March 2009

Truck Compliance

Advisory Panel Report

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* Information in the appendices was provided by the British Columbia Trucking Association.

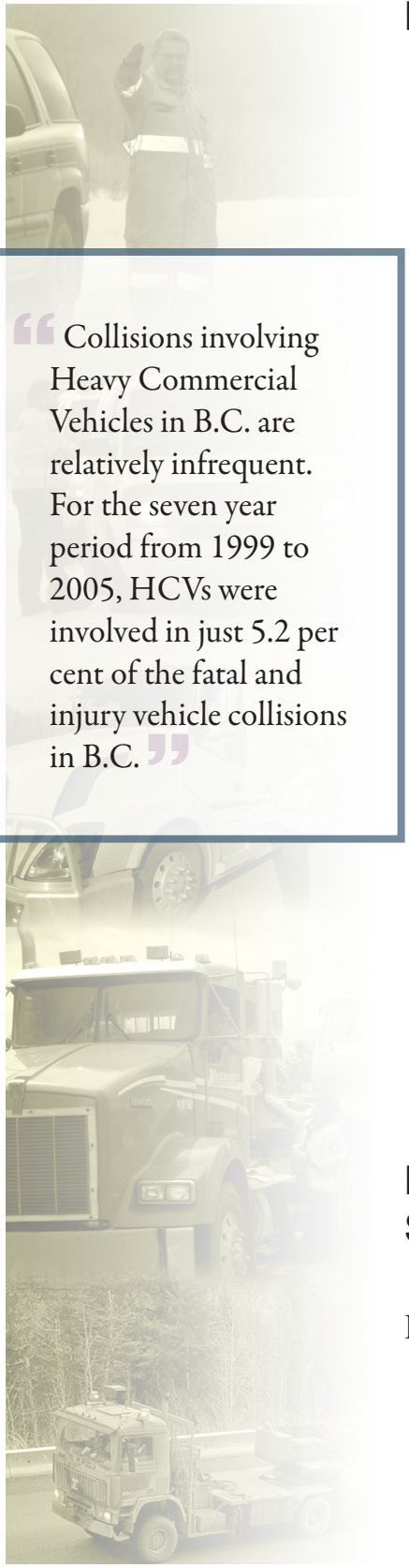
Executive Summary

The maintenance and safe operation of heavy commercial vehicles are primary objectives of the Ministry of Transportation and Infrastructure, industry and the public. Compliance and related enforcement measures are conducted regularly and generate interest, particularly following enforcement activities and published statistics regarding out of service (OOS) ratios.

To promote continuous improvement, the Truck Compliance Advisory Panel was formed in 2008 by the Minister of Transportation and Infrastructure. It was comprised of senior representatives from the ministry, the British Columbia Trucking Association and Teamsters Union. The panel examined out of service rates, safety inspection and enforcement practices in British Columbia and other jurisdictions across North America. Findings show that OOS rates in B.C. conform closely to national values. At times, higher rates have been reported; however, the variances are generally related to focused enforcement campaigns, where inspections are conducted only on those vehicles exhibiting conditions that inspectors feel should be examined more closely.

It is generally acknowledged that there is a very small percentage of non-conforming commercial vehicles operating on British Columbia's highways. However, efforts continue to be made to increase compliance and improve safety. To that end, this report examines current data and experiences from other jurisdictions and recommends the Province consider four different strategies:

- Implement a Premium Carrier Program
- Expand shipper responsibilities
- Strengthen roadside enforcement
- Enhance the Commercial Vehicle Inspection Program (CVIP)



> "Collisions involving Heavy Commercial Vehicles in B.C. are relatively infrequent. For the seven year period from 1999 to 2005, HCVs were involved in just 5.2 per cent of the fatal and injury vehicle collisions in B.C."

I. Introduction and Background

Collisions involving heavy commercial vehicles (HCV), although relatively infrequent, can have serious consequences due to their large size and weight. Heavy commercial vehicles are regularly inspected and placed "out of service" (OOS) if they exhibit defects that could increase risks to safe operation.

In 2008 the Minister of Transportation and Infrastructure created the Truck Compliance Advisory Panel to look into issues affecting out of service rates for commercial vehicles and propose recommendations to reduce OOS ratios. Members of the panel included executive representatives of the HCV drivers through the Teamsters Union and carriers through the British Columbia Trucking Association, as well as the Ministry of Transportation and Infrastructure, which has responsibility for regulating HCVs in B.C. The composition of the panel reflected that truck safety is a joint responsibility shared by all members of the trucking industry, and that cooperation toward the common goal is essential to produce results.

The Truck Compliance Advisory Panel was mandated to:

- Review existing research, including ICBC collision data, to determine the role of vehicle components in heavy commercial vehicle collisions;
- Identify issues which influence out of service rates;
- Identify enforcement strategies, sanctions for non-compliance and measures for improving compliance;
- Conduct research into proposed initiatives; and
- Provide recommendations to the Minister of Transportation and Infrastructure.

The panel has addressed each of these components, with contributions from each of the organizations that panel members represent. This report details the panel's findings and recommendations.

II. Current Situation – HCV Safety and Out of Service Rates

HCV Crashes and Vehicle Factors as Causation

Analysis of Insurance Corporation of British Columbia (ICBC) data (see Appendix A) shows that collisions involving HCVs in B.C. are relatively infrequent. For the seven year period from 1999 to 2005, HCVs were involved in just 5.2 per cent of the fatal and injury vehicle collisions in B.C. Nonetheless, these collisions remain of concern for the safety of the travelling

public and for the disruption of goods movement upon which economic activity depends.

Crashes involving HCVs, like those for all types of vehicles, can have many causative factors. By far the most common causes of HCV collisions are factors related to driver behaviour or to weather and road conditions.

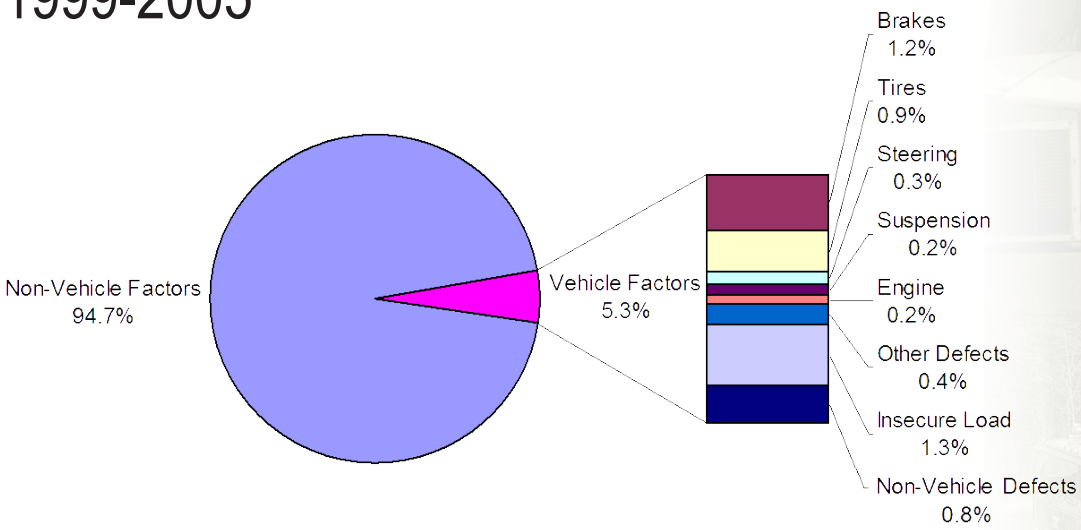
In contrast, vehicle factors were identified in only 5.3 per cent of the collisions reported during the seven years from 1999 to 2005. Vehicle factors include vehicle defects as well as factors related to the securement and weight of the load. In 1999-2005, only about 3.2 per cent of HCV collisions were a result of vehicle defects. Of those, the most common were defects with brakes (accounting for 1.2 per cent of HCV collisions) and defective tires (0.9 per cent).

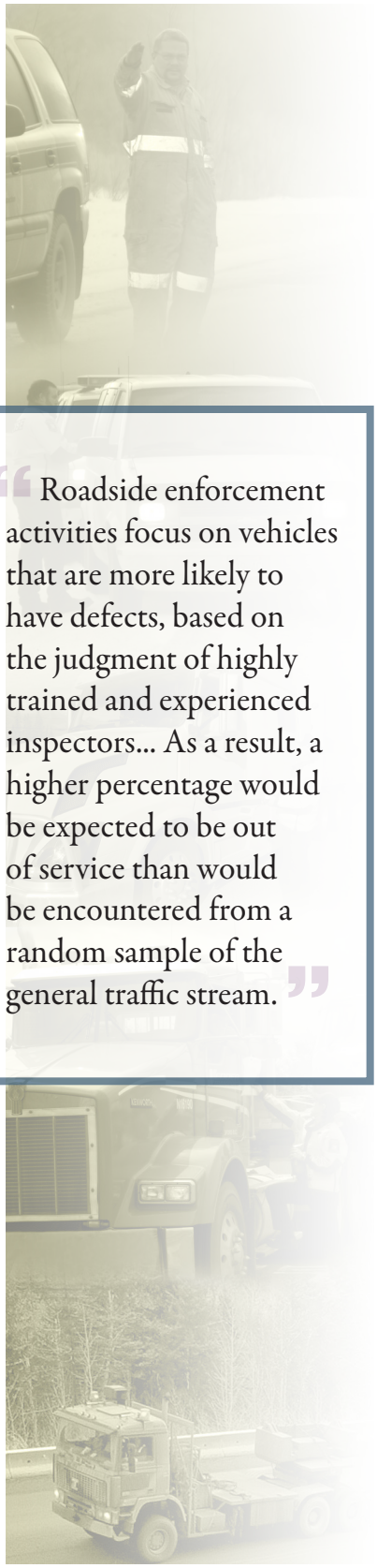
For comparison, "insecure load" was identified in about 1.3 per cent of HCV collisions.

These numbers are small, but industry and government are committed to reducing these ratios to further enhance the safe, efficient transportation of goods throughout the province.

Actions that result in reducing safety-related vehicle defects can have a small but important role in preventing HCV collisions and their resulting personal, social and economic costs.

Vehicle Factors in HCV Crashes in BC 1999-2005





Out of Service (OOS) Rates

Heavy commercial vehicles are placed "out of service" (OOS) when they do not meet standards related to safety. These standards reflect criteria that research has determined contribute to elevated risk that a collision may occur.

All jurisdictions in North America use similar criteria to place vehicles or drivers OOS. This means that OOS rates can be compared across jurisdictions when similar approaches to selecting vehicles for inspection (sampling) are used.

The National Safety Code requires that inspections are done daily by the driver (trip), monthly by the carrier/operator (maintenance), periodically by designated inspection facilities and at any time on-road by police agencies or ministry vehicle inspectors. The number of HCV systems and components inspected varies, but all are done to standard criteria in accordance with the National Safety Code.

Jurisdictions across North America cooperate in providing comparable data about OOS rates for the overall HCV fleet. Once a year they jointly undertake a 3 day event called "Roadcheck" – an annual roadside safety inspection program coordinated by the Commercial Vehicle Safety Alliance (CVSA) in partnership with member jurisdictions.

Vehicles and drivers are selected at random from the traffic stream and subjected to stringent inspection for mechanical and driver fitness.

Common criteria and random sampling approaches allow jurisdictions to obtain a statistically valid estimate of the proportion of the HCV fleet that exhibits defects that lead them to be placed OOS.

The OOS rate derived from Roadcheck is a statistically sound estimate of the proportion of the HCV fleet that is OOS in B.C., either for comparison to other jurisdictions or for trend analysis over a period of years.

Enforcement activities throughout the year also result in OOS data. However, this data cannot be compared to the results of Roadcheck. Roadside enforcement activities focus on vehicles that are more likely to have defects, based on the judgment of highly trained and experienced inspectors.

Vehicles are not pulled over at random for inspection during these enforcement activities. Inspectors usually visually screen vehicles and stop only those vehicles which they feel warrant closer inspection.

As a result, a higher percentage would be expected to be OOS than would be encountered from a random sample of the general traffic stream.

"Roadside enforcement activities focus on vehicles that are more likely to have defects, based on the judgment of highly trained and experienced inspectors... As a result, a higher percentage would be expected to be out of service than would be encountered from a random sample of the general traffic stream."

Higher OOS rates related to roadside enforcement actually reflect the experience of the inspectors and effective allocation of resources. This OOS data cannot be used to infer trends in overall truck safety, or to compare B.C. to other provinces.

III. Goals for Out of Service Rates

Consistency of the B.C. OOS rate with the Canadian average reflects compliance with industry standards across the country, including providing a "level playing field" for the industry in B.C. compared to other jurisdictions. A downward trend over the years in the B.C. OOS rate suggests improved road safety, reduced economic costs, and more efficient trucking to support B.C.'s economy. Goals for OOS rates thus stress a downward trend over time while maintaining reasonably close OOS rates to the Canadian average.

The remainder of this report will focus on reducing OOS rates in B.C., in the expectation that reduced OOS rates should contribute to reduced HCV collisions over time.

IV. Analysis and Discussion

Causes of Higher Out of Service Rates

While the vast majority of carriers and drivers are responsible and safe, there is a minority that do not operate or maintain their vehicles properly.

Initiatives to reduce OOS rates must address the root causes of why this minority of HCVs operate in a condition that would lead a vehicle to be placed OOS.

In this analysis, each potential countermeasure has been assessed according to how or if it could reasonably be expected to address various possible root causes. These reasonable expectations are based primarily on experience in B.C. and other jurisdictions, but also on academic research or results of tests and trials where these are available.

Some potential root causes that have been identified are listed below. They may be present singly or in combination in any particular situation.

- Lack of knowledge of what is required for safe operation (either on the part of operators and carriers or on the part of mechanics and inspectors)
- "Pushing the envelope" for economic gain with the hope of avoiding detection

"While the vast majority of carriers and drivers are responsible and safe, there is a minority that do not operate or maintain their vehicles properly.

Initiatives to reduce out of service rates must address the root causes of why this minority of heavy commercial vehicles operate in a condition that would lead a vehicle to be placed out of service."

- Succumbing to perceived competitive pressures (if some "get away with it" and lower their costs in the short term, then the pressure is on other carriers/operators to cut corners)
- Actions by others not within the control of the carrier/operator (e.g. shippers) that lead to being placed OOS

Types of Available Countermeasures

British Columbia and other jurisdictions have extensive experience with initiatives targeted at reducing OOS rates, providing both a selection of choices for action as well as a basis for evaluating specific types of action. Overall, such initiatives aim at one or more approaches to reducing OOS rates:

Prevention – Managing operations so that vehicles with defects and other conditions that would lead to a vehicle being placed OOS are not on the road in the first place. Carriers, operators and drivers may be motivated by opportunities to reduce costs by improving operations. They may also be motivated by sanctions that have a deterrent effect.

Detection and Correction – Monitoring vehicles on the road to find defects and other conditions that would lead a vehicle to be placed OOS. Once found, ensuring these conditions are properly corrected in a timely fashion.

Intervention and Apprehension of Risk – For the most serious conditions, removal of the vehicle and/or the driver from the traffic stream until the problems are fixed.

The causes of HCV collisions are not limited to any particular segment of the trucking industry. Hence, industry and government have recognized that HCV safety is a joint responsibility and that all participants have roles to play in reducing OOS rates.

British Columbia is a participant in national programs such as the National Safety Code and has a long history of safety initiatives directed at commercial transport. B.C. already has a set of programs in place to reduce OOS rates. Consequently, the analysis of potential measures to reduce OOS rates has focused on building upon current successes while considering innovative new opportunities for British Columbia.

Review of experience in other jurisdictions and consideration of suggestions from industry have provided a basis for selecting four general improvement areas for further analysis and recommendations.

The four general improvement areas are:

Premium Carrier Program – To provide incentives for carriers to follow best practices and therefore prevent conditions that would lead to vehicles being placed OOS.

Shipper Liability – To provide deterrents to shipper actions that can lead to increased OOS rates but which are largely outside the control of carriers and operators.

Strengthened Roadside Enforcement – Removing unacceptable vehicles from the traffic stream provides a powerful deterrent to carriers and operators through added expense, disruption of operations and public exposure.

Enhancements to the Commercial Vehicle Inspection Program (CVIP) – To improve timeliness and effectiveness of inspection, follow-up and audit processes. This will result in better detection and correction of defects and should provide incentives for carriers to take preventive action by making it more likely that offenders will be caught and sanctioned.

Proposed Initiatives to Reduce Out of Service Rates

1) Premium Carrier Program

Rationale

Premium carrier programs provide incentives to carriers to manage their operations to a higher safety standard, thus preventing the conditions that lead to vehicles or drivers being placed OOS.

In addition to the direct benefits of safer operation by premium carriers themselves, such programs allow government resources to target oversight and enforcement activities at higher-risk carriers and operators.

Promoting the benefits of safety should provide incentives to carriers to improve their practices. This in turn will allow an increased focus on non-compliant carriers. Together these should ultimately result in a reduction in the OOS rate.

> “Industry and government have recognized that HCV safety is a joint responsibility.”

Review of Experience Elsewhere

Premium carrier programs have been implemented in a few jurisdictions. Programs can either be based on the National Safety Code (NSC) carrier profiles (creating a higher threshold category of "excellent" in addition to the satisfactory, conditional, and unsatisfactory categories) or can be a separate voluntary program that requires carriers to demonstrate they have safety programs and practices that exceed NSC requirements.

Model 1: Recognition Program Based on Carrier Profile – This type of recognition program relies on the carrier's NSC profile and audit score to determine eligibility. Beyond the initial NSC audit requirement, no additional reporting is required, which saves carriers time and money compiling information and does not create significant additional program administration.

Carriers benefit from recognition, which can lead to better business opportunities. Carriers can use this recognition by the Province to assure shippers that their loads will be delivered reliably and safely.

Carriers do not receive benefits such as the ability to by-pass inspection stations, because random inspection data is needed to compile NSC profiles. As a result, government is unable to redirect enforcement resources from excellent carriers to higher-risk carriers, and carriers do not realize time savings.

In addition, because the carrier rating is relative to other carriers, only a certain percentage of carriers will be able to be included in the program.

<u>Example - Ontario</u>

Ontario formally recognizes carriers that achieve excellent safety results through the creation of an "excellent" rating in its NSC carrier profile, which Ontario calls a "commercial vehicle operator's record" (CVOR).

If a carrier wants to have an excellent rating, they must undergo a facility audit and attain a score of at least 80 per cent in both the driver and vehicle components. In comparison, a satisfactory rating requires an audit score of 55 per cent or better.

In addition to an excellent audit score, the carrier must have operated in Ontario for at least two years, have an overall violation rate not more than 10 per cent of their overall CVOR threshold, and an accident violation rate not more than 10 per cent of their accident threshold. In comparison, satisfactory carriers must have a violation rate of not more than 65 per cent of their CVOR threshold level.

Beyond meeting the carrier profile and audit requirements, there is no requirement for additional reporting. Carrier profiles are publicly accessible on-line, as is a list of excellent carriers. Carriers benefit from having an excellent rating by being able to demonstrate to shippers that they are safe operators.

Model 2: Recognition through a Separate Voluntary Program – This type of recognition program requires carriers to demonstrate they have a variety of programs in place beyond what is required to meet NSC requirements. These voluntary programs provide a variety of benefits to carriers to offset the increased effort carriers must make in order to commit to the program requirements.

Carriers receive a variety of benefits from being accepted in the program, including inspection station by-pass privileges and reduced audit requirements, for example.

Carrier safety is monitored through additional reporting requirements. Consequently, these programs can be both costly for government to administer and costly for carriers to participate in. Cost recovery from carriers participating in the program is possible. However, a high administrative fee could reduce any benefits from the program, resulting in low program uptake.

Voluntary programs have the potential to promote the early adoption of new safety technologies, and by allowing government to redirect enforcement resources from premium carriers to higher-risk carriers, a reduction in the OOS rate may occur.

Carriers benefit from a reduction in down time through efficiencies such as weigh-in-motion technologies. They can also benefit from participation in the program by being able to demonstrate to shippers that they are safe operators.

Example - Alberta

Alberta created its "Partners in Compliance" (PIC) program in 1994 and revised it in 2006. The program is a partnership between Alberta Transportation and the Alberta Motor Transport Association, which represents the trucking industry.

Carriers who enroll in the PIC program commit to demonstrating a high level of compliance with benchmark criteria, monitoring their own operations, submitting reports on a quarterly basis and allowing random vehicle inspections.

Approved 'PIC carriers' are rewarded through operational and financial benefits. They receive expedited service at vehicle inspection stations and roadside inspections, and are exempt from a number of audits.

Beyond offering recognition to good carriers, the PIC program is a management program and process that assists carriers to become and remain excellent carriers.

Example - Oregon

Oregon created its "Trusted Carrier" program 10 years ago based on Alberta's PIC program. The program is intended to help the Oregon Department of Transportation direct its motor carrier enforcement efforts to where they are most needed.

Carriers must have a transponder and be enrolled in Oregon's green light program (weigh in motion). Carriers must pass a review of their compliance with registration, tax, and safety requirements.

In the review of safety records, Trusted Carriers cannot have an unsatisfactory safety rating. Their driver and vehicle out-of-service percentage must be at or below the national average and there can be no serious safety violations on record.

Carriers benefit from being in the Trusted Carrier program through public recognition and by exemption from random safety inspection or safety compliance reviews, unless warranted. Also, they qualify for a waiver of surety bond requirements.

Program Considerations for B.C.

A voluntary recognition model provides strong incentive for carriers to focus on safety, and is likely to lead to a reduction in the OOS rate , due to a shift in the allocation of enforcement resources.

A premium carrier program is intended to change the behaviour of a significant number of carriers, not just to reward those who are already maintaining a high standard of operations. This means that the incentives must be carefully determined to have appropriate value for carriers not currently operating to that standard.

In order to ensure optimal uptake in the program, incentives for premium carriers would be developed in consultation with industry and could include:

- ***Less frequent stops at inspection stations*** – Premium carriers could receive permission for inspection station by-pass

- ***Fewer inspections at roadside*** – Vehicle inspections for premium carriers could be done at their facility rather than roadside, reducing inconvenience and delivery time for shipments
- ***Preferential consideration for participation in pilot programs*** – Being a premium carrier could be a pre-requisite for operators who wish to be in pilot projects or special programs, such as the Long Combination Vehicle program
- ***Public Recognition*** – Vehicle identifiers or a list of premium carriers available online could allow carriers to differentiate themselves as a carrier whose shipments more frequently arrive on-time, with fewer delays caused by collisions or stops at inspection stations

Eligibility to enter the premium carrier program would be based on demonstrated performance in a number of safety-related areas. Standards of performance required for entrance into the premium carrier program should be determined in consultation with industry.

Eligibility for initial entrance to the program would be verified by an audit to confirm the carrier's safety programs and NSC records are in order. Once accepted into the program, premium carriers would undergo recurring audits to verify that they are continuing to comply with program eligibility requirements.

Program eligibility requirements could include:

- Safety program
- Driver education program
- Initiatives to retain skilled drivers
- Vehicle maintenance program
- Transponder (registered with Green Light Transportation System)
- On board technology such as electronic logbooks

Ongoing requirements for regular reports of safety-related information by premium carriers could include:

- Accidents / Incidents
- WorkSafeBC statistics

Potential Benefits, Costs and Risks

Improved road safety can be accomplished by encouraging compliance in addition to enforcing regulations. The creation of a premium carrier program would provide recognition to good carriers and provide an incentive to other carriers to focus on their safety records. It would also allow government resources to be redirected and focused on those carriers

who require greater enforcement. Both these types of benefits should contribute to lower OOS rates in B.C.

The program will be most successful if designed and implemented in a way that is cost neutral for government and generates cost efficiencies for industry. This can be accomplished through partnership between government and industry.

Recommended Next Steps

It is recommended that the Province work in close association with stakeholders to implement a Premium Carrier Program and develop an administrative framework to make the program cost neutral for government and cost saving for industry.

2) Shipper Responsibility

Rationale

Drivers can be fined and vehicles can be placed OOS if their load is overweight or not properly secured. However, loading of HCVs is sometimes performed by shippers with little or no involvement of carriers and drivers.

Similarly, drivers can be placed OOS for exceeding their allowed Hours of Service (driving longer than the regulations permit) but shippers control delivery deadlines that may impact drivers' ability to fully conform to Hours of Service rules or other safety-related regulations.

The intent of shipper responsibility initiatives is to promote awareness of the joint accountabilities which exist throughout the supply chain. This should help lower OOS rates by deterring shipper practices that contribute to vehicles or drivers being placed OOS.

During Roadcheck 2008, load-related OOS violations accounted for 16.9 per cent of B.C.'s OOS violations.

> "The intent of shipper responsibility initiatives is to promote awareness of the joint accountabilities which exist throughout the supply chain."

Review of Experience Elsewhere

Several jurisdictions in Canada and the US have measures in place to penalize shippers for overloading or improperly loading vehicles. Depending on the jurisdiction, shippers may share liability with carriers and drivers, or shippers may be liable on their own for infractions.

Jurisdictions with shipper liability report that the trucking industry is generally supportive of these measures, although intervention is infrequent. In those jurisdictions, proving that shippers knowingly required carriers or drivers to contravene regulations has been challenging.

Gathering evidence may require that drivers or carriers come forward with information. As carriers and shippers are involved in a business relationship, coming forward may have a negative economic impact for carriers.

Example – Alberta

In Alberta, legislation has been in place since the early 1980s that apportions liability to shippers for contraventions of transportation regulations. While few charges have been laid, this measure is seen as a tool which, coupled with education, has improved compliance.

Example – Saskatchewan

Saskatchewan has legislation similar to Alberta's, limited to over-weight and over-dimensional loads. The driver retains responsibility for the vehicle but the shipper can also be found liable for loading infractions.

Example – Manitoba

Manitoba has broad provisions which hold shippers liable for transportation offences, for a range of contraventions of the *Highway Traffic Act* or regulations. A shipper may be liable for offences for which a carrier or driver may be liable, regardless of whether or not the carrier or driver has been prosecuted. Although few charges have been laid, the risk of potential charges appears to have led to improved compliance.

Example - Ontario

Ontario has provisions that hold shippers accountable for transportation related offences. Currently, Ontario is contemplating changes to broaden the scope of the regulations to include audits and investigations.

Program Considerations for B.C.

Currently in B.C., shippers cannot be held legally responsible for overloading or improperly loading vehicles under the *Commercial Transport Act*, *Motor Vehicle Act* or regulations created under those statutes. Responsibility rests with carriers and drivers to operate with compliant vehicles and loads.

The only liability that can currently accrue to a shipper is under section 37.12 of the Motor Vehicle Act Regulations, which indicates nobody shall cause a driver to exceed the hours of service permitted.

In consultations with members of the trucking industry, concerns were raised regarding shipper behaviour aimed at reducing costs. The most common concerns were that some shippers knowingly overload vehicles, load cargo insecurely or pressure drivers or carriers to exceed maximum load limits and hours of service.

In these situations, carriers are faced with difficult business decisions. They must either agree to shipper demands or refuse and perhaps lose the contract with the shipper.

Shipper responsibility should extend into the following primary areas:

Over-Weight and Over-Dimensional Loads

Shippers often have control over the weight and dimensions of HCV loads. By overloading trucks, a contractor (shipper) may save both time and money by reducing the number of trips required to move a given amount of material. However, overloaded vehicles have impaired handling and longer stopping distances. In addition to posing safety hazards, overloaded vehicles also accelerate wear and tear or damage to the vehicles themselves and to public roads.

When drivers are tasked with operating overloaded vehicles, it places them in a difficult situation. Drivers may not be aware that trucks are overweight but are liable for offences if they are caught operating an overweight vehicle.

When drivers are aware of overweight loads, they often have difficulty refusing shipper demands to carry them. Economically, it may be in the interest of carriers and drivers to accept the risks of carrying overweight loads. However, along with fines, carriers are also penalized for non-compliant behaviour through points on their NSC carrier profiles, which negatively affect their carrier safety rating.

Cargo Securement

In an initial consultation with industry, issues were raised regarding shipper responsibility for cargo securement. Although drivers are liable for cargo securement, shippers often load their own cargo into trailers or containers and seal them to ensure goods are not tampered with, in order to reduce losses.

However, shippers may not always ensure that cargo is properly secured. Heavy cargo that shifts during transport can affect the operability of the vehicle combination, and pose a significant risk to road safety. Improperly secured loads also contribute to OOS rates and to risks of collisions.

Hours of Service and Delivery Times

Industry has raised concerns around shippers requiring drivers to contravene driving regulations. For instance, shippers may schedule routes and delivery times which may be difficult for drivers to maintain within the Hours of Service requirements.

While authority exists in B.C. for holding shippers liable for contraventions of Hours of Service requirements, it is difficult to gather evidence required to prove intent.

Potential Benefits, Costs and Risks

Provisions for shipper responsibility could be a useful tool to enable the trucking industry to work with shippers to ensure compliant loads and appropriate travel times. This, plus consideration by shippers of the potential costs of noncompliance, might contribute to reduced OOS rates.

It is possible that imposing shipper responsibility could lead to increased costs for shippers. Shippers may also become more conscious of the safety records of carriers if they are to bear a portion of the costs of offences. This potentially could have the effect of increasing the value of the premium carrier program.

Information from other jurisdictions indicates that the legislation is difficult to enforce, but the existence of shipper liability may deter actions by shippers that lead to higher OOS rates.

More information is required to determine the impact shippers have on the OOS rates. A review of legislation and enforcement in other jurisdictions has indicated these measures may have improved shippers' practices, but the information is not conclusive. Before making recommendations for a legislative approach, additional information regarding shipper involvement in OOS rates should be reviewed. Where patterns and trends are evident, appropriate action is necessary to address the role of the shipper.

Recommended Next Steps

It is recommended that the Province:

- Educate shippers about their responsibility for highway safety
- Collect shipper information during roadside enforcement activities
- Immediately initiate intervention and enforcement activities where patterns or trends indicate a lack of shipper support for compliance with trucking regulations
- If positive trends are not evident, consider legislation to make shippers responsible for their actions relating to vehicles leaving their facilities.

3) Strengthened Roadside Enforcement

Rationale

Although most commercial vehicle owners and operators respond well to current enforcement and compliance processes, a small number require a different approach to improve compliance with vehicle safety requirements. For operators that do not comply with safety regulations and who continue to operate HCVs with serious safety problems, strengthened roadside enforcement could present a significant deterrent.

Review of Experience Elsewhere

Ontario has implemented a program for commercial vehicle impoundment. Although Ontario began impounding commercial vehicles in 1998, over 10 years ago, no other North American jurisdiction has followed Ontario's example of developing this type of program.

Example – Ontario

Commercial vehicles that are found to have "critical defects" are impounded for a minimum of 15 days. "Critical defect" is defined specifically by regulation under the Ontario *Highway Traffic Act* and pertains to air brakes, hydraulic brakes, steering, wheels, rims, tires, suspension and frame components. Critical defects are more serious than CVSA OOS defects. For example, under CVSA inspection criteria, a vehicle would be placed OOS if 20 per cent of the wheels on a unit had brake defects, but the unit would have a critical defect and would be impounded if 50 per cent of the wheels had brake defects.

In Ontario, inspections for critical defects and orders to impound are carried out at specified truck inspection stations. These facilities are located only on routes with high volumes of commercial traffic.

Program Considerations for B.C.

Vehicle impoundment represents only one approach to deter carriers and operators that are unresponsive to other regulatory approaches. Other measures also provide similar results and are effective deterrents to the operation of unsafe vehicles. Strengthened roadside enforcement and increased roadside effectiveness will be achieved by issuing permits through the permit centre allowing resources to be focused on inspections and improving inspectors' ability to target poor performers.

The current enforcement framework in B.C. already contains elements that deter unlawful carriers and operators and remove unsafe HCVs from the

road. These existing measures could be made stronger through changes in business processes, without requiring regulatory or legislative changes.

Peace officers in B.C. already exercise authority to order vehicles to be removed from the highway until the vehicle complies with the Motor Vehicle Act Regulations. Peace officers also have authority to seize the vehicle license plates.

Similar to a vehicle impoundment program, the current Notice and Order process provides for the vehicle to be immediately removed from the highway and towed to a safe location at the operator's expense.

The vehicle must be kept from the highway until it passes inspection by an authorized inspector. Failure to comply is an offense and may also result in refusal of future license transactions.

Both license plate seizure and the Notice and Order process for removal of unsafe vehicles can be enhanced through clarifying deficiency criteria that would invoke these sanctions.

Guidelines could be strengthened to define criteria for mechanical defects that would trigger these actions and to provide clarity to the existing processes that cause vehicle to be removed from the roadway. Such communication would also add to the deterrent value of these established measures by measuring operator awareness.

Potential Benefits, Costs and Risks

Both approaches to removing unsafe HCVs from the road share similar benefits, but present very different costs and risks. The benefits include protection of the public through immediate removal of unsafe HCVs and strong deterrents to carriers and operators for unsafe practices that lead to higher OOS rates.

Deterrents to drivers and carriers arise from fines and economic pressures resulting from loss of use of the vehicle. For drivers, removal of the vehicle from the road would result in fines, towing costs, and lost income during the impoundment period.

For carriers, there may also be fines and towing costs since they can be liable for unsafe vehicles being operated. Additionally, carriers could suffer losses if goods do not reach their destination on time, and lost revenue for the period during which the vehicle is impounded.

Benefits could be expected from widely-publicized initiatives to expand the use of existing tools such as license plate seizure and towing of HCVs at the owner's expense. Incorporation into policy of appropriate time periods

for re-inspection of vehicles or return of plates/relicensing could result in similar economic pressures on operators and carriers.

The costs and risks of establishing a truck impoundment program are much greater than for strengthening the existing measures.

Legislative change would be required to provide legal authority for an impoundment program, and costs would be incurred to establish designated impoundment facilities in various areas of the province.

Because no jurisdiction other than Ontario has implemented a truck impoundment program, there is limited evidence that such a program would reduce the OOS rate.

To the extent that such reductions would occur, similar reduction in OOS rates can likely be achieved at much lower cost through strengthening existing provisions that yield the same end result: immediately removing defective vehicles from the roadway until repaired and re-inspected.

Recommended Next Steps

It is recommended that the Province build on the existing program to take vehicles with critical defects (see Appendix B) off the road by strengthening guidelines to govern the seizure of license plates, towing of unsafe HCVs, return of plates and re-licensing and related fines and costs.

4) Enhancements to Commercial Vehicle Inspection Program (CVIP)

Rationale

In addition to random inspections roadside, all heavy commercial vehicles must undergo routine periodic inspections at a designated inspection facility. These periodic inspections ensure carriers conduct routine maintenance on their vehicles, and they reduce OOS rates by detecting and correcting defects. Vehicles must pass inspection for annual renewal of vehicle insurance.

Strengthening the periodic inspection program and ensuring Designated Inspection Facilities (DIFs) conduct inspections in full compliance with requirements, will help reduce OOS rates by making it less likely that poorly maintained vehicles will be operating on the roads.

Review of Experience Elsewhere

All jurisdictions across Canada require vehicles to undergo routine inspections as part of the National Safety Code's periodic vehicle inspection programs requirement (Standard 11B).

British Columbia, like other western provinces, employs a private facility model where government authorizes private facilities to perform inspections. Commercial Vehicle Safety and Enforcement (CVSE) staff authorize qualified mechanics that have completed a college course on inspection criteria to conduct inspections. These inspectors work at private facilities that have been designated by CVSE as having the appropriate shop and tools needed to perform inspections.

Quality control of the program is done by CVSE staff, which periodically review facilities and have the authority to issue violation tickets for improperly approving a vehicle or for unauthorized use of a certificate.

Inspectors may also have their authorization suspended, and facilities may have their designation cancelled for failure to maintain records, keep copies of standards, ensure security of decals, meet facility standards and monitor their inspectors.

This inspection model is cost effective because private facilities already have the necessary infrastructure in place. Because facilities are able to do repairs as well as inspections, carriers benefit from 'one-stop service'.

The large number of private facilities throughout the province provides easier access for carriers to have their vehicles inspected.

Program Considerations for B.C.

The effectiveness of periodic vehicle inspections depends on the stringency of the program requirements and the rigour with which they are enforced. By improving the quality of inspections and increasing CVSE's ability to monitor inspection facilities, the program can become more effective at detecting and correcting vehicles with defects that would lead them to be placed OOS. Over time, this should contribute to lowering the OOS rate.

Improving Inspection Quality – The quality of inspections is influenced by factors such as qualifications and training, continuing education, vehicle standards and monitoring. It is important to ensure inspectors keep their training up to date and are aware of changing technologies. Improving the training course for certifying inspectors and promoting continuing education will improve the quality of inspections.

Improving Program Monitoring – Opportunities for improvement in program monitoring are primarily related to computer system upgrades to manage data better and improved decal management. The potential for collusion between substandard carriers and facilities can be reduced through improved monitoring. Conducting an audit of a facility that has recently passed a vehicle which has had critical defects identified at a roadside inspection will increase the accountability of facilities.

Currently, CVSE staff manually track irregularities in inspections. The move to online inspection reports has enhanced timely access to current inspection data. This enables the creation of quantitative profiles for inspectors and facilities based on points accumulated for violation tickets received and for out of service or notice and orders given to vehicles they recently inspected. These profiles would allow for escalating enforcement to be triggered at certain thresholds, similar to the interventions used in the NSC program consisting of a warning letter, carrier interview, audit and show cause hearing.

Audits include random re-inspection of vehicles that have recently been inspected by a particular inspector or facility. Improving the enforcement will increase objectivity and reinforce inspection requirements to facility owners and operators thus contributing to the reduction in the OOS rate.

Unscrupulous carriers and facilities will always invent creative schemes to avoid program requirements. Improved technology will allow CVSE staff to monitor facilities more effectively and will increase the quality and quantity of evidence needed to support the intervention measures for substandard inspectors and facilities.

Potential Benefits, Costs and Risks

The periodic inspection program embodies all the approaches previously identified for reducing OOS rates. It contributes to prevention by encouraging proper vehicle maintenance so that HCVs do not develop the defects that lead to being placed OOS. It contributes to detection and correction of defects by ensuring that all vehicles are regularly checked and that defects are repaired. And it contributes to protection of the public by removing unsafe vehicles from the road until they are repaired. Improvements to inspection quality and to program monitoring intensify the benefits from each of these approaches, by ensuring that HCVs with defects are not missed and that defects are not hidden through fraud or collusion. This has the effect of both deterring noncompliance before it happens and stopping it when it is detected.

Investing in system enhancements will facilitate allocation of resources to the carriers and facilities that present the greatest risks of noncompliance.

Recommended Next Steps

It is recommended that the Province:

- Continue to strengthen the oversight and enforcement components of the commercial vehicle inspection program through improving the facility audit processes and system upgrades by:
    - Increase access to online training modules or community college training to assist inspectors and facility operators to remain current
    - Enhancing the auditing process and mirroring the intervention program used by the National Safety Code program
- Expedite auditing of DIFs when a vehicle which the facility has recently inspected has been found with critical defects

V. Conclusion

The efficient transportation of goods is vital to ensure safe operations on our roadways and contribute to a productive and competitive economy. Although the vast majority of commercial carriers operate and maintain their vehicles according to regulations, it's important to examine whether changes can be made to increase compliance, improve the flow of commercial traffic and further increase road safety.

After studying British Columbia's current approach, and those of other jurisdictions in North America, the Truck Compliance Advisory Panel recommends several steps that should be considered to garner improved compliance with safety regulations:

- Work with the trucking industry to introduce a Premium Carrier Program. This program would identify carriers who go above and beyond the normal safety regulations and provide special benefits to those that maintain a clean record;
- Develop balanced measures to promote shared responsibility between drivers, carriers and shippers;
- Ensure unsafe HCVs are taken off the road by strengthening enforcement of policies governing removal of the vehicles from the road and the seizure of license plates; and
- Continue to strengthen the oversight of DIFs and expedite the auditing of DIFs.

Appendix A

Vehicle Factors in HCV Collisions

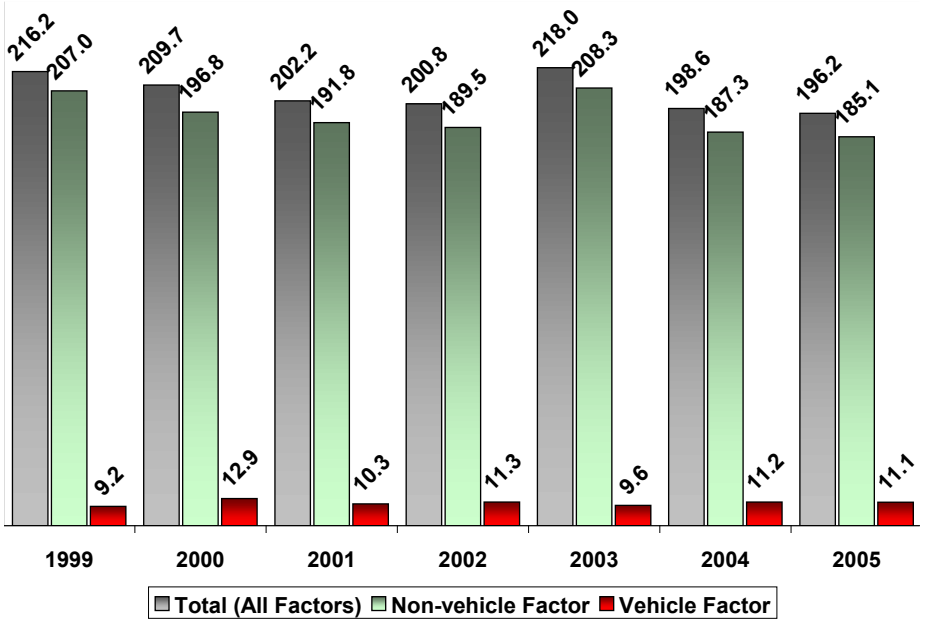
Vehicle Factors in HCV Collisions

Heavy commercial vehicle (HCV, GVW = 10,900 kg +) collision rates (collisions per 10,000 licensed HCVs) from 1999 to 2005 indicate that the trucking industry's road safety record has generally improved[1]. This observation holds with respect to total HCV collisions and collisions where the vehicle was not a factor (e.g. driver factors). It does not however hold for collisions where the vehicle was a factor (e.g. vehicle defects). At the same time, collisions where the vehicle was a factor only constituted a small proportion of HCV collisions and total collisions for all types of vehicles in BC.

HCV Collision Trend, 1999 to 2005

The total HCV injury and fatal collision rate (vehicle and non-vehicle factors) decreased by 7.1 percent from 216.2 collisions per 10,000 HCVs in 1999 to 200.8 collisions per 10,000 HCVs in 2002[2].

Figure 1: HCV Collisions per 10,000 Licensed HCVs by Vehicle and Non-Vehicle Factors



Source: ICBC Traffic Collision Statistics, 1999 to 2005

1 HCV collision rates were calculated using ICBC Traffic Collision Statistics (1999 to 2005), which are available online from
http://www.icbc.com/library/research_papers/traffic/index.asp
and ICBC Vehicle Licensing Data obtained from ICBC as a custom tabulation.

2 Lacking data for the number of vehicle kilometres driven by heavy commercial vehicles in B.C., the number of licensed vehicles has been used as a proxy to calculate collision rates.

Following an 8.6 percent increase to 218.0 collisions per 10,000 HCVs in 2003, it resumed its downward trend decreasing to 198.6 collisions per 10,000 HCVs in 2004 (-8.9 percent) and 196.2 collisions per 10,000 HCVs in 2005 (-1.2 percent). The total HCV collision rate was 9.2 percent lower in 2005 relative to 1999, on average decreasing by 1.5 percent per year (median = 2.1 percent).

Consistent with the trend in the total HCV injury and fatal collision rate, the rate for collisions involving non-vehicle factors, including among others driver fatigue, driver error, and road conditions, varied between 185.1 collisions per 10,000 HCVs (2005) and 218.0 collisions per 10,000 HCVs (2003). It decreased by an average of 1.7 percent per year (median = 1.9 percent), down from 207.0 collisions per 10,000 HCVs in 1999 to 185.1 collisions per 10,000 HCVs in 2005 (-10.6 percent).

HCV fatal and injury collisions involving vehicle factors occurred far less frequently than collisions involving non-vehicle factors. Collisions involving vehicle factors varied between 9.2 collisions per 10,000 HCVs (1999) and 12.9 collisions per 10,000 HCVs (2000). Although it fluctuated considerably, there nevertheless was a positive trend in the rate of HCV vehicle factor collisions. In 2005, the rate per 10,000 HCVs was 20.1 percent higher than in 1999, increasing by an average of 5.1 percent per year (median = 4.0 percent).

The small number of HCV collisions where the vehicle was factor amplifies the magnitude of the change in their rate. For example, one additional collision involving a vehicle factor, if there are 10 such collisions to begin with, represents a 10 percent increase. If there are 100 collisions to begin with, one additional collision represents a 1 percent increase. This in turn amplifies the magnitude of the change in the collision rate from one year to the next. As such, the proportion relative to all collisions, which is low, has to be kept in mind and is discussed in the following sections.

Proportion of HCV Collisions involving Vehicle Factors

Although the rate of HCV collisions where the vehicle was a factor increased, the small number of such collisions when compared to the total number of HCV collisions and collisions for all vehicle types puts their significance in perspective. Between 1999 and 2005, the number of collisions in BC for all vehicle types added up to 144,714 injury and fatal collisions (average = 20,673 collisions per year, median = 19,572 per year, range = 20,380 to 21,342 collisions per year). Of this total, 2,742 (1.9 percent) were fatal (average = 392 collisions per year, median = 398 collisions per year, range = 371 to 410 collisions per year).

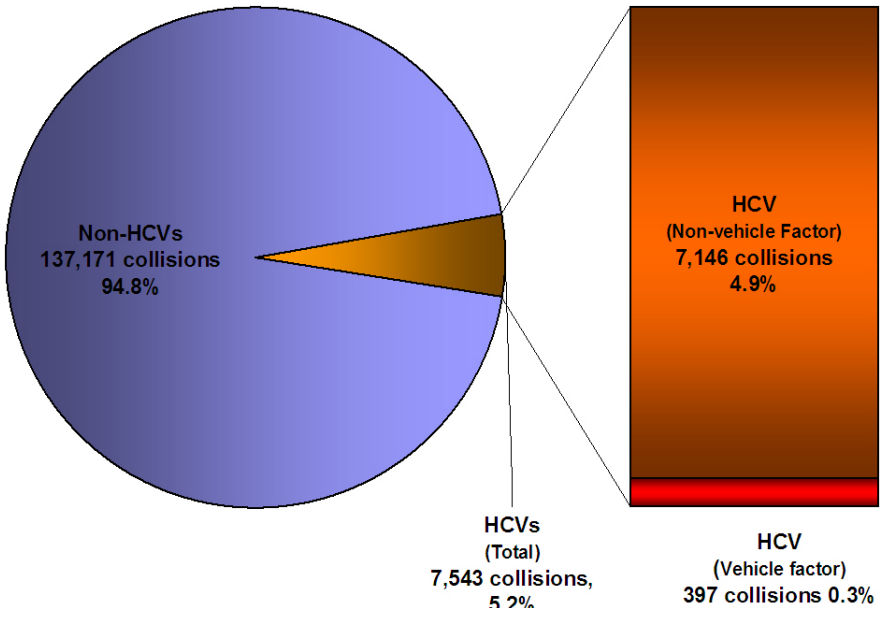
Breakdown of Injury and Fatal Collisions in BC

Vehicles other than HCVs accounted for the vast majority of all injury and fatal collisions in BC. The number of injury and fatal collisions not involving HCVs varied between 19,323 (1999) and 20,189 (2003) collisions per year (average = 19,596 collisions per year, median = 19,592 collisions per year). Over the entire 7-year period, the total number of injury and fatal collisions not involving HCVs came to 137,171, accounting for 94.8 percent of all collisions in BC.

The number of HCV injury and fatal collisions not involving vehicle factors varied between 965 (2001) and 1,102 collisions (2003) per year (average = 1,021 collisions per year, median = 1012 collisions per year). Over the 7-year period, there were 7,146 HCV injury and fatal collisions not involving vehicle factors, accounting for 4.9 percent of all collisions in BC.

The number HCV fatal collisions involving vehicle factors varied between 1 collision (1999) and 6 collisions (2000) per year (average = 3 collisions per year, median = 3 collisions per year). Over the 7-year period, there were 23 such collisions, accounting for 0.8 percent of all injury and fatal collisions and 4.6 percent of all HCV fatal collisions in BC.

Figure 2: Fatal & Injury Collisions, 7-year total, 1999 to 2005



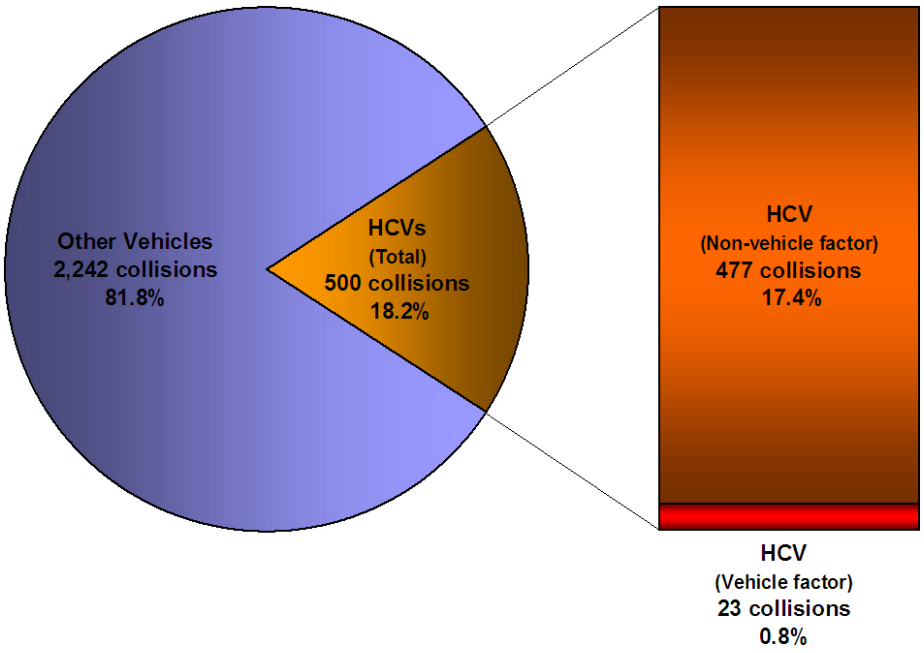
Source: ICBC Traffic Collision Statistics, 1999 to 2005

Breakdown of Vehicle Factors in HCV collisions

Of the 397 HCV injury and fatal collisions where the vehicle was a factor, the top 5 accounted for nearly 80 percent of the total. These vehicle factors included an insecure load (24.4 percent), defective brakes (22.7 percent), defective tires (16.6 percent), oversize vehicle (11.1 percent), and defective steering (4.8 percent). (See Figure 4 on the following page for all vehicle factors)

Vehicle "defects", rather than vehicle "factors", which include factors not necessarily attributable to mechanical failures (e.g. no driver), accounted for 239 injury and fatal collisions (60.2 percent of all HCV vehicle factor collisions). The following table contains a summary of HCV injury and fatal collisions between 1999 and 2005 attributable to vehicle defects.

Figure 3: Fatal Collisions, 7-year total, 1999 to 2005



Source: ICBC Traffic Collision Statistics, 1999 to 2005

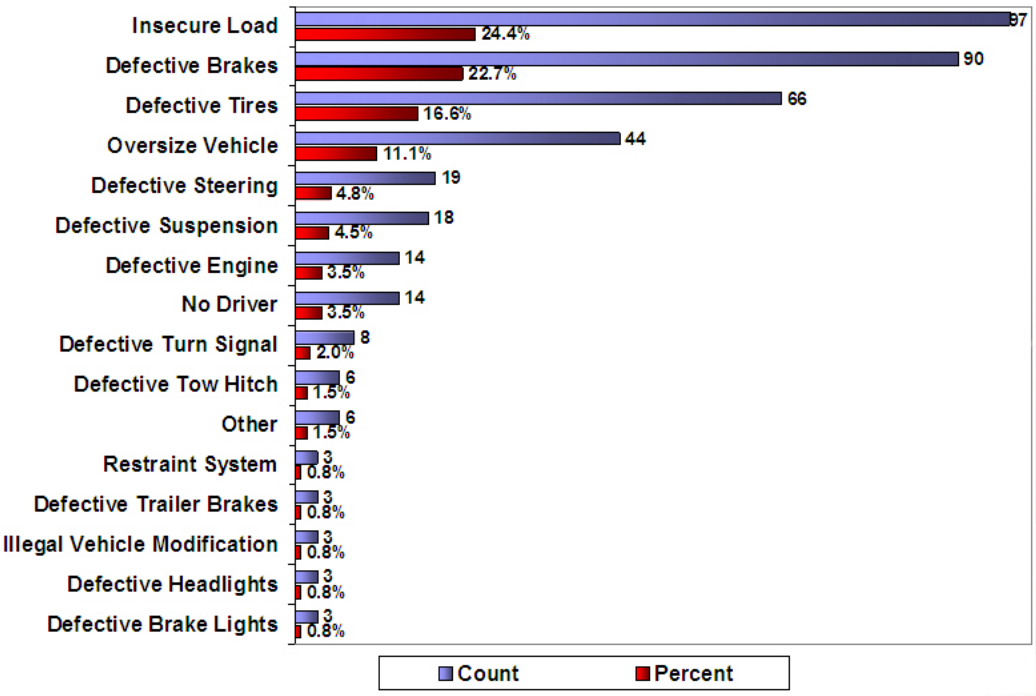
Table 1: HCV Injury and Fatal Collisions between 1999 and 2005 by Vehicle Defect

Vehicle Defect	Count	Percent	Average (per year)
Defective Brakes	90	22.7	12.9
Defective Tires	66	16.6	9.4
Defective Steering	19	4.8	2.7
Defective Suspension	18	4.5	2.6
Defective Engine	14	3.5	2.0
Defective Turn Signal	8	2.0	1.1
Defective Tow Hitch	6	1.5	0.9
Restraint System	3	0.8	0.4
Defective Trailer Brakes	3	0.8	0.4
Illegal Vehicle Modification	3	0.8	0.4
Defective Headlights	3	0.8	0.4
Defective Brake Lights	3	0.8	0.4
Defective Alternator	2	0.5	0.3
Defective Accelerator	1	0.3	0.1
Total Vehicle Defect Collisions	**239**	**60.2**	**34.1**
Total Vehicle Factor Collisions	**397**	**100.0**	**56.7**

Source: ICBC Traffic Collision Statistics, 1999 to 2005

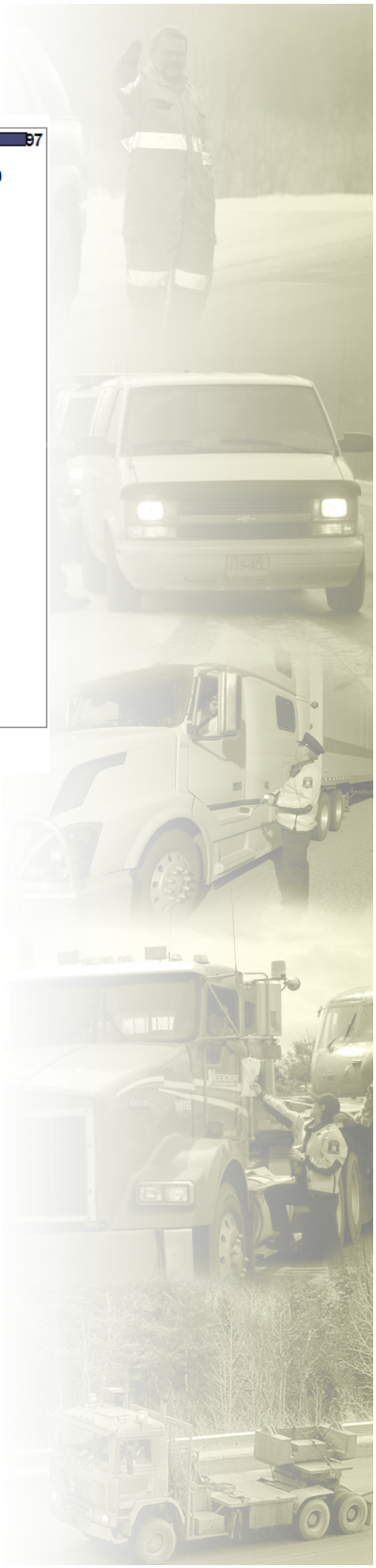
Note: Percentage expresses the number of HCV vehicle defect factors as a proportion of all HCV vehicle factors.

Figure 4: Vehicle Factors in HCV Injury and Fatal Collisions as a Percentage of Total HCV Collisions Involving Vehicle Factors, 1999 to 2005



Source: ICBC Traffic Collision Statistics, 1999 to 2005

Note: Other includes defective alternator (count = 2, 0.5 percent), dangerous goods (count = 2, 0.5 percent), windows obstructed
(count =1, 0.3 percent), defective accelerator (count =1, 0.3 percent)



Factor	Type	Statistic	1999	2000	2001	2002	2003	2004	2005	Total	Average	Median	Min	Max
Oversize Vehicle	Injury & Fatal	# Collisions	9	6	8	4	8	6	3	44	6.3	6.0	3	9
		per 10,000 vehicles	1.8	1.2	1.6	0.8	1.5	1.1	0.5		1.2	1.2	0.5	1.8
		% Factor (ALL)	20.0%	9.4%	15.4%	6.9%	15.7%	9.7%	4.6%		11.7%	9.7%	4.6%	20.0%
		% Collisions (HCV)	0.9%	0.6%	0.8%	0.4%	0.7%	0.5%	0.3%		0.6%	0.6%	0.3%	0.9%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
Defective Steering	Injury & Fatal	# Collisions	2	2	1	4	2	2	6	19	2.7	2.0	1	6
		per 10,000 vehicles	0.4	0.4	0.2	0.8	0.4	0.4	1.0		0.5	0.4	0.2	1.0
		% Factor (ALL)	4.4%	3.1%	1.9%	6.9%	3.9%	3.2%	9.2%		4.7%	3.9%	1.9%	9.2%
		% Collisions (HCV)	0.2%	0.2%	0.1%	0.4%	0.2%	0.2%	0.5%		0.2%	0.2%	0.1%	0.5%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
Defective Suspension	Injury & Fatal	# Collisions	1	4	2	1	4	3	3	18	2.6	3.0	1	4
		per 10,000 vehicles	0.2	0.8	0.4	0.2	0.8	0.5	0.5		0.5	0.5	0.2	0.8
		% Factor (ALL)	2.2%	6.3%	3.8%	1.7%	7.8%	4.8%	4.6%		4.5%	4.6%	1.7%	7.8%
		% Collisions (HCV)	0.1%	0.4%	0.2%	0.1%	0.3%	0.3%	0.3%		0.2%	0.3%	0.1%	0.4%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
Defective Engine	Injury & Fatal	# Collisions	1	2	0	1	1	7	2	14	2.0	1.0	0	7
		per 10,000 vehicles	0.2	0.4	0.0	0.2	0.2	1.3	0.3		0.4	0.2	0.0	1.3
		% Factor (ALL)	2.2%	3.1%	0.0%	1.7%	2.0%	11.3%	3.1%		3.3%	2.2%	0.0%	11.3%
		% Collisions (HCV)	0.1%	0.2%	0.0%	0.1%	0.1%	0.6%	0.2%		0.2%	0.1%	0.0%	0.6%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
No Driver	Injury & Fatal	# Collisions	3	4	2	0	1	3	1	14	2.0	2.0	0	4
		per 10,000 vehicles	0.6	0.8	0.4	0.0	0.2	0.5	0.2		0.4	0.4	0.0	0.8
		% Factor (ALL)	6.7%	6.3%	3.8%	0.0%	2.0%	4.8%	1.5%		3.6%	3.8%	0.0%	6.7%
		% Collisions (HCV)	0.3%	0.4%	0.2%	0.0%	0.1%	0.3%	0.1%		0.2%	0.2%	0.0%	0.4%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
Defective Turn Signal	Injury & Fatal	# Collisions	1	1	0	2	0	2	2	8	1.1	1.0	0	2
		per 10,000 vehicles	0.2	0.2	0.0	0.4	0.0	0.4	0.3		0.2	0.2	0.0	0.4
		% Factor (ALL)	2.2%	1.6%	0.0%	3.4%	0.0%	3.2%	3.1%		1.9%	2.2%	0.0%	3.4%
		% Collisions (HCV)	0.1%	0.1%	0.0%	0.2%	0.0%	0.2%	0.2%		0.1%	0.1%	0.0%	0.2%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%

Vehicle Factors in Heavy Commercial Vehicle (HCV) injury and Fatal Collisions in BC, 1999 to 2005

Statistic	1999	2000	2001	2002	2003	2004	2005	Total	Average	Median	Min	Max
# Collisions (HCV)	1,057	1,040	1,017	1,034	1,153	1,096	1,146	7543	1077.6	1057.0	1017	1153
# Collisions (Total)	20,380	20,397	20,589	20,527	21,342	20,703	20,776	144714	20673.4	20589.0	20380	21342
# HCVs	48,900	49,600	50,300	51,500	52,900	55,200	58,400	366800	52400.0	51500.0	48900	58400

Factor	Type	Statistic	1999	2000	2001	2002	2003	2004	2005	Total	Average	Median	Min	Max
All Factors	Injury & Fatal	# Collisions	45	64	52	58	51	62	65	397	56.7	58.0	45	65
		per 10,000 vehicles	9.2	12.9	10.3	11.3	9.6	11.2	11.1		10.8	11.1	9.2	12.9
		% Collisions (HCV)	4.3%	6.2%	5.1%	5.6%	4.4%	5.7%	5.7%		5.3%	5.6%	4.3%	6.2%
		% Collisions (ALL)	0.2%	0.3%	0.3%	0.3%	0.2%	0.3%	0.3%		0.3%	0.3%	0.2%	0.3%
	Injury	# Collisions	44	58	48	55	49	57	63	374	53.4	55.0	44	63
		per 10,000 vehicles	9.0	11.7	9.5	10.7	9.3	10.3	10.8		10.2	10.3	9.0	11.7
		% Collisions (HCV)	4.2%	5.6%	4.7%	5.3%	4.2%	5.2%	5.5%		5.0%	5.2%	4.2%	5.6%
		% Collisions (ALL)	0.2%	0.3%	0.2%	0.3%	0.2%	0.3%	0.3%		0.3%	0.3%	0.2%	0.3%
	Fatal	# Collisions	1	6	4	3	2	5	2	23	3.3	3.0	1	6
		per 10,000 vehicles	0.2	1.2	0.8	0.6	0.4	0.9	0.3		0.6	0.6	0.2	1.2
		% Collisions (HCV)	0.1%	0.6%	0.4%	0.3%	0.2%	0.5%	0.2%		0.3%	0.3%	0.1%	0.6%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
Insecure Load	Injury & Fatal	# Collisions	15	10	13	21	10	10	18	97	13.9	13.0	10	21
		per 10,000 vehicles	3.1	2.0	2.6	4.1	1.9	1.8	3.1		2.6	2.6	1.8	4.1
		% Factor (ALL)	33.3%	15.6%	25.0%	36.2%	19.6%	16.1%	27.7%		24.8%	25.0%	15.6%	36.2%
		% Collisions (HCV)	1.4%	1.0%	1.3%	2.0%	0.9%	0.9%	1.6%		1.3%	1.3%	0.9%	2.0%
		% Collisions (ALL)	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.1%		0.1%	0.1%	0.0%	0.1%
Defective Brakes	Injury & Fatal	# Collisions	6	14	15	11	14	13	17	90	12.9	14.0	6	17
		per 10,000 vehicles	1.2	2.8	3.0	2.1	2.6	2.4	2.9		2.4	2.6	1.2	3.0
		% Factor (ALL)	13.3%	21.9%	28.8%	19.0%	27.5%	21.0%	26.2%		22.5%	21.9%	13.3%	28.8%
		% Collisions (HCV)	0.6%	1.3%	1.5%	1.1%	1.2%	1.2%	1.5%		1.2%	1.2%	0.6%	1.5%
		% Collisions (ALL)	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%		0.1%	0.1%	0.0%	0.1%
Defective Tires	Injury & Fatal	# Collisions	6	14	10	11	7	10	8	66	9.4	10.0	6	14
		per 10,000 vehicles	1.2	2.8	2.0	2.1	1.3	1.8	1.4		1.8	1.8	1.2	2.8
		% Factor (ALL)	13.3%	21.9%	19.2%	19.0%	13.7%	16.1%	12.3%		16.5%	16.1%	12.3%	21.9%
		% Collisions (HCV)	0.6%	1.3%	1.0%	1.1%	0.6%	0.9%	0.7%		0.9%	0.9%	0.6%	1.3%
		% Collisions (ALL)	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.1%

Factor	Type	Statistic	1999	2000	2001	2002	2003	2004	2005	Total	Average	Median	Min	Max
Defective Tow Hitch	Injury & Fatal	# Collisions	1	2	1	0	1	1	0	6	0.9	1.0	0	2
		per 10,000 vehicles	0.2	0.4	0.2	0.0	0.2	0.2	0.0		0.2	0.2	0.0	0.4
		% Factor (ALL)	2.2%	3.1%	1.9%	0.0%	2.0%	1.6%	0.0%		1.5%	1.9%	0.0%	3.1%
		% Collisions (HCV)	0.1%	0.2%	0.1%	0.0%	0.1%	0.1%	0.0%		0.1%	0.1%	0.0%	0.2%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
Restraint System	Injury & Fatal	# Collisions	0	0	0	1	1	1	0	3	0.4	0.0	0	1
		per 10,000 vehicles	0.0	0.0	0.0	0.2	0.2	0.2	0.0		0.1	0.0	0.0	0.2
		% Factor (ALL)	0.0%	0.0%	0.0%	1.7%	2.0%	1.6%	0.0%		0.8%	0.0%	0.0%	2.0%
		% Collisions (HCV)	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.0%		0.0%	0.0%	0.0%	0.1%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
Defective Trailer Brakes	Injury & Fatal	# Collisions	0	0	0	0	0	1	2	3	0.4	0.0	0	2
		per 10,000 vehicles	0.0	0.0	0.0	0.0	0.0	0.2	0.3		0.1	0.0	0.0	0.3
		% Factor (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	3.1%		0.7%	0.0%	0.0%	3.1%
		% Collisions (HCV)	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%		0.0%	0.0%	0.0%	0.2%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
Illegal Vehicle Modification	Injury & Fatal	# Collisions	0	1	0	0	1	0	1	3	0.4	0.0	0	1
		per 10,000 vehicles	0.0	0.2	0.0	0.0	0.2	0.0	0.2		0.1	0.0	0.0	0.2
		% Factor (ALL)	0.0%	1.6%	0.0%	0.0%	2.0%	0.0%	1.5%		0.7%	0.0%	0.0%	2.0%
		% Collisions (HCV)	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.1%		0.0%	0.0%	0.0%	0.1%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
Defective Headlights	Injury & Fatal	# Collisions	0	1	0	0	1	1	0	3	0.4	0.0	0	1
		per 10,000 vehicles	0.0	0.2	0.0	0.0	0.2	0.2	0.0		0.1	0.0	0.0	0.2
		% Factor (ALL)	0.0%	1.6%	0.0%	0.0%	2.0%	1.6%	0.0%		0.7%	0.0%	0.0%	2.0%
		% Collisions (HCV)	0.0%	0.1%	0.0%	0.0%	0.1%	0.1%	0.0%		0.0%	0.0%	0.0%	0.1%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
Defective Break Lights	Injury & Fatal	# Collisions	0	2	0	0	0	1	0	3	0.4	0.0	0	2
		per 10,000 vehicles	0.0	0.4	0.0	0.0	0.0	0.2	0.0		0.1	0.0	0.0	0.4
		% Factor (ALL)	0.0%	3.1%	0.0%	0.0%	0.0%	1.6%	0.0%		0.7%	0.0%	0.0%	3.1%
		% Collisions (HCV)	0.0%	0.2%	0.0%	0.0%	0.0%	0.1%	0.0%		0.0%	0.0%	0.0%	0.2%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%

Factor	Type	Statistic	1999	2000	2001	2002	2003	2004	2005	Total	Average	Median	Min	Max
Defective Alternator	Injury & Fatal	# Collisions	0	1	0	1	0	0	0	2	0.3	0.0	0	1
		per 10,000 vehicles	0.0	0.2	0.0	0.2	0.0	0.0	0.0		0.1	0.0	0.0	0.2
		% Factor (ALL)	0.0%	1.6%	0.0%	1.7%	0.0%	0.0%	0.0%		0.5%	0.0%	0.0%	1.7%
		% Collisions (HCV)	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.1%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
Dangerous Goods	Injury & Fatal	# Collisions	0	0	0	1	0	1	0	2	0.3	0.0	0	1
		per 10,000 vehicles	0.0	0.0	0.0	0.2	0.0	0.2	0.0		0.1	0.0	0.0	0.2
		% Factor (ALL)	0.0%	0.0%	0.0%	1.7%	0.0%	1.6%	0.0%		0.5%	0.0%	0.0%	1.7%
		% Collisions (HCV)	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%		0.0%	0.0%	0.0%	0.1%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
Windows Obstructed	Injury & Fatal	# Collisions	0	0	0	0	0	0	1	1	0.1	0.0	0	1
		per 10,000 vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.2		0.0	0.0	0.0	0.2
		% Factor (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%		0.2%	0.0%	0.0%	1.5%
		% Collisions (HCV)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%		0.0%	0.0%	0.0%	0.1%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
Defective Accelerator	Injury & Fatal	# Collisions	0	0	0	0	0	0	1	1	0.1	0.0	0	1
		per 10,000 vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.2		0.0	0.0	0.0	0.2
		% Factor (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%		0.2%	0.0%	0.0%	1.5%
		% Collisions (HCV)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%		0.0%	0.0%	0.0%	0.1%
		% Collisions (ALL)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%

Source: ICBC Traffic Collision Statistics, 1999 to 2005

Appendix B

Critical Defect Criteria

Proposed Standard	Component	Description of OOS (Some descriptions have been shortened/abbreviated)
40% of brakes out of adjustment + 3 OOS criteria OR 5 OOS criteria	Brake hose	Hose with any damage extending through outer reinforcement ply
		Bulge/swelling when air pressure is applied
		Audible leak at other than proper connection
		Two hoses improperly joined
		Cracked, broken or crimped to restrict air flow
	Brake tubing	Audible leak at other than proper connection
		Cracked, damaged by heat, broken, crimped or improperly spliced/repaired
	Low pressure warning device	Missing, inoperative or does not operate at 55 psi and below or ½ of governor cutout pressure, whichever is less
	Air loss rate	Air leak discovered and reservoir pressure is not maintained when 1) governor is cut-in, 2) reservoir pressure is between 80 and 90 psi, 3) engine is idle and 4) service brakes are fully applied
	Tractor-protection system	Inoperable or missing
	Air reservoir	Separated from original attachment points
	Air compressor[3]	Loose mounting bolts
		Cracked, broken or loose pulley
		Cracked or broken mounting brackets, braces or adapters.
	Electric brakes	Missing or inoperable breakaway braking device

[3] Normally to be inspected when readily visible or problems apparent.

Component	Failure Threshold (see attachment for CVSA OOS criteria)
Brakes	40% of brakes out of adjustment + 3 OOS criteria (mechanical) OR 5 OOS criteria
Steering tires	100%
Non-steering tires	60% in one unit
Steering	free play over 60° + 2 OOS

Each vehicle unit in a multiple combination should be considered separately.

Proposed Standard	Component	Description of OOS (Some descriptions have been shortened/abbreviated)
40% of brakes out of adjustment + 3 OOS criteria OR 5 OOS criteria	Defective brakes	Absence of effective braking action upon application of service brakes
		Missing or broken mechanical components
		Loose brake components
		Audible air leak at brake chamber
		Cracked, loose or missing brake lining (except on power unit steering axles)
		Evidence of oil seepage into or out of brake lining/drum interface area
		Air brakes: lining with thickness less than ¼ inch or to wear indicator if lining is marked
		Hydraulic & electric brakes: lining with thickness 1/16 inch or less
		Missing brake

Proposed Standard	Component	Description of OOS (Some descriptions have been shortened/abbreviated)
40% of brakes out of adjustment + 3 OOS criteria OR 5 OOS criteria	Steering axle brakes	Any inoperative brake on either wheel
		Mismatch across any power unit steering axle of air chamber sizes OR slack adjuster length
		Cracked, loose, or missing lining
		Evidence of oil seepage into or out of the brake lining/drum interface area
		Lining with insufficient thickness
	Parking brakes/ breakaway systems	Any non-manufactured holes or cracks in the spring brake housing section
		Inoperable breakaway braking system on trailer
	Brake drums or rotors (discs)	Drums with any external crack or cracks that open upon brake application
		Any portion of drum or rotor (discs) missing or in danger of falling away
	Brake hose	Hose with any damage extending through outer reinforcement ply
		Bulge/swelling when air pressure is applied
		Audible leak at other than proper connection
		Two hoses improperly joined
		Cracked, broken or crimped to restrict air flow

Proposed Standard	Component	Description of OOS (Some descriptions have been shortened/ abbreviated)
40% of brakes out of adjustment + 3 OOS criteria OR 5 OOS criteria	Hydraulic brakes	No pedal reserve with engine running
		Master cylinder less than ¼ full1
		Power assist unit fails to operate
		Seeping or swelling brake hose(s) under application of pressure
		Missing or inoperable breakaway braking device
		Hose(s) abraded (chafed) through outer cover-to-fabric layer
		Fluid lines or connections restricted, crimped, cracked, or broken
		Any visually observed leaking hydraulic fluid in the brake system upon full application
		Hydraulic system: brake failure light/low fluid warning light on and/or inoperative
	Vacuum system	Insufficient vacuum reserve to permit one full brake application after engine is shut off
		Hose(s) or line(s) restricted, abraded (chafed) through outer cover-to-cord ply, crimped, cracked, broken, or has collapse of vacuum hose(s) when vacuum is applied

Proposed Standard	Component	Description of OOS (Some descriptions have been shortened/ abbreviated)
Steering mechanism – free play over 60° + 2 OOS criteria	Steering column	Absence or looseness of U-bolt(s) or positioning part(s)
		Obviously repair-welded universal joint(s)
		Improperly secured steering wheel
	Front axle beam & all steering components other than steering column (including hub)	Any crack(s)
		Any obvious welded repair(s)
	Steering gear box	Any mounting bolt(s) loose or missing
		Any crack(s) in gear box or mounting brackets
		Any obvious welded repair(s)
		Any looseness of the yoke-coupling to the steering gear input shaft
	Pitman arm	Any looseness of the pitman arm on the steering gear output shaft
		Any obvious welded repair(s)
	Power steering	Loose auxiliary power assist cylinder
	Ball and socket joints	Any movement under steering load of a stud nut
		Any motion, other than rotational, between any linkage member and its attachment point of more than 1/8 inch measured with hand pressure only
		Any obvious welded repair(s)
	Tie rods and drag links	Loose clamp(s) or clamp bolt(s) on tie rods or drag links
		Any looseness in any threaded joint
	Nuts	Loose or missing
	Steering system	Any modification or other condition that interfered with free movement of any steering component
	C-Dolly	Missing or inoperable steering locks
		Steering not centered in the “zero” locked position

Proposed Standard	Component	Description of OOS (Some descriptions have been shortened/abbreviated)
Steering tires – 100% OOS	Tires – steering axle of power unit	Less than 2/32 inch tread
		Any part of breaker strip or casing ply is showing in tread
		Sidewall is cut, worn or damaged to the extent that ply cord is exposed
		Labeled "Not For Highway Use" or carrying other markings, which would exclude use on steering axles
		Visually observable bump, bulge or knot apparently related to tread or sidewall separation
		Flat or has noticeable leak
		Mounted or inflated that it comes in contact with any part of vehicle
		Weight carried exceeds tire load limit, including overloaded tire resulting from low air pressure[4]
		Passenger Carrying Vehicle – regrooved, recapped or re-treaded tires on front steering axles

[4] Exception: A bulge due to a section repair is allowed not to exceed 3/8 inch in height. This bulge may sometimes be identified by a blue triangular label in the immediate vicinity

Proposed Standard	Component	Description of OOS (Some descriptions have been shortened/abbreviated)
Non-steering tires – 60% OOS in one unit	Tires – non-steering axle of powered vehicle[6]	Flat or has noticeable leak
		Bias ply tire – when more than one ply is exposed in the tread area or sidewall or when exposed area of the top ply exceeds 2 square inches
		Radial ply tire – when two or more plies are exposed in the tread area or damaged cords are evident in the sidewall or when the exposed area exceeds 2 square inches in the sidewall[5]
		Any tire with visually observable bump2 or knot apparently related to tread or sidewall separation
		Mounted or inflated that it comes in contact with any part of vehicle
		Weight carried exceeds tire load limit (includes overloaded tire resulting from low air pressure)3
		So worn that less than 1/32 inch tread remains when measured in any two adjacent major tread grooves at 3 separate locations on the tire
		75 percent or more of the tread width loose or missing in excess of 12 inches in circumference

[5] Exception: Does not apply to vehicles being operated under the special exclusion found in the Federal Motor Carrier Safety Regulations.

[6] Note: On dual wheels, both tires must meet one or more of this Out of Service condition.