

Implications of Stagnant Reporting Thresholds for Motor Vehicle Collisions

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Abstract

Each Canadian province and territory has laws requiring the reporting of vehicle collisions to enforcement agencies when there has been an injury, fatality or property damage of a specified extent. In most jurisdictions, including New Brunswick, the reporting threshold for Property Damage Only (PDO) collisions is \$1,000 in total collision damage; however, the Canadian Council of Motor Transport Administrators (CCMTA) recently endorsed moving to a \$2,000 reporting threshold for inclusion of PDO collisions in the National Collision Database. The collision reporting threshold was last adjusted in New Brunswick in 1993 (up from \$400 in place since 1980). This paper explored the impact of the static \$1000 reporting threshold on the inclusion of collisions in the New Brunswick collision database from 1994 – 2008 in terms of current and constant (1994) dollars, as well as implications for the availability of collision data in moving to a \$2,000 or \$4,000 threshold. Recommendations include developing uniform, objective criteria for assessing PDO collision severity.

Résumé

Chaque province et territoire du Canada a des lois exigeant la déclaration des collisions de véhicules aux organismes d'application de la loi quand il ya eu une blessure, décès ou dommages à la propriété d'une mesure précisée. Dans la plupart des juridictions, y compris le Nouveau-Brunswick, le seuil défini pour les accidents avec dommages matériels seulement (DMS) est de 1000\$ de dommages collision totale, mais le Conseil Canadien des Administrateurs en Transport Motorisé (CCATM) a récemment approuvé de passer à un seuil défini de 2000\$ pour des inclusions de collisions DMS dans la Base nationale de données sur les collisions. Le seuil de déclaration des collisions a été réglée pour la dernière au Nouveau-Brunswick en 1993 (contre 400\$ en place depuis 1980). Ce document explore l'impact du seuil de déclaration de 1000\$ statique sur l'inclusion de collisions dans la nouvelle base de données de collision-Brunswick de 1994 à 2008 en termes de dollars courants et constants (1994), ainsi que les implications de la disponibilité de données sur les collisions dans le déplacement à un seuil de 2,000\$ ou 4,000\$. Les recommandations comprennent élaborer un système uniforme, des critères objectifs pour évaluer la sévérité des accidents avec DMS.

1 INTRODUCTION

Each Canadian province and territory has laws requiring the reporting of vehicle collisions to enforcement agencies when there has been an injury, fatality or property damage of a specified extent. In 8 provinces, collisions where total vehicle property damage exceeds a threshold of \$1000 are to be reported. In Quebec, the value is \$2000 and in Saskatchewan, a "tow-away" threshold is employed. The dollar-based threshold, by virtue of being enshrined in provincial legislation or regulation, is a static figure and is not indexed to inflation, which means more collisions of lesser value (in constant dollars) are eligible for reporting today than in the past. In New Brunswick, the \$1000 reporting threshold has not changed since 1993 (up from \$400 in 1980). Either increasing the dollar amount or moving to a tow-away threshold is one of two possibilities to address this; however, there is the risk of losing collision information that could be valuable for network screening or collision black spot analysis. This is also an issue when undertaking year-over-year comparisons or time-based trends. Research for the Federal Highway Administration in the United States suggests moving to a tow-away threshold could exclude 40-60% of collisions.

This paper explores the impact of the \$1000 reporting threshold on the inclusion of collisions in the New Brunswick collision database. It examines current state of the practice in legislation across Canada, and perspectives of the Canadian Council of Motor Transport Administrators (CCMTA) and law enforcement. It reviews all property damage only (PDO) collisions in the province of New Brunswick from 1994 to 2008 in terms of current dollars and inflation-adjusted estimated repair costs. It compares the expected number and proportion of collisions to determine whether the static \$1000 figure has resulted in the inclusion of less severe PDO collisions in databases in New Brunswick over time. Estimates are also made to determine the number of collisions that may be excluded from such databases upon adoption of a higher threshold.

1.1 Background and Literature Review

The CCMTA has representatives from provincial, territorial and federal governments of Canada which makes "decisions on administration and operational matters dealing with licensing, registration and control of motor vehicle transportation and highway safety" [1]. The National Collision Data Task Force (herein referred to as the "Task Force") within CCMTA is tasked with ways of harmonizing and enhancing collision-related data across Canada [2]. One priority item for the Task Force has included exploring raising the threshold for reporting property damage only (PDO) collisions.

The PDO Collision Reporting Threshold is what police officers/enforcement agencies use to determine whether a non-fatal/non-injury vehicle collision should be included in provincial, and eventually national, collision databases. Each province and territory has legislation (and some have accompanying regulations) that specify the threshold (typically dollar-based) for PDO collision reporting (Table 1). The dollar threshold refers to the total value of property damage to vehicles in a collision, which for most provinces has remained at \$1,000.

Prov./ Terr.	Applicable statute	Applicable Regulation	Threshold
YK	Motor Vehicles Act (95 (1))	-none	\$1,000
NT	Motor Vehicles Act (261)	-none	\$1,000
NU	Motor Vehicles Act (262)	-none	\$1,000
BC	Motor Vehicle Act (249 (1) b)	Accident Report Threshold	\$1,000
AB	Traffic Safety Act (70)	Operator Licensing And Vehicle Control (147)	\$1,000
SK	Traffic Safety Act (3 d)	-none	Tow-away
MB	Highway Traffic Act (155 (4))	-none	\$1,000
ON	Highway Traffic Act (199 (1))	Damage to Property Accident Report (11)	\$1,000
QC	Highway Safety Code (176)	Regulation respecting accident reports (2 a-c)	\$2,000
NB	Motor Vehicle Act (130 (1))	-none	\$1,000
PE	Highway Traffic Act (3 b)	-none	\$1,000
NS	Motor Vehicle Act (98 (1))	-none	\$1,000
NL	Highway Traffic Act (170 (1))	-none	\$1,000

Table 1: Canadian provincial and territorial collision reporting legislation (current to Nov. 2010)

A background report [3] was completed for the CCMTA detailing the discussion and consultation history by the Task Force regarding changing the reportable collision threshold and is paraphrased here. Over the last four years, concerns were raised to the Task Force that the \$1,000 threshold was too low, requiring police forces to spend time completing collision reports at the expense of enforcement activities. The Task Force then explored three options for reducing the amount of PDO collision reporting: increasing the monetary value of the threshold, using damage severity criteria, or eliminate PDO collision reporting.

In May 2008, the Task Force recommended to the Road Safety Research and Policy Committee (RSRP) that the threshold be changed to “severe vehicle damage/not drivable from the scene”, which is also referred to as “tow-away” criteria. The recommendation was not endorsed, and in October 2008, was ultimately withdrawn in favour of further consultations with the Canadian Association of Chiefs of Police (CACP). In November 2009, further consultations were held with the Council of Deputy Ministers Engineering and Research Support Committee, and the Transportation Association of Canada (TAC) Chief Engineers Council. These discussions highlighted the different perspectives of each organization. The CACP was driven by the need to reduce member burden while the TAC Chief Engineers Council was concerned about the potential loss of data available to the engineering community for decision-making purposes.

In May 2010, the Task Force presented two options for consideration by the RSRP Committee:

- a) Increase the PDO reporting threshold to a \$2000 dollar value.

- b) Let jurisdictions decide their own PDO reporting threshold, although Transport Canada recommends using the “vehicle damage severity (tow-away-not driveable)” criteria as a ceiling for PDO reporting threshold

The Standing Committee on RSRP recommended to the CCMTA board of directors to support Option “a”. In their May 2010 meeting, the board of directors approved the RSRP recommendation [4]:

“The Board approved that a uniform PDO collision reporting threshold be maintained and that jurisdictions increase their PDO collision reporting threshold to \$ 2,000 as soon as they are able to implement it. It was clarified the \$2,000 collision reporting threshold relates to national reporting and not necessarily the driver reporting requirements in each jurisdiction.”

It can be expected over time that Canadian jurisdictions will amend their own legislation/regulations to accommodate this increased reporting threshold. The challenge remains that the dollar-based threshold remains a subjective way to quantify PDO collision severity and will likely need to be revisited at a future date when \$2000 is considered “too low”. The discussion by Task Force members in 2008 regarding the need to amend the dollar-based threshold to keep pace with inflation raises questions about the severity of collisions that are eligible to be reported over time. In New Brunswick, for example, the \$1000 reporting threshold has not changed since 1993 (up from \$400 in 1980) raising the possibility that less severe collisions will be included in provincial collision database over time. This, in-turn, creates a bias in annual collision statistics that develop time-series comparisons.

The “tow-away” threshold as a criterion for PDO reporting was recommended by Transport Canada in these discussions and the CCMTA’s Task Force on Commercial Vehicle Collision Reporting. Motor carriers were concerned with the perceived low (i.e. \$1,000) collision reporting threshold and its impact on carrier safety ratings. It was adopted in the National Safety Code #14 that “reportable collisions” for use by jurisdictions in determining whether to assign demerit points to carriers would be subject to either the \$1,000 threshold or a “tow-away” threshold, with the goal of moving towards a “tow-away” threshold [5]. Since none of the provincial/territorial legislation differentiates between a car or a heavy truck in terms of reportable collisions, all collisions meeting the dollar threshold will continue to be reported, but only “tow-away” would apply to motor carrier safety ratings.

Determining the impacts of moving to a “tow-away” reporting threshold is challenging since Canadian jurisdictions do not uniformly apply severity rating to PDO collisions. Even though doing so could reduce the subjectivity, there is the potential for data loss. While little published research exists on the impact of changing reportable collision thresholds, researchers in the U.S. did explore the concept for the Federal Highway Administration. Zegeer, et al. [6] quantified the number of collisions that would no longer be included in the U.S. Federal Highway Administration’s Highway Safety Information System (HSIS) database by exploring the four states which differentiate collisions with a “tow-away” variable. They found that 48.7% of all collisions recorded would be excluded from a database with a tow-away only threshold and that 70-82% of all animal-vehicle collisions would be excluded from the database. The main point made by Zegeer, et al. was that moving to a “tow-away” threshold would compromise the data

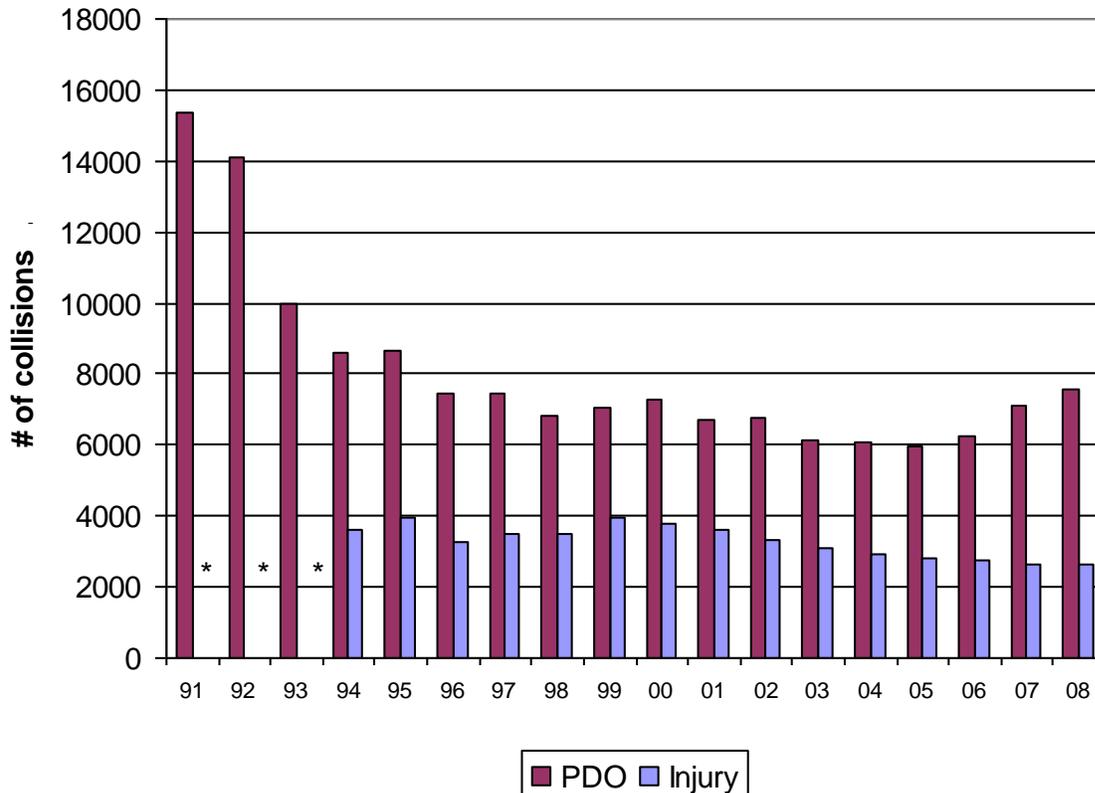
available to engineers to recommend safety treatments. The TAC Chief Engineers Council expressed the same concern.

2 METHODOLOGY AND RESULTS

This study explored 15 years of New Brunswick collision data (1994 – 2008) from the New Brunswick Collision Database to determine how the number and estimated repair value (a variable in the collision database) of PDO collisions have changed over time in New Brunswick. Values were calculated based on current dollars and constant 1994 dollars. The consumer price index (CPI) from Statistics Canada for New Brunswick was used to adjust for inflation.

2.1 Reporting thresholds and impact on collision reporting

Since 1991, the number of reported PDO collisions in New Brunswick decreased yearly until 1998, followed by minor increases (3%), and then decreased to a local minimum in 2005, when the reported number of collisions began to increase. The most notable decrease took place between 1992 and 1993 where New Brunswick saw a 30% decrease in reportable PDO collisions. While it is possible that New Brunswick drivers were experiencing fewer PDO collisions, it is far more likely that this decrease was due in large part to the increase in New Brunswick's reportable collision threshold from \$400 to \$1000 in 1993. Injury collisions were relatively stable and appear to decrease over time. This may be a reflection of major improvements in motor vehicle safety standards that have been introduced since 1993 (e.g. air cushion restraints, side impact protection, anti-lock brake technologies, etc.)



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Figure 1: Frequency of reported PDO collisions in NB by year

It appears that the decrease in PDO collision frequency over time may be attributable to the absolute decrease in the number of reported collisions worth less than \$3,000 (Figure 2) in current dollars. The number of collisions reported worth more than \$5,000 actually increased between 1994 and 2008. The frequency of reportable collisions of all values appears to have increased from 2005 – 2008.

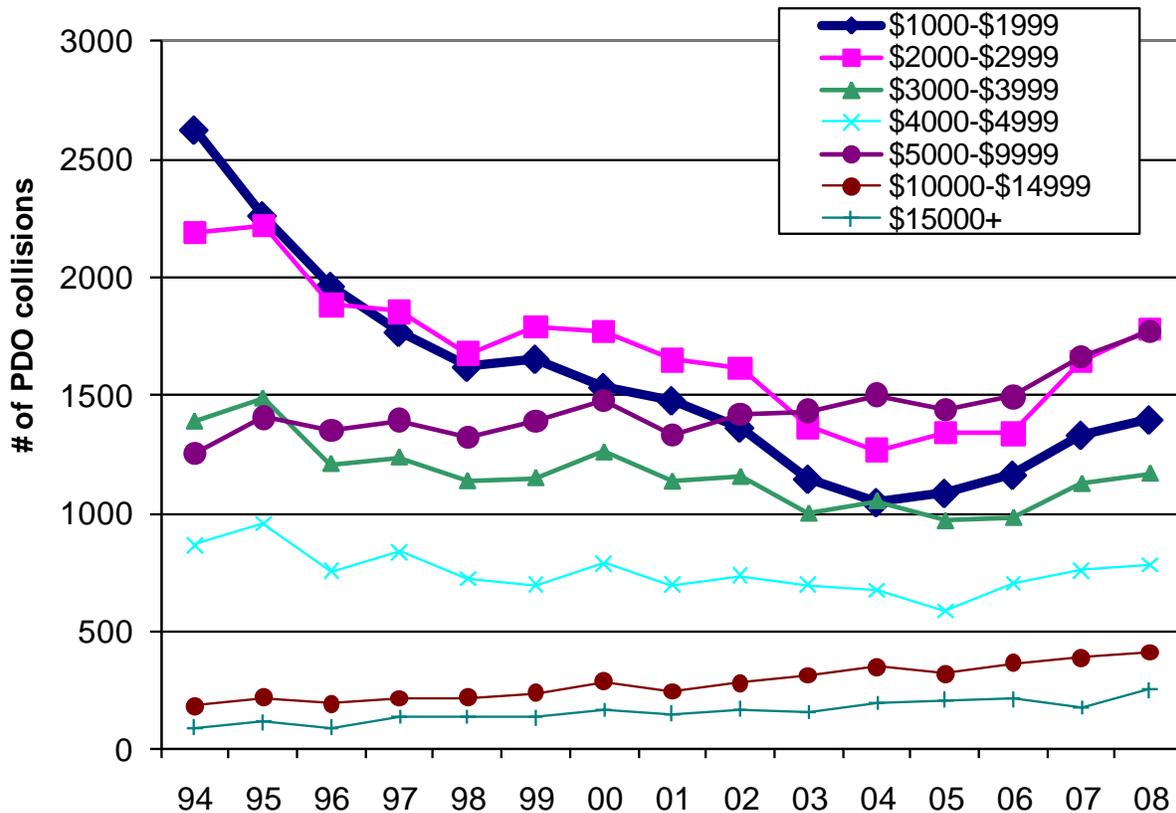


Figure 2: Frequency of PDO collisions by year and value in current dollars

The data in Figure 3 show that the biggest increases in collision frequency were among collisions worth \$15,000 or more in current dollars (the 3-year moving average in 2008 is 2.3 times the value in 1994, \$10,000 - \$14,999 (2.1 times) and \$5,000 - \$9,999 (1.3 times). There were fewer collisions recorded that were worth less than \$5,000 from 1994 – 2008.

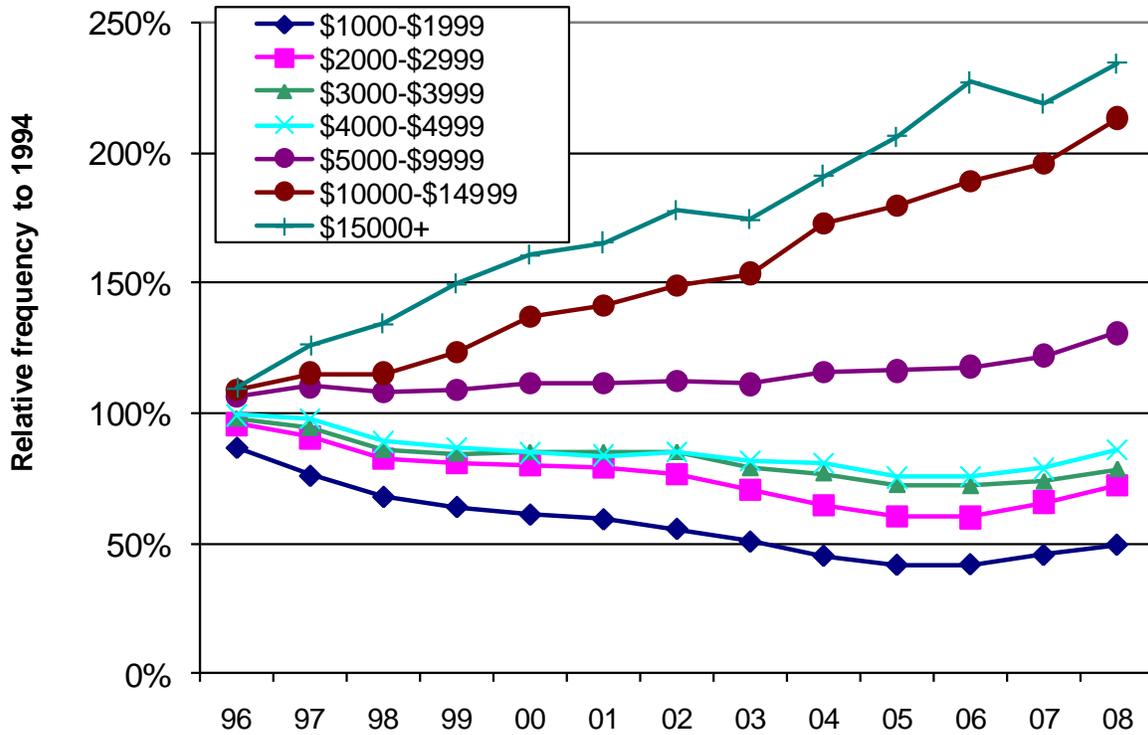


Figure 3: Relative frequency of reported PDO collisions based on 3-year moving average (1994 base year = 100)

In terms of the percentage breakdown of PDO collisions by value (Figure 4), the overall percentage of collisions worth less than \$2,000 decreased from over 30% in 1994 to 18% in 2008, while collisions worth \$5,000 - \$9,999 increased from 15% in 1994 to 23% in 2008.

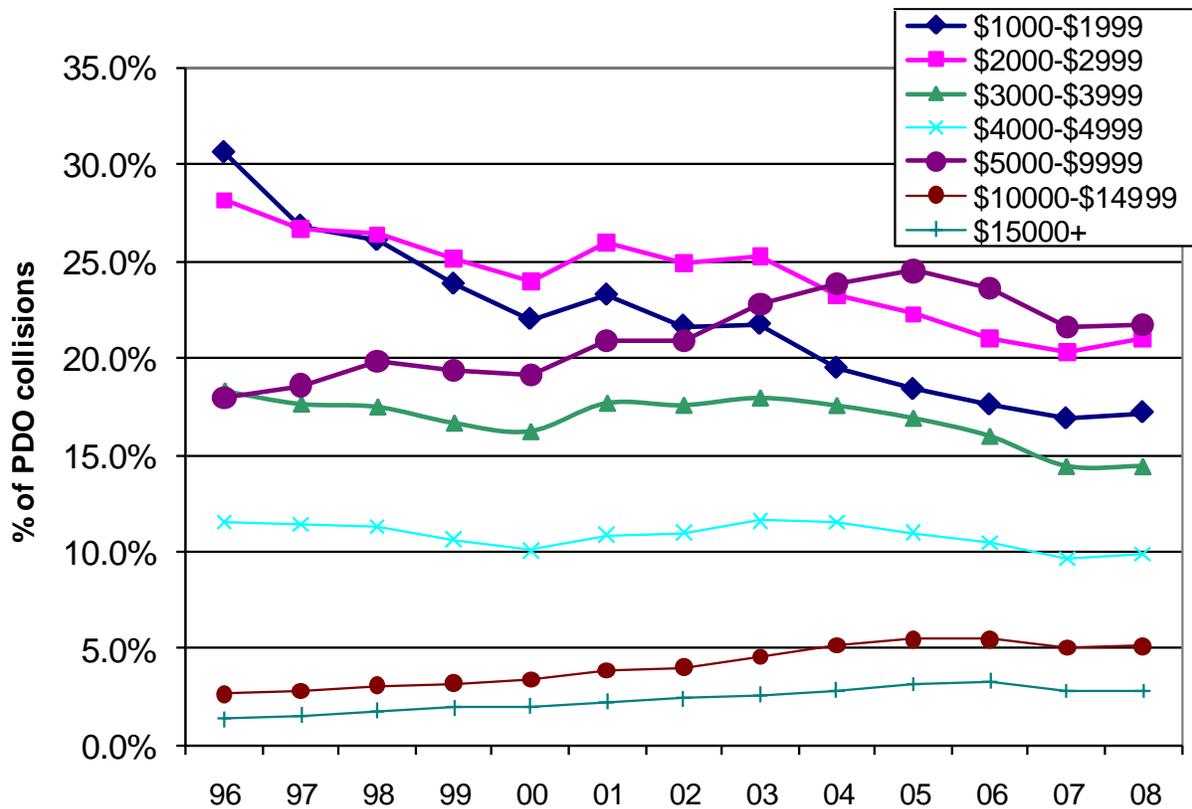


Figure 4: Percentage of all PDO collisions by value in current dollars (3-year moving average)

There are a few noteworthy trends. The biggest increases in reportable collisions from 1994 – 2008 were among the highest value collisions (>\$5,000) while the biggest decreases were among the lowest value collisions (<\$5,000). Given that injury collisions in New Brunswick were generally decreasing during this time period, in concert with vehicle safety advances, it is highly likely that some collisions that may have been injury collisions in the past were being manifested as higher value PDO collisions. It may also reflect a higher vehicle value. This does not explain the decrease in the number of lower value PDO collisions. The data in Figure 1 that show the decrease in reported collisions between 1993 and 1994 suggests that the observed decrease over time is likely due to underreporting. Elvik and Mysen [7] explored 49 studies in 13 countries and found only 25% (a weighted average) of PDO collisions were reported. It is possible that fewer drivers are reporting lower value PDO collisions over time to avoid increases to their own insurance rates, choosing to pay for costs out of their own pocket. In some cases, it is possible that the deductible may be similar to the actual repair cost.

2.2 Accounting for inflation (constant 1994 dollars)

Data in Figures 1 – 4 show fewer lower-value and more higher-value collisions recorded over time; however, it is not clear whether this represents a difference in *severity* because a collision worth \$1,000 in 1994 is likely more severe than a collision worth \$1,000 in 2008 due to inflation. Unfortunately, the New Brunswick collision database did not include a PDO severity variable

from 1994 – 2008 meaning that “estimated repair amount” remains the only measure available of PDO severity. While not ideal, it was assumed for purposes of this analysis that the estimated repair amount is a proxy for severity. This requires a broad assumption that the repair amounts estimated by the reporting officers are accurate and precise, as the margin of error for estimation is not known.

The dollar value of each PDO collision in the database was adjusted based upon the Consumer Price Index for New Brunswick from Statistics Canada [8] for each year, using 1994 as a base year. In current dollars, the data in Figure 5 show that from 1994 to 2008, the average estimated repair amount¹ associated with the collision increased from \$3,349 to \$4,585. Adjusting for inflation, the average estimated repair amount has stayed relatively constant ranging between a minimum of \$3,349 and maximum of \$3,754 (1994 dollars), suggesting average reportable collision costs in NB have kept pace with inflation, if not marginally ahead.

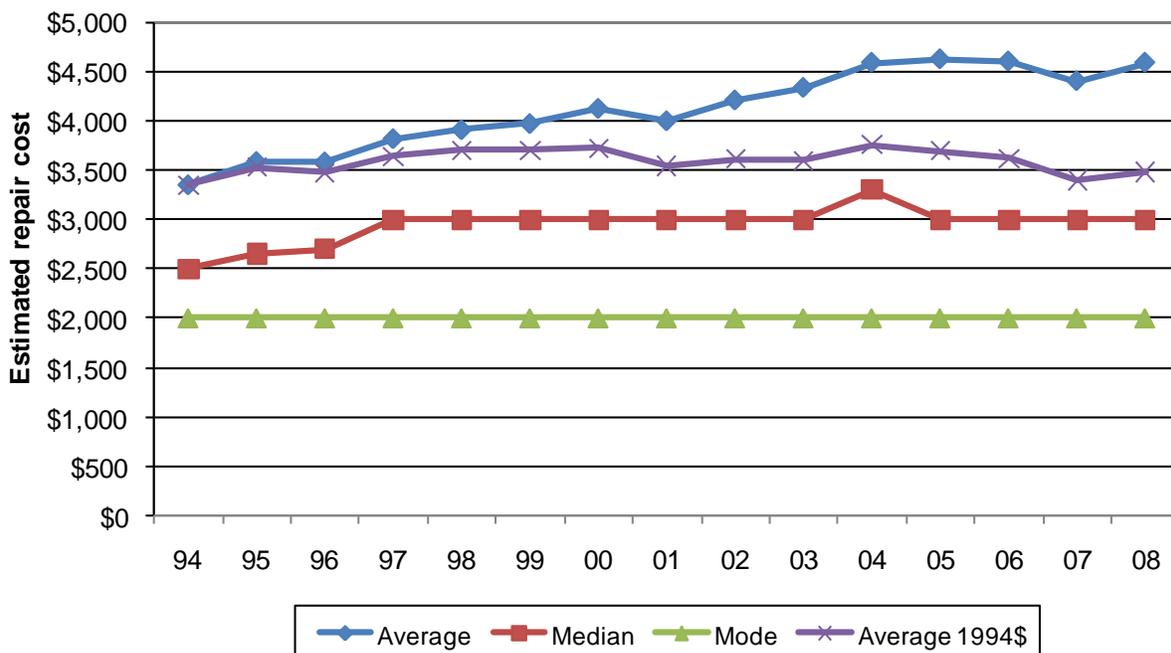


Figure 5: Average repair costs (current dollars and constant 1994 dollars)

The median (amount where 50% of collisions are greater in value) was \$3,000 for 11 of the 15 years observed, while the mode (most frequent dollar value recorded) did not change during the 15 years observed.

Using 1994 as a base year, the values of all collisions were adjusted to represent the cost in constant dollars (a collision worth \$1,000 in 2008 would be worth \$758 in 1994). The data in Figure 6 show the percentage of all PDO collisions that would fall under a \$1,000 threshold in constant 1994 dollars.

¹ Note that reported PDO collisions with a value greater than \$250,000 were excluded from this analysis
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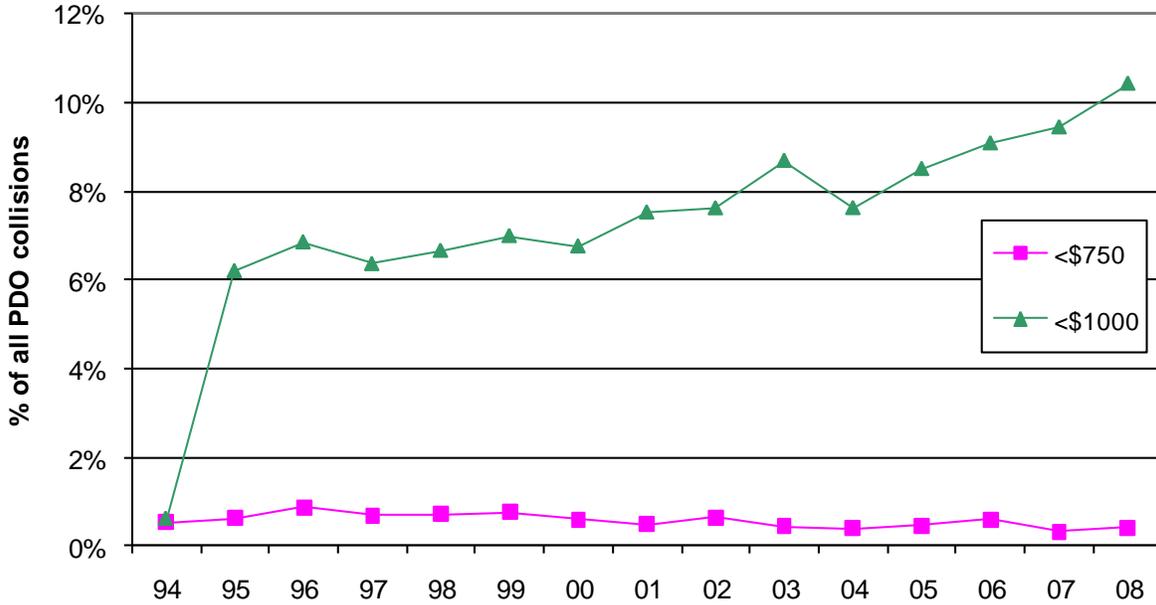


Figure 6: Percent of PDO collisions worth less than specified amount in constant 1994 dollars

Approximately 10% of the collisions in 2008 were worth less than \$1000 in 1994 dollars, meaning that there were 788 collisions reported in 2008 that would not have been eligible for reporting in 1994, assuming that a PDO collision worth less than exactly \$1,000 would not be reported. It is impossible to know the degree of rounding that police officers may introduce into their estimates of repair value. If a collision results in \$750 worth of damage, it is reasonable to assume that an officer would use discretion to either report it as \$1,000 or to not report it. There are likely subjective criteria employed in New Brunswick to associate collision damage with a certain range of collision values, but it is unknown whether these are standardized across police forces and to what degree underreporting exists at or near thresholds by officers. Ultimately, the rate of inflation from 1994 – 2008 may not have been dramatic enough to warrant changing the subjective criteria (if such criteria exist).

Based on the change in collision reporting threshold in 1993, a decrease in the number of reported PDO's should be expected when New Brunswick changes to a \$2,000 threshold for collision reporting. Figures from 2008 suggest that 18.5% (approx. 1400 per year) of all PDO collisions would no longer be included in the database. If raised to \$4,000 it would eliminate 57.5% (approx. 4300 per year) of all PDO collisions recorded in 2008.

3 DISCUSSION AND CONCLUSIONS

A dollar-based collision threshold presents complications for reporting. It is not indexed to inflation, and in practical terms, it does not make sense to do so since the incremental changes in repair costs annually would likely fall within the error margin of the estimate. It is unclear (from a New Brunswick perspective) whether retaining the existing threshold would present an additional burden to the police. There were approximately 50% fewer reported PDO collisions

in New Brunswick in 2008 than in 1991. Even in the environment of a stagnant reporting threshold, police collected data on 1000 fewer PDO collisions in New Brunswick in 2008 than in 1994. Existing issues with underreporting will only be magnified with an increased threshold, compromising the availability of collision data to identify areas of elevated collision risk. If an incrementally higher dollar-based threshold was to be adopted, \$2,000 does make the most sense for New Brunswick as it represents the most commonly reported collision value and presents a natural division in the data.

It could be expected that moving to a tow-away reporting threshold would again reduce the availability of data, as experienced in the study by Zegeer, et al.[6]. It does raise the question, that if the availability of data is so important, why have a threshold at all and instead have the police report *all* PDO collisions to which they are called? This may not be a practical solution for most jurisdictions balancing workload with resources, suggesting that PDO collision reporting should be aligned with uniform, objective criteria that may include fewer variables for less severe PDOs to allow network screening. The development of criteria represents a future research need, as does how estimated collision repair amounts are associated with PDO severity in New Brunswick. There is also a need to better understand how technology, such as Global Positioning Systems, could streamline collision data collection by police, while enhancing the precision of the measured variables and reducing officer burden.

4 ACKNOWLEDGEMENTS

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