1 st Four Years	Yes	1,004 (5.7)	686 (5.4)	30 (4.4)
	No	16,552 (94.3)	11,967 (94.6)	649 (95.6)
	Total	17,556 (100.0)	12,653 (100.0)	679 (100.0)⁺

*Crash counts reported here differ from those in Tables 32 and 33 because they were taken from the Traffic Accident System rather than from ICBC Claims.

⁺Based on the subset (N=35,698) of cohort (N=55,143) with three full years of solo licensure.

Tables 35 and 36 provide the relative frequency of Novice crash involvements by the time of day and age and number of passengers in the vehicle when the crash occurred. These are provided for descriptive purposes only. None of the Novice drivers included in this study were restricted in the number of passengers permitted or in the time of day when they could legally drive.

With respect to the time of day when crashes occurred, most of the Novice driver crash involvements occurred between 5:00 am and midnight, with about an equal split of crashes before and after 5:00 pm. A slightly smaller percentage of crashes occurred late at night (after midnight) during the first year of solo licensure than when the first four years of solo licensure were considered.

Table 35: Number (%) of Police-Reported Driver Crash Involvements* by the Period of Solo Licensure and Time of Day when the Crash Occurred

Period of Licensure	Time of Crash	Pre-GLP	Early GLP	Full GLP
		1996-1997	1999-2000	2001-2002
1 st Year	Midnight – 5:00 am	516 (7.9)	415 (9.3)	417 (8.4)
	5:00 am – 5:00 pm	3,222 (49.3)	2,111 (47.4)	2,402 (48.5)
	5:00 pm – Midnight	2,681 (41.1)	1,837 (41.3)	2,017 (40.8)
	Unknown	111 (1.7)	88 (2.0)	114 (2.3)
	Total	6,530 (100.0)	4,451 (100.0)	4,950 (100.0)
1 st Two Years	Midnight – 5:00 am	982 (9.1)	816 (10.5)	795 (9.5)
	5:00 am – 5:00 pm	5,338 (49.6)	3,775 (48.5)	4,098 (49.1)
	5:00 pm – Midnight	4,256 (39.6)	3,044 (39.1)	3,265 (39.1)
	Unknown	186 (1.7)	150 (1.9)	184 (9.5)
	Total	10,762 (100.0)	7,785 (100.0)	8,342 (100.0)
1 st Three Years	Midnight – 5:00 am	1467 (10.2)	1,170 (11.2)	702 (10.3)
	5:00 am – 5:00 pm	7,097 (49.3)	5,123 (49.2)	3,426 (48.9)
	5:00 pm – Midnight	5,591 (38.8)	3,914 (37.6)	2,717 (38.8)
	Unknown	245 (1.7)	206 (2.0)	155 (2.2)
	Total	14,400 (100.0)	10,413 (100.0) ⁺	7,000 (100.0) ⁺
1 st Four Years	Midnight – 5:00 am	1,935 (11.0)	1,472 (11.6)	-
	5:00 am – 5:00 pm	8,656 (49.3)	6,209 (49.1)	-
	5:00 pm – Midnight	6,665 (38.0)	4,714 (37.3)	-
	Unknown	300 (1.7)	258 (2.0)	-
	Total	17,556 (100.0)	12,653 (100.0)	-

*Crash counts reported here differ from those in Tables 32 and 33 because they were taken from the Traffic Accident System rather than from ICBC Claims.

⁺Based on the subset (N=35,698) of cohort (N=55,143) with three full years of solo licensure.

As shown in Table 36, about 50-60% of all Novice driver crash involvements in each study period occurred when the driver was alone, without any passengers. About one in three of the first-year crash involvements occurred when there was at least one passenger under the age of 19 in the vehicle and no adults present. Over the first four years of licensure the percentage dropped to between 20 and 25%. These findings were fairly consistent across Program groups.

Table 36: Number (%) of Police-Reported Driver Crash Involvements* by the Period of Solo Licensure and the Number and Ages of Passengers in the Vehicle

Period of Licensure	Passengers in Vehicle	Pre-GLP	Early GLP	Full GLP
		1996-1997	1999-2000	2001-2002
1 st Year	No more than 2 – at least 1 of whom was 19 or older	833 (12.8)	383 (8.6)	407 (8.2)
	None	3,214 (49.2)	2,211 (49.7)	2,759 (55.7)
	1 or more – all under 19	2,037 (31.2)	1,615 (36.3)	1,561 (29.9)
	Unknown	446 (6.8)	242 (5.4)	223 (4.5)
	Total	6,530 (100.0)	4,451 (100.0)	4,950 (100.0)
1 st Two Years	No more than 2 – at least 1 of whom was 19 or older	1,448 (13.5)	822 (10.6)	821 (9.8)
	None	5,600 (52.0)	4,168 (53.4)	4,882 (58.5)
	1 or more – all under 19	3,027 (28.1)	2,411 (31.0)	2,319 (27.8)
	Unknown	687 (6.4)	384 (4.9)	320 (3.8)
	Total	10,762 (100.0)	7,785 (100.0)	8,342 (100.0)
1 st Three Years	No more than 2 – at least 1 of whom was 19 or older	2,165 (15.0)	1,303 (12.5)	794 (11.3)
	None	7,826 (54.4)	5,898 (56.6)	4,202 (60.0)
	1 or more – all under 19	3,540 (24.6)	2,727 (26.2)	1,736 (24.8)
	Unknown	869 (6.0)	485 (4.7)	268 (3.8)
	Total	14,400 (100.0)	10,413 (100.0)	7,000 (100.0)⁺
1 st Four Years	No more than 2 – at least 1 of whom was 19 or older	2,907 (16.6)	1,787 (14.1)	-
	None	9,847 (56.1)	7,435 (58.8)	-
	1 or more – all under 19	3,800 (21.7)	2,864 (22.6)	-
	Unknown	1,002 (5.7)	567 (4.5)	-
	Total	17,556 (100.0)	12,653 (100.0)	-

*Crash counts reported here differ from those in Tables 32 and 33 because they were taken from the Traffic Accident System rather than from ICBC Claims.

⁺Based on the subset (N=35,698) of cohort (N=55,143) with three full years of solo licensure.

5.2.3 Novice Driver Crash Involvement Rates

Novice crash involvement rates were computed for each study cohort and each period of solo licensure. They are summarized in Table 37. A comparison of the Novice driver rates shown in Table 37 with those for the Learner drivers shown in Table 24 reveals the magnitude of the impact of transitioning from driving with supervision to driving without supervision. The rates for Novice drivers shown in Table 37 are almost 10 times as high as the Learner rates.

Table 37: Novice Crash Involvement Rates (per 100 licensed-years) and 95% Confidence Intervals by Program and Period of Solo Licensure

Crash Type by Period of Licensure	Pre-GLP	Early GLP	Full GLP ⁺
	1996-1997	1999-2000	2001-2002
All Crashes:			
1 st Year	29.16 (28.81-29.51)	32.41 (31.93-32.89)	32.59 (32.11-33.07)
1 st Two Years	27.56 (27.31-27.81)	30.08 (29.75-30.41)	29.11 (28.79-29.43)
1 st Three Years	26.95 (25.75-27.15)	28.13 (27.87-28.39)	27.77 (27.45-28.09) ⁺
1 st Four Years	26.26 (26.09-26.43)	26.48 (26.26-26.70)	-
Liable Crashes:			
1 st Year	18.81 (18.53-19.09)	21.29 (20.90-21.68)	21.73 (21.34-22.12)
1 st Two Years	16.60 (16.41-16.79)	18.54 (18.26-18.80)	18.36 (18.10-18.62)
1 st Three Years	15.49 (15.34-15.64)	16.66 (16.46-16.86)	16.80 (16.55-17.05) ⁺
1 st Four Years	14.57 (14.44-14.70)	15.20 (15.03-15.37)	-
Casualty Only:			
1 st Year	9.06 (8.86-9.26)	9.26 (9.01-9.51)	9.28 (9.02-9.54)
1 st Two Years	8.48 (8.34-8.62)	8.60 (8.43-8.77)	8.34 (8.17-8.51)
1 st Three Years	8.21 (8.10-8.32)	8.07 (7.93-8.21)	7.88 (7.71-8.05) ⁺
1 st Four Years	7.90 (7.80-8.00)	7.58 (7.46-7.70)	-
Material Damage:			
1 st Year	20.10 (19.81-20.39)	23.15 (22.75-23.55)	23.31 (22.90-23.72)
1 st Two Years	19.08 (18.88-19.28)	21.48 (21.20-21.76)	20.77 (20.50-21.04)
1 st Three Years	18.74 (18.57-18.91)	20.05 (19.83-20.27)	19.89 (19.62-20.16) ⁺
1 st Four Years	18.36 (18.21-18.51)	18.90 (18.71-19.09)	-

⁺Based on the subset (N=35,698) of cohort (N=55,143) with three full years of solo licensure.

Interestingly, the GLP Novice rates shown in Table 37 are lower than the GLP Novice rates shown in Table 24, while the Pre-GLP rates have changed little. This supports the notion raised previously that one of the reasons the GLP Novice rates were found to be significantly higher than the Pre-GLP rates, when analyzed within the context of the New driver timelines, was the difference in the crash risks of the different Novice driver groups. By standardizing the amount of Novice driver-time across the groups, a more accurate estimate of the GLP effect on Novice crash rates can be obtained. Nonetheless, despite the fact that the GLP rate is now lower, it still remains higher than that of the Pre-GLP comparison group.

To investigate whether full participation in GLP, including taking and passing the Class 5 or 6 exit road test, might have had an impact on Novice crash rates, crash rates were also calculated for the subgroup of GLP Novice drivers who obtained their Full privilege licence during each period of solo licensure (Table 38). Once again, these rates were based on the total number of crashes that occurred during the time period whether they occurred before or after the driver's Full privilege licence had been obtained.

Table 38: Novice Crash Involvement Rates (per 100 licensed-years) and 95% Confidence Intervals for Drivers who Graduated Out of GLP within each Period of Solo Licensure

Crash Type by Period of Licensure	Early GLP	Full GLP ⁺
	1999 - 2000	2001-2002
All Crashes:		
1 st Two Years	30.75 (29.90-31.60)	29.84 (29.21-30.47)
1 st Three Years	29.93 (29.65-30.21)	28.63 (28.30-28.96) ⁺
1 st Four Years ⁺	28.41 (28.17-28.65)	-
Liabile Crashes:		
1 st Two Years	17.54 (16.90-18.18)	17.50 (17.02-17.98)
1 st Three Years	16.75 (16.55-16.95)	16.66 (16.41-16.91) ⁺
1 st Four Years	15.60 (15.43-15.77)	-
Casualty Crashes:		
1 st Two Years	7.69 (7.26-8.12)	8.11 (7.78-8.44)
1 st Three Years	7.90 (7.76-8.04)	7.75 (7.58-7.92) ⁺
1 st Four Years ⁺	7.67 (7.55-7.79)	-
Material Damage Only Crashes:		
1 st Two Years	23.06 (22.32-23.80)	21.73 (21.19-22.27)
1 st Three Years	22.03 (21.79-22.27)	20.87 (20.58-21.16) ⁺
1 st Four Years ⁺	20.73 (20.53-20.93)	-

⁺Based on the subset (N=35,698) of cohort (N=55,143) with three full years of solo licensure.

Due to the 18 month minimum time requirement for the GLP Novice stage, no drivers had graduated by the end of their first year of solo licensure. Consequently, the rates shown in Table 38 could only be calculated for drivers for whom two, three, and four years had passed since they obtained their first Novice licence. With the exception of two-year liable and casualty crashes, the rates shown in Table 38 tended to be slightly higher than those reported in Table 37. The significance of these differences will be examined in the following section.

5.2.4 GLP Impact on Short- and Longer-term Novice Crash Involvement Rates

Table 39 summarizes the results of the Poisson regression analyses conducted to compare the crude (unadjusted) crash involvement rates of the Early and Full GLP Novice driver groups to those of the Pre-GLP group. The results revealed that, in contrast to the results presented in chapter 4 for New and Learner drivers, GLP did not have a clear and consistently positive impact on the crash rates of Novice drivers. With the exception of casualty crashes, the relative risks computed for the other crash categories were all significantly greater than one indicating higher rates for the GLP groups than for the Pre-GLP group. The results for casualty crashes were more encouraging in that they indicated some reductions in rates for GLP compared to Pre-GLP drivers, but the magnitudes of the reductions were small and tended to be only moderately or marginally significant. In addition, although a few of the relative risks indicated that the crash rates for the Full GLP group were slightly lower than for the Early group, few of these differences were statistically significant. The GLP implementation effect will be further explored later.

Table 39: Relative Risks of Crash Involvement for Drivers in their First Four Years of Solo Licensure

Period of Solo Licensure When Crashes Occurred	All Crashes		Liabile Crashes Only		Casualty Crashes Only		Material Damage Only	
	Relative Risk (95% CI) ¹	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)
1st Year of Licensure								
Full GLP (2001-2002)	1.12 (1.10, 1.14)	+12%*	1.16 (1.13, 1.18)	+16%*	1.02 (0.99, 1.06)	+2%	1.16 (1.13, 1.19)	+16%*
Early GLP (1999-2000)	1.11 (1.09, 1.13)	+11%*	1.13 (1.11, 1.16)	+13%*	1.02 (0.99, 1.06)	+2%	1.15 (1.13, 1.18)	+15%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	1.00 (0.98, 1.03)	+0%	1.02 (1.00, 1.05)	+2%	1.00 (0.96, 1.04)	0%	1.01 (0.98, 1.03)	+1%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 2 Years of Licensure								
Full GLP (2001 – 2002)	1.06 (1.04, 1.07)	+6%*	1.11 (1.09, 1.13)	+11%*	0.98 (0.96, 1.01)	-2%	1.09 (1.07, 1.11)	+9%*
Early GLP (1999 – 2000)	1.09 (1.08, 1.11)	+9%*	1.12 (1.10, 1.14)	+12%*	1.01 (0.99, 1.04)	+1%	1.13 (1.11, 1.15)	+13%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	0.97 (0.95, 0.98)	-3%*	0.99 (0.97, 1.01)	-1%	0.97 (0.94, 1.00)	-3%**	0.97 (0.95, 0.99)	-3%**
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 3 Years of Licensure								
Full GLP (2001-2002)	1.03 (1.02, 1.04)	+3%*	1.09 (1.07, 1.10)	+9%*	0.96 (0.93, 0.98)	-4%**	1.06 (1.04, 1.08)	+6%*
Early GLP (1999-2000)	1.04 (1.03, 1.06)	+4%*	1.08 (1.06, 1.09)	+8%*	0.98 (0.96, 1.00)	-2%***	1.07 (1.06, 1.09)	+7%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	0.99 (0.97, 1.00)	-1%	1.01 (0.99, 1.03)	+1%	0.98 (0.95, 1.00)	-2%	0.99 (0.97, 1.01)	-1%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 4 Years of Licensure								
Early GLP (1999 – 2000)	1.01 (1.00, 1.02)	+1%	1.04 (1.03, 1.6)	+4%*	0.96 (0.94, 0.98)	-4%*	1.03 (1.02, 1.04)	+3%**
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-

*P < 0.0001

**P < 0.005

***P<0.05

¹ CI = Confidence Interval

Comparison of Novice and Experienced Driver Crash Involvement Rates. To determine whether the changes observed in the Novice driver rates might be a reflection of external factors other than GLP, the crash involvement rates of the Novice driver groups were compared to those of time-matched Experienced driver groups. Comparisons were done using each of the four periods of licensure for the rate calculations (one year through four years). Due to the limited number of drivers with four years of solo licensure in the Full GLP study group, Table 40 shows the results obtained from the analysis of the three-year rates. For both the Novice driver and Experienced driver groups, the crash rates observed for the 1999-2000 and 2001-2002 time periods tended to be higher than those observed for 1996-1997. The only exception was for casualty crashes. Both groups had lower casualty crash rates in the GLP years than in the Pre-GLP years. Whether higher or lower, however, the pattern of change observed for the Novice and Experienced driver groups was the same. Consequently, there was little evidence to suggest that any of the increases or decreases observed for the Novice groups were attributable to GLP. In contrast, based on these global comparisons it would appear that GLP had very little impact. Similar results were obtained for all of the time periods examined.

Table 40: Three-Year Crash Involvement Rates (per 100 drivers)¹, Relative Risks (RR) and 95% Confidence Intervals (CI) for Novice and Experienced Drivers

Crash Type by Program Period	Novice Drivers			Experienced Drivers		
	Crash Rate (95% CI)	RR (95% CI)	% Change (from REF)	Crash Rate (95% CI)	RR (95% CI)	% Change (from REF)
All Crashes						
Full GLP (2001-2002)	26.34 (26.03-26.65)	1.03 (1.02,1.04)	+3%*	12.82 (12.78-12.86)	1.04 (1.04,1.05)	+4%*
Early GLP (1999 – 2000)	26.86 (26.61-27.11)	1.05 (1.04,1.06)	+5%*	12.80 (12.77-12.83)	1.04 (1.04,1.04)	+4%*
Pre-GLP (1996 – 1997)	25.57 (25.38-25.76)	1.00 (REF)	-	12.29 (12.26-12.32)	1.00 (REF)	-
Liable Only						
Full GLP (2001-2002)	15.94 (15.70-16.18)	1.08 (1.07,1.10)	+8%*	5.52 (5.49-5.54)	1.07 (1.06,1.07)	+7%*
Early GLP (1999 – 2000)	15.91 (15.72-16.10)	1.08 (1.07,1.10)	+8%*	5.40 (5.38-5.42)	1.05 (1.04,1.05)	+5%*
Pre-GLP (1996 – 1997)	14.70 (14.55-14.85)	1.00 (REF)	-	5.16 (5.14-5.18)	1.00 (REF)	-
Casualty Only						
Full GLP (2001-2002)	7.47 (7.31-7.63)	0.96 (0.93,0.98)	-4%***	3.13 (3.11-3.15)	0.96 (0.95,0.97)	-4%*
Early GLP (1999 – 2000)	7.71 (7.58-7.84)	0.99 (0.97,1.01)	-1%	3.18 (3.17-3.19)	0.98 (0.97,0.98)	-2%*
Pre-GLP (1996 – 1997)	7.80 (7.69-7.91)	1.00 (REF)	-	3.26 (3.25-3.27)	1.00 (REF)	-
Material Damage Only						
Full GLP (2001-2002)	18.86 (18.60-19.12)	1.06 (1.04,1.08)	+6%*	9.69 (9.66-9.72)	1.07 (1.07,1.08)	+7%*
Early GLP (1999 – 2000)	19.15 (18.94-19.36)	1.08 (1.06,1.09)	+8%*	9.61 (9.59-9.63)	1.06 (1.06,1.07)	+6%*
Pre-GLP (1996 – 1997)	17.78 (17.62-17.94)	1.00 (REF)	-	9.04 (9.02-9.06)	1.00 (REF)	-

*P < 0.0001 **P<.001 ***P<.05

¹Rates were calculated per 100 drivers as licensed driver-time was not available for the experienced driver groups.

Before drawing conclusions about the impact of GLP on Novice crash rates, however, it is important to look at other factors that may be influencing the results. In keeping with the results presented in chapter 4, the implementation of GLP tended to shift the age distribution of New drivers downward. Although some of this effect was counteracted by the GLP extended Learner stage, GLP drivers still tended to be younger than the Pre-GLP comparison group when they obtained their first solo licence. The GLP Novice groups also had a slightly higher percentage of male drivers. Both of these factors are known to be associated with higher crash risks and, consequently, could be elevating the relative risks obtained for the New driver groups. Although the age and gender shift is a potentially unintended negative consequence of implementing GLP, it is important to exclude the influence of these factors in order to ascertain whether any of the actual program components also

had an effect. The following section describes the analyses done to re-estimate the relative risks for the GLP Novice groups after taking age and gender differences into account. As well, the results obtained when the GLP Novice groups were restricted to those who got their Full Privilege during each period of licensure are presented.

Age and Gender Effects on Novice Driver Crash Involvement Rates. As summarized in Tables 41 and 42, after adjusting for age and gender, the differences in crash rates between the GLP and Pre-GLP driver groups were much smaller. The effect was most apparent for the subset of drivers who advanced to a Full Privilege licence (Table 42), and particularly for those who graduated out of GLP before the end of their second year of solo licensure. For these drivers, many of the adjusted relative risks fell below one, indicating lower estimated rates for the GLP than the Pre-GLP Novice drivers. The effect was also more pronounced for liable and casualty crashes. It appears, therefore, that the shift in the age and gender distributions observed in the GLP cohorts, relative to the Pre-GLP group, may have increased the GLP Novice crash rate and masked, to some extent, the effectiveness of the GLP program components. Nonetheless, to the extent that the implementation of GLP prompted younger male drivers to apply for licensure sooner, this effect would have to be considered a consequence of GLP, albeit one having a negative impact on the crash rates of Novice drivers. As noted in chapter 4, the trend in the age and gender distributions of GLP drivers will continue to be monitored to see if it is maintained over time, and to see what impact the implementation of GLPe, with its even longer Learner and Novice stage requirements, might have.

With respect to the effect of full GLP implementation on Novice crash rates after adjustment for age and gender, the results were inconsistent. During the first year of licensure there was no apparent effect; the relative risks for the comparison of Full GLP to Early GLP drivers remained close to one for all of the categories of crashes. For the first two and three years of licensure, however, all of the relative risks fell below one, and many were found to be at least marginally statistically significant. While this suggests the possibility of an implementation effect, the failure to find a difference for drivers in the first year of licensure makes the findings difficult to interpret. Given that full implementation consisted primarily of the addition of the enhanced knowledge and level 1 road test, it was expected that, if these components had an impact, it would have been most likely to be seen in the year following completion of the road test. Further investigation of the impact of the level 1 road test was undertaken and will be discussed in a later section.

Whether adjusted for age and gender differences or not, one other trend observed in the analysis of Novice crash involvement rates is worthy of note. With the exception of casualty crashes (which were an exception with experienced drivers as well), the magnitude of the estimated relative risks for Novice crashes were significantly greater than one for both the first and first two years of licensure. Although the unadjusted ratios remained higher than one for Novice drivers with three years of licensure, the magnitudes were smaller, and became less than one after taking into account age and gender. This positive effect is shown graphically in Figure 2 with the presentation of the monthly crash rates of the Early GLP cohort over their first four years of licensure. As can be seen, the crash rates of the GLP drivers were considerably higher than those of the Pre-GLP drivers throughout their first two years of solo licensure. During the third year they levelled off to a level similar to that of the Pre-GLP group, but by the fourth year the GLP rates started to drop considerably lower. Whether this is indicative of a GLP component effect (e.g., the longer Learner stage, the new exit road test, or simply the Novice stage restrictions), or the result of other factors, is unclear. The possibility of external factors can not be completely excluded. However, a comparison to the monthly crash rates of the time-matched Experienced drivers failed to reveal a distinctive trend suggesting such an influence. Although the crash rates of both the Pre-GLP and GLP time-matched groups declined slightly over their four year follow-up periods, the rate of decline was not greater for the GLP-matched group. Therefore, unless some external factor affected the GLP New drivers in some way differently from the Experienced drivers (for example, if New drivers curtailed their driving more as the cost of fuel increased), some other explanation for the observed GLP trend needs to be sought. More follow-up time will be required to ascertain whether the trend will continue when the complete cohort of Full GLP drivers have passed through their third and fourth years of licensure. In the next section, the results of analyses undertaken to explore the impact the extended Learner stage on Novice driver crash rates are described.

Table 41: Estimated Relative Risks of Crash Involvement for Drivers in their First Four Years of Solo Licensure – Adjusted for Age at Solo Licensure and Gender

Period of Solo Licensure When Crashes Occurred	All Crashes		Liabile Crashes Only		Casualty Crashes Only		Material Damage Only	
	Relative Risk (95% CI) ¹	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)
1st Year								
Full GLP (2001-2002)	1.05 (1.03, 1.08)	+5%*	1.06 (1.04, 1.09)	+6%*	0.95 (0.92, 0.99)	-5%***	1.10 (1.08, 1.13)	+10%*
Early GLP (1999-2000)	1.06 (1.04, 1.08)	+6%*	1.05 (1.03, 1.08)	+5%*	0.96 (0.93, 1.00)	-4%***	1.10 (1.08, 1.13)	+10%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	1.00 (0.98, 1.02)	+0%	1.01 (0.99, 1.04)	+1%	0.99 (0.95, 1.03)	-1%	1.00 (0.98, 1.03)	+0%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 2 Years								
Full GLP (2001 – 2002)	1.00 (0.99, 1.02)	+0%	1.02 (1.00, 1.04)	+2%***	0.92 (0.90, 0.95)	-8%*	1.04 (1.02, 1.05)	+4%*
Early GLP (1999 – 2000)	1.04 (1.03, 1.06)	+4%*	1.04 (1.02, 1.06)	+4%*	0.96 (0.93, 0.99)	-4%**	1.08 (1.06, 1.10)	+8%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	0.96 (0.95, 0.98)	-4%*	0.98 (0.96, 1.00)	-2%	0.96 (0.93, 0.99)	-4%***	0.96 (0.94, 0.98)	-4%*
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 3 Years								
Full GLP (2001-2002)	0.97 (0.95, 0.98)	-3%*	1.00 (0.98, 1.01)	+0%	0.89 (0.86, 0.91)	-11%*	0.99 (0.98, 1.01)	-1%
Early GLP (1999-2000)	0.99 (0.98, 1.00)	-1%	1.00 (0.99, 1.02)	+0%	0.92 (0.90, 0.95)	-8%*	1.02 (1.01, 1.03)	+2%***
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	0.98 (0.96, 0.99)	-2%**	0.99 (0.97, 1.01)	-1%	0.96 (0.93, 0.99)	-4%***	0.97 (0.96, 0.99)	-3%***
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 4 Years								
Early GLP (1999-2000)	0.96 (0.95,0.976)	-4%*	0.97 (0.96,0.99)	-3%*	0.90 (0.88,0.92)	-10%*	0.98 (0.97,1.00)	-2%***
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-

*P < 0.0001 **P < 0.005 ***P<0.05 ¹ CI=Confidence Interval

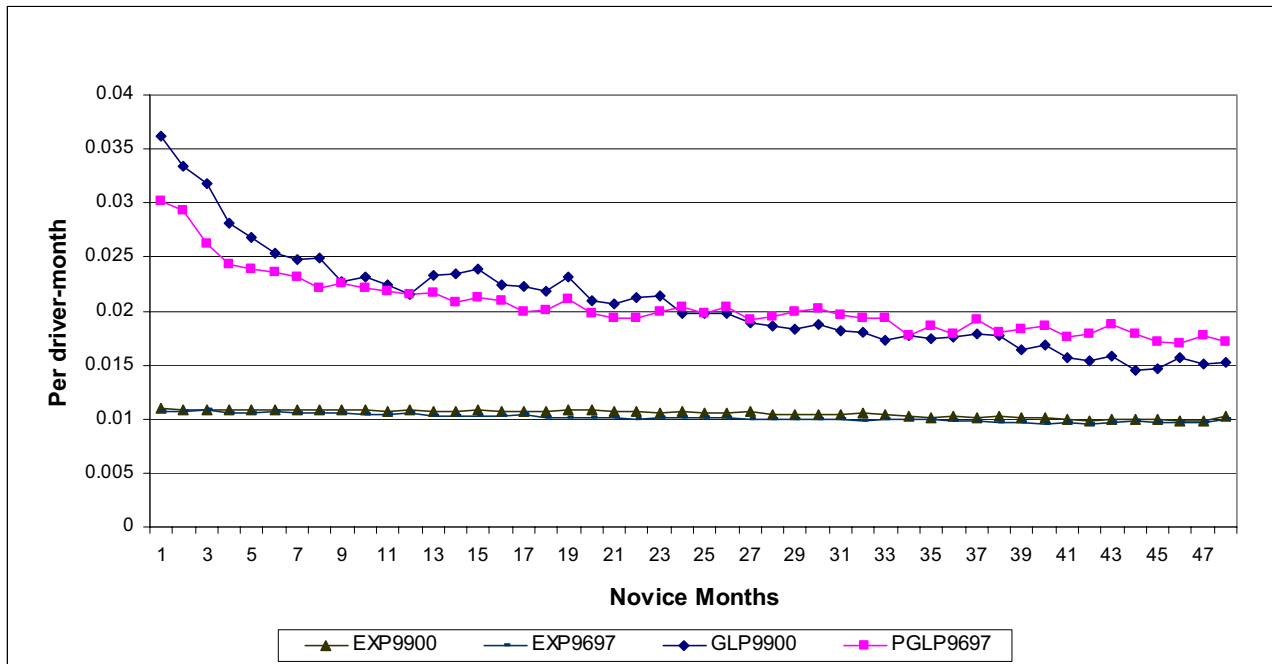
Table 42: Estimated Relative Risks of Crash Involvement for Novice Drivers who Graduated out of GLP in each Period of Solo Licensure Compared to Pre-GLP Novice Drivers – Adjusted for Age at Solo Licensure and Gender

Period of Solo Licensure When Crashes Occurred	All Crashes		Liabile Crashes Only		Casualty Crashes Only		Material Damage Only	
	Relative Risk (95% CI) ¹	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)
1st 2 Years								
Full GLP (2001 – 2002)	0.98 (0.97, 1.01)	-1%	0.93 (0.90, 0.96)	-7%*	0.87 (0.84, 0.91)	-13%*	1.04 (1.01, 1.07)	+4%***
Early GLP (1999 – 2000)	1.02 (0.99, 1.05)	+2%	0.93 (0.89, 0.97)	-7%**	0.83 (0.78, 0.88)	-17%**	1.10 (1.06, 1.14)	+10%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	0.97 (0.94, 1.01)	-3%	1.00 (0.96, 1.05)	+0%	1.05 (0.98, 1.13)	+5%**	0.95 (0.91, 0.99)	-5%***
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 3 Years								
Full GLP (2001-2002)	0.97 (0.95, 0.99)	-3%**	0.95 (0.93, 0.97)	-5%*	0.86 (0.83, 0.89)	-14%*	1.02 (1.00, 1.04)	+2%***
Early GLP (1999-2000)	1.01 (0.99, 1.03)	+1%	0.95 (0.93, 0.97)	-5%*	0.87 (0.84, 0.90)	-13%*	1.07 (1.05, 1.09)	+7%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	0.96 (0.94, 0.98)	-4%	1.00 (0.97, 1.03)	+0%	0.98 (0.94, 1.02)	-2%	0.95 (0.92, 0.97)	-5%**
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 4 Years								
Early GLP (1999-2000)	0.99 (0.98,1.00)	-1%	0.96 (0.93, 0.97)	-4%*	0.89 (0.86,0.91)	-11%*	1.04 (1.02,1.05)	+4%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-

*P < 0.0001 **P < 0.005 ***P<0.05

¹CI=Confidence Interval

Figure 2: Monthly Crash Involvement Rates of GLP and Pre-GLP Novice Drivers and Time Matched Experienced Drivers – First Four Years of Solo Licensure



Effect of the Length of the Learner Stage on Novice driver Crash Involvement Rates. One of the primary aims of this study was to determine whether the Novice stage restrictions and components had an impact on the crash rates of Novice drivers. As noted in the previous section, age and gender differences accounted for some of the observed differences between the GLP and Pre-GLP Novice driver crash rates. Another factor that could be influencing these rates is the program’s extended Learner stage. As was observed in chapter 4, the length of time spent in the Learner stage had a strong effect on the crash rates of New drivers. As was shown in Table 29, drivers in the GLP Novice driver groups spent considerably more time in the Learner stage than their Pre-GLP counterparts. To explore whether this difference might be influencing the crash rates of the Novice driver groups, several analyses were conducted.

Table 43 shows the percentage difference in the Novice driver crash involvement rates by the length of the Learner stage and by years of solo licensure. All drivers were included in the analysis, regardless of program. In each case the percentage difference in the Novice rate was computed using a Learner time of less than 3 months as the reference category. Prior to GLP, the minimum Learner stage was 30 days (1 month); after GLP it was 6 months (or 3 months for drivers who completed an approved driver education course). Table 44 shows the relative risks of Novice driver crash involvement after adjusting for age, gender, and length of time in the Learner stage.

Table 43: Estimated Percentage Change in Novice Crash Involvement Rates by the Number of Months Drivers Spent in the Learner Stage

Period of Solo Licensure	Length of Learner Stage	% Change in Novice Crash Involvement Rate (from Reference Group)
1st Year	12 months or more	-16%*
	9 - <12 months	-19%*
	6 - <9 months	-5%*
	3 - <6 months	0%
	less than 3 months	(Ref)
1 st Two Years	12 months or more	-19%*
	9 - <12 months	-19%*
	6 - <9 months	-5%*
	3 - <6 months	-2%**
	less than 3 months	(Ref)
1 st Three Years	12 - <18months	-19%*
	9 - <12 months	-19%*
	6 - <9 months	-7%*
	3 - <6 months	-5%*
	less than 3 months	(Ref)
1 st Four Years	12 - <18months	-21%*
	9 - <12 months	-19%*
	6 - <9 months	-8%*
	3 - <6 months	-7%*
	less than 3 months	(Ref)

* P< 0.0001

As shown in Table 43 there was an inverse relationship between the amount of time spent in the Learner stage and the crash involvement rates of Novice drivers; as Learner time increased, Novice crash involvement rates decreased. The relationship was particularly strong as the amount of time spent in the Learner stage increased beyond 270 days (9 months). Based on the categories used in this analysis, however, there does not appear to be much gain in terms of Novice crash rate reductions for drivers who remained in the Learner stage beyond 360 days (12 months). The categorization scheme used in this analysis was quite broad however. In addition, due to the criteria used for the formation of the Novice driver cohorts, only those drivers who progressed through the Learner stage fairly quickly were selected for inclusion (section 5.1.2). This may have limited the ability of this study to detect a Learner effect for longer Learner times. Further research will be required to confirm whether additional time spent in the Learner stage may be beneficial. Interestingly, the relationship between the amount of Learner time and Novice driver crash involvement rates was consistent across all of the lengths of solo licensure considered. What this suggests is that the impact of a longer Learner stage is not only strong and positive, but it is also enduring.

To investigate the extent to which this association between Learner-time and Novice crash rates might be influencing the crash rates of Novice drivers in the GLP and Pre-GLP groups, their relative risks of crash involvement were estimated after adjusting for age, gender and the number of months they spent in the Learner stage. Based on the association observed between the length of the Learner stage and Novice crash rates it was expected that, after this adjustment, the estimated relative risks for the GLP to Pre-GLP comparisons would increase across all categories and groups. And this was the case (see Table 44).

Table 44: Estimated Relative Risks of Crash Involvement for Drivers in their First Four Years of Solo Licensure - Adjusted for Age at Solo Licensure, Gender and Length of Time Spent in the Learner Stage

Period of Solo Licensure When Crashes Occurred	All Crashes		Liabile Crashes Only		Casualty Crashes Only		Material Damage Only	
	Relative Risk (95% CI) ¹	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)
1st Year of Licensure								
Full GLP (2001-2002)	1.21 (1.18, 1.24)	+21%*	1.21 (1.17, 1.24)	+21%*	1.06 (1.01, 1.11)	+6%***	1.28 (1.25, 1.32)	+28%*
Early GLP (1999-2000)	1.23 (1.20, 1.26)	+23%*	1.21 (1.17, 1.25)	+21%*	1.08 (1.03, 1.13)	+8%***	1.30 (1.26, 1.34)	+30%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	0.98 (0.96, 1.00)	-2%	0.99 (1.00, 1.05)	-1%	0.97 (0.94, 1.01)	-3%	0.98 (0.96, 1.01)	-2%
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 2 Years of Licensure								
Full GLP (2001 – 2002)	1.12 (1.10, 1.14)	+12%*	1.13 (1.10, 1.16)	+13%*	0.99 (0.96, 1.02)	-1%	1.19 (1.16, 1.21)	+19%*
Early GLP (1999 – 2000)	1.18 (1.16, 1.21)	+18%*	1.16 (1.14, 1.19)	+16%*	1.04 (1.01, 1.08)	+4%***	1.25 (1.22, 1.28)	+25%*
Pre-GLP (1996 – 1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	0.95 (0.93, 0.96)	-5%*	0.96 (0.95, 0.98)	-4%**	0.94 (0.92, 0.97)	-6%**	0.95 (0.93, 0.96)	-5%*
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 3 Years of Licensure								
Full GLP (2001-2002)	1.04 (1.03, 1.06)	+4%*	1.05 (1.03, 1.07)	+5%*	0.93 (0.91, 0.96)	-7%*	1.09 (1.07, 1.11)	+9%*
Early GLP (1999-2000)	1.08 (1.06, 1.09)	+8%*	1.07 (1.05, 1.09)	+7%*	0.98 (0.95, 1.00)	-2%	1.13 (1.08, 1.15)	+13%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-
Contrast:								
Full GLP (2001-2002)	0.96 (0.95, 0.98)	-4%*	0.98 (0.97, 1.00)	-2%	0.96 (0.93, 0.98)	-4%**	0.97 (0.95, 0.99)	-3%*
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 4 Years								
Early GLP (1999-2000)	1.03 (1.02,1.04)	+3%*	1.02 (1.00, 1.04)	+2%***	0.93 (0.91, 0.96)	-7%*	1.07 (1.06,1.08)	+7%*
Pre-GLP (1996-1997)	1.00 (REF)	-	1.00 (REF)	-	1.00(REF)	-	1.00(REF)	-

*P < 0.0001 **P < 0.005 ***P<0.05 ¹ CI = Confidence Interval

As shown in Table 44, during the first year of solo licensure, the relative risk after adjustment for the length of the Learner stage was 1.23 for the GLP 1999- 2000 group and 1.21 for the GLP 2001-2002 group. This compares to relative risks of 1.05 and 1.06, respectively, when only age and gender were taken into account. A similar pattern of results were obtained when the analyses were based on the first two years, three years, and four years of solo licensure. However, the magnitude of the effect decreased as the length of solo licensure increased. Thus, although the association between Learner-time and Novice crash involvement rates remained consistent across time periods, once drivers had accumulated more than two to three years of experience as a solo driver, the impact of the association diminished. The results do, however, indicate that the extended Learner stage of GLP may have played an important role in minimizing the crash involvement rates (relative to that of the Pre-GLP group) of Novice drivers. Taken together with the trends described previously, these results suggest that if GLP had not included an extended Learner stage, Novice driver crash rates might have been even higher than observed for GLP drivers – particularly during their first two years of Novice licensure. Moreover, despite the more rapid rate of decline in crash rates for GLP compared to Pre-GLP drivers in their third and fourth years of licensure, the road safety impact of GLP on the longer-term Novice crash rates might have remained slightly negative. In a later section, the impact of submitting a DOC and applying for early Novice licensure on the trends observed here will be discussed.

5.2.5 GLP Testing Processes: Impact, Ease of Passage, and Predictive Value

When GLP was introduced, the first change that was made to the testing processes used to evaluate New drivers was the introduction of new Class 5 (passenger vehicle) and Class 6 (motorcycle) exit road tests. The exit tests could only be taken after a minimum of 18 months in the Novice stage and had to be passed in order for drivers to apply for a Full privilege licence. Between 1998, when GLP was introduced, and the end of 2000, the road tests previously used as Class 5 (or 6) road tests for Pre-GLP drivers were used as the Class 7 (or 8) road tests that GLP drivers were required to take in order to progress into the Novice stage. At the end of 2000, new Class 7 and 8 road tests were introduced, as were the enhanced class 7 and 8 knowledge tests discussed in Study 2. The Class 7 and 8 road tests were developed using the same model and format as the GLP Class 5 and 6 exit tests. A report prepared by the original GLP project team summarizing the model, objectives, development and assessment of both sets of road tests (7/8 and 5/6) is provided in Appendix B. Although estimates of reliability (internal consistency and inter-rater) and validity (concurrent) were made in the development phase of the test, no attempt was made to determine whether passing the test would be associated with lower crash involvement rates (predictive validity). The study conducted to explore issues relevant to the impact of the road tests on Novice driver crashes will be described here. It should be noted, however, that as very few new drivers in the GLP and Pre-GLP cohorts (<1%) obtained a motorcycle licence as their first licence, only the road tests for passenger vehicle licences (Classes 7 and 5) were used in the study.

Due to the sequential nature of the implementation of the new tests, it was possible to compare the Early GLP and Full GLP cohorts to ascertain whether taking the new Class 7 test had any impact on Novice driver crash rates. Except for the enhanced knowledge and class 7/8 road test, both groups (Early and Full GLP) were exposed to all the same restrictions and conditions associated with GLP. As shown in chapter 4, no effect on Learner crash rates was found after the implementation of the enhanced knowledge test and, no impact on Novice crash rates would be expected from this test. Thus, a comparison of the crash rates of the two groups of Novice drivers was used to explore whether or not the introduction of the revised Class 7 test had a detectable effect on Novice crash rates. Although it is unknown how long any potential effect of passing the road test might be expected to last, it seems reasonable to assume that as drivers gain experience and exposure as solo drivers the influence of factors other than the test would begin to take precedence. Therefore, it seems unlikely that any effects observed after about two years of licensure would be attributable to testing.

As shown in Tables 41 and 44, during their first year of solo licensure, the relative risks of crash involvement for the Full GLP and Early GLP drivers were generally found to be close to one, indicating no significant difference between the two groups. For the first two and three years of licensure, however, the estimated relative risks indicated lower crash involvement rates for the Full GLP group. Although the lower crash involvement rates of the Full GLP Novice drivers during their second and third years of licensure are encouraging, the lack of an effect during the first year, when the impact of the level 1 road test might have been expected to be most apparent, makes the results difficult to interpret. However, Novice drivers have very high crash rates during the first year of licensure and this may have made it difficult to detect an effect of the test. By the time these drivers have moved into their second year of licensure some of this initial excess risk may start to dissipate and, perhaps, the rate reduction observed over the next two years of licensure could be associated with the test taken by the Full GLP driver group.

Although the findings concerning the impact of the enhanced road test on Novice crash rates were inconclusive, a strong association was observed between performance on the test and crash involvements during the first year of Novice licensure. Drivers from the Full GLP group who passed the test on the first attempt were found to have a 1-year Novice crash rate that was 20% (Relative Risk = 0.80, 95% Confidence Interval: 0.76, 0.84) lower than drivers who took three or more attempts ($P < 0.0001$); and drivers who took two attempts to pass were 13% less likely (Relative Risk = 0.87, 95% Confidence Interval: 0.82, 0.92; $P < 0.0001$). Unfortunately, due to the lack of data available for the Early GLP group, it was not possible to determine whether the observed association would have been similar with the old test.

To investigate the extent to which the Class 5 exit road test might be predictive of crash involvement for GLP graduates, two analyses were undertaken. Firstly, a comparison of the crash rates of GLP Novice drivers who did and did not obtain their full privilege licence during their first three years of licensure was undertaken. The first three years of solo licensure were selected as the period of primary interest because it provided a reasonable balance between the number of drivers who, by the study cut-off date, were able to accumulate that amount of time, and the time needed for sufficient numbers of drivers to apply for and take their exit test. Secondly, crash rates were examined during the six months before and after Novice drivers obtained their Full Privilege licence.

About 38% of the GLP drivers with three years of solo licensure graduated to a Full privilege licence by the end of their third year. Unfortunately, the results obtained from the Poisson regression analyses used to compare the age and gender-adjusted rates of the drivers were inconsistent. When all crashes and material damage only crashes were modelled, drivers who got their Full privilege licence were found to have relative risks greater than one (RR=1.05 and 1.09, respectively; $P < 0.0001$), indicating higher adjusted rates than drivers who had not obtained Full privilege licensure. When only 'liable' and casualty crashes were considered the results were reversed: drivers who got their Full Privilege licence had lower estimated rates than drivers who did not (RR=0.96 and 0.96, respectively; $P < 0.03$). The inconsistency of the results makes the findings difficult to interpret. However, this very inconsistency suggests that no stable and substantial effect likely occurred.

In the second analysis, the crash involvement rates of GLP graduates were compared during the first six months before and after they obtained their full privilege licence. Using a McNemar's test for comparing proportions for paired groups, a small (about 6%) and marginally significant ($P < 0.03$) reduction in the overall crash rate for drivers after passing the test was observed. Unfortunately, it was not possible to identify a comparison group for the drivers used in these analyses so, although the findings are suggestive, it is possible that the results are due to factors other than the test itself.

To investigate whether an association similar to the one obtained between performance on the Class 7 road test and the crash involvement rates of Novice drivers would be observed for the Class 5 road test, another set

of Poisson regressions were used to model the crash involvement rates of GLP graduates by the number of times they had to take the exit test before they passed it. For these analyses, all of the drivers in the Full GLP cohort who had accumulated 180 days of Full privilege licensure by the end of June 2005 were selected. Crashes that occurred during that period of time were counted and 180-day crash involvement rates were computed and compared for drivers who passed the Class 5 test on the first or second attempt or who took 3 or more attempts. Of the 25,567 drivers included in the analysis, 22,463 (88%) passed on the first attempt, 2,794 (11%) passed on the second attempt, and 310 (1%) took three or more attempts to pass.

Interestingly, a strong association was observed between passing the road test on the first attempt and the age at which the selected GLP graduates obtained their Full privilege licence ($P < 0.0001$). A higher percentage of the younger drivers passed on the first attempt than older drivers. Almost all of the 17 year old drivers (99%) in this analysis who had obtained their Full privilege licence passed the road test on the first attempt compared to 90% of the 18 year olds, 86% of 19-21 year olds, and 78% of drivers 22 years of age or older. Gender was likewise found to be associated with performance on the test ($P < 0.0001$), although the magnitude of the difference between them was less pronounced; a higher percentage of females (89%) than males (87%) passed the test on the first attempt.

After adjusting for these age and gender differences in test performance, an estimated relative risk of 0.77 was obtained indicating a lower crash involvement for drivers who passed the test on the first attempt than those who took three or more attempts. A relative risk of 0.78 was obtained for those who passed the test on the second attempt. Thus, in both cases drivers who passed the test with relative ease (first or second attempt) were found to have lower crash rates than those who found the test more difficult. While suggestive of an effect, the results did not achieve statistical significance ($P > 0.05$ in both cases).

One factor not taken into account in the abovementioned analysis, however, was the length of time that drivers had been licensed (as a Learner and Novice) before obtaining their Full Privilege licence. Once length of prior licensure was accounted for, the relative risks of crash involvement for the drivers who passed on the first and second attempts, relative to those who took three or more tries, were reduced to 0.72 and 0.76 respectively. Drivers who passed on the first or second attempt tended to have shorter periods of prior licensure than drivers who took three or more attempts. Finding lower relative risks for crash involvement after taking into account these differences in prior licensed driver- time suggests that the length of the Learner and Novice stages influenced the relationship between ease of passing the road test and drivers' crash involvement rates. After excluding the effect of the length of prior licensure, drivers who took fewer attempts to pass the Class 5 road test had even lower estimated crash involvement rates during their first 180 days of Full privilege licensure than drivers who took 3 or more attempts. However, only the results obtained for the drivers who passed on the first attempt were found to be statistically significant ($P < 0.02$).

To see if performance on the enhanced Class 7 knowledge and new Class 7 road test might combine with the performance on the Class 5 road test to produce an even more pronounced effect on the 180-day crash rates of the Full GLP graduates, the regressions were rerun with the number of attempts on each test added into the model. When this was done and the results obtained, the estimated relative risk for the drivers who passed the Class 5 test on the first attempt or second attempt was 0.75 ($P < 0.04$) and 0.78 ($P > 0.05$), respectively. The magnitudes of the relative risks differed little from those obtained when only performance on the Class 5 test was used in the model. Clearly performance on the earlier tests added little to the predictive value of the exit road test. All in all, drivers who passed the exit test on their first or second attempt had crash rates that were about 22-28% lower than drivers who took more attempts to pass. More research is needed to understand factors that may play an important role in increasing the likelihood that drivers will pass the road test on the first attempt.

In a final analysis, drivers from the Early GLP group were selected for inclusion in an analysis designed to investigate whether taking the new Class 7 road test might contribute, through a practice effect, to higher pass

rates for drivers taking the GLP exit test. As mentioned above, the new Class 7 test was modelled after the GLP Class 5 exit test. Consequently, although not as lengthy or comprehensive, it used the same format and had similar expectations. It was not possible to compare performance on the old test, however, as historical records of attempts were not kept for any tests that were passed prior to the introduction of the new test.

Of the 56,880 drivers included in the analysis, 45% took the new Class 7 test and 55% took the old Class 7 test. The results indicated that performance on the Class 5 test was associated with whether or not drivers took the new versus the old Class 7 test (Chi-square = 456.46, df=2, P<0.0001) A significantly higher percentage of drivers who took the new rather than the old test passed the Class 5 exit test on the first attempt (88% versus 82%). While certainly indicative of a practice effect, the findings also suggest that, despite the intent that Class 5 test to be harder and more advanced in what it covers, the high percentage of first time passes suggests that the two tests may not, in fact, be measuring elements that are all that different.

Although the findings reported above are interesting, they must be interpreted with caution. The drivers selected for inclusion in the analyses may not be representative of the broader group of GLP drivers who may obtain their Full Privilege licence. Due to the study time frame and the criteria used to select the drivers, a bias towards drivers who passed the test more easily may have been introduced. To be included in the sample, drivers had to obtain their Full privilege licence within a relatively short period of time. Therefore, drivers who may have struggled with the test and not obtained their full privilege licence may not have had time to retake and pass the test before the study cut-off date. Until more of the drivers in the cohort have had time to obtain their full privilege licence the results the generalizability of the findings is limited. Also, the methods used do not permit drawing causal connections between ease of performance on the tests and crash involvement rates. Other factors not taken into account in this research may also play a role. Similarly, although some relationships were found for drivers before and after they took the exit road test, the absence of an appropriate comparison group makes it difficult to know if the observed changes were due to the road test or to some other as yet unidentified factors.

5.2.6 The ICBC-Approved Driver Education Program, Early Novice Licensure, and Novice Crash Involvement Rates

Although not an actual GLP component, the ICBC-approved driver education curriculum was developed and implemented concurrently with GLP and became an integral part of the licensing process for many New drivers. The course was not mandatory but drivers who completed an approved course and submitted a declaration of completion (DOC) were permitted to apply for up to a 3-month reduction in the time they were required to spend in the Learner stage. This meant that they were able to advance from the Learner stage with as little as 90 days of Learner time. When the approved course was first introduced in 1998 it was assumed that the benefits from a well developed and comprehensive driver education curriculum would be sufficient to outweigh any potentially detrimental effects of a Learner time discount. The results of the year 3 interim evaluation suggested that this belief was likely unfounded; drivers who completed the course and applied for the time credit had a 26% higher 1-year Novice crash rate than drivers who did not.

The results of the year 3 evaluation were concerning but they were also preliminary; they had been obtained on a cohort of drivers who had entered the licensing process in the first year of GLP (i.e., before GLP was fully implemented) and before the approved course became well established or accessible. Given these limitations, it was recommended that although the time credit be considered for removal, more research was needed in order to determine whether similar effects would be obtained with drivers who entered GLP after the course had been more generally disseminated, and after GLP had been fully implemented.

Tables 45 and 46 provide the age and gender distributions of the Early and Full GLP Novice driver groups who either did or did not submit a DOC before taking their first (Class 7 or 8) road test.

About 78% of the DOC Novice groups and 72% of the No DOC Novice groups were aged 16 when they obtained their first Learner licence. Comparisons of the DOC and No DOC groups across the two GLP programs indicated that the patterns in the distributions were very similar, although there was a slightly lower percentage of 16 year olds and higher percentage of 17-21 year olds in the Full GLP No DOC group than in the Early GLP No DOC group. However, given the nature of the components added to GLP with full implementation, it is unlikely that this slight shift in the age distribution of the drivers was a program effect.

Table 45: Age at First Solo Licence for GLP Novice Driver Groups by DOC Status

Age at First Solo Licence (in years)	Early GLP 1999-2000				Full GLP 2001-2002			
	DOC		No DOC		DOC		No DOC	
	N	%	N	%	N	%	N	%
16	11,253	66.6	14,910	38.3	12,637	64.4	11,511	32.4
17	2,627	15.5	13,532	34.7	3,398	17.3	13,269	37.4
18	872	5.2	3,135	8.1	1,205	6.1	3,505	9.9
19-21	827	4.9	2,729	7.0	1,090	5.6	3,269	9.2
22-24	255	1.5	1,032	2.7	263	1.3	979	2.8
>= 25	1,074	6.3	3,610	9.3	1,020	5.2	2,997	8.4
Total	16,907	100.0	38,948	100.0	19,613	100.0	35,530	100.0

*Chi-Square = 3,921.8, df=5, P<0.0001

+Chi-Square = 5,348.2, df=5;P<0.0001

Table 46: Gender for GLP Novice Driver Groups by DOC Status

Gender	Early GLP 1999-2000*				Full GLP 2001-2002+			
	DOC		No DOC		DOC		No DOC	
	N	%	N	%	N	%	N	%
Male	8,673	51.3	20,251	52.0	10,092	51.5	19,050	53.6
Female	8,234	48.7	18,693	48.0	9,521	48.5	16,478	46.4
Unknown	1	0.0	4	0.0	0	0.0	2	0.0
Total	16,908	100.0	38,948	100.0	19,613	100.0	35,530	100.0

*Chi-Square = 2.33, df=1, P<0.13 (missing cases excluded)

+Chi-Square = 23.75, df=1; P<0.0001 (missing cases excluded)

Characteristics of Novice Crash Involvements by DOC status. The crash involvements of GLP Novice drivers who submitted a DOC prior to their first road test were compared with those who did not submit a DOC to see if there were any significant differences in the relative frequencies of liable or casualty crash involvements across Novice driver groups (Early or Full) and periods of licensure. Only the crash involvements that occurred within the first two years of solo licensure were slightly more heavily weighted towards casualty involvements for the No DOC group than for the DOC group. However, the magnitude of the difference was quite small (27.9% versus 29.1%; P<0.05).

A significantly higher percentage of the crash involvements of the DOC group (for both the Early and Full GLP drivers) than the No DOC group were classified as liable (66.9% and 65.0%, respectively, for the Early group, P<0.01); and 67.7% and 66.0%, respectively for the full GLP group, P<0.05). Once again, however, the magnitudes of the differences between the percentages were quite small.

Effect of DOC submission and Early Novice Licensure on GLP Novice Driver Crash Rates. Tables 47 and 48 summarize the crash involvement rates by DOC status for all GLP drivers, as well as for those who graduated to a Full privilege licence during their first four years of solo licensure. In both cases, the rates for the DOC groups are substantially higher than for the No DOC groups, and remain substantially higher all of the periods of licensure examined. They do, however, decline over time. This can be seen most clearly in Figure 3 which shows the monthly crash rates computed for the two groups. Although the rates do start to converge after about two years of licensure, and are quite similar by the end of the fourth year, the overall decline is not sufficient to negate the high rates observed in the earlier years.

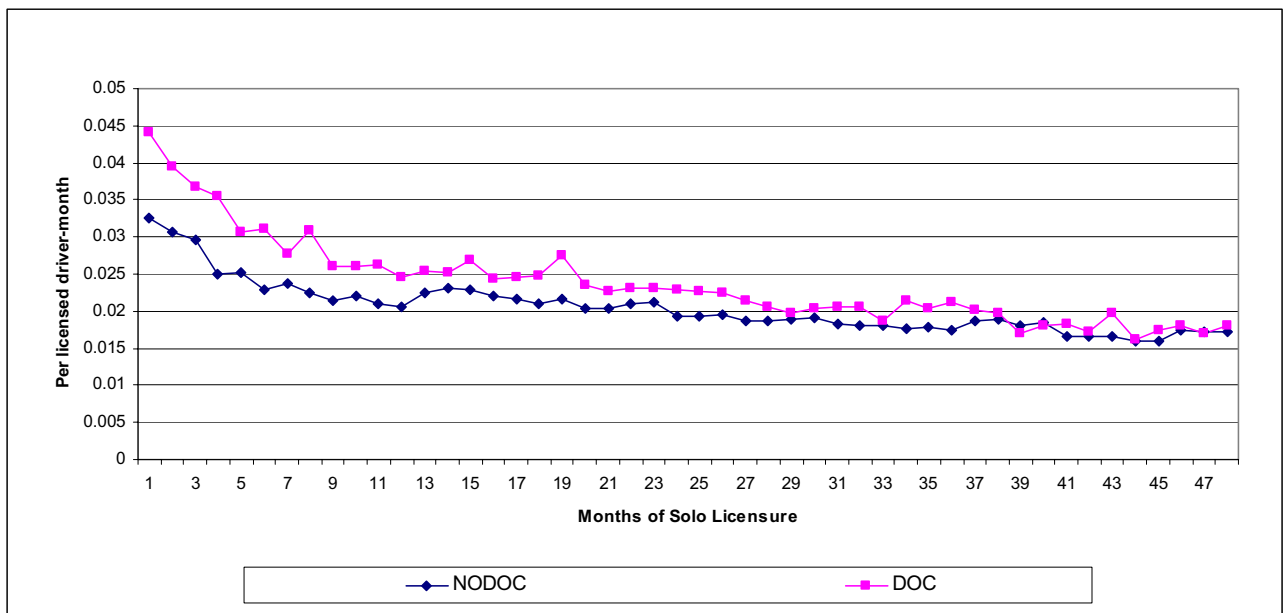
Table 47: GLP Crash Involvement Rates by Program, DOC Status, and Years of Solo Licensure

Type of Crash by Period of Licensure	Early GLP (1999 – 2000)		Full GLP (2001 – 2002)	
	DOC	No DOC	DOC	No DOC
All Crashes:				
1 st Year	38.08 (37.44-38.72)	29.95 (29.55-30.35)	38.02 (37.38-38.66)	29.58 (29.19-29.97)
1 st Two Years	34.22 (33.79-34.65)	28.27 (27.99-28.55)	33.08 (32.66-33.50)	26.92 (26.66-27.18)
1 st Three Years	31.59 (31.22-31.96)	26.61 (26.37-26.85)	30.66 (30.30-31.02)	25.94 (25.70-26.18)
1 st Four Years	29.25 (28.86-29.64)	25.26 (25.00-25.52)	-	-
Liabile Crashes:				
1 st Years	25.48 (24.96-26.00)	19.46 (19.14-19.78)	25.72 (25.20-26.24)	19.53 (19.21-19.85)
1 st Two Years	21.35 (21.01-21.69)	17.31 (17.09-17.53)	20.97 (20.63-21.31)	16.91 (16.70-17.12)
1 st Three Years	18.88 (18.59-19.17)	15.69 (15.50-15.88)	18.62 (18.34-18.90)	15.66 (15.47-15.85)
1 st Four Years	16.92 (16.62-17.22)	14.45 (14.26-14.64)	-	-
Casualty Crashes:				
1 st One Year	10.61 (10.28-10.94)	8.67 (8.46-8.88)	10.77 (10.43-11.11)	8.44 (8.23-8.65)
1 st Two Years	9.61 (9.38-9.84)	8.16 (8.01-8.31)	9.24 (9.02-9.46)	7.84 (7.70-7.98)
1 st Three Years	8.87 (8.67-9.07)	7.73 (7.60-7.86)	8.42 (8.23-8.61)	7.53 (7.40-7.66)
1 st Four Years	8.19 (7.98-8.40)	7.31 (7.17-7.45)	-	-
Material Damage Only Crashes:				
1 st Year	27.47 (26.93-28.01)	21.27 (20.94-21.60)	27.25 (26.71-27.79)	21.14 (20.81-21.47)
1 st Two Years	24.61 (24.24-24.98)	20.11 (19.88-20.34)	23.85 (23.49-24.21)	19.07 (18.85-19.29)
1 st Three Years	22.72 (22.40-23.04)	18.89 (18.68-19.10)	22.24 (21.93-22.55)	18.41 (18.21-18.61)
1 st Four Years	21.05 (20.72-21.38)	17.96 (17.74-18.18)	-	-

Table 48: GLP Crash Involvement Rates by Program, DOC Status, and Years of Solo Licensure – for Drivers who Graduated out of GLP During the Specified Period of Licensure

Type of Crash by Period of Licensure	Early GLP (1999 – 2000)		Full GLP (2001 – 2002)	
	DOC	No DOC	DOC	No DOC
All Crashes:				
1 st Two Years	33.88 (33.32-34.44)	28.43 (28.04-28.82)	32.81 (32.27-33.35)	26.83 (26.46-27.20)
1 st Three Years	33.10 (32.53-33.67)	28.16 (27.74-28.58)	31.02 (30.48-31.56)	26.80 (26.40-27.20)
1 st Four Years	30.92 (30.38-31.46)	27.09 (26.69-27.49)	-	-
Liabile Crashes:				
1 st Two Year	20.58 (20.15-21.01)	16.74 (16.44-17.04)	19.96 (19.54-20.38)	16.14 (15.85-16.43)
1 st Three Years	18.77 (18.34-19.20)	15.62 (15.31-15.93)	18.18 (17.77-18.59)	15.49 (15.18-15.80)
1 st Four Years	17.15 (16.75-17.55)	14.79 (14.50-15.08)	-	-
Casualty Crashes:				
1 st Two Years	9.14 (8.85-9.43)	7.75 (7.55-7.95)	8.78 (8.50-9.06)	7.46 (7.26-7.66)
1 st Three Years	8.73 (8.44-9.02)	7.44 (7.22-7.66)	8.19 (7.91-8.47)	7.42 (7.21-7.63)
1 st Four Years	8.22 (7.94-8.50)	7.38 (7.17-7.59)	-	-
Material Damage Only Crashes:				
1 st Two Years	24.73 (24.25-25.21)	20.68 (20.34-21.02)	24.03 (23.57-24.49)	19.37 (19.06-19.68)
1 st Three Years	24.37 (23.88-24.86)	20.72 (20.36-21.08)	22.83 (22.37-23.29)	19.37 (19.03-19.71)
1 st Four Years	22.70 (22.23-23.17)	19.70 (19.36-20.04)	-	-

Figure 3: Monthly Crash Involvement Rates Novice Drivers During their First Four Years of Solo Licensure by Whether or not they Submitted a Declaration of Completion (DOC) for an ICB Approved Driver Education Course



None of the rates shown in Tables 47 and 48 or in Figure 3 were adjusted for age and gender differences between the groups. As noted previously, a significantly higher percentage of DOC drivers in both the Early and Full GLP groups were younger than in the No DOC groups, and there was a higher percentage of males in the Full GLP group of DOC drivers. Table 49 shows the results of the relative risks obtained from the regression analyses conducted to determine whether or not submitting a DOC had an impact on the GLP Novice driver crash involvement rate after adjustment for age and gender. The estimated relative risks for the drivers who graduated to a Full privilege license during each period of licensure are provided in Table 50.

Whether all Novices or just those who graduated out of GLP were included in the analyses, the results were consistent: drivers who submitted a DOC and applied for early Novice licensure had significantly higher crash rates than those who did not – even after taking into account the differences in the age and gender distributions of the two groups. Moreover, this effect was consistent whether drivers entered the Early GLP licensing process or the Full licensing process. There was, however, evidence of a possible implementation effect on the crash rates of Novice drivers in their second and third years of licensure. Drivers in the Full GLP group had significantly lower crash involvement rates than drivers who entered in Early GLP. The magnitudes of the difference in estimated rates were, however, relatively small (from about 2% to 5%). Nonetheless, although the effect was small, full program implementation, including the improvements made in the standards and dissemination of the approved driver education course, was found to be associated with lowering of the Novice driver crash rate. No significant interaction effects were observed between membership in the Full GLP or Early GLP group and DOC status. Thus, if there was an implementation effect it did not appear to benefit the DOC or No DOC differentially.

The high rates of the DOC drivers during the first two years of Novice licensure (Figure 3) also help to explain the elevated risks observed for all GLP Novice drivers in relation to the Pre-GLP Novice driver group (Figure 2). Although the DOC group only comprises about a third of the total GLP Novice group, the very high rates associated with these drivers appears to be pulling the whole group's rates upwards. A comparison of the No DOC group's rates to the rates shown in Figure 2 for the Pre-GLP group shows that the two groups are quite similar – at least until the rate of decline for the GLP drivers starts to escalate. Thus, while external or other factors may also be impacting GLP Novice driver rates, it would appear that one of the key factors is submission of a DOC. The extent to which the DOC effect is influenced by early Novice licensure is explored below.

Table 49: Estimated Relative Risks of Crash Involvement for GLP Drivers by Program, DOC status, and Period of Solo Licensure – Adjusted for Age at Solo Licensure and Gender

Period of Solo Licensure When Crashes Occurred	All Crashes		Liabile Crashes Only		Casualty Crashes Only		Material Damage Only	
	Relative Risk (95% CI) ¹	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)
1st Year								
Full GLP (2001-2002) Early GLP (1999-2000)	0.98 (0.96, 1.00) 1.00 (REF)	-2% -	1.00 (0.97, 1.02) 1.00 (REF)	+0% -	0.98 (0.94, 1.02) 1.00 (REF)	-2% -	0.99 (0.96, 1.01) 1.00 (REF)	-1% -
DOC NO DOC	1.26 (1.24, 1.29) 1.00 (REF)	+26%* -	1.30 (1.26, 1.33) 1.00 (REF)	+30%* -	1.25 (1.20, 1.30) 1.00 (REF)	+25%* -	1.27 (1.24, 1.30) 1.00 (REF)	+27%* -
1st 2 Years								
Full GLP (2001-2002) Early GLP (1999-2000)	0.95 (0.93, 0.96) 1.00 (REF)	-5%* -	0.97 (0.95, 0.99) 1.00 (REF)	-3%** -	0.95 (0.92, 0.98) 1.00 (REF)	-5%** -	0.95 (0.93, 0.97) 1.00 (REF)	-5%* -
DOC NO DOC	1.21 (1.19, 1.23) 1.00 (REF)	+21%* -	1.23 (1.21, 1.26) 1.00 (REF)	+23%* -	1.19 (1.15, 1.23) 1.00 (REF)	+19%* -	1.22 (1.20, 1.24) 1.00 (REF)	+22%* -
1st 3 Years								
Full GLP (2001-2002) Early GLP (1999-2000)	0.96 (0.95, 0.98) 1.00 (REF)	-4%* -	0.98 (0.96, 1.00) 1.00 (REF)	-2% -	0.96 (0.93, 0.98) 1.00 (REF)	-6%** -	0.97 (0.95, 0.98) 1.00 (REF)	-3%** -
DOC NO DOC	1.18 (1.16, 1.20) 1.00 (REF)	+18%* -	1.19 (1.17, 1.22) 1.00 (REF)	+19%* -	1.15 (1.11, 1.18) 1.00 (REF)	+15%* -	1.19 (1.17, 1.21) 1.00 (REF)	+19%* -
1st 4 Years								
[Early GLP drivers only]								
DOC NO DOC	1.14 (1.12, 1.16) 1.00 (REF)	+14%* -	1.16 (1.13, 1.19) 1.00 (REF)	+16%* -	1.12 (1.09, 1.16) 1.00 (REF)	+12%* -	1.15 (1.13, 1.18) 1.00 (REF)	+15%* -

*P < 0.0001 **P < 0.005 ***P < 0.05 ¹CI=Confidence Interval

Table 50: Estimated Relative Risks of Crash Involvement by DOC Status for Novice Drivers who Graduated out of GLP in each Period of Solo Licensure – Adjusted for Age at Solo Licensure, Gender, and Licensing Program (Early versus Full GLP)

Period of Solo Licensure When Crashes Occurred	All Crashes		Liabile Crashes Only		Casualty Crashes Only		Material Damage Only	
	Relative Risk (95% CI) ¹	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)	Relative Risk (95% CI)	% Difference (from Reference Group)
1st 2 Years								
Full GLP (2001-2002)	0.96 (0.93, 0.99)	-4%***	0.99 (0.94, 1.03)	-1%	1.04 (0.97, 1.11)	+4%	0.93 (0.90, 0.97)	-7%***
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
DOC	1.23 (1.18, 1.27)	+23%*	1.24 (1.19, 1.30)	+24%*	1.23 (1.14, 1.31)	+23%*	1.23 (1.18, 1.28)	+23%*
NO DOC	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 3 Years								
Full GLP (2001-2002)	0.94 (0.92, 0.97)	-6%*	0.98 (0.95, 1.01)	-2%	0.97 (0.93, 0.99)	-3%	0.94 (0.91, 0.96)	-6%*
Early GLP (1999-2000)	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
DOC	1.19 (1.16, 1.22)	+19%*	1.21(1.17, 1.24)	+21%*	1.18 (1.12, 1.23)	+18%*	1.19 (1.16, 1.23)	+19%*
NO DOC	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-
1st 4 Years								
[Early GLP drivers only]								
DOC	1.15 (1.13, 1.18)	+15%*	1.17 (1.13, 1.21)	+17%*	1.14 (1.09, 1.20)	+14%*	1.16 (1.13, 1.19)	+16%*
NO DOC	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-	1.00 (REF)	-

*P < 0.0001 **P < 0.005 ***P < 0.05

¹CI=Confidence Interval

A factor that was found to be important in the year 3 evaluation of the DOC effect was the policy of permitting DOC drivers to apply for early Novice licensure. As was reported in chapter 4, the length of time spent in the Learner stage was found to have a strong inverse relationship with Novice driver crash involvement rates. Therefore, in an effort to account for the potentially confounding effects of this factor, the relative risks summarized in Table 50 were re-estimated with the length of the Learner stage included as a control variable. When the amount of Learner time was taken into account, the estimated relative risks were much smaller than they were before this variable was included. Across the periods of licensure and types of crashes, the adjusted relative risks (and 95% confidence intervals) obtained after adjustment for age, gender, and length of the learner stage ranged from 1.14 (1.11, 1.17), for the first year of solo licensure, to 1.09 (1.07, 1.11), for the first two years, 1.08 (1.06, 1.11) for the first three years, and 1.05 (1.02, 1.07) for the full four years of licensure. Although the estimated relative risks were smaller after adjustment for the length of the learner stage, they were still greater than one indicating that the adjusted rates for DOC drivers remained higher than the rates for No DOC drivers, but this was weighted heavily by the pattern of very high rates for the DOC in the first two years of solo licensure. Of course statistical adjustment only provides an estimate of what might be expected under a specified set of conditions and assumptions. A more accurate analysis would require comparisons of DOC and No DOC drivers who actually spent similar amounts of time in the Learner stage. Such an analysis will not be possible, however, until the Learner time discount has been removed as an incentive for participation in ICBC's approved driver education course.

As indicated above, even after adjusting for the effect of differences in Learner time the estimated relative risks of crash involvement for DOC drivers remained greater than one, and the effect was particularly strong in the first year of licensure. Although the length of the Learner stage is clearly an important factor, further research is required to better understand and identify what other factors may be contributing to the higher crash rates associated with the DOC group. A survey study undertaken as part of the year 3 evaluation failed to find evidence to suggest that the amount and type of driving undertaken by DOC and No DOC drivers is a major factor, and these results were confirmed recently in a similar study undertaken in Ontario. Despite these findings, more research is needed into the role of driving exposure. Most of the research done to date has relied on self-report data collected several months after driver education may have been completed. In addition, although such measures may provide reasonable estimates of exposure in the near past, it is quite possible that the self-reported estimates may not reflect the actual exposure at the time the drives were involved in the crashes. The very event of a crash could influence exposure. Clearly, something is contributing to the higher rates of drivers observed for the drivers who completed the approved course. It could be something in the nature or delivery of the course itself, the curriculum, or some as yet unidentified characteristics of the drivers who take such a course. One of the primary factors that New drivers who responded to the year 3 survey said contributed to their decision to take an approved driver education course was so that they would be eligible for early licensure. Due to the way in which the samples for the present study were selected, the drivers who were included in this study were those who tended to be the most motivated to move through the licensing process the most quickly, in both the DOC and NoDOC driver groups. Even so, the rates for DOC drivers remained higher. This does not mean that motivation to drive unsupervised quickly is not an important factor. It clearly is. But it suggests there is likely something more contributing to the finding of higher crash rates for DOC drivers than simply speed of licensure. It could be the amount of time they practice driving on the road, or the use of a compressed learning approach, personality characteristics of drivers, poor implementation or delivery of the curriculum or issues relating to content.

It should be noted that the findings reported here are not unusual. Other evaluations of driver education programs from many different jurisdictions have reported similar findings. And no one has yet found an adequate explanation. More research into the role, purpose, content, and delivery of driver education is required. New technologies need to be investigated, and more needs to be done to better understand the driver characteristics, and motivations, that contribute to the paradoxical findings associated with driver education. In the meantime, it is clear that offering early solo licensure to New drivers who take driver education is not warranted. This is not to say that participation in driver education should not be encouraged. But any incentives that are offered to promote such participation must be designed to motivate safe driving behaviours and not simply to motivate earlier mobility.

One final factor investigated in this study was performance on the Class 7 road test and its relationship to the Novice driver crash involvement rates of GLP drivers who did and did not submit a DOC. Crash rates observed during the first year of solo licensure for the Full GLP group were used in the analysis. Of the 55,143 drivers in the cohort, 55,108 (99.9%) had complete Class 7 knowledge and road test data and were included in the analysis. The remaining 35 had either obtained a motorcycle licence (n=23) as their first Novice licence or had missing data. Of the 55,108 drivers in the group, 36% had submitted a DOC and 64% had not.

When performance on the Class 7 road test was examined by DOC status a strong and statistically significant ($P < 0.0001$) association was obtained. A much higher percentage of DOC drivers passed their road test on the first attempt than No Doc drivers (75% versus 62%, respectively). A Poisson regression analysis undertaken to investigate the relationship between DOC status, test performance and Novice driver crash involvements produced an estimated relative risk (95% confidence interval) of 1.08 (1.04, 1.13) for DOC relative to No DOC drivers after age, gender, length of the Learner stage, and performance on the Class 7 road test were included in the model. This compared to a relative risk of 1.14 obtained for DOC versus No DOC drivers when performance on the Class 7 test was not taken into account. Within the same model, drivers who passed the road test on the first attempt were found to have relative risks of crash involvement of 0.69 (0.66, 0.73) when compared to drivers who took three or more attempts to pass the test. Thus, drivers who passed the test on the first try were estimated to have adjusted crash rates that were about 30% lower than drivers who had more difficulty passing the test. Although the DOC group had a high percentage of drivers who passed on the first attempt, the detrimental effect of their shorter time in the Learner stage may have outweighed some of the benefits gained by their better test performance.

5.3 Summary

The results of this study suggest that more work is needed to improve the crash outcomes associated with Novice drivers, particularly during their first two years of solo licensure, and particularly in relation to drivers who complete the approved driver education course. Much of this effect appears to be associated with early Novice licensure. Removal of the time incentive as a way to promote participation in driver education would, therefore, be expected to attenuate at least some of the DOC effect. And should this occur, the overall GLP Novice crash rates will most likely also come down. Another, albeit unintended, factor contributing the finding of higher crash rates for GLP Novice drivers is the higher percentage of younger drivers in the GLP groups. The implementation of GLP appears to have prompted new drivers to apply for licensure sooner. This trend will continue to be monitored as drivers proceed into the even longer enhanced program (GLPe).

The findings of this study confirmed the preliminary results reported in the year 3 evaluation and helped to clarify the relationships, both short- and longer-term, between DOC status, the length of the Learner stage and Novice driver crash involvements. Until the time incentive is removed, the crash rates of GLP Novice drivers will likely remain elevated – at least during the early stages of solo licensure. The results of this study demonstrated the effect of an extended Learner stage and confirmed the importance of not reducing the time spent by new drivers in this low risk, supervised stage.

This study also explored questions that arose concerning the possible effect of the staged implementation of GLP; the Novice crash rates of drivers in the Early GLP (1999-2000) group were compared to those who entered the fully implemented program (Full GLP group: 2001-2002). Some significant differences were observed although there was some inconsistency in the direction of the differences, and this made interpretation difficult. If there was an effect, it wasn't detected until the second and third years of Novice licensure. The differences between the two groups during the first year of licensure were not statistically significant. Given that the two most substantial additions to Full GLP were the enhanced knowledge test and the new level 1 (Class 7/8) road test, an indication of an effect was expected during the first year of solo licensure. It is possible that the benefits of the enhanced level 1 road test were masked within the context of the very high crash rates of Novice drivers in this period, or by the confounding influences of differences in lengths of licensure and DOC status. Why GLP Novice drivers were found to have higher crash rates than Pre-GLP drivers during this first year is not yet fully understood. The speed with which many of the drivers in this

study progressed through the Learner stage was likely an important factor, as was the high percentage of drivers who submitted a DOC and took advantage of the opportunity for early Novice licensure.

Although little consistent evidence of predictive validity for crash involvement was obtained for the level 1 test, another aim of this study was to examine the predictive validity of the level 2 (Class 5/6) exit road test. Although some encouraging results were obtained, methodological issues made the results difficult to interpret. A comparison of crash rates of drivers six months before and after they passed the exit test were compared. A positive effect was observed, but the magnitude was small and the lack of an appropriate comparison group makes it impossible to draw any causal connections. Thus, while the findings are suggestive, other factors could be responsible for the observed effects.

An analysis was also done to compare the crash rates of GLP Novice drivers who did and did not obtain their full privilege licence during their first three years of licensure. Although positive effects were observed for drivers who took the test when liable and casualty crashes were examined, the magnitudes of the observed differences were quite small, opposite results were obtained when all crashes and material damage only crashes were examined and, consequently, the results were difficult to interpret. Nonetheless, taken together with the finding of declining crash rates for GLP Novice drivers in their fourth year of licensure (when more drivers had successfully completed the test), the road test cannot be excluded as a possible factor contributing to the decline.

In addition to comparing the crash rates of drivers who did and didn't pass the road test, the number of attempts taken to pass the exit test was also examined. As with the level 1 test, after adjustment for age, gender, and length of licensure, drivers who passed the exit test without much difficulty (i.e., on the first or second attempt) were found to have lower crash rates than drivers who took three attempts or more. An interesting additional result was that a significantly higher percentage of drivers who took the new Class 7 road test passed the Class 5 road test on the first attempt than drivers who took the old Class 7 test (88% and 82%, respectively). This suggests that there may have been a practice effect for drivers who were exposed to both of the new tests. The very percentage of drivers who passed the Class 5 test on the first attempt also suggests, however, that the level 1 and exit road test may be measuring many of the same elements.

The finding of negative road safety benefits for drivers who completed an approved driver education course should not necessarily be attributed to the course itself. Many factors may have influenced these results. The difference between the study groups in the lengths of their learner stages is certainly a key factor. But other factors such as driver motivation, attitude, parental involvement and amount and type of driving were not investigated. Although amount and type of driving have been investigated elsewhere and have not been yet been found to explain the association between driver education and Novice crash involvement (Wiggins, 2004; Lonero et al., 2001; Zhao et al., 2005) more research is still required to measure and better understand relationships between driver education and other potentially confounding factors. There could also be issues in the implementation, content, and delivery of the approved course. More research is required to evaluate the extent to which the approved course curriculum is being implemented and taught to an appropriate standard. In the absence of such research, no causal inferences can be drawn about the impact of the ICBC-approved course on Novice crash involvement rates. However, the results of this study do clearly indicate that promoting participation in the course by offering to shorten the Learner stage has been counterproductive; the observed effect of DOC submission on the crash rates of the Novice drivers included in this evaluation was consistent with the results reported in the year 3 evaluation report, and there was no evidence of a reversal of effect after full implementation of GLP.

Based on the results of the preliminary Year 3 Evaluation (Wiggins, 2004), several recommendations were made for changes to improve the effectiveness of GLP. The recommendations included: 1) to extend the Learner stage, 2) to implement additional Novice conditions and restrictions, and 3) to consider removal of the Learner stage time discount for drivers who completed an ICBC-approved driver education course. The first two recommendations were implemented in October 2003, and the third is ongoing. One question that arose in connection with the implementation of the enhancements was what effect the Learner time discount would

have on the crash involvement rates of Novice drivers when they were required to spend an additional 6 months in the Learner stage. In the next chapter, the study undertaken to explore the early effects of the October 2003 program enhancements is described. The assessment of the impact of the Learner time discount within the context of the extended Learner stage will be the primary focus of Chapter 6.

6. Study 3 - Early Effects of GLPe on New and Novice Driver Crash Rates

Study 1 was conducted primarily to provide historical context, to ensure that the results of the year 3 interim evaluation were not an artefact of the selected study groups, and to examine the impact of the fully implemented program on New driver crash involvement rates, particularly in relation to ICBC's approved driver education course.

The results of the studies describe in chapters 4 and 5 of this report (Study 1 and Study 2) confirmed that GLP was effective in reducing the crash involvement rates of New drivers. They also demonstrated that the positive effect was consistent during both the early program years (1999- 2000) and after GLP had been fully implemented (2001-2002). Some evidence of a program implementation effect was found, although the magnitude of the effect was small (2%-5%); the 2-year and 3-year crash involvement rates of drivers who entered the program after full implementation were lower than the comparative rates obtained for drivers in the early program. Similar results were not observed for the 1-year rates. Given that the main components that were added to GLP in 2000 (new knowledge test and level 1 road test) these results suggest that if the new level 1 road test did have a positive impact, it was a delayed effect.

The results of Study 2 also confirmed that drivers who completed an approved driver education course and submitted a DOC had higher Novice crash involvement rates than drivers who did not submit a DOC. They further confirmed that the Learner stage time credit offered for taking an approved course was an important factor contributing to these higher rates. Study 2 was not, however, able to investigate whether an increase in the minimum Learner stage might reduce or reverse these findings.

In October 2003, as part of the GLP enhancement package, the minimum Learner stage for all GLP drivers was increased by 6 months. Drivers who submitted a DOC after October 2003 had to remain in the supervised Learner stage for at least 9 months; drivers who did not submit a DOC had to remain in the Learner stage for at least 12 months. Although the implementation of GLPe occurred too recently to permit a comprehensive impact assessment at this time, Study 2 was undertaken as a formative evaluation designed primarily to find out whether the GLPe Learner stage extension might have helped to reduce the effect of offering drivers who completed an approved driver education course the opportunity to leave the Learner stage three months early.

In the study described in this chapter, the early impacts of GLPe were evaluated in two ways. Firstly, to determine the early effects of GLPe on New driver crash rates (and on Learner driver crash rates) two New driver samples were selected. In order to control for seasonal variations in crashes, New drivers who entered GLPe between Oct 6, 2003 and December 31, 2004 were selected and their crash rates were compared to New drivers who entered the fully implemented GLP between October 6, 2001 and December 31, 2002. Crash rates were computed using a maximum follow-up period of 1.5 years for both groups (to March 31, 2005 for the GLPe group and to March 31, 2003 for the GLP group). Although future evaluations of GLPe will focus on calendar year intake periods (following the methods used in studies 1 and 2), a longer intake period (15-month) was used here in order to maximize the number of drivers who would have had time to progress through the 12-month Learner stage and into the Novice stage of GLPe.

Secondly, in order to assess the effects of GLPe on the Novice driver crash rates of those who elected to complete an ICBC-approved driver education course, two Novice driver samples were selected. For this part of the study it was necessary to limit the samples to those who had obtained a Novice licence and who had accumulated some Novice driver-time. As mentioned in the previous chapter, when comparing Novice driver crash rates it is important to base the rates on equivalent follow-up periods. Otherwise, any differences observed between their crash rates may simply be attributable to differences in risk (Novice drivers are at greatest risk when they first enter the Novice stage and then the risk declines) rather than to program effects. Due to the length of the GLPe Learner stage, the recency of GLPe implementation, and the lag time required

for a reliable crash count, the assessment of the impact of the ICBC-approved driver education course on the crash involvements of drivers exposed to GLPe had to be limited to the first 90-days of Novice licensure.

Due to the limited number of drivers who had progressed to the Novice stage when this was undertaken, the results concerning GLPe must be considered very early and not representative of the impact that the program is likely to have over a longer time frame. The 1-5-year study period upon which the New driver assessment was based was long enough only to get a preliminary view of the impact of the Learner stage; the results do not reflect what will happen to the New driver rate as more Learners advance to the Novice stage. For this impact to be assessed, a 3 or 4-year follow-up period will be required. As noted above, the primary reason for doing this study at this time was to find out what, if any, effect the time incentive for driver education was having on Novice crash rates within the context of GLP's longer Learner stage. Ongoing consultations concerning the role of the approved driver education course and, in particular, the retention of the time incentive, necessitated as early an assessment of the effect as possible. In this context, Study 3 has been conducted as a formative rather than summative evaluation, and no attempt has been made to evaluate the overall impact of GLPe on Novice driver crash rates. The amount of follow-up available for the drivers selected into the study was enough for an early, albeit preliminary, assessment of the DOC effect. However, 90 days was long enough to conduct an early assessment of the impact of the new GLPe Novice restrictions and conditions on Novice crash rates. The prohibition-free requirement, in particular, will take time to have a detectable effect.

6.1 Method

6.1.1 Sample Design

This study uses a quasi-experimental design in which drivers were followed prospectively from their licence issue date (Learner date for the New driver samples, Novice date for the Novice driver samples) to a specified study end date (see below). As the primary purpose of the study was to investigate the early impact of the Learner stage time discount on the crash rates of Novice drivers exposed to a longer minimum Learner period, the driver samples were categorized according to their licensing process (GLP or GLPe) and whether or not they submitted a DOC. Crash rates were computed for the New driver groups, Novice driver groups, and DOC – No DOC groups.

6.1.2 Sample

For the purposes of this study the following sample selection criteria were used:

GLPe New Drivers All BC drivers who obtained their first Learner licence between October 6, 2003 and December 31, 2004.

From this group the following drivers were excluded:

- Any driver identified as having held an out-of-province licence at any point after their entry into GLPe;
- Drivers who did not meet the minimum time requirements for completion of the GLPe Learner and / or Novice stages;

GLPe Novice Drivers All BC drivers who obtained their first Learner licence between October 6, 2003 and December 31, 2004 and who, by June 30, 2005, had accumulated a minimum of 90 days of active Novice licensure.

From this group the following drivers were excluded:

- Any driver who was identified as having held an out-of-province licence at any point after their entry into GLPe;

- Drivers who did not meet the minimum time requirements for completion of the GLPe Learner and / or Novice stages;

GLP New Drivers

All BC drivers who obtained their first Learner licence between October 6, 2001 and December 31, 2002.

From this group the following drivers were excluded:

- Any driver identified as having held an out-of-province licence at any point after their entry into GLP;
- Drivers who did not meet the minimum time requirements for completion of the GLP Learner and / or Novice stages;

GLP Novice Drivers

All BC drivers who obtained their first Learner licence between October 6, 2001 and December 31, 2002 and who, by June 30, 2003, had accumulated a minimum of 90 days of active Novice licensure.

From this group the following drivers were excluded:

- Any driver who was identified as having held an out-of-province licence at any point after their entry into GLPe;
- Drivers who did not meet the minimum time requirements for completion of the GLPe Learner and / or Novice stages;

6.1.3 Outcome Variables

The following were the primary outcome variables used in the study:

- New driver crash involvement rate – computed using total driver-time contributed and crashes that occurred between the date that the driver’s first Learner’s licence was issued until March 31, 2005 (for GLPe drivers) or March 31, 2003 (for GLP drivers). Drivers who died, surrendered their licence, or had a cancelled or expired licence before the study end date had their end date reset to the date of death, surrender or cancellation. As well, GLP drivers who transitioned into GLPe before reaching any other endpoint had their end date reset to their GLPe entry date. Learner and Novice crash involvement rates – computed by disaggregating the New driver crash involvement driver-time and crash counts into Learner and Novice driver-time and crash counts.
- 90-day Novice crash involvement rates – computed using the number of Novice driver crash involvements that occurred during the first 90-days of active Novice licensure

Crash rates were calculated using all crashes, liable crashes only, casualty crashes only, and material damage only crashes. In all cases, rates were calculated using **per licensed-driver years** in the denominator. Although the validity term of Learner licences was extended from one to two years with the implementation of GLPe, the rates were not adjusted to take into account this change. Due to the short follow-up period used in the calculation of the New driver crash rates any effect of the change in the validity term would be negligible (see section 4.1.4 for further discussion as to when and why such an adjustment would be needed).

6.1.4 Statistical Analysis

Crash involvement rates and relative risks were computed using Poisson regression techniques (see Section 4.1.4 for detailed description). All of the analyses were conducted using SAS Version 8 (1999) statistical software.

6.1.5 Data Sources

See section 4.1.5 for description of data sources.

6.2 Results

6.2.1 Sample Characteristics

Tables 51 and 52 show the age and gender distributions of new and Novice drivers in each of the GLP and GLPe study groups. For both of the New driver groups the age at entry into the licensing process is very similar: just over 60% of the drivers in each group obtained their Learner's licence while they were 16 years of age; 72% obtained it before turning 18 years of age. In contrast, when the samples were limited to those who had accumulated 90 days of Novice licensure, almost 80% of the GLPe drivers had obtained their Learner licence at age 16 compared to only 73% of the GLP drivers.

Table 51: Age on Issue Date of First Learner's Licence by Study Group

Age at First Learners (in years)	All New Drivers				Novice Drivers with 90-days Novice Licensure			
	GLP		GLPe		GLP		GLPe	
	N	%	N	%	N	%	N	%
16	41,044	61.4	39,844	62.3	18,575	72.8	9,517	79.6
17	7,454	11.1	6,431	10.1	2,523	9.9	815	6.8
18	4,134	6.2	3,893	6.1	1,210	4.7	425	3.5
19-21	5,327	8.0	5,225	8.2	1,333	5.2	487	4.1
22-24	2,154	3.2	2,314	3.6	446	1.8	200	1.7
>= 25	6,777	10.1	6,198	9.7	1,440	5.6	512	4.3
Total	66,890	100.0	63,905	100.0	25,527	100.0	11,956	100.0

Both of the New driver samples were almost evenly split between males and females (Table 52). However, the Novice driver samples had higher percentages of males suggesting that males tend to move through the Learner stage more quickly than females.

Table 52: Gender by Study Group

Gender	All New Drivers				Novice Drivers with 90-days Novice Licensure			
	GLP		GLPe		GLP		GLPe	
	N	%	N	%	N	%	N	%
Male	32,639	48.8	31,744	49.7	13,459	52.7	6,689	55.9
Female	34,247	51.2	32,161	50.3	12,068	47.3	5,267	44.1
Not Recorded	4	0.0	0	0.0	0	0.0	0	0.0
Total	66,890	100.0	63,905	100.0	25,527	100.0	11,956	100.0

Table 53 shows the age at which drivers in the GLP and GLPe groups obtained their first Novice licence. Of the 66, 890 drivers included in the GLP New driver group, 33,640 (50.3%) had obtained their Novice licence by the end of the 1.5-year study period (March 2003). In contrast, only 11,854 (18.5%) of the drivers in the GLPe had advanced to the Novice stage by the end of their 1.5-year study period (March 2005). This difference is a consequence of the longer Learner stage implemented with GLPe and is similarly reflected in the differences observed in the distribution of the ages at which drivers in the two groups obtained their Novice licence: almost 60% of the GLP New drivers who obtained their Novice licence within the study period were 16 years of age at the time the licence was issued compared to only 33% of the GLPe New drivers. A similar difference is seen between the percentage of 16 year olds in the GLP and GLPe Novice driver samples.

Table 53: Age on Issue Date of First Novice Licence by Study Group

Age at First Novice Licence (in years)	All New Drivers				Novice Drivers with 90-days Novice Licensure			
	GLP		GLPe		GLP		GLPe	
	N	%	N	%	N	%	N	%
16	19,874	59.1	3,952	33.3	15,319	60.0	3,948	33.0
17	6,460	19.2	5,538	46.7	4,662	18.3	5,611	46.9
18	2,255	6.7	800	6.8	1,762	6.9	809	6.8
19-21	2,301	6.8	756	6.4	1,754	6.9	769	6.4
22-24	689	2.1	258	2.2	519	2.0	256	2.1
>= 25	2,067	6.1	550	4.6	1,511	5.9	5,563	4.7
Total	33,646	100.0	11,854	100.0	25,527	100.0	11,956	100.0

Table 54 shows the number and percentage of Novice drivers in each study group who completed an ICBC-approved driver education course and submitted a DOC to an ICBC-driver services centre. Drivers who submitted a DOC could apply for up to a 3-month reduction of their Learner stage. A higher percentage of the drivers in the GLPe than in the GLP group submitted a DOC during the time periods studied. This suggests that the GLPe extension of the Learner stage from 6 to 12 months may have prompted more drivers to take an approved course in order to take advantage of the time discount.

Table 54: Number (%) of Novice Drivers in each Study Group who completed an ICBC-approved Driver Education course and submitted a Declaration of Completion (DOC) to a Driver Services Centre

DOC Submitted	All New Drivers				Novice Drivers with 90-days Novice Licensure			
	GLP		GLPe		GLP		GLPe	
	N	%	N	%	N	%	N	%
Yes	13,262	39.4	5,663	47.8	10,812	42.4	5,648	47.2
No	20,383	60.6	6,191	52.2	14,715	57.6	6,308	52.8
Total	33,645	100.0	11,854	100.0	25,527	100.0	11,956	100.0

Table 55 shows the total amount of licensed driver-time contributed by the drivers in the GLP and GLPe New driver samples. Recall that the intake periods used to obtain these samples were dynamic and took place over a 15-month period, while the follow-up period lasted for a maximum of 1.5 years (18 months). Drivers who entered the study in the 1st month would have contributed up to 18 months of driver-time while those who entered the study in the 15th month could have contributed no more than 3 months. During that time, only about half of the GLP drivers and a fifth of the GLPe drivers had graduated to the Novice stage. Thus, the statistics provided in Table 55 are preliminary and do not accurately reflect the actual length of the Learner stage (or Novice stage). They only reflect the status of the groups at the time they were assessed. It will not be possible to determine the actual length of the Learner stage (or Novice stage) until all of the drivers in each cohort have progressed to the Novice stage (or to Full Privilege licensure).

Table 55: Amount of Licensed driver-time Contributed by All GLP and GLPe New drivers and by New Drivers from each group who Advanced to the Novice Stage during the 1.5-year Study Period

Licensed Driver-Time	All New Drivers		New Drivers who Advanced to Novice Stage During Study Period	
	GLP (N=66,890)	GLPe (N=63,905)	GLP (N=33,646)	GLPe (N=11,854)
All Licensed-months (years)	679,435 (55,844)	637,974 (52,436)	405,944 (33,365)	175,153 (14,396)
Minimum Driver-months	0.2 ¹	0.2 ¹	3.1	9.1
Maximum Driver-months	18.1	18.1	18.1	18.1
Median driver-months	10.1	9.6	12.4	14.9
Mean driver-months	10.2	10.0	12.1	14.8
Learner-months (years)	489,574 (40,239)	597,099 (49,076)	216,083 (17,760)	134,278 (11,036)
Percentage of Total Months	72%	94%	53%	77%
Median Learner-months	6.7	9.1	6.2	12.0
Mean Learner-months	7.3	9.3	6.4	11.3
Novice-months (years)	189,861 (15,605)	40,875 (3,360)	189,861 (15,605)	40,875 (3,360)
Percentage of Total Months	28%	6%	47%	23%
Median Novice-months	0.2	0	5.3	3.3
Mean Novice-months	2.8	0.6	5.6	3.5

¹ Reported time is less than the required minimum for Learner drivers in GLP (3 months) or GLPe (9 months) because of licences that were cancelled or surrendered shortly after the issue date.

Table 56 shows the amount of licensed driver time contributed by the drivers in the GLP and GLPe Novice driver samples. Although the Learner times reported for these drivers are complete (since by definition all of the drivers in these samples had to have advanced to the Novice stage) they reflect the Learner times associated with the Novice drivers who moved most quickly through the licensing process. Due to the selection criteria used in defining the Novice driver samples, drivers who did not progress through the Learner stage quickly enough to accumulate 90 days of Novice licensure within the study time frame were excluded.

Table 56: Licensed Driver-time, Learner-time and Novice-time of GLP and GLPe New Drivers with 90-days of Novice Licensure

Licensed Driver-time (in months)	GLP (N=25,527)	GLPe (N=11,956)
All Licensed-months (years)	233,797 (19,483)	171,624 (14,302)
Minimum Driver-months	5.9	11.9
Maximum Driver-months	18.1	20.8
Median driver-months	9.1	15.0
Mean driver-months	9.2	14.4
Learner-months (years)	157,216 (13,101)	135,756 (11,313)
Percentage of total months	67%	79%
Median Learner-months	6.1	12.0
Mean Learner-months	6.2	11.4
Novice-months (years)	76,581 (6,382)	35,868 (2,989)
Percentage of total months	33%	21%
Median Novice-months	3.0	3.0
Mean Novice-months	3.0	3.0

6.2.2 Crash Characteristics

Liability and Severity. Table 57 summarizes the liability and severity of the Learner and Novice driver crash involvements by the licensing program to which the drivers were exposed (GLP or GLPe), and by the study group into which the drivers were selected. Only one notable difference was observed: in the 1.5-year study group the percentage of Novice crash involvements that resulted in a casualty was lower for the GLPe than the GLP group. No such difference was observed between the 90-day Novice groups. This suggests that the finding for the 1.5-year groups may have been related to the different amounts of Novice driver-time contributed by the GLP and GLPe Novice drivers. This will be investigated further in the evaluation of the GLPe impact on Novice crash involvement rates.

Table 57: Type of Crash Involvement (Liability and Severity) by Licence Stage, Program and Study Group

Type of Crash Involvement*	Study Group 1: 1.5-Year Study Period				Study Group 2: 90-Days Novice Licensure			
	Learner		Novice		Learner		Novice	
	GLP N (%)	GLPe N (%)	GLP N (%)	GLPe N (%)	GLP N (%)	GLPe N (%)	GLP N (%)	GLPe N (%)
Liabile	873 (69)	740 (69)	3,922 (69)	905 (69)	284 (61)	180 (65)	1,807 (72)	854 (72)
Non-liable or liability not assigned	392 (31)	339 (31)	1,776 (31)	409 (31)	184 (39)	99 (35)	708 (28)	331 (28)
Total	1,265 (100)	1,079 (100)	5,698 (100)	1,314 (100)	468 (100)	279 (100)	2,515 (100)	1,185 (100)
Casualty	334 (26)	263 (24)	1,603 (39)	360 (27)	127 (27)	58 (21)	692 (28)	319 (27)
Material Damage	931 (74)	816 (76)	4,095 (61)	954 (73)	341 (73)	221 (79)	1,823 (72)	866 (73)
Total	1,265 (100)	1,079 (100)	5,698 (100)	1,314 (100)	468 (100)	279 (100)	2,515 (100)	1,185 (100)

Compliance with GLPe Rules and Restrictions among the Crash Involved. In order for GLPe to have an impact on crash involvement rates New drivers must adhere to the conditions and restrictions put in place during the Learner and Novice licensing stages. Due to the preliminary nature of this evaluation, no attempt was made to assess driver compliance with the rules of GLPe. However, information extracted from police reported collision data (TAS) was used to explore to what extent the characteristics of the reported crashes involving New drivers had characteristics that suggested contravention of GLPe rules and restrictions. The results are summarized in Table 58.

As shown in Table 58, a higher percentage of the Learner than Novice crashes involving drivers in the 1.5 year follow-up cohort had characteristics indicating a violation of GLP or GLPe rules or restrictions. The reporting of alcohol as a possible contributing factor also occurred more frequently in crashes involving the Learner drivers in the 90-day cohorts, as did violations of the Learner stage passenger restriction. The limited time frame that was available for the selection of the 90-day GLPe group, accompanied by the longer GLPe Learner stage, may have contributed to these findings. In order to be selected into the 90-day group, GLPe drivers would have had to proceed through the Learner stage fairly quickly. Non-compliant Learners in GLPe may have taken longer to complete the Learner stage (due to prohibitions delaying their progress) and therefore not been able to accumulate enough Novice time for inclusion in the study group. Crash involvement might also have delayed progress through the Learner stage and subsequently excluded drivers from the group. While these factors would also have affected the 90-day GLP group, they would have had less impact due to the shorter minimum Learner term in GLP. Additional time and data will be required before inferences about compliance among the crash involved GLPe Learner and Novice drivers can be drawn. The higher percentages of restriction violations observed in the 1.5-year group more accurately reflect the magnitude of non-compliance among the crash-involved.

Table 58: Number (%) of Driver Crash Involvements in which a Learner or Novice Restriction May have been Violated by Licence Stage, Program and Study Group

Crash Characteristics	Study Group 1: 1.5-Year Study Period				Study Group 2: 90-Days Novice Licensure			
	Learner		Novice		Learner		Novice	
	GLP	GLPe	GLP	GLPe	GLP	GLPe	GLP	GLPe
Driver had been Drinking	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Yes	31 (8.2)	39 (12.3)	49 (2.8)	15 (3.7)	6 (5.4)	2 (2.9)	11 (1.4)	14 (3.8)
No	349 (91.8)	278 (87.7)	1,684 (97.2)	393 (96.3)	106 (94.6)	68 (97.1)	760 (98.6)	353 (96.2)
Total	380 (100)	317 (100)	1,733 (100)	408 (100)	112 (100)	70 (100)	771 (100)	367 (100)
Time of Collision			Not Restricted	Not Restricted			Not Restricted	Not Restricted
Midnight – 5:00 am	36 (9.5)	37 (11.7)	145 (8.4)	43 (10.5)	6 (5.4)	0 (0.0)	65 (8.4)	41 (11.2)
5:00 am - 5:00 pm	191 (50.3)	159 (50.2)	837 (48.3)	207 (50.7)	58 (51.8)	40 (57.1)	352 (45.7)	176 (47.9)
5:00 pm - midnight	137 (36.0)	113 (35.6)	715 (41.2)	154 (37.7)	41 (36.6)	28 (40.0)	336 (43.6)	146 (39.8)
Unknown	16 (4.2)	8 (2.5)	36 (2.1)	4 (0.1)	7 (6.2)	2 (2.9)	18 (2.3)	4 (1.1)
Total	380 (100)	317 (100)	1,733 (100)	408 (100)	112 (100)	70 (100)	771 (100)	367 (100)
Passengers in vehicle ¹			Not Restricted				Not Restricted	
Passenger restriction may have been violated	246 (63.0)	198 (62.5)	295 (17.0) (if GLPe rules applied)	48 (11.8)	61 (54.4)	34 (48.6)	129 (16.7) (if GLPe rules applied)	40 (10.9)
No apparent violation of Passenger restriction	123 (31.6)	98 (30.9)	1,366 (78.8)	348 (85.3)	44 (39.3)	30 (42.8)	606 (78.6)	315 (85.8)
Unknown	21 (5.4)	21 (6.6)	72 (4.2)	12 (2.9)	7 (6.3)	6 (8.6)	36 (4.7)	12 (3.3)
Total	380 (100)	317 (100)	1,733 (100)	408 (100)	112 (100)	70 (100)	771 (100)	367 (100)

¹ Passenger restrictions were applied to GLP Learner drivers and GLPe Learner and Novice Drivers. Learner drivers (GLP and GLPe) were not permitted to carry more than 2 passengers, one of whom had to be a supervising adult; GLPe Novice drivers were not permitted to carry more than 1 passenger (except for immediate family members) unless accompanied by a supervising adult (25 years of age or more).

6.2.3 Assessment of GLPe Impact on New Driver Crash Involvement Rates

The early effects of GLPe on the crash rates of New drivers were assessed in two ways. The impact of GLPe on New driver rates and Learner driver rates was evaluated using the 1-5-year New driver study cohorts. The impact of completing the approved driver education course on Novice driver crash rates was assessed using the 90-day Novice driver cohorts. No attempt was made to assess the impact of the GLPe Novice restrictions and conditions on Novice driver crash rates. At the time when this evaluation was undertaken the number of GLPe drivers who had progressed to the Novice stage was too small to permit reliable estimation of a GLPe Novice stage effect. A preliminary assessment of the impact of GLPe on Novice driver crash rates is not recommended undertaken until the majority of drivers in the GLPe cohort have spent at least two years in the Novice stage.

The results summarized in Table 59 show that GLPe has been highly effective in reducing the New driver crash involvement rate. The GLPe New driver rate for all crashes was 63% lower than the rate obtained for the comparison group of GLP drivers, and the effect varied little across crash types. GLPe Learner driver crash rates were also significantly lower than the Learner crash rates obtained for the GLP drivers, although the magnitude of the percentage difference was smaller (about 30%).

Although, intuitively, it may seem odd that a 63% reduction would be observed for all crashes when there was only a 30% reduction in the Learner rate and a 7% increase in the Novice rate, the overall effect takes into account not only what was happening within each licence stage, but for how long. The overall rate for GLPe New drivers reflects the fact that 94% of the total driver time was at the lower Learner rate while for GLP New

drivers the Learner rate (the magnitude of which was also higher than the GLPe Learner rate) applied for only 72% of the total driver-time. Thus, to arrive at the total, the separate effects must be weighted by both the number of drivers in each stage and the amount of licensed time they contribute to the total..

Table 59: Crude New Driver Crash Involvement Rates¹ (per 100 licensed driver-years), Relative Risks and 95% Confidence Intervals (CI) – Overall and by Licence Stage (Learner and Novice)

Driver Group	Crash Type	Crash Rate (95% CI)	Relative Risk (95% CI)	% Difference (from REF Group)
All New Drivers	All Crashes			
GLPe (N=63,905) GLP (N=66,890)	GLPe	4.56 (4.38, 4.74)	0.37 (0.35, 0.38)	-63%*
	GLP	12.47 (12.18, 12.76)	1.00 (Ref)	
	Liabile Crashes Only			
	GLPe	3.13 (2.99, 3.29)	0.37 (0.35, 0.39)	-63%*
	GLP	8.59 (8.35, 8.83)	1.00 (Ref)	
	Casualty Crashes Only			
GLPe	1.19 (1.10, 1.28)	0.34 (0.31, 0.38)	-66%*	
GLP	3.47 (8.35, 8.83)	1.00 (Ref)		
Material Damage Crashes Only				
GLPe	3.38 (3.22, 3.54)	0.38 (0.36, 0.40)	-62%*	
GLP	9.00 (8.75, 9.25)	1.00 (Ref)		
Learner Drivers	All Learner Crashes			
GLPe (N=63,905) GLP (N=66,890)	GLPe	2.20 (2.07, 2.33)	0.70 (0.64, 0.76)	-30%*
	GLP	3.14 (2.97, 3.31)	1.00 (Ref)	
	Learner Liabile Crashes			
	GLPe	1.51 (1.40, 1.62)	0.69 (0.63, 0.77)	-31%*
	GLP	2.17 (2.03, 2.31)	1.00 (Ref)	
	Learner Casualty Crashes			
GLPe	0.54 (0.48, 0.60)	0.65 (0.55, 0.76)	-35%*	
GLP	0.83 (0.74, 0.92)	1.00 (Ref)		
Learner Material Damage Only Crashes				
GLPe	1.66 (1.55, 1.77)	0.72 (0.65, 0.79)	-28%*	
GLP	2.31 (2.16, 2.46)	1.00 (Ref)		
Novice Drivers²	All Novice Crashes			
GLPe (N=11,854) GLP (N=33,645)	GLPe	39.11 (37.00, 41.22)	1.07 (1.01, 1.14)	+7%***
	GLP	36.52 (35.57, 37.47)	1.00 (Ref)	
	Novice Liabile Crashes			
	GLPe	26.94 (25.18, 28.70)	1.07 (1.00, 1.15)	+7%
	GLP	25.13 (24.34, 25.92)	1.00 (Ref)	
	Novice Casualty Crashes			
GLPe	10.72 (9.61, 11.83)	1.04 (0.93, 1.17)	+4%	
GLP	10.27 (9.77, 10.77)	1.00 (Ref)		
Novice Material Damage Only Crashes				
GLPe	28.40 (26.60, 30.20)	1.08 (1.0, 1.16)	+8%***	
GLP	26.24 (25.44, 27.04)	1.00 (Ref)		

*P < 0.0001 **P < 0.005 ***P < 0.05 ¹Based on an average of about 10 months of licensed driving per driver (to a maximum of 1.5 years)

²Drivers in the New driver study groups who advanced to the Novice stage during the 1.5-year study period

Effect of Age and Gender. The results presented in Table 59 were not adjusted for age and gender differences between the study groups. Due to the very similar distributions of gender and age at first Learner licence (Tables 51 and 52) within the New driver groups, these variables were not expected to have any major confounding effects in the comparison of the GLPe and GLP New driver and Learner driver crash involvement rates. Table 60 shows the adjusted estimates and, as expected, they vary little from the results in Table 59.

Table 60: New Driver Crash Rate Ratios and 95% Confidence Intervals (CI) – Overall and by Licence Stage (Learner and Novice) - after Adjustment for Age and Gender.

Driver Group	Crashes Type	Relative Risk (95% CI)	% Difference (from REF Group)
All New Drivers GLPe (N=63,905) GLP (N=66,890)	All Crashes	0.36 (0.35, 0.38) 1.00 (Ref)	-64%*
	GLPe GLP		
	Liabile Crashes	0.36 (0.34, 0.38) 1.00 (Ref)	-64%*
	GLPe GLP		
	Casualty Crashes	0.34 (0.31, 0.37) 1.00 (Ref)	-66%*
	GLPe GLP		
Material Damage Only Crashes	0.37 (0.35, 0.39) 1.00 (Ref)	-63%*	
GLPe GLP			
Learner Drivers GLPe (N=63,905) GLP (N=66,890)	All Learner Crashes	0.70 (0.65, 0.76) 1.00 (Ref)	-30%*
	GLPe GLP		
	Learner Liabile Crashes	0.70 (0.64, 0.77) 1.00 (Ref)	-30%*
	GLPe GLP		
	Learner Casualty Crashes	0.65 (0.55, 0.76) 1.00 (Ref)	-35%*
	GLPe GLP		
Learner Material Damage Only Crashes	0.72 (0.66,0.80) 1.00 (Ref)	-28%*	
GLPe GLP			
Novice Drivers² GLPe (N=11,854) GLP (N=33,646)	All Novice Crashes	1.06 (1.00, 1.13) 1.00 (Ref)	+6%
	GLPe GLP		
	Novice Liabile Crashes	1.06 (0.98, 1.14) 1.00 (Ref)	+6%
	GLPe GLP		
	Novice Casualty Crashes	1.03 (0.92, 1.16) 1.00 (Ref)	+3%
	GLPe GLP		
Novice Material Damage Only Crashes	1.07 (1.00, 1.15) 1.00 (Ref)	+7%	
GLPe GLP			

*P < 0.0001 **P < 0.005 ***P < 0.05 ¹ Based on an average of about 10 months of licensed driving per driver (maximum of 1.5 years)

² Drivers in the New driver study groups who advanced to the Novice stage during the 1.5-year study period

Although the results summarized in Table 59 and 60 show an increase in crash rate for the Novice drivers included in the 1.5-year follow-up group, this finding is confounded by the different crash risks associated with the different amounts of Novice driver-time contributed by the GLP and GLPe groups; drivers with more experience in the Novice stage tend to have lower crash rates and, because of its longer Learner stage, GLPe drivers in the 1.5-year group accumulated a much lower percentage of Novice time than the GLP drivers (Table 55). Consequently, these findings should not be interpreted as an indication that the GLPe Novice restrictions have not had a positive effect. As mentioned above, until sufficient Novice data are available it is not possible to estimate the impact of GLPe on Novice driver crash rates. The data in Tables 59 and 60 were included solely to provide an indication of the relative contributions of the Learner and Novice crash rates within the 1.5-year New driver group.

In the next section the analyses undertaken to investigate the early impact of the extended GLPe Learner stage on the previously reported (chapter 4 of this report, Wiggins, 2004) association between completion of an approved driver education course, early Novice licensure, and the crash involvement rates of GLP Novice drivers are described. Due to the limited amount of follow-up data available when the study was undertaken, these results are relevant only to the first 90-days of Novice licensure and do not provide information regarding any longer-term effects.

The Effect of DOC Submission on Novice Crash Involvement Rates. Tables 61 through 64 show the results of the analyses undertaken to investigate the impact of submitting a DOC on the annualized crash involvement rates estimated from the first 90-days of Novice licensure. DOC drivers in both study groups (GLPe and GLP) were found to be at higher risk of crash involvement than No DOC drivers (Table 61). This relationship persisted after adjustment for the possible confounding effects of age and gender differences between the groups (Table 62). However, there was less of a difference observed between the DOC and No DOC drivers in the GLPe than in the GLP study group.

Two factors may have contributed to the findings shown in Tables 61 and 62. Firstly, the sample selection criteria used in creating the 90-day Novice groups may have resulted in a higher-risk GLPe No DOC group than would have occurred if more of the No DOC group had been available for inclusion in the study. Due to the dynamic nature of the licensing process and the need to conduct this evaluation as soon as possible, only those drivers who progressed through the Learner stage quickly were eligible for inclusion in the samples. Thus, the difference between the DOC and No DOC groups, in terms of the amount of Learner time contributed, was less than it would have been had a longer time frame been used for the study. In addition, under GLPe rules, drivers who completed an approved course had to have accumulated 60 hours of driving practice before receiving their DOC; under GLP rules only 30 hours were required. This increase in the required practice hours for DOC drivers in combination with the extension of the GLPe Learner stage to 9 months, may have prompted a reduction in their Novice crash rates. In an effort to examine the impact of the changes affecting the DOC but not the No DOC drivers, and to determine to what extent the Novice crash rates observed for the GLP and GLPe DOC groups differed in comparison to each other, the No DOC drivers were removed from the analysis and the crash rates of the GLPe and GLP DOC drivers were compared. Table 63 shows the results of these analyses and indicates that, after adjustment for potential age and gender differences between the groups, GLPe DOC drivers had lower crash involvement rates than their GLP DOC counterparts. However, a lack of statistical power resulting from the small sample sizes available for this study made it possible to detect only the reduction observed for liable crashes as statistically significant.

Table 61: Novice Crash Involvement Rates¹, Relative Risk Ratios, and 95% Confidence Intervals (CI) Estimated from the First 90 Days of Novice Licensure by Program and DOC Status

Novice Crashes by Program and DOC Status	Crash Rate (95% CI)	Relative Risk (95% CI)	% Difference (from REF Group)
All Crashes			
GLPe: DOC (N=5,648) No DOC (N=6,308)	43.56 (40.12, 47.00) 36.14 (33.17, 39.11)	1.21 (1.08, 1.35) 1.00 (REF)	+21%**
GLP: DOC (N=10,812) No DOC (N=14,715)	46.98 (44.40, 49.57) 33.84 (31.96, 35.72)	1.39 (1.28, 1.50) 1.00 (REF)	+39%*
Liable Crashes			
GLPe: DOC (N=5,648) No DOC (N=6,308)	30.24 (27.37, 33.11) 27.08 (24.51, 29.65)	1.12 (0.98, 1.28) 1.00 (REF)	+12%
GLP: DOC (N=10,812) No DOC (N=14,715)	35.04 (32.81, 37.27) 23.38 (21.82, 24.94)	1.50 (1.37, 1.64) 1.00 (REF)	+50%*
Casualty Crashes			
GLPe: DOC (N=5,648) No DOC (N=6,308)	11.97 (10.17, 13.77) 9.52 (7.99, 11.03)	1.26 (1.01, 1.57) 1.00 (REF)	+26%***
GLP: DOC (N=10,812) No DOC (N=14,715)	13.21 (11.84, 14.58) 9.11 (8.13, 10.09)	1.45 (1.25, 1.68) 1.00 (REF)	+45%*
Material Damage Crashes			
GLPe: DOC (N=5,648) No DOC (N=6,308)	31.59 (28.66, 34.52) 26.63 (24.08, 29.18)	1.19 (1.04, 1.36) 1.00 (REF)	+19%***
GLP: DOC (N=10,812) No DOC (N=14,715)	33.78 (31.59, 35.97) 24.74 (23.13, 26.35)	1.37 (1.25, 1.50) 1.00 (REF)	+37%*

*P < 0.0001 **P < 0.005 ***P < 0.05

¹ Rates were calculated per 100 licensed driver-years.

Table 62: Relative Risk Ratios and 95% Confidence Intervals (CI) for Novice Driver Crash Involvements Rates – Estimated from the first 90 Days of Novice licensure and After Adjustment for Gender and Age at Novice Licensure

Novice Crashes by Program and DOC Status	Relative Risk (95% CI)	% Difference (from REF Group)
All Crashes		
GLPe: DOC (N=5,648) No DOC (N=6,308)	1.24 (1.06, 1.44) 1.00 (REF)	+24%**
GLP: DOC (N=10,812) No DOC (N=14,715)	1.40 (1.29, 1.51) 1.00 (REF)	+40%*
Liabile Crashes		
GLPe: DOC (N=5,648) No DOC (N=6,308)	1.20 (1.06, 1.43) 1.00 (REF)	+20%***
GLP: DOC (N=10,812) No DOC (N=14,715)	1.50 (1.36, 1.64) 1.00 (REF)	+50%*
Casualty Crashes		
GLPe: DOC (N=5,648) No DOC (N=6,308)	1.37 (1.02, 1.81) 1.00 (REF)	+37%***
GLP: DOC (N=10,812) No DOC (N=14,715)	1.44 (1.23, 1.67) 1.00 (REF)	+44%*
Material Damage Crashes		
GLPe: DOC (N=5,648) No DOC (N=6,308)	1.19 (1.00, 1.42) 1.00 (REF)	+19%***
GLP: DOC (N=10,812) No DOC (N=14,715)	1.38 (1.26, 1.52) 1.00 (REF)	+38%*

*P < 0.0001 **P < 0.005 ***P < 0.05

Table 63: Relative Risk Ratios and 95% Confidence Intervals (CI) for the Novice Crash Involvement Rates of GLP and GLPe drivers who Submitted a DOC – Estimated from the first 90 Days of Novice Licensure and After Adjustment for Gender and Age at Novice Licensure

DOC Drivers Only	Relative Risk (95% CI)	% Difference (from REF Group)
All Crashes		
GLPe (N=5,648)	0.92 (0.83, 1.01)	-8%
GLP: (N=10,812)	1.00 (REF)	
Liabile Crashes		
GLPe (N=5,648)	0.85 (0.76, 0.95)	-15%***
GLP: (N=10,812)	1.00 (REF)	
Casualty Crashes		
GLPe (N=5,648)	0.90 (0.75, 1.08)	-10%
GLP: (N=10,812)	1.00 (REF)	
Material Damage Crashes		
GLPe (N=5,648)	0.92 (0.82, 1.04)	-8%
GLP: (N=10,812)	1.00 (REF)	

*P < 0.0001 **P < 0.005 ***P<0.05

To further estimate the potential impact of the time incentive offered to DOC drivers, the Novice crash rates of the GLPe drivers who did and did not submit a DOC were reanalyzed with the length of the Learner stage included in the regression model as a control variable. Table 64 summarizes the results of these analyses and shows that after taking into account the length of the Learner stage, the differences in the Novice crash involvement rates of the GLPe DOC and No DOC groups have not only disappeared but reversed direction. The estimated relative risks indicate lower adjusted crash rates for the DOC than the No DOC group. Once again, due to the small sample sizes, the findings were not statistically significant. However, they were consistent across all of the crash categories.

Due to the preliminary nature of these findings, the limited time frame used for estimating Novice crashes, and the small number of drivers available for the rate calculations, the results presented must be interpreted cautiously. However, taken in combination with the results presented in Chapter 4, they provide consistent evidence that removal of the time incentive remains warranted.

Table 64: Relative Risk Ratios and 95% Confidence Intervals (CI) for the Novice Crash Involvement Rates of GLPe drivers by their DOC status – Estimated from the first 90 Days of Novice Licensure and After Adjustment for Gender, Age at Novice Licensure, and the Length of their Learner Stage

GLPe Drivers Only	Relative Risk (95% CI)	% Difference (from REF Group)
All Crashes		
DOC (N=5,648)	0.96 (0.75, 1.21)	-4%
No DOC (N=6,308)	1.00 (REF)	
Liabile Crashes		
DOC (N=5,648)	0.98 (0.74, 1.28)	-2%
No DOC (N=6,308)	1.00 (REF)	
Casualty Crashes		
DOC (N=5,648)	0.91 (0.57, 1.44)	-9%
No DOC (N=6,308)	1.00 (REF)	
Material Damage Crashes		
DOC (N=5,648)	0.97 (0.73, 1.27)	-3%
No DOC (N=6,308)	1.00 (REF)	

*P < 0.0001 **P < 0.005 ***P < 0.05

7. Discussion and Recommendations

By increasing the length of the Learner stage, and achieving reductions in the crash rates of Learner drivers, BC's GLP (and, more recently, GLPe) has reduced crash rates for New drivers during their first two years of licensure. Despite this success the crash involvement rates of Novice drivers continue to be a concern. Neither BC's GLP (as implemented to the end of 2002) nor the ICBC-approved driver education curriculum has produced the safety benefits that were originally anticipated. Two issues remain outstanding: 1) what more can be done to bring down the high crash rates of Novice drivers, and 2) how to resolve the dilemma of driver education, both in terms of expectations and understanding.

These are not new issues. Both were identified as concerns in the year 3 interim evaluation and, in response, ICBC took steps to enhance the program's effectiveness – particularly in the Novice stage. Several program changes were introduced (in October 2003). In fact, with the implementation of the 2003 enhancements, ICBC's GLP (GLPe) now contains or exceeds many of the conditions and requirements recommended as a 'best practice' by Mayhew, Simpson, & Singhal, (2005). These include:

- Application of program to all new drivers not just young new drivers
- A three-stage licensing process
- Minimum age of 16 years for starting the process
- Adult supervision throughout the Learner stage and a maximum holding period of 24 months before having to be retested
- Minimum 12-month Learner stage (BC's minimum is 12 months although this can be reduced by up to 3 months by completing an approved driver education course)
- Night time restriction on driving during the Learner stage
- Lower penalty points thresholds during both the Learner and Novice stages
- Limits on passengers in the Novice stage
- An exit test to ensure competence prior to Full Privilege licensure
- Penalty provisions that delay graduation for new drivers with poor driving records
- Zero tolerance for drinking and driving

With the implementation of GLPe in BC, a passenger restriction and prohibition-free driving requirement were introduced into the Novice stage. It is too early to determine whether these changes to the Novice stage will reduce the crash rates of Novice drivers. It will take time for the effect to be detected. The results of the preliminary study of GLPe New drivers so suggest, however, that whether there have been reductions or not, Novice crash involvement rates do continue to be much higher than the rates obtained for comparison groups of Experienced drivers. The study also showed the strong influence on Novice crash rates of providing early licensure to drivers who completed an approved driver education course. Clearly, continued work is needed to develop additional strategies to help New and Novice drivers to acquire the skills and judgement they need to drive safely.

Although it was too soon, in this evaluation, to conduct a formal impact assessment of GLPe on New driver (including Novice driver) crash rates, a formative assessment was required due to the potential consequences (higher crash rates) associated with continuing to offer the time discount for driver education. When GLPe was implemented it was thought that a time incentive reducing a 12-month Learner stage by up to three months might not have the same impact on crash rates as it had on a 6-month Learner stage. The results described in this report do not support this assumption. Drivers who submitted a DOC and applied for early Novice licensure continued to have higher crash rates than those who did not. And, although the results are

preliminary and are based on only the first 90 days of Novice licensure they are consistent with previous findings from this and other jurisdictions. Therefore, based on these findings, as well as those reported for GLP and from other jurisdictions, it is recommended that the time incentive for completing an ICBC-approved driver education course be eliminated from GLPe.

It should, however, be stated that the findings of this study and the recommendation made for the removal of the time incentive are in no way meant to imply that the ICBC-curriculum does not or could not have value. More research is needed to evaluate the course and to determine what is and what is not working effectively, to investigate the potential of staged learning or other educational models, and to determine more specifically what the goals and objectives of driver education should be. Perhaps, given the multiplicity of factors that influence new drivers' behaviours, choices, skills, and abilities it is unreasonable to expect driver education to produce 'safer drivers'. Perhaps other standards need to be developed for determining what is and isn't 'effective' driver education, at least in the short term.

Research conducted over the past 10 years suggests that teaching people to drive safely may require more emphasis on 'insight' training, staged learning (through both the Learner and Novice stages), comprehensive training in hazard perception, as well as training in self-assessment and awareness (Gregersen, 1995; Lonerio, et. al. 2001; Engstrom, et. al., 2003; Senserrick & Whelan, 2003). Standard road tests may not be the best mechanisms for assessing who has or has not acquired the appropriate skills, experience, and judgement to drive safely. Other assessment tools, or combinations of tools (including road tests, computer-assisted learning and assessment, or simulation technologies) may be needed. As well, finding more ways to involve parents in the process may prove fruitful. Emerging research suggests that parental involvement and role modelling may be very important in helping to promote safer driving behaviours and attitudes of amongst their children (Ferguson, et. al., 2001; Bianchi & Summala, 2004; Hartos, et. al., 2005; Wilson, et. al., 2005).

Clearly, the ultimate goal of driver education is to produce better, 'safer', drivers and more research is needed to address these and other issues related to driver training and assessment. But, until such research is available, perhaps a focus on other, more intermediate objectives might be helpful. In this regard, one of the findings of Study 2 was that drivers who passed their first road test had early (first-year) Novice crash rates that were about 30% less than those of drivers who took three or more attempts. Interestingly, 75% of GLP drivers who submitted a DOC and took a Class 7 road test passed the test on their first attempt; compared to only 62% of the drivers who did not submit a DOC. This suggests that the approved course may be preparing drivers for their first road test more effectively than the preparation drivers receive who do not take the course. Of course, it could and often is argued that driver education achieves this objective by teaching new drivers how to pass the road test rather than teaching them to 'drive'. But, perhaps this is not the primary issue. The road test is, after all, the main criterion that most jurisdictions use to determine who is and is not ready for solo driving. Perhaps rather than being concerned that driver educators are 'teaching to the test', it would be best to focus on what the test is testing. If the road test is comprehensive enough and is of a high enough standard to be used to test driving readiness then perhaps 'teaching to the test' – at least at the end of the Learner stage – is not an unreasonable goal. However, it is not yet clear why drivers who pass the road test on the first attempt have a lower crash rate. More research will be needed to identify and better understand the factors that are contributing to this finding and to determine how driver education and the road test component of GLP can or may need to be adapted to optimize their potential benefits.

RECOMMENDATIONS

1. Continue to monitor and evaluate the effectiveness of GLPe in reducing the crash involvement rates of New drivers, with particular emphasis on the impact of the new Novice stage components.

The findings of this evaluation concerning the impact of GLPe on New driver crash involvement rates are too early to be considered with anything but cautious optimism. The program enhancements do appear to be having significant and substantial positive impacts on New driver crash rates. However, very limited follow-up data were available for this evaluation, and it is unknown to what extent the benefits will continue over time or to what extent any benefits will be obtained from the changes to the Novice stage. The effectiveness of GLPe, in particular the Novice stage enhancements, will have to be monitored and evaluated once additional data becomes available. Of course, the new Novice stage components will have no chance of success if the rules are not followed. Consequently, a study to ascertain compliance with the new rules should be included in the evaluation plan.

2. Assess compliance with the GLPe Novice restrictions and continue to investigate new ways to effect crash rate reductions among drivers in the Novice stage of licensure.

The present evaluation was undertaken before the impact of the 2003 enhancements on Novice driver crash rates could be estimated reliably. However, it was clear from the analysis of the first 90-days of Novice licensure that Novice drivers still have higher crash rates than experienced drivers. Until this disparity is eliminated efforts to find new ways to effect crash rate reductions in Novice driver rates should continue.

3. Review and evaluate the approved driver education curriculum and determine to what extent standards for implementation and delivery have been achieved. Investigate new driver education models, including the potential benefits of adding an advanced component during the Novice stage.

The approved driver education curriculum has not been evaluated since the 2000 (Potentier and Zolinsky, 2000) preliminary review. Much work has been done to improve the standard of course implementation and delivery. However, without an evaluation it is unknown to what extent an appropriate standard has been achieved. It is also unknown what elements of the curriculum may be working effectively or ineffectively. Since the driver education curriculum was first developed and implemented a number of New driver education models and theories have been emerging in the research literature. The potential benefits of these strategies need to be investigated and, if appropriate, incorporated into the current curriculum model.

4. Remove the learner time incentive offered to new drivers who complete an approved driver education course. This would best be done in a way that mitigates any unintended consequences, such as the dissolution of the approved course, without having a confounding influence on crash rates.

The evidence demonstrating the detrimental impact of offering a learner stage time incentive for driver education was consistent across all of the Novice driver groups assessed (Early GLP, Full GLP, and GLPe); Novice drivers who submitted a DOC in application for a Learner stage discount had higher crash rates than those who did not. The time incentive needs to be removed and strategies for enhancing and evaluating the effectiveness of the approved driver education course in the absence of this confounding factor need to be explored.

However, removal of the time incentive could have unintended consequences; it could lead to the dissolution of the approved course and to the loss of an important, and unique, opportunity to test the effectiveness of the curriculum model. To avoid this possibility, alternative incentive mechanisms that would not be expected to have a confounding influence on crash rates, but that could help to ensure the continuation of the course while the work of recommendation #3 is undertaken, could be considered.

5. Review the role and content of the Class 5 exit test for New drivers.

Although a before – after comparison revealed a significant reduction in the crash rate of drivers who passed the road test and graduated out of GLP, little other evidence was found to suggest that the test has predictive validity for crash involvement. Moreover, the high percentage of drivers who passed the test after taking the new Class 7 test suggests there is a high degree of overlap between the tests.

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Class 5/7 and 6/8 Knowledge Tests

Rationale and Description

The newly enhanced Class 5/7 & 6/8 Knowledge Tests were developed to replace the previous - Class 5/7 and 6/8 Knowledge Tests. The new test content was aligned with GLP goals and philosophy, so that the test questions emphasized "the thinking driver." New drivers are tested on the content contained in the Road Sense guides. In addition, the questions no longer are taken verbatim from the guides, as occurred in the old tests, but in most cases require the applicant to apply the information in the guides to driving situations. Emphasis is placed on judgement and decision making, respecting other road users, safe driving attitudes, risk assessment and hazard recognition.

The previous Class 5/7 Knowledge Test consisted of 20 multiple-choice questions. Applicants also were required to complete a ten-item Signs and Signals Test. Applicants for a Class 6L or 8L Licence were required to complete the Class 5/7 Knowledge Test, the Signs and Signals Test and the ten-item multiple choice Class 6/8 Knowledge Test. The item bank for the Class 5/6 and Class 6/8.

The item bank for the previous Class 5/7 and 6/8 Knowledge Tests contained approximately 140 test items. Some of these items contained illustrations; however, the illustrations generally were not directly related to the content of the question.

For the new Knowledge Tests, all new test items were written. For many items, graphic illustrations or diagrams were created. These were included only in cases where the test question could not be answered without the associated picture or diagram. The new Class 5/7 Knowledge Test contains 50 multiple-choice questions, while the Class 6/8 Knowledge Test contains 40 questions. In both cases, the Signs and Signals questions are included, so applicants are not required to take a separate test for this purpose.

The resulting item bank for the enhanced Class SI7 Knowledge Test contains approximately 200 questions, while the item bank for the enhanced Class 6/8 Knowledge Test contains about 150 questions. The passenger vehicle test (Classes 5/7) is made up of test questions taken from the following content domains:

- The Safe Vehicle
- Observation
- Lane Position / Passing
- Speed/Steering/Road Surfaces
- Respecting Other Road Users
- Trains/Emergency Vehicles
- Turns/lanes/intersection
- Merging/Exiting
- Distractions/Emotions/Peer Pressure
- Impairment: Alcohol/Fatigue
- Braking/Skidding
- Weather Conditions: Snow/Wind/Night Driving
- Vehicle Emergencies/Animals
- Space Margin
- Signs and Signals

The domains for the motorcycle test (Class 6/8) are the same except that there is no domain for "Impairment" and "Turns/Lanes/Intersections" is combined with "Merging/Exiting".

Since all applicants for a Class 8L or Class 6L licence must take the passenger vehicle knowledge test as well as the motorcycle test, the Impairment domain is covered for all applicants.

The computer hardware and software for administering the knowledge tests have not changed with the implementation of the new test content. In most Points of Service, the tests are administered using the Automated Driver Knowledge Test system (ADKT), which allows applicants to complete the test at a kiosk with touch-screen technology. Paper tests are also available where the ADKT system is not in place and for applicants who are unable to use the computer kiosk. Administration procedures and policies related to the Class 5/7 and 6/8 Knowledge Tests are included in Chapter 6 of the Licensing Operations Manual (LOM).

Timeline and Development Process

Development of the Knowledge Tests began in January, 2000. A small core test development team began by creating items from the draft guide, *RoadSense for Drivers*. Class 5/7 Test item material was drawn in a representative manner from the draft guide, so that the number of questions pertaining to a given subject is proportional to the amount of text on that subject in the guide. Once the accompanying guide for motorcycle riders was drafted, items were developed for the Class 6/8 Test in the same manner.

Many more draft items were written than would be feasible to include in the final item bank, due to the extensive resource requirements of field testing, translating and implementing the new tests. For example, to comply with statistical standards that would allow adequate confidence that the test items were valid and reliable, each test question had to be answered by 100-150 field trial participants. It is not feasible to ask a secondary school student volunteer to study a driving or riding guide and then write a test of more than about 50 questions. Based on this analysis, 1200 student volunteers were required to participate in the Field Trial, which enabled the test development team to validate 200 passenger vehicle and 150 motorcycle test questions. Administering the Field Trial with more participants would not have been feasible. Culled test items were compiled and provided to ICBC Operations for future consideration.

Once the 350 questions that would be used for the field trials were selected, examiners on the development team created rough sketches to provide the graphic artist with diagram parameters such as the appropriate perspective, size, and spacing of critical elements within the driving environment.

The field trial was conducted May 15-26 and involved secondary students around the province. Participants were recruited and tests administered with the assistance of Student Voice, which is a provincial network of secondary students sponsored by the Principals' and Vice-principals' Association of BC. Participating students read draft copies of *RoadSense for Drivers* or *RoadSense for Riders* and completed the respective tests, in paper form, under the supervision of teachers at their respective high schools. Many students also completed voluntary feedback surveys.

Test results and survey feedback were analyzed with the assistance of an ICBC Research Services statistician. Items demonstrating low levels of reliability were either revised or removed from the final item bank. Rationales for correct answers to the most complex items were drafted to assist ICBC Point of Service staff respond to questions from applicants.

Once all test items were finalized, they were translated into French, Punjabi, Cantonese and Mandarin. The English text and its four translations were then used to produce audio voice-overs, so that both text and audio tests are now available in all five languages. The accuracy of all translations was then verified by a different group of independent translators.

Table 13. Time frames for development of the Class 5/6 and Class 7/8 Knowledge Tests.

Time Frame.	Activity
January - April 2000	Development of draft test items and diagrams for passenger Vehicle and motorcycle.
May 2000	Field trial involving 1200 secondary students around the province.
June - July 2000	Revision and sign-off of test items and diagrams.
July - September 2000	Translation and voice-overs completed for test items for: English, Punjabi, Cantonese, Mandarin and French.
October 16, 2000	New Knowledge Tests implemented using existing ADKT system.

Implementation

The entire item bank (including text, audio and graphics in all 5 languages) was uploaded into the computerized testing platform (ADKT). Once uploaded, user acceptance testing was conducted and the new test item banks were implemented on October 16, 2000.

Details of the implementation strategy and roll-out are contained in the *Project Completion Document for the Class 5, 6, 7 & 8 Knowledge Tests*.

Related Knowledge Test Documents

- *Test Development Advisors and Team Members, Appendix I*
- *Knowledge Test Field Trial Report, Appendix J*
- *Knowledge Test Translation Process, Appendix K*
- *Knowledge Test Survey Analysis, archived in ARCS*
- *Project Completion Document for Class 5, 6, 7 & 8 Knowledge Tests, archived in ARCS*

Recommendations

1. The draft test items that were not included in the field trails are available for future consideration. Resources could be applied to the validation of these questions through additional field trials and statistical analysis. In this way, more items could be included in the test item bank, resulting in less risk of public knowledge of test items and a more reliable testing system overall.

2. Any additional language translations should be verified by an independent service provider to ensure accuracy and to ensure that appropriate reading level and dialects are used.
3. Develop and implement an Automated Test of Advanced Driving Skills to complement the Road Tests and Knowledge Test. This would ensure that the perceptual/cognitive processes that underlie driving behavior are fully assessed, and would provide a truly comprehensive testing system for passenger vehicle drivers and motorcycle riders.

SUMMARY REPORT KNOWLEDGE TEST FIELD TRIALS

GRADUATED LICENSING PROGRAM, ICSC

Test Design

The Class 5/7 and 6/8 Knowledge Tests consist of 4 response-option multiple choice questions. The content of the Tests was derived directly from the new educational guides: RoadSense for Drivers and RoadSense for Riders. The emphasis of the Tests is on understanding rules, regulations and road signs, basic vehicle operation, hazard recognition, and safe driving attitudes and motivations. Content of the test is designed to encourage new drivers/riders to use thinking skills, rather than rote memory to answer questions.

Tests are generated from a computerized testing system (ADKT), so questions within the test item bank are randomly generated. Test results are compiled automatically, facilitating ongoing analysis of applicant performance on questions. Questions are divided into a number of content domains, from which an equal number of questions are drawn for each test. In this way, all applicants are asked a representative sample of questions from each content area, even though their tests are unique.

Field Trials

The Knowledge Test Field Trials were conducted May 15-26, 2000. The purpose of the Field Trials was to assess the reliability of each test question, and to obtain feedback from prospective test applicants about the tests and the content of the draft guides.

Field Trial Design and Sample Characteristics

Student Voice (an ICSC-sponsored, non-profit Association of teachers and students), assisted the test development team by distributing the draft manuals and close to 1200 tests to schools across the province. Centennial School assisted the team by providing all of their grade 10 students and automated test scoring services, and ICSC Research Services conducted an item analysis of test results.

1170 students from 17 high schools across the province participated in the Field Trials (903 students completed a passenger vehicle test, while 267 completed a motorcycle test). The passenger vehicle tests consisted of 50 questions, and the motorcycle tests consisted of 37 questions. Participants taking passenger vehicle tests were not permitted to have a learner's licence, and those taking motorcycle tests were permitted to hold a Passenger Vehicle Learner's Licence, but not a Motorcycle Learner's Licence.

Participants were provided with copies of the draft guides prior to the administration of their tests (participants taking Passenger Vehicle Tests were provided with RoadSense for Drivers, and those taking Motorcycle Tests were provided with RoadSense for Riders). Four Passenger Vehicle Field Trial Test versions and 3 Motorcycle Test versions were randomly assigned to students. Participant feedback surveys were attached to each test.

Participating students were provided with monetary incentives to read the guides and to complete the tests and accompanying surveys. Participating schools also received monetary incentives to encourage their students to participate in the Field Trial.

Field Trial Results

A number of analyses were run to facilitate the interpretation of Field Trial results. First, descriptive statistics on applicant test performance were analyzed. Results revealed that mean scores for applicants completing the Passenger Vehicle Tests ranged between 60% - 65%, and scores for those completing the Motorcycle Tests ranged between 61% - 65%.

Next, applicant performance on each test question was analyzed. Frequency tables for applicant performance on each question revealed that the vast majority of applicants who achieved high scores on the tests overall, also chose the correct answer on individual questions. Only 28 questions required review by the test development team to determine whether revisions were possible, or whether the question should be removed from the item bank. Participant comments on the surveys were also reviewed prior to making decisions about question revisions.

An item total reliability assessment was also evaluated in combination with frequency table data, to obtain measures of internal consistency. This analysis revealed that test questions from both Passenger Vehicle and Motorcycle Tests measured the same things ($a = .84$, and $.83$, respectively).

Finally, participant pass rates were compared to an 80% pass threshold. Results revealed that while the majority of participants obtained 60% - 65%, if the pass threshold was set at 80%, most would have failed (Passenger Vehicle Tests: $M = 92\%$, Motorcycle Tests: $M = 93\%$). This can be explained by the incompleteness of the draft manuals, and by the fact that Field Trial participation was voluntary. Participants received monetary incentives to complete the tests, and were not likely to be as motivated to do well as they would have been if they were applying for their respective Learner's Licence.

Note: Content Validity was achieved through extensive consultation with Knowledge Test Advisory Group Members.

LEVEL 2 ROAD TEST FIELD TESTING PLAN

PURPOSE

Field trials are important in the test development process because they allow opportunity to assess draft versions of the test for reliability and validity. The test can then be revised and subjected to further field testing until it meets minimum standards for reliability and validity.

Reliability

Reliability refers to the consistency of test scores from one measurement to another. There are a number of different types of consistency that can be looked for, using different kinds of reliability estimates. The method chosen should depend on the kind of evidence that is appropriate for the test being constructed.

In the case of a road test for drivers, it is most important to obtain evidence of reliability in terms of the following two types of consistency:

- 1) Consistency of Driver Examiner scoring:
 - of the same driver on the same route; and
 - across different drivers on the same route; and
 - of the same Examiner across different routes.
- 2) Internal consistency within categories of test content; ¹in particular:
 - within types of driving maneuvers; and
 - within sets of global skills.

Validity

Generally speaking, validity is concerned with the extent to which test results serve their intended use. A road test in driver licensing is used to *select*, from all drivers who take the test, those who are eligible for the licence applied for. In this context, the types of validity seen as most important are *content validity* and *concurrent validity*.

Content validity, in the case of a road test, refers to the extent to which the behaviours required in the test adequately represent the entire set of driving behaviours expected of "safe drivers". In other words, does the test measure what we want it to measure? If it does, then we can say it has high content validity. Content validity can be ensured by using appropriate sources of expertise to guide the development of test content. The following sources of information were used to develop both content and structure of the Level 2 road test:

¹ Note: driving maneuvers and global skills identified in the Level 2 Road Test are defined in the Level 2 Road Test Model.

- content analysis² of
 - Safe Driving Guide
 - Safe Riding Guide
 - BC Level 1 road tests
 - BC class 5/7, 6/8 knowledge tests
 - Signs and signals test
 - Tuning Up* manual
- road test results analysis (BC)³
- road tests from other jurisdictions
- road test scoring criteria from other jurisdictions
- BC collision statistics
- suggestions from Driver Examiners
- suggestions from driver training industry, other stakeholders and the public (through surveys).
- research documents
- driver manuals from other jurisdictions
- review of Driver Testing Forum proceedings
- subject matter experts from other jurisdictions

Evidence of **concurrent validity** will be produced if the test discriminates between skilled and less skilled drivers; skilled drivers should do better than less skilled drivers. This type of validity can be demonstrated by administering the test to drivers with a wide range of driving skill (e.g., novices and experts) and determining whether it discriminates between the two groups. However, defining which drivers should be included in an "expert" group will be important if such discrimination is to be observed. This may prove to be difficult in that while novice drivers lack experience, they may execute maneuvers with greater care than-experienced drivers (even professional drivers) who have developed expertise in judgement and risk avoidance, but may drive more carelessly. In Ontario's case, their level 2 road test showed little or no discrimination between their novice driver group and their expert group.

METHOD

In order to estimate the reliability and validity of draft versions of the Level 2 road test (both passenger vehicle and motorcycle versions) and to revise the test until satisfactory results are reached, we plan to conduct the following activities:

1. **Driver Examiner Training** (16 DE's, training to consistency criterion)
2. **Pilot Test** (with sample of 120 internal drivers/riders)
 - Revisions to test based on informal feedback
3. **Field Trial Cycle 1** (full sample, N=900)

Analysis of reliability and validity data

- Revisions based on statistical analyses

² Test Content Analysis Process (available on request)

³ Summary of Road Test Results Analysis (next section)

4. **Field Trial Cycle 2** (limited sample, N=200, only to be completed if required)
 - Statistical analysis and final revisions
5. **DE training for province-wide coverage (just-in-time)**

1. **Driver Examiner Training**

June 14 - July 4 *Build Road Test Routes and Prepare for Pilot Training*

Two Driver Training and Testing Team members will act as coordinators of the field trial process. They will train 4. Examiners (trainers) to train 12 more Examiners (trainees). The coordinators and trainers will develop two road test routes adjacent to ICBC Head Office which will be used for the pilot test. They will work to ensure that scoring consistency is achieved and that both routes are equivalent.

July 5 - July 23 - *Training the Trainees for Pilot Test*

The coordinators will provide an orientation for the trainees. The trainers will then teach the trainees how to administer the pilot test.

Training Model

The trainers and trainees will be divided into working groups for in-car training. The trainees in each group will practice scoring the trainer on predetermined routes using the Level 2 road test scoring criteria. The trainees will rotate their positions within the group, between trainers and between routes until 95 percent scoring consistency is achieved. . After scoring numerous mock road tests, scoring inconsistencies will be evaluated and discussed in a classroom setting.

The coordinators will oversee the training process by riding along on the mock road tests and by facilitating classroom discussions.

Examiner training material will be available for the 12 trainees at least two weeks prior to training.

2. Pilot Test

July 26 - 30 - *Pilot Test*

The purpose of the pilot test is to identify any administrative problems in the Level 2 road test before the field trials. ICBC Head Office staff volunteers will be invited to participate in the pilot test; up to 50 will be selected for each version of the test (motorcycle/passenger vehicle). Each of these participants will be invited to bring along another person whose familiarity with English is limited. . This will facilitate an evaluation of the test's impact on ESL applicants. The maximum sample size will be 120.

Each participant will receive a *Tuning Up* manual and a draft of the *Level 2 Road Test Supplement* in preparation for the test. Participants will be asked to bring their own vehicles for the test.

The Examiner trainers and trainees will be divided into eight pairs. When conducting a passenger vehicle test, one Examiner will score the participant from the front passenger seat and a second will score from the right back seat. The Examiner in the front seat will provide directions to the participant during the test. When conducting a motorcycle test, the participant will be followed by two Examiners in a car, which will be driven by a trained ICBC volunteer. Both Examiners will score the rider, but the Examiner in the front passenger seat will provide directions to the rider via a two way radio headset.

Four Examiner pairs and their respective participants will set out on the first route while a second group will set out on the second route. The tests will be administered in five minute intervals to ensure that the test routes are not overloaded. Examiners will switch scoring positions in the vehicle for each test. Additionally, each Examiner pair will conduct two tests on the first route and two tests on the second route on each of the four days of the pilot.

The road test will take approximately 45 to 50 minutes to complete. Each pilot test participant will be tested only once. Participants will be asked to complete a questionnaire immediately after completing the road test to provide feedback about the test. A full day workshop will be attended by all 16 Examiners on the final day of the pilot test to identify any revisions required prior to the field trials.

August 3 - 6 - Test Revisions and Route Development

The Examiner pairs will go to the six field trial locations across the province to develop road test routes. The field trial coordinators will return to Victoria to analyze pilot test results and to make any required revisions to the test.

3. Field Trial Cycle 1

August 9 - September 17 - Field Trial details

The Examiner pairs will conduct four road tests per day at each of the field trial locations. The sample size for each location will vary depending on the traffic volume normal for that site. Tests will be conducted Monday through Friday and on two Saturdays to accommodate participant availability. Two additional days are built into the field trial cycle to accommodate unforeseen participant scheduling difficulties. Twelve additional ICBC staff members will be required to act as drivers during the motorcycle road tests. The field trial procedures will be identical to those of the pilot test, with the exception of any revisions generated from results of the pilot test.

September 20 - October 1 - Field Trial Data Analysis

The 16 Examiners will return to their own points of service and the coordinators will return to Victoria while field trial results are being analyzed by the project team. Test revisions and preparations for a second field trial cycle will be made as required.

October 4 – 29 - Test/Route Revisions

a) Sample

The field trial participant sample will consist of an inexperienced (novice) group and an experienced (expert) group of drivers and motorcycle riders.

Invitations will be sent to inexperienced drivers/riders currently in the intermediate phase of GLP and expert drivers/riders including driving school instructors, motorcycle police officers, and motorcycle instructors and riding clubs in the vicinity of the six field trial sites. All participants will be required to meet specified criteria as outlined in Table 1.

• **Table 1. Field Trial Participant Criteria**

Total Sample Size = 900			
400 Motorcycle Riders		500 Passenger Vehicle Drivers	
200 Inexperienced Riders	200 Experts	300 Inexperienced Drivers	200 Experts
<ul style="list-style-type: none"> • Less than 2 years riding experience • Must have passed the Level 1 road test 	<ul style="list-style-type: none"> • driver training instructors, BCSC trainers, motorcycle, riding club members and police • minimum 10 years riding experience • No at fault crashes (must not be more than 25% responsible for any crash) over past 5 years • Less than 7 penalty points over past 5 years • No prohibitions or criminal code convictions over past 5 years 	<ul style="list-style-type: none"> • Less than 2 years driving experience • Must have passed the Level 1 road test 	<ul style="list-style-type: none"> • driver training instructors, police • minimum 10 years driving experience • No at fault crashes (must not be more than 25% responsible for any crash) over past 5 years • Less than 7 penalty points over past 5 years • No prohibitions or criminal code convictions over past 5 years

Prospective field trial participants will be notified of their test location, date and time prior to their test date. Participants will also be provided with a Tuning Up manual and Supplement to prepare for the test. An hour and a half will be required from each participant. Participants enlisted from the public will be offered incentives for their participation.

b. Sites

The field trials will be conducted at six sites across the province, representing a range of traffic conditions and geographic diversity (see Table 2).

The Examiner pairs will develop at least 2 routes at each site one week prior to the first field trial cycle.

Table 2. Field Trial Sites

High Volume Site	Low Volume Site
Burnaby	Duncan
Surrey	Prince George
Coquitlam	Kelowna

4. Field Trial Cycle 2

November 1 - 5 Field Trial details

This second field trial cycle will only be conducted if unacceptable reliability and/or validity statistics are obtained from the first field trial.

Sample size requirements are lower for the second field trial cycle as comprehensive statistics will have been derived from the initial cycle, pinpointing the particular test elements requiring revision and re-testing. Therefore, 200 participants will be run through the second trial. The Examiner pairs will return to the initial field trial sites, where they will conduct five road tests per day.

November 8 - 12 - Field Trial Data Analysis

Results of the second field trial will be analyzed in the same manner for the first field trial. The 16 Examiners will return to their own POS until December 6th.

November 18 - 22 - Test/Route Revisions

5. Driver Examiner Training, Province-Wide

Eighteen Examiners (including the coordinators, trainers and trainees) will have been trained on the Level 2 Road Test by the end of the field trial cycles. Approximately 130 will still require training, eventually. However, some of these Examiners will need training before January 24, 2000 to ensure availability of the Level 2 road test province-wide. This province-wide training will be conducted in the following manner:

November 22 - 26 Train The Trainer Workshop

Up to 16 of the Examiners will return to ICBC Head Office to participate in a Train the Trainer workshop in preparation for additional training of Examiners across the province. The training will be administered by the field trial coordinators.

January 3 - 21/ January 24 -February 11/ February 14 -March 3,2000 Province-Wide Examiner Training Sessions

Three week training sessions will be held at ICBC Head Office. The first week of training will be conducted in a classroom setting, covering the principles and scoring criteria of the Level 2 Road Test. The trainers will split into pairs, each training a group of Examiners in a

classroom setting. The trainees from the field trial will act as drivers for the remaining two week period, which will be devoted to achieving scoring consistency during mock road tests. The field trial coordinators will oversee the training sessions, ensuring that they are conducted in the same manner as the pilot test and field trial training sessions. Each training session can train up to 36 examiners and lasts three weeks.

SUMMARY REPORT OF THE RESULTS OF THE ROAD TEST -FIELD TRIALS

DESIGN OF THE CLASS 5/6 AND CLASS 7/8 ROAD TESTS

The Class 5/6 and Class 7/8 road tests are competency-based; there is no total score obtained on the test. Applicants must reach a minimum cut-off score for each Global Skill and for each Maneuver Category (e.g., Intersection Left, Intersection Right, etc.) to pass the test. A maneuver (e.g., one left turn) is failed (and circled on the score sheet) whenever more than one Global Skill (e.g., Observation, Space Margins, etc.) receives an error mark during that intersection. The same cut-off applies for Skills and Maneuvers within Left Turns, within Right Turns, etc. (See "How to Read Your Class 5/6 Road Test Results for more details on scoring).

Test design for the Class 7/8 Road Test is similar to that of the Class 5/6 Road Test. The score sheet differs in that it contains a separate section for Vehicle Handling maneuvers (these are in General Driving on the Class 5/6 RT). The marking criteria are identical with a very few exceptions. Hazard Perception is conducted twice, while stopped during the "pull-over" Vehicle Handling maneuvers.

ROAD TEST FIELD TRIALS

Because the tests are competency-based, consistency and validity estimates are reported for each Global Skill within each Maneuver Category. In some cases, coefficients are given for the Global Skills over the entire test.

Statistical results for both tests are reported only for passenger vehicle field trials, as adequate group sizes could not be obtained for motorcycle tests.

Interpretation of Statistical Results

- The consistency coefficients reported are a reflection of examiner agreement over and above that expected by chance. Coefficients reflect "good" agreement between examiners at .40 or above, and "excellent" agreement at .70 or above.
- Consistency estimates for the Class 5/6 road test were calculated at the level of individual sub-skills (e.g., shoulder checks, scanning, etc), in order to closely evaluate the psychometric properties of the test. When analyses were conducted on the Class 7/8 road test field trials, consistency estimates were calculated for the Global Skills only.
- As expected, there was more variability in consistency at the sub-skills level than at the Global Skills level. Much of this variability could be explained in terms of the following:
 - Front seat vs. back seat position of examiner (for some sub-skills this made lots of difference, for others, none);
 - If there was no need for a sub-skill to be used (e.g., shoulder check during an Intersection Through) there was no marking done, so consistency coefficient could not be calculated;
 - If few or no errors were made on a given skill or sub-skill, a consistency coefficient could not be calculated.
- The above factors will also have effected the calculation of group differences

Class 5/6 (Level 2) Road Test Field Trials

Design and Sample:

- 546 participants (433 passenger vehicle, 113 m/c)
- 239 Experienced drivers/riders
- 307 Inexperienced drivers/riders.
- 7 sites - 3 high-volume and 3 medium-low volume sites

Examiner Consistency (Reliability) Estimates

These are for Global Skills across' all maneuvers, averaged across testing sites (each site had one pair of examiners to compare against each other):

- | | |
|---------------------------|------|
| • Skill A: Observation | .79 |
| • Hazard perception | .82* |
| • Skill B: Space Margins | .77 |
| • Skill C: Speed | .73 |
| • Skill D Steering | .65 |
| • Skill E: Communications | .58 |

*For the field trials, Hazard Perception was scored as a separate Global Skill (because it was so new, we wanted to take a careful look at it). It stood up very well psychometrically, but due to ESL and other public perception questions, we placed it within Observation on the final version of the test.

Validity Estimates: Mean Differences Between Inexperienced ("Novice") And Experienced (Expert) Groups:

Mean differences were calculated only on sub-skill scores, not aggregated across sub skills to obtain an estimate for Skill A, Skill B etc.

For each maneuver category, the following mean sub-skill score differences between groups were statistically significant:

Intersection Right

- **Observation:** Shoulder check, Scan
- **Space Margins:** Lane Position, Following Distance
- **Speed:** Speed Maintenance, Rolling Stop, Acceleration/Deceleration
- **Steering:** General Steering
- **Communication:** (none)

Intersection Left

- **Observation:** Shoulder check, Scan
- **Space Margins:** Lane Position, Following Distance, Blocks Crosswalk, Occupies Crosswalk
- **Speed:** Speed Maintenance, Rolling Stop, Acceleration/Deceleration
- **Steering:** General Steering
- **Communication:** (none)

Intersection Through

- **Observation:** Scan
- **Space Margins:** Lane Position

Summary Report, Road Test Field Trial Results, GLP 02/28/01

- **Speed:** Rolling Stop
- **Steering:** (none)
- **Communication:** (none)

General Driving

- **Observation:** Scan
- **Space Margins:** Stops too close/too far
- **Speed:** Speed Maintenance, Amber Light, Shifting
- **Steering:** General Steering, Other
- **Communication:** Fails to signal/Late to Cancel

Hazard Perception

Differences in average number of hazards identified by novices vs. experts were Statistically significant.

Class 7 (Level 1) Road Test Field Trials

Design and Sample

- 133 participants
- 45 Learners and 35 Novices, all with 1-12 months driving experience (Inexperienced)
- 53 Instructors (Experienced)
- 3 testing locations - 2 high volume, one medium volume
- Passenger Vehicle tests only were conducted

Examiner Consistency (Reliability) Estimates **

These are for Global Skills across all maneuvers, averaged across testing sites (each site had one pair of examiners to compare against each other):

A: Observation	.89
B: Space Margins	.83
C: Speed	.81
D: Steering	.65
E: Communication	.73

Differences Between Inexperienced And Experienced Groups: **

1. When scores were aggregated across sub-skills to obtain an estimate for Skill A across all maneuver categories, the following results were obtained.

Significant differences among all 3 groups (Learners vs. Novices vs. Instructors) on:

Skill A: Observation

Skill B: Space Margins

No difference between Learners and Novices, but significant differences between Learners and Novices vs. Instructors on:

Skill C: Speed

Skill D: Steering

No difference between Novices and Instructors, but significant difference between Novices and Instructors vs. Learners on:

Summary Report, Road Test Field Trial Results, GLP 02/28/01

Skill E: Communication

2. When scores were aggregated across sub-skills to obtain an estimate for Skill A, Skill B etc. on each Maneuver Category (e.g., Left Turn, Tight Turn, etc.), the following results were obtained.

Differences between Instructors vs. both Inexperienced groups were statistically significant for the following:

Left Turns

- Observation
- Space Margins
- Speed

Through Intersections

- Space Margins
- Maneuver Score

Right Turns

- Space Margins
- Speed
- Steering

General Driving

- Observation
- Space Margins

Vehicle Handling

- Speed
- Steering

Differences between Instructors vs. Learners vs. Novices were statistically significant for the following:

Left Turns

- Steering
- Maneuver Score

Right Turns

- Observation
- Maneuver Score

Vehicle Handling

- Observation
- Maneuver Score

Differences between Instructors vs. Learners only were statistically significant for the following:

Through intersections

- Steering
- Maneuver Score

General Driving

- Steering
- Communication

Differences between Instructors and Novices vs. Learners were statistically significant for the following:

Vehicle Handling

- Space Margins

- Communication

No differences between groups were found for the following:

Left Turns

- Communication

Right Turn

- Communications

Through Intersections

- Observations
- Steering
- Communications

General Driving

- Speed

Hazard Perception

See notes under Class 5/6 Road Test Field Trials section.

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2007.1 RR IBC.39.1 Reference: Exhibit B-1-2, Chapter 7.3 Insurance, Marketing and Underwriting, C.1 Broker Relations and Sales, p. 7.3-9, paragraph 33

What are the advertising, corporate promotions, broker forms and publications that have resulted in the increased general expenses?

Response:

Please see the response to information request 2007.1 RR IBC.33.1.

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2007.1 RR IBC.40.1 Reference: Exhibit B-1-2, Chapter 7.3A Distribution Costs, A. Introduction, p.7.3A-1, paragraph 1

ICBC explores business methods "with" the involvement of brokers that have the potential to reduce or contain costs.

Where in its submission does ICBC explore and evaluate business methods "without" the involvement of brokers that have the potential to reduce or contain costs?

Response:

ICBC has explored internet and telephone renewals without the involvement of brokers in prior submissions, and has concluded that establishing parallel methods of distribution would result in higher costs and redundancies in the system for minimal benefit to customers. ICBC believes the current distribution system through brokers offers the best value for customers with low cost of service, professional advice on proper rating and coverage, and immediate delivery of documentation and the licensing decal.

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2007.1 RR IBC.41.1 Reference: Exhibit B-1-2, Chapter 7.3A Distribution Costs, B. Background, p.7.3A-2, paragraph 7

Please advise of the date that the renewal transaction fee was increased from \$8.60 to \$10.10 and the date that these negotiations first commenced.

Response:

The renewal transaction fee was increased on July 1, 2006. The negotiations first commenced in November 2005, and agreement was reached in May 2006.

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2007.1 RR IBC.42.1 Reference: Exhibit B-1-2, Chapter 7.7 Corporate Costs, E. Corporate Projects, pp. 7.7-13 to 7.7-16 and Chapter 7.8 Basic Insurance Portion of Operating Expenses, Appendix 1-B, p. 7.8-10

**In its Decision of July 13, 2006 at p. 61 the Commission stated:
The Commission Panel approves ICBC's project allocation of significant corporate projects which are appropriately allocated 100 percent to either Basic or Optional Insurance. ICBC should identify and quantify these specific projects when allocating costs. Also, ICBC should review these projects for scope changes to ensure that they would continue to be identified as either 100 percent Basic or Optional Insurance costs.**

How are the project costs identified in Figure 7.7.8 allocated?

Response:

The project costs identified in Figure 7.7.8 are allocated as shown in Attachment A - Financial Allocation of 2007 Projects.



2007.1 RR IBC.42.1 – Attachment A – Financial Allocation of 2007 Projects

2007 Proposed Projects
March 16, 2007 filing with the BCUC Utilities Commission

Line No.	Project	(\$ 000)		(\$ 000)		
		2007 Proposed Projects	Allocator	Basic	Non-insurance	Optional
1	Operations					
2	Collision Repair Industry Agreement	\$1,073	Claims Division Average	\$644	\$3	\$426
3	Claims Payment Controls	850	Claims Division Average	510	2	337
4	Operations Initiatives					
	• MD Estimating Platform Upgrade	2,261	Claims Division Average	1,357	6	898
	• BI Programs - Claims Handling Model	1,000	Directly attributable to Basic	1,000	0	0
	• Claims Servicing Direction	1,000	Claims Division Average	600	3	397
	• Digital Photo Identification	831	Directly attributable to Non-insurance	0	831	0
	• Others, under \$500,000	1,404	various *	318	887	199
5	Total Operations	\$8,419		\$4,429	\$1,733	\$2,257
6	Insurance					
7	Bill 93 - Phase 2	3,014	100% Optional	0	0	3,014
8	Competitive Initiative B	734	100% Optional	0	0	734
9	Semi annual updates (Release Fund)	1,500	Insurance Division Average	880	0	620
10	Insurance Initiatives					
	• Insurance Servicing Direction	500	Insurance Division Average	293	0	207
	• Rate Change Proposal 1	1,200	Insurance Division Average	704	0	496
	• Rate Change Proposal 2	tbd		tbd	tbd	tbd
	• Others, under \$500,000	1,843	various *	587	29	1,227
11	Total Insurance	\$8,791		\$2,464	\$29	\$6,298
12	ISD					
13	E-business Infrastructure	1,188	Equally between Basic and Optional per January 2005 BCUC Decision	594	0	594
14	Output Management	1,000	Equally between Basic and Optional per January 2005 BCUC Decision	500	0	500
15	ISD Initiatives					
	• SAP Upgrade	3,400	Equally between Basic and Optional per January 2005 BCUC Decision	1,700	0	1,700
	• End User PC Evergreening	1,750	various *	943	178	629
	• Workplace Technology Services Application move to ICBC	1,300	Directly attributable to Non-insurance	0	1,300	0
	• Integrated Corporate Reporting (BIP)	1,000	various *	575	1	424
	• Others, under \$500,000	795	various *	407	25	362
16	Total ISD	\$10,433		\$4,719	\$1,504	\$4,210
17	Finance					
18	Finance Initiatives					
	• Customer Credit System	1,730	Directly attributable to Basic	1,730	0	0
	• Others, under \$500,000	830	various *	421	0	409
19	Total Finance	\$2,560		\$2,151	\$0	\$409
20	HR					
21	HR Initiatives					
	• Others, under \$500,000	827	Equally between Basic and Optional per January 2005 BCUC Decision	414	0	414
22	Total HR	\$827		\$414	\$0	\$414
23	Corporate					
24	Minor Enhancements	1,000	various *	422	251	327
25	Total Corporate	\$1,000		\$422	\$251	\$327
26	Projects under \$500,000	\$1,280		\$735	\$101	\$444
27	Total	\$32,030		\$14,599	\$3,517	\$13,914
28	Grand Total	\$33,310		\$15,334	\$3,618	\$14,358
29	Estimated Net Project Refinements/Deferrals	(8,310)				
30	2007 Corporate Project Fund Budget	\$25,000				

* For initiatives and minor enhancements, these are allocated to business areas and further allocated to Basic insurance or Optional insurance, either directly or based on a divisional average.

2007.1 RR IBC.42.2 Reference: Exhibit B-1-2, Chapter 7.7 Corporate Costs, E. Corporate Projects, pp. 7.7-13 to 7.7-16 and Chapter 7.8 Basic Insurance Portion of Operating Expenses, Appendix 1-B, p. 7.8-10

**In its Decision of July 13, 2006 at p. 61 the Commission stated:
The Commission Panel approves ICBC's project allocation of significant corporate projects which are appropriately allocated 100 percent to either Basic or Optional Insurance. ICBC should identify and quantify these specific projects when allocating costs. Also, ICBC should review these projects for scope changes to ensure that they would continue to be identified as either 100 percent Basic or Optional Insurance costs.**

Where are the 2005 projects allocated in Appendix 1-B?

Response:

The 2005 projects are included in the following Appendix 1-B functional groups:

Projects	Appendix 1-B functional group
Claims Services-related projects	Claims General Support or Claims Basic Projects
Loss Management-related projects	Road Safety Initiatives
Administrative-related projects	Infrastructure Expenditure
Non-insurance Administrative-related projects	Non-insurance Project Expense
Insurance Services-related projects	Insurance Project Expense or Optional Coverage
Non-insurance Operations-related projects	Driver Services

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2007.1 RR IBC.43.1 Reference: Exhibit B-1-2, Chapter 7.7 Corporate Costs, E. Corporate Projects, p. 7.7-16, Figure 7.8.8

Is the "Collision Repair Industry Agreement" a renegotiation of an existing agreement or a new project?

Response:

The renewal of the Collision Repair Industry Agreement (CRIA) is intended to leverage the existing agreement and ICBC's investment while ensuring that the guiding principles and our strong relationship with industry is maintained. CRIA is a performance-based reward program which rewards efficiency while also ensuring safe, quality, guaranteed repairs for the benefit of our customers.

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2007.1 RR IBC.43.2 Reference: Exhibit B-1-2, Chapter 7.7 Corporate Costs, E. Corporate Projects, p. 7.7-16, Figure 7.8.8

Please advise what is contemplated with respect to the "MD Estimating Platform Upgrade".

Response:

ICBC's vehicle damage estimating software tool (PenPro) is reaching end of life and requires replacement. Similarly the cameras used to capture digital images in support of the estimating process have become obsolete and unreliable, and the storage and management of the images is outdated. ICBC initiated the Material Damage Estimating Platform project to address these needs, in order to provide improved systems and support to its Estimators and Express Repair Facilities. The business case has been provided in Attachment A, Material Damage Estimating Platform Upgrade October 2, 2006 in the response to 2007.1 RR BCUC.113.1.

Insurance Bureau of Canada Information Request No. 2007.1 RR IBC.43.3 Dated 04 May 2007 Insurance Corporation of British Columbia Response Issued 01 June 2007	Page 1 of 1
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2007.1 RR IBC.43.3 Reference: Exhibit B-1-2, Chapter 7.7 Corporate Costs, E. Corporate Projects, p. 7.7-16, Figure 7.8.8

Please breakdown the cost of \$6,721,000 as among the proposed Operations Initiatives

Response:

Please see the response to information request 2007.1 RR BCUC.111.1 for a breakdown of the Operations Initiatives.

Insurance Bureau of Canada Information Request No. 2007.1 RR IBC.43.4 Dated 04 May 2007 Insurance Corporation of British Columbia Response Issued 01 June 2007	Page 1 of 1
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2007.1 RR IBC.43.4 Reference: Exhibit B-1-2, Chapter 7.7 Corporate Costs, E. Corporate Projects, p. 7.7-16, Figure 7.8.8

What is the nature of the project titled "Minor Enhancements"?

Response:

From the 2007 corporate project fund of \$25 million, \$1 million has been set aside for minor enhancements. Minor enhancements are smaller scale system and business application modifications where costs are estimated to be \$50,000 or less. These are usually minor business changes to modify an existing system, or small additions of new functionality to an existing system.

Insurance Bureau of Canada Information Request No. 2007.1 RR IBC.43.5 Dated 04 May 2007 Insurance Corporation of British Columbia Response Issued 01 June 2007	Page 1 of 1
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2007.1 RR IBC.43.5 Reference: Exhibit B-1-2, Chapter 7.7 Corporate Costs, E. Corporate Projects, p. 7.7-16, Figure 7.8.8

Please break down the \$2,643,000 among the three Insurance Initiatives.

Response:

Please see the response to information request 2007.1 RR BCUC.111.1 for a breakdown of the Insurance Initiatives.

Insurance Bureau of Canada Information Request No. 2007.1 RR IBC.44.1 Dated 04 May 2007 Insurance Corporation of British Columbia Response Issued 01 June 2007	Page 1 of 2
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2007.1 RR IBC.44.1 Reference: Exhibit B-1-2, Chapter 7.8 Basic Insurance Portion of Operating Expenses, C. Basic Insurance Operating Expenses, p. 7.8-6, Figure 7.8.4 and footnote 1

Footnote 1 explains the declines in lines 8 and 2 but what accounts for the increase from 60.1% to 60.3% to 60.9% in line 1 (Claims Services) and the forecast reduction to 60.7%?

Response:

The Basic Insurance Allocation Percentages shown in Figures 7.8.4 is the result of numerous factors. Appendix 1B in Chapter 7.8 of ICBC's 2007 Revenue Requirements Application illustrates how the 2005 allocation percentages are derived and the underlying factors that impact the year-to-year changes in allocation percentage, which include:

- The total dollar amount of expenditure in each of the approximately 100 functional groups, thereby impacting the weighting of the functional group's allocation percentage.
- The allocator changes approved by the Commission from each Decision.
- The underlying data used to calculate the allocation percentage for each of the approximately 100 allocators, such as using the 2005 premiums written for the 2005 fiscal year and using the 2006 premiums written for the 2006 fiscal year as input data.

Overall, the allocation percentage varies slightly from year-to-year due to changes in the factors noted above. Variation between 2004, 2005, 2006 and 2007 are within 1% and not material. A number of key reasons for the year-over-year variance that have been identified are:

- The Basic Insurance Percentages increased from 60.1% in 2004 to 60.3% in 2005 primarily due to an approved change in allocation methodology related to corporate projects. For 2004, Claims projects were allocated between Basic and Optional insurance lines of business using the claims division average. For years 2005 to 2007, Claims projects, which were primarily related to Basic insurance, were allocated 100% to Basic insurance as per the Commission's July 2006 Decision, resulting in an overall shift of project costs to Basic insurance. Other projects which had both Basic and Optional insurance components continue to use the claims division average.
- The Basic Insurance Percentages increased in 2006 and in 2007 primarily due to an increased focus on managing Basic bodily injury claims costs.

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- The Basic Insurance Percentage decreased slightly from 60.9% in 2006 to 60.7% in 2007 and is mainly attributable to changes in the underlying expense data used in the calculation.

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2007.1 RR IBC.45.1 Reference: Exhibit B-1-2, Chapter 7.8 Basic Insurance Portion of Operating Expenses, Appendix 1B – 2006 Approved Allocators using 2005 Actual Cost Detail, pp.7.8-10 and 7.8-15

Given that 2006 Actual Costs and 2007 Forecasted Costs are available, please provide Appendix 1B using these alternate numbers.

Response:

Attachment A - Appendix 1 B – 2006 Approved Allocators Using 2006 Actual Cost Detail provides a Financial Statement View of the operating expenses for 2006 Actual presented in the same format as Appendix 1B in Chapter 7.8, pages 7.8-10 to 7.8-15 of the 2007 Revenue Requirements Application.

Attachment B - Appendix 1 B – 2006 Approved Allocators Using 2007 Forecast Cost Detail provides a Financial Statement View of the operating expenses for 2007 Forecast presented in the same format as Appendix 1B in Chapter 7.8, pages 7.8-10 to 7.8-15 of the 2007 Revenue Requirements Application.



2007.1 RR IBC.45.1 – Attachment A – Appendix 1 B – 2006 Approved Allocators Using 2006 Actual Cost Detail

Appendix 1 B – 2006 Approved Allocators Using 2006 Actual Cost Detail

Claims Services

Claims Services	Allocator	\$ in thousands				Allocation %*			
		Basic Insurance	Non-insurance	Optional Insurance	Total	Basic Insurance	Non-insurance	Optional Insurance	Total
Regional Claim Centres	Work Effort	82,715	-	47,042	129,757	63.7%	0.0%	36.3%	100.0%
Claims General Support	Claims Division Average	16,048	67	10,357	26,472	60.6%	0.3%	39.1%	100.0%
Call Centre Department	Newly Opened Exposures - TCD	8,264	-	13,483	21,747	38.0%	0.0%	62.0%	100.0%
Claims System Support	Claims Division Average	11,906	50	7,683	19,639	60.6%	0.3%	39.1%	100.0%
In-House Counsel (Provincial Litigation Services)	Work Effort - Provincial Litigation	9,464	-	498	9,962	95.0%	0.0%	5.0%	100.0%
Centralized Estimating Facilities	Net Claims Cost - MD	2,945	-	4,067	7,012	42.0%	0.0%	58.0%	100.0%
Material Damage Support	Net Claims Cost - MD	2,275	-	3,141	5,416	42.0%	0.0%	58.0%	100.0%
Head Office Claims	Net Claims Cost - HOC	1,887	-	2,913	4,800	39.3%	0.0%	60.7%	100.0%
Rehabilitation	Directly attributable to Basic	3,718	-	-	3,718	100.0%	0.0%	0.0%	100.0%
Salvage	Net Claims Cost - MD	1,457	-	2,012	3,470	42.0%	0.0%	58.0%	100.0%
Ongoing Claim Services	Net Claims Cost - OOP MD	1,474	-	1,801	3,275	45.0%	0.0%	55.0%	100.0%
Customer Service Support	Weighted Average - Cost Centres	1,206	243	1,403	2,852	42.3%	8.5%	49.2%	100.0%
Call Centre Support	Weighted Average - Cost Centres	1,127	277	1,348	2,753	41.0%	10.1%	49.0%	100.0%
Customer Service (low value BI)	Directly attributable to Basic	1,977	-	-	1,977	100.0%	0.0%	0.0%	100.0%
Heavy Equipment	Net Claims Cost - HE	555	-	1,359	1,915	29.0%	0.0%	71.0%	100.0%
Claims Litigation Support	Work Effort - Provincial Litigation	1,491	-	78	1,570	95.0%	0.0%	5.0%	100.0%
Out of Province BI	Directly attributable to Basic	1,444	-	-	1,444	100.0%	0.0%	0.0%	100.0%
BI Support	Work Effort	1,143	-	60	1,203	95.0%	0.0%	5.0%	100.0%
Head Injury	Work Effort	785	-	196	981	80.0%	0.0%	20.0%	100.0%
Claims Basic Projects	Directly attributable to Basic	897	-	-	897	100.0%	0.0%	0.0%	100.0%
Customer Advocacy	Claims Division Average	516	2	333	851	60.6%	0.3%	39.1%	100.0%
Optional Coverage	Directly attributable to Optional	-	-	497	497	0.0%	0.0%	100.0%	100.0%
Claims Dispute Resolution - MD	Collision / Property Damage Split	152	-	295	448	34.0%	0.0%	66.0%	100.0%
Claims Dispute Resolution - BI	Work Effort	394	-	34	429	92.0%	0.0%	8.0%	100.0%
Structured Settlement	Directly attributable to Optional	-	-	142	142	0.0%	0.0%	100.0%	100.0%
Customer Service (Litigation)	Work Effort - Provincial Litigation	70	-	4	73	95.0%	0.0%	5.0%	100.0%
Total Claims Services		153,909	639	98,748	253,296	60.8%	0.3%	39.0%	100.0%
Disclosure on Statement of Operations						Basic Insurance	Non-insurance	Optional Insurance	Total
Claims Services		153,909		98,748	252,657	60.9%		39.1%	100.0%
Included in Non-insurance, last page of appendix			639		639		100.0%		100.0%
Total Claims Services		153,909	639	98,748	253,296				

* Rounding may affect totals and allocation percentages

Appendix 1 B – 2006 Approved Allocators Using 2006 Actual Cost Detail

Loss Management (Including Auto Crime)

Loss Management	Allocator	\$ in thousands*				Allocation %*			
		Basic Insurance	Non-insurance	Optional Insurance	Total	Basic Insurance	Non-insurance	Optional Insurance	Total
Road Safety Initiatives	Directly attributable to Basic	34,391	-	-	34,391	100.0%	0.0%	0.0%	100.0%
Fraud Management	Weighted Average - Cost Centres	4,913	-	2,863	7,776	63.2%	0.0%	36.8%	100.0%
Regional Loss Prevention	100% Basic with Exceptions	3,025	-	478	3,503	86.4%	0.0%	13.6%	100.0%
Auto Crime Expenditures	Comprehensive Coverage - Market Share	437	-	1,217	1,654	26.4%	0.0%	73.6%	100.0%
Road Safety Project Ops	Road Safety Division Average	932	-	99	1,031	90.4%	0.0%	9.6%	100.0%
Total Loss Management		43,699	-	4,658	48,357	90.4%	0.0%	9.6%	100.0%

* Rounding may affect totals and allocation percentages

Appendix 1 B – 2006 Approved Allocators Using 2006 Actual Cost Detail

Administrative

Operating Costs - Administrative	Allocator ¹	\$ in thousands*				Allocation %*			
		Basic Insurance	Non- insurance	Optional Insurance	Total	Basic Insurance	Non- insurance	Optional Insurance	Total
ISD Shared Services: Insurance, Claims, Non- insurance	Corporate Shared Services Ratio	13,258	4,207	13,258	30,724	43.2%	13.7%	43.2%	100.0%
Facilities Management	Square Footage	3,598	906	3,598	8,102	44.4%	11.2%	44.4%	100.0%
Corporate Costs	Finance Shared Services Ratio	3,906	-	3,906	7,811	50.0%	0.0%	50.0%	100.0%
Human Resources Division	Corporate Shared Services Ratio	3,342	1,061	3,342	7,744	43.2%	13.7%	43.2%	100.0%
Finance Shared Services - Insurance Operations	Finance Shared Services Ratio	3,393	-	3,393	6,785	50.0%	0.0%	50.0%	100.0%
Infrastructure Expenditure	Finance Shared Services Ratio	2,422	-	2,422	4,843	50.0%	0.0%	50.0%	100.0%
Customer Collections	Weighted Average - Transactions	1,906	953	1,906	4,764	40.0%	20.0%	40.0%	100.0%
Supply Management Department	Work Effort	1,730	580	1,730	4,040	42.8%	14.4%	42.8%	100.0%
Regional Claims, Road Safety and Licensing Administration	Weighted Average - Cost Centres	1,966	-	1,966	3,932	50.0%	0.0%	50.0%	100.0%
Document Services	Square Footage	1,566	395	1,566	3,527	44.4%	11.2%	44.4%	100.0%
Customer Contact Call Centre	Premiums Written	1,713	-	1,713	3,427	50.0%	0.0%	50.0%	100.0%
Facilities Management (Victoria)	Square Footage	75	2,837	75	2,987	2.5%	95.0%	2.5%	100.0%
General Counsel	Work Effort	1,223	537	1,223	2,982	41.0%	18.0%	41.0%	100.0%
Regulator Costs	Directly attributable to Basic	1,466	-	1,466	2,932	50.0%	0.0%	50.0%	100.0%
Executive Office	Finance Shared Services Ratio	1,338	-	1,338	2,675	50.0%	0.0%	50.0%	100.0%
Freedom of Information Department	Work Effort	1,161	-	1,161	2,323	50.0%	0.0%	50.0%	100.0%
Finance Division Banking Operations	Work Effort	1,147	-	1,147	2,295	50.0%	0.0%	50.0%	100.0%
Investment Portfolio Management	Investment Income Ratio	1,070	-	1,070	2,140	50.0%	0.0%	50.0%	100.0%
General Support	Weighted Average - Cost Centres	656	269	656	1,580	41.5%	17.0%	41.5%	100.0%
Claims Administrative Support	Weighted Average - Cost Centres	486	199	486	1,170	41.5%	17.0%	41.5%	100.0%
Insurance & Telephone Claims Training	Insurance Division Average	584	-	584	1,168	50.0%	0.0%	50.0%	100.0%
Corporate Management Reporting	Work Effort	569	-	569	1,138	50.0%	0.0%	50.0%	100.0%
External Corporate Communications	Work Effort	454	136	454	1,043	43.5%	13.0%	43.5%	100.0%
Claims Training	Claims Division Average	478	2	478	959	49.9%	0.3%	49.9%	100.0%
Project Management Service Costs	Finance Shared Services Ratio	465	-	465	929	50.0%	0.0%	50.0%	100.0%
Communication - Government relations	Work Effort	250	167	250	668	37.5%	25.0%	37.5%	100.0%
Corporate Strategic Services	Corporate Shared Services Ratio	215	68	215	498	43.2%	13.7%	43.2%	100.0%
Insurance Support (Admin)	Weighted Average - Cost Centres	93	35	93	222	42.1%	15.8%	42.1%	100.0%

Appendix 1 B – 2006 Approved Allocators Using 2006 Actual Cost Detail

Administrative: Cont'd

Operating Costs - Administrative	Allocator ¹	\$ in thousands*				Allocation %*			
		Basic Insurance	Non-insurance	Optional Insurance	Total	Basic Insurance	Non-insurance	Optional Insurance	Total
Fair Practices Review	Work Effort - Provincial Litigation	96	-	96	191	50.0%	0.0%	50.0%	100.0%
ISD Insurance Systems Support	Insurance Division Average	72	-	72	144	50.0%	0.0%	50.0%	100.0%
Material Damage Fees	Net Claims Costs - MD	(1,918)	-	(1,918)	(3,835)	50.0%	0.0%	50.0%	100.0%
Interest on Receivables	Weighted Average - Transactions	(5,386)	-	(5,386)	(10,772)	50.0%	0.0%	50.0%	100.0%
Total Administrative		43,392	12,352	43,392	99,136	43.8%	12.5%	43.8%	100.0%

¹ Using the Allocator indicated, a portion of the costs is allocated to non-insurance. The remainder of the costs are allocated equally between Basic insurance and Optional insurance (see page 42 of the January 2005 BCUC Decision)

Disclosure on Statement of Operations	Basic Insurance	Non-insurance	Optional Insurance	Total
Total Admin Costs	43,392		43,392	86,785
Included in Non-insurance, last page of appendix		12,352		12,352
Total Administrative	43,392	12,352	43,392	99,136

* Rounding may affect totals and allocation percentages

Non-insurance Administrative

Operating Costs - Non-insurance	Allocator	\$ in thousands*				Allocation %*			
		Basic Insurance	Non-insurance	Optional Insurance	Total	Basic Insurance	Non-insurance	Optional Insurance	Total
Registration and Licensing	↑ Directly attributable to Non-insurance ↓	-	7,622	-	7,622	0.0%	100.0%	0.0%	100.0%
ISD Non-insurance Vehicle Application		-	3,931	-	3,931	0.0%	100.0%	0.0%	100.0%
Government Revenue Administration		-	906	-	906	0.0%	100.0%	0.0%	100.0%
Vehicle Records		-	447	-	447	0.0%	100.0%	0.0%	100.0%
Non-insurance (Victoria) Telephone Education		-	270	-	270	0.0%	100.0%	0.0%	100.0%
Insurance Corporate Cost		-	184	-	184	0.0%	100.0%	0.0%	100.0%
Corporate Costs		-	189	-	189	0.0%	100.0%	0.0%	100.0%
Non-insurance Project Expense		-	140	-	140	0.0%	100.0%	0.0%	100.0%
Distribution Fees		-	102	-	102	0.0%	100.0%	0.0%	100.0%
Total Non-insurance operating costs, included in Non-insurance, last page of this appendix			-	13,790	-	13,790	0.0%	100.0%	0.0%

* Rounding may affect totals and allocation percentages

Appendix 1 B – 2006 Approved Allocators Using 2006 Actual Cost Detail

Insurance Services

Operating Costs - Insurance	Allocator	\$ in thousands*				Allocation %*			
		Basic Insurance	Non-insurance	Optional Insurance	Total	Basic Insurance	Non-insurance	Optional Insurance	Total
Insurance System Support	Premiums Written	3,966	-	3,324	7,290	54.4%	0.0%	45.6%	100.0%
Field Broker Support	Work Effort	2,664	684	3,494	6,843	38.9%	10.0%	51.1%	100.0%
General Broker Support & Direct Sales	Premiums Written	1,621	-	1,358	2,979	54.4%	0.0%	45.6%	100.0%
Bad Debts & Allowances	Weighted Average - Transactions	1,318	108	1,264	2,690	49.0%	4.0%	47.0%	100.0%
Optional Coverage	Directly attributable to Optional	-	-	2,682	2,682	0.0%	0.0%	100.0%	100.0%
Insurance Project Expense	Insurance Division Average	1,520	-	1,123	2,643	57.5%	0.0%	42.5%	100.0%
Chief Underwriter	Premiums Written - With Exception	1,197	-	1,188	2,385	50.2%	0.0%	49.8%	100.0%
Marketing and Broker Services	Premiums Written - With Exception	1,552	-	801	2,352	66.0%	0.0%	34.0%	100.0%
Insurance Corporate Cost	Finance Shared Services Ratio, modified by Commission Decision	1,083	-	1,083	2,167	50.0%	0.0%	50.0%	100.0%
Actuarial	Weighted Average - FTE	896	-	896	1,791	50.0%	0.0%	50.0%	100.0%
Garage & Fleet	Weighted Average - FTE	811	78	670	1,559	52.0%	5.0%	43.0%	100.0%
Registration and Licensing	Directly attributable to Non-insurance except for some minor costs that are allocated based on transaction volume	-	1,423	35	1,458	0.0%	97.6%	2.4%	100.0%
Customer Accounting	Weighted Average - Transactions	559	519	253	1,330	42.0%	39.0%	19.0%	100.0%
Internet Services	Premiums Written	642	-	538	1,179	54.4%	0.0%	45.6%	100.0%
Insurance Business Analysis	Weighted Average - Cost Centres	431	166	454	1,052	41.0%	15.8%	43.2%	100.0%
Insurance Business Support	Weighted Average - Cost Centres	410	145	479	1,035	39.6%	14.1%	46.3%	100.0%
Market Research	Weighted Average - Projects	570	-	462	1,032	55.2%	0.0%	44.8%	100.0%
Specialty Lic & Ins	Weighted Average - Special Coverages	101	342	582	1,025	9.9%	33.3%	56.8%	100.0%
Insurance Broker Team	Premiums Written	545	-	457	1,003	54.4%	0.0%	45.6%	100.0%
Product Research	Premiums Written	527	-	441	968	54.4%	0.0%	45.6%	100.0%
Insurance Planning	Work Effort	309	309	309	927	33.3%	33.3%	33.3%	100.0%
Insurance Services Applications Support	Insurance Division Average	408	-	302	710	57.5%	0.0%	42.5%	100.0%
Insurance Processing	Premiums Written - Insurance Processing	206	204	172	582	35.4%	35.0%	29.6%	100.0%
Regional Marketing	Work Effort	282	28	254	565	50.0%	5.0%	45.0%	100.0%
ADP Technical	Premiums Written	240	-	201	442	54.4%	0.0%	45.6%	100.0%
Insurance Support (Autoplan)	Weighted Average - Cost Centres	65	235	59	359	18.0%	65.6%	16.5%	100.0%
Premium Financing Plan Operations	Premiums Written	195	-	164	359	54.4%	0.0%	45.6%	100.0%
Product Development	Premiums Written	178	-	149	327	54.4%	0.0%	45.6%	100.0%
Insurance Basic Projects	Directly attributable to Basic	195	-	-	195	100.0%	0.0%	0.0%	100.0%

Appendix 1 B – 2006 Approved Allocators Using 2006 Actual Cost Detail

Insurance Services: Cont'd

Operating Costs - Insurance	Allocator	\$ in thousands*				Allocation %*			
		Basic Insurance	Non-insurance	Optional Insurance	Total	Basic Insurance	Non-insurance	Optional Insurance	Total
Funds Management	Premiums Written	92	-	77	170	54.4%	0.0%	45.6%	100.0%
Collector Vehicle Program	Weighted Average - FTE	14	70	56	140	10.0%	50.0%	40.0%	100.0%
Mgr. Of Comm. Lines	Commercial Vehicle Premiums Written	57	-	48	105	54.3%	0.0%	45.7%	100.0%
Total Insurance Services		22,653	4,311	23,378	50,342	45.0%	8.6%	46.4%	100.0%

* Rounding may affect totals and allocation percentages

<i>Disclosure on Statement of Operations</i>				Basic Insurance	Non-insurance	Optional Insurance	Total	
Operating Costs		22,653	23,378	46,031	49.2%		50.8%	100.0%
Included in Non-insurance, last page of this appendix			4,311	4,311		100.0%		100.0%
Total Insurance Services		22,653	4,311	23,378	50,342			

Non-insurance Operations

Non-insurance Costs	Allocator	\$ in thousands*				Allocation %*			
		Basic Insurance	Non-insurance	Optional Insurance	Total	Basic Insurance	Non-insurance	Optional Insurance	Total
Claims services	see Claims Services		639		639	0.0%	100.0%	0.0%	100.0%
Administrative	See Administrative		12,352		12,352	0.0%	100.0%	0.0%	100.0%
Insurance	See Insurance		4,311		4,311	0.0%	100.0%	0.0%	100.0%
Non-insurance Administrative	Directly attributable to Non-insurance		13,790		13,790	0.0%	100.0%	0.0%	100.0%
Non-insurance Administrative			31,092		31,092	0.0%	100.0%	0.0%	100.0%
Payment to the Province for Compliance Operations	Directly attributable to Non-insurance		6,240		6,240	0.0%	100.0%	0.0%	100.0%
Driver Services	Directly attributable to Non-insurance		40,796		40,796	0.0%	100.0%	0.0%	100.0%
Total Non-insurance Costs			78,128		78,128	0.0%	100.0%	0.0%	100.0%

* Rounding may affect totals and allocation percentages



2007.1 RR IBC.45.1 – Attachment B – Appendix 1 B – 2006 Approved Allocators Using 2007 Forecast Cost Detail

Appendix 1 B – 2006 Approved Allocators Using 2007 Forecast Cost Detail

Claims Services

Claims Services	Allocator	\$ in thousands*				Allocation %*			
		Basic Insurance	Non-insurance	Optional Insurance	Total	Basic Insurance	Non-insurance	Optional Insurance	Total
Regional Claim Centres	Work Effort	83,854	-	49,124	132,978	63.1%	0.0%	36.9%	100.0%
Claims General Support	Claims Division Average	14,373	68	9,506	23,947	60.0%	0.3%	39.7%	100.0%
Call Centre Department	Newly Opened Exposures - TCD	7,903	-	12,895	20,799	38.0%	0.0%	62.0%	100.0%
Claims System Support	Claims Division Average	11,377	54	7,525	18,955	60.0%	0.3%	39.7%	100.0%
In-House Counsel (Provincial Litigation Services)	Work Effort - Provincial Litigation	9,670	-	509	10,179	95.0%	0.0%	5.0%	100.0%
Centralized Estimating Facilities	Net Claims Cost - MD	2,966	-	4,269	7,235	41.0%	0.0%	59.0%	100.0%
Material Damage Support	Net Claims Cost - MD	2,252	-	3,241	5,493	41.0%	0.0%	59.0%	100.0%
Head Office Claims	Net Claims Cost - HOC	1,946	-	2,899	4,845	40.2%	0.0%	59.8%	100.0%
Rehabilitation	Directly attributable to Basic	3,809	-	-	3,809	100.0%	0.0%	0.0%	100.0%
Salvage	Net Claims Cost - MD	1,460	-	2,102	3,562	41.0%	0.0%	59.0%	100.0%
Ongoing Claim Services	Net Claims Cost - OOP MD	1,554	-	1,824	3,378	46.0%	0.0%	54.0%	100.0%
Customer Service Support	Weighted Average - Cost Centres	1,257	271	1,481	3,009	41.8%	9.0%	49.2%	100.0%
Call Centre Support	Weighted Average - Cost Centres	1,194	313	1,460	2,967	40.3%	10.5%	49.2%	100.0%
Customer Service (low value BI)	Directly attributable to Basic	2,788	-	-	2,788	100.0%	0.0%	0.0%	100.0%
Heavy Equipment	Net Claims Cost - HE	505	-	1,436	1,941	26.0%	0.0%	74.0%	100.0%
Claims Litigation Support	Work Effort - Provincial Litigation	1,701	-	90	1,791	95.0%	0.0%	5.0%	100.0%
Out of Province BI	Directly attributable to Basic	1,515	-	-	1,515	100.0%	0.0%	0.0%	100.0%
BI Support	Work Effort	1,201	-	63	1,264	95.0%	0.0%	5.0%	100.0%
Head Injury	Work Effort	826	-	206	1,032	80.0%	0.0%	20.0%	100.0%
Claims Basic Projects	Directly attributable to Basic	892	-	-	892	100.0%	0.0%	0.0%	100.0%
Customer Advocacy	Claims Division Average	490	2	324	817	60.0%	0.3%	39.7%	100.0%
Optional Coverage	Directly attributable to Optional	-	-	580	580	0.0%	0.0%	100.0%	100.0%
Claims Dispute Resolution - MD	Collision / Property Damage Split	156	-	303	460	34.0%	0.0%	66.0%	100.0%
Claims Dispute Resolution - BI	Work Effort	404	-	26	429	94.0%	0.0%	6.0%	100.0%
Customer Service (Litigation)	Work Effort - Provincial Litigation	85	-	4	89	95.0%	0.0%	5.0%	100.0%
Total Claims Services		154,179	707	99,868	254,754	60.5%	0.3%	39.2%	100.0%

<i>Disclosure on Statement of Operations</i>					Basic Insurance	Non-insurance	Optional Insurance	Total
Claims Services	154,179		99,868	254,047	60.7%		39.3%	100.0%
Included in Non-insurance, last page of appendix		707		707		100.0%		100.0%
Total Claims Services	154,179	707	99,868	254,754				

* Rounding may affect totals and allocation percentages

Appendix 1 B – 2006 Approved Allocators Using 2007 Forecast Cost Detail

Loss Management (Including Auto Crime)

Loss Management	Allocator	\$ in thousands*				Allocation %*			
		Basic Insurance	Non-insurance	Optional Insurance	Total	Basic Insurance	Non-insurance	Optional Insurance	Total
Road Safety Initiatives	Directly attributable to Basic	35,963	-	-	35,963	100.0%	0.0%	0.0%	100.0%
Fraud Management	Weighted Average - Cost Centres	4,915	-	2,939	7,854	62.6%	0.0%	37.4%	100.0%
Regional Loss Prevention	100% Basic with Exceptions	3,275	-	519	3,794	86.3%	0.0%	13.7%	100.0%
Auto Crime Expenditures	Comprehensive Coverage - Market Share	369	-	1,028	1,397	26.4%	0.0%	73.6%	100.0%
Road Safety Project Ops	Road Safety Division Average	966	-	100	1,066	90.6%	0.0%	9.4%	100.0%
Total Loss Management		45,488	-	4,586	50,074	90.8%	0.0%	9.2%	100.0%

* Rounding may affect totals and allocation percentages

Appendix 1 B – 2006 Approved Allocators Using 2007 Forecast Cost Detail

Administrative

Operating Costs - Administrative	Allocator ¹	\$ in thousands*				Allocation %*			
		Basic Insurance	Non- insurance	Optional Insurance	Total	Basic Insurance	Non- insurance	Optional Insurance	Total
ISD Shared Services: Insurance, Claims, Non- insurance	Corporate Shared Services Ratio	13,513	4,061	13,513	31,087	43.5%	13.1%	43.5%	100.0%
Corporate Costs	Finance Shared Services Ratio	6,396	-	6,396	12,792	50.0%	0.0%	50.0%	100.0%
Facilities Management	Square Footage	4,078	1,023	4,078	9,178	44.4%	11.1%	44.4%	100.0%
Human Resources Division	Corporate Shared Services Ratio	3,663	1,101	3,663	8,427	43.5%	13.1%	43.5%	100.0%
Finance Shared Services - Insurance Operations	Finance Shared Services Ratio	3,784	-	3,784	7,568	50.0%	0.0%	50.0%	100.0%
Infrastructure Expenditure	Finance Shared Services Ratio	2,896	-	2,825	5,722	50.6%	0.0%	49.4%	100.0%
Customer Collections	Weighted Average - Transactions	1,934	967	1,934	4,834	40.0%	20.0%	40.0%	100.0%
Supply Management Department	Work Effort	1,588	538	1,588	3,715	42.8%	14.5%	42.8%	100.0%
Regional Claims, Road Safety and Licensing Administration	Weighted Average - Cost Centres	1,790	-	1,790	3,580	50.0%	0.0%	50.0%	100.0%
Customer Contact Call Centre	Premiums Written	1,790	-	1,790	3,580	50.0%	0.0%	50.0%	100.0%
Document Services	Square Footage	1,464	367	1,464	3,296	44.4%	11.1%	44.4%	100.0%
Finance Division Banking Operations	Work Effort	1,617	-	1,617	3,233	50.0%	0.0%	50.0%	100.0%
Facilities Management (Victoria)	Square Footage	78	2,949	78	3,104	2.5%	95.0%	2.5%	100.0%
General Counsel	Work Effort	1,261	554	1,261	3,075	41.0%	18.0%	41.0%	100.0%
Regulator Costs	Directly attributable to Basic	1,530	-	1,530	3,061	50.0%	0.0%	50.0%	100.0%
Executive Office	Finance Shared Services Ratio	1,275	-	1,275	2,550	50.0%	0.0%	50.0%	100.0%
Freedom of Information Department	Work Effort	1,231	-	1,231	2,461	50.0%	0.0%	50.0%	100.0%
Investment Portfolio Management	Investment Income Ratio	916	-	916	1,831	50.0%	0.0%	50.0%	100.0%
General Support	Weighted Average - Cost Centres	675	220	675	1,569	43.0%	14.0%	43.0%	100.0%
Insurance & Telephone Claims Training	Insurance Division Average	647	-	647	1,294	50.0%	0.0%	50.0%	100.0%
Corporate Management Reporting	Work Effort	592	-	592	1,184	50.0%	0.0%	50.0%	100.0%
Claims Administrative Support	Weighted Average - Cost Centres	496	161	496	1,153	43.0%	14.0%	43.0%	100.0%
Project Management Service Costs	Finance Shared Services Ratio	538	-	538	1,076	50.0%	0.0%	50.0%	100.0%
Claims Training	Claims Division Average	486	3	486	976	49.9%	0.3%	49.9%	100.0%
Communication - Government relations	Work Effort	354	236	354	944	37.5%	25.0%	37.5%	100.0%
External Corporate Communications	Work Effort	255	76	255	586	43.5%	13.0%	43.5%	100.0%
Corporate Strategic Services	Corporate Shared Services Ratio	250	75	250	576	43.5%	13.1%	43.5%	100.0%

Appendix 1 B – 2006 Approved Allocators Using 2007 Forecast Cost Detail

Administrative: Cont'd

Operating Costs - Administrative	Allocator ¹	\$ in thousands*				Allocation %*			
		Basic Insurance	Non-insurance	Optional Insurance	Total	Basic Insurance	Non-insurance	Optional Insurance	Total
Fair Practices Review	Work Effort - Provincial Litigation	90		90	181	50.0%	0.0%	50.0%	100.0%
Insurance Support (Admin)	Weighted Average - Cost Centres	72	28	72	172	41.8%	16.4%	41.8%	100.0%
Material Damage Fees	Net Claims Costs - MD	(1,899)		(1,899)	(3,799)	50.0%	0.0%	50.0%	100.0%
Interest on Receivables	Weighted Average - Transactions	(5,020)		(5,020)	(10,040)	50.0%	0.0%	50.0%	100.0%
Total Administrative		48,338	12,360	48,267	108,965	44.4%	11.3%	44.3%	100.0%

¹ Using the Allocator indicated, a portion of the costs is allocated to non-insurance . The remainder of the costs are allocated equally between Basic insurance and Optional insurance (see page 42 of the January 2005 BCUC Decision)

<i>Disclosure on Statement of Operations</i>					Basic Insurance	Non-insurance	Optional Insurance	Total
Total Admin Costs	48,338		48,267	96,605	50.0%		50.0%	100.0%
Included in Non-insurance, last page of appendix		12,360		12,360		100.0%		100.0%
Total Administrative	48,338	12,360	48,267	108,965				

* Rounding may affect totals and allocation percentages

Non-insurance Administrative

Operating Costs - Non-insurance	Allocator	\$ in thousands*				Allocation % *			
		Basic Insurance	Non-insurance	Optional Insurance	Total	Basic Insurance	Non-insurance	Optional Insurance	Total
Registration and Licensing	↑ Directly attributable to Non-insurance ↓	-	7,017	-	7,017	0.0%	100.0%	0.0%	100.0%
ISD Non-insurance Vehicle Application		-	3,692	-	3,692	0.0%	100.0%	0.0%	100.0%
Non-insurance Project Expense		-	1,198	-	1,198	0.0%	100.0%	0.0%	100.0%
Government Revenue Administration		-	801	-	801	0.0%	100.0%	0.0%	100.0%
Vehicle Records		-	477	-	477	0.0%	100.0%	0.0%	100.0%
Non-insurance (Victoria) Telephone Education		-	366	-	366	0.0%	100.0%	0.0%	100.0%
Insurance Corporate Cost		-	177	-	177	0.0%	100.0%	0.0%	100.0%
Corporate Costs		-	120	-	120	0.0%	100.0%	0.0%	100.0%
Total Non-insurance operating costs, included in Non-insurance, last page of this appendix			-	13,848	-	13,848	0.0%	100.0%	0.0%

Appendix 1 B – 2006 Approved Allocators Using 2007 Forecast Cost Detail

Insurance Services

Operating Costs - Insurance	Allocator	\$ in thousands*				Allocation %*			
		Basic Insurance	Non-insurance	Optional Insurance	Total	Basic Insurance	Non-insurance	Optional Insurance	Total
Insurance System Support	Premiums Written	4,361	-	3,760	8,121	53.7%	0.0%	46.3%	100.0%
Field Broker Support	Work Effort	2,708	690	3,503	6,901	39.2%	10.0%	50.8%	100.0%
Optional Coverage	Directly attributable to Optional	-	-	5,618	5,618	0.0%	0.0%	100.0%	100.0%
Insurance Project Expense	Insurance Division Average	2,084	-	1,468	3,552	58.7%	0.0%	41.3%	100.0%
General Broker Support & Direct Sales	Premiums Written	1,582	-	1,364	2,947	53.7%	0.0%	46.3%	100.0%
Insurance Corporate Cost	Finance Shared Services Ratio, modified by Commission Decision	1,447	-	1,447	2,893	50.0%	0.0%	50.0%	100.0%
Chief Underwriter	Premiums Written - With Exception	1,190	-	1,318	2,507	47.4%	0.0%	52.6%	100.0%
Marketing and Broker Services	Premiums Written - With Exception	1,547	-	960	2,507	61.7%	0.0%	38.3%	100.0%
Actuarial	Weighted Average - FTE	1,205	-	1,205	2,409	50.0%	0.0%	50.0%	100.0%
Bad Debts & Allowances	Weighted Average - Transactions	1,072	70	858	2,000	53.6%	3.5%	42.9%	100.0%
Insurance Business Support	Weighted Average - Cost Centres	818	151	785	1,754	46.6%	8.6%	44.8%	100.0%
Insurance Basic Projects	Directly attributable to Basic	1,589	-	-	1,589	100.0%	0.0%	0.0%	100.0%
Garage & Fleet	Weighted Average - FTE	839	79	665	1,583	53.0%	5.0%	42.0%	100.0%
Customer Accounting	Weighted Average - Transactions	644	571	276	1,490	43.2%	38.3%	18.5%	100.0%
Registration and Licensing	Directly attributable to Non-insurance except for some minor costs that are allocated based on transaction volume	-	1,428	44	1,472	0.0%	97.0%	3.0%	100.0%
Internet Services	Premiums Written	686	-	591	1,277	53.7%	0.0%	46.3%	100.0%
Insurance Business Analysis	Weighted Average - Cost Centres	510	201	511	1,222	41.8%	16.4%	41.8%	100.0%
Insurance Services Applications Support	Insurance Division Average	712	-	502	1,214	58.7%	0.0%	41.3%	100.0%
Market Research	Weighted Average - Projects	554	-	567	1,121	49.4%	0.0%	50.6%	100.0%
Specialty Lic & Ins	Weighted Average - Special Coverages	139	430	546	1,116	12.5%	38.5%	49.0%	100.0%
Insurance Broker Team	Premiums Written	543	-	468	1,011	53.7%	0.0%	46.3%	100.0%
Product Research	Premiums Written	481	-	415	896	53.7%	0.0%	46.3%	100.0%
Insurance Planning	Work Effort	293	293	293	878	33.3%	33.3%	33.3%	100.0%
Insurance Processing	Premiums Written - Insurance Processing	239	239	206	684	34.9%	35.0%	30.1%	100.0%
Regional Marketing	Work Effort	274	27	247	548	50.0%	5.0%	45.0%	100.0%
ADP Technical	Premiums Written	262	-	226	487	53.7%	0.0%	46.3%	100.0%
Product Development	Premiums Written	220	-	190	410	53.7%	0.0%	46.3%	100.0%
Insurance Support (Autoplan)	Weighted Average - Cost Centres	51	279	49	379	13.5%	73.6%	12.9%	100.0%
Funds Management	Premiums Written	124	-	107	232	53.7%	0.0%	46.3%	100.0%

Appendix 1 B – 2006 Approved Allocators Using 2007 Forecast Cost Detail

Insurance Services: Cont'd

Operating Costs - Insurance	Allocator	\$ in thousands*				Allocation %*			
		Basic Insurance	Non-insurance	Optional Insurance	Total	Basic Insurance	Non-insurance	Optional Insurance	Total
Collector Vehicle Program	Weighted Average - FTE	14	72	58	144	10.0%	50.0%	40.0%	100.0%
Mgr. Of Comm. Lines	Commercial Vehicle Premiums Written	76	-	61	137	55.3%	0.0%	44.7%	100.0%
Total Insurance Services		26,264	4,530	28,306	59,100	44.4%	7.7%	47.9%	100.0%

* Rounding may affect totals and allocation percentages

<i>Disclosure on Statement of Operations</i>					Basic Insurance	Non-insurance	Optional Insurance	Total	
Operating Costs		26,264		28,306	54,570	48.1%		51.9%	100.0%
Included in Non-insurance, last page of this appendix			4,530		4,530		100.0%		100.0%
Total Insurance Services		26,264	4,530	28,306	59,100				

Non-insurance Operations

Non-insurance Costs	Allocator	\$ in thousands*				Allocation %*			
		Basic Insurance	Non-insurance	Optional Insurance	Total	Basic Insurance	Non-insurance	Optional Insurance	Total
Claims services	see Claims Services		707		707	0.0%	100.0%	0.0%	100.0%
Administrative	See Administrative		12,360		12,360	0.0%	100.0%	0.0%	100.0%
Insurance	See Insurance		4,530		4,530	0.0%	100.0%	0.0%	100.0%
Non-insurance Administrative	Directly attributable to Non-insurance		13,848		13,848	0.0%	100.0%	0.0%	100.0%
Non-insurance Administrative			31,445		31,445	0.0%	100.0%	0.0%	100.0%
Driver Services	Directly attributable to Non-insurance		41,266		41,266	0.0%	100.0%	0.0%	100.0%
Total Non-insurance Costs			72,711		72,711	0.0%	100.0%	0.0%	100.0%

* Rounding may affect totals and allocation percentages

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2007.1 RR IBC.46.1 Reference: Exhibit B-1-2, Chapter 8, Performance Measures, p. 8-4, paragraph 17

Could you please outline what is the margin of error for the statistics shown in paragraph 17

Response:

At the 95% confidence interval, the margins of error for the particular statistics are approximately 2.0% ("Yes"), 2.3% ("No [only bought from ICBC]"), and 1.2% ("No [do not buy Optional coverage]").

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2007.1 RR IBC.47.1 Reference: Exhibit B-1-2, Chapter 8, Performance Measures, p. 8-5, Figure 8.2

ICBC recently implemented further changes to the Graduated Licensing Program. Does ICBC anticipate any changes to the Driver Service Satisfaction as result of these changes? If yes, please quantify the impact.

Response:

ICBC is not anticipating any changes to the driver services satisfaction measure results for 2007 as a result of the GLP changes. The forecast for 2007 is the same as for 2006 – 90%, and first quarter results show the driver services satisfaction measure to be on track to achieve 90%.

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2007.1 RR IBC.48.1 Reference: Exhibit B-1-2, Chapter 8, Performance Measures, p. 8-13, Figure 8.12

Please outline the changes to the operating expenses that were implemented that impact the Basic Administrative Cost Ratio.

Response:

Between 2004 and 2005, there were no significant changes in operating expenses. The decline in Basic Administrative Cost Ratio was primarily due to higher premiums earned in 2005.

Between 2005 and 2006, there was a slight decline in operating expenses due to lower corporate project costs and higher recoveries related to bad debts. The Basic Administrative Cost Ratio decreased further due to higher premiums earned in 2006.

For changes from 2006 to 2007, please see the response to information request 2007.1 RR BCUC.122.0.

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2007.1 RR IBC.49.1 Reference: Exhibit B-1-2, Chapter 9, Financial Allocation, p. 9-9, paragraph 20

ICBC indicates that it has re-examined the allocation of road safety and auto crime costs within the Marketing and Broker Support Services department. What other allocation methodologies did you consider in this process? Please indicate what the allocation would be for Marketing and Broker Services had you chosen the alternative cost allocator.

Response:

ICBC has not considered other allocation methodologies as the methodology employed to allocate costs under the principals of cost causality is the appropriate method. This is in agreement with the allocation methodology approved by the Commission.

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2007.1 RR IBC.50.1 Reference: Exhibit B-1-2, Chapter 9 Financial Allocation, C.2 Salvage Allocation, pp. 9-3 to -5

ICBC provides an explanation of subrogation and why a private insurer providing collision and comprehensive coverage cannot recover administrative expense. Given this explanation, if ICBC provides optional coverage to a non-liable insured and recovers the amount of the claim from the at-fault driver's basic coverage:

Why should any portion of the administrative expense be recovered by the optional side of the business by allocating the underlying operating costs using the Net Claims Costs – MD allocator?

Response:

ICBC operates its Basic insurance, Non-insurance and Optional insurance lines of business on an integrated basis. The integrated nature of ICBC's business model is recognized in ICBC's governing statute, the *Insurance Corporation Act*. Section 49 of that Act is premised on ICBC operating as an integrated entity and requires the Commission to ensure that ICBC's costs and revenues are properly allocated among ICBC's lines of business. The costs that require allocating under section 49 include administrative or operating expenses. In its January 19, 2005 Decision, the Commission approved ICBC's financial allocation methodology that allocates costs and revenues pro rata based on cost causality. The allocation of the salvage allocation function operating expense using the net claims costs-MD allocator is done pursuant to the approved financial allocation methodology.

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2007.1 RR IBC.50.2 Reference: Exhibit B-1-2, Chapter 9 Financial Allocation, C.2 Salvage Allocation, pp. 9-3 to -5

ICBC provides an explanation of subrogation and why a private insurer providing collision and comprehensive coverage cannot recover administrative expense. Given this explanation, if ICBC provides optional coverage to a non-liable insured and recovers the amount of the claim from the at-fault driver's basic coverage:

Why should the administrative expense of private-insurers (not paid by ICBC Basic) be treated differently than the administrative expense of ICBC's optional product?

Response:

The treatment of operating expenses is based on the provisions of the *Insurance Corporation Act* as described in the response to information request 2007.1 RR IBC.50.1 and the law with respect to the scope of subrogation as set out in pages 9-3 to 9-5 of Chapter 9 of the 2007 Revenue Requirements Application. It is the provisions of the *Insurance Corporation Act* and the law with respect to subrogation that dictate the different treatment.

2007.1 RR IBC.51.1 Reference: Exhibit B-1-2, Chapter 9 Financial Allocation, C.1 Premiums Written Allocator, p. 9-3, Figure 9.1

Please provide the data and calculations as set out in Figure 9.1 for 2007 (projected).

Response:

The data and calculations used for 2007 (projected) are shown in the figure below. The 2007 projections (shaded) are appended to years 2003 to 2006, in a format similar to Figure 9.1. Details of the premiums written allocator calculation is described in paragraph 6, page 9-2 of ICBC's 2007 Revenue Requirements Application.

Year	Value of Premiums Written used in Calculation (\$000's)					Basic Optional Allocation Ratio			
	Total	Basic	% Change	Optional	% Change	Basic	% Change	Optional	% Change
2003	\$2,776,514	\$1,506,275		\$1,270,239		54.25%		45.75%	
2004	\$2,913,317	\$1,552,300	3.1%	\$1,361,017	7.1%	53.28%	-0.97%	46.72%	0.97%
2005	\$2,954,309	\$1,587,595	2.3%	\$1,366,714	0.4%	53.74%	0.46%	46.26%	-0.46%
2006	\$3,185,319	\$1,733,857	9.2%	\$1,451,462	6.2%	54.43%	0.69%	45.57%	-0.69%
2007	\$3,304,074	\$1,857,001	7.1%	\$1,447,073	-0.3%	56.20%	1.77%	43.80%	-1.77%

For the purposes of the 2007 rate application, the 2007 projected premiums written was not used in the allocation of 2007 forecasted expense. ICBC's policy is to use the latest audited data in the allocation calculation. At the time when the 2007 rate application was prepared, the 2006 actual data had not yet been approved so the 2007 premiums written allocator was determined using 2005 audited premiums written.

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**2007.1 RR IBC.51.2 Reference: Exhibit B-1-2, Chapter 9 Financial Allocation, C.1
Premiums Written Allocator, p. 9-3, Figure 9.1**

ICBC is requesting an increase in the Basic premium. Has there been an increase or decrease in the Optional premium and, if so, what is it and what is the effective date?

Response:

Information requests related to the Optional insurance business are not relevant to the 2007 Revenue Requirements Application for Basic insurance rates. However, any public information that is available can be found at www.icbc.com.

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2007.1 RR IBC.52.1 Reference: Exhibit B-1-2, Chapter 9, Financial Allocation, C.3, Marketing and Broker Services, p.9-5, paragraph 17

What is "the small amount of costs related to broker activities"?

Response:

The small amount of costs related to broker activities is in reference to costs associated with supporting broker conferences and hosting meetings to discuss operational and strategic issues facing brokers. (This represents approximately \$70,000 annually. The reorganization of the Insurance, Marketing and Underwriting Division in 2006, which is referenced in Chapter 7.3 of ICBC's 2007 Revenue Requirements Application resulted in these costs being transferred to the Broker Relations & Sales business area in 2007).

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2007.1 RR IBC.52.2 Reference: Exhibit B-1-2, Chapter 9, Financial Allocation, C.3, Marketing and Broker Services, p.9-5, paragraph 17

Please provide a list of those activities.

Response:

The broker activities consist of:

- Participating in annual broker association events.
- Hosting monthly broker meetings.

Insurance Bureau of Canada Information Request No. 2007.1 RR IBC.53.1 Dated 04 May 2007 Insurance Corporation of British Columbia Response Issued 01 June 2007	Page 1 of 1
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2007.1 RR IBC.53.1 Reference: Exhibit B-1-2, Chapter 9, Financial Allocation, C.3, Marketing and Broker Services, p.9-5, paragraph 18

Please provide more details of the work involved in respect of "broker support related functions" by the communications professionals in Marketing and Broker Support Services.

Response:

The communications professionals in Marketing and Broker Services perform the following broker-specific support work:

- write and edit material for broker job aids
- develop or coordinate the creation of Point of Sale material for use in broker offices
- develop or coordinate the creation of co-op advertising templates.

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2007.1 RR IBC.53.2 Reference: Exhibit B-1-2, Chapter 9, Financial Allocation, C.3, Marketing and Broker Services, p.9-5, paragraph 18

How many FTEs are involved in this area?

Response:

There are 11 FTE's in Marketing and Broker Services.

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2007.1 RR IBC.54.1 Reference: Exhibit B-1-2, Chapter 10, Road Safety and BCUC Letter No. L-82-06 of December 19,2006

Letter No. L-82-06 on page 3 states "The Commission was seeking specific assessment data on Road Safety programs and projects before program implementation, interim evaluations as to progress and likelihood of meeting targets, and after the fact analysis."

Please identify where ICBC has addressed this request specifically with regards to assessment data on Road Safety programs and projects before program implementation.

Response:

Please see the response to information request 2007.1 RR IBC.55.1, where ICBC has provided the 2007 ICBC Road Safety Action Plan. Pages 3-6 of this document describe the assessment process completed by ICBC before selecting road safety programs and projects.

Regarding Letter L-82-06, in this letter the Commission Panel requested additional information.

In a letter to the Commission dated February 22, 2007, ICBC submitted a proposal as to further information to be filed with its 2007 Revenue Requirements Application. This proposal was accepted by the Commission in Letter L-13-07 dated March 1, 2007. In accordance with this proposal, Chapter 10 of ICBC's 2007 Revenue Requirements Application included information on a planned review of ICBC's education and awareness programs.

Insurance Bureau of Canada Information Request No. 2007.1 RR IBC.55.1 Dated 04 May 2007 Insurance Corporation of British Columbia Response Issued 01 June 2007	Page 1 of 1
16 March 2007 Insurance Corporation of British Columbia 2007 Revenue Requirements Application and Filings	

2007.1 RR IBC.55.1 Reference: Exhibit B-1-2, Chapter 10, Road Safety and ICBC's Filings of October 11, 2006, Chapter 2, Road Safety Action Plan Filing

Please provide the 2007 Road Safety Action Plan and any analysis justifying the investments proposed.

Response:

Please see Attachment A - 2007 ICBC Road Safety Action Plan, which includes rationale for strategies, tactics and targets.



2007.1 RR IBC.55.1 - Attachment A – 2007 ICBC Road Safety Action Plan



Appendix A to 2007.1 RR IBC.55.1
2007 ICBC Road Safety Action Plan

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Introduction

ICBC invests in road safety programs to prevent claims costs, thereby helping to provide low and stable rates for policyholders. This document describes the 2007 Road Safety action plan and includes a summary of the planning process, definitions of the specific road safety issues that will be addressed, objectives of the programs addressing the issues, specific strategies and tactics that will be used, program costs and measures.

1. Road Safety Planning Process

This section describes how ICBC:

- decides which road safety issues will be addressed;
- establishes strategic objectives for each of the priority issues; and
- selects strategies and tactics for each of the priority issues.

1.1 Selecting the priority road safety programs

ICBC analyzes crash data from two perspectives; first, to determine the causes of crashes; and second, to determine who is involved in these crashes.

Contributing Factors to Crashes

Reports completed by police are used to review the causes of crashes. The police do not attend or prepare a report for all collisions. In 2005, police reported 20,778 casualty (injury or death) collisions, whereas claims data indicate that 51,739 casualty collisions were reported to ICBC. It is therefore not possible to know the driving behaviour that contributed to every crash in B.C.; however, sufficient data are available to guide program priority decisions.

Contributing Factors

The police reporting system allows up to four contributing factors for each person involved in a collision. The following table describes the top police-assigned contributing factors in 2005 casualty collisions.

Table 1 - Top Ten Contributing Factors in 2005 B.C. Casualty Collisions

Contributing Factor	Injury Collisions	Fatal Collisions	Total Collisions	% of Total Collisions
Driver Inattentive	6,736	99	6,835	34.68
Speeding *	3,809	170	3,979	20.19
Driver Error/Confusion	3,573	60	3,633	18.43
Failing to Yield Right of Way *	3,355	40	3,395	17.23
Alcohol	2,197	110	2,307	11.71
Road Condition	2,105	48	2,153	10.92
Following too Closely *	2,008	1	2,009	10.19
Weather	1,420	30	1,450	7.36
Ignoring Traffic Control Device *	1,421	20	1,441	7.31
Improper Turning	980	8	988	5.01

* = Classified as "High Risk" driving behaviours

Occupant Restraint Use

According to the most recent Transport Canada survey, BC's seat belt usage rate was 91.6%. Urban seat belt use is 91.9%, compared to rural use of 86%. In police-reported 2004 collisions, there were 1,609 people injured who did not use a restraint, and 97 people killed. Even though BC has a high seat belt rate, almost one quarter of people killed were not using restraints. If everyone wore seat belts, there would be about 3,800 fewer annual casualties with savings to ICBC policyholders of about \$52 million per year. Increasing the use of seat belts is a policing priority in B.C.

Based on the information in Table 1 above and the discussion in the previous sections, the priority behaviours are:

Table 2 – Priority Road Safety Behaviours

Priority	Behaviour	Considerations
1	High-Risk Driving	High-risk driving includes the contributing factors of Speed, Following Too Close, Ignoring Traffic Control Devices, Improper Turning, and Improper Passing. These behaviours are all enforceable and have been identified as policing priorities.
2	Impaired Driving	One-quarter of all traffic deaths still involve alcohol. The issue is enforceable and is likely to deteriorate without constant reminders that if you drink and drive, you will get caught.
3	Seat Belts	BC saw increased deaths in the early 2000's when seat belt wearing rates were high and police enforcement and public awareness programs were reduced. High levels of enforcement recently have increased the seat belt wearing rate and this issue is a policing priority in B.C.
4	Inattention/ Distractions	This behaviour contributes to the most crashes, but can't be enforced except in the most extreme cases. The issue is just starting to be addressed by road safety practitioners around the world through public education and awareness programs.

People involved in crashes

The following table summarizes the number of casualty (death and injury) crashes, the casualty crash rate, and the estimated costs of these crashes to ICBC's policyholders.

Table 3 - People Involved in B.C. Crashes in 2005

Age	No. of Casualty Crashes	Injuries/ Deaths for Age Group	Population	Casualty Crash Rate / 10,000pop	Estimated Injury Cost (\$millions)	Estimated Injury Cost /10,000pop (\$millions)	
Children	0–12	1,811	2,377	584,099	41	24	0.4
Youth	13–21	8,061	9,747	504,578	193	148	2.9
	16-18	2,880	3,288	164,322	200	58	3.5
	19-21	4,880	5,490	179,612	306	73	9.2
Adults	22–35	17,637	20,766	808,370	257	283	3.5
	36–54	21,524	24,446	1,270,849	192	363	2.9
Seniors	55 +	9,967	11,529	1,071,168	108	169	1.6

Sources: Crash data – ICBC claims data as of December, 2006
Population data – Stats Canada, December, 2006

Note: The number of crashes cannot be totalled as a single car crash can involve people from several age groups.

The priority audiences for road safety programs are:

Table 4 – Audience Priorities

Priority	Age Group	Considerations
1	22 – 54	This large age group is involved in a high number of crashes and is most likely to be influenced by enforcement and information on the risk and consequences of unsafe driving behaviours.
2	13 – 21	Motorists aged 16-21 have very high crash rates. School-based programs targeted at younger teens can encourage positive driving attitudes before they obtain driver licenses.
3	55 +	Although the crash rate for senior motorists is fairly low, the number of people in this age group, and the miles driven, is expected to increase significantly in the next decade. Research indicates that the crash rate per kilometer driven for the oldest drivers is comparable to that of new drivers. By starting to encourage safe mobility for seniors now, an expected significant increase in crashes can be avoided.
4	0 – 12	Although the number of deaths and injuries and the claims costs are low, deaths and injuries of young children are particularly tragic and ICBC has a responsibility to provide information to parents that will help keep their children safe.
5	Pedestrians	The number of crashes involving pedestrians is quite low (2,230 in 2005) but the resulting injuries are very severe, producing high costs. The estimated cost of pedestrian crashes in 2005 is \$110 million. As well, deaths and injuries are concentrated in the Lower Mainland and are a significant cost to that region.
6	Motorcyclists	The number of crashes involving motorcyclists is quite low (2,122 in 2005) but the resulting injuries are very severe, producing high costs. The estimated cost of motorcycle crashes in 2005 is \$63 million.

1.2 Selecting the strategic objectives

Each of ICBC’s road safety programs has a strategic objective and targets. The rationale for each program’s strategic objective is described later in this document. The targets are established by reviewing crash rate trends for each program and considering the major factors that are likely to influence trends in the next few years.

The strategic plan assumes that ICBC will maintain fairly consistent road safety investment levels for the next few years, while always looking for incremental improvements for all tactics. As most of the road safety programs have been in place for many years, the impact of these programs is already included in the trends. At a high level, the casualty crash rate is influenced by many factors, including continuation of road safety programs, improved occupant protection in newer vehicles and a stable economy.

ICBC expects that continuation of its investment in road safety will help maintain a slow, steady decline in the crash casualty rate. The major external influences on traffic crashes will change incrementally. There will be improved occupant protection as newer vehicles are added to the fleet. This will be offset by positive economic factors, which increases exposure.

1.3 Selecting the strategies and tactics

ICBC's road safety strategies fall into two categories:

1. Strategies that will produce short-term, measurable crash prevention benefits;
2. Strategies that will produce long-term improvements in driving attitudes and behaviours.

Under the first category, ICBC supports enhanced enforcement and road engineering improvements.

Enhanced Traffic Law Enforcement

ICBC's previous evaluations have demonstrated that increased levels of traffic law enforcement, coupled with high levels of public awareness of the enforcement, produce an immediate, short-term crash reduction benefit.

Engineering

ICBC shares the costs of road design improvements with local road authorities, requiring a minimum 50% Internal Rate of Return for each project. This investment criteria enables investment in projects that will provide measurable benefits to policyholders over long periods of time. The most recent independent evaluation of the program (December, 2006) confirms that the program is achieving its crash prevention objectives.

Education and Awareness

ICBC's investment in Engineering and Enforcement, including education and awareness programs supporting enforcement, produces immediate crash prevention benefits. These strategies generally do not produce long-term improvements in driving attitudes and behaviours. ICBC also invests in education and awareness strategies that encourage motorists to improve their driving habits, even if enforcement is not present or they encounter less than optimum road and weather conditions.

These education and awareness programs are not expected to produce immediate measurable crash prevention results. Rather, they are expected to gradually change attitudes towards risky driving behaviours. It is not possible to measure the specific impact of this attitudinal change on crashes. In 2006, ICBC developed a model to measure incremental changes in driving attitudes. This research concluded that it appears likely that incremental improvements can be measured; however, the evaluation methodology must be refined in 2007 before any conclusions can be reached. ICBC continues to monitor indicators such as awareness levels to determine intermediate progress and develop improvements to education and awareness tactics.

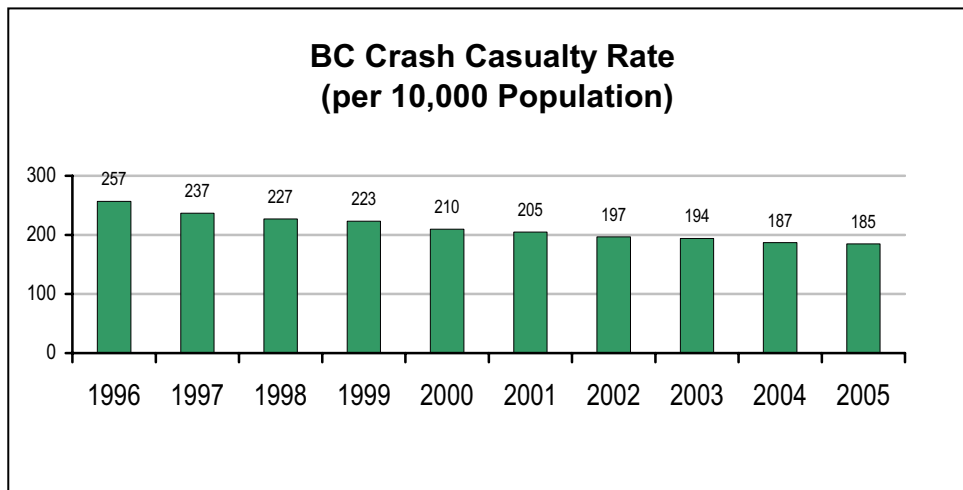
2. Road Safety Summary

2.1 Introduction

Problem Definition:

Total Crashes 2003 – 2005 in British Columbia

Average annual number of crashes	250,257
Average annual total cost of crashes	Approx. \$1.78B
Average total number of fatalities per year	446
Average annual number of injuries and fatalities (from ICBC claims data)	79,125



The BC Crash Casualty Rate is the number of people killed or injured in crashes reported to ICBC per 10,000 population in BC.

Problem Description:

There has been continuous improvement in the rate of traffic crash injuries and deaths in BC in recent years; however, the rising cost of serious injury claims is a significant concern for ICBC's policyholders. Traffic crashes remain a tragic and costly problem, costing ICBC's customers about \$1.8 billion annually.

Strategic Program Objective:

- Reduce the crash casualty rate in BC by 5%, when 2005 is compared with the average for the period 2007 through 2009.

Strategic Program Objective Rationale:

The target for reducing the casualty crash rate was developed by reviewing recent changes in the rate and considering the major factors that are likely to affect the rate in the next few years.

The crash casualty rate reduced by an average of 2% per year from 2002 – 2005. The recent reduction in the casualty crash rate was influenced by many factors, including continuation of road safety programs, enhancement to the Graduated Licensing Program, improved occupant protection in newer vehicles and a stable economy.

ICBC expects to maintain fairly consistent investment levels between 2007 and 2009, while always making evidence-based incremental improvements in the programs. ICBC expects that the combination of initiatives will help maintain a steady decline in the crash casualty rate. The major external influences on traffic crashes will change. There will be improved occupant protection as newer vehicles are added to the fleet. This will be offset by a continuing buoyant economy, which increases exposure.

For these reasons, the strategic objective assumes that the casualty crash rate realized in 2005 will be reduced slightly in the period 2007-2009.

2.2 Cost Summary

ICBC's 2007 Road Safety action plan includes each of the three major components: Enforcement, Engineering and Education.

Enforcement

ICBC's previous evaluations have demonstrated that increased levels of traffic law enforcement produce an immediate, short-term crash reduction benefit. For this reason, ICBC entered into a five-year agreement in 2004 with the Ministry of Public Safety and Solicitor General (MPSSG) to provide funding for enhanced levels of traffic law enforcement.

In accordance with the terms of the agreement with MPSSG, ICBC's level of investment in 2007 will be about \$17 million. This level was established by reviewing the actual levels of enhanced enforcement that were achieved in the late 1990s and discussing with MPSSG the number of new traffic enforcement policing positions that could realistically be recruited and sustained. The total 2007 costs of the agreement include \$1.8 million for enhanced auto crime enforcement and that amount is not included in the road safety costs included in this document.

Engineering

ICBC shares the costs of road design improvements with local road authorities requiring a minimum 50% Internal Rate of Return. ICBC's 2007 planned investment in road improvement strategies is \$9.7 million. ICBC's investment level is limited by the local road authorities' ability to budget for and complete road design improvement projects.

Education and Awareness

ICBC's investment in Engineering and Enforcement, including education programs supporting enhanced enforcement, produces immediate crash reduction benefits. However, these programs generally do not produce long-term improvements in driving attitudes and behaviours. ICBC also invests in education and awareness programs that encourage motorists to improve their driving habits, even if enforcement is not present or if they encounter less than optimum road and weather conditions.

ICBC's approach is to invest in education and awareness programs at a level that will ensure that road safety remains a public focus. In 2007, ICBC will invest approximately \$3.5 million in education and awareness programs that support enforcement (these costs are included in Enforcement Programs in the table below) and approximately \$3.8 million in education and awareness programs designed to change attitudes towards risky driving behaviours.

The 2007 road safety program forecast costs are summarized in the following table.

Road Safety Costs	2007 Forecast (\$000's)
Enforcement Programs	\$20,588
Engineering Programs	9,709
Education/Awareness Strategies	3,783
Research and Administration	2,982
TOTAL	\$37,062

Details with respect to the 2007 forecast costs associated with each of the road safety programs are included in the road safety program descriptions in the following section.

3. Road Safety Program Descriptions

The following sections describe each planned program, divided into enforcement programs, engineering programs and education and awareness programs. The descriptions include strategies, tactics, and measures. Where education and awareness tactics form part of the overall approach to a road safety issue that is primarily addressed through an enforcement program, they and their costs are included in the enforcement program description.

Please note that the claims costs associated with each program cannot be summed to produce total claims costs, due to overlap. For example, a crash involving a speeding young driver who was impaired would be included in three categories: Youth Safety, High Risk Driving and Impaired Driving.

Enforcement Programs

3.1 High Risk Driving Program Description

Problem Definition:

ICBC classifies high risk driving crashes as those crashes involving one or more of the following contributing factors: Unsafe Speed, Following Too Close, Ignoring Traffic Signals, Improper Passing and Failing to Yield.

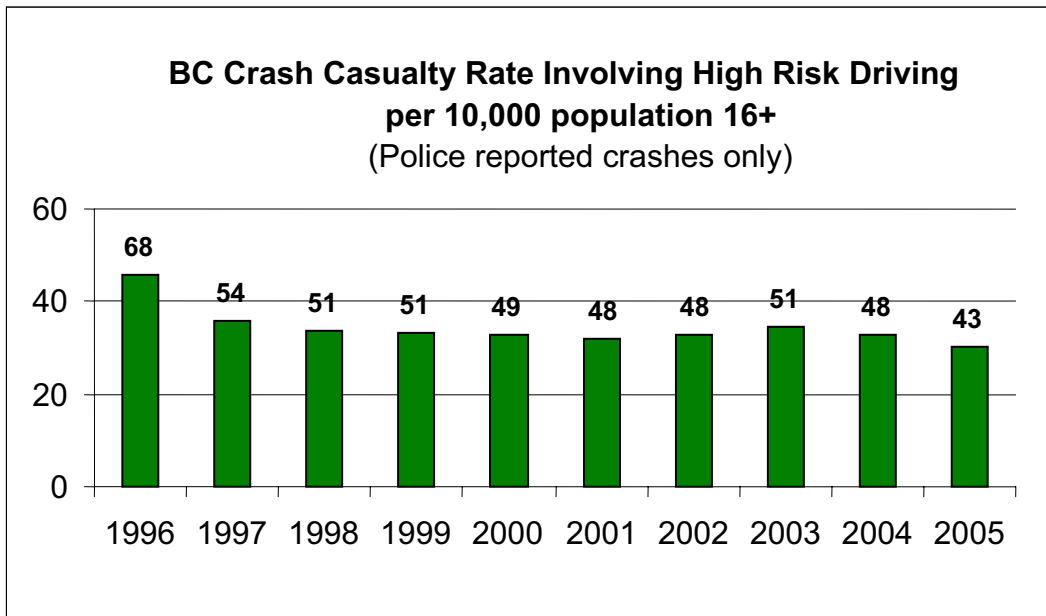
High Risk Driving Crashes 2001 – 2003 in British Columbia

Average annual number of crashes involving High Risk Driving	Approx. 47,300
Average annual total cost of crashes	Approx. \$1066 M
Average total number of fatalities per year (TAS)	170
Average annual number of injuries & fatalities (from BIW)	Approx. 34,200

The numbers in the above table are estimates. Causal factor data are only available for collisions attended by the police. These collisions are only a small portion of the collisions that are reported to ICBC. Therefore, these numbers use the police-reported data as a base, then extrapolate the data and apply it to ICBC crash data.

The above table uses 2001 – 2003 numbers as the annual extrapolation of this information is labour intensive and would be costly to complete yearly. The predicted data changes are insignificant and therefore this table will be updated every three years.

The balance of the data in this section is extracted from the Traffic Accident Statistics database of police-reported crashes as it is the only source of consistent causal factor data.



This rate is the number of people killed or injured in crashes reported to the police involving contributing factors of unsafe speed, following too close or ignoring traffic signals, improper passing and failing to yield per 10,000 population 16+ in BC.

Program Direction and Rationale:

A combination of enforcement, education and community involvement initiatives has been shown by research to be an effective way to address high risk driving. A well informed public made aware that targeted enforcement could be present is the most effective strategy to ensure a higher level of driver compliance with road traffic law.

BC citizens agree that unsafe speed and aggressive driving are major safety concerns. Every developed country in the world with a national road safety plan acknowledges the importance of, and plans to reduce, the incidence of speeding and other high risk driving behaviours.

Strategic Program Objective:

Reduce the crash casualty rate involving high risk driving by 5%, when 2003 – 2005 is compared with the average for 2007 through 2009.

Strategic Program Objective Rationale:

The casualty rate declined by an average of 6.2% per year from 2003 – 2005, but this may be caused by a change in police reporting procedures in 2004. The crash casualty rates for 2005 and 2006 will be reviewed in 2007 and the strategic objective will be updated at that time.

2007 Program Strategies and Tactics

Strategy 1

Support enhanced traffic law enforcement

Tactic 1	Description:	Enforcement Campaign - Increased enforcement effort to target issues identified during a focused time frame. "Enforcement hours" denote actual time spent by officers enforcing this issue in their community.
	Target:	Achieve a 5% increase in tickets issued for high risk driving behaviours in 2007.
	Measurement:	Review contraventions data.
	Costs (\$000s)	\$7,408
Tactic 2	Description:	The Intersection Safety Camera initiative monitors drivers who run red lights. ICBC is responsible for administrative processing of the tickets. ICBC will participate in a government review of the ISC program.
	Target:	Participate in government review of ISC program, to be completed by year-end 2007.
	Measurement:	Review report completed.
	Costs (\$000s)	\$2,253

Note: The costs for the above tactics include \$7.408 million of the \$17 million included in the Enhanced Enforcement Memorandum of Understanding .

Strategy 2

Conduct public education about the risks, consequences and dangers associated with high risk driving behaviours.

Tactic 3	Description:	Public Awareness Campaigns - Regional public education and awareness activities and advertising during a focused time frame.
	Target:	Establish a baseline percentage of people who feel they will get caught for high risk driving behaviours and establish a 2007 target. Achieve a 5% increase in awareness levels of people who identify intersections as a safety issue.
	Measurement:	Review of public opinion surveys.
	Costs (\$000s)	\$1,795
Tactic 4	Description:	Conduct community involvement activities to increase local awareness of aggressive driving issues. Activities will include use of community portable radar equipment and electronic digital boards.
	Target:	1.8 million vehicles checked by community SpeedWatch groups.
	Measurement:	Review reports completed by community groups.
	Costs (\$000s)	\$211

3.2 Impaired Driving Program Description

Problem Definition:

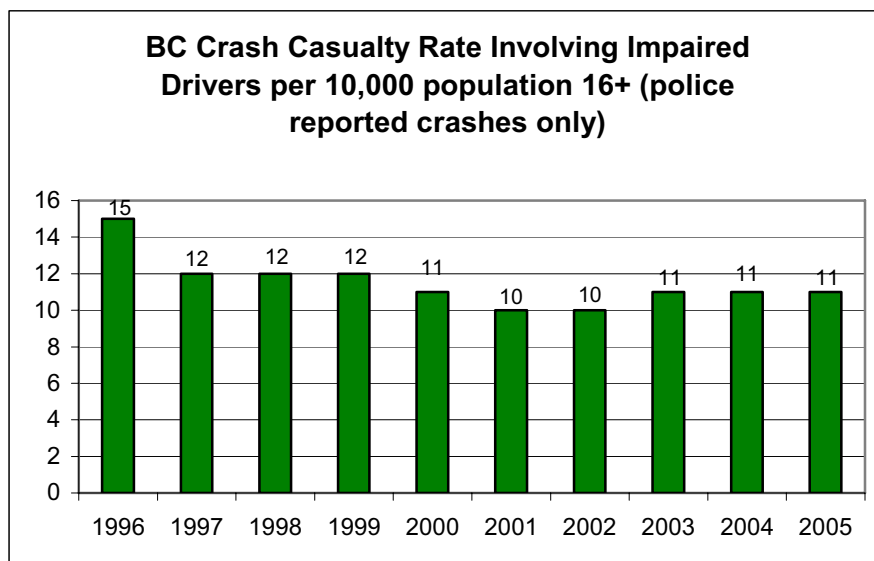
Each year in British Columbia, motor vehicle crashes involving alcohol take a staggering toll in lives lost, injuries, and property damage. Despite the progress that has been made in the past two decades, drinking and driving continues to be a serious problem in British Columbia. Skills, perceptions and attitudes required to drive an automobile are widely known to be affected by alcohol.

Impaired Driving Crashes 2001 – 2003 in British Columbia

Average annual number of crashes involving drivers impaired by alcohol and/or drugs	Approx. 6,000
Average annual total cost of crashes	Approx. \$170M
Average total number of fatalities per year (TAS)	110
Average annual number of injuries + fatalities (from BIW)	Approx. 3,700

The numbers in the above table are estimates. Causal factor data are only available for collisions attended by the police. These collisions are only a small portion of the collisions that are reported to ICBC. Therefore, these numbers use the police-reported data as a base, then extrapolate the data and apply it to ICBC crash data. This table uses 2001 – 2003 numbers as the annual extrapolation of this information is labour intensive and would be costly to complete yearly. The predicted data changes are insignificant and therefore this table will be updated every three years.

The balance of the data in this section is extracted from the Traffic Accident Statistics database of police-reported crashes as it is the only source of consistent causal factor data.



This rate is the number of people killed or injured in crashes reported to the police where impaired driving was identified as a contributing factor per 10,000 Population 16+ in BC.

Program Direction and Rationale:

Reasons provided by research indicate people drink and drive because it is the most convenient thing to do, they feel perfectly safe doing so, they feel there are all kinds of risks that they face daily in their driving, and there is nothing special about alcohol-related risk. The fear of being caught is the main perceived deterrent, followed by fear of being involved in a crash.

Therefore, ICBC's Impaired Driving program direction is to continue supporting police enforcement of impaired driving laws, and to implement awareness campaigns and community involvement initiatives that will cause motorists to think carefully about their personal driving risks and consequences.

Strategic Program Objective:

Reduce the crash casualty rate involving impaired driving by 2.5%, when the period 2003 through 2005 is compared with the period 2007 through 2009.

Strategic Program Objective Rationale:

The casualty crash rate has been stable in the past few years. The new Integrated Policing Units, recent legislative initiatives such as ignition interlock, and continuation of public awareness programs should produce a small decline in the casualty crash rate for the period 2007-2009.

2007 Program Strategies and Tactics:

Strategy 1

Support enhanced traffic law enforcement

Tactic 1	Description:	CounterAttack and Enhanced Road Safety Enforcement - Increased enforcement effort to target impaired driving. Road check hours denote actual time spent by officers enforcing road checks in their community.
	Target:	Achieve a 5% increase in impaired driving charges and suspensions in 2007
	Measurement:	Review contraventions data
	Costs (\$000s)	\$3,654

Note: The costs for the above tactics include \$3.654 million of the \$17 million included in the Enhanced Enforcement Memorandum of Understanding .

Strategy 2

Educate the public of the risks and consequences associated with drinking and driving

Tactic 2	Description:	Public Awareness Campaigns - Public awareness and community involvement activities during a focused time frame.
	Target:	60% of respondents feel they are likely to get caught if they drink and drive.
	Measurement:	Review public opinion survey
	Costs (\$000s)	\$782

3.3 Seat Belt Program Description

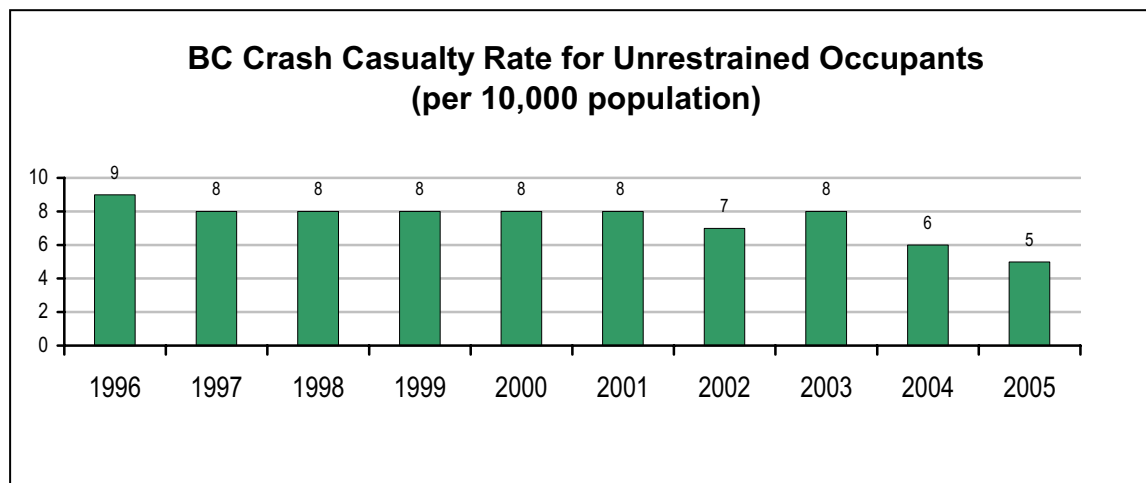
Problem Definition:

According to Transport Canada, BC's seat belt usage rate for 2004/2005 was 91.6%. The following groups have the lowest wearing rates: males under the age of 25, light truck occupants, and back seat passengers. Urban seat belt use is 91.9%, compared to rural use of 86%. In 2005, 79% of drivers involved in casualty collisions who did not use restraints were injured or killed, while 52% of those who used the standard lap and harness restraint system were injured or killed. If everyone wore seat belts there would be about 3,800 fewer annual casualties with savings to ICBC policyholders of about \$52 million per year.

Unrestrained Injuries & Fatalities 2003 – 2005 in British Columbia

Average annual total cost of crashes involving non-use of seat belts	Approx. \$52M
Average total number of fatalities per year (TAS)	122
Average total number of injuries per year (TAS)	2,386

Causal factor data are only available for collisions attended by the police; therefore, this section uses data from the police's Traffic Accident System (TAS).



This rate is the number of people killed or injured in crashes reported to the police where the police identified that no restraint was used per 10,000 population in BC.

Program Direction and Rationale:

Motivating habitual seat belt use with all BC motorists is critical as nearly two-thirds of people who don't use their seat belt all the time rationalize they "just forgot to" or were "going on a short trip or not going too far". Enforcement is the key motivator amongst the groups with the highest rate of misuse (males under 25, light truck occupants, and back seat passengers). Education and awareness is also important as reminding motorists about enforcement motivates these groups to buckle up to avoid penalty.

Strategic Program Objective:

To achieve a 20% reduction in the crash casualty rate for unrestrained motorists when the period 2003-2005 is compared with the period 2007-2009.

Strategic Program Objective Rationale:

Police conducted extensive seat belt enforcement in 2005, combined with a strong public awareness focus. It is assumed that continuation of these tactics will maintain a casualty crash rate for unrestrained occupants of 5 per 10,000 population for 2007-2009. This is a 20% decrease from the average rate for 2003-2005.

2007 Program Strategies and Tactics:

Strategy 1

Support enhanced traffic law enforcement

Tactic 1	Description:	Occupant Restraint Enforcement Campaign - Increased enforcement effort to target issue identified during a focused time frame. These campaigns can be complemented by advertising to promote awareness that targeted enforcement is being conducted.
	Target:	5% increase in the number of people that say that if they drive unrestrained, they will be apprehended.
	Measurement:	Public opinion survey
	Costs (\$000s)	\$3,714

Note: The costs for the above tactics include \$3.714 million of the \$17 million included in the Enhanced Enforcement Memorandum of Understanding .

Strategy 2

Conduct public education awareness campaigns

Tactic 2	Description:	Occupant Restraint Awareness Campaign - Regional public education and awareness activities and advertising during a focused time frame. Regional seat belt surveys are seat belt wearing compliance observations conducted by volunteers and staff.
	Target:	1% increase in occupants using their seat belts in 2007 (Transport Canada survey)
	Measurement:	Transport Canada survey
	Costs (\$000s)	\$196

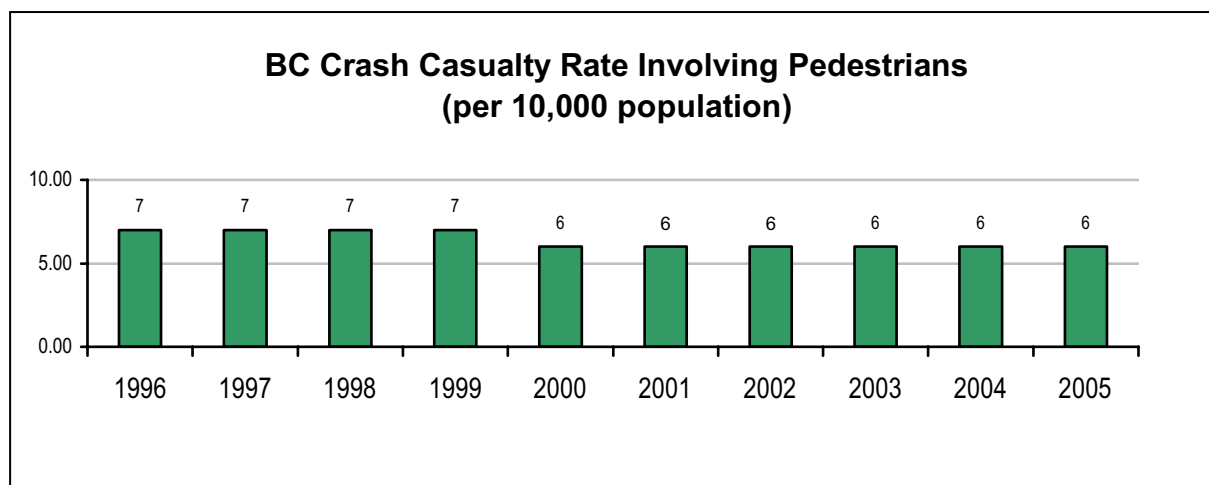
3.4 Pedestrian Safety

Problem Definition:

Pedestrian crashes are often caused by pedestrian error, such as jaywalking, pedestrian inconspicuity, and drivers failing to look before turning right on red.

Pedestrian Crashes 2003 – 2005 in British Columbia

Average annual number of crashes involving pedestrians	2,263
Average annual total cost of crashes	Approx. \$116M
Average total number of fatalities per year (TAS)	71
Average annual number of injuries & fatalities (from BIW)	2,384



This rate is the number of people killed or injured in crashes involving pedestrians reported to ICBC per 10,000 population in BC.

Program Direction and Rationale:

Based on police data, approximately 85% of pedestrian crashes occur on city or municipal streets. Almost ½ of all pedestrian incidents occur at intersections. Males aged 15-24 are the highest risk group for pedestrian crash incidents. ICBC will support a police enforcement campaign in the Lower Mainland in the fall.

Strategic Program Objective:

Achieve a 10% reduction in the average crash casualty rate involving pedestrians when the period 2003-2005 is compared with the period 2007-2009.

Strategic Program Objective Rationale:

The police are intending to have a strong focus on pedestrian safety enforcement in the Lower Mainland in 2007 and subsequent years. This enforcement, combined with an extensive public awareness campaign in the Lower Mainland, should produce a significant reduction in the crash rate.

2007 Program Strategies and Tactics:

Strategy 1

Conduct public education awareness campaigns in support of enhanced enforcement

Tactic 2	Description:	Conduct public awareness campaign to support enhanced enforcement
	Target:	Increase awareness of pedestrian safety message by 5% over 2006 levels in the Lower Mainland region
	Measurement:	Public opinion survey
	Costs (\$000s)	\$580

Engineering Programs

3.5 Road Improvement Program Description

Problem Definition:

Many of BC's roads were designed to standards existing in the 1950's or 1960's. Newer standards offer an opportunity to reduce crashes significantly.

Program Direction and Rationale:

The Road Improvement Program partners financially with municipal road authorities, the Ministry of Transportation and other authorities such as Translink to invest in countermeasures appropriate and specific to individual sites and issues. Examples include: sign up-grades, signal head up-grades, roundabouts, road delineation, rumble strips, left-turn bays, pedestrian facilities, and bicycle facilities. ICBC requires a minimum 50% Internal Rate of Return on road improvement projects.

In addition to making improvements at existing high-crash locations, ICBC also provides updated tools and processes to road engineers and participates in road safety audits to help ensure that new roads are constructed to the highest feasible safety standards.

Strategic Program Objective and Measurement:

Achieve a minimum 50% Internal Rate of Return for road improvement projects. ICBC conducts an evaluation every three years.

2007 Program Strategies and Tactics:

Strategy 1

Reduce crashes at high risk locations

Tactic 1	Description:	Retrofit Program - Using engineering solutions to improve safety and reduce crashes at specific high risk locations.
	Target:	Achieve a minimum 50% Internal Rate of Return on projects.
	Measurement:	Conduct evaluation every three years.
	Costs (\$000s)	\$9,139

Tactic 2	Description:	Safety Studies - Retaining the services of consulting engineering firms to study specific high risk locations and to submit recommendations to both ICBC and the road authority regarding appropriate engineering solutions for that site.
	Target:	Conduct 15 Safety Studies by December 31, 2007.
	Measurement:	Completed studies.
	Costs (\$000s)	\$300

Strategy 2

Encourage road authorities to assign high priority to infrastructure projects that will reduce crashes and improve safety

Tactic 3	Description:	Network Screening - Prioritizing, studying and improving high crash locations in cities interested in participating in the program.
	Target:	Complete network screening in 2 municipalities by December 31, 2007.
	Measurement:	Completed studies.
	Costs (\$000s)	\$170
Tactic 4	Description:	Road Safety Audits - Examining pre-construction design drawings to determine if there are safety-related improvements to be made proactively.
	Target:	Conduct 15 Road Safety Audits by December 31, 2007.
	Measurement:	Count completed audits.
	Costs (\$000s)	\$100

Education and Awareness Programs

As stated above, ICBC's approach to claims cost reductions through road safety programs includes investing in education and awareness programs for identified road safety issues at a level that will ensure that road safety remains a public focus. In 2007, ICBC will invest approximately \$3.8 million of the \$37 million road safety program budget in education and awareness programs not associated with enforcement. These programs are designed to change attitudes towards risky driving behaviours and for research of emerging road safety issues.

Set out below is a table which details each of the education and awareness programs, the problem definition, the program objective, the program measurement and the costs.

Program	Issue	Description
3.6 Aging Drivers	Problem Definition	Drivers aged 55 and older are involved in approximately 26% of the crashes reported to ICBC each year, while those aged 55 and older represent 23% of the population of BC. There are many medical conditions that potentially affect the ability of individuals to drive in a safe manner. The focus of the Aging Driver program will be to develop education and engineering strategies that increase safe mobility for seniors.
	Program Objective	Reduce the rate of crashes involving aging drivers by 2%, when the period 2003 through 2005 is compared with the period 2009 through 2011.
	Strategies	Provide educational materials for aging drivers and their families, to encourage recognition of unsafe driving practices and planning alternative transportation strategies. Evaluate a pilot program in Vernon which included engineering improvements.
	Measurement	Completion of educational materials. Completion of Vernon pilot evaluation. Review crash data to determine injury and fatality rates.
	Costs (\$000s)	\$197
3.7 Child Passenger Safety	Problem Definition	Nearly 2,500 children under the age of 13 sustain serious injuries or die in motor vehicle crashes annually. Correct use of child restraints and seat belts reduces the risk of death by 71% for infants and 54% for children ages 1 to 4, and reduces the need for hospitalization by 69% for children ages 4 and under. While the majority of parents try to ensure that their children are restrained properly in their vehicle, clinic data has shown that most child seats inspected were installed or used incorrectly. In BC, over 90% of child seats inspected are used or installed incorrectly.
	Program Objective	Achieve a 10% reduction of seriously injured children ages 0-12 when the period 2003-2005 is compared to 2007-2009.
	Strategies	Support government review of legislation and regulation opportunities to increase child restraint

Program	Issue	Description
		usage; conduct public awareness campaigns about proper child restraint usage.
	Measurements	Obtain annual statistics from child seat inspections; conduct bi-annual observation survey; review crash data to determine injury rates.
	Costs (\$000s)	\$396
3.8 Youth	Problem Definition	Car crashes are the number one killer of youth aged 13-21 years. Although youth aged 13-21 represented 12% of BC's total population in 2005, 24% of ICBC's total injury crash costs in 2005 involved youth injured victims. While youth crashes have been generally declining in recent years, they are still at high levels. ICBC's Youth Road Safety programs are intended to raise awareness among youth of the magnitude of risk associated with driving, being a passenger in a vehicle and other road uses.
	Program Objectives	Achieve a 10% reduction in the rate of casualty crashes involving youth (13-21 yrs inclusive), when the period 2003-2005 is compared with the period 2007-2009.
	Strategies	Conduct public awareness initiatives about the personal risks and consequences of unsafe driving and being a passenger with an unsafe driver. Provide educational materials and programs to schools, communities and stakeholders.
	Measurements	Review crash data to determine injury rates.
	Costs (\$000s)	\$946
3.9 Distractions and Driver Inattention	Problem Definition	ICBC is currently unable to provide empirical data related to driver distraction. Although all jurisdictional evidence points to driver distraction as a significant contributor to crashes, current BC crash definitions, detection and reporting make it difficult to quantify the magnitude of the problem. Two-thirds of Canadians believe cell phone use by drivers is a serious or extremely serious problem.
	Program Objective	Increase the level of awareness of driving distraction issues by 10%, when the baseline level is compared with the period 2007 through 2009.
	Strategies	Conduct a public awareness campaign on driver distractions and driver inattention.
	Measurements	Review public opinion surveys
	Costs (\$000s)	\$385

3.10 Motorcycle Safety	Problem Definition	ICBC data shows that motorcycle crashes have a high risk of injury. Based on police reported data, single-vehicle motorcycle crashes tend to occur in rural undeveloped areas, at high speeds. Multi-vehicle motorcycle crashes tend to occur in urban areas, at lower speeds where the driver of the other vehicle violates a motorcyclist's right of way or fails to notice the motorcyclist.
	Program Objectives	47% of survey respondents indicate awareness of a motorcycle campaign in 2007.
	Strategies	Conduct public awareness campaign about motorcycle safety.
	Measurements	Public opinion survey
	Costs (\$000s)	\$203
3.11 Multi-Issue	Problem Definition	ICBC's Road Safety Department develops programs which target an audience (e.g. youth, children) or a behaviour (e.g. high risk driving, impaired driving). ICBC also invests in programs that encompass multiple issues/
	Program Objective	<p>ZERO CRASH MONTH is an awareness program to help communities understand the magnitude of crashes involving their citizens and provides information on how to prevent crashes. The long-term goal is to reduce the number of crashes by focusing on local contributing factors and high crash locations. <i>Objective:</i> Increase awareness by 5% over 2006 levels.</p> <p>MISSION POSSIBLE AT WORK is a road safety program geared for employees to improve driver knowledge and attitudes. Sessions cover topics such as driver fatigue, distraction, unsafe speed, managing emotions, winter driving and animal hazards. <i>Objective:</i> 20 new companies implement the program.</p> <p>BAD WEATHER AWARENESS is an awareness program to reduce crashes caused by motorists who were not prepared for, or who did not adapt their driving to, the change in weather conditions. <i>Objective:</i> Increase awareness of messages by 5% over 2006 levels in the North Central and Southern Interior Regions.</p> <p>COMMERCIAL VEHICLE SAFETY: Crashes involving heavy vehicles are extremely serious and costly. <i>Objective:</i> Prepare a business plan by July, 2007.</p> <p>WILDLIFE CRASH REDUCTION: Collisions with wildlife are a serious problem in the North Central and Southern Interior Regions. <i>Objective:</i> Develop wildlife collision prevention tactics by December, 2007.</p>
	Strategies	Provide education resources, tools and information to the motoring public, stakeholders

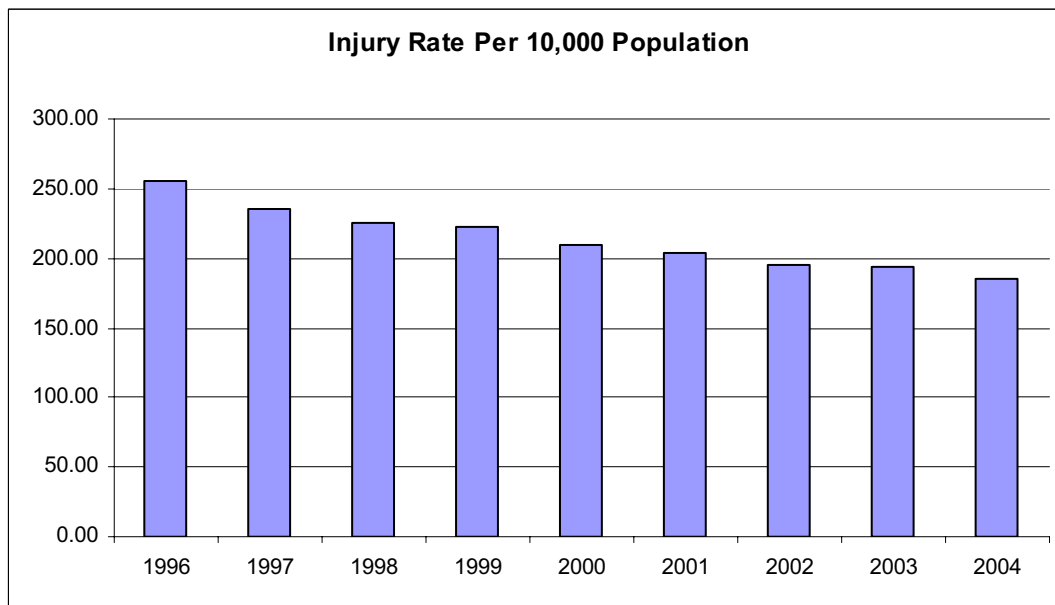
		and communities to reduce crash incidents.
	Measurements	ZERO CRASH MONTH: Public opinion survey BAD WEATHER AWARENESS PROGRAM: Public opinion survey MISSION POSSIBLE AT WORK: Report on company involvement. COMMERCIAL VEHICLE SAFETY: Business plan prepared WILDLIFE CRASH PREVENTION: Report prepared
	Costs (\$000s)	\$1,651
	Program Objective	Provide current information to the public that helps to raise motorists' and cyclists' awareness of cycling safety issues.
3.12 Driver Fatigue	Problem Definition	Present crash definitions, detection and reporting do not allow quantification of the magnitude of the problem in BC. Therefore, ICBC will conduct research to determine potential tactics.
	Program Objective	Complete driver fatigue business plan by October, 2007
	Strategies	Before programs can be developed, driver fatigue must be carefully defined, and crash and driver characteristics established. A business plan will be completed.
	Measurement	Report completed.
	Costs (\$000's)	\$5

2007.1 RR IBC.56.1 Reference: Exhibit B-1-2, Chapter 10, Road Safety and ICBC's Filings of October 11, 2006, Chapter 2, Road Safety Action Plan Filing, B.1 Road Safety Summary, p.2

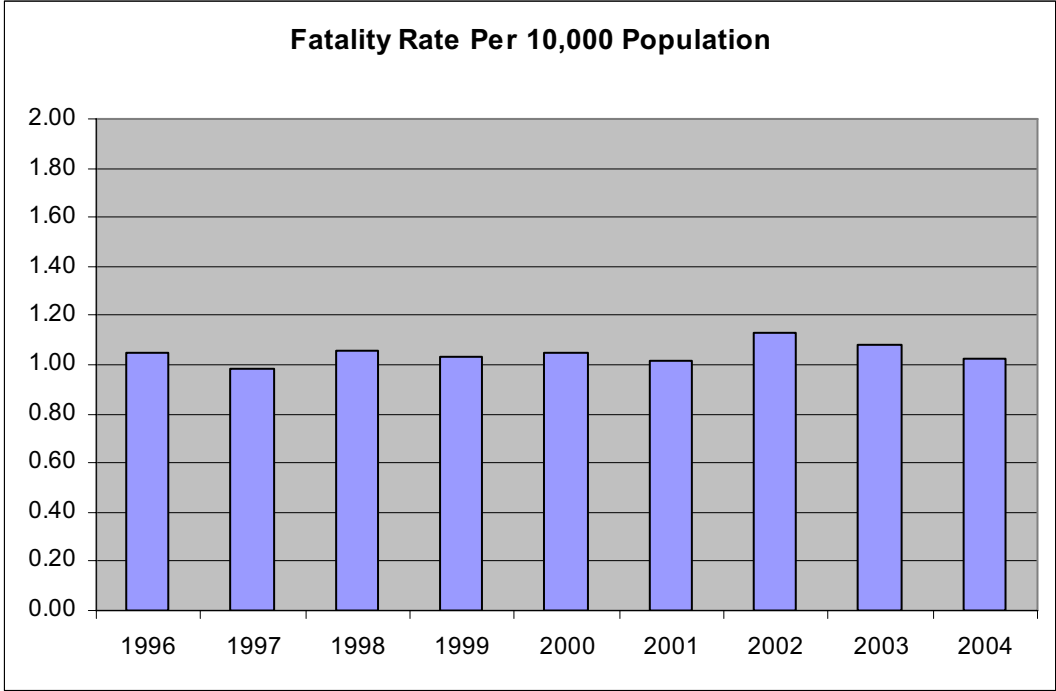
Please provide BC Crash Casualty Rate separately for both fatalities and injuries for each year from 1996 to 2004.

Response:

The following chart displays the number of injured people reported to ICBC per 10,000 population in B.C.



The following chart displays the number of traffic crash fatalities reported to the police in B.C., per 10,000 population in B.C.



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2007.1 RR IBC.57.1 Reference: Exhibit B-1-2, Chapter 10, Road Safety and ICBC's Filings of October 11, 2006, Chapter 2, Road Safety Action Plan Filing, B.1 Road Safety Summary, Problem Description, p.3

What is the source for the statement that the average fatality rate in BC "was about 27%, compared to the national average of 23%"?

Response:

The source is Transport Canada which maintains data submitted by individual provinces related to annual counts of traffic crash fatalities and registered vehicles. During the period 1990-1995 prior to the implementation of large-scale road safety program in BC, the province had a fatality rate of 2.473 fatalities per 10,000 registered vehicles compared to the Canada-wide average of 2.123. In the subsequent period of 1996-2003, the BC rate reduced to 1.810 – a 26.81% drop – while the Canada-wide rate reduced to 1.638 – a 22.85% drop.

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2007.1 RR IBC.58.1 Reference: Exhibit B-1-2, Chapter 10, Road Safety and ICBC's Filings of October 11, 2006, Chapter 2, Road Safety Action Plan Filing, B.1 Road Safety Summary, Strategic Program Objective, p.3

What is the ICBC target for reducing the number of fatalities and the number of injuries to reach its goal of reducing the overall crash casualty rate in BC by 2%?

Response:

ICBC did not establish separate targets for fatality reduction and for injury reduction. A target was established for reducing the traffic crash casualty rate, which includes both deaths and injuries.

The reason that ICBC did not establish a specific short-term target for fatality reduction is that the number of deaths in a year is relatively small when compared with the number of injuries. It is possible that the number of deaths may vary in any given year due to external factors, such as weather, multiple victims in a single crash, etc. For that reason, ICBC's three-year targets focus on casualty reduction.

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2007.1 RR IBC.58.2 Reference: Exhibit B-1-2, Chapter 10, Road Safety and ICBC's Filings of October 11, 2006, Chapter 2, Road Safety Action Plan Filing, B.1 Road Safety Summary, Strategic Program Objective, p.3

What would be the savings to customers for each category?

Response:

ICBC established a target for casualty reduction, rather than establishing separate targets for fatality reduction and injury reduction. ICBC has not analyzed the savings to customers that would be realized if the target for crash casualty reduction is achieved.

This analysis is complex and requires support from research and actuarial experts. ICBC will explore the feasibility of conducting this analysis.

ICBC's 2007 Revenue Requirements Application (Chapter 10, Appendix 10 E) included an evaluation of the effectiveness of road safety programs. This report concluded that the most likely effect of the road safety programs was an annual average reduction in injury claims of 7.9%.

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2007.1 RR IBC.59.1 Reference: Exhibit B-1-2, Chapter 10, Road Safety, C. Engineering, p.10-2, paragraph 8

Please provide any supporting documents, studies and reports that justify the change in the rate of return from 3 to 1 to 50%.

Response:

Please see the response to information request 2005.1 BCUC.75.1.9.3, issued October 6, 2005. ICBC provided a report entitled Decision Request for a Change to the Road Improvement Program Investment Criteria which explained the change in the investment criteria.

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2007.1 RR IBC.59.2 Reference: Exhibit B-1-2, Chapter 10, Road Safety, C. Engineering, p.10-2, paragraph 8

What other criteria—other than the rate of return—are used to determine the number of eligible projects?

Response:

There are two other factors used to determine ICBC's investment in road improvement projects.

The first factor is a guideline that ICBC's contribution is generally limited to \$250,000 for any individual project. Exceptions can be made if a project is determined to have exceptionally high crash prevention potential. This guideline was established to ensure that a large number of high value projects can be completed, rather than limiting investment to a few, expensive projects. This guideline also ensures that ICBC is partnering with many municipalities each year, which helps maintain the priority of road safety in these communities.

In 2004, 2005 and 2006, there were no projects where ICBC's contribution exceeded \$250,000. In 2003, one project exceeded this guideline. ICBC contributed \$300,000 to the City of Surrey for extensive corridor improvements on the Fraser Highway.

The second factor is that ICBC will share the cost of the improvement with the road authority. There are projects where the potential crash prevention benefit exceeds the cost of the improvement; however, ICBC will not contribute the total costs of the project. This maintains the cost-share philosophy of the program, leaving the municipality with responsibility for implementing the improvement.

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2007.1 RR IBC.60.1 Reference: Exhibit B-1-2, Chapter 10, Road Safety, p.10-2, paragraph 8

ICBC in its July 5, 2004 filing established a guideline under which the projects exceeding \$500,000 are required to have a formal business case.

Is the established minimum return on equity mentioned in paragraph 8 applicable to all projects regardless of cost?

Response:

Exhibit B-1-2, Chapter 10, Road Safety, C. Engineering, P.10-2, paragraph 8 refers to ICBC's investment in road improvement projects. The estimated claims cost prevention of each potential project is reviewed and ICBC's investment is limited to an amount that will produce a minimum 50% Internal Rate of Return.

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2007.1 RR IBC.61.1 Reference: Exhibit B-1-2, Chapter 10, Road Safety, p. 10-2, paragraph 8

Please explain the selection process of road improvement projects.

Response:

ICBC's road improvement engineers examine crash data and consult with municipal and Ministry of Transportation engineering staff to identify sites that could potentially benefit from road design improvements. ICBC then reviews potential improvements with staff from the responsible road authority.

Please see the response to information request 2007.1 RR IBC.61.4 for a complete description of project selection and benefit analysis.

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2007.1 RR IBC.61.2 Reference: Exhibit B-1-2, Chapter 10, Road Safety, p. 10-2, paragraph 8

If two or more projects meet the 50% internal rate of return, how does ICBC decide which program to implement?

Response:

The local road improvement authorities are responsible for determining which road improvement projects they will implement. ICBC's role is to help identify opportunities for improvement and to encourage municipalities to implement projects that will improve road safety by offsetting the costs of these projects. There are often occasions where all identified projects cannot be implemented in a single calendar year, mainly due to limited budgets of the road authority. In these cases, ICBC and the road authority would work together to implement the improvement in a subsequent year.

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2007.1 RR IBC.61.3 Reference: Exhibit B-1-2, Chapter 10, Road Safety, p. 10-2, paragraph 8

Please outline how many road improvement projects were proposed to ICBC in 2005 and 2006 that met the internal rate of return, and how many of these projects were chosen. Please briefly outline why these specific projects were chosen to be implemented.

Response:

ICBC does not track the number of road improvement projects that are proposed, only those that are accepted. ICBC's road improvement engineers meet frequently with municipal and Ministry of Transportation staff to share ideas and discuss potential projects, but there is no centralized system for recording these discussions. When the ICBC engineer and the road authority staff identify a promising project, a study is conducted to determine the potential benefit of the project. Please see the response to information request 2007.1 RR IBC.61.4 for a description of this rigorous project.

There were 256 projects implemented in 2005 and 246 projects implemented in 2006. All projects have an estimated benefit that meets the internal rate of return criteria.

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2007.1 RR IBC.61.4 Reference: Exhibit B-1-2, Chapter 10, Road Safety, p. 10-2, paragraph 8

Please explain how ICBC assesses the program impact prior to implementation.

Response:

After a potential road improvement project is identified, ICBC's road improvement engineers assess the potential return and impact of each project by conducting an economic evaluation.

The economic evaluation tasks are:

1. Identify the estimated cost of implementing the improvements. This information is provided by the road authority.
2. Review the historical crash data based on ICBC claims for the most recent three to five year period.
3. The engineer will then determine the collision reduction factor (CRF) associated with the improvement. The CRF is typically based on before-and-after observations of road improvements available in research studies conducted either in B.C. or in other jurisdictions. A summary of the CRFs and the associated service life (two or five years) is included in the response to information request 2005.1 BCUC.75.1.9.3, issued October 6, 2005. The attachment to that information request was the report entitled Decision Request for a Change to the Road Improvement Program Investment Criteria.
4. The CRFs used represent the best estimate of effect and are usually provided in a range of values. For example, the installation of shoulder rumble strips is estimated to reduce 35% to 60% of run-off-road crashes. The road improvement engineers use their engineering judgment to determine the appropriate value to use depending on the site's crash history and the potential for improvement.
5. The road improvement engineers then estimate the potential reduction in the number and severity of collisions. ICBC's investment in the project is limited to an amount that will

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produce an estimated 50% Internal Rate of Return within either two years or five years, depending on the service life of the improvement.

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2007.1 RR IBC.61.5 Reference: Exhibit B-1-2, Chapter 10, Road Safety, p. 10-2, paragraph 8

Please explain what techniques are used to ensure that the program will meet ICBC internal rate of return.

Response:

Please see the response to information request 2007.1 RR IBC.61.4

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2007.1 RR IBC.61.6 Reference: Exhibit B-1-2, Chapter 10, Road Safety, p. 10-2, paragraph 8

Please explain how ICBC manages programs that fail to meet their internal rate of return. Please indicate if any road improvement program implement in 2000-2006 that failed to meet their internal rate of return.

Response:

Exhibit B-1-2, Chapter 10, Road Safety, p. 10-2, paragraph 8 refers to ICBC's investment in the road improvement program. ICBC evaluates the road improvement program to determine if the internal rate of return target has been achieved. The most recent evaluation, completed in December, 2006 can be found in the 2007 Revenue Requirements Application, Exhibit B-1-2, Chapter 10, Appendix 10 B.

In this evaluation, several projects were identified that did not achieve the internal rate of return target. ICBC manages this situation by reviewing projects that did not achieve the investment criteria. This review includes an analysis of site characteristics, traffic pattern changes, and other factors that may have influenced the benefits realized from the road improvement project. ICBC expects to have the current review completed by the end of June, 2007. The results will then be analyzed by ICBC's road improvement engineers to determine changes that could be implemented to improve the impact of the program.

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2007.1 RR IBC.62.1 Reference: Exhibit B-1-2, Chapter 10, Road Safety, D. Education and Awareness, p.10-3 and 10-4

Notwithstanding the fact that a review of ICBC's investment in education and awareness programs is underway, what has been, to date, the process by which ICBC has set targets for individual programs and how it has determined that the said targets were appropriate, how the appropriate level of expenditures on individual programs has been determined?

Response:

On October 11, 2006, ICBC filed a detailed road safety plan that included information for establishing targets for individual Road Safety programs and the budgets for these programs. The Commission Panel, in its December 19, 2006 letter (Letter L-82-06), requested additional information.

In a letter to the Commission dated February 22, 2007, ICBC submitted a proposal as to further information to be filed with its 2007 Revenue Requirements Application. This proposal was accepted by the Commission in Letter L-13-07 dated March 1, 2007. In accordance with this proposal, ICBC's 2007 Revenue Requirements Application included information on a planned review of ICBC's education and awareness programs, the 2005 Annual Report from the Ministry of Public Safety and Solicitor General required by the Traffic and Road Safety Law Enforcement Funding Memorandum of Understanding and the recently completed road improvement program evaluation.

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2007.1 RR IBC.63.1 Reference: Exhibit B-1-2, Chapter 10, Road Safety, p. 10-3, paragraph 12-16

Please explain the methodology used currently by ICBC to assess the success of educational and awareness programs.

Response:

Please see Exhibit B-1-2, Chapter 10, Appendix 10 D for a description of the methodology used to assess the impacts of ICBC's education and awareness programs.

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2007.1 RR IBC.63.2 Reference: Exhibit B-1-2, Chapter 10, Road Safety, p. 10-3, paragraph 12-16

Does ICBC currently use a zero based budgeting technique in selecting which educational and awareness programs to implement. If no, please explain why that is the case.

Response:

ICBC did not engage in a separate zero based budgeting process for its road safety educational and awareness programs, although each program area was reviewed to determine the specific tactics that would be supported in 2007. Please see the response to information request 2007.1 RR IBC.55.1 for a description of the 2007 strategies and tactics.

All divisions participated in a 2007 operating expense budget development and approval process. Please see the response to information request 2007.1 RR BCUC.47.2 for a description of this process.

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2007.1 RR IBC.64.1 Reference: Exhibit B-1-2, Appendix 10 B – Road Improvement 2006 Evaluation, p. ES-7

Please provide a more comprehensive rationale for the use of a 5 year rather than a 2 year evaluation period.

Response:

Please see the response to information request 2005.1 BCUC.75.1.9.3, issued October 6, 2005.

The report entitled Decision Request for a Change to the Road Improvement Program Investment Criteria includes a list of countermeasures and whether they are classified as producing a two year crash prevention benefit or a five year crash prevention benefit.

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2007.1 RR IBC.65.1 Reference: Exhibit B-1-2, Appendix 10 B – Road Improvement 2006 Evaluation, p. 4

ICBC states "each project is examined to determine the potential safety benefits before ICBC enters into a partnership with the authority that has jurisdiction over that roadway."

Please provide more detail regarding project examination.

Response:

Please see the response to information request 2007.1 RR IBC.61.4.

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2007.1 RR IBC.65.2 Reference: Exhibit B-1-2, Appendix 10 B – Road Improvement 2006 Evaluation, p. 4

ICBC states "each project is examined to determine the potential safety benefits before ICBC enters into a partnership with the authority that has jurisdiction over that roadway."

Please submit a copy of such examination.

Response:

Please see ICBC's July 2004 Application, Chapter 2, Appendix 2C for a sample of a road improvement project study.

A recent study is attached as Attachment A – Traffic Safety Review – Montroyal Boulevard and Prospect Avenue.



2007.1 RR IBC.65.2 – Attachment A – Traffic Safety Review; Montroyal Boulevard and Prospect Avenue; District Of North Vancouver, British Columbia

DISTRICT OF NORTH VANCOUVER
INSURANCE CORPORATION OF BRITISH COLUMBIA

TRAFFIC SAFETY REVIEW

**MONTROYAL BOULEVARD
AND PROSPECT AVENUE**

**DISTRICT OF NORTH
VANCOUVER, BRITISH
COLUMBIA**



DISTRICT OF NORTH VANCOUVER
INSURANCE CORPORATION OF BRITISH COLUMBIA

MONTROYAL BOULEVARD AND PROSPECT AVENUE

DISTRICT OF NORTH VANCOUVER, BRITISH COLUMBIA

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December 2006

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EXECUTIVE SUMMARY

Background

The intersection of Prospect Avenue and Montroyal Boulevard is an all-way STOP-controlled four-legged intersection in the north central area of the municipality. Due to recent collisions, the Insurance Corporation of British Columbia and the District of North Vancouver have expressed safety-related concerns for the Montroyal Boulevard and Prospect Avenue intersection.

The intersection is also part of a small transit loop for four bus routes operated by the Coast Mountain Bus Company (CMBC). The transit loop allows northbound buses on Lonsdale Avenue to turn around via Rockland Road, Prospect Road and Balmoral Road, and re-enter Lonsdale Avenue going southbound. A time transfer focal point (TTFP) for these routes is located on Prospect Road just south of the intersection with Montroyal Boulevard. Residents near the TTFP have expressed the undesirability of buses stopping at the TTFP.

ICBC and the District of North Vancouver have therefore initiated this traffic safety review to identify potential interim and long-term road safety improvements that can enhance the safety of the intersection, and an operation review for the transit loop to answer residents' questions concerning possible relocation of the TTFP.

Identified Safety and Bus Operational Issues

Based on the physical, traffic, collision, and on-site observation characteristics, the safety issues at the intersection were identified, and are shown in FIGURE ES-1.

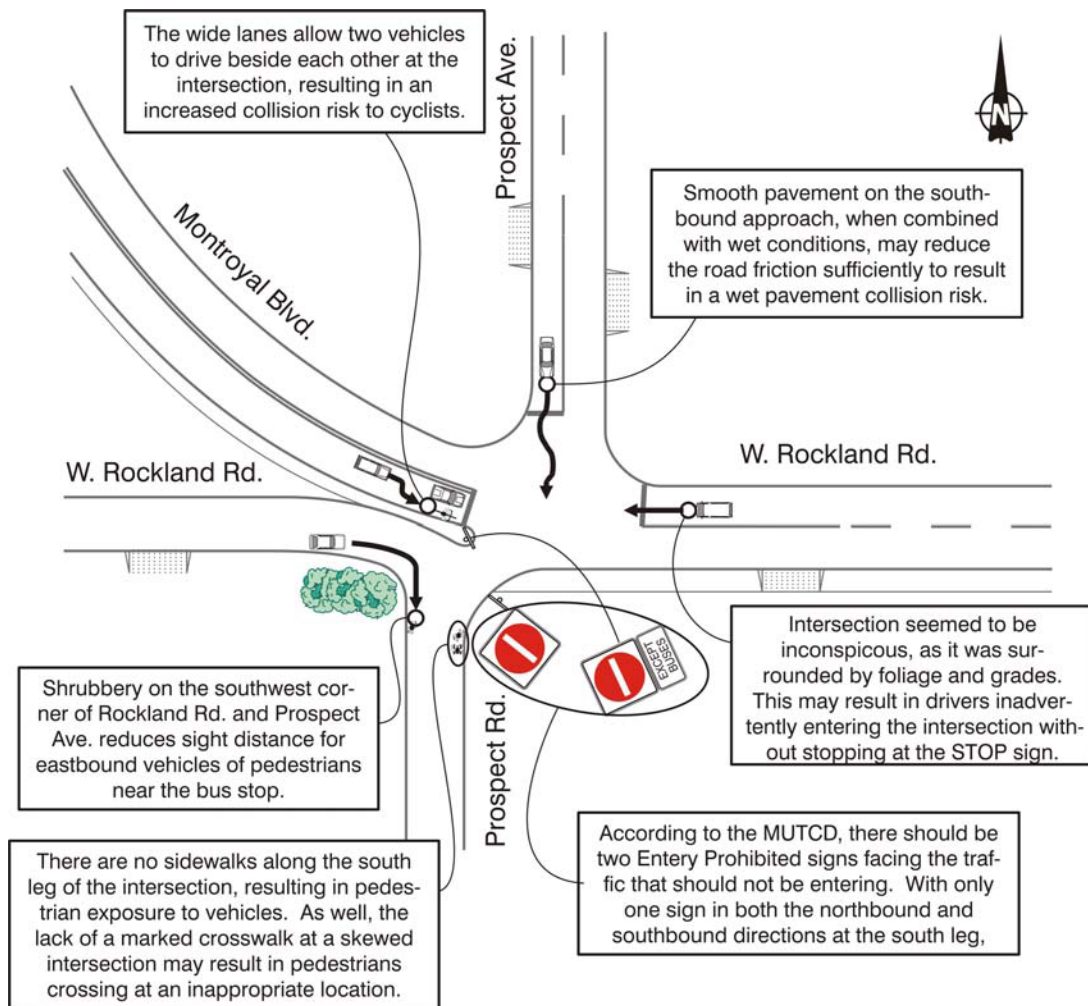


FIGURE ES-1 IDENTIFIED SAFETY ISSUES

It was also found that transit service is generally to be avoided on Local roads; under current principles of roadway classification, transit operations would be better suited to Collector and Arterial roads and away from Prospect Road (as well as Balmoral Road, also part of the transit loop).

Mitigating Measures

The potential safety-related mitigating measures are shown in FIGURE ES-2.

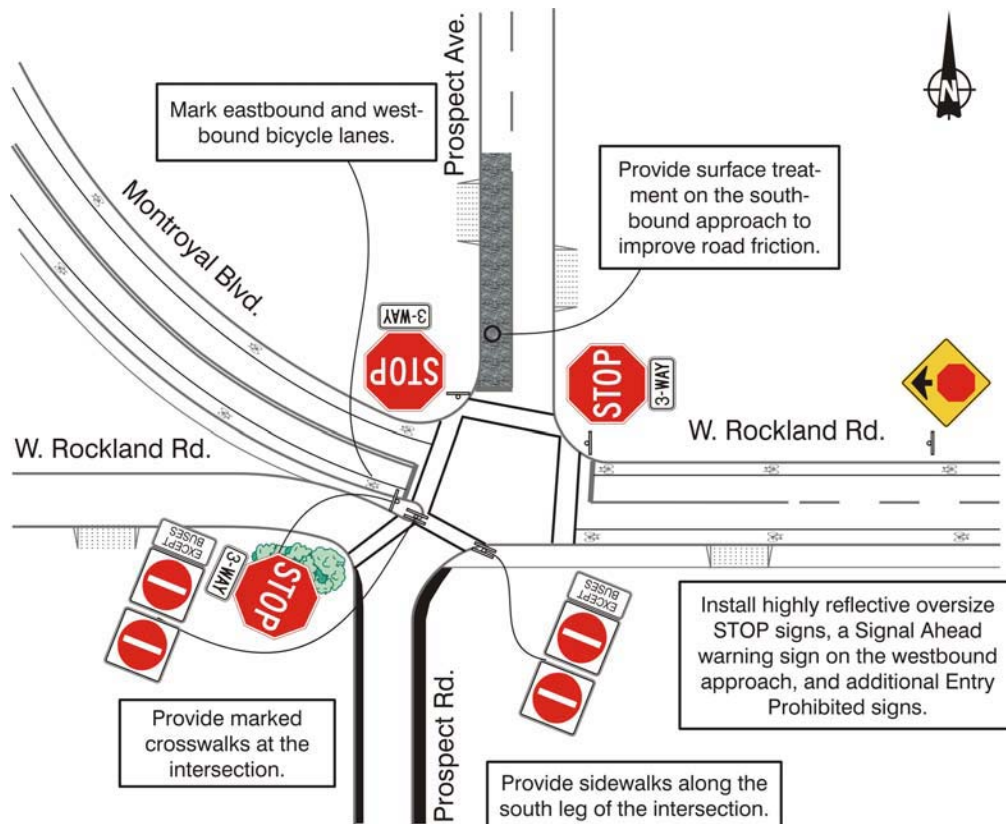


FIGURE ES-2 POTENTIAL SAFETY-RELATED MITIGATING MEASURES

Two plans are also suggested with the bus routing:

Relocate the TTFP. As a short-term measure, the District and CMBC may consider retaining the existing Prospect Road transit loop and bus stop, while moving the TTFP, where buses idle as drivers wait to start their scheduled southbound route, to a less sensitive bus stop. A candidate location for the TTFP within the District may be bus stops on Lonsdale Avenue between 29th Street and Kings Road, where adjacent land uses are zoned for commercial use.

Re-route Transit Buses to Avoid Local Road. In the longer term, while the historical presence of the transit loop and TTFP on Prospect and Balmoral Roads is acknowledged, current principles of road and network design and operation, which are based on distinct service functions for different roadway classifications, do not support transit operations on Local roads.

A summary of potential ICBC investment is shown in TABLE ES-1. Based on the findings of this report, ICBC may consider investing up to \$7,800 towards mitigating measures with the current intersection and road network, with expected annual collision cost savings of up to \$9,100. With continued cooperation between the District and ICBC, the study location can be made safer and more desirable for all road users.

TABLE ES-1 POTENTIAL ICBC INVESTMENT

MITIGATING MEASURES	COST	PROJECT LIFE	ANNUAL SAVINGS	POTENTIAL ICBC INVESTMENT
Improve Roadway Friction for North Leg	\$30,000	5	\$2,600	\$1,500
Provision of Proper Entry Prohibited Signs	\$2,000	2	n/a	n/a
Provision of Marked Crosswalks	\$2,000	2	\$300	\$300
Provision of sidewalks along the south leg	\$20,000	5	n/a	n/a
Greater Intersection Conspicuity with Oversize STOP signs, warning sign	\$6,000	2	\$6,200	6,000
Eastbound and Westbound Bicycle Lanes	\$10,000	5	n/a	n/a
TOTAL	\$70,000	n/a	\$9,100	\$7,800

1.0 INTRODUCTION

1.1 Background

The intersection of Prospect Avenue and Montroyal Boulevard is an all-way STOP-controlled four-legged intersection in the north central area of the municipality. Due to recent collisions, the Insurance Corporation of British Columbia and the District of North Vancouver have expressed safety-related concerns for the Montroyal Boulevard and Prospect Avenue intersection.

The intersection is also part of a small transit loop for four bus routes operated by the Coast Mountain Bus Company (CMBC). The transit loop allows northbound buses on Lonsdale Avenue to turn around via Rockland Road, Prospect Road and Balmoral Road, and re-enter Lonsdale Avenue going southbound. A time transfer focal point (TTFP) for these routes is located on Prospect Road just south of the intersection with Montroyal Boulevard. Residents near the TTFP have expressed the undesirability of buses stopping at the TTFP.

ICBC and the District of North Vancouver have therefore initiated this traffic safety review to identify potential interim and long-term road safety improvements that can enhance the safety of the intersection, and an operation review for the transit loop to answer residents' questions concerning possible relocation of the TTFP.

1.2 Study Objectives

The objectives of this study are:

- Identifying any existing traffic safety, operational, and bus route concerns;
- Developing potential bus routing and TTFP relocation options;
- Developing and evaluating mitigation measures that will reduce the risk of collisions and improve traffic efficiency; and,
- Determining the potential for funding of the favourable mitigation measures from the ICBC Road Improvement Program.

1.3 Study Location

The intersection is located in the north central area of the District of North Vancouver to the north of Highway 1 and one block west of Lonsdale Avenue. The land use around the intersection is mainly residential. The south leg of the intersection (Prospect Road) has a transit stop that is considered a TTFP where buses can layover. The intersection location is shown in FIGURE 1.1.

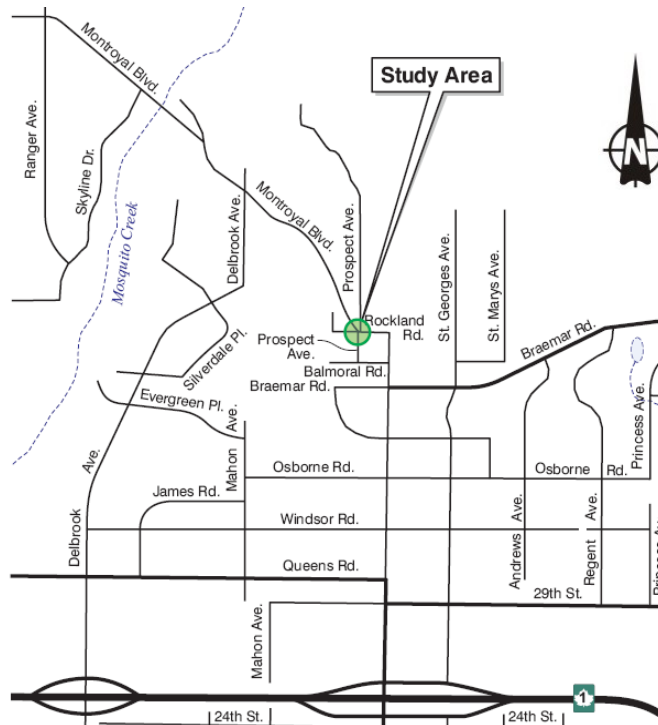


FIGURE 1.1 SITE LOCATION

1.4 Method

The following tasks were completed in this study:

1. Review of the physical characteristics at the study corridor;
2. Review and analysis of traffic characteristics, bus routing, and operations;
3. Review and analysis of collision claims data;
4. Identification of potential bus routing and TTFP relocation options;
5. Identification of safety issues and potential mitigation measures; and,
6. Estimate of potential level of ICBC investment based on recognized Road Improvement Program evaluation criteria.

2.0 INTERSECTION FEATURES

2.1 Physical Characteristics

The intersection layout is shown in FIGURE 2.1, and is summarized as follows:

- Montroyal Boulevard is a minor arterial that generally runs east-west and connects to Lonsdale Avenue one block to the east. The north leg of Prospect Avenue is a collector road and the south leg (called Prospect Road) is a limited-access local road for southbound transit vehicles only.
- The east leg of Montroyal Boulevard becomes Rockland Road. Parallel to the east leg of Montroyal Boulevard, there is a local road named Rockland Road located to the southwest of the intersection.
- The west approach is curved, and the north and south approaches have a gradient of about 7 percent (downhill in the southbound direction). The pavement appears to be worn and smooth (shown in FIGURE 2.2), and may have less than expected friction during wet pavement conditions.
- Sidewalks are provided on the south side of Montroyal Boulevard and on the west side of Prospect Avenue. There are no marked crosswalks at the intersection. The lack of pedestrian crossing guidance may result in pedestrians crossing within the intersection due to the unusual intersection layout.
- Montroyal Boulevard has one wide lane of about 5.0 metres in each direction and is part of the City's bikeway network.
- There is a guardrail fence on the south side of Montroyal Boulevard up to the intersection to protect pedestrians from the difference in level between Montroyal Boulevard and Rockland Road.
- There is a STOP-ahead sign on the eastbound direction.
- There is one Entry Prohibited sign facing south located at the south-east corner of the intersection and one No-Entry Except Buses sign facing north-west at the south-west corner of the intersection, all with a diameter of 600 millimetres. The sign layout (shown in FIGURE 2.3) is inconsistent with the Manual of Uniform Traffic Control Devices for Canada (MUTCDC), which recommends signs on the far corners facing oncoming traffic.
- All STOP signs are reflective signs of 600 millimetres. The southbound approach sign also has a reflective stand.
- On-street parking is generally permitted on the north, south, and east legs, except at the bus stop on the south leg.

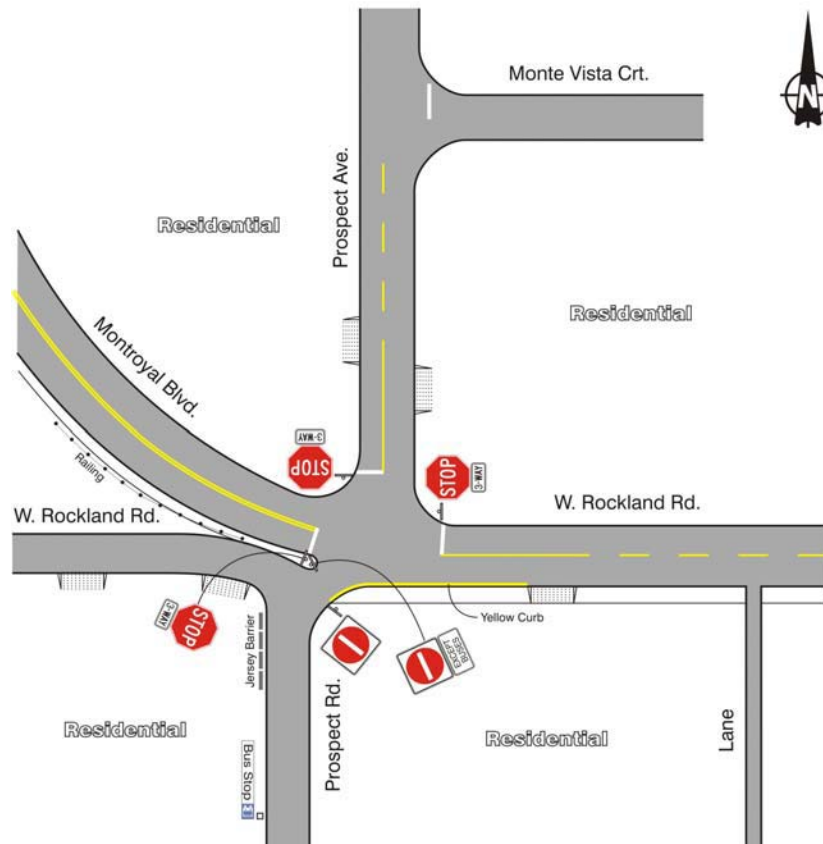


FIGURE 2.1 INTERSECTION LAYOUT



FIGURE 2.2 SMOOTH PAVEMENT ON NORTH LEG



FIGURE 2.3 SOUTH LEG SIGN LAYOUT

2.2 Traffic and Pedestrian Characteristics

The average two-way 24-hour volumes along Montroyal Boulevard for an entire week in January 2004 were provided by the District. The volumes are summarized in FIGURES 2.4 and 2.5, and indicate the following:

- The two-way vehicle volumes along Montroyal Boulevard are highest during the Saturday afternoon peak period with about 400 vehicles per hour.
- The one-way volumes are generally highest during the morning and afternoon peak periods with 150 to 200 vehicles per hour.
- On weekdays the eastbound volume is highest during the morning peak period, while the westbound is highest during the afternoon peak period. On Saturday, the eastbound and westbound volumes were generally similar between the morning and afternoon peak periods.

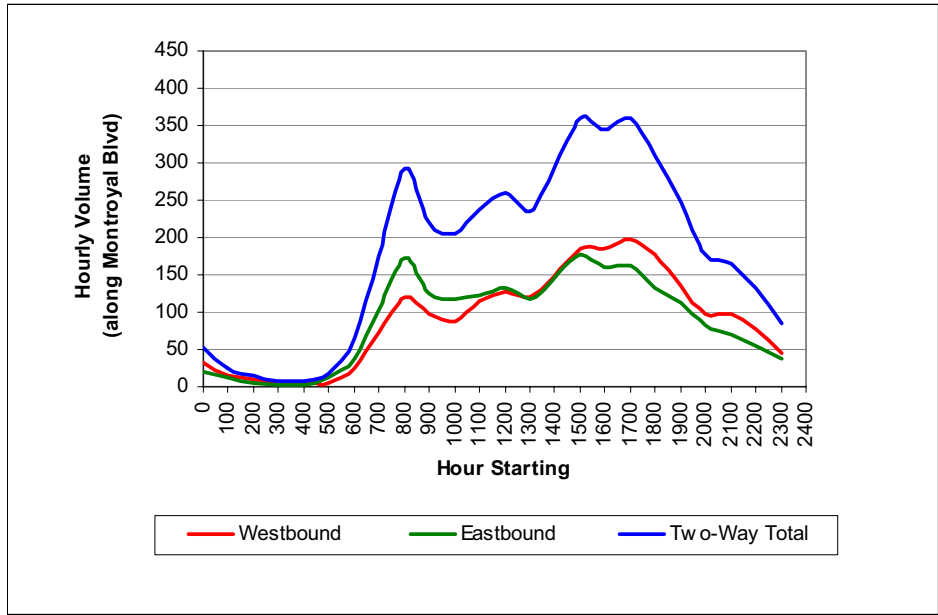


FIGURE 2.4 AVERAGE WEEKDAY 24-HOUR TWO-WAY VEHICLE VOLUMES ALONG MONTROYAL BOULEVARD
(West of intersection. January 22nd to 28th, 2004)

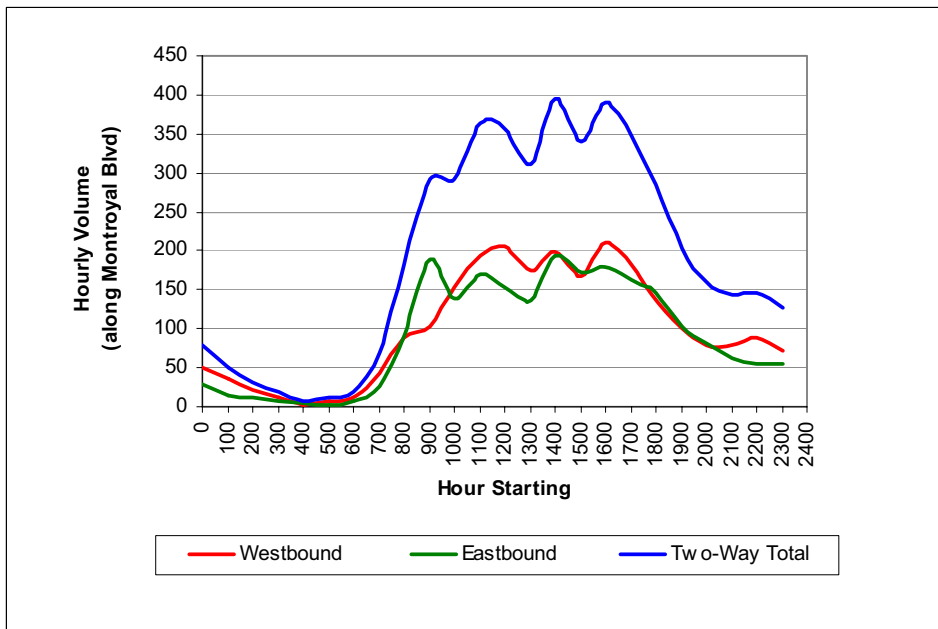


FIGURE 2.5 SATURDAY 24-HOUR TWO-WAY VEHICLE VOLUMES ALONG MONTROYAL BOULEVARD
(West of intersection. January 24th, 2004)

2.3 Collision Characteristics

Five years of collision data between January 2001 and December 2005 were obtained from ICBC and reviewed. A total of seven collisions occurred at the intersection, and are shown spatially in FIGURE 2.7, with a detailed description of each one in TABLE 2.1.

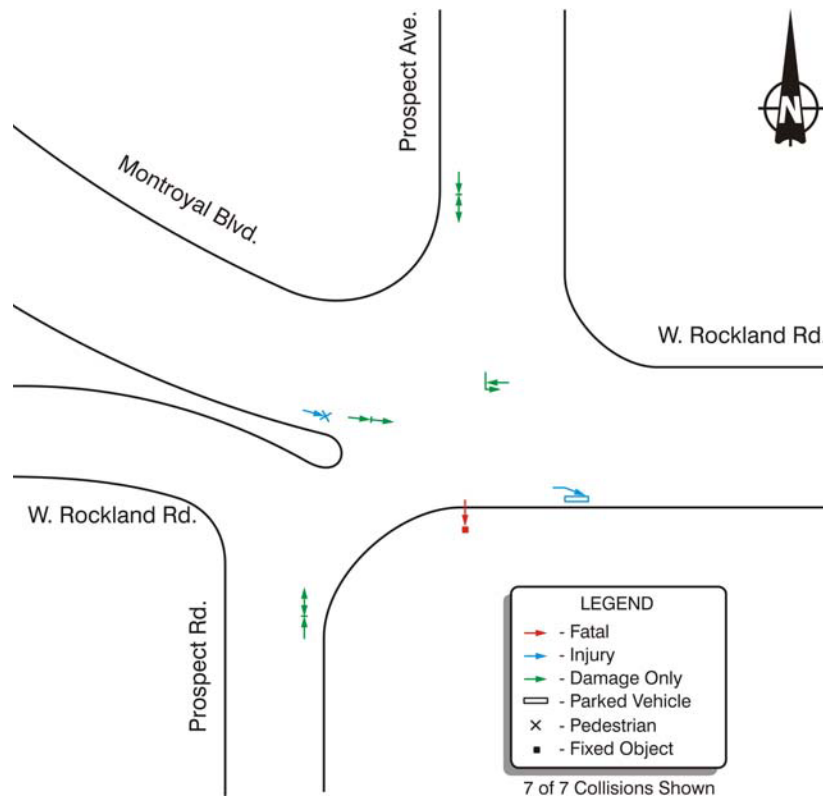


FIGURE 2.7 SPATIAL AND COLLISION TYPE DISTRIBUTION

TABLE 2.1 COLLISION DETAILS

COLLISION TYPE	DATE	HOUR ENDING	SEVERITY
Reverse	April 12, 2002	900	Property Damage Only
Parked Car/Side	August 26, 2002	1000	Injury
Reverse	April 14, 2003	1830	Property Damage Only
Rear-End	February 13, 2004	1400	Property Damage Only
Fixed Object	June 6, 2004	245	Fatal
Pedestrian	October 15, 2004	820	Injury
Left-Turn Opposing	March 31, 2005	1830	Property Damage Only





The collision findings are as follows:

- The fatal collision involved a southbound driver coming downhill from Prospect Ave. through Montroyal Boulevard at about 2:45 AM and colliding with a house on the south-east side of the intersection. According to collision accounts from the RCMP, the driver was likely intoxicated and that engineering was not a contributing cause of the collision.
- The pedestrian collision occurred on the west leg of the intersection by a car that had stopped at the STOP sign and continued through.
- One of the collisions was caused by a driver asking for directions. The driver was on the south leg traveling northbound asked for directions and reversed into a vehicle.
- Because of the low number of collisions, no statistically significant trends were found.

2.4 On-Site Observations

A human factors observation was performed on-site on May 11, 2006 throughout the day. This was performed through numerous drive-throughs on all approaches and with on-site observations of physical and traffic characteristics, as well as any observed evasive manoeuvres or near-collisions. The findings are documented below in TABLE 2.2.

TABLE 2.2 ON-SITE OBSERVATIONS

<p>Pedestrians walking between the intersection and the bus stop were observed to walk on the street pavement, as sidewalks are not provided on the south leg. This potentially places pedestrians in the path of vehicles using this leg of the intersection.</p>	
<p>As mentioned, Prospect Boulevard and Rockland Road is part of the District's bicycle network, and cyclists were observed to use the route. However, it was also observed that drivers sometimes use the approach as if it were two travel lanes. The lane widths of approximately 5.0 metres are wide enough to allow two vehicles to travel alongside one another and potentially conflict with cyclists.</p>	
<p>The sightlines for vehicles along Rockland Road west of the intersection is poor, especially for pedestrians around corner that may be on the road or have just unloaded off a bus at the bus stop.</p>	
<p>The intersection sight distance for an eastbound vehicle as one approaches the intersection is approximately 100 metres, and is restricted by the landscaped slope on the north side of Prospect Boulevard. This is just within the calculated required sight distance of 98 metres, with an assumed vehicle speed of 50 kilometres per hour. The intersection also appears to be inconspicuous with the amount of foliage surrounding the intersection.</p>	

2.5 Identified Safety Issues

Based on the physical, traffic, collision, and on-site observation characteristics, the safety issues at the intersection were identified, and are shown in FIGURE 2.8.

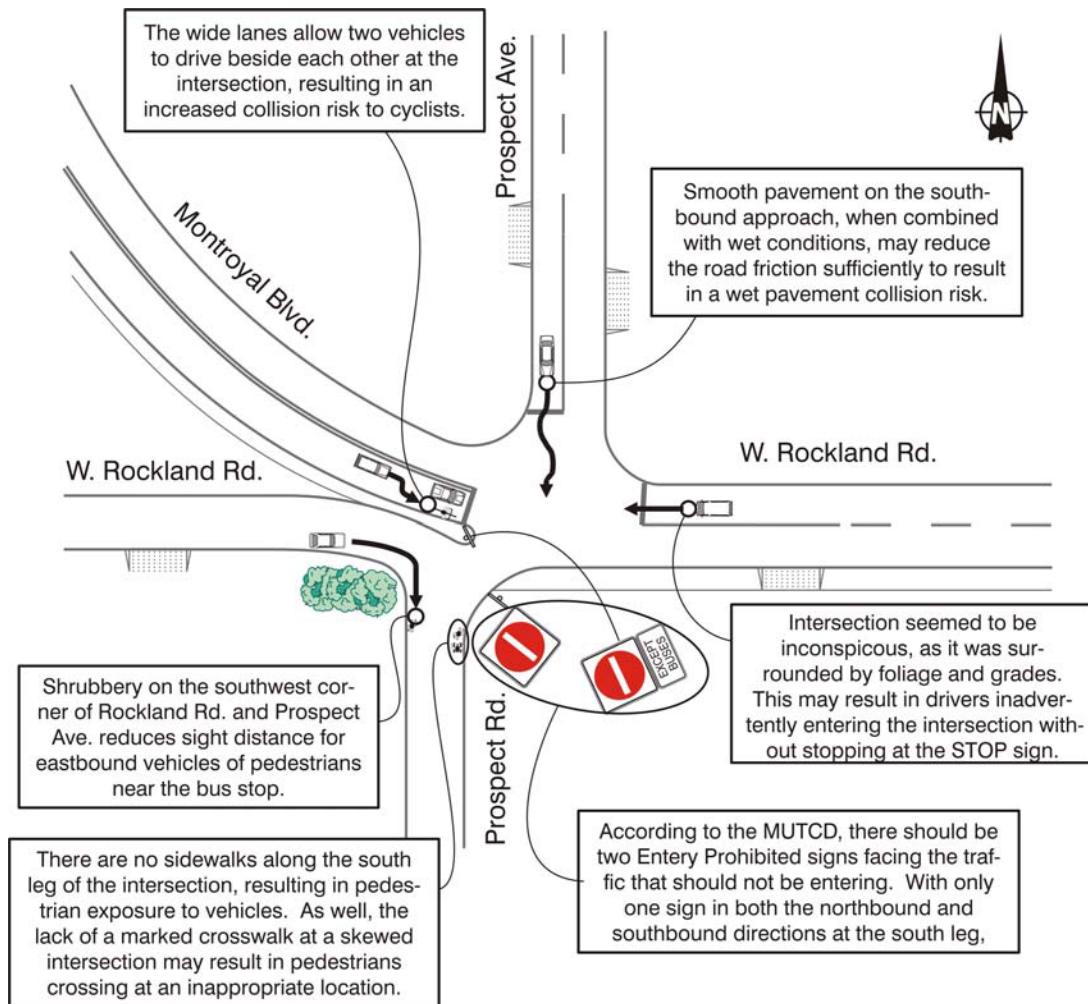


FIGURE 2.8 IDENTIFIED SAFETY ISSUES

3.0 BUS STOP AND ROUTING ANALYSIS

3.1 Current Conditions

CMBC currently operates four bus routes – the #230, #241, #242, and #N24 -- that pass through the study intersection. The intersection is part of a small transit loop that allows northbound buses on Lonsdale Avenue to turn around via Rockland Road, Prospect Road, and Balmoral Road, and re-enter Lonsdale Avenue going southbound. A TTFP for these routes is located on Prospect Road just south of the intersection with Montroyal Boulevard. The CMBC estimates that buses on the #230 route have a typical layover time of about 2 minutes at this TTFP, and buses on the #241 route typically have longer but more variable layover times. The CMBC also notes that buses have been using this TTFP since at least 1963, when bus routes existing at the time terminated at the intersection.

Residents near the TTFP have expressed concern relating to buses stopping at the TTFP. To answer residents' questions concerning possible relocation of this TTFP, this study examines operations of the existing transit loop and to see if an alternative loop routing is considered desirable and feasible. Opus Hamilton has met with representatives from CMBC and the District to discuss measures to improve and/or relocate transit operations at the TTFP. Based on their comments, as well as on-site analysis, the findings are as follows:

A. Transit Operations on Local Roads

The transit loop involving Rockland Road, Prospect Road, and Balmoral Road directs buses along two designated Local roads (Prospect Road and Balmoral Road). In the road classification hierarchy, Local roads are primarily intended to provide access to local properties, rather than to accommodate mobility for through traffic. The Geometric Design Guide for Canadian Roads specifically notes that transit service is generally to be avoided on Local roads; the Geometric Design Guide notes that transit service is permitted on roads in the next two higher roadway classifications, Collectors and Arterials. Thus, although buses have been operating on these Local roads since 1963, under current principles of roadway classification, transit operations would be better suited to Collector and Arterial roads.

B. CMBC Concerns

In previous e-mail correspondence with District staff, the CMBC has noted that it prefers to retain the existing transit loop and TTFP to maintain service coverage while minimizing new neighbourhood disruption. The CMBC has stated that a change to the #230 route to redirect it along Montroyal Boulevard to Cleveland Dam is the only viable alternative to the existing Prospect Road loop and TTFP. CMBC notes that this change would result in undesirable over-servicing of the Montroyal area, which is identified as an area of limited future growth, while reducing service reliability on the Lonsdale corridor, which is identified as a growth area. In addition, CMBC notes that this change would result in significant operating cost increases, expose the route operation to severe-weather detours, and shift possible impacts to new neighbourhoods, rather than resolving these impacts. The CMBC concludes that the existing TTFP on Prospect Road is the best available terminus location for transit routes in this area.

3.2 Identified Transit Loop and TTFP Issues

The transit operator currently uses the Prospect Road transit loop to allow northbound buses to turn around at the top of Lonsdale Avenue, and to maintain reliable transit schedules by using the Prospect Avenue bus stop as a TTFP. Prospect Road has been used for these purposes for over 40 years, and substantial changes to bus routing in this area are expected by the transit operator to result in increased costs and reduced customer service. However, local residents have expressed concerns over idling buses at the TTFP. In addition, as a designated Local road, Prospect Road (as well as Balmoral Road, also part of the transit loop) is not suitable for transit operations.

4.0 MITIGATING MEASURES

4.1 Measures for Safety Issues

Based on the identified safety issues, mitigating measures were developed. The potential mitigating measures are summarized below.

A. Improve Roadway Friction for North Leg

To address the potential for slippery pavement surfaces during wet conditions for southbound approaching vehicles, it is suggested that pavement treatment to increase surface friction be considered. This may be in the form of pavement grooving, surface overlay, or porous pavement type. By improving the friction, the likelihood of a southbound vehicle slipping on a wet road surface and sliding uncontrollably into the intersection will be reduced. However the following are noted:

- While there is the collision risk due to the lack of pavement friction, none of the reviewed collisions were caused by wet and slippery pavement.
- Due to the geography of the study location, where snow and subsequent ploughing is more commonplace than other locations in the Lower Mainland, the maintenance costs of any pavement treatment may be higher.

While from a safety standpoint, the pavement treatment is recommended, it is also acknowledged that the ICBC contribution will be limited (as discussed in Chapter 5.0) and that the maintenance costs will likely be high.

B. Provision of Proper Entry Prohibited Signs

To further improve the signage notifying drivers that the south leg should not be used other than by westbound buses making a left-turn, it is suggested that additional Entry Prohibited signs be installed. According to the MUTCDC, there should be two signs on the far corners facing oncoming traffic. There should therefore be two back-to-back signs on both the southeast and southwest corners facing northward and southward traffic.

Tabs with the text “EXCEPT BUSES” should accompany the northward facing signs to allow TransLink buses to turn into Prospect Road. With the provision of these signs, the likelihood of motorists erroneously using the south leg of the intersection would be less.

C. Provision of Pedestrian Facilities

Pedestrians might cross within the intersection due to the unusual intersection layout and lack of marked crosswalks. For example, should pedestrians walk along the west sidewalk on the north leg of the intersection and straight through the intersection, they would actually enter the intersection. The proper crossing path is at an angle to the southwest corner. The provision of marked crosswalks across all intersection legs (as well as at the Rockland Road and Prospect Road intersection southwest of the main intersection, which would address the sight distance issue at this location) would clarify the desired pedestrian path and reduce the collision risk for the pedestrians.

It is also suggested that a sidewalk be provided along both sides of Prospect Road, as pedestrians are currently walking on the roadway. By providing the sidewalks, the pedestrian exposure to vehicular traffic and the collision risk will be reduced.

D. Greater Intersection Conspicuity

To increase the intersection conspicuity, the following are suggested:

- Provide highly reflective oversize STOP signs (750 millimetre diameter) for the eastbound, westbound, and southbound approaches; and
- Install a STOP AHEAD warning sign for the westbound approach.

The provision of these signs will increase the awareness of drivers that they are approaching an intersection. This will thereby reduce the likelihood of a vehicle entering the intersection without stopping, and diminish the risk of crossing, left-turn crossing, and left-turn opposing collisions. The risk of unexpected and sudden braking, and thus rear-end collisions will also be reduced.

E. Provision of Eastbound and Westbound Bicycle Lanes

To reduce the likelihood of vehicles treating the eastbound and westbound approaches as two operating lanes, and to further establish the bikeway network, it is suggested that a bicycle lane be marked adjacent to the curbs. Based on the Geometric Design Guide, a bicycle lane should be at least 1.5 metres wide, which can be accommodated within the current 5.0 metre-wide lane while providing adequate vehicle width. The bicycle lane also explicitly demarks the bicycle path from the vehicle paths, further reducing the bicycle collision risk.

Local roads are typically used for access to adjacent properties, and consequently have geometric and operational characteristics that meet this function. Specifically, Prospect Road has a steep gradient, closely-spaced residential driveways, and no sidewalk, characteristics that render it suitable for local access but less suitable for transit operations. Transit operations are better suited to the operational and geometric characteristics of Collector and Arterial roads, where road geometry is less challenging and appropriate pedestrian facilities are provided.

The potential safety-related mitigating measures are shown in FIGURE 4.1.

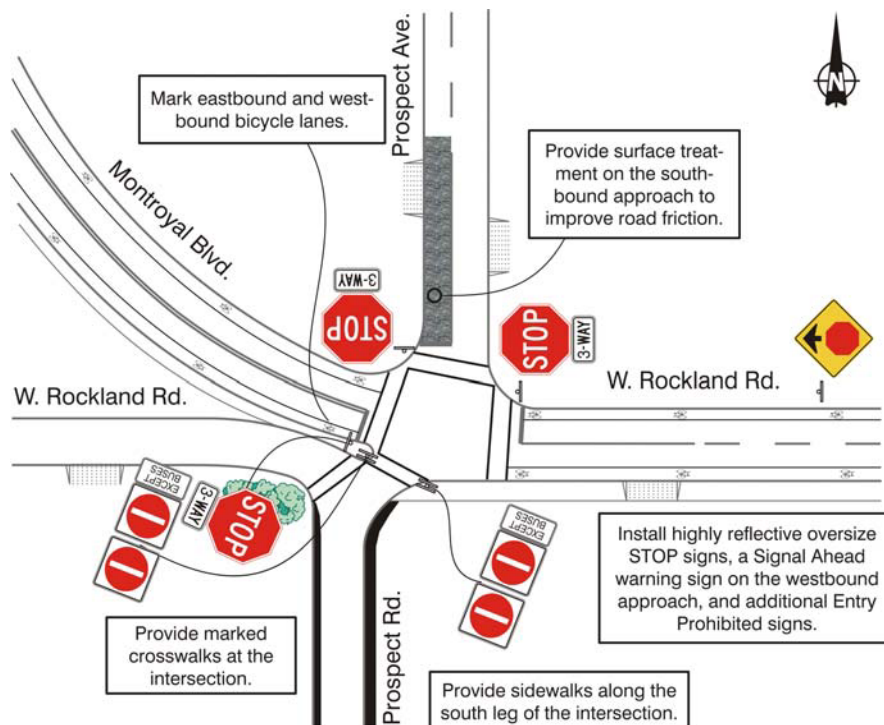


FIGURE 4.1 POTENTIAL SAFETY-RELATED MITIGATING MEASURES

4.2 Measures for Transit Loop and TTFP Issues

To reconcile the interests of the transit operator and affected residents on Prospect Road, the following measures may be considered.

A. Relocate TTFP

As a short-term measure, the District and CMBC may consider retaining the existing Prospect Road transit loop and bus stop, while moving the TTFP, where buses idle as drivers wait to start their scheduled southbound route, to a less sensitive bus stop. A candidate location for the TTFP within the District may be bus stops on Lonsdale Avenue between 29th Street and Kings Road, where adjacent land uses are zoned for commercial use.

B. Re-route Transit Buses to Avoid Local Road

In the longer term, while the historical presence of the transit loop and TTFP on Prospect and Balmoral Roads is acknowledged, current principles of road and network design and operation, which are based on distinct service functions for different roadway classifications, do not support transit operations on Local roads.

5.0 ECONOMIC EVALUATION AND CONCLUSION

5.1 Cost Estimates and Expected Collision Reduction Factors

ICBC has indicated that funding may be available through the Road Improvement Program if favourable investment opportunities exist to reduce the number of motor vehicle collisions and the associated claims costs. An economic evaluation of the proposed mitigating measures in Section 4.0 was conducted according to the methods described in the in the report titled Update to the Economic Evaluation Method for Road Improvement Investments (Opus Hamilton for ICBC, 1997) and ICBC's memorandum New Funding Criteria for Road Improvement Projects (August 2005). The investment criteria require that ICBC investments in projects be based on achieving a minimum of 50 percent Internal Rate of Return over either a two-year or five-year post-implementation period.

Collision reduction factors for the suggested safety-related mitigating measures are shown in TABLE 5.1. A summary of potential ICBC investment is shown in TABLE 5.2. It is noted that the following mitigating measures did not have any documented collisions or collision reduction factors attributed to it, and were therefore excluded from the analysis:

- Provide sidewalk on the south leg of the intersection;
- Provide east-west bicycle lanes; and,
- Install additional Entry Prohibited signs.

As well, for the purposes of determining the maximum potential funding for surface friction treatment along the southbound approach to the intersection, it was assumed that the fatal collision could have been mitigated.

Based on the findings of this report, ICBC may consider investing up to \$7,800 towards mitigating measures with the current intersection and road network, with expected annual collision cost savings of up to \$9,100.

TABLE 5.1 COLLISION REDUCTION FACTORS

MITIGATING MEASURES	COLLISION TYPE REDUCED	COLLISION REDUCTION FACTORS		
		Low Estimate	Most Likely	High Estimate
Improve Roadway Friction for North Leg	All collisions involving southbound vehicles entering the intersection	5%	8%	11%
Provision of Proper Entry Prohibited Signs	All collisions involving relevant illegal movements	10%	15%	20%
Provision of Marked Crosswalks	All pedestrian collisions at the intersection	5%	8%	11%
Provision of sidewalks along the south leg	Pedestrian collisions on the south leg	65%	70%	75%
Greater Intersection Conspicuity with Oversize STOP signs, warning sign	Crossing, left-turn crossing, left-turn opposing, rear-end collisions in the intersection	10%	15%	20%
Eastbound and Westbound Bicycle Lanes	Eastbound and westbound bicycle collisions	25%	30%	35%

TABLE 5.2 POTENTIAL ICBC INVESTMENT

MITIGATING MEASURES	COST	PROJECT LIFE	ANNUAL SAVINGS	POTENTIAL ICBC INVESTMENT
Improve Roadway Friction for North Leg	\$30,000	5	\$2,600	\$1,500
Provision of Proper Entry Prohibited Signs	\$2,000	2	n/a	n/a
Provision of Marked Crosswalks	\$2,000	2	\$300	\$300
Provision of sidewalks along the south leg	\$20,000	5	n/a	n/a
Greater Intersection Conspicuity with Oversize STOP signs, warning sign	\$6,000	2	\$6,200	6,000
Eastbound and Westbound Bicycle Lanes	\$10,000	5	n/a	n/a
TOTAL	\$70,000	n/a	\$9,100	\$7,800

5.2 Overview

Based on the findings of this study, ICBC may consider investing up to \$7,800. The District may consider various safety-related mitigating measures that total \$70,000. The District may also work with the Coast Mountain Bus Company to consider moving the time transfer focal point to Lonsdale Avenue between 29th Street and Kings Road in the short term, and consider re-routing buses away from Prospect Road in the long term. With continued cooperation between the District and ICBC, the study location can be made safer and more desirable for all road users.

OPUS HAMILTON

- Traffic Operations
- Transportation Planning
- Road Safety Engineering
- Transit and Sustainability
- Asset Management
- Project Management

Insurance Bureau of Canada Information Request No. 2007.1 RR IBC.66.1 Dated 04 May 2007 Insurance Corporation of British Columbia Response Issued 01 June 2007	Page 1 of 2
16 March 2007 Insurance Corporation of British Columbia 2007 Revenue Requirements Application and Filings	

2007.1 RR IBC.66.1 Reference: Exhibit B-1-2, Appendix 10 B – Road Improvement 2006 Evaluation, p. 4

ICBC states that "the 3:1 funding criteria was considered very aggressive investment target, which ultimately reduced the level of ICBC contribution and marginalized ICBC's involvement in some projects."

Please provide the number of projects ICBC has been involved with regarding road improvement from 2003 – 2007.

Response:

ICBC shared the cost of 219 projects in 2003, 258 projects in 2004, 256 projects in 2005 and 246 projects in 2006.

ICBC is not able to provide the number of 2007 projects as ICBC's road improvement engineers are currently discussing project priorities with the Ministry of Transportation and municipal road engineering staff.

Please see the response to information request 2005.1 BCUC.75.1.9.3, Attachment A – Decision Request for a Change to the Road Improvement Program Investment Criteria – for additional information on the change to the investment criteria. Page 2 of this report includes the following comment:

Because most high return, quick win projects have now been completed, the program must evolve to take into consideration the reality of lower returns per investment dollar. ICBC needs to be able to make a meaningful contribution to higher value projects to maintain its leadership role in encouraging Road Authorities to assign high priority to safety-oriented projects. The current investment criterion reduces our ability to invest in projects that provide excellent returns over longer time frames. In order to achieve the dual goals of the program, a careful balance must be reached whereby the Corporation continues to reap excellent financial benefits while still ensuring the focus on safety-related projects is maintained by our partners.

The number of projects supported by the Road Improvement program is not a good measure of whether the change in the investment criteria is producing the desired effect. It is very difficult to assess whether ICBC's goal of maintaining its leadership role is being achieved. One

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indicator is the total costs of the projects, which is the approximate cost borne by the road authority. In 2005, the estimated total cost of the projects which ICBC supported was approximately \$183 million. In 2006, this climbed to \$527 million. This may be an indicator that ICBC is influencing the road authorities to have a strong safety focus in higher value projects.

Insurance Bureau of Canada Information Request No. 2007.1 RR IBC.66.2 Dated 04 May 2007 Insurance Corporation of British Columbia Response Issued 01 June 2007	Page 1 of 1
16 March 2007 Insurance Corporation of British Columbia 2007 Revenue Requirements Application and Filings	

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ICBC states that "the 3:1 funding criteria was considered very aggressive investment target, which ultimately reduced the level of ICBC contribution and marginalized ICBC's involvement in some projects."

Please provide detailed information regarding ICBC's contribution to various road improvement project from 2003 – 2007, and outline what the investment target for each was and whether this investment target was met.

Response:

Please see Attachment A – 2003 Road Improvement Projects, Attachment B – 2004 Road Improvement Projects, Attachment C – 2005 Road Improvement Projects, and Attachment D – 2006 Road Improvement Projects.

These reports provide a list of all road improvement projects and ICBC's financial investment in each project. ICBC conducts an evaluation of its road improvement program every three years. The most recent evaluation, completed in December, 2006, can be found in Exhibit B-1-2, 2007 Revenue Requirements Application, Appendix 10 B.

As described on pages 19 and 20 of this evaluation, not all road improvement projects are evaluated, mainly due to specific data availability and the costs to conduct individual project evaluations. Instead a representative group of projects is selected randomly, and the results of the overall road improvement program are assessed.

ICBC is therefore not able to determine whether the investment criteria for every project was achieved. The evaluation assessed projects completed in 2002, when the criterion was a 2 to 1 return on investment, and 2003, when the criterion was a 3 to 1 return on investment. The evaluation concluded that the overall return on investment was 4.4 to 1, assuming a conservative useful service life of 2 years.



2007.1 RR IBC.66.2 – Attachment A – 2003 Road Improvement Projects

2003 Road Improvement Projects

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
ABBOTSFORD	20035072	Implem - South Fraser Way (left-turn lanes) - Abbotsford	\$10,100.00
ABBOTSFORD	20035073	Implem - McLure Rd & Gladwin Rd (left-turn lane) - Abbotsford	\$14,900.00
ABBOTSFORD	20035074	Implem - McKenzie Rd & Marshall Rd (left-turn lanes) - Abbotsford	\$27,000.00
ABBOTSFORD	20035124	Implem - Marshall Rd/McCallum rd - Abbotsford	\$23,000.00
ABBOTSFORD	20038038	Implem - MoT - Hwy 11 Truck Staging Area - Sumas	\$4,400.00
ALISON PASS	20038072	Implem - MoT - Hwy 3 - Alison Pass	\$30,700.00
BARRIERE	20038034	Implem - MoT - Hwy. 5 near fishtrap canyon - Barriere	\$12,300.00
CAMPBELL RIVER	20035027	Implem - Revised laning 4 intersec. Dogwood St - Campbell River	\$100,000.00
CAMPBELL RIVER	20038053	Implem - MoT - Hwy 19 (Elk Falls to Roberts Lake) - Campbell River	\$43,300.00
CASTLEGAR	20035016	Implem - Columbia Ave. (14th St. to 18th St.) - City of Castlegar	\$25,450.00
CASTLEGAR	20038035	Implem - MoT - Hwy 22 near 24th Street - Castlegar	\$26,900.00
CHETWYND	20038064	Implem - MoT - Hwy 97 (Cairns Creek Corner) - Chetwynd	\$4,000.00
CHILLIWACK	20035067	Implem - Vedder Rd (Keith Wilson Rd to Chilliwack Lake Rd)- Chilliwack	\$31,500.00
CHILLIWACK	20035098	Implem - Lickman @ Hwy 1, Yale & Luckakuck @ Hwy 1 - Chilliwack	\$31,400.00
CHILLIWACK	20035118	Implem - Young Rd & Hocking Rd - Chilliwack	\$20,500.00
CHILLIWACK	20035140	Implem - Directional Signage Vedder Rd - Chilliwack	\$600.00
CHILLIWACK	20035141	Implem - Safety Improve. Vedder Rd (Luckakuck to Thomas) - Chilliwack	\$18,981.00
CHILLIWACK	20035142	Implem - Safety Improve Yale Rd (Hodgins Ave to Airport Rd)-Chilliwack	\$16,496.00
CHILLIWACK	20035147	Implem - Intersection Improvement 1st Ave & Young Rd - Chilliwack	\$5,100.00
CHRISTINA LAKE	20038033	Implem - MoT - Hwy 3 near Hwy 395 intersection - Christina Lake	\$11,200.00
COLWOOD	20035007	Implem - Signal Heads - Wishart & Metchosin Rd	\$4,700.00
COLWOOD	20035160	Implem - Crosswalk - Jacklin Rd & Sunridge Valley Dr. - Colwood	\$12,000.00
COURTENAY	20035152	Implem - Modern Roundabout - Cumberland Rd & Willemar Ave - Courtenay	\$51,500.00
CRANBROOK	20035013	Implem - 4 additional signal heads - Victoria/Kootenay/6th - Cranbrook	\$4,000.00
CRANBROOK	20038041	Implem - MoT - Hwy 3 Moyie Bluffs C & D - Cranbrook	\$13,800.00
CRANBROOK	20038042	Implem - MoT - Hwy 97 Sough Peace Hill - Cranbrook	\$30,100.00
CRESTON	20035014	Implem - Sign Upgrades - Creston	\$3,666.88
CRESTON	20038003	Implem - MoT - Signal Head Upgrad - Creston	\$16,000.00
DAWSON CREEK	20035026	Implem - Sign Upgrade - Dawson Creek	\$23,234.20
DAWSON CREEK	20038074	Implem - MoT - Rumble Strips-Hwy 2 between Dawson Creek & Alta Border	\$26,000.00
DUNCAN	20038052	Implem - MoT - Hwy 1 (Mayes Rd to Jame Rd) - Duncan	\$60,000.00
FERNIE	20038057	Implem - MoT - Hwy 3 near Fernie Ski Hill - Fernie	\$4,800.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
GIBSONS	20038048	Implem - MoT - Hwy 101 & Oceanview Drive - Gibsons	\$7,700.00
HOPE	20035009	Implem - Stop Sign Replacement - Hope	\$5,132.91
HOPE	20035039	Implem - Signal Head Upgrade Wallace & 3rd - Hope	\$3,000.00
HOUSTON	20038066	Implem - MoT - Hwy 16 (Pleasant Valley Bridge) - Houston	\$12,000.00
HOUSTON	20038067	Implem - MoT - Hwy 16 (Silver Thorne Slide) - Houston	\$4,900.00
KAMLOOPS	20035038	Implem - Signal Head Upgrade - Kamloops	\$25,000.00
KAMLOOPS	20035063	Implem - Seymour St. & Third Ave. (Signal Upgrade) - Kamloops	\$27,400.00
KAMLOOPS	20035064	Implem - Seymour St. & Fourth Ave. (signal upgrade) - Kamloops	\$13,300.00
KAMLOOPS	20035065	Implem - Semour St. & Fifth Ave. (signal upgrade) - Kamloops	\$6,900.00
KAMLOOPS	20035100	Implem - 125 Stop Sign Upgrades - Kamloops	\$3,125.00
KAMLOOPS	20035101	Implem - 149 Sign Infill Upgrades - Kamloops	\$13,037.50
KAMLOOPS	20035104	Implem - Seymour & 3rd (curb extensions) - Kamloops	\$1,700.00
KAMLOOPS	20035144	Implem - McGill Rd Corridor Improvements - Kamloops	\$28,693.00
KAMLOOPS	20038070	Implem - MoT - Hwy 5 Coquihalla - Kamloops	\$57,600.00
KELOWNA	20034002	Implem - Relocate bus stop & signs - Springfield & Spall - Kelowna	\$2,000.00
KELOWNA	20035040	Implem - Signal Head Upgrade - area wide - Kelowna	\$81,050.91
KELOWNA	20035048	Implem - Hwy. 97 & Water Street - Kelowna	\$3,500.00
KELOWNA	20035057	Implem - Barnaby, Lakeshore & Chute Lake Rds (traffic signal)- Kelowna	\$10,000.00
KELOWNA	20035075	Implem - Stop Sign Ugrade (year 5 of 5) - Kelowna	\$14,025.00
KELOWNA	20035158	Implem - Anti-skid pavement overlay - Casorso Rd Bridge Deck - Kelowna	\$10,000.00
KELOWNA	20038005	Implem - MoT - Signal Head Upgrade (Part 1) - Kelowna	\$96,000.00
KELOWNA	20038006	Implem - MoT - Signal Head Upgrade (Part 2) - Kelowna	\$66,000.00
LADNER	20038044	Implem - MoT - Hwy 17 & 10 (pavement treatment) - Ladner	\$37,900.00
LAKE COWICHAN	20035116	Implem - Upgrade School Zone Signs - Lake Cowichan	\$3,150.00
LANGFORD	20035146	Implem - Signal Visibility Upgrade - District of Langford	\$3,400.00
LITTLE FORT	20038055	Implem - MoT - Hwy 5 & Old North Thompson Hwy - Littlefort	\$5,700.00
METCHOSIN	20035018	Implem - Additional Chevrons - Happy Valley Road - Dist. of Metchosin	\$2,100.00
METCHOSIN	20035024	Implem - School Zone Signs - Dist. of Metchosin	\$700.00
MISSION	20035078	Implem - Cedar St. & 14th St. (traffic signal) - Mission	\$10,100.00
MISSION	20038009	Implem - MoT - Signal Head Upgrade - Mission	\$10,000.00
MISSION	20038073	Implem - MoT - Hwy 7 near Silverdale Flats-delineation - Mission	\$19,500.00
NANAIMO	20035022	Implem - Sign Visibility Upgrade - Nanaimo	\$5,500.00
NANAIMO	20035036	Implem - Bowen Rd & Buttertubs Dr (pedestrian refuge) - Nanaimo	\$12,000.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
NANAIMO	20035056	Implem - Area-wide signal Visibility Upgrade - Nanaimo	\$6,300.00
NANAIMO	20038051	Implem - MoT - Hwy 1, 19 & 19A - Nanaimo	\$113,400.00
NANAIMO	20038058	Implem - MoT-Hwy 19 College at 5th(Elk Falls to Roberts Lake)- Nanaimo	\$6,500.00
NANOOSE BAY	20038032	Implem - MoT - Hwy 19 near Northwest Bay Rd - Nanoose	\$91,400.00
NELSON	20035145	Implem - Signal Head Upgrade - Baker Street (3 locations) - Nelson	\$27,880.20
NEW HAZELTON	20038010	Implem - MoT - Signal Head Upgrade - New Hazelton	\$3,000.00
OAK BAY	20035103	Implem - Cadboro Bay & Cedar Hill Cross - Oak Bay	\$5,500.00
OLIVER	20038013	Implem - MoT - Signal Head Upgrade - Oliver	\$8,000.00
OSOYOOS	20038014	Implem - MoT - Signal Head Upgrade - Osoyoos	\$4,000.00
PEMBERTON	20038046	Implem - MoT - Hwy 99 at BCR - Pemberton	\$13,600.00
PENTICTON	20035128	Implem - Warren Ave & Government St (Traffic Signal) - Penticton	\$15,500.00
PENTICTON	20038015	Implem - MoT - Signal Head Upgrade - Penticton	\$56,000.00
PORT ALBERNI	20035059	Implem - Area-wide Signal Visibility Upgrade - Port Alberni	\$15,300.00
PORT ALBERNI	20035060	Implem - Johnston & Gertrude (left-turn arrows) - Port Alberni	\$3,500.00
PORT ALBERNI	20035061	Implem - Johnston & Tebo (traffic signal) - Port Alberni	\$12,000.00
PORT ALBERNI	20035126	Implem - Sign Visibility Upgrade Area-wide - Port Alberni	\$26,000.00
PORT ALBERNI	20038017	Implem - MoT - Signal Head Upgrade - Port Alberni	\$16,000.00
PORT HARDY	20038045	Implem - MoT - Hwy 19 (between Sayward & Pt Hardy) - Port Hardy	\$35,000.00
PORT MOODY	20035127	Implem - Noons Creek Drive (pavement Grooving) - Port Moody	\$10,000.00
POUCE COUPE	20038029	Implem - MoT - Hwy. 2 Corridor Improvements - Pouce Coupe	\$12,100.00
POWELL RIVER	20035017	Implem - Stop Sign Upgrade - District of Powell River	\$4,000.00
PRINCE GEORGE	20035028	Implem - Larger Signal Heads (23 intersections) - Prince George	\$28,886.00
PRINCE GEORGE	20035111	Implem - Upgrade traffic signal 13th Ave & Winnipeg St - Prince George	\$3,500.00
PRINCE GEORGE	20035119	Implem - 15th Ave & Spruce St - Prince George	\$10,200.00
PRINCE GEORGE	20035120	Implem - 5th Ave & Carney St - Prince George	\$21,700.00
PRINCE GEORGE	20035123	Implem - Massey Drive & Westwood Drive - Prince George	\$7,400.00
PRINCE GEORGE	20035132	Implem - Stop Sign Upgrades (year 2) - Prince George	\$22,548.12
PRINCE GEORGE	20038071	Implem - MoT-Hwy 16 (Cat Fish Creek to West Twin Bridge) Prince George	\$11,500.00
PRINCE RUPERT	20035008	Implem - Signal Head Upgrade - Fulton St & 3rd Ave - Prince Rupert	\$9,700.00
PRINCE RUPERT	20035157	Implem - Year 3 of 3 Stop Signs (up to 75 signs) - Prince Rupert	\$4,122.78
PRINCE RUPERT	20038018	Implem - MoT - Signal Head Upgrade - Prince Rupert	\$33,000.00
QUALICUM BEACH	20035105	Implem - Rupert Rd (centreline reflector) - Qualicum Beach	\$925.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
QUESNEL	20038068	Implem - MoT - Hwy 97 (East Pine to Arras) - Quesnel	\$36,300.00
REVELSTOKE	20038039	Implem - MoT - Hwy 1 near Victoria Rd Intersection - Revelstoke	\$45,900.00
REVELSTOKE	20038056	Implem - MoT - Hwy 1 near Rugherford Beach Rest Area - Revelstoke	\$20,500.00
SAANICH	20038049	Implem - MoT - section of Hwy 17 - North Saanich	\$60,700.00
SALMON ARM	20035010	Implem - Sign Upgrade - Salmon Arm	\$6,840.76
SOOKE	20035002	Implem - Charters Rd & Sooke Rd - Sooke	\$2,000.00
SQUAMISH	20038020	Implem - MoT - Signal Head Upgrade (2 locations) - Squamish	\$8,000.00
SUMMERLAND	20038021	Implem - MoT - Signal Head Upgrade - Summerland	\$16,000.00
TERRACE	20038028	Implem - MoT - Rte 16 at Eby Street (signal head upgrade) - Terrace	\$16,500.00
TETE JAUNE CACHE TRAIL	20038061	Implem - MoT-Hwy 16 (Tete Jaune Cache to Alta Border)- Tete Jaune Cache	\$25,100.00
TRAIL	20035003	Implem - Sign upgrade - Trail	\$5,553.19
TRAIL	20038007	Implem - MoT - Signal Head Upgrade - Kootenays	\$4,050.00
TRAIL	20038036	Implem - MoT - Hwy 22 near Birchbank - Trail	\$48,700.00
TRAIL	20038059	Implem - MoT - Hwy 3B & Hwy 22 (Trail to Rossland) - Trail	\$7,500.00
UCLUELET	20035025	Implem - Sign Visibility Upgrade - Dist. of Ucluelet	\$1,000.00
VANDERHOOF	20038030	Implem - MoT - Hwy 16 (Engren & Vanderhoof) - Vanderhoof	\$13,500.00
VANDERHOOF	20038031	Implem - MoT - Hwy. 16 (Cluculz Lake Intersection) - Vanderhoof	\$10,500.00
VANDERHOOF	20038065	Implem - MoT - Hwy 16 (Engen to Blackwater) - Vanderhoof	\$27,000.00
VARIOUS LOCATIONS	20035117	Implem - Sign upgrade 19 First Nation Bands - Astrographic Industries	\$29,817.78
VARIOUS LOCATIONS	20035155	Implem - Rainline Material Charges - Continental Traffic & Ind Signs	\$49,097.75
VERNON	20035097	Implem - 32 Ave & 33rd St (traffic signals) - Vernon	\$15,500.00
VERNON	20038060	Implem - MoT - Hwy 97 (Bernie Rd to Kalamalka Dr) - Vernon	\$7,100.00
VG - BURNABY	20035011	Implem - Stop Sign In-fill Program - Burnaby	\$15,000.00
VG - BURNABY	20035012	Implem - School Zone Signs - Burnaby	\$6,500.00
VG - BURNABY	20035029	Implem - Willingdon Ave Interchange - Burnaby	\$102,000.00
VG - BURNABY	20035034	Implem - Signal Visibility Upgrade (100 intersections) - Burnaby	\$200,000.00
VG - BURNABY	20035068	Implem - Highly Reflective Pavement Mkgs (area-wide)- Burnaby	\$51,000.00
VG - BURNABY	20035069	Implem - Canada Way (anti-skid surfacing 4 intersections) - Burnaby	\$48,500.00
VG - BURNABY	20035125	Implem - Lougheed Town Centre - Burnaby	\$133,500.00
VG - BURNABY	20038027	Implem - MoT - Signal Head Upgrade - Burnaby	\$8,000.00
VG - BURNABY	20038069	Implem - MoT - Hwy 1 & Willingdon Interchange - Burnaby	\$30,000.00
VG - COQUITLAM	20035049	Implem - Stop & Yield Signs Area-wide - Coquitlam	\$20,110.00
VG - COQUITLAM	20035050	Implem - Johnson/Durant & Guildford/Town Centre - Coquitlam	\$10,000.00
VG - COQUITLAM	20035051	Implem - Sign Visibility Upgrade - Area-wide - Coquitlam	\$158,000.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
VG - COQUITLAM	20035052	Implem - Lougheed Hwy. & Como Lake (left-turn arrows) - Coquitlam	\$7,500.00
VG - COQUITLAM	20035053	Implem - Lougheed Hwy. Corridor - Coquitlam	\$120,000.00
VG - COQUITLAM	20035066	Implem - Blue Mountain Rd & Foster Ave. - Coquitlam	\$15,650.00
VG - COQUITLAM	20035115	Implem - Highly Ref. Pave. Mkgs - Mariner Way - Coquitlam	\$3,000.00
VG - COQUITLAM	20035134	Implem - Street Signs Lougheed Corridor - Coquitlam	\$51,400.00
VG - DELTA	20035019	Implem - Ladner Trunk Corridor (80th St to Hwy 99) - Delta	\$31,000.00
VG - DELTA	20035020	Implem - River Road E. (Main Ravine to Nelson View) - Delta	\$54,300.00
VG - DELTA	20035021	Implem - Sunbury Area (traffic calming) - Delta	\$22,000.00
VG - DELTA	20035023	Implem - 16 Intersections (larger signal heads) - Delta	\$39,117.00
VG - DELTA	20035129	Implem - 116th St & 90th Ave (pedestrian signal) - Delta	\$13,800.00
VG - DELTA	20035130	Implem - 56th St Corridor (signal coordination) - Delta	\$40,000.00
VG - DELTA	20035139	Implem - Delineation etc. Nordel Way (BNSF to 84 Ave) - Delta	\$17,100.00
VG - DELTA	20038004	Implem - MoT - Signal Head Upgrade - Delta	\$14,000.00
VG - DELTA	20038047	Implem - MoT - Nordel Way Truck Weigh Scale - Delta	\$12,800.00
VG - LANGLEY CITY	20035058	Implem - Fraser Hwy/ Production Way (traffic signals) - Langley City	\$15,400.00
VG - LANGLEY CITY	20035062	Implem - Area-wide Sign Upgrade Program - Langley City	\$4,658.00
VG - LANGLEY CITY	20035110	Implem - 200th Street Corridor - Langley City	\$9,000.00
VG - LANGLEY CITY	20035121	Implem - Signal Head Upgrade - Langley City	\$21,682.00
VG - LANGLEY CITY	20035122	Implem - Signal Head Upgrade-200th St-7 intersections - Langley City	\$110,000.00
VG - LANGLEY TOWNSHIP OF	20035030	Implem - "0" Ave. Corridor - Township of Langley	\$21,400.00
VG - LANGLEY TOWNSHIP OF	20035031	Implem - 16th Ave. Corridor - Township of Langley	\$4,000.00
VG - LANGLEY TOWNSHIP OF	20035032	Implem - Albion Ferry Terminal - Township of Langley	\$29,800.00
VG - LANGLEY TOWNSHIP OF	20035033	Implem - Fraser Hwy (264 to 276 St)-Signal Prog - Township of Langley	\$38,000.00
VG - LANGLEY TOWNSHIP OF	20035037	Implem - 56th Ave & 248th St (flashing beacon) - Township of Langley	\$10,600.00
VG - LANGLEY TOWNSHIP OF	20035042	Implem - 64th Ave & 197th St (upgrade signals) - Langley Township	\$20,000.00
VG - LANGLEY TOWNSHIP OF	20035043	Implem - Willowbrook & 198th St. - Township of Langley	\$40,000.00
VG - LANGLEY TOWNSHIP OF	20035044	Implem - 200th St. & 16th Ave. - Langley Township	\$9,000.00
VG - LANGLEY TOWNSHIP OF	20035045	Implem - 200th St. & 32nd Ave. - Township of Langley	\$11,000.00
VG - LANGLEY TOWNSHIP OF	20038008	Implem - MoT - Signal Head Upgrade - Langley	\$32,000.00
VG - MAPLE RIDGE	20035112	Implem - Left-turn lanes 228th & Abernethy - Maple Ridge	\$7,000.00
VG - MAPLE RIDGE	20035151	Implem - Pedestrian Safety - Dewdney Trunk & Fletcher St - Maple Ridge	\$2,000.00
VG - NEW WESTMINSTER	20035004	Implement - Replace signal heads - New Westminister	\$27,000.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
VG - NEW WESTMINSTER	20035143	Implem - Anti-skid surfacing-Brunette Ave & Braid St - New Westminster	\$65,000.00
VG - NEW WESTMINSTER	20038011	Implem - MoT - Signal Head Upgrade - New Westminster	\$20,000.00
VG - NORTH VAN CITY	20035079	Implem - Low Level Rd & Esplanade - North Van City	\$9,000.00
VG - NORTH VAN CITY	20035096	Implem - Signal Visibility Ugrade Phase 2 - North Van City	\$54,000.00
VG - NORTH VAN CITY	20035106	Implem - Keith Rd & Chesterfield (Roundabout) - North Van City	\$54,000.00
VG - NORTH VAN CITY	20035113	Implem - Signal heads - Marine Dr/Hanes Ave - North Van City	\$20,000.00
VG - NORTH VAN CITY	20035148	Implem - Traffic Calming Ridgeway - North Van City	\$30,000.00
VG - NORTH VAN CITY	20035149	Implem - Speed Humps - Marine Dr & Hamilton St - North Van City	\$30,000.00
VG - NORTH VAN CITY	20038012	Implem - MoT - Signal Head Upgrade - North Van Dist/City	\$48,000.00
VG - NORTH VAN DIST	20035001	Implem - William Ave @ Lynn Valley Rd - North Van Dist	\$8,000.00
VG - NORTH VAN DIST	20035005	Implem - Ross Rd @ Lynn Valley Rd - North Van Dist	\$27,000.00
VG - NORTH VAN DIST	20035133	Implem - Ped. Xing at Whiteley Court & E 27th St - North Van Dist	\$10,000.00
VG - PITT MEADOWS	20038016	Implem - MoT - Signal Head Upgrade - Pitt Meadows	\$4,000.00
VG - PORT COQUITLAM	20035080	Implem - Area-wide School Zone Sign Upgrade - Port Coquitlam	\$6,300.00
VG - PORT MOODY	20035035	Implem - Chevron signs, etc. Gatensbury Rd. - Port Moody	\$18,000.00
VG - PORT MOODY	20035150	Implem - signal upgrade - Barnet Hwy & View St - Port Moody	\$1,800.00
VG - PORT MOODY	20035159	Implem - Traffic Sign Upgrades - Port Moody	\$4,200.00
VG - RICHMOND	20035081	Implem - Hazelbridge Way & Leslie Rd (traffic signals) - Richmond	\$20,000.00
VG - RICHMOND	20035082	Implem - Bridgeport Rd. & Simpson Rd. (left-turn phasing) - Richmond	\$20,000.00
VG - RICHMOND	20035083	Implem - Blundell Rd. (#4 to Scott Rd Corridor Improvements)- Richmond	\$20,200.00
VG - RICHMOND	20035085	Implem - No 2 Rd/ Francis Rd & Williams Rd (signals upgrade)- Richmond	\$22,000.00
VG - RICHMOND	20035086	Implem - Steveston Hwy at #2 Rd, #3 Rd, Gilbert Rd, Shell Rd- Richmond	\$20,800.00
VG - RICHMOND	20035137	Implem - Delineation Hazelbridge Way & Cooney Rd - Richmond	\$6,000.00
VG - RICHMOND	20035138	Implem - Road Extension Garden City Rd - Richmond	\$32,000.00
VG - RICHMOND	20038019	Implem - MoT - Signal Head Upgrade - Richmond	\$24,000.00
VG - SURREY	20035015	Implem - Fraser Hwy (fleetwood to 160th) - City of Surrey	\$300,000.00
VG - SURREY	20035046	Implem - 128th St. Corridor (68th Ave. to 76th Ave.) - Surrey	\$106,000.00
VG - SURREY	20035047	Implem - 152nd St. & 76th Ave. (traffic signal) - Surrey	\$27,300.00
VG - SURREY	20035087	Implem - 104th Ave. Corridor (153rd to 159th) - Surrey	\$250,000.00
VG - SURREY	20035088	Implem - 140th Street Corridor (91A Ave to 96th Ave) - Surrey	\$31,000.00
VG - SURREY	20035089	Implem - 84th Ave. & 148th St. (traffic signal) - Surrey	\$35,000.00
VG - SURREY	20035090	Implem - 80th Ave. Corridor (Scott Rd. To 122nd St.) - Surrey	\$23,300.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
VG - SURREY	20035091	Implem - 88th Ave. at 176th St. (road widening etc) - Surrey	\$30,000.00
VG - SURREY	20035092	Implem - 64th Ave. Corridor (164th St. to 169th St.) - Surrey	\$101,000.00
VG - SURREY	20035093	Implem - 64th Ave. Corridor (175th St. to 177th St.) - Surrey	\$84,000.00
VG - SURREY	20035099	Implem - King George Hwy/88th Ave (advance warning flasher) - Surrey	\$15,000.00
VG - SURREY	20035131	Implem - 152nd St & 88th Ave. - Surrey	\$1,419.00
VG - SURREY	20038001	Implem - MoT - Rumble Strips - Hwy. 1 Surrey to Hope	\$116,000.00
VG - SURREY	20038022	Implem - MoT - Signal Head Upgrade - Surrey	\$10,000.00
VG - VANCOUVER	20035054	Implem - Area-wide Stop Sign In-fill Program - Vancouver	\$50,000.00
VG - VANCOUVER	20035055	Implem - Victoria & Hastings (left-turn bays etc) - Vancouver	\$80,000.00
VG - VANCOUVER	20035094	Implem - Woodland & Grandview and Atlin & E 29th Ave. - Vancouver	\$20,000.00
VG - VANCOUVER	20035095	Implem - Hemlock/W. 6th Ave & Jackson/Prior (traff signals)- Vancouver	\$60,000.00
VG - VANCOUVER	20035109	Implem - 8 intersections (pedestrian signals) - Vancouver	\$120,000.00
VG - VANCOUVER	20035135	Implem - Traffic Signal Anderson Rd & 2nd Ave - Vancouver	\$85,000.00
VG - VANCOUVER	20035136	Implem - Corner Bulges/Crosswalk Improv (6 locations) - Vancouver	\$48,000.00
VG - VANCOUVER	20035156	Implem - Speed Humps at 30 locations - Vancouver	\$75,000.00
VG - VANCOUVER	20038023	Implem - MoT - Signal Head Upgrade - UBC	\$14,000.00
VG - WEST VANCOUVER	20035102	Implem - Signal Visibility Upgrade Program - West Vancouver	\$18,000.00
VG - WEST VANCOUVER	20038024	Implem - MoT - Signal Head Upgrade - West Vancouver	\$22,000.00
VICTORIA	20035154	Implem - Traff Calm Chambers St (Pandora to N Park) Phase 1 - Victoria	\$20,000.00
VICTORIA	20038050	Implem - MoT - Section of Hwy 1 - Victoria	\$16,300.00
WESTBANK	20038025	Implem - MoT - Signal Head Upgrade - Westbank	\$48,000.00
WESTSIDE	20038026	Implem - MoT - Signal Head Upgrade - Westside	\$84,000.00
WHISTLER	20038002	Implem - MoT - Signal Head Upgrade - Whistler	\$14,000.00
WILLIAMS LAKE	20035006	Implem - Signal Visibility Upgrade - Williams Lake	\$11,213.54



2007.1 RR IBC.66.2 – Attachment B – 2004 Road Improvement Projects

2004 Road Improvement Projects

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
100 MILE HOUSE	20048051	Implem - MoT - Rumble Strips - Hwy 97 N of Clinton - 100 Mile House	\$2,500.00
100 MILE HOUSE	20048052	Implem - MoT -Signing, delineation-Hwy 24 Gasplan curve-100 Mile House	\$1,500.00
100 MILE HOUSE	20048053	Implem - MoT -Impove sign.-Hwy 24 Sheridan Lake to Bell-100 Mile House	\$2,900.00
ABBOTSFORD	20045064	Implem - Clearbrook Rd Corridor Improve. (Marshall to Fir)-Abbotsford	\$63,000.00
ABBOTSFORD	20045101	Implem - Road extension - Cyril Street - Abbotsford	\$51,000.00
ABBOTSFORD	20045102	Implem - Intersection improvements - McCallum & McDougall - Abbotsford	\$44,000.00
ABBOTSFORD	20048076	Implem -MoT-Signals, signing, etc-Hwy 11 Clayburn to Harris-Abbotsford	\$36,000.00
ABBOTSFORD	20048079	Implem - MoT - Horizontal alignment - Hwy 1 - Abbotsford	\$8,000.00
AGASSIZ	20048006	Implem - MoT - Install left turn - Hwy 9 at Whelpton Rd - Agassiz	\$7,700.00
ANMORE	20045150	Implem - Speed reduction re emergency response zone -Village of Anmore	\$1,500.00
BOSTON BAR	20048007	Implem - MoT - Rumble Strips - Blue Lake to Jackass Mtn - Boston Bar	\$7,200.00
CAMPBELL RIVER	20045015	Implem - Transportation Network Planning Tool - Campbell River	\$10,000.00
CAMPBELL RIVER	20048014	Implem - MoT - Hwy 19 - Shoulder Widening - Campbell River	\$2,900.00
CASTLEGAR	20048019	Implem - MoT - Bugle Creek to Castlegar O/H - Rumble Strips- Castlegar	\$13,600.00
CEDAR CREEK	20048027	Implem - MoT - Rumble Strips - Cedar Creek to Penticton - Cedar Creek	\$2,400.00
CHASE	20048025	Implem - MoT - Shoulder widening - Hwy 1 Hoffmans Bluff - Chase	\$23,500.00
CHILLIWACK	20045034	Implem - Intersection Improv. - Vedder Rd & Watson Rd - Chilliwack	\$18,000.00
CHILLIWACK	20045078	Implem - Young Road Corridor Improvements - Chilliwack	\$13,150.00
CHILLIWACK	20048061	Implem - MoT - Shoulder wide. Etc -Hwy 1 Annis Rd to Hwy 9 -Chilliwack	\$87,700.00
CHILLIWACK	20048064	Implem - MoT - Reconfiguration - Hwy 1 Vedder I/C - Chilliwack	\$56,000.00
CHILLIWACK	20048100	Implem - MoT - Hwy 9 & E Yale Rd - Modern Roundabout - Chilliwack	\$30,000.00
CLINTON	20048081	Implem - MoT - Extend NB passing lane, etc - Hwy 97 Chasm - Clinton	\$39,300.00
CLINTON	20048084	Implem - MoT - Curve realignment - Hwy 97 4-mile curves - Clinton	\$14,700.00
COMOX	20045001	Implem - Replace signal heads with LED lens - Comox	\$4,000.00
COURTENAY	20048015	Implem - MoT - Hwy 19 Rumble Strips - Courtenay/Parksville	\$90,000.00
CRANBROOK	20048083	Implem - MoT - Realignment - Hwy 3 Steamboat Hill - Cranbrook	\$15,300.00
CRESTON	20048020	Implem - MoT - Kootenay River Ch to Creston - Rumble Strips - Creston	\$8,800.00
CRESTON	20048023	Implem - MoT - Kootenay Pass Web Camera - Creston	\$8,000.00
DAWSON CREEK	20048075	Implem -MoT-Intersect reconstruct-Hwy 97 & Bessborough Rd-Dawson Creek	\$13,500.00
ELKO	20048018	Implem - MoT - Elko Overhead - Rumble Strips - Elko	\$4,800.00
ELKO	20048073	Implem - MoT - Extend climb. Lane - Hwy 3 Motts Hill - Elko	\$10,500.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
FALKLAND	20048054	Implem - MoT - SB Passing Lane - Hwy 97 Lynes Road - Falkland	\$17,300.00
FORT NELSON	20048040	Implem - MoT - Pavement treatments, etc - Hwy 77 Liard - Fort Nelson	\$18,100.00
FORT ST. JAMES	20048042	Implem - MoT - Accel/dec lanes, etc - Hwy 27@Sowchea Rd - Ft St James	\$4,900.00
FORT ST. JOHN	20045111	Implem - Median installation - 100 Ave. & 96 St. - Fort St. John	\$7,100.00
FORT ST. JOHN	20048038	Implem - MoT - signing/delineation/etc- Hwy 97 & Wright Rd- Ft St John	\$1,700.00
FORT ST. JOHN	20048078	Implem - MoT - Pavement markings, etc -Hwy 97 (4 laning)- Fort St John	\$17,700.00
GLADE	20048060	Implem - MoT - Intersection upgrade - Hwy 3A Glade Ferry Rd - Glade	\$6,400.00
GOODLOW	20048039	Implem - MoT - Pavement treatmts, etc.-Cecil Lake/Clayhurs Rds-Goodlow	\$9,900.00
HAZELTON/NEW HAZELTON	20048097	Implem - MoT - Ped/cyclis facility, etc - Hwy 954 - Hazelton	\$12,800.00
HIGHLANDS	20045151	Implem-Install 150 centre-line reflectors-Millstream Rd-D of Highlands	\$2,250.00
HOPE	20048005	Implem - MoT - Hwy. 3 Allison Pass Area - Hope	\$29,700.00
HOPE	20048105	Implem - MoT - Enh Curve Del (Hwy 1 Hope to Ashcroft) - Hope	\$180,000.00
HUDSON'S HOPE	20048037	Implem - MoT - Lane/shoulder widening - Hwy 29 - Hudson Hope	\$14,700.00
INVERMERE	20045075	Implem - Traffic Control Sign Upgrades (area-wide) - Dist of Invermere	\$17,211.00
KAMLOOPS	20045027	Implem - Summit Drive Corridor Improvements - Kamloops	\$30,000.00
KAMLOOPS	20045047	Implem - Corridor Improvements (Tranquille Road) - Kamloops	\$55,900.00
KAMLOOPS	20045048	Implem - Install Stop Signs (up to 125) - Kamloops	\$3,125.00
KAMLOOPS	20045126	Implem - Signal Progression - Fortune & Tranquille - Kamloops	\$4,922.00
KAMLOOPS	20048030	Implem - MoT - Improve signal - Hwy 5 Mt Paul Way Intersect- Kamloops	\$31,200.00
KAMLOOPS	20048063	Implem - MoT - Hwy Realignment - Hwy 5 Preacher Hill Curves - Kamloops	\$21,600.00
KAMLOOPS	20048104	Implem - MoT-Hwy 921-Sun Peaks Hill Area-signing/conspicuity- Kamloops	\$19,200.00
KELOWNA	20045020	Implem - Signal Head Upgrades (28 intersections) - Kelowna	\$38,525.00
KELOWNA	20045021	Implem - Gordon Drive Corridor Improvements - Kelowna	\$73,000.00
KELOWNA	20045043	Implem - Install traffic signal (Gordon Dr & Dehart Rd) - Kelowna	\$10,900.00
KELOWNA	20045044	Implem - Corridor Improvements (Glenmore Rd) - Kelowna	\$18,300.00
KELOWNA	20045045	Implem - Install traffic signal (Hollywood Rd & Houghton Rd) - Kelowna	\$7,700.00
KELOWNA	20045046	Implem - Corridor Improvements (Rutland Road) - Kelowna	\$33,900.00
KEREMEOS	20045026	Implem - Area-wide sign upgrade - Keremeos	\$2,184.31
KIMBERLEY	20045139	Implem - Area-wide Sign Upgrade - Kimberley	\$3,869.29
KITIMAT	20048089	Implem - MoT- Shoulder/centreline rumble strips - Terrace to Kitimat	\$80,000.00
KITWANGA AREA	20048074	Implem - MoT - Grade/realignment -Hwy 16Andimaul to Shandilla-Kitwanga	\$5,600.00
KITWANGA AREA	20048096	Implem - MoT - Shoulder widening, etc - Hwy 37 Cranberry - Kitwanga	\$18,100.00
LAC LA HACHE	20048082	Implem - MoT - Realign., passing lane - Hwy 97 Doyle Rd - Lac La Hache	\$19,200.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
LAKE COUNTRY	20048068	Implem - MoT-NB left turn slot-Hwy 97 Ponderosa intersect-Lake Country	\$17,300.00
LAKE COWICHAN	20045033	Implem - Stop Sign Visibility Upgrade (125 signs) - Lake Cowichan	\$23,000.00
LANGFORD	20048048	Implem - MoT- Install DMS & camera - Hwy 1 Malahat - Langford/Mill Bay	\$37,100.00
LANGFORD	20048101	Implem - MoT - Hwy 14, Segment 371 - roadside delineation - Langford	\$8,100.00
LANGFORD	20048102	Implem - MoT - Hwy 1, Segment 319 - centreline delineation - Langford	\$6,800.00
LILLOOET	20048045	Implem - MoT - Shoulder widening, etc - Hwy 99 Graham Bridge- Lillooet	\$2,500.00
LYTTON	20048028	Implem - MoT - Remove passing lane - Hwy 1 Scuppa Rest Area - Lytton	\$6,700.00
LYTTON	20048029	Implem - MoT - Jackass Mountain (Rte 12 Jct) - Rumble Strips - Lytton	\$12,800.00
MAZIADIN	20048095	Implem - MoT - Shoulder widening, etc. - Hwy 37 Bell Irving - Maziadin	\$15,700.00
MCBRIDE	20048041	Implem - MoT -Horizontal align, etc-Hwy 16 Dome Crk to Catfish-McBride	\$65,100.00
MERRITT	20048092	Implem - MoT - Shoulder Rumble Strips - Coquihalla Hwy - Merritt	\$58,500.00
MISSION	20045008	Implem - corridor improve. - Grand St from 1st to 14th Ave - Mission	\$59,412.00
MISSION	20045009	Implem - intersection improve. - 7th Ave & Hurd St. - Mission	\$41,000.00
NANAIMO	20045060	Implem - Upgrade 240 warning signs - Nanaimo	\$8,863.31
NANAIMO	20045083	Implem - Pedestrian safety improve. (Wallace & Albert) - Nanaimo	\$11,000.00
NANAIMO	20045132	Implem - Right-turn Channelization - Jingle Pot & Westwood - Nanaimo	\$7,000.00
NANAIMO	20045133	Implem - Intersection Improvements - Howard Ave. & 3rd St. - Nanaimo	\$2,063.79
NANAIMO	20045134	Implem - Left-turn Lane - Hammond Bay Rd & Brickyard Rd - Nanaimo	\$5,000.00
NANAIMO	20045135	Implem - Traffic Signal Displays - Aulds Rd & Metral Dr - Nanaimo	\$2,500.00
NANAIMO	20048010	Implem - MoT - Nanaimo Parkway left turn ext at Jinglepot - Nanaimo	\$10,400.00
NANAIMO	20048011	Implem - MoT - Nanaimo Parkway Left-turn Ext at Northfield - Nanaimo	\$3,200.00
NEW DENVER	20048085	Implem - MoT - Realignment - Hwy 6 Hicks Corner - New Denver	\$6,400.00
NEW WESTMINSTER	20045138	Implem-High Refl Pave. mark-Brunette Ave/McBride Blvd -New Westminster	\$15,000.00
NORTH COWICHAN	20045049	Implem -Left-turn Lane (Beverly St & Trans-Canada Hwy) -North Cowichan	\$20,000.00
NORTH COWICHAN	20045074	Implem - Visibility Upgrade (Janes & Lakes) - Dist of North Cowichan	\$2,500.00
NORTH COWICHAN	20045149	Implem - Install Traffic Signal - Drinkwater & TCH - North Cowichan	\$10,000.00
OAK BAY	20045103	Implem - Pedestrian Crosswalk - Eastdowne & Cadboro Bay - Oak Bay	\$5,000.00
OKANAGAN FALLS	20048071	Implem - MoT - SB Passing Lane -Hwy 97 N of Vaseux Lake-Okanagan Falls	\$20,500.00
PARKSVILLE	20045014	Implem - Sign Upgrade - Parksville	\$23,500.00
PEACE ARCH	20048056	Implem - MoT - Thru Lanes - Hwy 99 Nexus Lane - Peace Arch	\$16,000.00
PENTICTON	20045007	Implem - Area-wide signal head upgrade - Penticton	\$49,421.22
PENTICTON	20045016	Implem - Warren Ave & Govt St (4-way Stop flashing beacon) - Penticton	\$15,500.00
PENTICTON	20045032	Implem - Modern Roundabout - Front St/Vancouver Ave/Ellis St-Penticton	\$15,000.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
PENTICTON	20048069	Implem-MoT-NB double left turn lanes-Hwy 97 Eckhardt/Railway-Penticton	\$14,100.00
PORT ALBERNI	20048012	Implem - MoT - Hwy 4 Shoulder Widening West of Sutton Pass- Pt Alberni	\$3,900.00
PORT ALBERNI	20048013	Implem - MoT - Hwy 4 pullouts West of Sutton Pass - Port Alberni	\$3,900.00
PORT ALBERNI	20048057	Implem - MoT -Lane wide. etc.-Hwy 4 S-bends Cathedral Grove-Pt Alberni	\$80,000.00
PORT ALICE	20048016	Implem - MoT - Hwy 30 - Improve horizontal alignment - Port Alice	\$300.00
PORT MCNEILL	20048059	Implem - MoT - Realignment & reconst.-Hwy 19 Misty Lakes N - Pt McNeil	\$45,600.00
POWELL RIVER	20045002	Implem - Upgrade 100 stop signs (year 2) - Powell River	\$4,000.00
PRINCE GEORGE	20045013	Implem - Signal Head Upgrade 6 intersections - Prince George	\$10,393.00
PRINCE GEORGE	20045110	Implem - Area-wide Stop Sign Upgrades (year 3) - Prince George	\$24,000.00
PRINCE GEORGE	20045120	Implem - Intersection improvements-Ospika Blvd & 5th Ave-Prince George	\$16,000.00
PRINCE GEORGE	20045122	Implem-Intersect improve-Domano Blvd/O'Grady Rd & McGill Cr- Pr George	\$31,400.00
PRINCE GEORGE	20048044	Implem - MoT -Sign/access control, etc-Hwy 16@Bear Kimball- Pr. George	\$8,800.00
PRINCE RUPERT	20048091	Implem - MoT - Illumination - McBride @ 6th Ave - Prince Rupert	\$7,000.00
QUESNEL	20048032	Implem - MoT - Wildlife Reflectors - Hwy 97 - Quesnel	\$20,000.00
QUESNEL	20048035	Implem - MoT - Inlaid pavement markings - Hwy 97 & Maple Dr - Quesnel	\$8,700.00
QUESNEL	20048036	Implem - MoT - Inlaid pavement markings- Hwy 97 & Cedar/Larch- Quesnel	\$4,000.00
QUESNEL	20048065	Implem - MoT - Realign/replace - Hwy 97 Cottonwood Bridge - Quesnel	\$41,300.00
REVELSTOKE	20048017	Implem - MoT - Hwy 1 Rumble Strips - Revelstoke	\$50,400.00
SAANICH	20045127	Implem-Ped & cyc safe improv-Interurban-W Burnside to Dumeresq-Saanich	\$10,000.00
SAANICH	20045128	Implem - Pedestrian Signal - Larchwood Dr & Feltham Rd - Saanich	\$3,000.00
SAANICH	20045129	Implem - Pedestrian Signal-McKenzie/Borden & Quadra/Greenridge-Saanich	\$6,000.00
SAANICH	20048009	Implem - MoT - Hwy 17 Sayward Rd to Mt Newton Cross Rd - Saanich	\$51,500.00
SALMO	20048049	Implem - MoT - Improve delineation - Hwy 6 Nelway to border - Salmo	\$9,300.00
SALMON ARM	20045146	Implem - Enhanced Curve Delineation Area Wide - Salmon Arm	\$6,000.00
SCOTT CREEK	20048024	Implem - MoT - Anti-skid - Adams River Bridge - Scott Creek	\$8,700.00
SECHELT	20048008	Implem - MoT - left turn - Hwy 101 at Brooks Rd - Sechelt	\$1,600.00
SMITHERS	20048002	Implem - MoT - Traffic Signs (Houston & Burns Lake area) - Smithers	\$1,567.10
SMITHERS	20048077	Implem - MoT - Signing, etc. -Hwy 16 Old Babine to Viewmount -Smithers	\$36,500.00
SMITHERS	20048094	Implem - MoT - Rumble strips 5 loc. Hwy 16 near Smithers - Smithers	\$88,200.00
SOOKE	20048047	Implem - MoT - Improve delineation - Jordan Riv Br-Loss Crk Br - Sooke	\$12,000.00
SOOKE	20048103	Implem - MoT - Hwy 14, Segment 372 - warning sign installation - Sooke	\$7,000.00
SORRENTO	20048062	Implem - MoT - 4 laning - Hwy 1 Broderick to Ford - Sorrento-Salmon Arm	\$38,400.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
SPALLUMCHEEN	20048072	Implem - MoT - 4 laning - Hwy 97 Swan Lake to Larkin - Spallumcheen	\$89,600.00
SQUAMISH	20048067	Implem - MoT - Reconstruction -Hwy 99 Culliton to Cheakamus - Squamish	\$83,200.00
SWAN LAKE	20048026	Implem - MoT - Rumble Strips - Swan Lake to Schweb's Bridge- Swan Lake	\$46,400.00
SWARTZ BAY FERRY	20044003	Implem - BC Ferries - Install DMS & Camera - Swartz Bay Ferry Terminal	\$13,500.00
TERRACE	20048003	Implem - MoT - Hwy 37 Onion Lake to Jct Hwy 16 - Terrace	\$72,900.00
TERRACE	20048086	Implem -MoT-Signing/delineation/guardrail/etc-Hwy 16 CNR Cross-Terrace	\$18,400.00
TERRACE	20048087	Implem - MoT -Enhanced signs/delineation, etc.-St Croix Curves-Terrace	\$4,500.00
TERRACE	20048088	Implem - MoT - Shoulder rumble strips - Pr Rupert to Terrace - Terrace	\$95,000.00
TERRACE	20048090	Implem - MoT - Shoulder rumble strips - Hwy 16 E. of Terrace - Terrace	\$40,000.00
THREE VALLEY GAP TRAIL	20048066	Implem - MoT - Realign/replacement - Hwy 1 Woods Overhead-3 Valley Gap	\$36,000.00
TRAIL	20045003	Implem - Sign Upgrade - Trail	\$5,580.00
TRAIL	20048022	Implem - MoT - Hwy 3B Trail Chain Up - Trail	\$29,200.00
UCLUELET	20048080	Implem - MoT - Lane & shoulder widening - Hwy 4 Hydro Hill - Ucluelet	\$3,200.00
VANDERHOOF	20045006	Implem - Signal upgrade - Burrard/Victoria & Stewart Ave - Vanderhoof	\$9,000.00
VANDERHOOF	20048043	Implem - MoT - Signing/access control, etc - Hwy 16@Haynes- Vanderhoof	\$1,500.00
VARIOUS LOCATIONS	20048098	Implem - MoT - Hwy 1 N & S Fraser Perimeter Rds - Lower Mainland	\$15,000.00
VERNON	20045030	Implem - Signal Installation - 48th Ave & 29th St - Vernon	\$24,000.00
VERNON	20045092	Implem - 27 St & 32 Ave - Eastbound left-turn phase - Vernon	\$3,800.00
VERNON	20045093	Implem - Signal Installation - 48 Ave & 20 St - Vernon	\$16,500.00
VERNON	20045094	Implem - Left-turn lane - Kalmalka Lk. Rd. & 11 Ave. - Vernon	\$2,100.00
VERNON	20045109	Implem - Left-turn Phase - 30 St & 30 Ave - Vernon	\$3,700.00
VERNON	20048070	Implem - MoT - SB left turn slots - Hwy 97 21st Ave intersect - Vernon	\$33,600.00
VG - BURNABY	20045076	Implem - Highly Reflective Pavement Markings (Lougheed Hwy) - Burnaby	\$45,000.00
VG - BURNABY	20048093	Implem - MoT - Improve sight distance, etc -Sprout St at TCH - Burnaby	\$34,800.00
VG - COQUITLAM	20044002	Implem - Lansdowne & Guildford - new left-turn arrow - Coquitlam	\$1,500.00
VG - COQUITLAM	20045018	Implem - Johnson St & Delahaye Dr - Anti-skid - Coquitlam	\$43,000.00
VG - COQUITLAM	20045019	Implem - King Edward @ Lougheed/Woolridge (Left-turn arrow)- Coquitlam	\$16,000.00
VG - COQUITLAM	20045022	Implem - Pipeline & Dunkirk (new traffic signal) - Coquitlam	\$5,000.00
VG - COQUITLAM	20045023	Implem - Johnson & Glen (left-turn bays) - Coquitlam	\$60,000.00
VG - COQUITLAM	20045024	Implem - Signal Visibility Upgrade-Phase 2(12 intersections)-Coquitlam	\$83,500.00
VG - COQUITLAM	20045025	Implem - Refletive Borders (area-wide) - Coquitlam	\$75,000.00
VG - COQUITLAM	20045054	Implem - Left-turn Bays (Schoolhouse & Brunette) - Coquitlam	\$5,000.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
VG - COQUITLAM	20045068	Implem - Enhanced Curve Del. (Mariner Way) - Coquitlam	\$1,525.00
VG - COQUITLAM	20045087	Implem - Highly reflective pavement markings (Austin Ave.) - Coquitlam	\$6,500.00
VG - COQUITLAM	20045088	Implem - Highly reflective pavement markings (Pinetree Way)- Coquitlam	\$65,000.00
VG - COQUITLAM	20045089	Implem - Enhanced Curve Delineation (Johnson St) - Coquitlam	\$450.00
VG - COQUITLAM	20045090	Implem - Enhanced curve delineation (Laurentian Crescent) - Coquitlam	\$10,000.00
VG - COQUITLAM	20045115	Implem - Stop & yield signs replaced (year 6 of 6) - Coquitlam	\$20,000.00
VG - COQUITLAM	20045116	Implem-Lane modification-Parkway Blvd @ Summit Middle School-Coquitlam	\$4,000.00
VG - COQUITLAM	20045117	Implem - Corridor improvements - Austin Ave Corridor - Coquitlam	\$13,000.00
VG - COQUITLAM	20045118	Implem - Pedestrian crosswalk - 500 blk Clarke Rd & Glen Dr- Coquitlam	\$10,000.00
VG - DELTA	20045141	Implem - Corridor Improvements - 112th St. (72 to 90 Ave) - Delta	\$9,900.00
VG - DELTA	20045142	Implem - Pedestrian Xwalk - 112th St & Bridlington Dr - Delta	\$2,100.00
VG - DELTA	20045143	Implem - Corridor Improvements - 56th St (4th Ave to 10A Ave) - Delta	\$13,500.00
VG - DELTA	20045144	Implem - Nordel Way & 112th St - left-turn phase - Delta	\$12,600.00
VG - DELTA	20045145	Implem - Nordel Way (BNSF Rail to 84 Ave)-high ref pave markgs - Delta	\$23,500.00
VG - DELTA	20048058	Implem - MoT - Improve signals etc - Nordel Way - Delta	\$32,800.00
VG - LANGLEY TOWNSHIP OF	20045039	Implem - Install Traffic Signal (64 Ave & 198 St) - Langley Township	\$7,100.00
VG - LANGLEY TOWNSHIP OF	20045040	Implem - Install Traffic Signal (42 Ave & 208 St) - Langley Township	\$6,500.00
VG - LANGLEY TOWNSHIP OF	20045041	Implem -Install Traffic Signal (76A Ave & Glover Rd) - Langley Township	\$5,500.00
VG - LANGLEY TOWNSHIP OF	20045100	Implem - Fraser Highway Corridor - Langley Township	\$24,000.00
VG - LANGLEY TOWNSHIP OF	20045123	Implem - Intersection Improve -88th Ave & Glover Rd - Langley Township	\$2,500.00
VG - LANGLEY TOWNSHIP OF	20045130	Implem - Traffic Calming - "0" Avenue Corridor - Langley Township	\$16,000.00
VG - LANGLEY TOWNSHIP OF	20045136	Implem - UPS Installation - 88th Ave & 216 St - Langley Township	\$5,000.00
VG - LANGLEY TOWNSHIP OF	20045140	Implem - 200th Street Corridor Improvements - Langley Township	\$11,900.00
VG - LANGLEY TOWNSHIP OF	20045148	Implem - Enh. curve del.-16th Ave (200 St to 208 St) -Langley Township	\$8,000.00
VG - MAPLE RIDGE	20045055	Implem - Traffic Signal (River Rd & 207 St) - Maple Ridge	\$8,000.00
VG - MAPLE RIDGE	20045056	Implem - Traffic Signal (102 Ave & 240 St) - Maple Ridge	\$6,000.00
VG - MAPLE RIDGE	20045071	Implem - Dewdney Trunk Rd Corridor Improvments - Maple Ridge	\$25,400.00
VG - MAPLE RIDGE	20045153	Implem - Sidewalk/bike lane-232nd St Bridge - Phase 1 - Maple Ridge	\$20,000.00
VG - NEW WESTMINSTER	20048001	Implem - MoT - Anti-skid Queensborough Bridge - New Westminster	\$15,000.00
VG - NEW WESTMINSTER	20048046	Implem - MoT-Highly reflect pave mkgs-N end Queensboro Bridge-New West	\$6,700.00
VG - NORTH VAN CITY	20045065	Implem - Ped. Signal Upgrade (Westview & 28) - North Van City	\$10,000.00
VG - NORTH VAN CITY	20045066	Implem - Intersection Safety (Marine, Hamilton & 16) - North Van City	\$46,000.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
VG - NORTH VAN CITY	20045067	Implem - Bike Rte Safety (Cotton Rd) - North Van City	\$10,000.00
VG - NORTH VAN CITY	20045079	Implem - Pedestrian Xwalk (Fell Ave & 17 St) - North Van City	\$3,000.00
VG - NORTH VAN CITY	20045080	Implem - Traffic Calming Cloverley Area - North Van City	\$25,000.00
VG - NORTH VAN CITY	20045081	Implem - Anti-skid (Marine at Hamilton & 16) - North Van City	\$12,000.00
VG - NORTH VAN CITY	20045082	Implem -Ped. Signals (E & W Grand Blvd at Keith Rd) - North Van City	\$20,000.00
VG - NORTH VAN CITY	20045098	Implem - Anti-skid treatment - Marine Dr at Fell Ave - North Van City	\$18,000.00
VG - NORTH VAN CITY	20045099	Implem - Anti-skid treatment -Edgemont Blvd N of 21 St- North Van City	\$5,000.00
VG - NORTH VAN DIST	20045072	Implem - Road widening - Lynn Valley Rd - North Van Dist	\$20,000.00
VG - NORTH VAN DIST	20045073	Implem - Ped Xwalk- Lynn Valley Rd at Allan Rd - North Van Dist	\$10,000.00
VG - NORTH VAN DIST	20045096	Implem - Signal coordination - Lynn Valley Rd. - North Van Dist	\$19,000.00
VG - NORTH VAN DIST	20045097	Implem - Signal Visibility Upgrade -Phase 1 area-wide - North Van Dist	\$5,500.00
VG - PITT MEADOWS	20045010	Implem - Signal head upgrade (Harris Rd & McMyn Rd) - Pitt Meadows	\$6,000.00
VG - PITT MEADOWS	20045011	Implem - RI at Dewdney Trunk Rd & 203 St/Sharpe Rd - Pitt Meadows	\$3,000.00
VG - PORT COQUITLAM	20045004	Implem - Safety Improve - Lougheed & Shaughnessy - Port Coquitlam	\$62,200.00
VG - PORT COQUITLAM	20045005	Implem - Anti-skid pavement surfacing (Lougheed/Shaugnessy)-Port Coq	\$80,000.00
VG - PORT COQUITLAM	20045038	Implem - Lougheed Hwy (reflective markings) - Port Coquitlam	\$39,000.00
VG - PORT COQUITLAM	20045042	Implem - Area-wide Enhanced Curve Delineation - Port Coquitlam	\$3,650.00
VG - PORT MOODY	20045052	Implem - Portable Speed Bumps - Port Moody	\$1,500.00
VG - PORT MOODY	20045069	Implem - Sign Upgrade (150 signs) - Port Moody	\$4,000.00
VG - RICHMOND	20045035	Implem - Anti-skid - No. 2 Rd & Granville - Richmond	\$6,600.00
VG - RICHMOND	20045036	Implem - Raised median - Westminster Hwy - Richmond	\$4,400.00
VG - RICHMOND	20045037	Implem - Centre median - No 2 Rd - Richmond	\$5,000.00
VG - SURREY	20045050	Implem-64 Ave Corr. & Intersect. Improve. (16800 Blk to 175 St)-Surrey	\$45,100.00
VG - SURREY	20045051	Implem -64 Ave corridor & intersect. improv. (143 St to 146 St)-Surrey	\$97,200.00
VG - SURREY	20045061	Implem - Corridor Improvements (72nd Avenue) - Surrey	\$57,800.00
VG - SURREY	20045062	Implem - Left lane improve. (152 St & 104 Ave) - Surrey	\$17,300.00
VG - SURREY	20045063	Implem - Left lane improve. (152 St & 88 Ave) - Surrey	\$28,700.00
VG - SURREY	20045077	Implem - Left-turn Lane (64th Ave & King George) - Surrey	\$18,200.00
VG - SURREY	20045108	Implem - Traffic Signal - E Whalley Ring Rd & King Geogre - Surrey	\$2,300.00
VG - SURREY	20045112	Implem - Traffic signal installation - 152 St & 68 Ave - Surrey	\$9,300.00
VG - SURREY	20045113	Implem - Centre Median - 128 St (between 87 & 88 Ave) - Surrey	\$6,700.00
VG - SURREY	20045114	Implem - Signal heads - 96th Ave to 134th St - Surrey	\$18,500.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
VG - SURREY	20045119	Implem - Traffic Signal - 77th Ave & 140th St - Surrey	\$41,100.00
VG - SURREY	20045124	Implem - Corridor Improvements - 82 Ave (152 St to 160 St) - Surrey	\$88,100.00
VG - SURREY	20045125	Implem - Corridor Improvements - 132nd St (68 Ave to 72 Ave) - Surrey	\$88,300.00
VG - SURREY	20045137	Implem - Install raised centre median - 68th Ave & 144 St - Surrey	\$17,000.00
VG - SURREY	20045147	Implem - Traffic Signal Installation - 32nd Ave & 192nd St - Surrey	\$14,200.00
VG - SURREY	20045154	Implem - curve delineation along 8th Ave between 192 & 196 Surrey	\$16,700.00
VG - SURREY	20048055	Implem - MoT - Nexus Lane & fast lane - Hwy 15 - Surrey	\$6,400.00
VG - SURREY	20048099	Implem - MoT - 8th Ave/King George/hwy 99 on-ramp roundabout - Surrey	\$47,200.00
VG - VANCOUVER	20045012	Implem - pedestrian Xwalks at 3 locations - Vancouver	\$21,000.00
VG - VANCOUVER	20045017	Implem - Signal Upgrade (100 intersections-phase 2) - Vancouver	\$200,000.00
VG - VANCOUVER	20045028	Implem - Stop Sign In-fill Program - Vancouver	\$50,000.00
VG - VANCOUVER	20045029	Implem - New Traffic Signal - Hemlock & W. 6th Ave - Vancouver	\$30,000.00
VG - VANCOUVER	20045053	Implem - Traffic Signal (inter. Marine/Hudson & 54th/Tyne) - Vancouver	\$20,000.00
VG - VANCOUVER	20045057	Implem - 10th Avenue Bike Route (Cyclists & Ped. Signals) - Vancouver	\$125,000.00
VG - VANCOUVER	20045058	Implem - 10th Ave Bike Route (traffic circles) - Vancouver	\$32,000.00
VG - VANCOUVER	20045059	Implem - 10th Ave Bike Route (Safety Enhancements) - Vancouver	\$16,000.00
VG - VANCOUVER	20045070	Implem - Pedestrian Safety Improvements - City of Vancouver	\$90,000.00
VG - VANCOUVER	20045084	Implem - Crash Barrier Installation (Georgia Viaduct) - Vancouver	\$22,000.00
VG - VANCOUVER	20045085	Implem - Right-turn arrows visib. upgrade (40 intersect.) - Vancouver	\$45,000.00
VG - VANCOUVER	20045086	Implem - Highly Reflective Pavement Markings (Mariner Way) - Coquitlam	\$25,000.00
VG - VANCOUVER	20045091	Implem-Street signs visibility upgrade phase 1 (25 inters) - Vancouver	\$25,000.00
VG - VANCOUVER	20045095	Implem - Cyclist activation buttons at 12 intersections - Vancouver	\$24,000.00
VG - VANCOUVER	20045131	Implem - Crash barriers - Marine Dr @ Knight Bridge on-ramp -Vancouver	\$38,000.00
VG - WEST VANCOUVER	20048004	Implem - MoT - Lions Gate Cyclist Improvments - West Vancouver	\$12,000.00
VICTORIA	20045031	Implem - Traffic Calming - Chambers St. - Victoria	\$20,000.00
VICTORIA	20045104	Implem - Bike Lane Installation - Finlayson St - Victoria	\$10,000.00
VICTORIA	20045105	Implem - Xing for cyclists at railway tracks - Esquimalt Rd - Victoria	\$5,000.00
VICTORIA	20045106	Implem - New sidewalks 3 intersections - Hollywood Crescent - Victoria	\$5,000.00
VICTORIA	20045107	Implem - Left-turn lanes - Quadra & Finlayson - Victoria	\$17,700.00
WILLIAMS LAKE	20038075	Implem - MoT - Wildlife reflectors Hwy 97 - Williams Lake	\$4,700.00
WILLIAMS LAKE	20048031	Implem - MoT - Rumble Strips - Hinsche Rd to Hwy 20 - Williams Lake	\$16,000.00
WILLIAMS LAKE	20048033	Implem - MoT - Inlaid Pvmt Mkgs- Hwy 20 & Mackenzie Ave- Williams Lake	\$11,100.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
WILLIAMS LAKE	20048034	Implem - MoT - Inlaid pvmt markings - Hwy 97 & Hwy 20 - Williams Lake	\$9,100.00



2007.1 RR IBC.66.2 – Attachment C – 2005 Road Improvement Projects

2005 Road Improvement Projects

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
100 MILE HOUSE	20058047	Implem - MoT - Install Median Barrier-Hwy 97 @ 103 Mile-100 Mile House	\$56,600.00
100 MILE HOUSE	20058049	Implem - MoT - S-Curve Realignment - Hwy 24 - 100 Mile House	\$12,500.00
100 MILE HOUSE	20058055	Implem - MoT - Improve Pedestrian Facility - Hwy 927 - 100 Mile House	\$4,000.00
70 MILE HOUSE	20058054	Implem - MoT - Improved Delineation - Highway 97 - 70 Mile House	\$4,000.00
ABBOTSFORD	20055047	Implem - Curb extensions at 9 locations - Riverside St - Abbotsford	\$20,000.00
ABBOTSFORD	20055048	Implem-One-way conversion-West Railway (Hazel to Essendene)-Abbotsford	\$21,000.00
ABBOTSFORD	20055049	Implem - Realignment - S Fraser Way (E of Mt Lehman Rd) - Abbotsford	\$68,000.00
ABBOTSFORD	20055050	Implem - Intersection Improvements - N Parallel/Whatcom - Abbotsford	\$30,000.00
ABBOTSFORD	20055051	Implem - Road widening & curve flat. - McKee Rd - Abbotsford	\$3,000.00
ABBOTSFORD	20055052	Implem - Curb Extensions - S Fraser Way/Montvue - Abbotsford	\$8,000.00
ABBOTSFORD	20058067	Implem - MoT - Improve Interchange Ramp - TCH & Hwy 11 - Abbotsford	\$92,600.00
AGASSIZ	20058028	Implem -MoT- Delineation, pavmnt markg, etc.- Hwy 9 @ Whelpton-Agassiz	\$21,900.00
ASHCROFT	20058014	Implem - MoT - Sign Upgrading - Highway 97C - Ashcroft	\$35,000.00
BARRIERE	20058066	Implem - MoT - Sign Upgrades - Highway 5 - Barrier to Jasper	\$40,000.00
CAMPBELL RIVER	20055109	Implem - Install 7 school Xwalks-elem school Cheviot Rd-Campbell River	\$8,000.00
CASTLEGAR	20055044	Implem - Signal Head Upgrade - Columbia Ave/3rd St - Castlegar	\$12,000.00
CHILLIWACK	20055035	Implem - 4-way stop installation - Prest/Teskey/Bailey - Chilliwack	\$4,000.00
CHILLIWACK	20055078	Implem - Road Widening - Young Rd (Railway to 1st Ave) - Chilliwack	\$20,000.00
CHILLIWACK	20055079	Implem - Road widening - Majuba Hill Rd (Railway to Nikada)-Chilliwack	\$2,500.00
CHRISTINA LAKE	20058005	Implem - MoT - Centreline Delineation - Hwy 3 - Christina Lake	\$4,500.00
CLINTON	20058015	Implem - MoT - Pavement Markings - Highway 97C - Clinton	\$40,000.00
CLINTON	20058053	Implem - MoT - Pavement Marking & Parking - Hwy 97 - Clinton	\$5,000.00
CRANBROOK	20055034	Implem - Year 1 of 4 - Stop Sign Upgrade (area-wide) - Cranbrook	\$7,500.00
CRANBROOK	20058058	Implem - MoT - Intersect. Upgrade & Wards Bridge - Hwy 3 - Cranbrook	\$23,300.00
DAWSON CREEK	20058038	Implem - MoT - Signing/delineation/etc - Hwy 2 & 116 Ave -Dawson Creek	\$22,200.00
DAWSON CREEK	20058039	Implem-MoT-Signing/delineation/etc-Hwy 97 danger gds Rte 94-Dawson Crk	\$45,000.00
DAWSON CREEK	20058041	Implem - MoT - delin/pave mkg/etc -Hwy 97 & Tower Lake Rd-Dawson Creek	\$17,500.00
DAWSON CREEK	20058050	Implem - MoT - Misc. Improvements - Highway 49 - Dawson Creek	\$62,200.00
DAWSON CREEK	20058051	Implem - MoT - Rail Xing Improvements - Hwy 2 at CN Xing -Dawson Creek	\$13,400.00
DAWSON CREEK	20058065	Implem-MoT-Reconstruct Inters/L-T slot-Hwy 97/Bessborough-Dawson Creek	\$18,800.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
DUNCAN	20055007	Implem - Visibility & Safety Improvements - Trunk Rd Corridor - Duncan	\$25,000.00
DUNCAN	20058001	Implem - MoT - Left-turn Phase Install - Cobble Hill Rd & TCH - Duncan	\$12,500.00
DUNCAN	20058073	Implem - MoT - NB left-turn phase - TCH & Koksilah - Duncan	\$14,000.00
FALKLAND	20058069	Implem - MoT - SB passing lane - Hwy 97 Lynes Rd - Falkland	\$56,600.00
FORT NELSON	20055115	Implem - Replace 152 traffic control signs - area-wide - Fort Nelson	\$7,000.00
FORT ST. JAMES	20058035	Implem - MoT-RI's bridge approaches at Hwy 28 & Sowchea- Fort St James	\$13,900.00
FORT ST. JAMES	20058037	Implem - MoT - Improve sight distance etc -Hwy 97/Todd Rd -Ft St James	\$14,900.00
FORT ST. JOHN	20058064	Implem - MoT - 4-laning, turning bays - Hwy 97 Arterial - Fort St. John	\$99,200.00
FORT ST. JOHN	20058074	Implem-MoT-Modern Roundabout-Airport Rd @ Swanson Lumber Rd-Ft St John	\$10,500.00
GIBSONS	20055037	Implem - Area-wide Sign Visibility Upgrade - Gibsons	\$882.00
HARRISON HOT SPRINGS	20058045	Implem - MoT -110 post-mounted delineators -Hwy 9- Harrison Hot Springs	\$6,600.00
HAZELTON/NEW HAZELTON	20058019	Implem - MoT - Enhanced Delineation - Highway 16 - Hazelton	\$26,800.00
HOPE	20058056	Implem - MoT - Revitalizing the Old Hope-Princeton Way (Hwy 915) -Hope	\$93,800.00
HOUSTON	20058020	Implem - MoT - Enhanced Delineation - Highway 16 - Houston/Burns Lake	\$16,600.00
HOUSTON	20058033	Implem -MoT-sign/delineation/pvmt mkg etc-Hwy 16/Maurice River-Houston	\$25,900.00
HOUSTON	20058063	Implem - MoT -Left-turn slot & lighting -Hwy 16 at Morgan Rd - Houston	\$20,700.00
KAMLOOPS	20055054	Implem - 125 Diamond Grade Stop Signs - various locations - Kamloops	\$4,000.00
KAMLOOPS	20055055	Implem - Larger signal heads - Fortune Dr/Sydney Ave - Kamloops	\$36,000.00
KAMLOOPS	20055056	Implem - New traffic signal - Halston Ave/12th St - Kamloops	\$16,000.00
KAMLOOPS	20055057	Implem - Larger signal heads - Pacific Way/Hillside Dr - Kamloops	\$3,000.00
KAMLOOPS	20055058	Implem - Intersection Improve. - Pacific Way/Howe Rd - Kamloops	\$6,000.00
KAMLOOPS	20055097	Implem - Signal Head Upgrades - Fortune Dr & Tranquille Rd - Kamloops	\$18,500.00
KAMLOOPS	20055156	Implem - Corridor Improvements - Valleyview Dr - Kamloops	\$1,500.00
KAMLOOPS	20058025	Implem-MoT-Impr med. treat./install att.-Hwy 5 Yellowhead Br- Kamloops	\$35,400.00
KAMLOOPS	20058027	Implem - MoT - Centreline Delineation - Hwy 1 - Kamloops	\$186,500.00
KAMLOOPS	20058044	Implem - MoT - Rumble Strips - Hwy 5 - Kamloops	\$95,000.00
KAMLOOPS	20058052	Implem - MoT - Pavement Marking & Delineation - Hwy 5 - Kamloops	\$20,000.00
KASLO	20058048	Implem - MoT - Lost Ledge Retaining Wall - Hwy 31 - Kaslo	\$1,700.00
KELOWNA	20055009	Implem - Intersection improvements (KLO Rd & Benvoulin Rd) - Kelowna	\$55,000.00
KELOWNA	20055010	Implem - Corridor Improve. (Rutland - McCurdy to Rains) - Kelowna	\$34,000.00
KELOWNA	20055015	Implem - Rd Diversion Benvoulin Rd from Cooper - Springfield - Kelowna	\$230,000.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
KELOWNA	20055016	Implem - Curve delineation Valley Rd - Kelowna	\$9,000.00
KELOWNA	20055026	Implem - Curve Delineation - Sexsmith Rd - Kelowna	\$4,000.00
KELOWNA	20055068	Implem - Modern Roundabout - Burtch Rd/Guisachan Rd/Byrns Rd - Kelowna	\$55,000.00
KELOWNA	20055111	Implem - Corridor Improve-Springfield Rd (Monterey to Rutland)-Kelowna	\$10,000.00
KELOWNA	20055124	Implem - E/B & W/B left-turn signals - Hwy 33 & Hollywood Rd - Kelowna	\$2,834.00
KELOWNA	20055171	Implem - Solar powered Xwalk - Springfield Rd & Wilkinson Rd - Kelowna	\$3,000.00
KELOWNA	20055172	Implem - Solar powered crosswalk - Gordon Drive & Cameron Rd - Kelowna	\$4,000.00
KELOWNA	20055173	Implem-4-leg intersect/rd realign-Gordon/Clement & Gordon/High-Kelowna	\$60,000.00
KIMBERLEY	20055036	Implem - Area-wide sign visibility upgrade (year 2 of 3) - Kimberley	\$6,481.02
KITIMAT	20055096	Implem - Replace 126 Stop Signs - area-wide - Kitimat	\$8,000.00
KITIMAT	20058018	Implem - MoT - Enhanced Delineation - Highway 37 - Kitimat	\$12,000.00
KITWANGA AREA	20058036	Implem-MoT-Shoulder widening etc-Hwy 37 Hodder Lake-Bob Quinn-Kitwanga	\$35,300.00
LAC LA HACHE	20058031	Implem - MoT - Shoulder & median rumble strips - Hwy 97 - Lac La Hache	\$38,100.00
LAC LA HACHE	20058059	Implem -MoT-Realignment/passing lane, etc-Hwy 97 Doyle Rd-Lac La Hache	\$55,100.00
LAKE COUNTRY	20058068	Implem - MoT - L-T Channelization - Hwy 97 & Ponderosa - Lake Country	\$65,600.00
LYTTON	20058062	Implem - MoT -Left-turn slot, etc -Hwy 1 Lytton Airport Access -Lytton	\$12,500.00
MCBRIDE	20058016	Implem - MoT - Enhanced Delineation - Highway 16 - McBride	\$16,700.00
MERRITT	20058030	Implem - MoT - Shoulder & median rumble strips - Highway 5 - Merritt	\$16,200.00
MISSION	20055033	Implem - Area-wide Enhance Curve Delineation - Mission	\$21,000.00
MISSION	20058002	Implem - MoT - Median barrier & imp. delineation - Hwy 11 - Mission	\$46,600.00
MISSION	20058057	Implem - MoT-Intersect Improve-Hwy 7 (285-Silverdale & McLean)-Mission	\$89,300.00
NANAIMO	20055040	Implem - Enh Curve Del - Bruce/10th, Cedar/Jingle Pot at 3rd - Nanaimo	\$8,000.00
NANAIMO	20055041	Implem - new Xwalk with flashers - Bowen & Pine - Nanaimo	\$8,000.00
NANAIMO	20055042	Implem - Replace all RA-r signs (area-wide) - Nanaimo	\$11,877.00
NANAIMO	20055043	Implem - Safety Measures - Bowen & Wakesiah - Nanaimo	\$4,768.00
NANAIMO	20055135	Implem - Install Ped. Xwalk - Departure Bay & Brooks Landing - Nanaimo	\$4,500.00
NANAIMO	20055136	Implem - Geometric changes to intersect. Wallace & Franklyn - Nanaimo	\$4,500.00
NANAIMO	20055137	Implem - New Traffic Signal - Milton St & Victoria Rd - Nanaimo	\$25,000.00
NANAIMO	20055138	Implem -Geometric changes intersection Terminal & St. George - Nanaimo	\$9,000.00
NANAIMO	20055139	Implem - Geometric changes Uplands Dr & Hammond Bay Rd - Nanaimo	\$60,000.00
NELSON	20058007	Implem - MoT - Centreline Delineation - Hwy 3A - Nelson	\$10,200.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
NELSON	20058029	Implem - MoT - Improved signal, signing, etc - Hwy 3A - Nelson	\$52,100.00
NEW WESTMINSTER	20055162	Implem -Corner bulges/signal upgrades-Royal & 6th St- New Westminster	\$40,000.00
NEW WESTMINSTER	20055163	Implem - New Xwalk - Hospital St & E Columbia Ave - New Westminster	\$25,000.00
NORTH COWICHAN	20055024	Implem - Roundabout (Chemainus & Henry Rds) - North Cowichan	\$20,000.00
NORTH COWICHAN	20055032	Implem - Modern Roundabout - Chemainus & Henry Rds - North Cowichan	\$20,000.00
NORTH COWICHAN	20055067	Implem - Modern Roundabout - Lakes Rd & Beverley Rd - North Cowichan	\$105,000.00
NORTH COWICHAN	20055180	Implem -Ped sidewalks & widen Howard Ave for parking lanes -N Cowichan	\$13,000.00
NORTH SAANICH	20055110	Implem - Modern Roundabout - Willington & E Saanich Rds- North Saanich	\$85,000.00
OAK BAY	20055119	Implem - Ped contr xwalk lights - Foul Bay Rd & Haultain St - Oak Bay	\$12,000.00
PARKSVILLE	20055006	Implem - Sign Visibility Upgrade (423 signs) - Parksville	\$21,000.00
PARKSVILLE	20055070	Implem - Advance E/W left-turn phase - Pym St & Hwy 19A - Parksville	\$10,000.00
PARKSVILLE	20055071	Implem - Advance W/B left-turn phase - McMillan/Hwy 19A - Parksville	\$12,000.00
PARKSVILLE	20055072	Implem - Pedestrian indicators - 4 intersections - Parksville	\$20,000.00
PEACE ARCH	20058072	Implem -MoT-Widening & geometric-8 Ave (Hwy 914, 99 & 15) - Peace Arch	\$93,800.00
PENTICTON	20055017	Implem - Relocate fire hydrant Main Street - Penticton	\$4,000.00
PENTICTON	20055060	Implem - New traffic signal - Atkinson St/Industrial Ave W - Penticton	\$41,000.00
PORT CLEMENTS	20058034	Implem - MoT - Lane/shoulder widening, etc - Hwy 16 - Port Clements	\$50,000.00
POWELL RIVER	20055002	Implem - Areawide stop sign upgrade (yr 3) - Powell River	\$5,500.00
PRINCE GEORGE	20055059	Implem - Stop Sign Upgrade (year 4 of 4) - Prince George	\$24,000.00
PRINCE GEORGE	20055075	Implem -Cyclist & Ped. Pathway- Hwy 16 (Cemetery Trail) -Prince George	\$54,000.00
PRINCE GEORGE	20055076	Implem - Cyclist & Ped. Pathway - Hwy 97 (Hart Trail) - Prince George	\$35,000.00
PRINCE GEORGE	20055077	Implem - Ped. Signal Upgrade - Lansdowne Rd/Ferry Ave - Prince George	\$7,000.00
PRINCE GEORGE	20055123	Implem - Delineate 2.0 metre bicycle lane - Ferry Ave - Prince George	\$5,000.00
PRINCE GEORGE	20058017	Implem - MoT - Enhanced Delineation - Highway 97 - Prince George	\$23,200.00
PRINCE GEORGE	20058022	Implem - MoT - Enhanced Delineation - Highway 16 - Prince George area	\$24,500.00
PRINCE GEORGE	20058032	Implem - MoT-Shoulder widening, etc.-Hwy 97 Redrock Overpass-Pr George	\$25,000.00
PRINCE GEORGE	20058040	Implem - MoT - Sign/del/pavement/etc - Hwy 16 & Jensen - Prince George	\$17,000.00
PRINCE RUPERT	20055098	Implem - Intersect. Improve. - McBride St & 3rd Ave - Prince Rupert	\$10,000.00
PRINCE RUPERT	20055187	Implem - Upgrade 111 signs - Lax Kw' Alaams Band - Prince Rupert Area	\$10,000.00
PRINCE RUPERT	20058009	Implem - MoT - Improved Delineation/Signing - Hwy 16 - Prince Rupert	\$35,600.00
PRINCE RUPERT	20058026	Implem - MoT - Improve pedestrian facilities - Hwy 16 - Prince Rupert	\$71,200.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
QUESNEL	20058061	Implem - MoT - NB left-turn slot & SB decel lane - Hwy 97 - Quesnel	\$6,900.00
ROCK CREEK	20058003	Implem - MoT - Centreline Delineation - Hwy. 3 - Rock Creek	\$12,400.00
ROSSLAND	20058004	Implem - MoT - Centreline Delineation - Hwy 3B - Rossland/Trail	\$6,300.00
SAANICH	20055001	Implem - Install left-turn lane, etc (Royal Oak&W Saanich Rd) -Saanich	\$40,000.00
SAANICH	20055142	Implem - Signal head upgrade, lane reconf, etc -West Burnside -Saanich	\$70,000.00
SAANICH	20055143	Implem - Intersection Improve. - Glanford & Vanalman - Saanich	\$50,000.00
SAANICH	20055144	Implem - Left-turn lanes - Prospect Lake Rd & W Saanich Rd - Saanich	\$18,000.00
SAANICH	20055145	Implem-Install signal/left-turn lane-Cedar Hill Cross & Epsom- Saanich	\$50,000.00
SAANICH	20055146	Implem - Signal Visibility Upgrade - McKenzie Corridor 3 loc.-Saanich	\$34,000.00
SAANICH	20055147	Implem - Install new traffic signal - Quadra & Beckwith - Saanich	\$45,000.00
SAANICH	20055148	Implem - Corridor Improvements - McKenzie Corridor - Saanich	\$10,000.00
SAANICH	20055188	Implem - Upgrade ped. Xwalk - Royal Oak & Amblewood - Saanich	\$9,000.00
SALMO	20058008	Implem - MoT - Centreline Delineation - Hwy 6 - Salmo/Ymir	\$9,200.00
SALMON ARM	20055069	Implem - Construction Zone Traffic Warning Signs-Area Wide -Salmon Arm	\$3,200.00
SECHELT	20055157	Implem - Portable Speed Bumps - Sunshine Coast Reg District - Sechelt	\$1,284.00
SUMMERLAND	20058070	Implem-MoT-4-laning/curve del.-Hwy 97/Okanagan Lake Park -Summerland	\$94,800.00
TOFINO	20055183	Implem - Upgrade 136 traffic signs (area-wide) - Tofino	\$6,800.00
TRAIL	20058006	Implem - MoT - Centreline Delineation - Hwy 3B - Trail/Waneta	\$2,100.00
TRAIL	20058013	Implem - MoT - Shoulder Rumble Strips - Hwy 22 - Trail/Castlegar	\$40,000.00
TRAIL	20058042	Implem - MoT - Del/pvmt mkg etc - Hwy 3B (Trail to Fruitvale) - Trail	\$40,800.00
TSAWWASSEN	20055159	Implem - Dynamic message sign - Approach to BC Ferries - Tsawwassen	\$35,300.00
TSAWWASSEN	20058023	Implem - BC Ferries - Dynamic Message Sign - Highway 17 - Tsawwassen	\$35,300.00
VANDERHOOF	20058021	Implem - MoT - Enhanced Delineation - Highway 16 - Vanderhoof to Pr Geo	\$19,700.00
VERNON	20055064	Implem - New Traffic Signal - 43th Ave/29th St - Vernon	\$11,000.00
VERNON	20055065	Implem - W/B left-turn lane - 25th St/39th Ave - Vernon	\$7,500.00
VERNON	20055066	Implem - E/B left-turn signal - 27th St/30th Ave - Vernon	\$4,000.00
VERNON	20055112	Implem - Signal Progression - 27th St & 48th Ave - Vernon	\$20,000.00
VERNON	20055113	Implem - Reprofilng - North leg of Hwy 6 & 15 St - Vernon	\$20,000.00
VERNON	20055114	Implem -Install 2nd S/B left-turn lane north leg -Hwy 6 & 27 St-Vernon	\$8,000.00
VERNON	20055155	Implem - Area-wide improve. Re older drivers & ped. - Vernon	\$51,600.00
VG - BURNABY	20055018	Implem - 53 Stop Signs - Burnaby	\$4,500.00
VG - BURNABY	20055025	Implem - Area-wide Stop Sign In-fill (53 stop signs) - Burnaby	\$4,500.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
VG - BURNABY	20055182	Implem - Roadside concrete barrier - Inlet Dr (Barnet-Bayview)-Burnaby	\$37,500.00
VG - COQUITLAM	20055125	Implem - Various Safety Improvements - Como Lake Ave. - Coquitlam	\$24,000.00
VG - COQUITLAM	20055126	Implem - Install Pedestrian Signal - Como Lake & Custer Cr- Coquitlam	\$25,000.00
VG - COQUITLAM	20055127	Implem -Anti-skid pave. surfacing - Dawes Hill Rd (1800 Blk)-Coquitlam	\$10,000.00
VG - COQUITLAM	20055128	Implem - Anti-skid pavemt surfacing - Decaire St (300 Blk) - Coquitlam	\$18,000.00
VG - COQUITLAM	20055129	Implem - Area-wide highly reflective pavement markings - Coquitlam	\$50,000.00
VG - COQUITLAM	20055130	Implem - Larger LED signal heads - Lougheed & Brunette - Coquitlam	\$30,000.00
VG - COQUITLAM	20055131	Implem - Uninterrupted Power Signal - Lougheed Highway - Coquitlam	\$10,500.00
VG - COQUITLAM	20055132	Implem - Install area-wide pedestrian crosswalks - Coquitlam	\$38,000.00
VG - COQUITLAM	20055133	Implem - Install left-turn lanes - Austin Rd & Schoolhouse - Coquitlam	\$65,000.00
VG - COQUITLAM	20055134	Implem - New Traffic Signal - Johnson St & Delahaye Dr - Coquitlam	\$45,000.00
VG - COQUITLAM	20055149	Implem - Corridor Improve - Lougheed Hwy & Brunette Ave - Coquitlam	\$250,000.00
VG - COQUITLAM	20055150	Implem - Area-wide (13 locations) Signal Visibility Upgrade -Coquitlam	\$242,000.00
VG - DELTA	20055014	Implem - Roundabout at 82 Ave & 116 St - Delta	\$56,100.00
VG - DELTA	20055122	Implem - Hi Refl. Pavement Markings - Nordel Way (116 to 84) - Delta	\$30,000.00
VG - DELTA	20055160	Implem - Curb extensions/raised median-116th St (72 to Nordel) - Delta	\$91,600.00
VG - DELTA	20055161	Implem-Median/ped. signal etc-Kittson Parkway (McKenzie/Summit)- Delta	\$6,200.00
VG - LANGLEY TOWNSHIP OF	20055080	Implem - E/B Primary Overhead Signal - 200th Street - Langley Township	\$63,000.00
VG - LANGLEY TOWNSHIP OF	20055081	Implem-lines/tertiary signal head etc-Fraser Hwy-215 to 217-Langley T.	\$18,000.00
VG - LANGLEY TOWNSHIP OF	20055082	Implem - Intersection improve. - Fraser Hwy & 232 St - Langley Township	\$10,000.00
VG - LANGLEY TOWNSHIP OF	20055095	Implem - Corridor Improve.-200th St (40 Ave to 42 Ave)- Langley Township	\$20,000.00
VG - LANGLEY TOWNSHIP OF	20055116	Implem - Road widening/bike lane- Fraser Hwy (117 to 222)-Langley Town	\$10,000.00
VG - LANGLEY TOWNSHIP OF	20055117	Implem - Road widening, etc - 203 St (64 to 66 Ave) - Langley Township	\$5,000.00
VG - MAPLE RIDGE	20055073	Implem - W/B left-turn lane - Dewdney Trunk & 207 St - Maple Ridge	\$10,000.00
VG - MAPLE RIDGE	20055074	Implem -Illuminated street name signs-Dewdney Trunk/Laity -Maple Ridge	\$5,500.00
VG - MAPLE RIDGE	20055083	Implem - sidewalk & bike lane Ph. 2 - 232nd St Bridge - Maple Ridge	\$25,000.00
VG - MAPLE RIDGE	20055084	Implem - Signal Coordination - Dewdney Trunk Road - Maple Ridge	\$7,500.00
VG - MAPLE RIDGE	20055085	Implem - New Traffic Signal - 240 St & 104 Ave - Maple Ridge	\$30,000.00
VG - MAPLE RIDGE	20055086	Implem - New Traffic Signal - 232 St & Abrenethy Way - Maple Ridge	\$30,000.00
VG - MAPLE RIDGE	20055087	Implem - Relocate Utility Poles-Dewdney Trunk at 227 & 228-Maple Ridge	\$45,000.00
VG - MAPLE RIDGE	20055169	Implem - Sidewalk installation-230 St (N of Dewdney Trunk)-Maple Ridge	\$15,000.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
VG - MAPLE RIDGE	20055170	Implem - Pedestrian Crosswalk - 232nd St & 128th Ave - Maple Ridge	\$20,000.00
VG - NORTH VAN CITY	20055023	Implem - Corridor Improv. (Lonsdale Avenue) - North Van City	\$100,000.00
VG - NORTH VAN CITY	20055031	Implem - Corridor Improvements - Lonsdale Ave - North Van City	\$100,000.00
VG - NORTH VAN CITY	20055099	Implem - Pedestrian Safety Improve.-Lonsdale Ave & 4 St-North Van City	\$15,000.00
VG - NORTH VAN CITY	20055100	Implem - Pedestrian Safety Improve. -Chesterfield & 16 - North Van City	\$30,000.00
VG - NORTH VAN CITY	20055101	Implem - Pedestrian Safety - 100 Block E 13 St - North Van City	\$4,000.00
VG - NORTH VAN CITY	20055102	Implem - Bike lanes - Cotton Rd (Brooksbank to Mtn Hwy)-North Van City	\$20,000.00
VG - NORTH VAN CITY	20055103	Implem - Pedestrian Safety - Hendry & Keith - North Van City	\$15,000.00
VG - NORTH VAN CITY	20055104	Implem - Pedestrian Safety - Lonsdale & E. Keith - North Van City	\$35,000.00
VG - NORTH VAN CITY	20058046	Implem - MoT - Signal Progression - Hwy 1 & Lonsdale - North Van City	\$25,000.00
VG - NORTH VAN DIST	20055004	Implem -Safety Meas (Marine Dr & Capilano Rd)-Phase 3 - North Van Dist	\$55,000.00
VG - NORTH VAN DIST	20055105	Implem - Corner Bulges & Special Xwalk -W Keith & 19 St-North Van Dist	\$8,000.00
VG - NORTH VAN DIST	20055106	Implem - Traffic Signal - Ross Rd & Mountain Hwy - North Van Dist	\$50,000.00
VG - NORTH VAN DIST	20055165	Implem - Close access to highway - Duchess Ave - North Van Dist	\$10,000.00
VG - NORTH VAN DIST	20055166	Implem - New pedestrian signal - Mountain Hwy & Emery - North Van Dist	\$25,000.00
VG - NORTH VAN DIST	20055167	Implem - Signal progression - Lynn Valley Rd - North Van Dist	\$16,000.00
VG - NORTH VAN DIST	20055168	Implem - Portable traffic calming signs -area-wide - North Van Dist	\$5,000.00
VG - NORTH VAN DIST	20055181	Implem -Upgrade ped. Xwalk-Lynn Valley Rd & Harold Rd - North Van Dist	\$3,500.00
VG - NORTH VAN DIST	20055184	Implem- Corner bulges/upgrade Xwalk-Queens/Will Griffin-North Van Dist	\$8,000.00
VG - PITT MEADOWS	20055021	Implem - Inters. Imp. (Harris & Hammond Rds) - Pitt Meadows	\$4,000.00
VG - PITT MEADOWS	20055022	Implem - Inters. Improvements (Harris/Dewdney Trunk Rds) -Pitt Meadows	\$46,000.00
VG - PITT MEADOWS	20055029	Implem - extension of island, etc. - Harris Rd - Pitt Meadows	\$4,000.00
VG - PITT MEADOWS	20055030	Implem - Lighting/markings/signs, etc-Harris/Dewdney Trunk-Pitt Meadows	\$46,000.00
VG - PITT MEADOWS	20055038	Implem - Replace 112 Stop Signs - Pitt Meadows	\$5,400.00
VG - PORT COQUITLAM	20055121	Implem - High reflect. pavement mkgs - Pitt River Rd - Port Coquitlam	\$20,000.00
VG - PORT MOODY	20055008	Implem - Area-wide Signal Visibility Upgrade - Port Moody	\$7,000.00
VG - PORT MOODY	20055039	Implem - Xwalk safety improve- loco Rd & Heritage Mtn Rd - Port Moody	\$5,000.00
VG - RICHMOND	20055003	Implem - Area-wide signal head upgrade - Richmond	\$130,000.00
VG - RICHMOND	20055045	Implem - Volume/Density Signal Improve. - 25 intersections - Richmond	\$75,000.00
VG - RICHMOND	20055088	Implem - Install Special Crosswalk - #1 Rd/Springfield Dr - Richmond	\$2,000.00
VG - RICHMOND	20055089	Implem -Install Special Crosswalk-Garden City Rd & Bennett Rd-Richmond	\$1,000.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
VG - RICHMOND	20055093	Implem - Intersection Improve. - Steveston Hwy & No 5 Rd - Richmond	\$9,000.00
VG - SURREY	20055011	Implem - 128th Street Road widening (64 Ave to Hwy 10) - Surrey	\$77,500.00
VG - SURREY	20055012	Implem - Left-turn Bays (32nd Ave & 184th St) - Surrey	\$9,000.00
VG - SURREY	20055013	Implem - Wireless communication on 16th Ave. - Surrey	\$20,000.00
VG - SURREY	20055046	Implem - Primary Signal Head Upgrades (various location) - Surrey	\$20,000.00
VG - SURREY	20055053	Implem - Traffic Signal - Fraser Hwy/84th Ave - Surrey	\$75,000.00
VG - SURREY	20055061	Implem - Corridor Improvements - Fraser Hwy (160 to 164) - Surrey	\$250,000.00
VG - SURREY	20055062	Implem - Corridor Improvements - Fraser Hwy (164 to 168) - Surrey	\$150,000.00
VG - SURREY	20055063	Implem - 2-way left-turn centre lane - 84 Ave (160 to Fraser) - Surrey	\$125,000.00
VG - SURREY	20055107	Implem - New Traffic Signal - 16 Ave & 168 St - Surrey	\$30,000.00
VG - SURREY	20055108	Implem - Corridor Improvements - 64th Avenue - Surrey	\$100,000.00
VG - SURREY	20055174	Implem - New traffic signal - 75th Avenue & 121-A Street - Surrey	\$6,000.00
VG - SURREY	20055175	Implem - Raised Median - 152nd St & 40th Ave - Surrey	\$20,000.00
VG - SURREY	20055176	Implem - Raised Median - King George Hwy & 78th Ave - Surrey	\$2,500.00
VG - SURREY	20055177	Implem - Raised Median - 132nd St (68th Ave to 72nd Ave) - Surrey	\$6,000.00
VG - SURREY	20055178	Implem - Widening 168th St to a 5-lane divided arterial - Surrey	\$70,000.00
VG - SURREY	20055186	Implem - Road widening - 88 Ave (124 to 128 St) - Surrey	\$100,000.00
VG - VANCOUVER	20055019	Implem - left-turn arrows (6 intersections) - Vancouver	\$245,000.00
VG - VANCOUVER	20055027	Implem - Left-turn arrows/ larger LED lens-6 intersections - Vancouver	\$245,000.00
VG - VANCOUVER	20055120	Implem - New Crosswalks - Norquay St & Slocan St - Vancouver	\$4,500.00
VG - VANCOUVER	20055141	Implem - New pedestrian signals (10 locations) - Vancouver	\$209,000.00
VG - VANCOUVER	20055151	Implem - Geometric Changes - Kingsway & Clark Dr. - Vancouver	\$24,000.00
VG - VANCOUVER	20055152	Implem - Install Median -King Edwad (Kingsway to Dumfries) - Vancouver	\$40,000.00
VG - VANCOUVER	20055153	Implem - Install Pedestrian Xwalk - Kingsway & Dumfries - Vancouver	\$24,000.00
VG - VANCOUVER	20055154	Implem - Install Median - Kingsway (Inverness to Perry) - Vancouver	\$95,000.00
VG - VANCOUVER	20055158	Implem - Left-turn Lane - Clark & E 6th - Vancouver	\$115,000.00
VG - VANCOUVER	20055179	Implem - Area-wide Stop Sign In-fill Program - Vancouver	\$37,600.00
VG - WEST VANCOUVER	20055164	Implem - Curve Del. Signs/reflectors - Westport Rd - West Vancouver	\$10,000.00
VICTORIA	20055005	Implem - Street Widening Caledonia St - Victoria	\$5,000.00
VICTORIA	20058010	Implem - MoT - Centreline Delineation - Highway 17 - Victoria	\$26,250.00
VICTORIA	20058011	Implem - MoT - Centreline Delineation - Highway 14 - Victoria	\$11,100.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
VICTORIA	20058012	Implem - MoT - Centreline Delineation - Highway 1 - Victoria	\$22,700.00
VIEW ROYAL	20055185	Implem - Replace 299 traffic signs - area-wide - View Royal	\$6,000.00
WILLIAMS LAKE	20055020	Implem - Signal Head Upgrade (Oliver at 2nd/3rd Aves.) - Williams Lake	\$13,000.00
WILLIAMS LAKE	20055028	Implem - Signal Head Upgrade - Oliver at 2nd & 3rd - Williams Lake	\$13,000.00
WILLIAMS LAKE	20055118	Implem - Solar Powered FI Ped Xwalks - 3 intersections - Williams Lake	\$6,000.00
WILLIAMS LAKE	20058043	Implem - MoT - Signing/delineation - Hwy 97 - Williams Lake	\$18,300.00
WILLIAMS LAKE	20058060	Implem-MoT-4-laning & extend pass/climbing lanes-Hwy 97-Williams Lake	\$23,300.00
YAHK	20058071	Implem-MoT-I/S access mgmt & channelization-Hwy 3/95 Weigh Scale -Yahk	\$18,800.00



2007.1 RR IBC.66.2 – Attachment D – 2006 Road Improvement Projects

2006 Road Improvement Projects

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
ABBOTSFORD	20065018	Signal Head Upgrade -(George Ferguson Way & Montrose Ave) - Abbotsford	\$5,000.00
ABBOTSFORD	20065023	Install flash. O/H beacon (Bradner Rd & Townshipline Rd) - Abbotsford	\$21,000.00
ABBOTSFORD	20065025	L/T & R/T lanes & improve turning radii (Vye & Rverside) - Abbotsford	\$60,000.00
ABBOTSFORD	20065026	Improve curve alignment & geometrics (Whatcom Road) - Abbotsford	\$5,000.00
ABBOTSFORD	20065027	Road widening, improve geometrics & L/T lane (McCallum Rd) - Abbotsford	\$66,000.00
ABBOTSFORD	20065155	Upgrade traffic signal heads, Gladwin & Hillcrest Ave - Abbotsford	\$2,000.00
ABBOTSFORD	20065156	Upgrade traffic signal heads, S. Fraser Way & Ware St - Abbotsford	\$13,000.00
ABBOTSFORD	20065157	Upgrade traffic signal heads, Old Yale Rd & McMillan - Abbotsford	\$12,000.00
ABBOTSFORD	20065158	Upgrade traffic signal heads, Peardonville Rd & Townline Rd - Abbotsford	\$9,000.00
ABBOTSFORD	20065159	Upgrad traffic signal heads, S. Fraser Way & Bourquin Cr W - Abbotsford	\$6,000.00
ALBERT CANYON	20068051	Centreline rumble strips & pavement markings, Hwy 1 - Albert Canyon	\$13,700.00
ARMSTRONG	20065132	Solar power ped Xwalks, Pleasand Valley @ Patten & Rosedale -Armstrong	\$5,000.00
BALFOUR	20068049	Signing & Delineation, Hwy 33 & Hwy 31 - Westbridge & Balfour	\$3,200.00
BARRIERE	20068057	Centreline rumble strips & pavement markings, Hwy 5 - Barriere	\$41,200.00
BARRIERE	20068070	Improve sight distance, l/t slot, etc - Hwy 5 @ Agate Bay Rd - Barriere	\$23,700.00
BARRIERE	20068071	Left-turn slot & realignment - Hwy 5 @ Boulder Mountain - Barriere	\$18,200.00
BARRIERE	20068088	Imp. sight dist., add L/T slot & imp. align., Hwy 5 at Agate - Barriere	\$23,700.00
BARRIERE	20068089	Left turn slot & realignment, Hwy 5 at Boulder Mountain - Barriere	\$18,200.00
BOSTON BAR	20068015	Webb Cameras Installation - Hwy 1 at Jackass Mountain - Bostan Bar	\$17,600.00
BOSTON BAR	20068030	Signing & Delineation - Hwy 1, Tunnels - Boston Bar	\$14,600.00
BRITANNIA BEACH	20068072	Road widen. 2 lanes, passg opps with 3 & lanes-Hwy 99 - Britannia Beach	\$60,100.00
BRITANNIA BEACH	20068090	Improve 2 laning & passing ops, etc, Hwy 99 Sea-to-sky - Britannia Beach	\$60,100.00
CACHE CREEK	20068064	Centreline rumble strips & pavement markings, Hwy 99 - Cache Ceek	\$9,200.00
CAMPBELL RIVER	20065006	2 ped controlled Xwalks -Dogwood at Pinecrest & Robron - Campbell River	\$34,000.00
CAMPBELL RIVER	20065021	Install traffic Signals (Dogwood at Evergreen & 7th) - Campbell River	\$145,000.00
CASTLEGAR	20065045	Ped. activated O/H flashing Xwalks (Columbia at 9, 14 & 32)- Castlegar	\$6,000.00
CASTLEGAR	20068038	Barrier Installation - Hwy 3 & 3A - Castlegar	\$12,500.00
CASTLEGAR	20068055	Centreline rumble strips & pavement markings, Hwy 3 - Castlegar	\$46,700.00
CENTRAL SAANICH	20065154	Modern Roundabout, West Saanich Rd & Verdier Ave - Central Saanich	\$25,400.00
CHERRYVILLE	20068060	Centreline rumble strips & pavement markings, Hwy 6 - Cherryville	\$3,300.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
CHILLIWACK	20065015	New traffic signal & geometrics (1st Ave & Cheam Ave) - Chilliwack	\$16,000.00
CHILLIWACK	20065016	New traffic signal & geometrics (Hodgins Ave & Ashwell Rd) - Chilliwack	\$14,000.00
CHILLIWACK	20065017	Corridor Widening (Annis Road) - Chilliwack	\$9,000.00
CHILLIWACK	20065150	Road widening, Unsworth Rd (S Sumas Rd to Keith Wilson Rd) -Chilliwack	\$4,000.00
CHILLIWACK	20065151	N/B L-T prot perm signal, Lickman & Industrial Way & Yale - Chilliwack	\$3,500.00
CHILLIWACK	20065152	L-T signal head upgrade, Young Rd & First Ave - Chilliwack	\$2,000.00
CHILLIWACK	20065153	Install post-mounted delineators, Burma Rd/Florence Lake Rd - Mission	\$3,000.00
CHILLIWACK	20068032	Shoulder Widening - Hwy 1 (Vedder Canal to Sardis Rd) - Chilliwack	\$21,500.00
CRANBROOK	20065037	Replace 125 Stop Signs (year 2 of 4) - Area-wide - Cranbrook	\$7,500.00
CRANBROOK	20068067	Hwy realignment & widening, Hwy 3 - 6th St to Victoria Ave - Cranbrook	\$75,800.00
CRANBROOK	20068085	Realignment & widening, Hwy 3 (6th St. to Victoria Ave.) - Cranbrook	\$75,800.00
CRESTON	20068021	Install Centreline Rumble Stips - Hwy 3 - Creston	\$2,000.00
CRESTON	20068066	Intersect. realign, l/t slot & r/t deceler.-Hwy 3 Erickson Rd - Creston	\$19,000.00
CRESTON	20068084	Realign, L/T slot & R/T deceleration, Hwy 3 Erickson Rd - Creston	\$19,000.00
CULTUS LAKE	20068001	MoT - Traffic calming - Golden Ears Park Entrance - Cultus Lake	\$9,000.00
DAWSON CREEK	20068080	Various hwy improvements, Hwy 2 Pouce Coupe - Dawson Creek	\$25,000.00
DAWSON CREEK	20068098	Various highway improvements - Hwy 2 Pouce Coupe - Dawson Creek	\$25,000.00
DUNCAN	20065013	Cowichan Tribes - 53 Stop Signs Upgraded (area-wide) - Duncan	\$1,500.00
DUNCAN	20068016	Drainage improvements & install barrier - Hwy 1 - Duncan	\$7,500.00
DUNCAN	20068035	Improve del., pvmt mkg, etc - Hwy 1 Frances Rd to James Rd - Duncan	\$70,400.00
DUNCAN	20068036	Soulder widening, improve delineation, etc -Hwy 18 & Youbou Rd -Duncan	\$20,000.00
FORT NELSON	20065075	Area-wide traffic control sign upgrade - Fort Nelson	\$2,200.00
GLADE	20068068	Inters upgrade & extend w/b climbing lane- Hwy 3A Glade Ferry Rd-Glade	\$18,800.00
GLADE	20068086	Upgrade & extend W/B climbing lane, Hwy 3A Glade Ferry Rd Glade	\$18,800.00
GOLDEN	20068050	Centreline rumble strips & pvmt mrkgs, Hwy 1 - Golden	\$57,100.00
GOLDEN	20068065	Phase 1 5 mile Yoho Bridge Replacement-Hwy 1 Kick Horse Canyon- Golden	\$47,800.00
GOLDEN	20068083	Phase 1 - 5 mile (Yoho) Bridge replacement & 4-laning, Hwy 1 - Golden	\$47,800.00
GRAND FORKS	20068054	Centreline rumble strips & pavement markings, Hwy 3 - Grand Forks	\$10,400.00
HARRISON HOT SPRINGS	20065011	Sidewalk Harrison HS Elem School - Walnut Ave - Harrison Hot Springs	\$2,000.00
HOPE	20068012	Improved Delineation - Highway 5 - Hope	\$15,000.00
HOPE	20068013	Webb Cameras Installation - Hwy 3 Manning Park - Hope	\$10,000.00
HOPE	20068033	Shoulder widening & install barrier - Hwy 7 Seabird Bluffs - Hope	\$7,100.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
HORSESHOE BAY	20068075	4-laning with cont. med. Barrier, etc, Hwy 99 Sea-to-Sky-Horseshoe Bay	\$98,200.00
HORSESHOE BAY	20068093	4-laning with cont. med. Barrier, etc, Hwy 99 Sea-to-Sky-Horseshoe Bay	\$98,200.00
HOUSTON	20065101	Pedestrian & cyclist pathway, Highway 16 - Houston	\$3,000.00
HOUSTON	20068010	Centreline rumble strips & pvmt mkgs - Hwy 16 - Houston	\$35,000.00
HUDSON'S HOPE	20068041	Pedestrian facility, etc -Hwy 29 from Cameron to Farrell-Hudson's Hope	\$20,000.00
KAMLOOPS	20065086	Area-wide Stop Sign Upgrade - Kamloops	\$3,125.00
KAMLOOPS	20065087	Increase size of signal heads - Lansdowne St @ 4, 5 & 6 Ave. Kamloops	\$8,000.00
KAMLOOPS	20065088	Increase size -signal heads-Lansdowne @ Westmount & Oakhills- Kamloops	\$8,400.00
KAMLOOPS	20065089	Optimize & retime signal settings - Sahali Area - Kamloops	\$7,500.00
KAMLOOPS	20065090	Install overhead lit flashing Xwalk - Westyde Rd @ Woodhaven -Kamloops	\$8,000.00
KAMLOOPS	20068063	Centreline rumble strips & pavement markings, Hwy 97 - Kamloops	\$1,700.00
KELOWNA	20065126	Install solar-powered flashing Xwalk, KLO Rd & DeMontreuil Crt-Kelowna	\$2,000.00
KELOWNA	20065127	Install traffic signals, Lanfranco & Richter - Kelowna	\$38,000.00
KELOWNA	20065128	Signal Head Upgrade, Springfield Rd (Durnim to Hollywood) - Kelowna	\$17,000.00
KELOWNA	20065129	Road widening, etc., Gordon Drive (Old Meadows to Stonybrook) -Kelowna	\$8,000.00
KELOWNA	20065130	Road widening, etc., Gordon Dr & DeHart Rd - Kelowna	\$11,000.00
KELOWNA	20065131	Install solar powered flashing beacon, Glenmore & Glenmeadows-Kelowna	\$5,000.00
KELOWNA	20065160	Solar powered flashing Xwalk, Bernard Ave & Richmond St - Kelowna	\$8,000.00
KELOWNA	20068073	Intersection extension & upgrade, etc., Hwy 97 & Hwy 33 - Kelowna	\$98,200.00
KELOWNA	20068091	Intersection extension & upgrade, Hwy 97 & Hwy 33 - Kelowna	\$98,200.00
KIMBERLEY	20065007	Area-wide sign visibility-188 signs & 39 posts-Year 3 of 3 - Kimberley	\$13,200.00
KITIMAT	20068025	Delineation Improvements - Hwy 37 - Kitimat to Terrace	\$15,700.00
LANGFORD	20065117	New N/B through-lane & R-turn lane, Millstream & McCullam - Langford	\$25,000.00
LANGFORD	20068003	Barriers, signing, delineation, pvmt mrking & CRS - Hwy 1 - Langford	\$98,300.00
LITTLE FORT	20068058	Centreline rumble strips & pavement markings, Hwy 5 - Little Fort	\$13,400.00
MERRITT	20068059	Centreline rumble strips & pavement markings, Hwy 5 - Merritt	\$51,300.00
MIDWAY	20068053	Centreline rumble strips & pavement markings, Hwy 3 - Midway	\$46,800.00
MISSION	20065048	Traffic Signal Installation (Cedar St & Cherry Ave) - Mission	\$17,000.00
MISSION	20065050	Install traffic signal (Cedar St & McRae Ave) - Mission	\$10,000.00
MISSION	20065139	New road link, Cedar St (Hwy 7 & Hwy 11 and 7 Ave & Cedar) - Mission	\$108,000.00
NANAIMO	20065061	Improve pedestrian crosswalk (Northfield Rd & Boxwood Rd) - Nanaimo	\$3,000.00
NANAIMO	20065062	Install ped. Xwalk & laning modif. (Front St & Port Place) - Nanaimo	\$3,000.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
NANAIMO	20065063	Install pedestrian crosswalk (Cedar Rd & Fielding Rd) - Nanaimo	\$4,000.00
NANAIMO	20065064	Pedestrian crosswalk upgrade (Norwell Dr & Barons Dr) - Nanaimo	\$5,000.00
NANAIMO	20065065	Pedestrian crosswalk upgrade (Northfield Rd & Spencer Rd) - Nanaimo	\$8,000.00
NANAIMO	20065066	Stop Signs (Area-wide) - Nanaimo	\$20,000.00
NANAIMO	20065067	Protected left-turn N/B & S/B traffic (Uplands Dr & Turner Rd)- Nanaimo	\$5,000.00
NANAIMO	20065073	Install new traffic signal - Applecross Rd & Hammond Bay Rd - Nanaimo	\$45,000.00
NANAIMO	20068002	BC Ferries - Dynamic Message Sign (Highway 19) - Nanaimo	\$39,600.00
NANAIMO	20068005	Un-interrupted Power Supply - Various Hwys - Nanaimo	\$67,500.00
NELSON	20065161	Full traffic singal, etc, Baker St & Kootenay St - Nelson	\$14,000.00
NEW DENVER	20068061	Centreline rumble strips & pavement markings, Hwy 31A - New Denver	\$3,300.00
NEW WESTMINSTER	20065094	Upgrade pedestrian crosswalk - Royal & 7th St - New Westminster	\$15,000.00
NORTH COWICHAN	20065059	Modern Roundabout (Sherman Rd & Cowichan Lake Rd) - North Cowichan	\$85,000.00
NORTH COWICHAN	20065104	Ped. Sidewalks, etc., Howard Ave (Digwall to Alexander)- North Cowichan	\$8,000.00
NORTH COWICHAN	20065105	Install curb extensions & corner bulges, Lane Rd. - North Cowichan	\$3,500.00
PENTICTON	20065034	Intall Traffic Signal (Fairview Rd & Industrial Ave) - Penticton	\$38,000.00
PORT ALBERNI	20065043	Relocate Crosswalk (Redford St & 11 Ave) - Port Alberni	\$1,000.00
PORT EDWARD	20065074	Area-wide traffic control sign upgrade - Port Edward	\$4,000.00
PORT HARDY	20068037	Improve delineation, pvmt mrkgs & pvmt treatments - Hwy 19 - Port Hardy	\$17,800.00
POWELL RIVER	20065005	Curb Ext & Xwalk realignment - Marine Ave & Hemlock St - Powell River	\$6,000.00
POWELL RIVER	20065022	Stop Signs (area-wide) - Powell River	\$2,050.00
POWELL RIVER	20065068	Curb extension/ Xwalk realign. (Marine Ave & Albernie St)- Powell River	\$5,000.00
PRINCE GEORGE	20065077	Reconstruct corridor - Dagg Rd/E Austin - Prince George	\$2,000.00
PRINCE GEORGE	20065078	Ramp construction - 15th Ave & Winnipeg St - Prince George	\$10,000.00
PRINCE GEORGE	20065079	Turn-lanes, medians & resurfacing - 18 Ave & Ospika Blvd- Prince George	\$52,000.00
PRINCE GEORGE	20065080	Corridor Improve. - Foothills Blvd (N Nechako/Highland) - Prince George	\$2,000.00
PRINCE GEORGE	20068007	Centreline rumble strips & pvmt mkgs - Hwy 16 - Prince George	\$70,700.00
PRINCE GEORGE	20068029	Delineation Improvements - Hwy 16 - Prince George Area	\$32,100.00
PRINCE GEORGE	20068042	Install accel. lane, etc - Hwy 16/Blackwater Rd/Hwy 97 - Prince George	\$20,500.00
PRINCE GEORGE	20068074	4-laning, Hwy 97 Plett Rd to Crysedale Creek - Prince George	\$19,200.00
PRINCE GEORGE	20068092	4-laning, Hwy 97 Plett Rd to Crysedale Creek - Prince George	\$19,200.00
PRINCE RUPERT	20068008	Centreline rumble strips & pvmt mkgs - Hwy 16 - Prince Rupert	\$46,500.00
PRINCE RUPERT	20068023	Delineation Improvements - Hwy 16 - Prince Rupert	\$46,500.00
PROVINCE-WIDE	20068079	Signing & sign conspicuity - Province-wide	\$155,000.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
PROVINCE-WIDE	20068082	Signing & sign conspicuity - Province-wide	\$155,000.00
QUESNEL	20068020	Centreline Rumble Stips & Improve Delineation - Hwy 97 - Quesnel	\$12,000.00
QUESNEL	20068047	Enhanced Curve Delineation, Hwy 97 - Cache Creek to Quesnel	\$145,000.00
QUESNEL	20068062	Centreline rumble strips & pavement markings, Hwy 97 - Quesnel	\$51,700.00
RICHMOND	20065072	Delineation - Airport Connector & Miller Rd - Richmond	\$11,000.00
RUMBLE CREEK	20068076	Improve 3 lane section, Hwy 99 Sea-to-Sky - Rumble Creek	\$58,200.00
RUMBLE CREEK	20068094	Improve 3 lane section, Hwy 99 Sea-to-Sky - Rumble Creek	\$58,200.00
SAANICH	20065038	Install bike lane (McKenzie St - Borden to Blenkinsop) - Saanich	\$35,000.00
SAANICH	20065039	Traffic Calming Measures (West Saanich Road) - Saanich	\$54,000.00
SAANICH	20065118	New Traffic Signal, Interurban Rd & W Saanich Rd - Saanich	\$30,000.00
SAANICH	20065119	Upgrade Xwalks, Shelbourn St & McRae Ave - Saanich	\$30,000.00
SAANICH	20065120	Upgrade Xwalk, area-wide (10 locations) - Saanich	\$20,000.00
SAANICH	20065143	Upgrade exist Xwalks/W Saanich Rd (Brentwood Bay area)- Central Saanich	\$8,000.00
SALMO	20068048	Signing/delineation/rumble strips, Hwy 3 - Castlegar, Yahk & Salmo	\$3,100.00
SALMON ARM	20068039	Two-way left-turn land installation - Hwy 1 - Salmon Arm	\$46,500.00
SALMON ARM	20068096	4-laning & intersect. improve., Hwy 1 from 30 NE to Hwy 97B-Salmon Arm	\$26,200.00
SECHELT	20065069	Upgrade stop signs - area wide - Sechelt	\$8,500.00
SUMMERLAND	20065162	Roadside Barrier, Thompson Rd & Hwy 97 - Summerland	\$4,000.00
TERRACE	20068009	Centreline rumble strips & pvmt mkg's - Hwy 16 - Terrace	\$97,000.00
TERRACE	20068069	Turning islands & lanes, imprv sign & repaving-Hwy 16 @ Hwy 37-Terrace	\$41,200.00
TERRACE	20068087	Turning islands/lanes, improve sign & repave, Hwy 16 at Hwy 37-Terrace	\$41,200.00
VERNON	20065133	Realignment & shoulder widening, Okanagan Ave West of Fulton Rd-Vernon	\$4,000.00
VERNON	20065134	Shoulder widening, etc, Pleasant Valley Rd - 30 Ave to 43 Ave - Vernon	\$3,000.00
VERNON	20065135	Install S/B right-turn lane, 27th St & 43rd Ave - Vernon	\$11,000.00
VERNON	20065136	Road widening, etc, 48th Ave from 27th St to 23rd St - Vernon	\$10,000.00
VG - BURNABY	20065029	Enh. curve delineation (Marine Way, Barnet Hwy & Gaglardi Way)-Burnaby	\$39,000.00
VG - COQUITLAM	20065081	UPS Installation - area-wide 10 locations - Coquitlam	\$35,000.00
VG - COQUITLAM	20065082	Install traffic signal - Johnson St & Durant Dr - Coquitlam	\$25,000.00
VG - COQUITLAM	20065083	Corridor Improvements - Johnson St & Mariner Way - Coquitlam	\$27,500.00
VG - COQUITLAM	20065084	Install left-turn lanes - United Blvd & Burbidge St - Coquitlam	\$35,000.00
VG - COQUITLAM	20065106	Replace exist signal displays with larger LED heads, 11 locs-Coquitlam	\$186,000.00
VG - COQUITLAM	20065144	Anti-skid pavement, Austin Ave & Mariner Way - Coquitlam	\$30,000.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
VG - COQUITLAM	20065145	Sidewalks & street lighting, Rochester Ave - Coquitlam	\$11,000.00
VG - COQUITLAM	20065146	Right-turn lanes, Lougheed Hwy at West Coast Express - Coquitlam	\$100,000.00
VG - COQUITLAM	20065147	Install missing sidewalk links, area-wide - Coquitlam	\$29,500.00
VG - COQUITLAM	20065148	New ped signal mid-block, Austin Rd (Nelson to Marmont) - Coquitlam	\$55,000.00
VG - COQUITLAM	20065165	Install traffic signals, David Ave (4 locations) - Coquitlam	\$120,000.00
VG - DELTA	20065091	Install N/B left-turn signal phase - Scott Rd & 70th Ave - Delta	\$4,000.00
VG - DELTA	20065093	Install N/B left-turn signal phase - Scott Rd & 68 Ave - Delta	\$7,500.00
VG - DELTA	20065149	Install 16 stop signs, Tsawwassen Ridge area - Delta	\$3,000.00
VG - LANGLEY CITY	20065070	Pedestrian Traffic Signal - Park Ave & Douglas Cres - Langley City	\$5,000.00
VG - LANGLEY TOWNSHIP	20065030	Intersection improvements (Fraser Hwy. & 232nd St.) - Langley Township	\$10,000.00
VG - LANGLEY TOWNSHIP	20065032	Reflective panels on Stop Sign posts (area-wide) - Langley Township	\$3,000.00
VG - LANGLEY TOWNSHIP	20065033	Road widening, install L/T, traffic signal (208th St)-Langley Township	\$33,000.00
VG - LANGLEY TOWNSHIP	20065044	Realignment, install traffic signal & L/T lanes. - Langley Township	\$43,000.00
VG - LANGLEY TOWNSHIP	20065046	Raised Pavement Markers (Fraser Hwy 216 to 222) - Langley Township	\$1,300.00
VG - LANGLEY TOWNSHIP	20065047	Corridor improvements (48 Ave from Fraser Hwy to 222)-Langley Township	\$15,000.00
VG - LANGLEY TOWNSHIP	20065049	Road widening, etc. (Fraser Hwy - 222 St to 228 St) - Langley Township	\$55,000.00
VG - LANGLEY TOWNSHIP	20065060	Modern Roundabout (216 St, 48th Ave & Old Yale Rd) - Langley Township	\$35,000.00
VG - LANGLEY TOWNSHIP	20065100	Road widening etc - Glover Rd & 88 Ave - Langley Township	\$3,000.00
VG - LANGLEY TOWNSHIP	20065107	Signal coordination improvements, 200th St (84 to 92)-Langley Township	\$16,000.00
VG - LANGLEY TOWNSHIP	20068017	Install Flashing Beacon - Hwy 10 at 232nd St - Langley Township	\$13,300.00
VG - MAPLE RIDGE	20065095	Upgrading existing crosswalk - Dewdney Trunk Rd & 236 St - Maple Ridge	\$20,000.00
VG - MAPLE RIDGE	20065096	New traffic signal installation - Lougheed Hwy & 223 St - Maple Ridge	\$100,000.00
VG - MAPLE RIDGE	20065097	Upgrade existing Xwalk - Dewdney Trunk Rd & 234 St - Maple Ridge	\$10,000.00
VG - MAPLE RIDGE	20065098	Install Median - Lougheed Hwy (116 St to Haney Bypass) - Maple Ridge	\$60,000.00
VG - MAPLE RIDGE	20065099	Install UPS - Dewdney Trunk Rd at 224, 227 & Edge Sts - Maple Ridge	\$10,500.00
VG - MAPLE RIDGE	20068031	Traffic Signal Improvement - Hwy 7 & 240th - Maple Ridge	\$10,000.00
VG - NORTH VAN CITY	20065140	Replace 100 existing stop signs, area-wide - North Van City	\$3,000.00
VG - NORTH VAN CITY	20065141	Speed bumps, speed tables, etc, central E Lonsdale - North Van City	\$10,000.00
VG - NORTH VAN CITY	20065142	Install median islands, Keith Rd & Hendry Ave - North Van City	\$15,000.00
VG - NORTH VAN CITY	20065163	4-way stop & sidewalk, Keith Rd & St George Ave - North Van City	\$6,000.00
VG - NORTH VAN DIST	20065010	Area-wide Sign Visibility -up to 270 O/H str name signs-North Van Dist	\$20,000.00
VG - NORTH VAN DIST	20065040	Closure of access to Hwy. (Duchess Ave & Hwy 11) - North Van Dist	\$10,000.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
VG - NORTH VAN DIST	20065041	Corner bulges/ Xwalk upgrade (Griffin Rec Ctr/Queens) - North Van Dist	\$8,000.00
VG - NORTH VAN DIST	20065042	Corner bulges/Xwalk upgrade (W Keith Rd & 19 St) - North Van Dist	\$8,000.00
VG - PORT COQUITLAM	20068011	Improve signal oper - Hwy 7B (Maryhill @ Sharughnessy)-Port Coquitlam	\$18,500.00
VG - PORT MOODY	20065031	Install Sidewalk (Albert St. north of St. Johns) - Port Moody	\$6,000.00
VG - RICHMOND	20065004	Signal Coordination of 180 traffic signals - area-wide - Richmond	\$35,000.00
VG - RICHMOND	20065008	Median Installation - Great Canadian Way & Costco Access - Richmond	\$11,000.00
VG - RICHMOND	20065014	Realignment S/B left-turn lane (Garden City Rd & Cambie Rd) - Richmond	\$31,000.00
VG - RICHMOND	20065051	Extension N/B L-T & right lanes, etc (Steveston Hwy & No 5 Rd)-Richmond	\$45,000.00
VG - RICHMOND	20065052	Install improved pedestrian crosswalk (Lansdowne & Kwantlen) -Richmond	\$11,000.00
VG - RICHMOND	20065055	Install improved ped. Xwalk (No 5 Rd & McNeely Rd) - Richmond	\$3,000.00
VG - RICHMOND	20065056	Install improved ped. Xwalk (Steveston Hwy & Roseland Gate) - Richmond	\$5,000.00
VG - RICHMOND	20065057	Install improved ped. Xwalk (Garden City Rd & Bennett Rd) - Richmond	\$1,000.00
VG - RICHMOND	20065058	Install improved ped. Xwalk (No. 1 Rd & Springfield Rd) - Richmond	\$2,000.00
VG - RICHMOND	20065071	Area-wide traffic signal head upgrade - Richmond	\$125,000.00
VG - RICHMOND	20065122	Modify S/B L-T signal, etc., Russ Baker Way & Cessna Dr - Richmond	\$8,000.00
VG - RICHMOND	20065123	Replace ped signal with full signal, Minoru Blvd/Blundell Rd- Richmond	\$15,000.00
VG - RICHMOND	20065124	Mod. N/B L-T signal, etc, Russ Baker Way & Hudson Ave - Richmond	\$7,000.00
VG - RICHMOND	20065125		\$25,000.00
VG - RICHMOND	20065166	Raised pavement markings etc, Alderbridge Way & Garden City - Richmond	\$482.95
VG - RICHMOND	20065167	N&S/B thru lane guid line pvmt mrkgs etc, Alderbridge & Shell- Richmond	\$490.82
VG - RICHMOND	20068014	Webb Cameras Installation - Hwy 99 at Shell Road - Richmond	\$10,000.00
VG - SURREY	20065028	Install new traffic signal (68th Ave. & 124th St.) - Surrey	\$45,000.00
VG - SURREY	20065085	Centre Median Installation - King George Hwy. & 77th Ave. - Surrey	\$75,000.00
VG - SURREY	20065108	Install centre median, 152 St (26 Ave to King George Hwy) - Surrey	\$45,000.00
VG - SURREY	20065109	Install traffic signals, King George Hwy & 74th Ave - Surrey	\$45,000.00
VG - SURREY	20065110	Road widening & traffic signal install., 184th St & 68th Ave - Surrey	\$12,000.00
VG - SURREY	20065111	Corr. Widening & install traffic signals, King George Hwy - Surrey	\$183,000.00
VG - SURREY	20065112	Corridor Widening, 152nd St (Hwy 99 to 36th Ave) - Surrey	\$38,000.00
VG - SURREY	20065113	Full traffic signal, etc., King George Hwy & 94 A Ave - Surrey	\$13,000.00
VG - SURREY	20065114	Corridor widening, 24th Ave (King George Hwy to Hwy 99) - Surrey	\$104,000.00
VG - SURREY	20065115	New traffic signal with L/T Bays, 7nd Ave & 148th St - Surrey	\$67,000.00

COMMUNITY LOCATION	PROJECT NUMBER	PROJECT DESCRIPTION	ICBC INVESTMENT
VG - SURREY	20065116	Raised centre median, King George Hwy & 96th Ave - Surrey	\$11,000.00
VG - SURREY	20065121	Install centre median & ped. Signal, 97th Ave (K Geo to 137B) - Surrey	\$46,000.00
VG - SURREY	20065137	Corridor widening, etc, Fraser Hwy from 17900 Blk to 19000 Blk -Surrey	\$80,000.00
VG - SURREY	20065138	Corridor widening, etc, 24th Ave (King George Hwy to 152 St) - Surrey	\$164,000.00
VG - SURREY	20068034	Traffic Signal Installation - Hwy 10 & 184th St - Surrey	\$4,600.00
VG - SURREY	20068077	Extend fast lane, Hwy 15 Pacific Border Crossing - Surrey	\$36,400.00
VG - SURREY	20068095	Extension of fast lane,Hwy 15 Pacific Border Crossing - Surrey	\$36,400.00
VG - SURREY	20068100	Add on & off ramps to flyover - Hwy 1 at 192 interchange proj - Surrey	\$79,600.00
VG - VANCOUVER	20065012	Corner Bulges - 4 intersections - Vancouver	\$27,500.00
VG - VANCOUVER	20065019	Install corner bulges at 15 intersections on Main Street - Vancouver	\$144,000.00
VG - VANCOUVER	20065020	Install pedestrian crosswalks (Main St at 3 intersections) - Vancouver	\$130,000.00
VG - VANCOUVER	20065036	Install Traffic Signal (Alma St & Point Grey Rd) - Vancouver	\$25,000.00
VG - VANCOUVER	20065102	Install full traffic signal, Alberta St & 49th Ave - Vancouver	\$60,000.00
VG - VANCOUVER	20065103	Upgrade existing Xwalks to pedestrian signals, 6 locations - Vancouver	\$53,500.00
VG - VANCOUVER	20068006	Un-interrupted Power Supply - various highways - Lower Mainland	\$72,500.00
VICTORIA	20065001	Anti-skid surface "S" bend - Esquimalt Road - Victoria	\$30,000.00
VICTORIA	20065002	Pavement Markings - Dallas Road to Bushby Street - Victoria	\$9,000.00
VICTORIA	20065003	Install anti-skid material at Cook Street & Kiwanis Way - Victoria	\$4,000.00
VICTORIA	20068004	Un-interrupted Power Supply - Various Hwys - Victoria	\$57,500.00
WILLIAMS LAKE	20068081	Signing & delineation (Phase 1-purchase), northern hwys - Williams Lake	\$30,000.00
WILLIAMS LAKE	20068097	Construct intersection - Hwy 97 Likely to Lexington - Williams Lake	\$3,000.00
WILLIAMS LAKE	20068099	Signing & delineation (phase 1 purchase)-northern hwys - Williams Lake	\$30,000.00
YAHK	20068043	Wildlife Advisory Signs, Hwy 3 - Kitchner to Yahk	\$700.00
YAHK	20068056	Centreline rumble strips & pavement markings, Hwy 3 - Yahk	\$45,000.00

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2007.1 RR IBC.66.3 Reference: Exhibit B-1-2, Appendix 10 B – Road Improvement 2006 Evaluation, p. 4

ICBC states that "the 3:1 funding criteria was considered very aggressive investment target, which ultimately reduced the level of ICBC contribution and marginalized ICBC's involvement in some projects."

What has been the impact of changing the funding criteria? Please indicate what the impact of this change has been in terms of number of projects available for ICBC to invest in.

Response:

The most immediate impact of changing the funding criteria is that ICBC's contribution to the cost of individual safety projects has increased. The road authorities have finite budgets for road construction projects and are responsible for both increasing mobility and increasing safety in their communities. When ICBC contributes to a safety-oriented project, it reduces the cost borne by the road authority, thus making safety-oriented projects more attractive to the road authority.

Although ICBC conducts rigorous studies to ensure that the estimated benefit of each project meets the investment criteria, ICBC will not be able to calculate the actual return on investment for these projects until the next evaluation of the Road Improvement program, which will be completed in 2009.

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2007.1 RR IBC.67.1 Reference: Exhibit B-1-2, Appendix 10 D – Evaluation of the Effectiveness of Education and Awareness Programs, p. 3

ICBC states "the TCM model is currently being used as a framework for the evaluation of ICBC's road safety programs".

Is ICBC aware of any other jurisdiction that uses TCM model for assessing road safety programs?

Response:

The Transtheoretical Model of Change (TMC) has been used by the State of Rhode Island in connection with seat belt programs for high school and college students. The TMC has been used in Massachusetts in relation to driving aids for the elderly and in Mississippi, Ohio and Australia to study readiness to change in traffic offenders. In Quebec and Hawaii the TMC has been employed to study driver attitudes towards speed interventions.

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2007.1 RR IBC.67.2 Reference: Exhibit B-1-2, Appendix 10 D – Evaluation of the Effectiveness of Education and Awareness Programs, p. 3

ICBC states "the TCM model is currently being used as a framework for the evaluation of ICBC's road safety programs".

Please explain what other models were considered by ICBC for evaluation of road safety programs. Please provide reasoning as to why the TMC model was considered the best approach.

Response:

Risk threshold/acceptance models such as Risk Homeostasis, Zero-risk and the Health Belief Model were also considered as were motivational models such as the Theory of Planned Behaviour and various ecological models (e.g. Juarez's Multi-Faceted Model and the Bronfenbrenner Model). The TMC was chosen because it encompasses several of the aspects of the other models that are relevant to measuring attitudes towards driving. It incorporates motivation as a primary underpinning and recognizes the interaction of various levels of influence on individual behaviours. In the TMC individuals are seen as being at different stages along a continuum of motivation to change rather than dichotomously classed as either "motivated" or "not motivated" as in other models. In addition, the TMC allows for the identification of key factors influencing movement between stages of change and thus facilitates evaluation of educational interventions.

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2007.1 RR IBC.68.1 Reference: Exhibit B-1-2, Appendix 10 D – Evaluation of the Effectiveness of Education and Awareness Programs, p. 17

ICBC states "no attempt has yet been made to take into account the effect of differences in sample characteristics on the observed changes, nor has any attempt been made to directly associate any of the changes with specific advertising or education campaign".

Please indicate if ICBC is planning to conduct another study where the issues above are taken into consideration. If yes please provide timeline for such study.

Response:

Once the survey instrument is finalized and validated, the first priority will be to attempt to associate respondents' readiness for change with specific road safety campaigns and messages. Since the instrument is still in the developmental stage, it is difficult to give a precise timeline for the application phase but it should commence by the end of 2007.

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2007.1 RR IBC.68.2 Reference: Exhibit B-1-2, Appendix 10 D – Evaluation of the Effectiveness of Education and Awareness Programs, p. 17

ICBC states "no attempt has yet been made to take into account the effect of differences in sample characteristics on the observed changes, nor has any attempt been made to directly associate any of the changes with specific advertising or education campaign".

If ICBC is unable to distinguish the result of specific advertising or education campaigns, how can ICBC assess the effectiveness of a specific program?

Response:

ICBC conducts public opinion surveys to measure the awareness levels of educational campaigns. ICBC is examining methods of assessing effectiveness of public education programs as part of the current comprehensive review of its education and awareness programs.

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2007.1 RR IBC.68.3 Reference: Exhibit B-1-2, Appendix 10 D – Evaluation of the Effectiveness of Education and Awareness Programs, p. 17

ICBC states "no attempt has yet been made to take into account the effect of differences in sample characteristics on the observed changes, nor has any attempt been made to directly associate any of the changes with specific advertising or education campaign".

How does ICBC assess which programs are meeting its objectives, without measuring the impact of specific projects?

Response:

Please see the response to information request 2007.1 RR IBC.68.2.

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2007.1 RR IBC.69.1 Reference: Exhibit B-1-2, Appendix 10 D – Evaluation of the Effectiveness of Education and Awareness Programs, p. 18

Please indicate if any of the recommendations outlined have been implemented.

Response:

Please see the response to information request 2007.1 RR BCUC.135.1.

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2007.1 RR IBC.70.1 Reference: ICBC April 11, 2007 News Release "Corporation of British Columbia joins drive towards 2010" and ICBC April 11, 2007 News Release "Backgrounder: 2010 Winter Games license plates"

ICBC will also be the official supplier of motor vehicle insurance for VANOC's fleet of approximately 4,500 General Motors passenger vehicles.

The insurance sponsorship that ICBC has with VANOC is worth \$6 million dollars, representing the foregone Basic and Optional insurance revenues. Does this amount include any foregone revenue for the new Driver Risk Premium? If no, why. If yes, what is the amount that ICBC will not be collecting for Driver Risk Premiums? How was this amount arrived at?

Response:

There is no foregone premium associated with Basic insurance. The Driver Risk Premium takes effect in January 2008 and will apply to individual drivers. The premium is not applicable to fleet policies and therefore there are no revenue implications to ICBC's sponsorship agreement with VANOC.

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2007.1 RR IBC.70.2 Reference: ICBC April 11, 2007 News Release "Corporation of British Columbia joins drive towards 2010" and ICBC April 11, 2007 News Release "Backgrounder: 2010 Winter Games license plates"

ICBC will also be the official supplier of motor vehicle insurance for VANOC's fleet of approximately 4,500 General Motors passenger vehicles.

Please indicate how much of the forgone premium from insuring the 4,500 Olympics vehicles is from Basic insurance. Please provide any supporting documentation regarding this allocation.

Response:

ICBC's Optional insurance business is paying the cost of VANOC's Basic Insurance premium.

There is no forgone premium associated with Basic insurance.

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2007.1 RR IBC.70.3 Reference: ICBC April 11, 2007 News Release "Corporation of British Columbia joins drive towards 2010" and ICBC April 11, 2007 News Release "Backgrounder: 2010 Winter Games license plates"

ICBC will also be the official supplier of motor vehicle insurance for VANOC's fleet of approximately 4,500 General Motors passenger vehicles.

When a claim is filed with regard to one of those vehicles, where will the cost of claims handling and adjusting, as well as bodily injury, property damage and liability be allocated to?

Response:

In the event of a claim, the appropriate costs as indicated above will be charged to either Basic insurance or Optional insurance depending upon the coverage.

The premiums collected for Basic insurance are set to cover the costs for claims and the cost to handle those claims. Premium levels are based on the history and performance of the fleet. Premiums will be adjusted annually to reflect the performance of the fleet. Under the Insurance portion of the sponsorship, ICBC's Optional insurance business will pay VANOC for the Basic insurance premium to insure the VANOC fleet.

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2007.1 RR IBC.70.4 Reference: ICBC April 11, 2007 News Release "Corporation of British Columbia joins drive towards 2010" and ICBC April 11, 2007 News Release "Backgrounder: 2010 Winter Games license plates"

ICBC will also be the official supplier of motor vehicle insurance for VANOC's fleet of approximately 4,500 General Motors passenger vehicles.

Does ICBC have any actuarial projections of the probable cost of the claims for these vehicles? Please provide any supporting documents available.

Response:

For Basic insurance purposes these vehicles are being treated the same as other vehicles carrying Basic insurance coverage. ICBC's Optional insurance business is paying for the cost of VANOC's Basic insurance premium, and the vehicles insured are being treated in the same manner as if VANOC had been paying the cost.

ICBC does not have any specific actuarial projections of the probable cost of the claims for these vehicles. Similar to other fleets of this size and use, the rating will be developed in accordance with ICBC's fleet plan rating formula.