

Analysis of New Entrant Motor Carrier Safety Performance and Compliance Using SafeStat

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PREFACE

This report documents the findings of a special study undertaken to update, confirm and expand upon previous studies on the comparative (to experienced carriers) safety performance and compliance of large commercial motor vehicle operators (motor carriers) newly entering into U.S. interstate operations. Once these operator/carriers engage in interstate operations with large commercial motor vehicles, they are required to register with the U.S. Department of Transportation (USDOT) and they become subject to the Federal Motor Carrier Safety Regulations (FMCSRs). In particular, this study was accomplished to help provide a basis for formulating the details of a new entrant education and safety assurance process including the possible need for special emphasis among the component groups of new entrants. Component groups include U.S., Canadian, and Mexican domiciled motor carriers newly registering with the USDOT for interstate operations in the U.S..

The study was performed at the Volpe National Transportation Systems Center (the Volpe Center) under a Project Plan Agreement with the Department of Transportation's Federal Motor Carrier Safety Administration (FMCSA). The Volpe Center technical project manager was Donald Wright of the Economic Analysis Division in the Office of System and Economic Assessment. The study was undertaken and this report was written by Donald Wright with assistance from Jon Ohman of the Economic Analysis Division and Leon Parkin of EG&G Services. At the FMCSA, the project was managed by Dale Sienicki of the FMCSA's Office of Data Analysis and Information Systems, Data Analysis Division.

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1. BACKGROUND

This special study was undertaken at the Volpe National Transportation Systems Center (the Volpe Center) in conjunction with a project for the Federal Motor Carrier Safety Administration (FMCSA) to develop a process for the safety qualifying and monitoring of new entrant interstate motor carriers. New entrant interstate motor carriers are defined as motor carriers initially registering for interstate operations with the FMCSA and thus newly subject to the Federal Motor Carrier Safety Regulations (FMCSR). For purposes of this study, motor carriers are considered to be new entrants for the first two years following their registration with the FMCSA to perform U.S. interstate operations. Some of these “new entrants” may not be new operators, having previously established operations within a state or foreign country

This study follows an earlier study¹ also performed at the Volpe Center for the FMCSA that found new entrants to have significantly lower levels of safety regulation compliance than experienced carriers, suggesting a need for additional education and oversight. Due to data limitations, earlier studies produced inconclusive results with respect to new entrant crash rate comparisons to experienced carriers. Following those earlier findings and resulting recommendations, the FMCSA requested that the Volpe Center further study and develop a process to safety qualify and monitor new entrants. The study described in this report updates, confirms, and expands upon the previous studies of new entrant safety compliance and performance, and helps provide a basis for formulating the details of a new entrant process.

Because of increased trade with Mexico and Canada, occasioned in part by the North American Free Trade Agreement (NAFTA), increasing numbers of motor carriers domiciled in those countries are newly registering with the FMCSA. Since these motor carriers are usually experienced carriers, but subject to different safety regulations and different levels of safety education, enforcement, and oversight in their own countries, they are broken out for study separately from U.S. new entrants. Thus, the safety analysis of new entrants includes the comparative study of four groups: 1) U.S. experienced carriers, 2) U.S. new entrants, 3) Mexican carriers, and 4) Canadian carriers. In addition to confirming the need for a new entrant program, this study helps to identify the possible need for special emphasis among the component groups of new entrants.

In performing this study the Volpe Center took advantage of a relatively new analytical process or tool developed at the Center for the FMCSA that evaluates the safety status of both individual and groups of motor carriers. Called SafeStat,² it uses data from a variety of state and federal sources to measure the relative safety performance and compliance of individual motor carriers in four Safety Evaluation Areas (SEAs): Accident, Driver, Vehicle, and Safety Management. SafeStat is currently used by the FMCSA to identify and prioritize motor carriers for on-site

¹ “New Entrant Safety Research: Final Report,” April 1998, John A. Volpe National Transportation Systems Center (Volpe Center), DTS-42, Kendall Square, Cambridge, MA 02142.

² For a detailed description of SafeStat, see “SafeStat: Motor Carrier Safety Status Measurement System Methodology: Version 7,” October 1999, which is also available from the Volpe Center.

compliance reviews (CRs) and roadside inspections. In addition to measuring the safety compliance and performance of individual carriers, SafeStat can also be used to assess the relative safety status of defined groups of carriers (such as new entrants) and provide for comparisons with other defined groups (such as experienced carriers). Furthermore, using SafeStat and FMCSA Census File data, group analysis and comparisons by domicile (state or country) of the carrier are also possible. In addition to the safety status analysis, by using data from the FMCSA Motor Carrier Management Information System (MCMIS), the amount of safety oversight/intervention (compliance reviews, roadside inspections, moving violations, and enforcement actions initiated) can be determined for the identified groups. In this way, the amount of current oversight may be related to the safety status measurements.

This study is organized into five sections. Section 2 uses the FMCSA's MCMIS Census of registered interstate motor carriers to identify and count the carriers in the four groups: U.S. experienced carriers (in operation two or more years), U.S. new entrants (in operation less than two years), Mexican carriers, and Canadian carriers. The Census is based on the Form MCS-150 information provided by motor carriers that register with the U.S. DOT to perform interstate operations. A motor carrier is required to register with the FMCSA using Form MCS-150 prior to or shortly after commencing interstate operations. Examined in this section are the numbers of carriers, their size distributions (in terms of numbers of power units operated), and the rates of increase in their numbers. In Section 3, the safety performance and compliance of the four groups are measured and compared in terms of SafeStat SEAs and indicators. Section 4 describes the level of safety oversight of the four groups of carriers by the FMCSA. Section 5 contains a summary and conclusions.

2. SIZES OF AND CHANGES IN CARRIER POPULATIONS

In this section, the sizes of and recent changes in carrier populations for U.S., Canadian, and Mexican new entrants and their experienced counterparts are examined. The data source is the FMCSA Census File of motor carriers in the MCMIS, which contains carrier registration information from Form MCS-150. Population totals and changes from September 1997 to September 1999, the date of the most recent SafeStat run, are examined. As of late September 1999, there were about 508,500 registered (U.S., Canadian, and Mexican) carriers, of which about 90,500 had been registered less than two years. In this study, a new entrant is defined as any carrier registered for less than two years, while an experienced carrier is defined as any carrier registered for two or more years.

Figure 2-1 shows a steady increase in the active U.S. interstate motor carrier population over the two-year period, rising from about 401 thousand to almost 486 thousand, an increase of almost 85 thousand, or 21.1 percent.

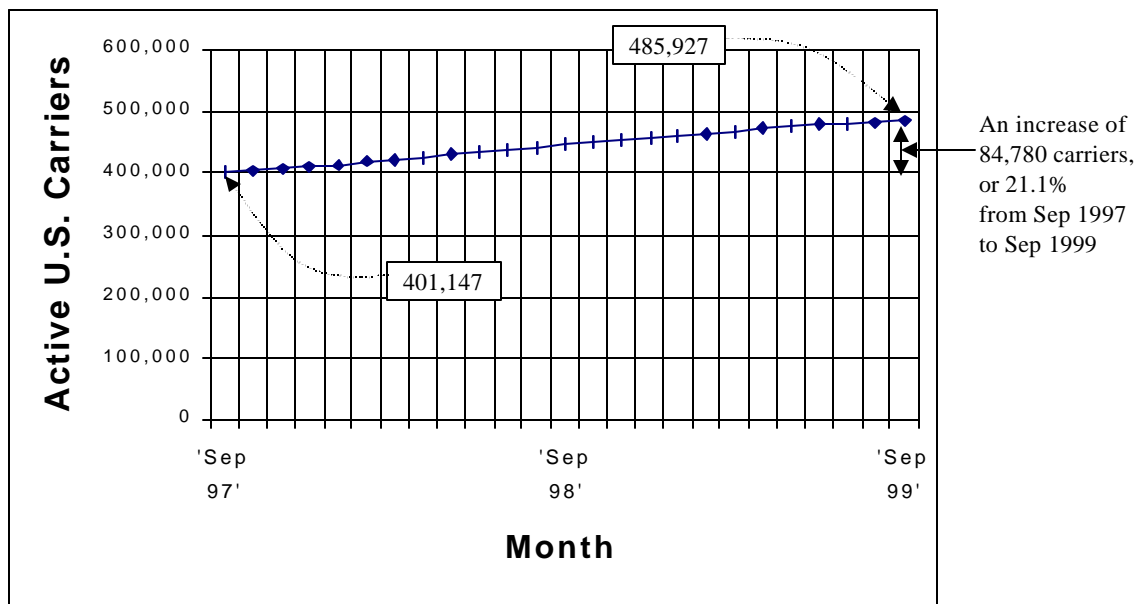


Figure 2-1. Active U.S. Carriers in the MCMIS Census File

These data indicate that over 40,000 U.S. carriers per year are being added to the Census.

Figure 2-2 shows that over 3,200 Canadian carriers were added to the Census during the same two-year period, an increase at 27.2 percent, which is slightly greater than the 21.1 percent increase in the number of U.S. carriers. Figure 2-3 shows that, during the same period, over 2,700 Mexican carriers were added to the Census, an increase of 54.9 percent, more than double the percentage increase of U.S. carriers.

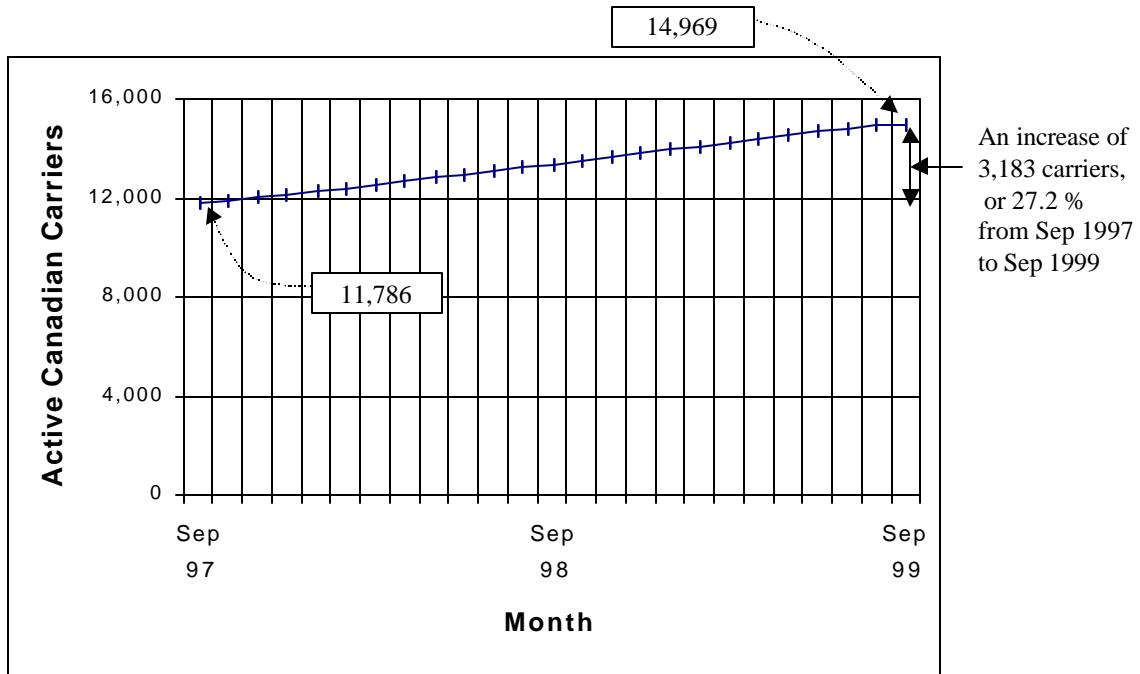


Figure 2-2. Active Canadian Carriers in the MCMIS Census File

While 93 percent of new entrants are U.S.-based carriers, the number of foreign carriers (and, in particular, the number of Mexican carriers) is increasing at a much faster rate than the number of U.S.-based carriers.

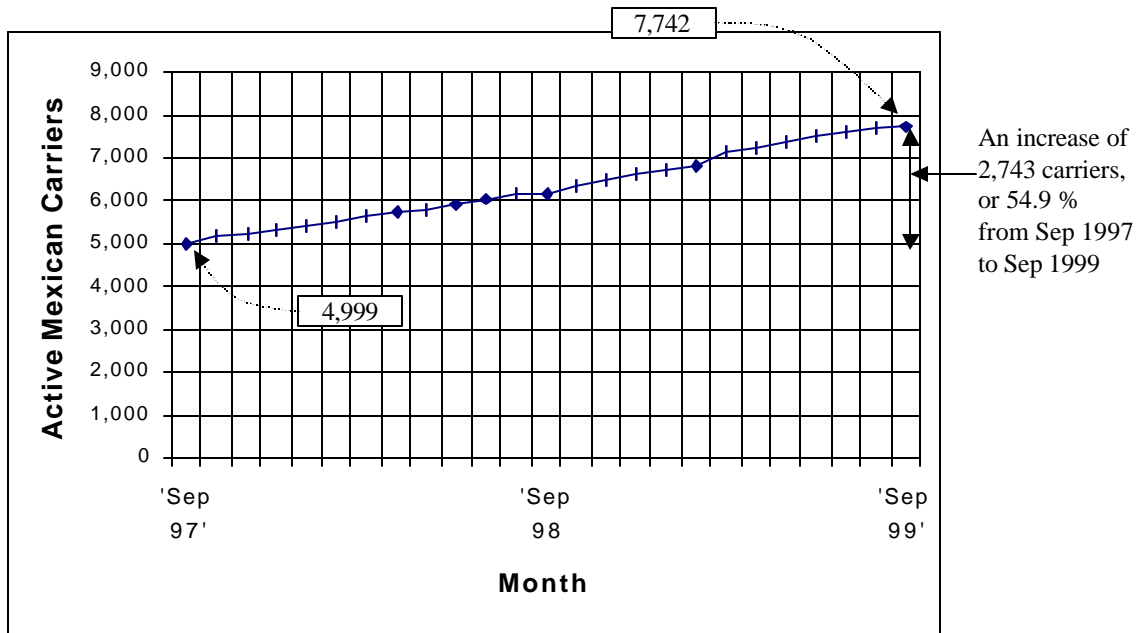


Figure 2-3. Active Mexican Carriers in the MCMIS Census File

In order to gain some additional perspective on the actual number of vehicles operated by new entrants as compared to experienced carriers, fleet size and drivers employed distributions were also computed. Figure 2-4 shows the number of power units registered to new entrants compared to experienced carriers. Figure 2-5 contains the distribution of the number of drivers employed by new entrants compared to experienced carriers. In both distributions, it can be seen that, as expected, new entrants are smaller with the majority having 1 or 2 power units and drivers. It is not surprising that some “new entrants” have larger fleets and employ more drivers since many may have established intrastate operations prior to registering for interstate operations. The data show some carriers with “0” power units or drivers since they either short-term lease these resources or failed to complete the information on their MCS-150 registration forms.

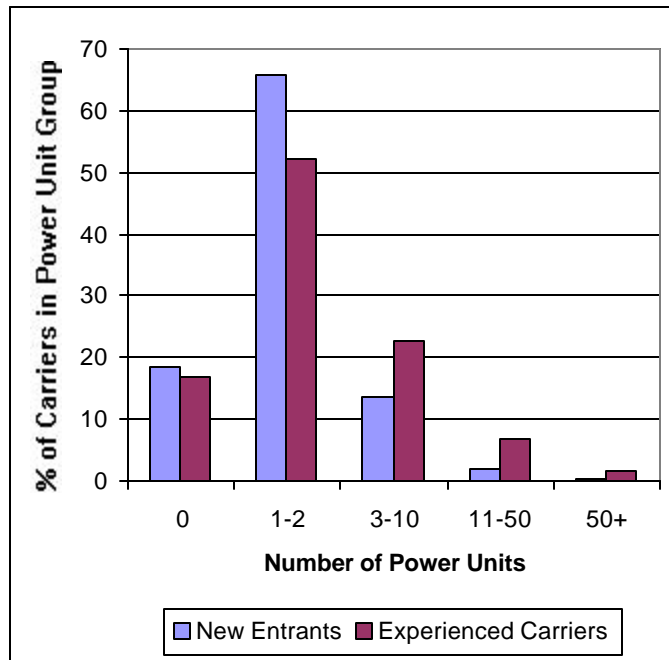


Figure 2-4. Power Unit Distribution by Experience Level

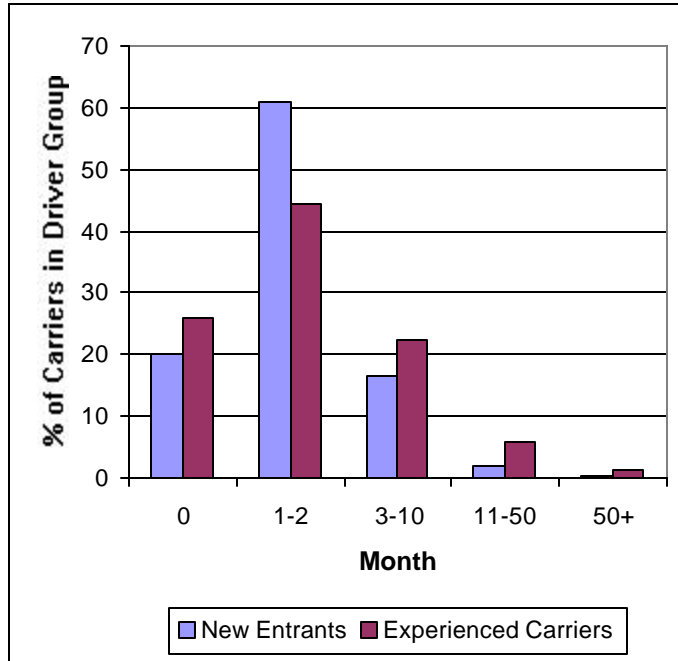


Figure 2-5. Driver Distribution by Experience Level

3. ANALYSIS OF SAFESTAT RESULTS

In this section, an analysis of the results of the September 1999 SafeStat run is made comparing new entrant and experienced carriers, and, where possible, Canadian and Mexican carriers. SafeStat measures the relative safety performance and compliance of individual motor carriers in four Safety Evaluation Areas: Accident, Driver, Vehicle, and Safety Management. Since complete crash data and exposure measures are not available for Canadian and Mexican carriers, their Accident SEA values are not reliable and, therefore, are not broken out separately. Similarly, the lack of reliable data precludes the separate analysis of Canadian and Mexican carriers in the Safety Management SEA. Most of the data on which the Safety Management SEA is based come from compliance reviews and resulting enforcement actions. Few Canadian and no Mexican carriers receive these on-site safety investigations. Comparisons are generally possible for the Driver and Vehicle SEAs, which are based on roadside inspection and traffic enforcement data and indicators.

3.1. ACCIDENT SEA

The Accident SEA is based on crash rate data from state-reported crashes involving commercial motor vehicles and recordable crashes obtained during FMCSA on-site compliance reviews. Two or more crashes are required for a motor carrier to receive an Accident SEA value. The values are expressed in percentile terms where 100 is the highest or worst value and 0 is the lowest or best. SafeStat specifically identifies as deficient any value at or above 75 (i.e., performance is in the worst 25th percentile).

Figure 3-1 shows the proportions of new entrant and experienced carriers scoring at or above the 75th percentile (deficient). These results show that almost half (47.7 percent) of new entrant carriers were deficient in the Accident SEA. This result is significantly higher than that for experienced carriers of whom less than one fourth (23.7 percent) were deficient. Figure 3-1 shows new entrant carriers to have significantly higher crash involvement according to SafeStat. This result is particularly significant, since earlier studies failed to show poorer crash performance by new entrants, due to data limitations and the lack of an appropriate tool, such as SafeStat.

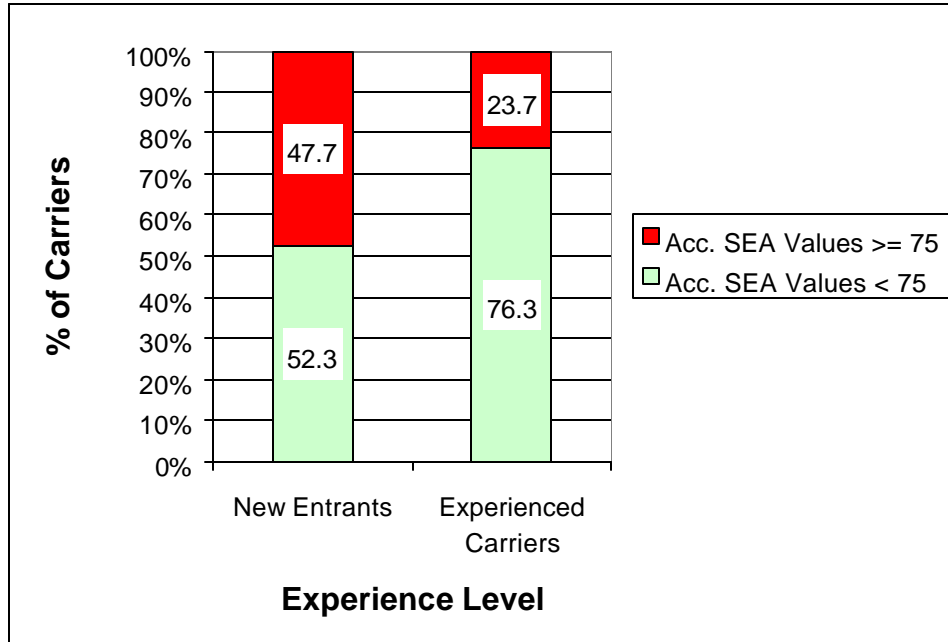


Figure 3-1. Percent of Carriers with Deficient Accident SEA Values by Experience Level

3.2. DRIVER SEA

The Driver SEA in SafeStat is based on three indicators using independent data sources. They are: the Driver Inspection Indicator (DII), which is based on out-of service violations from driver roadside inspections; the Driver Review Indicator (DRI), which is based on driver-related violations from on-site compliance reviews; and the Moving Violations Indicator (MVI), which is based on moving violations issued in conjunction with traffic stops that resulted in roadside inspections. As in the Accident SEA, the values are expressed in percentile terms where 100 is the highest or worst value and 0 is the lowest or best. SafeStat specifically identifies as deficient any value at or above 75 (i.e., performance is in the worst 25th percentile).

Figure 3-2 shows the proportions of new entrant and experienced carriers scoring at or above the 75th percentile (i.e., deficient). These results show that over half (55.2 percent) of new entrant carriers were deficient in the Driver SEA. This result is significantly higher than that for experienced carriers, of which about one fourth (26.9 percent) were deficient. Figure 3-2 shows new entrant carriers to have significantly worse driver safety compliance and performance when compared to experienced carriers, according to SafeStat. These results are consistent with findings from previous studies, which showed new entrants to have lower levels of compliance than experienced carriers.

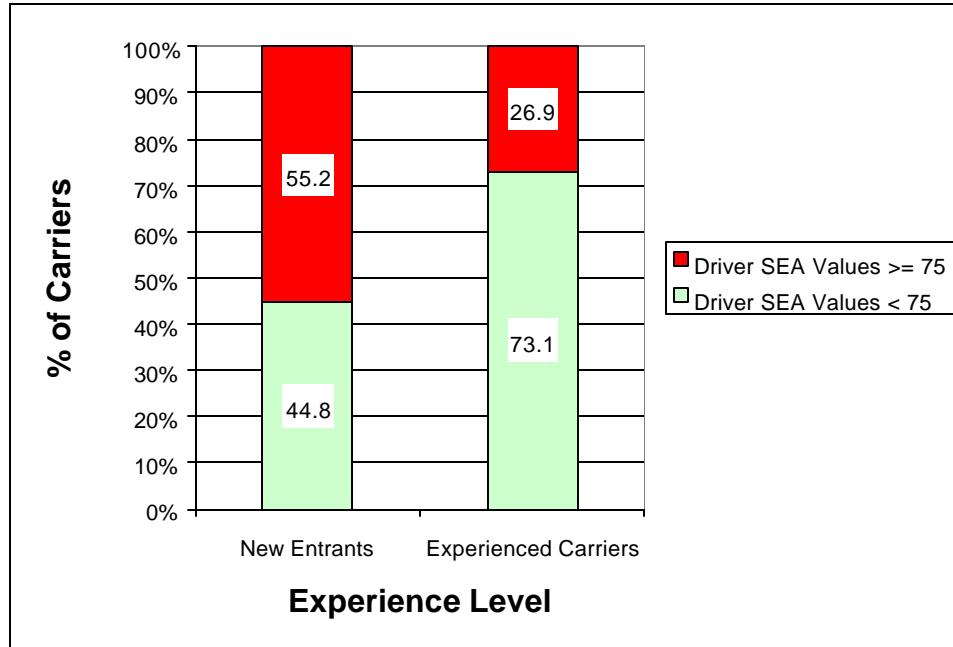


Figure 3-2. Percent of Carriers with Deficient Driver SEA Values by Experience Level

3.2.1. Driver Inspection Indicator (DII)

In addition to the overall comparison of new entrants to experienced carriers, it is possible to break out the U.S., Canadian, and Mexican carriers for one of the indicators in the Driver SEA, the Driver Inspection Indicator (DII). This is because both the out-of-service violation data and the normalizing data (number of inspections) from roadside inspections are complete and comparable. Data from the other two indicators that contribute to the Driver SEA, which come from compliance reviews and moving violations, are only valid for U.S. carriers whose operations are mainly in the U.S. and that receive compliance reviews. The Driver Inspection Indicator is a more sophisticated and inclusive measure of roadside inspection performance than the commonly used simple out-of-service (OOS) rate. The DII accounts for up to a 30-month history and weights the out-of-service inspections by both severity (number of OOS violations found) and the date of the inspection (most recent inspections are considered to be more indicative of the current status and are assigned greater weights).

Figure 3-3 compares the DIIs for new entrants and experienced carriers. As in the overall Driver SEA, new entrants had significantly worse performance with the DII, with almost 52 percent of the carriers in the worst 25th percentile as compared with a normal 25 percent of the experienced carriers.

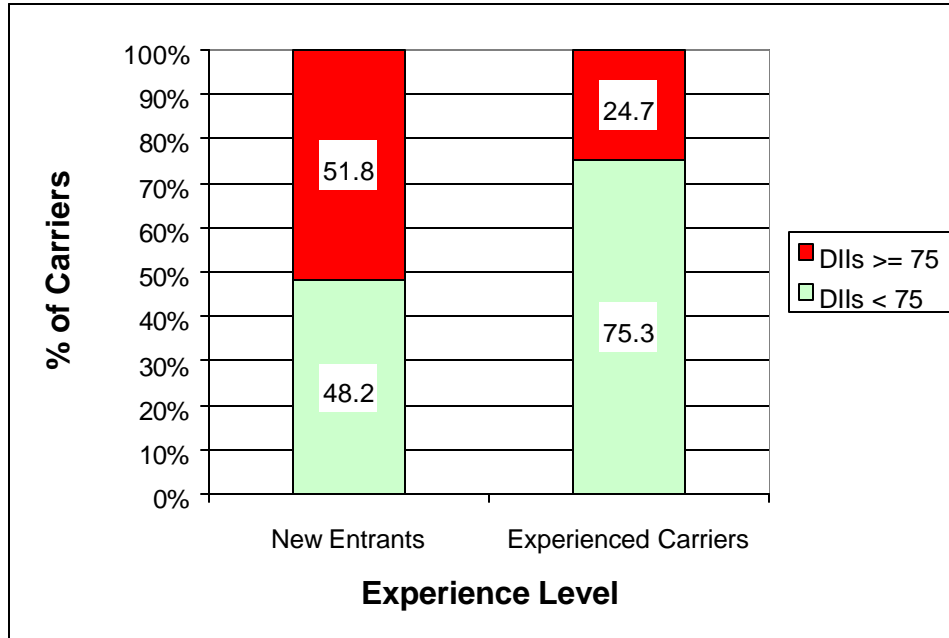


Figure 3-3. Percent of Carriers with Deficient Driver Inspection Indicators by Experience Level

Figure 3-4 breaks out the DII results by domicile of carrier. While comparisons of the DII among U.S., Canadian, and Mexican new entrants confirm their poor performance as compared to experienced carriers, they do not reveal great differences among them. Actually, US new entrants had slightly higher DII values than did either of the foreign carrier groups.

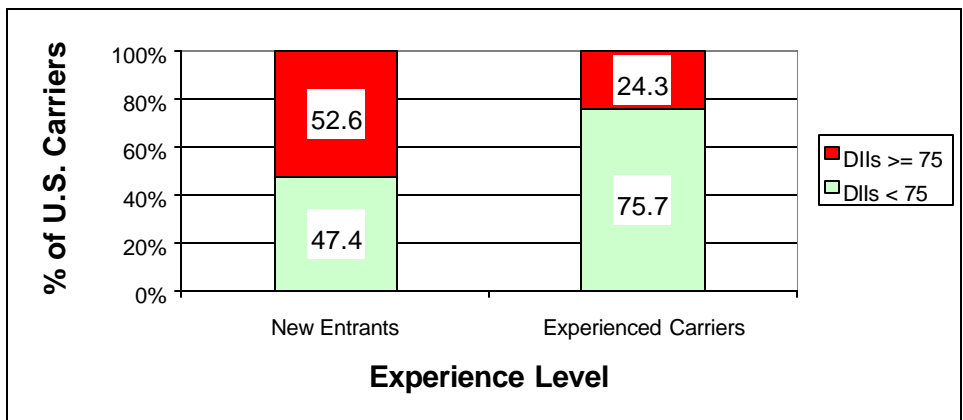
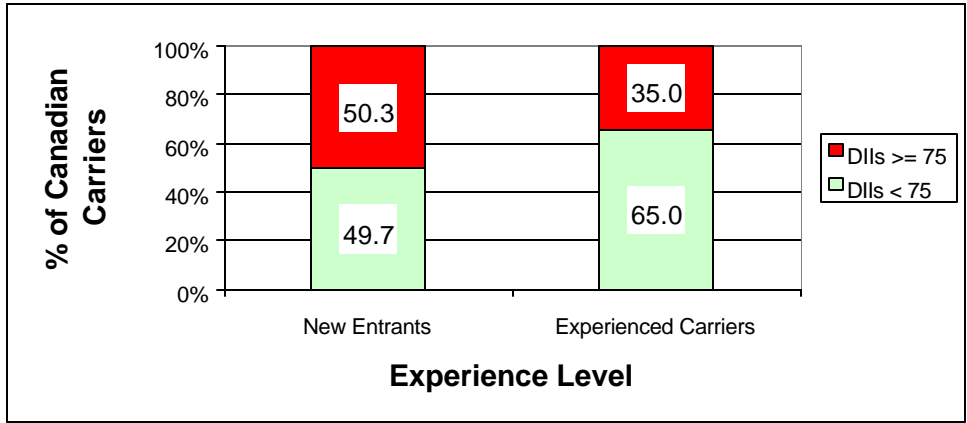


Figure 3-4. Percent of Carriers with Deficient Driver Inspection Indicators by Experience Level and Domicile of Carrier

3.2.2. Moving Violations Indicator (MVI)

A second component of the Driver SEA is the Moving Violations Indicator (MVI). The MVI is based on moving violations issued in conjunction with traffic stops resulted in roadside inspections. As in the Driver SEA, the values are expressed in percentile terms where 100 is the highest or worst value and 0 is the lowest or best. SafeStat specifically identifies as deficient any value at or above 75 (i.e., performance is in the worst 25th percentile).

Figure 3-5 shows the proportion of new entrant and experienced carriers scoring above the 75th percentile (deficient). These results show that nearly half (47.4 percent) of new entrant carriers were deficient in the MVI. This result is significantly higher than that for experienced carriers of whom less than one fourth (23.9 percent) were deficient. Figure 3-5 shows new entrant carriers to have significantly higher driver moving violation rates as compared to experienced carriers according to SafeStat. These results are consistent with findings from previous studies, which showed new entrants to also have lower levels compliance with Federal safety regulations than experienced carriers.



Figure 3-5. Percent of Carriers with Deficient Moving Violation Indicators by Experience Level

3.3 VEHICLE SEA

The Vehicle SEA in SafeStat is based on two indicators using independent data sources. They are: the Vehicle Inspection Indicator (VII), which is based on out-of-service violations from vehicle roadside inspections; and the Vehicle Review Indicator (VRI), which is based on vehicle-

related violations from on-site compliance reviews. As in the Accident and Driver SEAs, the values are expressed in percentile terms where 100 is the highest or worst value and 0 is the lowest or best. SafeStat specifically identifies as deficient any value at or above 75 (i.e., performance is in the worst 25th percentile).

Figure 3-6 shows the proportions of new entrant and experienced carriers scoring at or at above the 75th percentile (i.e., deficient). These results show that over 34 percent of new entrant carriers were deficient in the Vehicle SEA. This result is higher than that for experienced carriers, of which less than one third (27.1 percent) were deficient. Although not dramatic, these results indicate that new entrant carriers have somewhat worse vehicle safety compliance and performance when compared to experienced carriers. These results are also consistent with findings from previous studies, which showed new entrants to have lower levels of compliance than experienced carriers.

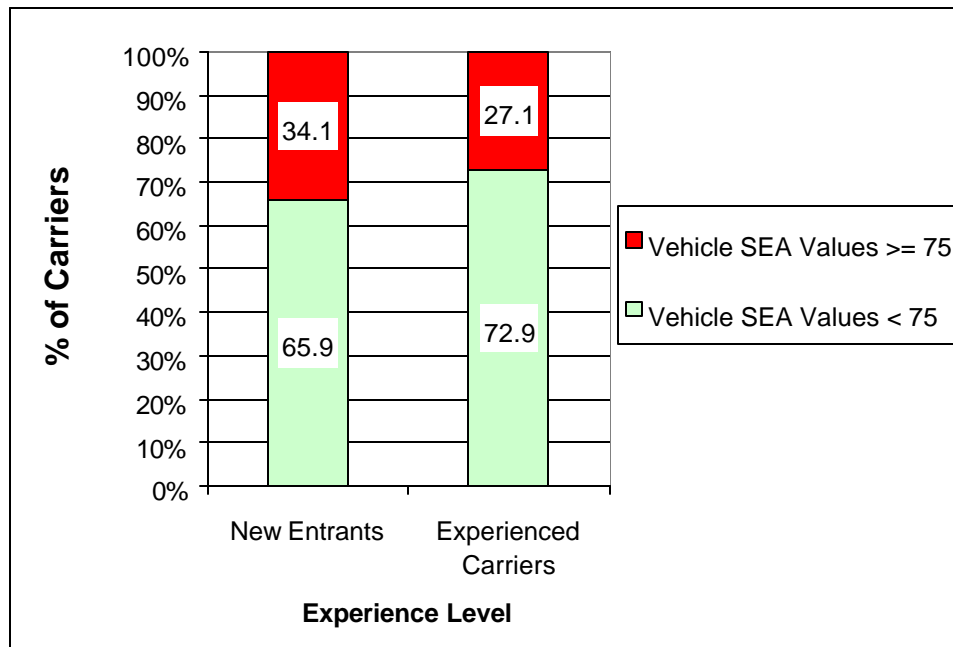


Figure 3-6. Percent of Carriers with Deficient Vehicle SEA Values by Experience Level

In addition to the comparison of new entrants to experienced carriers, it is possible to break out the U.S., Canadian, and Mexican carriers for one of the indicators in the Vehicle SEA, the Vehicle Inspection Indicator (VII). This is because both the out-of-service violation data and the normalizing data (number of inspections) from roadside inspections are complete and comparable. Results from the other indicator used in the Vehicle SEA, the indicator relating to compliance reviews, are only valid for U.S. carriers whose operations are mainly in the U.S. and that generally are the only carriers subject to FMCSA compliance reviews. The Vehicle Inspection Indicator is a more sophisticated and inclusive measure of vehicle roadside inspection performance than the commonly used simple out-of-service (OOS) rate. The VII accounts for up

to a 30-month history and weights the out-of-service inspections by both severity (number of OOS violations found) and the date of the inspection (most recent inspections are considered to be more indicative of the current status and are assigned higher weights).

Figure 3-7 compares the VIIs for new entrants and experienced carriers. As in the overall Vehicle SEA, new entrants had worse performance with the VII, with 34.0% of the carriers in the worst 25th percentile as compared with a more normal 27.1 % of the experienced carriers.

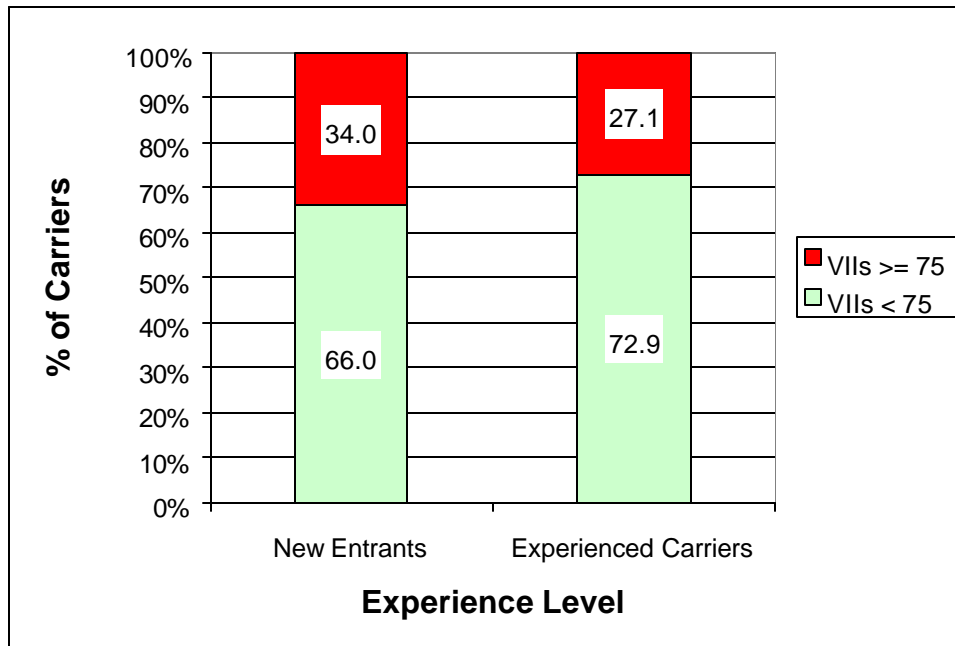


Figure 3-7. Percent of Carriers with Deficient Vehicle Inspection Indicators by Experience Level

Figure 3-8 breaks out the VII results by domicile of carrier. Interestingly, comparisons of the VII for U.S., Canadian, and Mexican new entrants show their relative performance to be comparable to experienced carriers of the same domicile. There are significant differences among the three domiciles, however, with the Canadian carriers having exceptionally low VIIs, the U.S. carriers having closer to expected levels and the Mexican carriers much higher than expected. Indeed, almost 60% of the Mexican carriers (both new entrant and experienced) fell in the worst 25th percentile of the VIIs. Actually, U.S. new entrants had significantly higher VII values than do the Canadian carriers, which had exceptionally low 8.6 (for new entrants) and 7.0 (for experienced carriers) average VIIs.

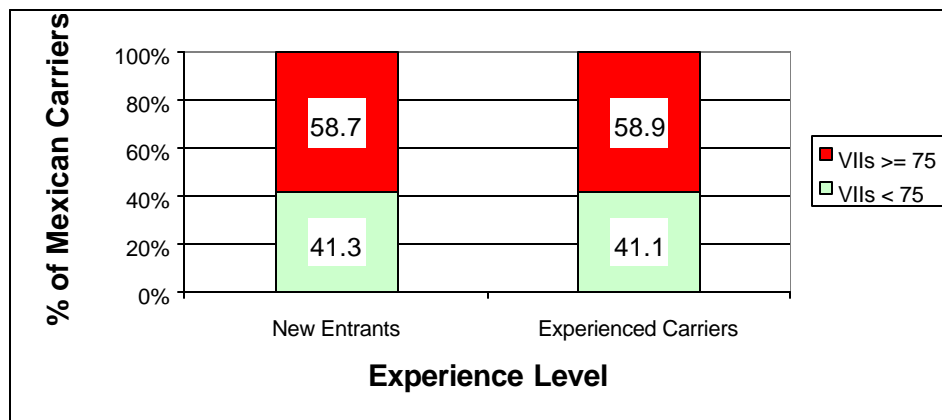
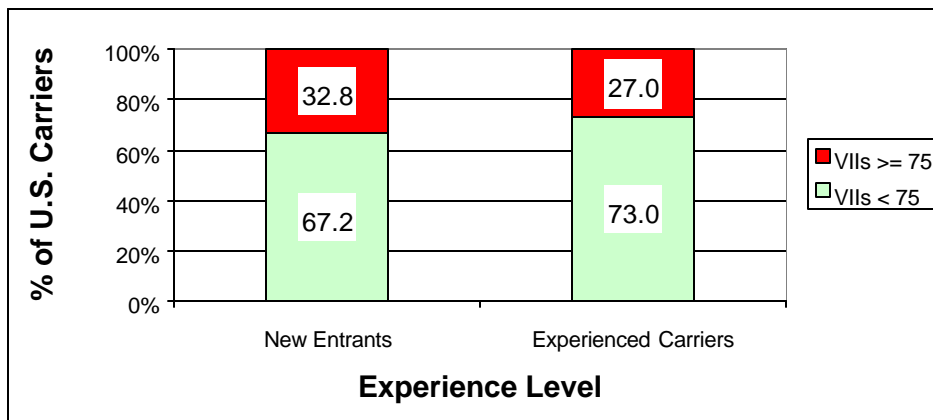


Figure 3-8. Percent of Carriers with Deficient Vehicle Inspection Indicators by Experience Level and Domicile of Carrier

3.4. SAFETY MANAGEMENT SEA

The Safety Management SEA in SafeStat is based on three indicators, two based on compliance review data and one based on data from enforcement cases. They are: the Safety Management Review Indicator (SMRI), which is based on violations of acute and critical regulations that are related to safety management programs and practices (as opposed to violations committed during actual driver or vehicle operations); the Hazardous Material Review Indicator (HMRI), which is based on violations of the Hazardous Material Regulations (HMR), if applicable; and the Enforcement History Indicator, which is based on the carrier's entire enforcement case history. As in the Accident, Driver, and Vehicle SEAs, the values are expressed in percentile terms where 100 is the highest or worst value and 0 is the lowest or best. SafeStat specifically identifies as deficient any value at or above 75 (performance is in the worst 25th percentile).

Since one of the indicators, the EHI, requires a history of enforcement cases that only experienced carriers would have, and another indicator, the HMRI, is not applicable to most carriers, the only meaningful way to compare new entrants and experienced carriers in the Safety Management SEA is to use the third indicator. That is, show the compliance levels found in the most recent compliance review as measured by the SMRI.

Figure 3-9 shows the results of the SMRI comparison and indicates that new entrant carriers had significantly worse safety management compliance compared to experienced carriers. These results are also consistent with findings from previous studies, which showed new entrants to have lower levels of compliance with the FMCSR and HMR than experienced carriers.

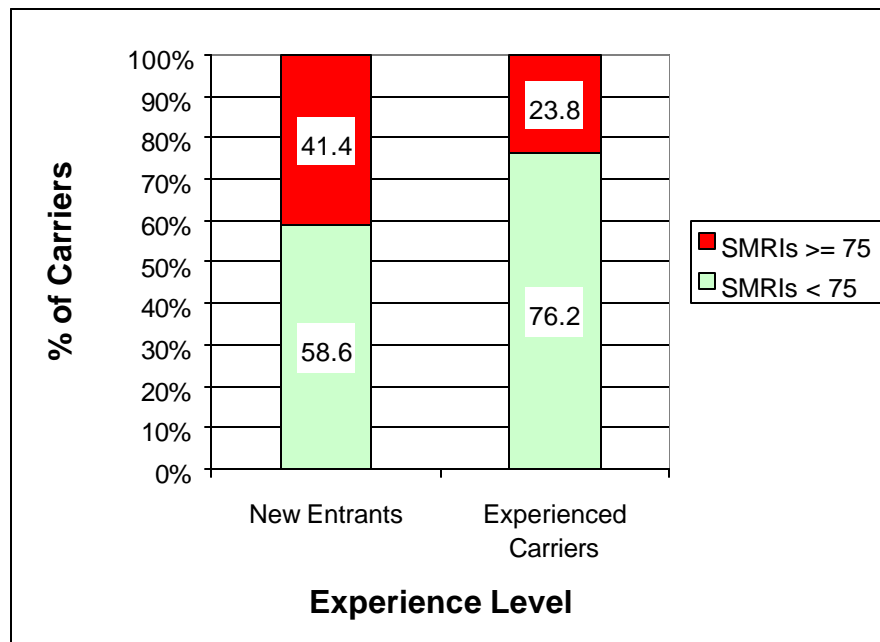


Figure 3-9. Percent of Carriers with Deficient Safety Management Review Indicators by Experience Level

Although overall comparisons of new entrant and experienced carriers may be made for the SMRI, separate breakouts of foreign carriers are not possible, since those carriers generally do not receive compliance reviews.

4. ANALYSIS OF EXPOSURE TO FMCSA OVERSIGHT

This section compares the level of safety oversight of experienced carriers and new entrant carriers by the FMCSA. Where meaningful, breakouts of the component groups (U.S., Canadian, and Mexican carriers) are also done. Specifically, comparisons are made for compliance reviews, driver roadside inspections, and vehicle roadside inspections. Table 4-1 shows the amount of FMCSA oversight for new entrants and experienced carriers during the study period, September 1997 to September 1999

Table 4-1.
Amount of FMCSA Oversight by Experience Level
- September 1997 to September 1999

Type of Oversight	New Entrants	Experienced Carriers	Total
Compliance Reviews	1,072	13,538	14,610
Driver Roadside Inspections	364,191	2,811,318	3,175,509
Vehicle Roadside Inspections	287,352	2,166,100	2,453,632

4.1. COMPLIANCE REVIEWS

As shown in Figure 4-1, of the 14,610 compliance reviews performed in the two-year period prior to the last SafeStat run (September 1997 to September 1999), 13,538, or 92.6%, were on experienced carriers (carriers that had been registered for two or more years at the time of the review), while 1,072 reviews were performed on new entrant carriers (carriers that had been registered for less than two more years at the time of the review). Almost all of the compliance reviews were on U.S. carriers, since very few Canadian carriers and no Mexican carriers receive reviews. Direct comparisons of the percentages of new entrants and experienced carriers that received reviews are difficult, since an unknown percentage of registered carriers in the census are no longer active. This is particularly true for the experienced carrier group. Since 90,564 carriers registered in the two-year time period, however, it can be estimated that the percentage of “new entrants” receiving reviews was about 1.2% (1,072/90,564). The average population over the last two years of experienced carriers was about 401,000. Therefore, the percentage of experienced carriers receiving reviews was about 3.4% (13,538/401,000), or almost three times the percentage of new entrants receiving reviews during that period. The lower percentage of new entrants receiving reviews is not surprising, since SafeStat is being used to identify and prioritize carriers for reviews based on safety performance and compliance data over a time frame of up to 30 months. Recent registrants are less likely to have accumulated sufficient data to be scored by SafeStat.

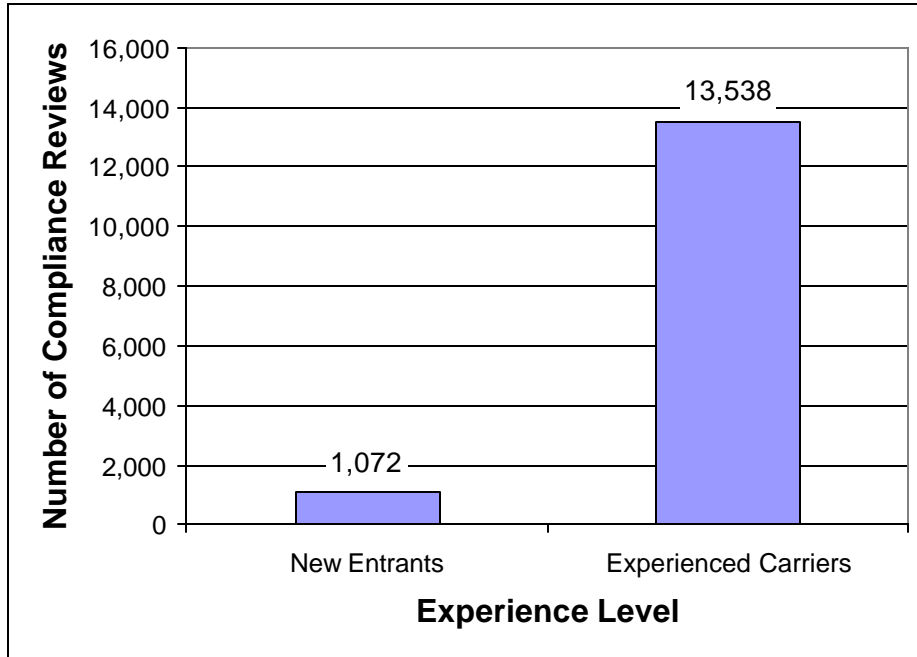


Figure 4-1. Number of Compliance Reviews by Experience Level

A potentially more serious discrepancy exists with the exclusion of most foreign carriers, some of which are being scored by SafeStat, but are not receiving compliance reviews. This is particularly the case with Mexican carriers, as shown in Table 4-2. Although 307 Mexican carriers were scored by SafeStat (i.e., deficient in two or more SEAs), none received reviews. An additional 933 Mexican carriers were deficient in one SEA. The majority of those were deficient in the Vehicle SEA. Also, the percentage of Mexican carriers receiving SafeStat scores (i.e., 4.0%) was more than three times the percentage of U.S. carriers receiving SafeStat scores (i.e., 1.2%).

**Table 4-2.
SafeStat Results by Domicile of Carrier**

Domicile of Carrier	Number of Census Carriers	Number of Census Carriers' Power Units	Number of Scored Carriers	% of Census Carriers Scored	Number of Scored Carriers' Power Units	SS Score 300-550 CAT A	SS Score 225-300 CAT B	SS Score 150-225 CAT C	Accident SEA only CAT D	Driver SEA only CAT E	Vehicle SEA only CAT F	Safety Mgmt. SEA only CAT G
United States	485,927	2,920,978	6,031	1.2	101,741	946	2,244	2,841	2,413	9,051	16,269	1,733
Canada	14,969	84,155	117	0.8	1,441	23	45	49	59	572	98	39
Mexico	7,742	18,942	307	4.0	2,451	40	138	129	0	105	780	48
Total	508,638	3,024,075	6,455	1.3	105,633	1,009	2,427	3,019	2,472	9,728	17,147	1,820

4.2. DRIVER ROADSIDE INSPECTIONS

As shown in Figure 4-2, of the nearly 3.2 million driver roadside inspections performed in the two-year period prior to the last SafeStat run (September 1997 to September 1999), about 2.8 million, or 88.5%, were on experienced carriers' drivers (drivers of carriers that had been registered for two or more years at the time of the inspection). About 364 thousand driver inspections, or 11.5%, were performed on new entrant carriers (drivers of carriers that had been registered for less than two years at the time of the inspection). Since about 91,400 carriers registered in the two-year study time period out of a total census population of 509,000 at the end of the period, then almost 18% of the population could be considered "new entrants". Therefore, although 18% of the carriers were new entrants, they received less than 12% of the total driver inspections. Conversely, it was estimated that over 86% of the driver inspections were performed on experienced carriers, which represented about 82% of the carrier population. The lower percentage of driver inspections performed on new entrants is not surprising for two reasons. The first is the smaller fleet sizes that are typical of new entrants. The second is due to the increasing use of the SafeStat-based Inspection Selection System (ISS), which is being used by the states to identify and prioritize carriers for roadside inspections. Since SafeStat is based on safety performance and compliance data over a time frame of up to 30 months, recent registrants are unlikely to have accumulated sufficient data to be scored by SafeStat and targeted by the ISS.

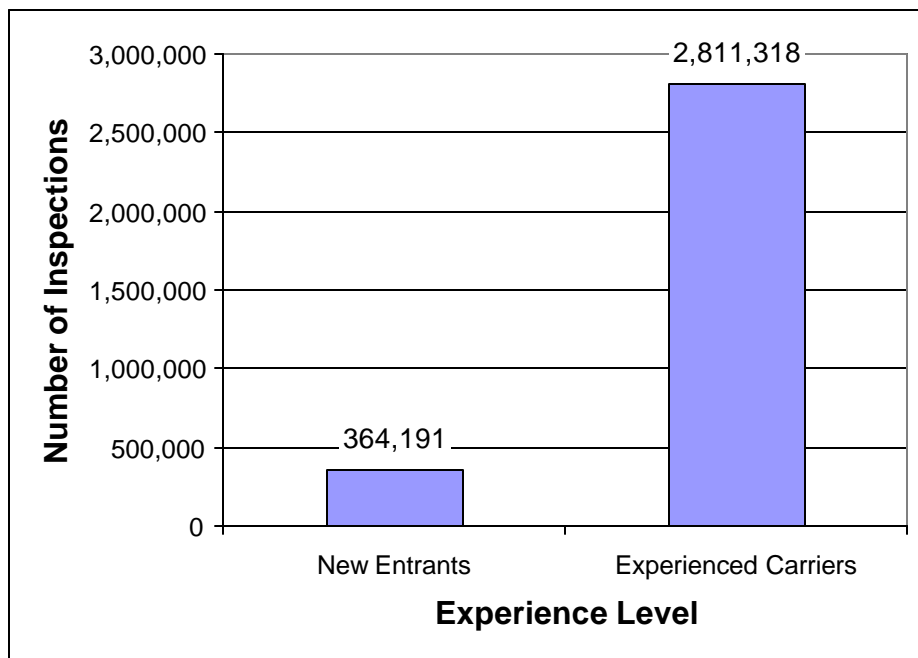


Figure 4-2. Number of Driver Roadside Inspections by Experience Level

4.3. VEHICLE ROADSIDE INSPECTIONS

As shown in Figure 4-3, of the over 2.4 million vehicle roadside inspections performed in the two-year period prior to the last SafeStat run (September 1997 to September 1999), nearly 2.2 million, or 88.3%, were on experienced carriers' vehicles (vehicles of carriers that had been registered for two or more years at the time of the inspection). About 287 thousand vehicle inspections, or 11.7%, were performed on new entrant carriers (vehicles of carriers that had been registered for less than two years at the time of the inspection). Since 90,564 carriers registered in the two-year study time period out of a total census population of 509,000 at the end of the period, then almost 18% of the population could be considered "new entrants." Therefore, although almost 18% of the carriers were new entrants, they received less than 12% of the total vehicle inspections. Conversely, it was estimated that over 88% of the vehicle inspections were performed on experienced carriers, which represented about 82% of the carrier population (and probably less than that since an unknown proportion may have been inactive). As with driver inspections, the lower percentage of vehicle inspections performed on new entrants is not surprising for two reasons. The first is the smaller fleet sizes that are typical of new entrants. The second is due to the increasing use of the SafeStat-based Inspection Selection System (ISS), which is being used by the states to identify and prioritize carriers for roadside inspections. Since SafeStat is based on safety performance and compliance data over a time frame of up to 30 months, recent registrants are unlikely to have accumulated sufficient data to be scored by SafeStat and targeted by the ISS.

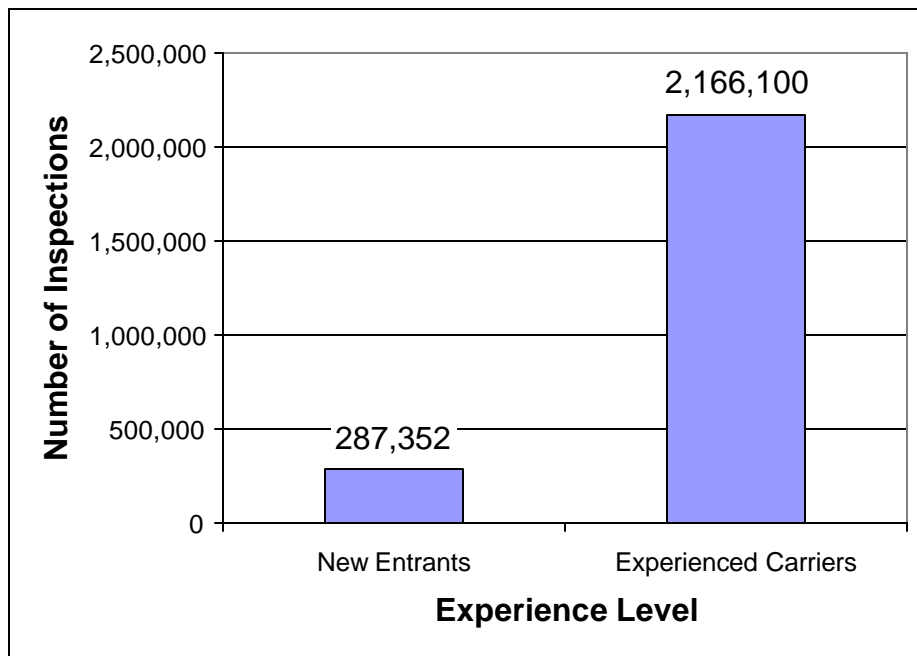


Figure 4-3. Number of Vehicle Roadside Inspections by Experience Level

5. SUMMARY AND CONCLUSIONS

As shown in Section 2, there are both a significant and increasing number of new entrant interstate motor carriers registering each year with the U.S. DOT. The total registered interstate motor carrier population increased by over 90,000, or 21%, during the two years examined by the study. Of these new entrants, a relatively small proportion are of foreign domicile (3,209 were Canadian carriers and 2,743 were Mexican carriers). The registration rate of new foreign carriers, however, exceeds that of U.S. carriers. During the two-year study period, the increase in the registered Canadian carrier population was over 27%, while the increase in the Mexican carriers was over 50%. During the same period, the increase in the U.S.-domiciled carrier population was 21.1%. Therefore, while 93% of new entrants are U.S.-based carriers, the number of foreign carriers (in particular, the number of Mexican carriers) is increasing at a much faster rate.

5.1. SAFESTAT ANALYSIS

SafeStat results were used to measure the comparative safety compliance and performance of new entrant carriers and experienced carriers. Where possible, additional comparisons were made between U.S. and foreign carriers. SafeStat, measures the relative safety performance and compliance of individual motor carriers in four Safety Evaluation Areas: Accident, Driver, Vehicle, and Safety Management. The values are expressed in percentile terms where 100 is the highest or worst value and 0 is the lowest or best. SafeStat specifically identifies as deficient any value at or above 75 (performance is in the worst 25th percentile). Since complete crash data and exposure measures are not available for Canadian and Mexican carriers, their Accident SEA values are not reliable and, therefore, are not broken out separately. Similarly, the lack of reliable data precludes the separate analysis of Canadian and Mexican carriers in the Safety Management SEA. The Safety Management SEA is based on data from compliance reviews and resulting enforcement actions. Few Canadian and no Mexican carriers receive these on-site safety investigations. Comparisons are generally possible for the Driver and Vehicle SEAs.

5.1.1. Accident SEA

The Accident SEA in SafeStat is based on crash rate data from state-reported crashes involving commercial motor vehicles and recordable crashes obtained during FMCSA on-site compliance reviews. Two or more crashes are required for a motor carrier to receive an Accident SEA value.

Figure 3-1 shows the proportions of new entrant and experienced carriers scoring above the 75th percentile (deficient). These results show that almost half (47.7%) of new entrant carriers were deficient in the Accident SEA. This result is significantly higher than that for experienced carriers, of which less than one fourth were deficient (23.7%). In summary, new entrant carriers

have significantly higher crash involvement according to SafeStat. This result is particularly significant since earlier studies had failed to confirm higher crash rates among new entrants.

5.1.2. Driver SEA

The Driver SEA in SafeStat is based on three indicators using independent data sources. They are: the Driver Inspection Indicator (DII), which is based on out-of service violations from driver roadside inspections; the Driver Review Indicator (DRI), which is based on driver-related violations from on-site compliance reviews; and the Moving Violations Indicator (MVI), which is based on moving violations issued by state enforcement agencies in conjunction with traffic stops resulting in roadside inspections.

Figure 3-2 shows the proportions of new entrant and experienced carriers scoring at or above the 75th percentile (i.e., deficient). These results show that over half (55.2%) of new entrant carriers were deficient in the Driver SEA. This result is significantly higher than that for experienced carriers of whom less than one third were deficient (26.9%). Figure 3-2 shows new entrant carriers to have significantly worse driver safety compliance and performance when compared to experienced carriers according to SafeStat. These results are consistent with findings from previous studies, which showed new entrants to have lower levels of compliance than experienced carriers.

In addition to the overall comparison of new entrants to experienced carriers, it is possible to break out the U.S., Canadian, and Mexican carriers for one of the indicators in the Driver SEA, the Driver Inspection Indicator (DII). Figure 3-3 compares the DIIs for new entrants and experienced carriers. As in the overall Driver SEA, new entrants had significantly worse performance with the DII with almost 52% of the carriers in the worst 25th percentile as compared with a normal 25% of the experienced carriers.

The DII results were also compiled by domicile of the carrier. While comparisons of the DII between U.S., Canadian, and Mexican new entrants confirms their poor performance as compared to experienced carriers, it does not reveal great differences among them. Actually, U.S. new entrants had slightly higher DII values than did either of the foreign carrier groups.

5.1.3. Vehicle SEA

The Vehicle SEA in SafeStat is based on two indicators using independent data sources. They are: the Vehicle Inspection Indicator (VII), which is based on out-of-service violations from vehicle roadside inspections; and the Vehicle Review Indicator (VRI), which is based on vehicle-related violations from on-site compliance reviews.

Figure 3-6 shows the proportions of new entrant and experienced carriers scoring at or at or above the 75th percentile (i.e., deficient). These results show that over 34% of new entrant carriers were deficient in the Vehicle SEA. This result is higher than that for experienced carriers, of which less than one third (27.1%) were deficient. Although not dramatic, these

results indicate that new entrant carriers have somewhat worse vehicle safety compliance and performance when compared to experienced carriers. These results are also consistent with findings from previous studies, which showed new entrants to have lower levels of compliance than experienced carriers.

In addition to the comparison of new entrants to experienced carriers, it was possible to break out the U.S., Canadian, and Mexican carriers for one of the indicators in the Vehicle SEA, the Vehicle Inspection Indicator (VII). As in the overall Vehicle SEA, new entrants had worse performance with the VII, with almost 34% of the carriers in the worst 25th percentile as compared with a more normal 27.1% of the experienced carriers.

Comparisons of the VIIs for US, Canadian, and Mexican new entrants shows their relative performance to be comparable to experienced carriers of the same domicile. There are significant differences, however, among the three domiciles with the Canadian carriers having exceptionally low VIIs, the U.S. carriers having closer to expected levels, and the Mexican carriers much higher than expected. Indeed, almost 60% of the Mexican carriers (both new entrant and experienced) fell in the worst 25th percentile of the VII. Actually, U.S. new entrants had significantly higher VII values than did the Canadian carriers, which had exceptionally low 8.6 (for new entrants) and 8.0 (for experienced carriers) average VIIs.

5.1.4. Safety Management SEA

The Safety Management SEA in SafeStat is based on three indicators, two based on compliance review data and one based on data from enforcement cases. They are: the Safety Management Review Indicator (SMRI), which is based on violations of acute and critical regulations that are related to safety management programs and practices (as opposed to violations committed during actual driver or vehicle operations); the Hazardous Material Review Indicator (HMRI), which is based on violations of the Hazardous Material Regulations (HMR), if applicable; and the Enforcement History Indicator, which is based on the carrier's entire enforcement case history.

Since one of the indicators, the EHI, requires a history of enforcement cases that only experienced carriers would have, and another indicator, the HMRI, is not applicable to most carriers, the only meaningful way to compare new entrants and experienced carriers in the Safety Management SEA is to use the third indicator. That is, show the compliance levels found in the most recent compliance review as measured by the SMRI.

Figure 3-9 shows the results of the SMRI comparison and indicates that new entrant carriers had significantly worse safety management compliance compared to experience carriers. These results are also consistent with findings from previous studies, which showed new entrants to have lower levels of compliance with the FMCSR and HMR than experienced carriers.

5.1.5. Conclusion

In conclusion, it can be stated that SafeStat results show new entrants to have significantly lower levels of safety compliance and performance. In addition, while crash rate indicators could not be accurately calculated for foreign carriers, compliance levels are significantly lower for Mexican carriers, particularly related to vehicle inspection violations,

5.2. ANALYSIS OF EXPOSURE TO FMCSA OVERSIGHT

Comparisons were made of the level of safety oversight of experienced carriers and new entrant carriers by the FMCSA. Where meaningful, breakouts of the component groups (U.S., Canadian, and Mexican carriers) were also done. Specifically, comparisons were made for compliance reviews, driver roadside inspections, and vehicle roadside inspections.

5.2.1. Compliance Reviews

Of the 14,610 compliance reviews performed in the two-year period prior to the last SafeStat run (September 1997 to September 1999), 13,538, or 92.6%, were on experienced carriers (carriers that had been registered for two or more years at the time of the review), while 1,072 reviews were performed on new entrant carriers (carriers that had been registered for less than two years at the time of the review). Almost all of the compliance reviews were on U.S. carriers, since very few Canadian carriers and no Mexican carriers receive FMCSA reviews. Of the 90,564 carriers that newly registered in the two-year study time period, 1,072, or 1.2%, received compliance reviews. The average population of experienced carriers over the two-year study period was about 401,000, of which 13,538, or 3.4%, received compliance reviews. Thus, the percentage of experienced carriers receiving reviews was almost three times the percentage of new entrants receiving reviews during that period. The lower percentage of new entrants receiving reviews is not surprising, since SafeStat is now being used to identify and prioritize carriers for reviews based on safety performance and compliance data over a time frame of up to 30 months. Recent registrants are less likely to have accumulated sufficient data to be scored by SafeStat.

The study also noted a potentially more serious discrepancy with respect to compliance reviews brought about by the exclusion of most foreign carriers, some of whom are being scored by SafeStat, but are not receiving reviews. This is particularly the case with Mexican carriers, as shown in Table 4-2. Although 307 Mexican carriers were scored by SafeStat (measured deficiency in two or more SEAs), none received reviews. An additional 933 Mexican carriers were deficient in one SEA. The majority of those were deficient in the Vehicle SEA. Also, the percentage of Mexican carriers receiving SafeStat scores (i.e., 4.0%) was more than three times the percentage of U.S. carriers receiving SafeStat scores (i.e., 1.2%).

5.2.2. Driver Roadside Inspections

Of the nearly 3.2 million driver roadside inspections performed during the study period, about 2.8 million, or 88.5%, were on experienced carriers' drivers (drivers of carriers that had been registered for over two years at the time of the inspection) and about 364 thousand driver inspections, or 11.5%, were performed on new entrant carriers' drivers (drivers of carriers that had been registered for less than two years at the time of the inspection). Therefore, the 18% of the carrier population consisting of new entrants received less than 12% of the total driver inspections. Conversely, it was estimated that over 86% of the driver inspections were performed on experienced carriers, which represented about 82% of the carrier population. The lower percentage of driver inspections performed on new entrants is not surprising for two reasons. The first is the smaller fleet sizes that are typical of new entrants. The second is due to the increasing use of the SafeStat-based Inspection Selection System (ISS), which is being used by the states to identify and prioritize carriers for roadside inspections. The situation is similar to that with compliance review prioritization. Since SafeStat is based on safety performance and compliance data over a time frame of up to 30 months, recent registrants are unlikely to have accumulated sufficient data to be scored by SafeStat and targeted by the ISS.

5.2.3. Vehicle Roadside Inspections

Of the over 2.4 million vehicle roadside inspections performed during the study period, nearly 2.2 million, or 88.3%, were on experienced carriers' vehicles (vehicles of carriers that had been registered for over two years at the time of the inspection) and about 287 thousand vehicle inspections, or 11.7%, were performed on new entrant carriers' vehicles (vehicles of carriers that had been registered for less than two years at the time of the inspection). Since about 91,400 carriers registered in the two-year study time period out of a total census population of 509,000 at the end of the period, then almost 18% of the population could be considered "new entrants." Therefore, although almost 18% of the carriers were new entrants, they received less than 12% of the total vehicle inspections. Conversely, it was estimated that over 88% of the vehicle inspections were performed on experienced carriers, which represented about 82% of the carrier population (and probably less than that since an unknown proportion may have been inactive). As with driver inspections, the lower percentage of vehicle inspections performed on new entrants is not surprising for two reasons. The first is the smaller fleet sizes that are typical of new entrants. The second is due to the increasing use of the SafeStat-based Inspection Selection System (ISS), which is being used by the states to identify and prioritize carriers for roadside inspections. Since SafeStat is based on safety performance and compliance data over a time frame of up to 30 months, recent registrants are unlikely to have accumulated sufficient data to be scored by SafeStat and targeted by the ISS.

5.2.4. Conclusion

In conclusion, the study shows that new entrants receive disproportionately less FMCSA oversight than experienced carriers. This is true for both of the FMCSA-sponsored safety programs, roadside inspections, and compliance reviews. A particular gap is evident with

respect to the lack of compliance reviews for Mexican carriers identified by SafeStat to have safety deficiencies in their U.S. operations.

5.3. GENERAL CONCLUSION

In general, the study's findings support increased safety education and oversight for new entrant motor carriers. In particular, any "new entrant program" that is formulated to address these objectives should have a component that emphasizes closing the gaps in the current safety assurance of Mexican carriers.