Applicability of Federal Safety Regulations to All 9-to-15-Passenger Vans Operating Interstate for Direct Compensation

Final Report

U.S. Department of Transportation
Federal Motor Carrier Safety Administration

October 2006

FOREWORD

This report, sponsored by the Federal Motor Carrier Safety Administration (FMCSA), investigated the regulatory impact on small businesses from eliminating the 75-air-mile criterion from the applicability of FMCSA's Final Rule issued on August 12, 2003. This report provides an important new resource to estimate the number of motor carriers, drivers, and vehicles that would be subject to implementing regulations to address the provisions of Section 4136 of SAFETEA-LU, as codified in 49 U.S.C. 31136. The study team's work generates a range of estimates of the regulated entities using new and innovative techniques. The report also draws upon information obtained from important stakeholders in the crash reconstruction expert, van operator, and State regulatory communities – communities with whom FMCSA has rarely, if ever, communicated in the past. Finally, it provides a framework to estimate the benefits and costs of implementing such a regulation.

A team conducted a literature review; collected data from States and carriers; and developed a questionnaire to interview and collect data from State agencies, stakeholders, and experts pertaining to 9-to-15-passenger vans.

Although the report can be helpful to the general public in understanding safety issues regarding 9-to-15 passenger vans, the report is primarily targeted towards commercial motor carriers, private fleet operators, and van drivers.

This publication is considered a final report and does not supersede another publication.

NOTICE

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SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yards	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	ml
gal	gallons	3.785	liters	l
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lbs)	0.907	megagrams	Mg
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5(F-32)/9 or (F-32)/1.8	Celsius temperature	°C
		ILLUMINATION		
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m2	cd/m2
		FORCE and PRESSURE or STRESS		
lbf	pound-force	4.45	newtons	N
psi	pound-force per square inch	6.89	kilopascals	kPa

APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	Yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
		VOLUME		
ml	milliliters	0.034	fluid ounces	fl oz
l	liters	0.264	gallons	gal
m^3	cubic meters	35.71	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
		MASS		
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg	megagrams	1.103	short tons (2000 lbs)	T
		TEMPERATURE (exact)		
°C	Celsius temperature	1.8 C + 32	Fahrenheit temperature	°F
		ILLUMINATION		
lx	lux	0.0929	foot-candles	fc
cd/m2	candela/m2	0.2919	foot-Lamberts	fl
		FORCE and PRESSURE or STRESS		
N	newtons	0.225	pound-force	lbf
kPa	kilopascals	0.145	pound-force per square inch	psi

* SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380.

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LIST OF ACRONYMS

BEA	Bureau of Economic Analysis
BIFA	Buses Involved in Fatal Accidents
BLS	Bureau of Labor Statistics
BMCS	Bureau of Motor Carrier Safety
CHP	California Highway Patrol
CFR	Code of Federal Regulations
CMV	Commercial Motor Vehicle
CMVSA	Commercial Motor Vehicle Safety Act
CTAA	Community Transportation Association of America
CVSA	Commercial Vehicle Safety Alliance
DATIA	Drug and Alcohol Testing Industry Association
DL	Driver License
DOT	Department of Transportation
DQF	Driver Qualification File
FLC	Farm Labor Contractor
FLV	Farm Labor Vehicles
FARS	Fatality Analysis Reporting System
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FMCSRs	Federal Motor Carrier Safety Regulations
GES	General Estimates System
GM	General Motors
GAWR	Gross Axle Weight Rating
GCWR	Gross Combination Weight Rating
GVW	Gross Vehicle Weight
GVWR	Gross Vehicle Weight Rating
HM	Hazardous Materials
ICCTA	Interstate Commerce Commission Termination Act of 1995
LLW	Lightly Loaded Weight
MCMIS	Motor Carrier Management Information System
MCSA	Motor Carrier Safety Act

MCSAP	Motor Carrier Safety Assistance Program
MCSIA	Motor Carrier Safety Improvement Act
NAICS	North American Industrial Classification System
NHTSA	National Highway Traffic Safety Administration
NPRM	Notice of Proposed Rulemaking
NSC	National Safety Council
NTSB	National Transportation Safety Board
OOS	Out-of-Service
PAR	Police Accident Report
SAFER	Safety and Fitness Electronic Records
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SBA	Small Business Administration
SSF	Static Stability Factor
SUV	Sport Utility Vehicle
TLPA	Taxicab, Limousine & Paratransit Association
TTI	Texas Transportation Institute
TIA	Tire Industry Association
TEA	Transportation Equity Act
TRB	Transportation Research Board
USDOT	United States Department of Transportation
UMTRI	University of Michigan Transportation Research Institute

EXECUTIVE SUMMARY

This report presents the results of a project entitled the Applicability of Federal Motor Carrier Safety Regulations (FMCSRs) to 9-to-15-Passenger Vans Operating Interstate for Direct Compensation, sponsored by the Federal Motor Carrier Safety Administration (FMCSA). The report investigated the regulatory impact on small businesses from eliminating the 75-air-mile criterion from the applicability of FMCSA's Final Rule issued on August 12, 2003. This report provides an important new resource to estimate the number of motor carriers, drivers, and vehicles that would be subject to implementing regulations to address the provisions of Section 4136 of SAFETEA-LU, as codified in 49 U.S.C. 31136. The study team's work generates a range of estimates of the regulated entities using new and innovative techniques. The report also draws upon information obtained from important stakeholders in the crash reconstruction expert, van operator, and State regulatory communities – communities with whom FMCSA has rarely, if ever, communicated in the past. Finally, it provides a framework to estimate the benefits and costs of implementing such a regulation.

The project has three primary objectives:

1. Identify the number of for-hire carriers that are operating vehicles designed or used to transport 9-to-15-passengers, including the driver, interstate within 75-air-miles of the driver's reporting location.
2. To estimate the benefit and costs of eliminating the 75-air-mile criterion from the applicability of FMCSA's Final Rule issued on August 12, 2003.
3. To estimate the regulatory impact on small businesses operating 9-to-15-passenger vans interstate based on the Small Business Administration's (SBA) size standards.

In order to meet these objectives, Battelle assembled and led a project team that included the Commercial Vehicle Safety Alliance (CVSA) and the University of Michigan Transportation Research Institute (UMTRI). The team conducted a literature review; collected data from States and carriers; and developed a questionnaire to interview and collect data from State agencies, stakeholders, and experts pertaining to 9-to-15-passenger vans.

Overview

Production of 15-passenger vans began in the early 1970s to transport small groups of people where a full-size bus would be too large, but a passenger car would be too small. However, instead of creating a new model, most manufacturers modified their existing cargo van by adding more seats and lengthening the body without lengthening the wheelbase. Dodge (now part of DaimlerChrysler), Ford and General Motors (GM) were the only manufacturers of 15-passenger vans in the United States.

The 9-to-15-passenger van is utilized by motor carriers to serve many different markets. These vans are operated primarily intrastate by private carriers such as church groups, hotels, industrial

companies, van pools and schools. The vans are used by for-hire carriers to transport passengers to and from airports, tour transportation, in rural areas, and to transport agricultural and industrial workers. For-hire carriers operate 9-to-15-passenger vans both intrastate and interstate.

According to the National Transportation Safety Board (NTSB), from 1991 to 2000, 9-to-15-passenger vans were involved in approximately 0.22 percent of all fatal accidents and 0.24 percent of all single-vehicle fatal accidents. Since they make up 0.25 percent of all vehicles in the United States, on a per-vehicle basis, they are actually involved in slightly less than the average number of fatal accidents. However, when compared to passenger vehicles and smaller occupancy vans, they have a higher incidence of rollover, resulting in a higher percentage of multiple fatalities and severe injuries.

There are many safety concerns for 9-to-15-passenger vans due to their design and handling characteristics. Improperly inflated tires can change the vehicle-handling characteristics and increase rollover propensity. Roof crush is also an issue when a van overturns. The space left above each row of passenger seats can be reduced by as much as 15 inches. The lack of experienced drivers operating vans is an issue since these vans handle differently than regular passenger cars especially when they are fully loaded and during emergency situations. The 9-to-15-passenger van design increases the rollover propensity, due to its high and rearward center of gravity when fully loaded.

Some van operators appear to believe that if they do not charge for transport they are exempt from all regulations. While this is not true if the van operator is under contract to provide the service to a government or non-profit agency, by not being familiar with the regulations, some private van operators may not regularly perform pre-trip inspections.

Data Investigation and Analysis

There is no single adequate source that provides the characteristics for for-hire 9-to-15-passenger van carriers. Identifying the percentage of for-hire 9-to-15-passenger carriers that travel less than 75-air-miles in the Motor Carrier Management Information System (MCMIS) Census File database is unreliable due to the small number of carriers remaining after the effects of underreporting and the exclusion of carriers that operate larger vehicle types in addition to 9-to-15-passenger vans is considered. If the MCMIS Crash File is being used to identify excluded carriers, and if the carrier does not register for a USDOT number, it becomes a difficult task to identify these carriers and link them to the MCMIS Census File.

Each year, vehicles identified as buses in Fatality Analysis Reporting System (FARS) are found to be other vehicle types. The Buses Involved in Fatal Accidents (BIFA) file does not include information about the carrier's radius of operations. The accident rate information in the MCMIS Census File was found to be unreliable. Therefore, the MCMIS Crash and Census Files are used along with an accident rate to develop a "backwards" estimate of the total number of 9-to-15-passenger van carriers. The numbers of for-hire 9-to-15-passenger van carriers that

operate interstate and could come under the FMCSRs in the future were estimated from industry associations, literature and interview sources.

If the FMCSRs are applied to interstate carriers that are currently exempt from the regulation, an estimated 1,590 new carriers would come under the regulations. The total estimated compliance cost for those carriers in 2006 would be $1.81 million or $1,135 per carrier. Over a ten-year period, assuming a 1.7 percent growth rate in the number of new carriers in 2015, there will be an estimated 1,847 carriers. Assuming a 7 percent discount rate, the total discounted cost to those carriers over the ten-year period will be $13 million or $7,000 per carrier.

Benefits were estimated based on calculated reductions in injuries and fatalities stemming from compliance with the FMCSRs. By including these 1,590 carriers under the regulations, there would be a 40 percent reduction in the fatal-crash-to-crash ratio and a 10 percent reduction in the injury-crash-to-crash ratio. Assuming average annual miles traveled, fleet size, and accident rates remain unchanged, an estimated 13 fatalities and 117 injuries will be prevented each year by bringing the 1,590 carriers under the regulations. If 13 fatalities are avoided, costs would be reduced by $52 million. If 117 injuries are avoided, costs would be reduced by an additional $23 million. A total estimated reduction of $75 million for fatality and injury damages would be saved each year. Holding the crash reduction percentage constant, assuming a 1.7 percent growth rate and a discount rate of 7 percent, results in a total cost reduction over a ten-year period of $606 million. Of this total, $420 million can be attributed to the reduction in fatalities and $186 million to the reduction in injuries. The net benefit-cost ratio is a positive 47 to 1.

A sensitivity analysis was performed to look at the effect of possible changes in the number of carriers and the fatal and injury crash ratios. Assuming a standard deviation in the number of carriers coming under the regulations of 25 percent and a 42 percent standard deviation for the crash ratio estimates, then it can be stated with 95 percent confidence that the number of carriers will be between 795 and 2,385. Furthermore, the reduction in the crash ratio would be between 6.5 and 74 percent for the fatal-crash-to-crash ratio and between 1.6 and 18.4 percent for the injury-crash-to-crash ratio. Since the benefit-cost ratio is so high, and both the costs and benefits are proportional to the number of carriers, the ratio will be minimized by using the low bound numbers. When the lower numbers are put into the equations, the benefit-cost ratio is reduced to 7.6. Therefore, this data analysis shows with greater than 95 percent confidence that the benefit-cost ratio is positive by more than a factor of 7.6 to 1.

A survey of motor carriers showed that 76 percent of the carriers operating vans that will be affected by including all interstate for-hire carriers under the FMCSRs will be small businesses. The expected total discounted cost to small businesses over the ten-year period from 2006 through 2015 was estimated to be $9 million. Based on the sensitivity analysis performed using all potentially covered carriers, the impacts on small business could range from $4.0 million to $14.6 million over the ten-year period.

Findings

An estimated 1,590 additional for-hire 9-to15-passenger van carriers would come under the FMCSRs if all for-hire interstate carriers are covered. The lower and upper bound estimate on the number of carriers was 795 and 2,385 respectively. Given the wide range of uncertainty, these estimates are best presented as approximately 1,600 additional carriers with a lower and upper bound of 800 and 2,400 carriers. The exact numbers will be used in the paragraphs that follow simply to retain mathematical consistency. The only rounding that has been performed is on the final numbers.

The cost for eliminating the 75-air-mile criterion can be classified into three categories: driver medical examination and certification; driver qualifications; and vehicle inspection, repair and maintenance. In 2006, the estimated cost for medical examinations and certification would be $356,000, or approximately $225 per driver. In 2006, the estimated cost to create driver qualification files would be $319,000, or approximately $200 per file. To insure proper vehicle inspection, repair, and maintenance records are retained, it would cost $1,131,000 in 2006, or approximately $325 per vehicle. Therefore, the total cost for carriers to comply with the regulation would be approximately $1.8 million for 2006.

An estimated 76 percent of 9-to-15-passenger van carriers, which are currently exempt from the regulations, are small businesses. The costs for including the small businesses operating interstate under the FMCSRs can be classified into the same three categories. In 2006, the estimated cost for medical examinations and certification would be $271,000, or approximately $225 per driver. In 2006, the estimated cost to create driver qualification files would be $243,000 million, or approximately $200 per file. To insure proper vehicle inspection, repair and maintenance records are retained, it would cost $0.86 million, or approximately $325 per vehicle. Therefore, the total cost for a small business carrier to comply with the regulation would be approximately $1.4 million for 2006.

The for-hire 9-to-15-passenger van carriers operating interstate and further than 75-air-miles from the driver's reporting location, became subject to the FMCSRs in late 2003. Using the fatal-crash-to-crash ratio and the injury-crash-to-crash ratio, and calculating the ratios for the biennium before and after the regulations, the data show that the second biennium had a 40 percent lower fatal ratio and a 10 percent lower injury ratio. Private and for-hire carriers operating within 75-air-miles of their normal work reporting location (and not subject to the FMCSRs), showed no similar reduction; the reduction was attributed to regulatory effectiveness. A sensitivity analysis was performed by estimating the lower and upper bound on the number of affected carriers and on the ability to estimate the regulatory effect. The standard deviation for the number of carriers was estimated to be 25 percent and the standard deviation of the regulatory effect was estimated at 42 percent. The standard deviation for the regulatory effect encompassed the standard deviation for carrier numbers. Even considering the large uncertainty, the results show that the regulations have significantly reduced the fatal and injury crash ratios.

For 2006, the estimated benefits of applying the proposed rule outweigh the costs of complying with the regulation by 40 to 1. Over a ten-year analysis period, the benefit-cost ratio would be

47 to 1. Even after considering the uncertainty in the numbers that went into the estimate, the lowest benefit-cost ratio calculated was 7.6 to 1. Thus it is believed that the positive benefit-cost ratio is significant.

If the FMCSRs are applied to all interstate carriers that are small businesses and are currently not covered by the regulations, an estimated 10 fatalities and 89 injuries will be prevented each year. If 10 fatalities are avoided, costs would be reduced by $40 million. If 89 injuries are avoided, costs would be reduced by $18 million. A total reduction of $58 million for fatality and injury damages would be saved each year.

A variety of measures were considered for evaluating the regulatory effectiveness. By far the most sensitive measures found were the fatal-crash-to-crash ratio and the injury-crash-to-crash ratio. The large effect observed—a 40 percent difference for the fatal ratio and a 10 percent difference for the injury ratio—could only be attributed to regulatory effectiveness. The fatal and injury crash ratios should be considered when attempting to evaluate the effectiveness of new regulations.

Recommendations

This project has confirmed that a rulemaking to implement section 4136 of SAFETEA-LU would not only be cost-effective, but would also result in the avoidance of fatalities and serious injuries.

To further increase the safety of 9-to-15-passenger vans, improvements in driver capabilities should be made. Upgraded driver training programs should be investigated and implemented.

A large proportion of roadside inspections occur at weigh stations and 9-to-15-passenger vans are not required to stop. Consequently, FMCSA should consider devoting additional resources to ensure that a greater percentage of these motor carriers are subject to inspections. One potential approach would be to target these carriers parked at such facilities as tourist destinations and passenger pickup locations.

Additional research should be conducted to collect data and analyze the operational and safety performance of the industry. Many carriers involved in this industry are currently unaccounted for, and many are not complying with the Federal Motor Carrier Safety Regulations even when operating in interstate commerce beyond the 75-air-mile threshold.

One of the major uncertainties associated with this study was the underreporting of reportable 9-to-15-passenger van accidents. FMCSA should study ways to increase the percentage of these accidents that are reported in MCMIS. Until this is done, uncertainties in assessments of regulatory changes directed at improving the safety of 9-to-15-passenger van operations will continue to be significant.

1.0 INTRODUCTION

This report presents the results of a project entitled "The Applicability of Federal Motor Carrier Safety Regulations (FMCSRs) to 9-to-15-Passenger Vans Operating Interstate for Direct Compensation," a project sponsored by the Federal Motor Carrier Safety Administration (FMCSA). The report investigates the regulatory impact on small businesses from eliminating the 75-air-mile criterion from the applicability of FMCSA's Final Rule issued on August 12, 2003. This report provides an important new resource to estimate the number of motor carriers, drivers, and vehicles that would be subject to implementing regulations to address the provisions of Section 4136 of SAFETEA-LU, as codified in 49 U.S.C. 31136. The study team's work generates a range of estimates of the regulated entities using new and innovative techniques. The report also draws upon information obtained from important stakeholders in the crash reconstruction experts, van operators, and State regulatory communities – communities with whom the FMCSA has rarely, if ever, communicated in the past. Finally, it provides a framework to estimate the benefits and cost of implementing such a regulation.

1.1 Project Methodology

Battelle assembled and led a project team that included the Commercial Vehicle Safety Alliance (CVSA) and the University of Michigan Transportation Research Institute (UMTRI). The work performed for the study involved conducting a literature review; collecting data from the States and other sources; and developing a plan and questionnaire to interview and collect data and information from State agencies, stakeholders, and experts concerning 9-to-15-passenger van operations and safety. All information obtained was examined and loaded into safety and economic models to determine the benefits and costs that could be expected from implementation of the potential regulation eliminating the less than 75-air-mile from the driver's reporting location exemption for the FMCSRs for for-hire 9-to-15-passenger vans operating in interstate commerce.

1.1.1 Literature and Data Search

The literature search for this project focused on gathering literature, sources, studies, reports, and data relating to crashes and associated injuries, fatalities, property damage, and operational and regulatory issues for small passenger-carrying vehicles. Data sources included the Buses Involved in Fatal Accidents (BIFA) and the Motor Carrier Management Information System (MCMIS) Crash File, Registration, and Inspection databases. The team also searched for studies and safety-related databases maintained by State motor carrier agencies including crash/accident, inspection, operational, and regulatory data. The team queried each State to identify these data and consequently was able to use State databases including ones for Texas and California that provided the Battelle team with insights into the operational and safety issues related to 9-to-15-passenger van operations.

Battelle also reviewed technical material including data, reports, studies, and articles from such Federal sources as the National Highway Traffic Safety Administration (NHTSA), Federal

Highway Administration (FHWA), and National Transportation Safety Board (NTSB), and associations such as the Taxicab, Limousine & Paratransit Association (TLPA) and the Community Transportation Association of America (CTAA). Battelle also used its Technical Information Center to conduct a search for relevant materials found in electronic databases covering collections in major university libraries. The information and data collected during this phase of the project provided the primary inputs for the characterization of the industry presented in the report.

1.1.2 Interviews with Nine Entities Concerning 9-to-15-Passenger Van Operational Factors and Costs for Safety Regulation Implementation

The Battelle team identified respondents, developed a questionnaire, and interviewed experts at the States and van/bus associations to provide an overview of how vans operate and the significance of particular operational factors to safety. Carriers also were interviewed to collect cost data related to the implementation of the FMCSRs. The interviews were conducted among representatives from the following groups:

- State regulatory agencies such as Arizona, California, and Texas
- Industry associations, such as the Community Transportation Association of America (CTAA), and the Taxicab, Limousine & Paratransit Association (TLPA)
- National Safety Council (NSC)
- Selected 9-to-15-passenger van carrier operations

For passenger van carriers, the team interviewed company officials responsible for understanding overall operational issues, elements contributing to the safety of their operations, and the cost impacts for implementing the FMCSRs.

1.1.3 Interviews with Nine Entities Concerning Vehicle Condition, Maintenance, and Driver Training as Contributing Factors in Crashes Involving 9-to-15-Passenger Vans

Battelle identified respondents, prepared a questionnaire focused on developing a more in-depth understanding of the factors relating to small passenger-carrying van crashes and van maintenance by collecting information on more qualitative aspects of small passenger van safety. The Battelle team conducted interviews from the following groups:

- Selected State regulatory agencies with specialized knowledge of van operations
- National experts in crash reconstruction and data analysis
- Maintenance experts

For State motor carrier safety agencies, interviews were conducted with those individuals responsible for regulating passenger vans and/or responsible for carrier compliance to safety regulations. Crash reconstruction and maintenance experts were selected for interviews based on

their experience with 9-to-15-passenger van crash investigations or maintenance issues. All interviews were conducted by teleconference.

1.1.4 Safety and Economic Analyses

The data and information obtained in earlier stages of the project were used to develop the safety and economic models needed to determine the potential benefit-cost ratio for implementing the FMCSRs for for-hire motor carriers that operate 9-to-15-passenger vans in interstate commerce within a 75-air-mile radius of the drivers' normal work-reporting location. This is the target population for the analysis because they are currently not covered by the FMCSRs and are proposed to be covered by the FMCSRs under the planned regulation. The data were analyzed to determine if there were statistically identifiable benefits related to 9-to-15-passenger van carriers' compliance with the FMCSRs. The primary benefits are the safety impacts of the prevention of injury and fatalities related to the potential adoption of FMCSRs that are applicable to the target population: for hire motor carriers that operate 9-to-15-passenger vans in interstate commerce within a 75-air-mile radius of drivers' normal work reporting location. The primary costs are those related to carrier expenses required to comply with the potential regulation.

1.2 Background

FMCSA issued several regulations to respond to the conditions of the Transportation Equity Act for the 21st Century (TEA-21) and the Motor Carrier Safety Improvement Act of 1999 (MCSIA). The purpose of these regulations is to improve the operational safety of all for-hire motor carriers that operate small passenger-carrying vehicles. The subsections below summarize the history of the safety regulations applicable to this project.

1.2.1 History of Regulations

Section 204 of the Motor Carrier Safety Act (MCSA) of 1984 defined a "commercial motor vehicle" (CMV) as: one having a gross vehicle weight rating (GVWR) of 10,001 pounds or more; designed to transport more than 15 passengers, including the driver; or transporting hazardous materials (HM) in quantities requiring the vehicle to be placarded. This definition, codified at 49 U.S.C. 31132, was the basis for the regulatory definition of a CMV in 49 CFR 390.5, which determines the jurisdictional limits and applicability of most of the FMCSRs. The Senate Committee on Commerce, Science and Transportation, in a report which accompanied the MCSA stated: "The 10,000-pound limit, which is in the current BMCS [Bureau of Motor Carrier Safety, now the FMCSA] regulations, is proposed to focus enforcement efforts and because small vans and pickup trucks are more analogous to automobiles than to medium and heavy commercial vehicles, and can best be regulated under State automobile licensing, inspection, and traffic surveillance procedures."

Although the MCSA demonstrated congressional intent to focus the applicability of the FMCSRs on larger vehicles, Congress did not repeal Section 204 of the Motor Carrier Safety Act of 1935.

This statute, now codified at 49 U.S.C. 31502, authorizes the FMCSA to regulate the safety of all for-hire motor carriers of passengers or property without respect to the weight or passenger capacity of the vehicles they operate.

When the Congress enacted the Commercial Motor Vehicle Safety Act (CMVSA) of 1986 to require implementation of a single, classified commercial driver's license program, it also limited the motor vehicles subject to the program to those designated to transport more than 15 passengers, including the driver. This, too, revealed the congressional policy of applying available Federal motor carrier safety resources to larger vehicles.

The ICC Termination Act of 1995 (ICCTA) changed the MCSA's definition of a commercial motor vehicle. As amended, 49 U.S.C. 31132(1) defined a commercial motor vehicle as one that is "designed or used to transport passengers for compensation, but excludes vehicles providing taxicab service and having a capacity of not more than 6 passengers and not operated on a regular route or between specified places; (or) is designed or used to transport more than 15 passengers, including the driver, and is not used to transport passengers for compensation." The ICCTA authorized, but did not require, the FHWA to change the FMCSRs. Accordingly, the agency did not incorporate the amended language into the CMV definition in 49 CFR 390.5. The agency notes that the ICCTA included the phrase "designed or used" in specifying the passenger-carrying threshold for the FMCSRs. This change was intended to make the FMCSRs applicable based upon the number of passengers in the vehicle or the number of designated seating positions, whichever is greater. In other words, a bus designed to carry 13 people but actually carrying 18 would be subject to the FMCSRs.

Section 4008(a) (2) of the TEA-21 again amended the passenger-vehicle component of the CMV definition in 49 U.S.C. 31132(1). Section 4008 also changed the weight threshold in the CMV definition by adding "gross vehicle weight" (GVW) to the previous "gross vehicle weight rating." The agency is now able to exercise its jurisdiction based on the GVW or GVWR, whichever is greater. "Commercial motor vehicle" is now defined to mean a self-propelled or towed vehicle used on the highways in interstate commerce to transport passengers or property, If the vehicle –

(a) Has a gross vehicle weight rating or gross vehicle weight of at least 10,001 pounds, whichever is greater;

(b) Is designed or used to transport more than 8 passengers (including the driver) for compensation;

(c) Is designed or used to transport more than 15 passengers, including the driver, and is not used to transport passengers for compensation; or

(d) Is used in transporting material found by the Secretary of Transportation to be hazardous under Section 5103 of this title and transported in a quantity requiring placarding under regulations prescribed by the Secretary under Section 5103.

On December 9, 1999, the President signed the Motor Carrier Safety Improvement Act (MCSIA). Section 212 of the MCSIA requires that the FMCSA make its safety regulations

applicable to: (1) Commercial vans sometimes referred to as "camionetas," and (2) those commercial vans operating in interstate commerce outside of commercial zones that have been determined to pose serious safety risks.

On January 11, 2001, FMCSA amended the FMCSRs to adopt the statutory definition of a CMV found at 49 U.S.C. 31132. FMCSA also amended the FMCSRs to require that motor carriers operating CMVs designed or used to transport between 9 and 15 passengers (including the driver) for compensation to file a motor carrier identification report, mark their CMVs with a USDOT identification number, and maintain an accident register. The agency imposed these requirements to monitor the operational safety of motor carriers operating small passenger-carrying vehicles for compensation. In addition, the three requirements were implemented to help the agency compile information on the number of motor carriers operating small passenger-carrying vehicles for compensation, the locations of their principal places of business, the number of vehicles operated, and the number of drivers employed. Through marking the vehicles with USDOT identification numbers, State agencies will be able to identify small passenger-carrying vehicles and collect accident data for submission to the FMCSA through the agency's SAFETYNET database.

On August 12, 2003, FMCSA issued a Final Rule that amended the FMCSRs to require that motor carriers operating CMVs, designed or used to transport between 9 and 15 passengers (including the driver) in interstate commerce, must comply with the applicable safety regulations when they are directly compensated for such services and the vehicle is operated beyond a 75-air-mile radius (86.3 statute miles or 138.9 kilometers) from the driver's normal work reporting location. The agency revised its proposed distance threshold to focus on the distance that the driver operates the vehicles, as opposed to the distance that the passengers are transported. These motor carriers, drivers, and vehicles were then, through this rule, subject to the same safety requirements as motor coach operators, except for the commercial driver's license, and controlled substances and alcohol testing regulations. This rule implemented Sections 212 of the Motor Carrier Safety Improvement Act of 1999.

1.2.2 Potential Regulations

On August 10, 2005, Congress enacted the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) [119 Stat. 1144]. Section 4136 of this Act addressed interstate van operations:

> The Federal motor carrier safety regulations that apply to interstate operations of commercial motor vehicles designed to transport between 9 and 15 passengers (including the driver) shall apply to all interstate operations of such carriers regardless of the distance traveled.

FMCSA is currently evaluating how to amend the regulations to comply with this statute that effectively eliminates the exemption for interstate carriers operating 9-to-15-passenger vehicles less than 75 miles. This report will assist the FMCSA in evaluating the costs and benefits of

amending the regulations. Table 1 shows the current and potential regulations that are applicable by type of motor carrier. Note that all of the regulations shown in Table 1 have precedence over Part 398.

Table 1. Current and Potential Regulation Application by Motor Carrier Type

Regulation / Motor Carrier Type	Interstate, For-hire Greater than 75-Air-miles	Interstate, For-hire Less than 75-Air-miles	Interstate, Private Greater than 75-Air-miles	Interstate, Private Less than 75-Air-miles	Intrastate, For-hire	Intrastate, Private
§385 – Safety Fitness Procedures	X	Δ				
§390 – General Applicability	X	X				
§390.15 – Assistance in Investigations and Special Studies	X	X	X	X	X	X
§390.19 – Motor Carrier Identification Report	X	X	X	X	X[1]	X[1]
§390.21 – Marking of CMVs	X	X	X	X	X	X
§391.15 – Disqualification of Drivers	X	X	X	X	X	X
§391.21 – Application for Employment	X	Δ				
§391.23 – Driver Investigation and Inquiries	X	Δ				
§391.25 – Annual Review of Driver Records	X	Δ				
§391.27 – Record of Violations	X	Δ				
§391.41 – Physical Qualifications for Drivers	X	Δ				
§391.45 – Driver Medical Examination and Certification	X	Δ				
§391.51 – Driver Qualification Files	X	Δ				
§391.53 – Driver Investigation History File	X	Δ				
§392 – Maintenance, Operation and Driving Requirements	X	Δ				
§393 – Minimum Standards for Commercial Motor Vehicles	X	Δ				
§395.5 – Maximum Driving Time for Passenger-Carrying Vehicles	X	Δ				
§395.8 – Driver's Record of Duty Status	X	Δ				

[1] Intrastate motor carriers operating prior to January 1, 2005, are exempted from §390.19(a) (1)

Table 1. Current and Potential Regulation Application by Motor Carrier Type (Continued)

Regulation / Motor Carrier Type	Interstate, For-hire Greater than 75-Air-miles	Interstate, For-hire Less than 75-Air-miles	Interstate, Private Greater than 75-Air-miles	Interstate, Private Less than 75-Air-miles	Intrastate, For-hire	Intrastate, Private
§396.3 – Inspection, Repair, and Maintenance Records Created and Stored	X	Δ				
§396.5 – Lubrication	X	Δ				
§396.7 – Unsafe Operations Forbidden	X	Δ				
§396.9 – Inspection of Motor Vehicles in Operation	X	Δ				
§396.11 – Driver Vehicle Inspection Reports	X	Δ				
§396.13 – Driver Inspection	X	Δ				
§396.15 – Driveway Towaway Operations Inspections	X	Δ				
§396.17 – Periodic Vehicle Inspections	X	Δ				
§396.19 – Inspector Qualifications	X	Δ				
§396.23 – Equivalent to Periodic Inspection	X	Δ				
§396.21 – Periodic Inspection Recordkeeping Requirements	X	Δ				
§396.25 – Qualifications of Brake Inspectors	X	Δ				
§398 – Transportation of Migrant Workers	X	Δ				
USDOT Number Application	X	X				

Source: 49 CFR Parts 380-399, FMCSA, DOT

Note: **X** denotes currently under regulation
Δ denotes potential regulation application

2.0 9-TO-15-PASSENGER VAN OVERVIEW

2.1 The 9-to-15-Passenger Van Carrier Industry in the United States

The 9-to-15-passenger van is utilized by carriers to serve a number of different markets. Private carriers that use these vans include churches and other religious congregations, hotels, companies operating employee shuttles between their facilities, and schools. These private carriers account for the majority of the passenger van carriers in the United States. These vans tend to be used locally and primarily intrastate. Of an estimated 16,000 carriers in the United States, the private carriers constitute about 64 percent of the total. The origin of these numbers is discussed in Section 3.0.

Those carriers that use 9-15 passenger vans in interstate for-hire operations are most important for this analysis since they could be affected by the new rule mandating that the Federal safety requirements apply to for-hire carriers operating interstate within the 75-air-mile distance from the driver's reporting location. The for-hire carriers are used for a number of purposes including transporting people to and from airports; providing transportation for tours; moving canoeists to and from a river; transporting people in rural areas; and moving agricultural, industrial, and service workers. The for-hire small passenger vans operate both intrastate and interstate; those operating interstate operate both within the 75-air-mile zone from the driver's reporting location and beyond that distance. Therefore, these for-hire 9-to-15-passenger van carriers are currently operating both under the Federal Motor Carrier Safety Regulations and outside of the regulations. In addition, a number of States, including Arizona, New Mexico, California, North Dakota, Washington, and Nebraska, require carriers operating within that State to also operate under State-mandated safety regulations. These regulations are either similar or equivalent to the Federal regulations in that they tend to be adopted from the Federal Motor Carrier Safety Regulations into the particular State's regulations. States were not required to adopt the 2003 regulations as a condition of receiving Motor Carrier Safety Assistance Program (MCSAP) funds.

2.1.1 History of 15-Passenger Van Production

Fifteen-passenger van production began in the early 1970s to fill a unique need to transport small groups of people where a full-size bus would be too large, but passenger cars would be too small. However, instead of creating a new vehicle, most vehicle manufacturers modified their existing cargo vans by making the body longer and installing more seats without lengthening the wheel base. Three manufacturers produced 15-passenger vans: Dodge (now part of DaimlerChrylser), Ford, and General Motors. Ford and Dodge began production in the early 1970s; General Motors did not enter the market until the early 1990s. GM's full-size van models were available as 2-passenger cargo vans, or as 5-, 9-, or 12-passenger vans. The following are several examples of 15-passenger van models:

- Ford E-350 Super Duty XLT (Econoline and Club Wagons)
- Dodge Ram Van B3500/Wagon B350 (1 ton)—discontinued in 2002 and replaced by the Dodge Sprinter. (This model is currently available in cargo and passenger configurations.)
- GMC Savana/Rally 1-ton Extended
- Chevrolet Express 1-ton Extended.

Figure 1 shows the number of 15-passenger vans registered in the United States from 1990 to 2002. One can observe a steady increase in the number of registrations, which resulted in more than three times as many 15-passenger vans registered in 2002 than in 1990. In 2002, there were approximately 500,000 15-passenger vans registered, which represents about 0.25 percent of the passenger vehicle fleets (passenger cars, light trucks, and vans) (NHTSA, May 2004). Note that many of these "passenger" vans are used primarily to haul cargo and such equipment as tools. Often, most of the seats are removed to allow for additional cargo. In many jurisdictions, a vehicle sold by the manufacturer without seats is classed and registered as a truck, whereas with seats it is classed as a station wagon. Depending on local circumstances, the classification can affect license fees, insurance costs, tolls, and ability to drive on non-truck routes and routinely park in residential neighborhoods. Moreover, sometimes used passenger vans get a new life as cargo vans for painters, carpet layers, and other service providers.

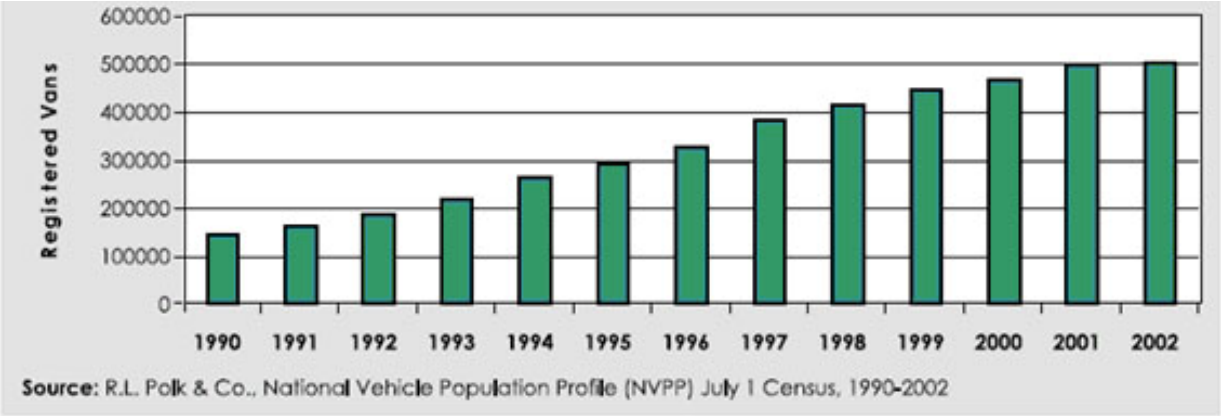


Figure 1. Registered 15-Passenger Vans in U.S., 1990-2002

2.2 For-hire 9-to-15-Passenger Van Operations

For-hire passenger vans are emphasized in this section because any potential regulation developed to implement the SAFETEA-LU provision regarding the application of the Federal Motor Carrier Safety Regulations for carriers operating interstate and less than 75-air-miles from the driver's reporting location would apply to the for-hire vans. Passenger van operations tend to be specialized and serve particular niche markets.

2.2.1 Airport Ground, Tours and Charter Operations

One important niche is providing transportation to major transportation hubs such as railroad stations, bus depots, and airports. Major airports are served by carriers transporting passengers by small passenger vans. Most major airports are served by 20 or more shuttle services and these provide the majority of airport passenger van transportation. However, many airports have far fewer services because of a limited market or by design. For example, until very recently, Washington Dulles airport allowed only one franchisee, Washington Flyer, to pick up passengers. Most of the carriers serving major airports are very small. For example, according to the head of an organization representing passenger carriers at airports, John Wayne Airport in Orange County, California, is served by 21 small passenger carriers. Of these, all are very small operations with the exception of Super Shuttle (Mundy, 2006). Super Shuttle is the largest carrier providing van service for airports and provides service to 23 airports. Airport shuttle companies began a process to diversify their operations after 9/11, which resulted in a reduction in the number of passengers using airports and a related decline in the number of passengers using the shuttles. Some airport shuttle companies have diversified into such activities as providing guided tours and serving special functions such as sporting events (Armstrong, 2003).

Passengers travel both intrastate and interstate. The differences largely reflect the region and city in which a carrier is located and the relative location of the city with respect to State borders. For example, carriers located in cities near State borders, such as Boston, New York, Philadelphia, Cincinnati, and St. Louis, have a high likelihood of operating interstate. Furthermore, they are likely to operate within the 75-air-mile distance from the driver's reporting location. On the other hand, carriers located in such cities as Columbus (Ohio), Austin, Denver, Phoenix, and Los Angeles, are far less likely to be engaged in interstate travel. If carriers operating from locations far from the State border do travel into another State, they clearly would not be operating within the 75-air-mile distance from the driver's reporting location since any driver would have to drive more than the 75-air-mile distance (86 statute miles) just to reach the border of the next State. Furthermore, estimating the percentage of for-hire carriers that are operating both in interstate commerce and within the 75-air-mile radius is difficult to accomplish from data such as that found in the MCMIS Census File. According to one official of a major transportation association that includes operators of small passenger vans, those carriers operating within the 75-mile zone have little incentive to obtain a DOT number, which although it is a requirement in itself, carries virtually no other responsibilities. Those carriers are not currently subject to the FMCSRs, and would be subject to safety regulations only if their State has adopted compatible safety regulations.

Vans used to transport participants of outdoor recreational tours, such as viewing the leaves changing in New England or transporting kayakers or canoeists for a river outing, comprise another important function. These types of vans often travel interstate and usually exceed the 75-air-mile threshold. Companies specializing in guided tours usually operate more than one type of vehicle and often include full-size buses.

2.2.2 Vans for Rural Communities Operations

A larger number of carriers operate for-hire vans in predominantly rural communities. These operations provide bus-type services to low-income residents without personal transportation as well as to individuals who have physical disabilities and who are unable to drive themselves. Many of these carriers' operations are subsidized by Federal grants and are operated by a local government agency or a nonprofit organization. However, only when the transportation service is contracted to a for-hire carrier would the carrier be covered by the FMCSRs. According to information provided by the CTAA, the overwhelming majority of these vehicles operate intrastate and perhaps only 10 percent would travel interstate.

2.2.3 Vans Transporting Workers Operations

Carriers transporting primarily agricultural, industrial, and service workers and other clients are among the most numerous of the carriers operating small passenger vans. These operations vary considerably from one another. A major center of this 9-to-15-passenger van activity is in the southwest. In Texas, small passenger vans are locally called "camionetas." This term will be used to describe all carriers that cater to a predominantly Latino client base. David Ellis of the Texas Transportation Institute (TTI) defines camionetas as "15-passenger vans that operate in a similar fashion to a motor coach carrier in that they are carriers for-hire transporting individuals for a fee between predetermined points." Ellis describes the primary routes of the camionetas in Texas as originating along the Mexican border and then leading to such Texas cities as Dallas, Houston and San Antonio as well as cities outside of the State such as Atlanta and Chicago (Ellis, 2001).

A major function of camionetas is to transport Mexican and other Latino workers. According to a recent study in southern California, approximately half of the passengers are undocumented (Valenzuela, 2003). However, this percentage may vary widely. Latino and Mexican workers often prefer to travel in "camionetas" because the drivers are almost always Spanish-speaking, there is little chance that the authorities will question the riders, and the smaller vans can be more flexible on their routes and schedules.

Many carriers will travel to Mexico to pick up passengers in communities some distance from the border. Upon arrival at the border, these passengers will usually exit the van, walk across the Rio Grande border bridge, clear customs, and then board the vans on the U.S. side. Obtaining a count of the number crossing the border is difficult because these vans are not considered to be commercial vehicles by U.S. Customs and therefore their numbers are not recorded. The carriers transport their passengers both interstate and interstate. David Ellis, who studied the van operations a few years ago, believes that there is more interstate travel than is readily apparent. When his team interviewed drivers at Border Patrol stations during his study, some would not admit that they were traveling interstate. Ellis was able to determine from visiting the carrier's terminal that many of these small buses were indeed traveling interstate. Ellis estimates that approximately 30 percent of the camioneta carriers in Texas are not registering with the proper

authorities (Ellis, 2005). These carriers often pick up passengers close to the U.S. border and transport them to cities located in other parts of the United States.

Most camionetas operating in Texas are usually not inspected at the roadside by State transportation officials. Texas State safety regulations do not cover the small passenger vans. Furthermore, according to a State-based FMCSA official, although most interstate vans operating in States such as Texas and Arizona do fall under the Federal Motor Carrier Safety Regulations, Federal authorities tend to be more focused on large trucks than the small passenger vans.

The great majority of these small passenger vans operate in California where they are designated farm labor vehicles (FLV). The farm labor vehicles are used predominantly to transport agricultural workers from the towns where they are living to the fields where they are working for that day. The estimated numbers of small passenger van carriers used to move agricultural workers in California are discussed in Section 3.2.4. In California, there are also an additional number of carriers that function as general transportation for a client population without personal vehicles or who do not want to use their own vehicles. The overwhelming majority of the passengers and drivers of these vans is also Latino.

2.3 General Characteristics of 9-to-15 For-hire Passenger Van Carriers

There is no single adequate source that will provide the characteristics of for-hire 9-to-15-passenger van carriers. In fact, even using multiple sources will not provide a thorough and accurate portrait of the carriers. Therefore, in order to describe the general characteristics of 9-to-15-passenger van carriers, two sources were used with each providing a partial look at some of the carriers' characteristics: the MCMIS Census File, which was analyzed directly, and an analysis data requested from a number of small carriers.

2.3.1 Characterizing 9-to-15 For-hire Passenger Vans Directly from the Census File

The MCMIS Census File was used to characterize the population of carriers that operate 9-to-15 for-hire passenger vans in interstate commerce within a 75-air-mile radius of base—in other words, the target population for this analysis. The MCMIS Census File is used for this purpose because at least some fraction of the target carriers should be recorded in the file. All interstate carriers that operate 9-to-15-passenger vans for compensation are required to file a motor carrier identification report, mark their vehicles with a USDOT identification number, and keep a register of reportable traffic accidents. Given these requirements, all carriers that fall into the target group—operate a 9-to-15-passenger van in interstate commerce within 100-statute-miles of the driver's reporting location—should be found in the MCMIS Census File.

Yet it is acknowledged that it is very likely that a significant fraction of the target carriers have not registered, and, therefore, will not be found in the Census File. The non-registered carriers

may not have registered either because they did not know of the requirement, do not think they have a realistic chance of being caught, or are not concerned by the penalties of non-compliance. Therefore, it is assumed that the number of target carriers identified in the Census File underestimates the true number of target carriers. Note, however, that the number identified certainly constitutes a lower bound of the true number.

The intent of this section is to describe the characteristics of the target population, not to estimate the true total population of the target carriers, which is undertaken in Section 3.0. In that sense, the carriers identified here may be regarded as a sample of the target population.

Identifying the target population involved a number of decisions in using the wealth of information available in the MCMIS Census File. Much of the information in the Census File is essentially self-reported[2] and as such depends upon the interpretation of the registrant. When registering, carriers can choose some or all of the 12 types of carrier-type classifications available and up to 30 different cargo types, including passengers. Carriers may self-identify as both authorized for-hire and private. Moreover, many businesses are very diverse and may legitimately operate buses as well as a fleet of trucks. Similarly, bus companies also may operate trucks used for maintenance or other purposes. To identify carriers whose business it is to transport passengers for compensation, we selected carriers that identified themselves as authorized for-hire, exempt for-hire, migrant, or any combination of those classifications and selected no other carrier classification. In addition, the carriers listed only passengers as cargo, and no other cargo type.

To further refine the target population of bus carriers, Census File information was used to identify the area of operation (interstate or intrastate); the size of buses operated (1 to 8 passengers, 9 to 15, and more than 15); and counts of intrastate drivers, interstate drivers operating within 100 miles from their normal work-reporting location and farther than 100 statute-miles from that location. This mileage is used to categorize motor carriers' record-keeping methods for compliance with hours-of-service regulations; it is used here to approximate the 75-air-mile radius rule for compliance with safety regulations.

Carriers that operate buses larger than 15 passengers were excluded in order to focus the analysis on 9-to-15-passenger vans. Such carriers already may be required to comply with Federal safety regulations. This exclusion eliminated 64 for-hire operators of 9-to-15-passenger buses in interstate commerce from the analysis.

[2] Although some data items are audited and potentially corrected during compliance reviews.

The analysis queried the Census File for for-hire carriers with the following characteristics:

- Authorized, exempt, migrant carrier, with no other classification claimed
- Transports only passengers
- Operators of 9-to-15-passenger buses
- In interstate commerce, less than 100 miles from their normal work reporting location (assumed equivalent to the 75-air-mile exclusion criterion)
- Do not operate larger buses

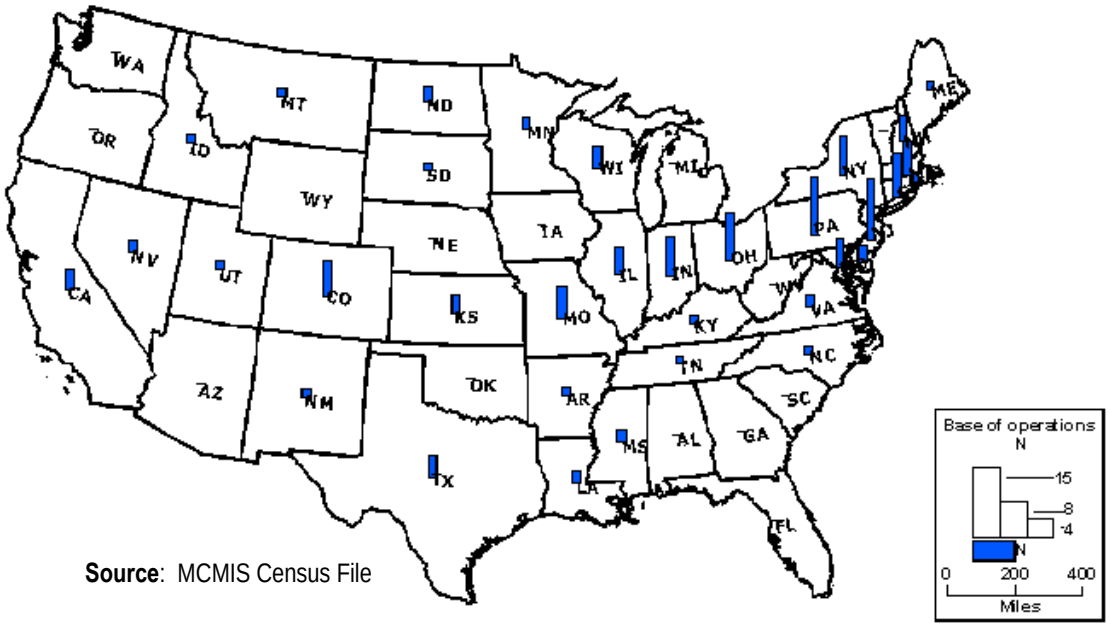
A total of 140 such carriers were found in the MCMIS Census File that meets the five criteria. These carriers will be referred to as the target group or target bus operators. The listing of these carriers in MCMIS must be examined within the limitations of the data in the Census File. The data have the following limitations:

- *Underreporting for Close-in Carriers.* Many of the carriers that operate within an area of less than 100-miles radius in interstate commerce do not register since they are not currently under the Federal Motor Carrier Safety Regulations.
- *Underreporting Regionally.* For certain States, the number of carriers listed appears to be lower than expected (e.g., Oregon).
- *Carriers Excluded Those Operating Larger Vehicle Types in Addition to the Vans.* A large proportion of the 9-to-15-passenger vans are operated by carriers that also operate larger vehicles.

Nevertheless, the analysis offers some insights into the nature of the passenger van carriers, providing a useful spatial portrait of the location of the for-hire interstate carriers and a valuable description of carrier size distributions.

Figure 2 shows the distribution of target carriers by State of registry in the Census File. The height of the bar indicates the number of carriers based in each State. Table 2 tabulates the data displayed in Figure 2. The target carriers were found to be based in 34 States, plus one carrier located in British Columbia, Canada, and one carrier in Michoacán, Mexico. Note the concentration in the Northeastern States, particularly New Jersey, New York, Connecticut, and New Hampshire, though many were also located in Pennsylvania, Ohio, Indiana, Illinois, and Missouri. The States with the largest number of carriers tend to have major metropolitan areas at their borders. Colorado, Utah, Nevada, and California also have large tourist industries. Several of the States with large populations, such as California, Texas, and Florida, have very small numbers because there are not many carriers that would meet all the conditions for being included in the target group. The most restrictive conditions are probably that the carrier be operating in interstate commerce and operate less than 100-statute-miles from the normal work-reporting location. Carriers in populous States such as New York, Pennsylvania, and Illinois are not similarly restricted by their size because there is much interstate travel, and the travel distances are frequently less than 100-statute-miles.

Figure 3 shows the distribution of the 140 target carriers by total number of buses that they operate. All of the buses operated are either 9-to-15-passenger buses, smaller limousines, or smaller vans because the definition of target carriers excluded carriers that operate larger buses (i.e., those seating more than 15 passengers). The number of smaller buses[3] operated by some was notable. While all target carriers operated 9-to-15-passenger buses, some operated a substantial number of smaller vehicles. For about one-third of the carriers (30 out of 140), most of their vehicles are designed to transport fewer than nine passengers. The fleets of about 10 percent of the carriers were 80 percent one-to-eight-passenger buses. Overall, only about 55.6 percent of the total 1,025 buses operated were 9-to-15-passenger buses. The remainder were smaller.



Source: MCMIS Census File

Figure 2. Base State of Target 9-to-15-Passenger Bus Operators

[3] Note that 49 CFR 390.5 defines a bus as "any motor vehicle designed, constructed, and or used for the transportation of passengers, including taxicabs." The MCMIS Census File includes counts of buses smaller than 9 passengers.

Table 2. Number of Carriers by Base of Operation

State	N	State	N
Arizona	1	North Carolina	1
California	4	North Dakota	3
Colorado	7	New Hampshire	5
Connecticut	9	New Jersey	13
Delaware	3	New Mexico	1
Idaho	1	Nevada	2
Illinois	5	New York	8
Indiana	8	Ohio	10
Kansas	3	Pennsylvania	12
Kentucky	1	Rhode Island	1
Louisiana	2	South Dakota	1
Massachusetts	7	Tennessee	1
Maryland	6	Texas	4
Maine	1	Utah	1
Minnesota	2	Virginia	2
Missouri	6	Wisconsin	4
Mississippi	2	British Columbia	1
Montana	1	Mexico	1

Source: MCMIS Census File

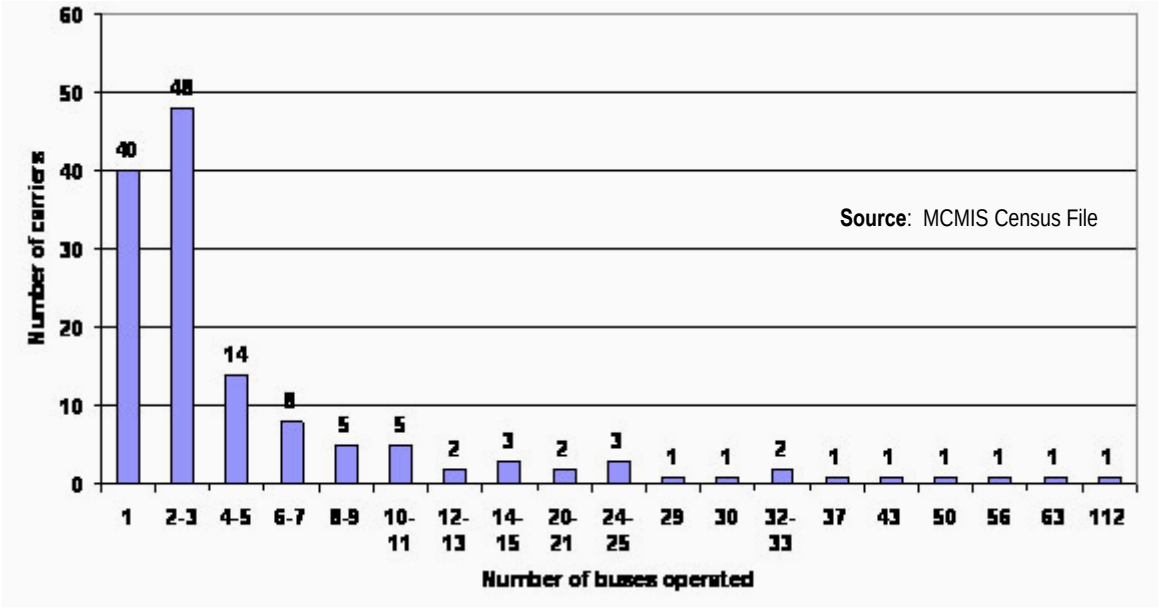


Figure 3. Distribution of Target Carriers by Number of Buses Operated

Most of the 140 target carriers are very small operations. Operators of three or fewer buses account for 62.9 percent of the carriers, and 90 percent operate fifteen or fewer buses. The largest carrier operated only 112 buses, and only four carriers operated 50 or more.

Figure 4 shows the distribution of the 140 target carriers by the total number of drivers they used, including both intrastate drivers and interstate drivers within 100 miles of base. Just as in the number of buses, most of the carriers had only a few drivers. Over 60 percent had five or fewer drivers. Almost 88 percent had 19 or fewer drivers. On average, these 140 target carriers had 1.23 drivers per bus.

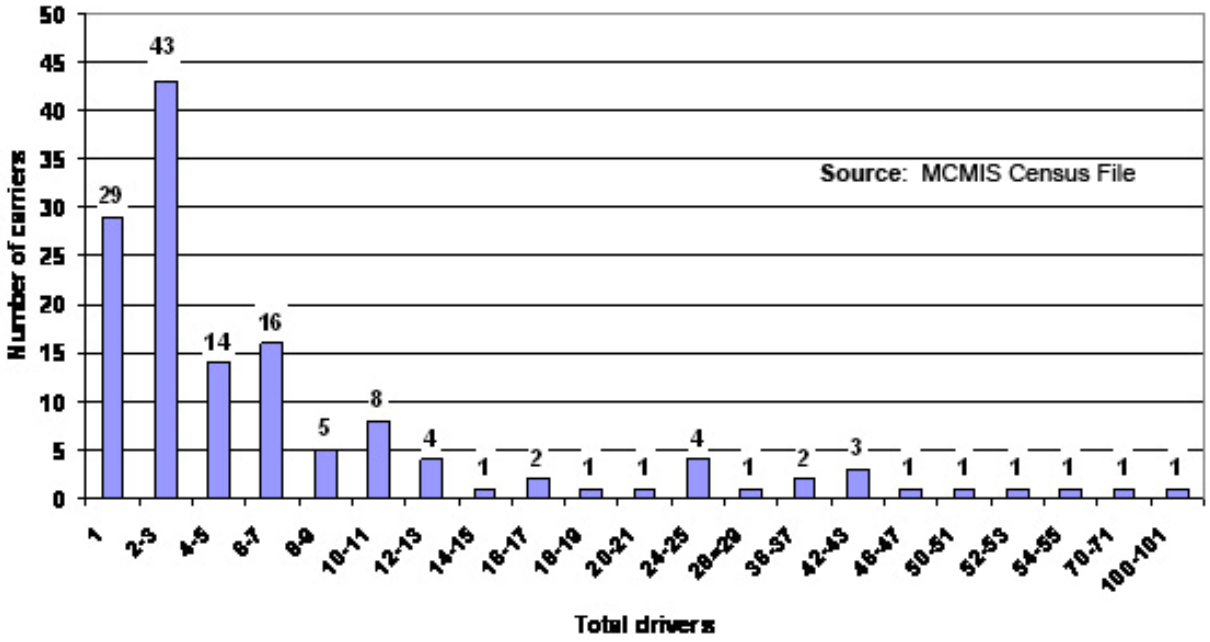


Figure 4. Distribution of Target Bus Operators by Number of Drivers

To qualify as a target carrier for this analysis, each had to have at least one interstate driver who operated within 100-statute miles from their base, and none could have any interstate drivers who operated beyond the 100-mile limit. Both of those conditions are part of the definition of the group. Figure 5 shows the distribution of target carriers by the number of interstate drivers they used. All of the carriers had at least one driver but most had fewer than ten. However, it is notable that at least a handful had a substantial number of interstate drivers, with six carriers using 50 or more, and one using 100 interstate drivers within 100 miles of base. Figure 6 shows the distribution of the number of intrastate drivers employed. Note that 120 of the 140 target carriers listed no drivers exclusively driving intrastate. Overall, about 90 percent of the drivers recorded by the target carriers were listed as interstate drivers.

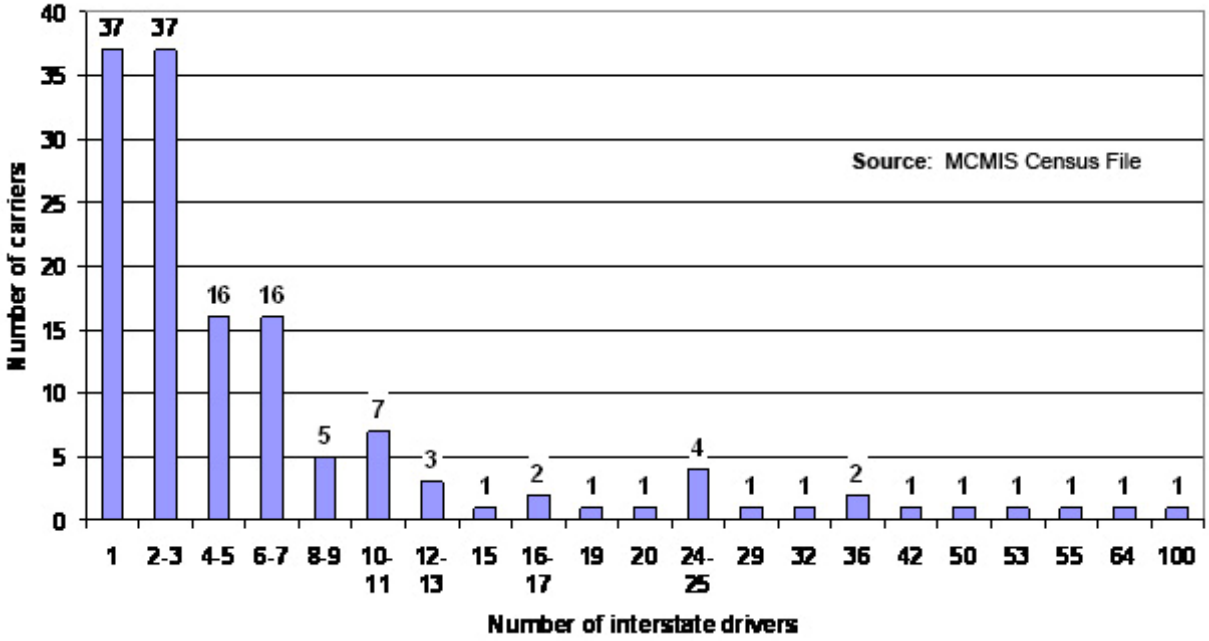


Figure 5. Distribution of Target Bus Operators by the Number of Interstate Drivers

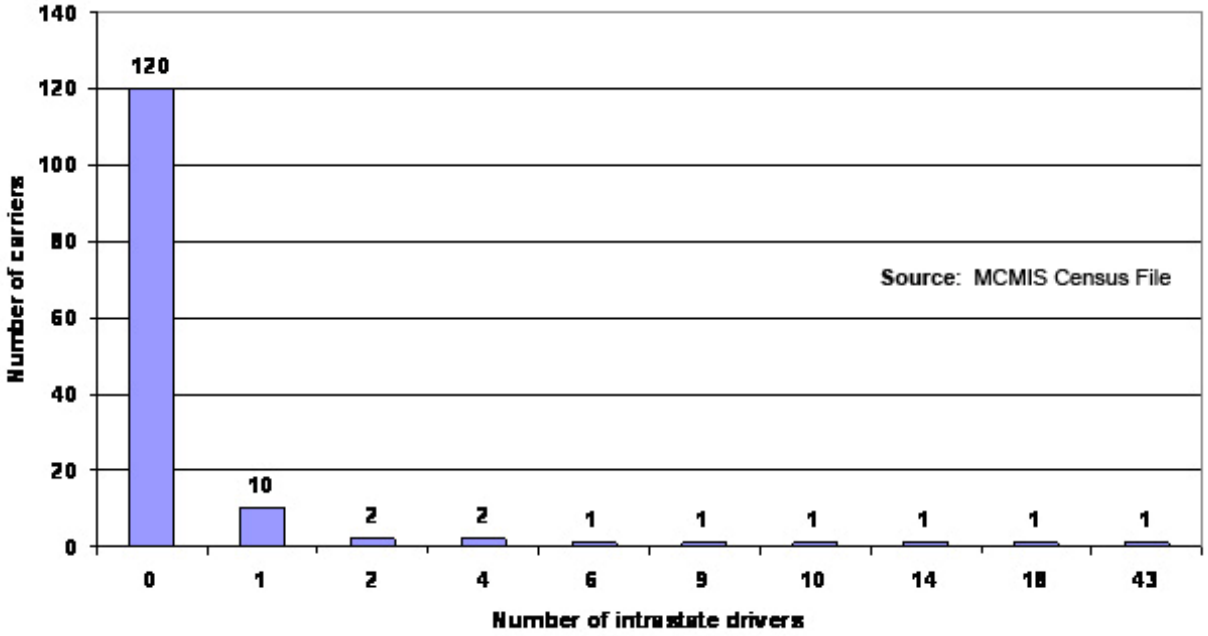


Figure 6. Distribution of Target Bus Operators by the Number of Intrastate Drivers

Table 3 summarizes statistics for the 140 target carriers charted in the previous figures. The figures more meaningfully convey the fact that these carriers are overwhelmingly small, with most operating fewer than five buses and employing fewer than five drivers. The largest carriers in the group operate fleets only slightly over 100 vehicles. Moreover, though most of the buses operated fall into the 9-to-15-passenger range, they also operate a substantial number of 1-to-8-passenger buses, more commonly described as limousines or minivans.

Table 3. Drivers and Buses of Target Carriers

Variable	Mean	Std Dev	Minimum	Maximum
Total buses	7.32	13.94	1	112
Total drivers	9.01	14.65	1	100
Buses, 1-8 passengers	3.25	8.90	0	55
Buses, 9-15 passengers	4.07	10.80	1	112
Interstate drivers	8.09	13.73	1	100
Intrastate drivers	0.88	4.27	0	43

Source: MCMIS Census File

2.3.2 Analysis of Results from a Data Request from Small Carriers

Approximately 80 carriers were selected from the Census File to provide data. Although the sample was not random, it was designed to represent the population of carriers and was selected to include carriers representing various sizes and geographic regions of the country. Of the 80 carriers selected, 18 responses were obtained. Tables 4 and 5 separate respondent carrier profiles into two categories based on 9 responses from: motor carriers operating (1) more than 75-air-miles interstate, and (2) less than 75-miles interstate.

The majority of respondents for both categories indicated that they do have a formal vehicle maintenance program. Most respondents indicated that they do not institute a safe driver incentive program, but safety is essential for drivers to maintain employment.

Carriers operating greater than 75-air-miles interstate are more likely to travel greater distances and have vans with higher mileage. The majority of these carriers require their new drivers to have between 1 and 3 years of experience driving large vehicles, and are more likely to have a safe driver incentive program. More than 60 percent of respondents reported that they have had no accidents in the past 4 years.

Approximately 40 percent of carriers operating less than 75-air-miles interstate reported no accidents in the past 4 years. Less than 50 percent of these respondents required drivers to have prior experience operating large/heavy vehicles.

Table 4. Motor Carrier Profile – Interstate Operating in the more than 75-air-mile Range

Motor Carrier	No. of 9-15 Passenger Vans	No. of Other Buses *	No. Drivers Employed to Drive Vans	Typical Routes and Distances	Average Mileage on all Vans	Minimum Years of Experience Required	Safe Driver Incentive Programs	Formal Maintenance Program	No. of Accidents in the Past 4 Years
1	2	5	6	5 – 530 miles	139,000	3	No	Yes	None
2	4	5	4	165 miles (avg.)	300,000	None	No	Yes	2
3	130	330	137 – 150	Varies	150,000 +	Unknown	Yes	Yes	100
7	1	9	18	600 miles	300,000	1	Yes	Yes	None
9	1	0	2	112 – 164 miles	334,000	None	No	No	None
11	18	0	70	To Chattanooga, Nashville, or Atlanta airports	200,000	None	Yes	Yes	4 – 8
13	1	10	14	Airport shuttle to Grand Canyon	120,000	1	No	Yes	None
14	1	0	1	2,000 miles	200,000	2	Yes	Yes	None
15	2	0	20	14 – 460 miles	65,000	3	No	No	None

Source: Data collected from motor carriers (Battelle, 2006)

* Other buses include limousines, motor coaches, school buses, and medium-size shuttle buses

Table 5. Motor Carrier Profile – Interstate Operating in the less than 75-air-mile Range

Motor Carrier	No. of 9-15 Passenger Vans	No. of Other Buses *	No. Drivers Employed to Drive Vans	Typical Routes and Distances	Average Mileage of all Vans	Minimum Years of Experience Required	Safe Driver Incentive Programs	Formal Maintenance Program	No. of Accidents in the Past 4 Years
4	8	40	8	Short, less than 75-miles	102,500	None	Yes	No	2 or 3
5	3	3	9	400 miles	350,000	3	No	Yes	None
6	38	0	45 – 50	45 – 100 miles	30,000	None	No	Yes	25
8	1	3	10	50 miles	40,000	4	No	Yes	1
10	4	32	1 – 6	Around Niagara Falls		None	Yes	Yes	8 – 12
12	5	15	6	15 – 20 miles from rafting center to launch points	Unsure	None	No	Yes	Unsure, but at least 1
16	1	7	9	100 miles	40,000	1	No	Yes	None
17	35	45	150	3 – 100 miles	50,000			Yes	None
18	6	7	10	5 – 15 miles	40,600	None	No	Yes	None

Source: Data collected from motor carriers (Battelle, 2006)

* Other buses include limousines, motor coaches, school buses, and medium-size shuttle buses

While this was not a scientific survey, in general, carriers operating interstate greater than 75-air-miles were found to operate slightly more safely than those operating less than 75 miles. That more respondents in the greater-than 75-air-mile category stated that they had no accidents in the past four years, had a safe driver incentive program, and required drivers to have a minimum number of years of experience suggests that these companies may be exercising a stronger degree of safety oversight than companies operating in the less than 75-mile category. If this is true, it could be because those for-hire motor carriers operating passenger vehicles in interstate commerce beyond a 75-air-mile radius are subject to the FMCSRs.

3.0 ESTIMATING THE NUMBER OF 9-TO-15-PASSENGER VAN MOTOR CARRIERS

There are no data sources with comprehensive statistics on the number of 9-15 passenger van carriers. Industry experts and knowledgeable State and Federal transportation officials were unable to provide an estimate due to the lack of accurate and reliable data. Consequently, estimates of 9-to-15-passenger van motor carriers were developed using other methods. This section estimates the:

- Overall number of motor carriers
- Number of for-hire and private carriers
- Number of for-hire carriers that operate interstate and intrastate
- Number of for-hire carriers that operate interstate < 75-air-miles and would be affected by the proposed rule

One important source for data about carriers is the MCMIS Census File. However, this data source has limited value for developing an estimate of the overall number of 9-to-15-passenger van motor carriers because it includes only those carriers that have registered for a DOT number, which all for-hire interstate small passenger van carriers are required to obtain. Consequently, the Census File should include a list of interstate carriers currently covered under the FMCSRs and those not covered. Those carriers that travel interstate and provide transportation for compensation ("for-hire") beyond 75-air-miles from the driver's reporting location are subject to the FMCSRs. These carriers have a strong incentive to register and are likely to be included in the Census File. On the other hand, although for-hire interstate motor carriers of passengers traveling less than the 75-air-miles in interstate commerce are required to register and to obtain public liability insurance, they are not subject to Parts 390-399 of the FMCSRs. Therefore, they have little incentive to obtain a DOT number. According to an official of a major small passenger van organization, there are far fewer carriers that travel within the 75-mile zone actually registered than should be registered if they were following the current regulations. Intrastate small passenger van carriers are not required to register for a DOT number. Consequently, this major group usually does not appear in the Census File. Clearly, the MCMIS Census File could not be used by itself to estimate the number of carriers.

In order to estimate the number of 9-to-15-passenger van companies operating in the United States, a two-pronged approach was followed. First, the number of crashes in MCMIS was used to estimate the overall number of motor carriers using the approach outlined in Section 3.1. The number of carriers was estimated using the number of crashes involving 9-to-15-passenger vans and then working backwards to assume that applying a certain crash rate, there would be an expected number of vans traveling on the highways and consequently the number of carriers could be estimated. Second, in order to estimate the number of for-hire carriers, data were obtained from organizations that represent most 9-to-15-passenger van carriers. Data from the TLPA and the Community Transportation Association of America (CTAA) were used. In addition, the number of small passenger vans (camionetas) that transport primarily agricultural,

industrial, service workers and other clients were estimated from data and information collected from interviews with State officials and pertinent literature sources.

3.1 Overall Motor Carrier Estimate Using the Crash File

While the MCMIS Census File could produce an estimate of the number of interstate carriers that would be affected by the proposed regulation, this estimate would be inaccurate because many existing carriers are not registered. While the Census File may have higher registration rates in certain categories, the Crash File should be less biased since all reportable accidents are supposed to be reported to MCMIS no matter whether the carrier is interstate or intrastate. Therefore, the number of accidents from the Crash File will be used along with an accident rate and the carrier mileage to estimate the total number of carriers. Additional information on the breakdown of interstate and intrastate carriers also will be provided. The following steps explain in more detail how this calculation was performed:

- Step 1. *Determine number of reportable accidents from MCMIS Crash File*. The MCMIS Crash File was queried to find the crashes involving a vehicle with a vehicle configuration of "3=Bus (Seats for 9 to 15 People, Including Driver)" and a cargo body of "1=Bus (seats for 9 to 15 people, including driver)." This included both carriers with DOT numbers and without and therefore represented both intrastate and interstate carriers. Five years of data were queried from 2001 to 2005. The average number of crashes per year for these types of vehicles was 670.

- Step 2. *Adjust the number of reportable accidents to account for underreporting*. Several studies from the University of Michigan Transportation Research Institute (UMTRI) have indicated that crashes to MCMIS are under-reported. Therefore, a reporting rate of 27.6 percent for buses was used to adjust the number of crashes to one which would represent a 100 percent reporting rate. See Appendix A for details on how the reporting rate was derived.

- Step 3. *Adjust the number of crashes to convert from reportable accidents to all crashes*. MCMIS defines recordable crashes as an accident involving a fatality, an injury requiring hospitalization, or having a vehicle towed away. Since an accident rate that includes all accidents will be used later, the MCMIS crashes should be adjusted to represent all crashes, not just recordable ones. Appendix B presents an analysis by UMTRI using General Estimates System (GES) data, which found that 27.34 percent of the accidents involving vans are recordable.

- Step 4. *Find the average carrier mileage from MCMIS Census File*. During compliance reviews, carrier mileage is recorded. This can be found in the MILETOT field in the MCMIS Census File. A query was performed to find mileage for 287 carriers that own 9-to-15-passenger vans. After excluding all of the blank and zero mileages, an average of 615,770 vehicle miles traveled (VMT) per carrier per year was calculated.

- Step 5. *Find an accident rate*. The accident rate information in the MCMIS Census File was found to be unreliable due to inconsistencies in methods used to calculate the number of accidents and mileage. Therefore, an accident rate for passenger carriers was obtained from a report by the University of Maryland entitled, *Motor Carrier Industry Profile: Safety Performance Differences Among Major Segments*. This report provided an accident rate of 0.91 crashes/million VMT for for-hire passenger carriers and 0.13 crashes/million VMT for private passenger carriers. An average of these two numbers resulted in an overall accident rate of 0.52 crashes/million VMT.

- Step 6. *Calculate the total number of carriers*. The total number of inter- and intrastate carriers was calculated using the adjusted number of crashes, average mileage, and accident rate. The following calculation shows how this was obtained and also aligns the units to properly cancel. An alternative way to view the calculation is presented in Table 6, which also gives the source of each piece of information.

$$\frac{8{,}879\ \text{crashes}}{\text{year}} * \frac{1{,}000{,}000\ \text{VMT}}{0.52\ \text{crashes}} * \frac{\text{carrier} * \text{year}}{615{,}770\ \text{VMT}} = 27{,}730\ \text{carriers}$$

- Step 7. *Distribute the total number of carriers among categories*.
    - *For-hire/Private*. This was obtained from the MCMIS Census File. Any carrier with operational classification A or B was considered for-hire, even if the other carrier classes were listed. Appendix C contains form MCS-150, where carriers are asked to identify this classification and other information. Approximately 64 percent of 9-to-15-passenger van companies were found to be private, while 36 percent were found to be for-hire.
    - *Interstate/Intrastate*. This was obtained from the Census Crash File. Crashes involving a carrier without a DOT number were assumed to be intrastate, while crashes involving a carrier with a DOT number were assumed to be interstate. It should be noted that 200 carriers that were originally classified as intrastate (since they did not have a DOT number) were found to be involved in a crash in a State other than the one in which it was registered. Since this group of carriers was found to be traveling interstate (during the crash) they were subtracted from the "intrastate" category and added to the "interstate" category. Approximately 72 percent of carriers were found to be intrastate, while 28 percent were found to be interstate.

Table 6. Calculation of Total Number of Carriers

Description	Amount	Units	Reference
Average Crashes	670	crashes/year	Battelle MCMIS analysis of Crash File including null DOT numbers
Reporting Rate	27.6	percent	UMTRI
Percent Recordable	27.34	percent	UMTRI
Adjusted for Underreporting	2,428	crashes/year	Calculation
Adjusted from Recordable to All Crashes	8,879	crashes/year	Calculation
Average Mileage	615,770	VMT/(carrier*year)	Battelle MCMIS analysis of Census File
Crash Rate	0.52	crashes/million VMT	Motor Carrier Industry Profile, University of Maryland
Crashes/Carrier	0.3202	crashes/(carrier*year)	Calculation
Carriers	27,730	carriers	Calculation

Table 7 applies the percentage breakdowns from Step 7 to the total number of carriers calculated in Step 6. This provides a general descriptive picture of the industry, but does not provide the level of detail necessary to determine the number of carriers that will fall under the potential regulation. Therefore, Section 3.2 provides a more detailed estimate using other sources.

Table 7. Estimate of Interstate/Intrastate Carriers

	For-hire Companies	Private Companies	Total
Interstate	2,800	5,000	7,900
Intrastate	7,200	12,700	19,900
Total	10,000	17,700	27,700

Note: Totals may not add due to rounding.

3.2 For-hire Estimate Using Interview Sources

While the analysis in Section 3.1 provided an estimate for the total number of 9-to-15-passenger van carriers, it did not provide enough detail to determine how many would be subject to the proposed regulation. In order to obtain this level of detail, information about how many of the carriers travel interstate within a 75-air-mile radius must be known. This analysis combines estimates of 9-to-15-passenger van companies from three industry segments. It is believed that

most of the population of for-hire 9-to-15-passenger vans comes from one of the following industry segments:

- *Airport Ground, Tours and Charter Transportation Segment*. Estimate from interview with TLPA.
- *Vans for Rural Communities Transportation Segment.* Estimate from CTAA.
- *Camionetas (small passenger vans that transport primarily agricultural, industrial, and service workers).* Estimate based on interviews with State officials, pertinent literature sources, and professional judgment.

3.2.1 Airport Ground, Tours and Charter Transportation Segment

The TLPA estimates that their members comprise approximately 12,000 carriers. Of these, 62 percent, or about 7,440, operate at least one 9-to-15-passenger van. Therefore, in the United States there is a core of approximately 7,440 carriers that are operating at least one for-hire 9-to-15-passenger van. Data from the TLPA indicate that the average company has two vans in operation and an average of about three drivers. These 7,400 companies are dispersed into the following regions: New England, Middle Atlantic, South, Midwest, Plains States, Southwest and Pacific States. For each region, the TLPA breaks out carriers in their membership.

The following method was used to estimate the percentage of these carriers that are being operated intrastate, interstate within the 75-air-mile zone and not covered by the Federal safety regulations, and interstate and subject to the FMCSRs. First, the percentage of carriers that operate interstate within the 75-air-mile zone was estimated based on the region where the carriers are located. For example, for New England, it is assumed that a large percentage of the carriers would be operating interstate, less than 75 miles, because States are small and the major cities are located close to borders where they can operate interstate within the 75-mile criterion. This estimate was set at 40 percent. For the Midwest, centers of passenger van activity were located both in cities close to State borders and in those with more central locations. For the Midwest, the percentage of carriers operating interstate less than 75-air-miles was estimated to be 20 percent. A number of major cities such as Des Moines and Columbus are located centrally and far from a State border, but a number of cities, such as Chicago and St. Louis, are adjacent or close to State borders. For the Pacific States, on the other hand, it was assumed that because of the large size of California that only a small percentage of the carriers (10 percent) would operate interstate because of the location of several major cites far from State borders. The great majority of the carriers would be operating intrastate and when they operated interstate they would be traveling more than 75-air-miles from the driver's reporting location to reach another State.

Table 8 provides the estimates of the number of airport ground, tours, and charter passenger van carriers using data from the TLPA.

Table 8. Estimate of For-hire Airport, Tours, Charter Carriers

Company Location	Total[1]	At least one van (62%)[1]	% Under New Regulation*	# Under New Regulation
New England	1,176	729	40.0%	292
Mid-Atlantic	3,024	1,875	30.0%	562
South	2,748	1,704	15.0%	256
Midwest	1,776	1,101	20.0%	220
Plains	660	409	15.0%	61
Southwest	492	305	5.0%	15
Mountain West	588	365	5.0%	18
Pacific	1,536	952	5.0%	48
TOTAL	**12,000**	**7,440**		**1,472**

[1]**Source**: Taxicab, Limousine & Paratransit Association (TLPA)
*Based on analysis of the location of major van company movements

3.2.2 Vans for Rural Communities Transportation Sector

The Community Transportation Association of America (CTAA) estimated that they have about 1,215 members that provide passenger services for predominantly rural and small communities. The organizations operating these transport systems include communities, other governmental entities such as counties, and non-profit organizations. However, only 231 of the transportation systems are operated by for-hire carriers. The association further estimated that of these about 23 might be operating interstate and would be eligible to be included within those motor carriers that could become subject to the FMCSRs.

3.2.3 Vans Transporting Workers, "Camionetas," Transportation Sector

Small passenger vans classified as "camionetas" for this report and serving predominantly agricultural, industrial, and other service workers were judged to be dominated by the farm labor vehicles (FLV) in California. Based on crash records for FLVs in California, the project team estimated that approximately 1,200 carriers were operating in California and transporting predominantly Latino farm workers by small passenger vans. This estimate was reinforced by the estimated 1,200 farm labor contractors in 2000 presented in an article in *Rural Migration News* (2000). A large percentage of these farm labor contractors (FLC) operate 9-to-15-passenger vans as a way to transport farm workers to the fields where they are working on a particular day. Carriers of migrant workers operating 9-to-15-passenger vehicles for direct compensation in interstate commerce are subject to the requirements of the FMCSRs when the motor vehicle is operated beyond a 75-air-mile radius from the driver's normal work reporting location. The California Institute of Rural Studies estimated that in 1992, 53 percent of farm workers hired by the FLCs received transportation from either the FLC, his foreman or hired

drivers known as raiteros (Sherman, 1996). In California, there were also another 200 carriers functioning as camionetas and located in urban settings such as Los Angeles.

Outside California, there were an estimated additional 500 carriers operating camionetas in a number of States, but primarily Texas. In Texas, although there are no accurate numbers available that could be used to determine the number of camioneta carriers operating in the State, one source estimates that there are perhaps 90 companies operating out of Houston alone (Borden, 2005). For the entire State, there are an estimated 200 camioneta carriers currently in operation. Other States with a significant number of camioneta carriers include Arizona, New Mexico, and Florida.

3.2.4 Summary of Estimate of For-hire Van Companies

Table 9 combines the estimates of the number of for-hire van companies from each of the three industry segments. It should be noted that the total number of for-hire companies (9,571 companies) is similar to the estimate of for-hire van companies from Section 3.1 (10,000 companies). These estimates will be used to calculate the costs of the potential regulation in Section 5.0.

Table 9. Estimate of For-hire Van Companies Under New Regulation

	Total	% Under New Regulations	# Under New Regulation	Vans/ Company	Drivers/ Van
Airport Ground, Tours, and Charter[1]	7,440	19.8%	1,472	2	1.3
Rural Communities[2]	231	10%[2]	23	8	1.6
"Camioneta"[3]	1,900	5.00%	95	4	1.3
Total	9,571	15.98%	1,590	2.54	1.31
Lower Bound[4]			795		
Upper Bound[4]			2,385		

[1] **Source**: Taxicab, Paratransit and Limousine Association

[2] **Source**: Community Transportation Association of America

[3] Based on estimate of 200 companies operating in Texas; 1,400 in California; and 300 in other States; professional judgment based on interviews with State and Federal officials, knowledge of the literature and examination of crash data.

[4] Assumes a range of 50 percent above and below the total, which represents 2 standard deviations to give a 95 percent confidence level.

The estimate of the number of carriers that could be affected by the proposed regulation is uncertain. The estimated uncertainty is plus or minus 25 percent. If this is assumed to be the standard deviation of the data, and using the normal distribution, the 2σ (Sigma) level or 95 percent confidence level would be plus or minus 50 percent. Thus, at the 95 percent confidence level, the number of carriers that would come under the proposed regulation would range from 795 to 2,385 carriers.

4.0 SMALL PASSENGER VAN SAFETY

4.1 Literature Review

4.1.1 General Safety Compared to Other Highway Transport

According to the National Transportation Safety Board (NTSB), between 1991 and 2000, 9-to-15-passenger vans were involved in about 0.22 percent of all fatal accidents and 0.24 percent of all single-vehicle fatal accidents. Since they make up 0.25 percent of all vehicles in the United States, on a per-vehicle basis, they are actually involved in slightly less than the average number of fatal accidents (Property Casualty Insurers Association of America, 2005). However, the 9-to-15-passenger vans do experience a number of specific safety problems. Foremost among them is a higher incidence of rollover when compared to smaller vans or small passenger vehicles.

4.1.2 Safety Concerns that FMCSA Regulations May Address

There are a variety of safety concerns for 9-to-15-passenger vans; those that may be improved by FMCSA regulations are described in the following paragraphs.

Driver experience with unique vehicle-handling characteristics. Several NTSB documents discuss how the handling characteristics of 15-passenger vans are different than regular passenger cars. They note that especially when vans are fully loaded or during emergency situations, such as a tire blowout, these types of vans react differently. Several accidents have shown that drivers' instinctive reactions to tire blowouts may be inappropriate for the situation if they apply the brakes and oversteer while attempting to regain control of the vehicle. The NTSB states that drivers of 15-passenger vans need additional training to acquire a knowledge and skill level different from and above that for passenger vehicles.

Vehicle loading. The likelihood of a rollover crash significantly increases when 10 or more people ride in a 15-passenger van. The likelihood increases because the additional passenger weight causes the van's center of gravity to raise and shift rearward. When the van is not full, this shift can be circumvented if passengers are forced to sit in seats that are in front of the rear axle (NHTSA, May 2004).

Tire pressure. NHTSA found that almost 75 percent of all 15 passenger vans had improperly inflated tires. In comparison, only 39 percent of passenger cars had improperly inflated tires (American Bus Association, http://www.buses.org/press_room/the_report_newsletter/1060.cfm). The NTSB believes that two of the 15 passenger van accidents they investigated were caused by under-inflated tires. The NTSB also notes that infrequent use and exposure to sun and weather can make low-mileage tires deteriorate. According to NHTSA research, improperly inflated tires can change the handling characteristics and increase the chances of rollovers. However, one study found that tire inflation pressures up to 25 percent below the recommended inflation level noted on the vehicle's tire safety label should not have a significant adverse affect on vehicle

handling (NHTSA, June 2004). Yet, the Tire Industry Association (TIA) believes that pressures up to 25 percent below the tire's recommended cold inflation pressure are unsafe and should be tied to the vehicle's placard and gross axle weight rating (GAWR)(TIA, 2004).

Safety belt use. In a number of accidents investigated by the NTSB, occupants that were riding in a 9-to-15-passenger van involved in an accident were not wearing safety belts. In general, those wearing safety belts when the accident occurred sustained less severe injuries and were less likely to be ejected from the vehicle. An accident simulation for one accident showed that during an overturn "head, neck, and thorax injuries were not predicted for simulated occupants wearing lap/shoulder belts" (Property Casualty Insurers Association of America, 2005).

4.1.3 Other Safety Concerns

While not subject to the FMCSRs, the following concerns are of interest because they amplify the importance of other safety concerns.

Lack of passenger protection due to roof crush. In an NTSB investigation of a 15-passenger van rollover accident in Henrietta, Texas, investigators found that roof crush left only 4 to 6 inches of space above each row of passenger seats, while there was 18 to 21 inches of space originally available. The injuries in this accident were more severe than injuries from another rollover accident that did not sustain similar roof crush damage due to vehicle dynamics during the rollover sequence. Later in this report, the NTSB recommended that NHTSA "should include 12- and 15-passenger vans in FMVSS 216, "Roof Crush Resistance" to minimize the extent to which survivable space is compromised in the event of a rollover accident"(NTSB, July 2003).

Rollover propensity. Rollover propensity in the vans is due to a high and rearward center of gravity when fully loaded. When compared to passenger cars or smaller vans, the likelihood of 15-passenger vans rolling over in an accident is much greater because 15-passenger vans have a greater payload capacity, passengers sit higher up than in other vehicle types, and, when fully loaded, the center of gravity shifts up and rearward. Table 10 uses data from a 2001 NHTSA study to show that the rollover propensity of 15-passenger vans in single vehicle accidents increases with occupancy level.

Table 10. Rollover Propensity of 15-Passenger Vans by Occupancy Level

Occupancy Level	All Single-vehicle Accidents	All Rollovers	Rollover Ratio	Combined Rollover Ratio
Less than 5	1,815	224	12.3%	12.7%
5 – 9	77	16	20.8%	
10 – 15	55	16	29.1%	35.4%
Over 15	10	7	70%	

Source: NHTSA, 2001

The Static Stability Factor (SSF) is lower for 15-passenger vans. SSF is the at-rest calculation of rollover resistance based on track width (t) and center of gravity height (h). The formula is SSF = t/2h. A higher SSF value indicates a more stable vehicle. Table 11 shows the SSF for a minivan, seven-passenger van, and a 15-passenger van when it has a lightly loaded weight (LLW), and loaded to its Gross Vehicle Weight (GVW). This table shows that out of the three vehicle types, the15-passenger vans are the most unstable. It also shows that the decrease in stability, between when a vehicle is lightly or fully loaded, is greatest for 15-passenger vans.

Table 11. Static Stability Factors for Three Vehicles

Vehicle	LLW (lbs)	GVW (lbs)	Track Width (in.)	Center of Gravity Height (in.)		Static Stability Factor		
				@ LLW	@ GVW	@ LLW	@ GVW	Percent Change
Minivan	3,816	5,000	63.5	25.5	26.4	1.24	1.20	-3%
7-passenger van	5,658	7,000	69.7	30.1	31.5	1.16	1.11	-4%
15-passenger van	6,415	9,100	68.2	31.9	35.9	1.07	0.95	-11%

Source: NHTSA, 2001

Table 12 compares two statistics for various vehicle types:

- The percentage of vehicles that roll over when they are involved in single-vehicle, fatal accidents.
- The percentage of all passenger fatalities for a particular vehicle type that occurred in single-vehicle rollover accidents, as opposed to multi-vehicle accidents or non-rollover accidents.

Table 12. Rollover Characteristics by Vehicle Type

Vehicle Type	Percentage of Vehicles that Roll Over when Involved in a Single-vehicle, Fatal Accident	Percentage of Passenger Fatalities that Occurred in Single-vehicle Rollover Accidents
Passenger cars	33%	45%
15-passenger vans	50%	80%
Sport Utility Vehicles (SUVs)	67%	80%

Source: Property Casualty Insurers Association of America, 2005

The table shows that 15-passenger vans are more likely than passenger cars to roll over when involved in a single-vehicle, fatal accident, but SUVs have an even greater likelihood of rolling over in such an accident. Passenger cars also perform better when comparing the percentage of passenger fatalities that occurred in a single-vehicle rollover accident. For passenger cars, this amounts to 45 percent, but 15 passenger vans and SUVs perform approximately equally with 80 percent of fatalities involving rollovers. NHTSA reported that a total of 349 15-passenger vans rolled over in single-vehicle crashes between 1990 and 2002 (Property Casualty Insurers Association of America, 2005).

Causes of 9-to-15-passenger van rollovers. Fifteen-passenger vans seem to be subject to more rollovers than other vehicle types due to their high and rearward center of gravity when fully loaded. This is especially true when passengers are located towards the rear of the vehicle, and/or luggage is placed on the roof. Vehicle manufacturers designed the 15-passenger van by merely extending the length of their cargo van and adding an additional row of seating beyond the rear axle. When this characteristic is combined with sources of vehicle instability such as low tire pressure, tire-blowouts, icy conditions, or other emergency conditions, it can lead to rollovers. In addition, "statistical analyses have shown that increased occupancy level and vehicle speed consistently predict the increased likelihood of 15-passenger van rollover" (NTSB, July 2003). Finally, a study by the NHTSA in May 2004 found that both speed and roadway geometry are statistically significant factors in predicting the likelihood of a 15-passenger van rollover. According to the report, a 15-passenger van is five times more likely to rollover on a high-speed road (greater than 50 mph) than a low-speed road (less than 50 mph). The odds of a 15-passenger van rolling over on a curved road are twice as high as that on a straight road (NHTSA, May 2004). This underscores the importance of drivers maintaining a safe speed on curved roads. If they do not, the high and rearward center of gravity can cause the vehicle to overturn or run off the road.

Measures to prevent rollovers. Several recommendations have been made to prevent rollovers. Most of these deal directly with the causes of rollovers mentioned above. While only the first bulleted item below could be regulated by FMCSA, the rest are the purview of other regulatory agencies or they could be implemented by van manufacturers:

- *Driver training.* The NTSB calls for increased driver training in most of their reports on 15-passenger van accidents. Driver training is cited often since 15-passenger vans handle differently than other passenger vehicles, especially in emergency situations. For example, in two different accidents, which were documented by the NTSB, drivers instinctively, but inappropriately, applied the brakes and over-steered in an attempt to regain control of their vans after a tire blowout. However, these actions led to further vehicle instability, resulting in the loss of control and subsequent rollover.

- *Extend wheel base for new vehicles.* During interviews with van carrier companies, some indicated that they only use GM 15-passenger vans because they have always had an extended wheel base. When GM entered the 15-passenger van market around 1990, it extended the wheel base from the 12-passenger design (Safety Forum, 2005). The extended wheelbase deals directly with the rearward center of gravity, which was contributing to vehicle instability.

- *Dual rear wheels for new vehicles.* Several articles mentioned that dual rear wheels may help prevent 15-passenger van rollovers. In addition, dual rear wheels would provide extra load capacity, better traction, and improved handling. Public Citizen, a nonprofit organization that represents consumer interests, conducted a series of tests using vehicles that were modified to include dual rear wheels. A modified GM van did not demonstrate oversteer nor a propensity toward rollover in severe turning maneuvers. The Ford and Dodge vans similarly performed better after being modified to include dual rear wheels. However, the modified Dodge van still demonstrated two-wheel lift (Public Citizen with C. Tab Turner, 2002).

- *Decrease loading*. Several NTSB reports advise 15-passenger van users not to overload their vehicles with more than 15 passengers and instruct them not to use the roof rack. In addition, users have been advised that fully loading the vehicle will increase the rollover propensity in comparison to a partially loaded vehicle. When a vehicle is partially loaded, all passengers should move towards the front to prevent the center of gravity from moving towards the rear.

- *Install safety-promoting vehicle technologies*. The NTSB has suggested that safety-promoting technological systems, such as traction control, lane departure systems, and particularly electronic stability control systems, may have the potential to help drivers maintain control of the 15-passenger van in an emergency situation. They note that electronic stability control manufacturers maintain that their systems will activate during a blowout situation, but the NTSB is not sure if sure if such a system would have prevented the accidents they were investigating. However, they feel that such a system would have given the driver greater opportunity to regain control of the vehicle.

4.2 Interviews

The previous sections highlight what recent literature indicates about the inherent safety problems associated with the 9-to-15-passenger vans. NTSB conclusions include the finding that 9-to-15-passenger vans, when fully loaded, have a high center of gravity and, when coupled with poor maintenance of such items as tires and brakes, are susceptible to rollover. In a project for the FMCSA, the Texas Transportation Institute (TTI) surveyed a portion of the camioneta industry in Texas. For their analysis, the TTI researchers interviewed drivers, inspected van condition, and recorded basic information such as vehicle mileage. The researchers conducted the survey at selected inland border checkpoints from Brownsville to Laredo and concluded that the van owners operated at lower safety standards than traditional motor coach operators. This conclusion was based on observed industry practices (Ellis & Hanley, 2002).

4.2.1 Driver Responsibility for Safety

Several industry-recognized crash investigation experts were interviewed to determine their views of the major factors contributing to 9-to-15-passenger van crashes. The consensus of the crash investigators interviewed was that the driver was the most important factor leading to crashes. The experts feel strongly that the drivers need to be trained in the characteristics of the vehicle. They also believe that this training needs to address the high-speed handling characteristics, not just test the ability to do low-speed maneuvers, such as backing the vehicle into a parking place.

In addition, the driver needs to be fit for duty. It is common for the driver also to have another job with full-time responsibilities. Then, the driver is, in effect, doing two jobs and may be too tired to properly drive the van. The crash investigators judged that a driver's alertness was critical because in addition to making crucial decisions while driving, the driver must determine whether or not weight of passengers plus cargo is within the gross vehicle weight limits for the vehicle. If this weight is exceeded, the safe operation of the vehicle could be jeopardized.

One crash investigator interviewed has investigated many 9-to-15-passenger vans crashes. He judged that the ratio of driver issues to mechanical issues is seven or eight to one. The main driver issue he has identified is lack of training to properly estimate the stopping distance of the vehicle. This would be particularly true when the vehicle is fully loaded with people and equipment, such as ski equipment. Another crash investigator confirmed that loss of vehicle control due to driver error is virtually always the initiating event of the accident.

The crash investigators assessment of the importance of the driver qualifications and capabilities for passenger van safety is supported by evidence from other sources. Many organizations such as colleges and universities that use the 9-to-15-passenger vans require all drivers to take a passenger van training course before they are permitted to operate a vehicle because the van handles very differently from a passenger car, especially under emergency conditions and particularly for inexperienced drivers.

However, as the crash investigators also emphasized, even experienced drivers can run into difficulty when overly tired. In both Texas and Arizona, officials have observed drivers driving more hours consecutively than would be considered safe under the FMCSRs. In Arizona, carriers were making trips from Nogales to Flagstaff and back (a round trip of 634 miles and about 11 hours) in the same day. The State has incorporated the Federal safety regulations into State law and therefore has been able to crack down on drivers that stay on the road for too many consecutive hours.

4.2.2 Vehicle Contribution in Serious Crashes

The crash investigators stated that the design of the vehicle is another major contributing cause for serious crashes. One crash investigator indicated that the most important vehicle safety issue is that associated with lateral stability. Virtually all of the van accidents he deals with are roll-overs. In addition, he identified passenger ejection as a major issue. Safety belts are either not used, unavailable, or it is too difficult for passengers to understand their function. For example, passengers might not understand how to use shoulder belts on side seats and therefore are less likely to use them.

Some of the issues mentioned by crash investigators such as those related to the design of the vehicle that directly affect the stability of the vehicle, such as a high center of gravity, would be most effectively handled by the vehicle manufacturer. One design change that could be implemented for new vehicles by the manufacturer is the use of dual rear tires. The use of dual rear tires has been found to increase the stability of the vehicle.

4.2.3 Compliance Issues

Crash investigators acknowledged that regardless of the regulations envisioned to improve safety, enforcement, and oversight are big issues. These experts believe that enforcement of regulations applying to vans would be more difficult than enforcement of regulations for heavy-duty trucks because vans have a lower enforcement priority among regulators.

There is also the perception among van operators—particularly private carriers such as church groups, schools, and employers that transport workers—that they do not come under the FMCSRs. This belief makes it a challenge to ensure compliance. Van use also includes some categories that tend to be completely unregulated, such as employee van pools in metro areas such as Washington, DC.

The investigators also believe that pre-trip inspections are not rigorously followed for many van carriers. Since compliance is very low even with many commercial truck carriers, they believe van pre-trip inspection requirements would be largely ignored. One crash investigator doubted that low tire pressure on a van would even be noticed in a pre-trip inspection, because it would require the use of a tire-pressure gauge and would not be noticed during a visual “walk-around” inspection.

4.2.4 Maintenance Issues

Crash investigators identified maintenance issues that may be considered as potential reasons for a crash. They believe that the type of tire used and the age and condition of the tire were the most important maintenance issues. Tire-related maintenance problems they identified included tires that were too old to be safe,[4] the use of tires with improper load rating, and the use of the incorrect tire for the vehicle. In some cases, a much cheaper pick-up truck tire might fit the wheel, but would not be adequate for the vehicle's load. Another problem they identified is improper tire pressure. Tire pressure maintained at too low levels can result in rollovers or crashes due to vehicle instability or to failure of the under inflated tire.

The maintenance experts contacted stated that manufacturers already have mechanical standards for these vehicles, and that some States, like Virginia, already have State-required vehicle inspections of safety-related equipment. Therefore, no new mechanical standards are needed. Other States may want to follow Virginia's example in order to improve safety.

4.3 Safety Data Analyses

4.3.1 Approach

Previous sections have shown that the safety of 9-to-15-passenger vans is dependent on proper driver action to stop the chain of causation. When the driver of a van encounters unexpected road and vehicle conditions, the driver has to make rapid adjustments or maneuvers, some of which are not instinctive. Since it does not automatically follow that 9-to-15-passenger vans are less safe than other vehicle configurations because of the previously described tendencies, a comparative analysis of the crash data is needed to confirm this finding. This section will examine the accident statistics for for-hire motor carriers that are currently covered by the FMCSRs and compare their performance with the accident statistics for motor carriers not covered by the FMCSRs.

The analysis of the difference in safety between the carriers covered by the FMCSRs and those which are not covered is made more difficult because there is no simple way to identify a non-covered or a covered for-hire carrier in the MCMIS Crash File. The approach taken here is to assume that:

- Any 9-to-15-passenger vans that do not have a USDOT number are not covered by the FMCSRs.
- Any 9-15 passenger vans that have a USDOT number, but do not have registered drivers that operate vehicles more than 100 statute miles from their normal reporting work location, are not covered by the FMCSRs

[4] Some vans used by churches and other non-profit groups are driven only occasionally and accumulate mileage at such a low rate that the tires may experience unacceptable age-related deterioration long before they wear out.

- Any 9-15 passenger vans that have a USDOT number and registered drivers that operate vehicles more than 100 statute miles from their normal reporting work location are covered by the FMCSRs.

Note that the distance from the normal work reporting location that a driver operates a vehicle is reported by the carrier and is found in the MCMIS Census file.

For the vast majority of carriers, the absence of a DOT number will be a good indication of a motor carrier that does not have to meet the FMCSRs. Conversely, the vast majority of those carriers who have USDOT represent those carriers that must meet the FMCSRs. This approach is not perfect, because a covered carrier might have been mistakenly included with the non-covered carriers because the USDOT number was left blank when the accident report was filed. In spite of this potential exception, this is an effective method to differentiate the covered and uncovered carriers.

In an effort to identify the potential uncertainty in this approach, it would be useful to determine what percentage of the reportable accidents that included a vehicle with a USDOT number omitted that number when the data were transferred from the Police Accident Reports (PARs) to MCMIS. As part of a previous Battelle study of HM accidents, PARs were obtained for all the listed HM accidents in the 2002 MCMIS Crash File. Over 1,200 records were reviewed to determine if the crash involved HM and, if it did, then any information missing from the crash record but listed in the PAR was added. Of 1,036 HM records, the DOT number was blank in the Crash File and not on the PAR for 148 records (about 15 percent of all the records). Thus the uncertainty in the identification of carriers that are covered by the FMCSRs and those that are not could be as large as 30 percent, 15 percent being removed from the uncovered category resulting in 15 percent being added to the covered category.

The next step in examining the differences in safety between those motor carriers with DOT numbers and those without DOT numbers is to identify a safety measure that could be used to measure differences. Logical measures, such as the accident rate, cannot be used because the accident rate requires both the number of accidents in a period of time and the number of miles driven during the same time period. This is available for carriers with DOT numbers through the Census File, but since carriers without DOT numbers do not have a census record, there is no way to obtain the mileage for these motor carriers. It is not practical to assume that both groups have the same mileage because vans have different uses depending upon whether or not they are covered by the FMCSRs. For example, a van owned by a church organization, which would not be covered by the FMCSRs, would travel fewer total miles than a for-hire van operated by a tour company in interstate commerce.

In looking at other possible ways to measure safety, it was decided to try measures such as fatal-crash-to-crash ratios and injury-crash-to-crash ratios. The use of such measures was suggested in an FMCSA report, *FMCSA Safety Program Effectiveness Intervention Model* (2004). The advantage of such measures is their robustness. The denominator is the number of crashes, something readily determined from the same file being used to identify the number of injury and

fatal crashes. Even if the under-reported percentages for crashes, fatal and injury crashes are different, as long as the percentages are the same for both the carriers covered by the FMCSRs and those that are not covered, the percentage difference in the ratio between the covered and not covered carriers is a true difference in performance. For example, assume that the ratio of fatal-crash-to-crash ratio is 4 percent before a group of carriers were subjected to the regulations and it decreased to 3 percent after the regulations were effective, a 25 percent decrease in the ratio. Even if the crashes were under-reported by a factor of 4, the 4 percent ratio would decrease by a factor of 4 to 1 percent and if the underreporting factor remained the same, a good assumption if no reporting changes were made, then the 3 percent ratio would become 0.75 percent. However, the percent change remains the same, a 25 percent change in the ratio. If these differences are the result of regulatory differences, it is reasonable to assume that the change is due to the effectiveness of the regulations. Another benefit from use of these ratios is that in using an accident rate, any percentage change in each of the ratios can be translated directly into lives saved or injuries avoided, which can be used directly on the benefit side of the cost-benefit analyses. For these reasons, the fatal crash-to-total crash ratio and the injury crash-to-total crash ratio will be used to measure the differences in safety.

The first section below addresses the databases that might provide insights into the safety of 9-to-15-passenger vans. If these databases also provide information on the fatal-crash to crash and injury-crash to crash ratios for exempt and non-exempt carriers, this will be noted. This will be followed by a discussion of the structures of the databases used to identify these fatal and injury crash ratios. The third section summarizes any insights on 9-to-15-passenger vans that can be determined from the various databases and also summarizes the results of the comparison of the for-hire vans that are covered by the FMCSRs and those that are not covered.

4.3.2 Databases

The analysis of van safety began by obtaining Motor Carrier Management Information System (MCMIS) databases from FMCSA. There were tens of millions of records associated with the databases related files. The first step was to extract 9-to-15-passenger van information from these massive files into a Microsoft Access database. In addition to the MCMIS data, van accident and inspection data were also obtained from Texas and placed in an Access database. A Microsoft Excel spreadsheet containing the accident findings and inspections of small passenger van crashes in California was also received. Although limited, data on fatal van crashes were obtained from the BIFA database. The main use of the BIFA data was to estimate under-reporting rates. The information obtained from each of these databases will be described in the following subsections.

4.3.2.1 Motor Carrier Management Information System

The FMCSA Motor Carrier Management Information System (MCMIS) database contains a Census File, a Crash File, an Inspection File, and a Violation File.

The Census File contains hundreds of thousands of carrier profiles, mostly supplied by the motor carrier who desires to transport goods or provide services in interstate commerce. In addition to

describing the type of service provided, the carrier provides information on the fleet and number of drivers used for interstate and intrastate commerce traveling greater and less than 100-statute-miles. Also provided is an estimate of the vehicle accident rate and the total annual miles traveled by the carrier. The carrier also defines the classification of the service to be provided: Authorized For-hire designated as "A", Exempt For-hire – "B", Private – "C", Private Passenger –"D", Private Non-Business –"E" and several other categories that are not of interest to this project. At the present time, for-hire vans that transport people across State lines and are therefore operating under interstate commerce need not comply with the FMCSRs if they do not travel outside a 75 air-mile radius from the driver's normal work reporting location. This analysis considers the potential outcomes of removing this 75-air-mile criterion.

When a carrier registers, all of the descriptive information about the carrier is self-reported, so it is of unknown quality. Moreover, until recently, unless the carrier underwent a compliance review, the information dated is from the original registration, so it could be out-of-date. In 2000, FMCSA initiated a program that required carriers to update their information every 2 years. While still self-reported, at least the data would more likely be up-to-date. Better data are available when a carrier undergoes a compliance review, because all the information is updated under the supervision of an FMCSA reviewer. Key data derived from a compliance review include information on total annual miles and number of accidents, which means that the accident rate information is updated and should be reasonably accurate. The reviewer also has a variety of means to cross-check other census data for accuracy. A field in the Carrier File provides the date of the most recent compliance review.

The MCMIS database also contains a Crash File and its related Carrier and Events tables. Every reportable accident involving (1) a heavy truck having a gross weight greater than 10,000 pounds, (2) all 9-to-15-passenger vehicles not used for personal use, after April 1, 2001, and (3) all 16 passenger vehicles should be recorded in the Crash File. A reportable accident is defined as one in which there is a fatality, an injury requiring immediate treatment away from the crash scene, or a tow-away of any motor vehicle disabled as a result of the crash and towed from the scene by a tow truck or other vehicle. Since there were no requirements to file accidents involving 9-to-15-passenger van accidents before April 1, 2001, all the records used in this analysis are based on crashes that occurred in 2002 or later. While the crashes in 2001 after April 1, 2001 might have been analyzed, the assumption would have to be made that every State immediately started reporting 9-to-15-passenger van accidents beginning on April 1, 2001. Use of the 2001 data might have been attempted if there were an efficient way to determine when the van accidents began to be reported. Prior to the time a State started to report 9-to-15-passenger van accidents, vehicle configuration "3" was a bus carrying more than 15 passengers, and after that time vehicle configuration "3" was designated as a 9-to-15-passenger bus. There is no other field in the Crash File that would indicate when a State made the change. The prudent approach is to give the system nine months and assume that by calendar year 2002, all the States were reporting van accidents and identifying the vehicle configuration to be "3."

Lastly, the MCMIS data contains Inspection and Violation Files that contain the results from roadside inspections and compliance reviews for all registered carriers. In terms of numbers of

records, these files are by far the largest. The Violation File was evaluated to see if there were significant differences between for-hire van motor carriers and private van motor carriers. This evaluation used the private carriers as a surrogate for the carriers that are not subject to the FMCSRs. Very few inspections were found and, based on the number of OOS violations observed, no significant differences between the two groups of carriers could be detected. Since the vehicle configuration being inspected is not specified in the Inspection File and many motor carriers operate fleets with mixed vehicle configurations, it is impossible to find OOS rates specifically for vans. Appendix D contains a comparison and analysis of inspection results for buses that is found in the Inspection and Violation File.

The MCMIS Carrier File contains additional records on each carrier involved in a reportable accident. Thus, there is typically one carrier record for each crash record. The name of the carrier is not given in the crash record. Therefore, without this file, it would be impossible to determine the number of crashes a carrier without a DOT number has had over a period of time.

Since the MCMIS files are very large, the first step in the data analysis process was to extract the data in the Census File records where the OWNVAN_9_15 field was greater than zero, indicating the number of 9-to-15-passenger vans in the carrier's fleet. A total of 3,218 carriers met this criterion. The next step was to use the CLASS field to identify which of the carriers are "For-hire" and which are "Private." The for-hire carriers were identified by searching the CLASS field for the entries A, AB, or B. The "A" carriers are "Authorized For-hire" and the "B" carriers are "Exempt For-hire." The "B" carriers are exempt from economic regulation by the Federal Government; the "A" carriers are not. When this screen is used the number of carriers registered as either authorized or exempt "For-hire" was found to be 663. The other class of carriers that was investigated was the "Private" carriers. These were identified by searching the CLASS field for the entries C, D, E, CD, CE, DE or CDE. "C" class carriers are defined as "Private Property" carriers, "D" class carriers are defined as "Private Passenger Businesses," and "E" carriers are defined as "Private Passenger Non-business." When this query was run, a total of 1,613 private carriers were identified as "Private." The difference between the sum of the For-hire and Private Carriers is 942. These carriers have CLASS letter designations that have different classes or are mixed, having a portion of business for-hire and a portion private. These mixed companies were not included in the analysis.

Once the for-hire and private carriers were identified, it was possible to use the DOT number to analyze the crash history for three groups of carriers. These groups are:

- Carriers with a DOT number that have drivers that travel more than 100 statute-miles from their normal work reporting location
- Carriers with DOT numbers that have no drivers that travel more than 100 statute-miles from their home office
- Carriers with no DOT number and are therefore assumed to be intrastate-only carriers

The first group of carriers is subject to the FMCSRs. The latter two categories are not subject to the FMCSRs. For those carriers with DOT numbers, it is possible to identify the inspections performed for the for-hire and private carriers and, therefore, the history of violations.

All reportable accidents involving 9-to-15-passenger vans, even those involving carriers not subject to the FMCSRs, must be reported to MCMIS. Additional information on van crashes can therefore be obtained by looking at all the van crashes even though they are not covered carriers. Thus, an additional query of the MCMIS files, in this case the Crash File, was performed to identify any crashes involving a 9-to-15-passenger van. Two fields in the Crash File can be used to identify 9-to-15-passenger vans: CARGO_BODY_TYPE_ID = 1 and VEHIC_CONFIGURATION_ID = 3. Because the 9-to-15-passenger van was not a configuration that was listed in the MCMIS Crash File before April 1, 2001, only those crashes occurring in 2002 or later were considered for analysis. Using an entry of either CARGO_BODY_TYPE_ID = 1 or VEHIC_CONFIGURATION_ID = 3 in these fields resulted in the identification of 2,998 crashes. These crashes included both carriers subject to the FMCSRs and those not covered by the regulations. There were 712 crashes associated with 395 carriers with USDOT numbers assumed to be subject to FMCSRs. The process of determining how many carriers without DOT numbers had crashes is always difficult because, although it is possible to join the Crash File to a Carrier File associated with the crash, the carrier name is as entered on the police accident report and there is no standardization of names in the process of transferring the crash into the electronic Crash File. After much editing of carrier names and addresses, based on similar names with exact street, city and State matches, it was determined that the remaining 2,286 crash records involved 1,523 carriers.

4.3.2.2 Buses Involved in Fatal Accidents

The Buses Involved in Fatal Accidents (BIFA) is a file that has been compiled since 1999 by the Center for National Truck and Bus Statistics at UMTRI. Cases for the BIFA file are identified in NHTSA's FARS file. Police reports for each crash are acquired from the States and trained interviewers contact the owner, driver, operator, reporting police officer, or any other source with knowledge of the vehicle. A detailed interview is completed to determine that the vehicle is a bus and to collect a detailed description of the vehicle, the operator of the vehicle, the type of trip, the number of hours driving prior to the crash, and some details about the crash. Among the data items collected that are particularly relevant to the current project are the following:

- The number of seats for passengers
- The type of bus, including small vans, cowl and chassis with a bus body, the different school bus types, transit buses, and over-the-road motor coaches
- Whether the carrier operates interstate or intrastate
- Carrier type, including for-hire, private, or government
- A brief text description of the carrier.

The BIFA file includes all buses with seating for 9-to-15-passengers, including the driver, not used for personal use (such as a family vehicle) and all buses with seating for more than 15 passengers. Contacting owners, operators, and drivers of the buses allows the identification of

buses in BIFA to be somewhat more accurate than in FARS. Each year, some vehicles identified as buses in FARS are found to be other vehicle types. In addition, some vehicles identified as trucks prove to be buses.

The data elements in BIFA cover some, but not all, of the criteria for this project. Nine-to-fifteen-passenger vans operated for-hire in interstate commerce can be identified, but the BIFA file includes no information about the carrier's radius of operations. The type and distance of trip that the bus was on prior to the crash is identified, but not the region in which the carrier itself operates. However, as part of the methodology of the BIFA survey, police reports are acquired for each crash. Police reports typically include the carrier's name and address. The carrier then may be searched for in FMCSA's Safety and Fitness Electronic Records (SAFER) system or on the internet for any information that might further describe its operations. In addition, police report investigations may provide information about the carrier's area of operations. Thus, BIFA data can be used to identify a set of crashes that meet some of the target population characteristics, and the police reports and other resources can be used to further refine the group.

The BIFA file supplements the Fatality Analysis Reporting System file, but the FARS file itself is a resource, though less useful for the current project than the BIFA file. The BIFA file will be used to estimate under-reporting of fatal bus crashes.

4.3.2.3 Texas Crash File

The State of Texas Department of Transportation provided a database of 9-to-15-passenger van accidents and inspections that have been performed in the last three years – 2003 to 2005. The database consisted of 348 crash records and 229 inspections of these vehicles. While less extensive than the national data, it provided some insights on local van operations that were not obtainable from the national data.

4.3.2.4 California Crash Data

The State of California Highway Patrol requires the registration of vans and buses transporting farm laborers from cities and towns to farms. The inspection regulations are similar to the current DOT regulations for the transport of passengers in 9-to-15-passenger buses and vans traveling more than 75-miles in interstate commerce. These regulations were enacted in 2000, so California has 5 years of data that might show the effectiveness of such regulations on safety. The State provided data on 9-to-15-passenger van crashes from 1996 through 2005, thus providing 5 years of data before and after the enactment of the regulations.

4.3.3 Description of Crash Data

There are many techniques for pulling the crash data out of the MCMIS Crash File. One way is to go to the Census File, identify the DOT numbers for carriers that operate vans, and then analyze all the crashes these carriers have had. Another technique is to look at the crash records themselves and identify crashes which state that either the Vehicle Configuration was a 9-to-15-passenger van

or that the cargo body type was a bus that carried 9 to 15 passengers. The Census File will only contain carriers that are registered for interstate commerce. The Crash File contains carriers that are involved in both interstate and intrastate commerce that have been involved in a reportable accident. The Census File is needed to distinguish for-hire and private carriers and the Crash File is needed to get a listing of the reportable accidents for both those carriers covered by the FMCSRs and those that are not covered by the regulations. Theoretically, the carriers whose vans are coming under the proposed regulations—interstate carriers who limit their range to less than 100 miles—do not currently come under the FMCSRs. Carriers not covered by the FMCSRs may have DOT numbers indicating that they travel interstate but show that their drivers are operating less than 100 statute-miles from their reporting work location. Note that since 75 air-miles represents about 86 statute-miles, the 100-statute-mile limit used in the Census File is being used as a surrogate for the 75-air-mile distance.

Starting with the Census File, the team identified carriers that have vans and identified number of van drivers in each of four driving classifications: interstate greater than 100 miles, interstate less than 100 miles, intrastate less than 100 miles, and intrastate greater than 100 miles. The Census File for these carriers also includes a stated inventory of vans, limousines, and school buses in the 9-to-15-passenger range that the carrier owns, leases, or leases by the trip. The carrier also registers under one or several 12 carrier classifications with 13 reserved as other in which the carrier can self declare its classification. In this case, the classifications of interest are A and B, which are the for-hire, and C, D, and E, which are three classes of private carriers.

4.3.4 Comparison of Crash Data

The crash data can be compared using a variety of performance measures. As described in the introduction to this subsection, two ratios, fatal crashes/total crashes and injury crashes/total crashes were used. In this analysis, these two measures were used to identify any changes to these two ratios that might result from the institution in 2003 of the requirement that interstate vans traveling more than 75-air-miles from their primary location must register. The following analyses looks at the difference in performance between those motor carriers covered by the FMCSRs and those not covered by the FMCSRs.

Appendix E includes tables showing examples of carriers included in the analysis. One table shows selected interstate for-hire 9-to-15-passenger van carriers that were covered by the FMCSRs beginning in 2004. Another table shows 9-to-15-passenger van carriers that were not covered by the FMCSRs beginning in 2004. The final table in Appendix E shows a list of 14 for-hire interstate 9-to-15-passenger van carriers that have DOT numbers but were not covered by the FMCSRs after December 2003.

4.3.4.1 Carriers Subject to the FMCSRs and Those not Covered

The analysis shown in this subsection compares 9-to-15-passenger van carriers that must comply with the FMCSRs and those that do not have to comply. As described previously, if the crash record lists a USDOT number, then it is assumed that the carrier must comply with the FMCSRs beginning in 2003, unless the Census File shows the carrier has no drivers who travel more than

100 statute-miles from their reporting work location. A carrier was assumed not to be complying with the regulations if the Crash File does not include a DOT number in the crash record, or if the carrier has a DOT number but no drivers that travel more than 100 miles from the home office. This approach has flaws, because the DOT number that is entered into the PAR by the officer is not always transferred into the MCMIS crash file. However, it is a conservative approach because the absence of the DOT number would put that crash into the class of carriers that do not have to comply with the FMCSRs, which could make any observed differences in the fatality and injury ratios smaller. So if a difference is observed, it is likely to be less than the actual difference. Table 13 shows crash and fatal crash data for all vans, and the fatal-crash-to-crash ratio by year for the four-year period beginning in 2002. At the bottom of the table are the averages for the first 2 years and the average for the last 2 years and the percent change observed between the two time periods. The data did not use any crash records before 2002 because, prior to April 1, 2001, there was no requirement to report crashes involving 9-to-15-passenger vans. The break was made between 2003 and 2004 because the FMCSA inspection requirement was imposed on for-hire 9-to-15-passenger van companies that travel interstate and more than 75 air-miles from their normal work reporting location beginning in 2004. The table shows that considering all van crashes, the fatal-crash-to-crash ratio decreases by 18 percent.

Table 13. All Van Crash Records—Fatal-Crash-to-Crash Ratio by Year and Totals

Fatal Crash	2002	2003	2004	2005	Total
No	495	731	886	795	2,907
Yes	18	25	28	20	91
Total	513	756	914	815	2,998
Fatal Crash %	3.51%	3.31%	3.06%	2.45%	3.04%
Averages					**Percent Change**
Years	2002 to 2003		2004 to 2005		
Fatal Crash %	3.39%		2.78%		-18.1%

Source: MCMIS Crash File

Table 14 separates out the van crashes involving 9-to-15-passenger vans that are subject to the FMCSRs beginning in 2004. When comparing the fatal-crash-to-crash ratios between the two time periods of interest, the later time period is 59 percent lower. Table 15 shows the same calculation for the 9-to-15-passenger van carriers that are not subject to the FMCSRs during both time periods. Instead of a decrease in the ratio, there is a 3.4 percent increase during the same time period.

Table 14. Vans Currently Covered by FMCSRs – Fatal-Crash-to-Crash Ration by Year and Totals

Fatal Crash	2002	2003	2004	2005	Total
No	126	161	194	191	672
Yes	7	8	5	3	23
Total	133	169	199	194	695
Fatal Crash %	5.26%	4.73%	2.51%	1.55%	3.31%
Averages					Percent Change
Years	2002 to 2003		2004 to 2005		
Fatal Crash %	4.97%		2.04%		-59.0%

Source: MCMIS Crash and Census Files

Table 15. Vans Not Currently Covered by FMCSRs – Fatal-Crash-to-Crash Ratio

Fatal Crash	2002	2003	2004	2005	Total
No	369	570	692	604	2,235
Yes	11	17	23	17	68
Total	380	587	715	621	2,303
Fatal Crash %	2.89%	2.90%	3.22%	2.74%	2.95%
Averages					Percent Change
Years	2002 to 2003		2004 to 2005		
Fatal Crash %	2.90%		2.99%		3.4%

Source: MCMIS Crash and Census Files

Table 14 shows a very significant result. During the entire four-year period, there was a requirement to enter any reportable 9-to-15-passenger van accidents in the MCMIS Crash File. Beginning in 2004, the FMCSRs were imposed on all the motor carriers used to tabulate the crashes and fatal crashes and the ratio decreased 59 percent. There are many possible explanations for this decrease. One is an overall decrease in the fatal-crash-to-crash ratio for all carriers. If this were true, then the same change also would be shown in Table 15. However, Table 15 shows a 3.4 percent increase rather than a decrease. Since no other change can be identified that would cause a 59 percent decrease other than the imposition of the new regulations, it is reasonable to attribute the change to the regulations. Because there is no reason for the ratio to increase over the four-year period, other than statistical variation, rather than use the difference in the percentage change between Table 14 and 15 of 63 percent as the effectiveness of the regulations, it is judged to be better to use the difference between Tables 13 and 14, a 40 percent change. This change will be attributed to the imposition of the new FMCSRs on the 9-to-15-passenger van motor carriers. Note that due to the considerable lag time required to incorporate some of the serious accidents that occurred in 2005 into the MCMIS

Crash File, all 2005 accidents may not have been entered into the database when this analysis was conducted.

A calculation similar to the fatal-crash-to-crash ratio was performed using injury crashes. These results are shown in Tables 16 through 18. In this case, the differences are much smaller. For the two periods in Table 14 there is only an 18 percent decrease. As was the case with the fatal-crash-to-crash ratio, this change will be attributed to the effectiveness of the FMCSRs. The changes in Tables 16 and 18 are approximately the same so it will be concluded that the effect of the FMCSRs on the injury-crash-to-injury ratio is about 10 percent. This represents the difference in percent change between the results shown in Table 16 and 17. Although smaller than the 40 percent observed for the change in the fatal-crash-to-crash ratio, the smaller change is still considered significant because there are many more injury accidents than fatal accidents.

Table 16. All Van Crash Records – Injury-Crash-to-Crash Ratio

Injury Crash	2002	2003	2004	2005	Total
No	187	265	334	370	1,156
Yes	308	466	552	425	1,751
Total	495	731	886	795	2,907
Injury Crash %	62.22%	63.75%	62.30%	53.46%	60.23%
Averages					Percent Change
Years	2002 to 2003		2004 to 2005		
Injury Crash %	63.13%		58.12%		-7.9%

Source: MCMIS Crash File

Table 17. Vans Currently Covered by FMCSRs Injury-Crash-to-Crash Ratio

Injury Crash	2002	2003	2004	2005	Total
No	49	71	98	104	322
Yes	77	90	96	87	350
Total	126	161	194	191	672
Injury Crash%	61.11%	55.90%	49.48%	45.55%	52.08%
Averages					Percent Change
Years	2002 to 2003		2004 to 2005		
Injury Crash %	58.19%		47.53%		-18.3%

Source: MCMIS Crash and Census Files

Table 18. Vans Not Currently Covered by FMCSRs

Injury Crash	2002	2003	2004	2005	Total
No	138	194	236	266	834
Yes	231	376	456	338	1,401
Total	369	570	692	604	2,235
Injury Crash %	62.60%	65.96%	65.90%	55.96%	62.68%
Averages					Percent Change
Years	2002 to 2003		2004 to 2005		
Injury Crash %	64.64%		61.27%		-5.2%

Source: MCMIS Crash and Census Files

In Section 3.0, an analysis using data from interview sources estimated that 1,590 carriers might not be subject to the FMCSRs because of the 75-air-mile interstate criterion. In Section 4.3.4.4, the change in the fatal-crash-to-crash ratio and the injury-crash-to-crash ratios attributable to the new regulations will be applied to the 1,590 carriers. The accident rate will assumed to be the same for all van companies. However, when the new carriers become subject to the FMCSRs, the lives saved and injuries prevented will be calculated by estimating the number of accidents these 1,590 carriers will experience each year. The number of accidents will be multiplied by first the old crash ratios and then the new crash ratios. The difference will be the fatalities and injuries prevented as a result of removing the 75-air-mile criterion from the FMCSRs for interstate carriers.

4.3.4.2 Changes in Intrastate Crash Rates before and after the Introduction of an Intensive Enforcement Campaign for State Safety Regulations (California)

The California Highway Patrol (CHP) provided two sets of data regarding drivers for farm labor contractors. These data are applicable for this analysis because, beginning in 2000, these vehicles were much more likely to be subject to inspection by the CHP using requirements very similar to those that must be met by interstate carriers. Two sets of data were provided, one related to accidents and the other related to inspections. The accident data were from 1996 and contained an annual summary of fatalities, injuries, and property damage for certified vehicles, non-certified vehicles, and farm labor transporters. The latter might be driving passenger cars, SUVs, or small trucks. The pre-crash condition at the time of the crash was recorded as was an assessment of which driver was at fault for the crash. Farm labor vehicles in California must be certified by the CHP once every 13 months. Once a general safety inspection of the passenger vehicle is performed by the CHP and no violations are found, a sticker is issued so that certification can be verified later if the vehicle is stopped. The safety inspection conducted by the CHP is equivalent to a LEVEL I North American Standard Inspection.

A comparison of the data, before and after the enforcement campaign for the regulations was in effect, yields useful results. The data divided the drivers of vehicles that have been certified and drivers of vehicles that are uncertified. The ratio of the fatal-crash-to-crash rate for the certified drivers is about 3 percent and for the drivers of the non-certified vehicles about 6 percent, similar

to the 50 percent difference observed using the MCMIS Crash data. The injury-crash-to-crash rate is 67 percent for the uncertified vehicle and 39 percent for the certified vehicle, a 20 percent difference. The California data are inconsistent with the findings shown from the analysis of the MCMIS crash data.

Regarding the compliance inspections that are also part of the California program, it is very difficult to notice any trends, as was the case with the analysis of the OOS data from MCMIS. Table 19, which contains data from the CHP, shows that the violation rate is actually increasing rather than decreasing between 2002 and 2003 for most violation categories, and then levels off between 2003 and 2004. When a new program is instituted there is a flurry of activity to get the new program up and running and during that time it would be expected that the compliance rate would not improve in the short term. This is what is observed. Apparently a longer time period is needed to show the effectiveness of compliance programs.

Table 19. California Farm Labor Vehicle Violations

	2002	2003	2004
Total Number of FLVs Placed OOS	159	309	293
Total Number of Registration Violations	159	179	145
Total Number of Unlicensed FLV Drivers	84	209	220
Total Number of Other DL Violations	333	1,044	719
Total Number of Safety Belt Violations	156	489	478
Total Number of Lighting Violations	157	489	537
Total Number of Tire and Wheel Violations	11	29	48
Total Number of Other Equipment Violations	188	712	703
Total Number of Load Violations	59	5	32

Key: FLV—Farm Labor Vehicle
OOS—Out of Service
DL—Driver License

4.3.4.3 Significance of the FMCSRs in Improving Safety

The two performance measures found to effectively show the impact of new regulations indicate that these measures also can be used to show the effect of requiring all for-hire passenger vans traveling in interstate commerce to comply with the FMCSRs. By imposing this requirement, it appears that the result will be about a 40 percent decrease in the ratio of fatal crashes to crashes and about a 10 percent reduction in the ratio of injury crashes to all crashes. The next section will estimate the number of fatalities and injuries prevented annually by eliminating the criterion that interstate vans traveling less than 75 miles from their main office are exempt from the Federal Motor Carrier Safety Regulations.

4.3.4.4 Number of Accidents Avoided or Mitigated because of Adoption of Federal Regulations

If there are 1,590 carriers coming under the regulations, the crash data show that on average a carrier has about 0.56 crashes per year. While this number would be affected by the size of the carrier, the assumption being made is that the average number of vans operated by both the newly regulated and current carriers is about the same at three vans per carrier. A fatal-crash-to-crash ratio of about 0.03 results in an estimated 27 fatal crashes per year if there were no reduction in the fatal-crash-to-crash ratio. Assuming a 40 percent reduction in this ratio and using the calculated value of 1.24 fatalities per fatal crash, the number of fatalities prevented as a result of the new regulations is approximately 13.

A similar calculation was performed using the injury-crash-to-crash ratio. In this case, the number of injury crashes per crash is 60 percent. If the current injury-crash-to-crash rate were maintained, then the new carriers coming under the regulations would experience 534 injury crashes per year. Assuming a 10 percent reduction in the ratio, and 2.2 injuries per crash (calculated from the crash records), then, a total of 118 injuries would be avoided as a result of applying the FMCSRs to the uncovered interstate carriers.

There is quite a bit of uncertainty associated with these estimates of fatalities avoided and injuries prevented. The uncertainty in the number of carriers affected by removing the 75-mile criterion is estimated to be about 25 percent. The standard deviation of the accident rate for the four years is about 15 percent. There is also an uncertainty in the accuracy of the MCMIS data that is estimated to be about 30 percent. If these uncertainties are combined by taking the square root of the sum of the variances, the overall standard deviation becomes 42 percent. Note that it would be improper to simply sum the uncertainties because errors tend to cancel one another. If the standard deviation is 42 percent and the uncertainties are normally distributed, then it can be stated with 95 percent confidence that the number of fatalities prevented each year is at least two and the number of injuries requiring treatment away from the accident scene that are avoided is at least 19. It could also be stated with 95 percent confidence that the number of fatalities prevented per year is not greater than 24 and the number of injuries avoided is not greater than 217. While these ranges are quite large, it reflects the inability to identify the exact number of carriers that will be affected by the new regulations. It also reflects the inability to identify the exact number of carriers that were affected when the current regulations became effective in December 2003.

If the improved performance is applied to interstate carriers that are currently exempt from the FMCSRs because of the 75-air-mile criterion, then it is estimated that about 16 fatalities and 115 injuries will be prevented annually.

5.0 COST-BENEFIT ANALYSIS

This analysis estimates the potential costs to the public, and those imposed on industry associated with the elimination of the 75-air-mile criterion from the applicability of the 2003 final rule. Additionally, special consideration will be given to the cost impacts on small businesses. Removing this criterion would impose the same type of compliance burdens as the 2003 final rule, but would extend these burdens to a larger group of motor carriers, drivers, and vehicles.

5.1 Baseline

The first step in conducting a benefit-cost analysis is to establish a baseline that identifies the number of entities affected by the proposed rule and examines the baseline case of a no-action alternative. The number of 9-to-15-passenger van carriers that operate interstate within a 75-air-mile radius has been estimated to be 1,590. A no-action alternative would result in no additional costs to this group but would not, by itself, improve the safety of these carriers.

Since no single source of information identifies the size of businesses that operate 9-to-15-passenger vans interstate within a 75-air-mile radius, it is difficult to assess how many or what percentage of these business are considered small businesses. The Small Business Administration (SBA) recognizes businesses as small businesses based on total revenue and number of employees thresholds set for different industries using the North American Industrial Classification System (NAICS). Using information from the van carriers surveyed and identified to be interstate, the population of interstate 9-to-15-passenger van carriers falls within several NAICS code classifications. Table 20 provides these classifications and identifies the SBA limits under which these businesses can be classified as small businesses. For all classifications identified, only businesses whose revenue is less than $6.5 million are considered small; the number of employees is not a part of the small business threshold for these industries.

Of the approximately 80 carriers chosen from the Census File as representative of 9-to-15-passenger van carriers (see Section 2.3.2), 24 of those operated only interstate and were exempt from the regulation within the 75-air-mile radius. To determine the percentages that are small businesses, revenue information was obtained for 22 of these businesses. Note that only for-hire carriers are required to report revenue information.

Of these, four reported annual revenues higher than $6.5 million. The minimum revenue in this sample is $44,000 and the maximum revenue in this sample is $14.8 million. The average revenue of these companies is $3.5 million.

Table 20. 9-to-15-Passenger Van Industry Classifications

NAICS Code	NAICS U.S. Industry Title	Size Standard (in Millions)
48532	Limousine Service	$6.5
48541	School and Employee Bus Transportation	$6.5
48551	Charter Bus Industry	$6.5
48599	Other Transit and Ground Passenger Transportation	$6.5
48711	Scenic and Sightseeing Transportation, Land	$6.5
48821	Support Activities for Rail Transportation	$6.5
56152	Tour Operators	$6.5
56159	Other Travel Arrangement and Reservation Services	$6.5
62191	Ambulance Services	$6.5

Source: North American Industry Classification System, 2002

5.2 Costs

These costs can be generally classified into three categories: driver medical examination and certification; driver qualifications; and vehicle inspection, repair, and maintenance. Table 21 provides a summary of the specific requirements considered to have a cost impact.

It should be noted that the 2003 Final Rule regarding the 9-to-15-passenger CMVs also examined the requirement for records of duty status. However, the hours-of-service requirements include an exemption for passenger operations within a 100-air-mile radius of their work reporting location as long as the drivers are released from work within a 12-hour period and have 8 consecutive hours off duty before returning to a 12-hour shift. Since the group examined necessarily includes only those interstate carriers traveling under a 75-air-mile radius and these carriers generally do not operate on a round-the-clock basis, this requirement was considered inapplicable for this evaluation.

Table 21. Additional Requirements for 9-to-15-Passenger Van Operators < 75 Miles

Requirement Area	Regulatory Reference	Summary of Requirement
Driver Medical Examination and Certification	§ 391.45 Driver Medical Certification	Requires driver to be medically examined and certified in order to operate a commercial motor vehicle.
Driver Qualifications	§ 391.51 General requirements for driver qualification files	Requires an initial set up and ongoing maintenance of a qualification file for each driver.
Driver Qualifications	§ 391.23 Investigation and inquiries	Requires an initial investigation to be performed and documented by the motor carrier which includes an inquiry into a driver's driving record in States where the driver held a motor vehicle operators license during the previous 3 years. This documentation is to be placed into the driver qualification file.
Driver Qualifications	§ 391.23 Investigation and inquiries *(Continued)*	Also requires an initial investigation to be performed by the motor carrier of the driver's safety performance history if previously employed by DOT regulated employers in all States where the driver had employment during the previous 3 years.
Driver Qualifications	§ 391.53 Driver Investigation History File	Requires motor carriers to store and maintain documentation of the safety performance history of each driver.
Driver Qualifications	§ 391.27 Record of violations	Requires motor carriers once every 12 months to require drivers to supply a list of all traffic violations.
Driver Qualifications	§ 391.25 Annual inquiry and review of driving record	Requires motor carriers to annually review the driver records for each driver it employs.
Vehicle Inspection, Repair, and Maintenance	§ 396.19 Inspector qualifications	Requires motor carriers to retain evidence regarding an individual's qualifications for performing periodic vehicle inspections.
Vehicle Inspection, Repair, and Maintenance	§ 396.25 Qualifications of brake inspectors	Requires motor carriers to retain evidence regarding an individual's qualifications for performing brake inspections.
Vehicle Inspection, Repair, and Maintenance	§ 396.3 Inspection, repair, and maintenance	Requires motor carriers to retain records created and stored regarding systematic inspection, repair, and maintenance.
Vehicle Inspection, Repair, and Maintenance	§ 396.21 Periodic inspection recordkeeping requirements	Records created and stored regarding annual periodic inspections.
Vehicle Inspection, Repair, and Maintenance	§ 396.11 Driver vehicle inspection report(s)	Requires drivers to prepare vehicle inspection reports at the end of each day for each CMV operated.

Source: 49 CFR Parts 380-399, FMCSA, DOT

5.2.1 Driver Medical Examination and Certification

With removal of the 75-air-mile criterion, all interstate motor carriers operating 9-to-15-passenger vans would have to require their drivers to be medically examined and certified every 24 months. The costs imposed by this requirement are the price paid for the medical examination and the work time taken by the driver to be examined. Both costs are considered to have been absorbed by the motor carrier unless the exam took place prior to employment. The total number of 9-to-15-passenger van drivers has been previously estimated at 4,616 in 2006. From interviews with passenger carrier companies, it was estimated that drivers spend approximately 1.5 working hours including travel to receive a medical exam. The $300 cost of a medical exam used in the 2004 regulation evaluation was not justified and had no source. Consequently, the average cost of a DOT driver medical examination and certification was determined through responses of motor carriers interviewed for this analysis and by a brief survey of the price of a DOT medical physical from 21 companies in 18 States. These medical examination companies were identified through the Drug and Alcohol Testing Industry Association's (DATIA) member directory. The highest and lowest price for a medical exam and certification were $86 and $35 respectively. Using these sources, the cost of a medical examination and certification of drivers was estimated to average $53 per exam. This medical examination cost does not include the price of drug and alcohol testing since this is not a requirement of the proposed regulation.

The wage rates for 9-to-15-passenger van operators likely vary depending on location. Additionally, no data could be found regarding the exact labor costs for this specific group of drivers. Therefore, the 2004 average wage plus fringe benefits for taxi drivers and chauffeurs inflated 2 years based on consumer price index growth yielded $16.01, which was used in this analysis (U.S. Department of Labor, 2005).

The costs of the examination would be incurred initially for the estimated 4,616 drivers, but also would occur due to industry growth and driver turnover. An industry growth rate for this industry of 1.7 percent was estimated by averaging growth in gross output for transit and ground passenger transportation over 1999 to 2004 (BEA, 2005). When asked about driver turnover rates, most companies responded with estimates ranging from 16 percent to 38 percent. An average turnover rate of 25 percent for 9-to-15-passenger van drivers is assumed for this analysis.

Table 22 estimates total medical examination and certification costs to motor carriers at $697,806 as expressed in real 2006 dollars, over the 10-year analysis time horizon. A discount rate of 7 percent was used to construct the net present value estimate (OMB, 2002).

Table 22. Driver Medical Examination and Certification Costs

Year	Initial Number of Drivers Requiring Certification	Initial Exam Cost	Initial Cost of Driver Time	Number of Drivers Required to Re-certify	Re-certify Exam Cost	Re-certify Cost of Driver Time	Total Costs
2006	4,616	$245,204	$110,858	0	$0	$0	$356,062
2007	1,231	$61,139	$27,641	0	$0	$0	$88,780
2008	1,252	$58,099	$26,267	3,462	$160,628	$72,621	$317,614
2009	1,273	$55,210	$24,961	3,520	$152,641	$69,010	$301,821
2010	1,295	$52,465	$23,720	3,579	$145,050	$65,578	$286,813
2011	1,316	$49,856	$22,540	3,639	$137,838	$62,317	$272,551
2012	1,338	$47,377	$21,419	3,700	$130,984	$59,218	$258,998
2013	1,361	$45,021	$20,354	3,762	$124,470	$56,274	$246,119
2014	1,384	$42,782	$19,342	3,825	$118,281	$53,476	$233,881
2015	1,407	$40,655	$18,380	3,890	$112,400	$50,816	$222,251
TOTAL	**16,473**	**$697,806**	**$315,482**	**29,377**	**$1,082,291**	**$489,310**	**$2,584,890**

Source: Questionnaires to motor carriers

5.2.2 Driver Qualifications

In addition to the medical fitness certification, motor carriers are required to ensure that their drivers meet all of the minimum qualifications for interstate CMV travel, which includes documentation of those qualifications. Upon initial hire of a driver, 9-to-15-passenger van carriers will be required to create a driver qualification file (DQF) that contains the following information:

- The driver's application for employment.
- A copy of the response by each State agency concerning a driver's driving record.
- The certificate of driver's road test issued to the driver or a copy of the license or certificate which the motor carrier accepted as equivalent to the driver's road test pursuant.
- The response of each State agency to the annual driver record inquiry.
- A note relating to the annual review of the driver's driving record as required. A list or certificate relating to violations of motor vehicle laws and ordinances.
- The medical examiner's certificate of his/her physical qualification to drive a commercial motor vehicle.

The motor carrier also must perform certain tasks to ensure the qualifications of the driver, which is the basis for some of the documentation that is required for the DQF. These tasks include, as referred to in Table 21, requesting State driving records and conducting a driving test. Motor

carriers also are required to investigate and document prior driver safety performance; however, this documentation is often included into the DQF instead of being put in a separate driver safety investigation history file. Additionally, the DQF must be updated and maintained annually by obtaining a list of driving violations from each driver and submitting an annual inquiry into the State driving record for each employed driver.

5.2.3 Initial DQF Setup Costs

The 2003 Final Rule estimated the documentation time required by a supervisor at a motor carrier to take approximately 21 minutes. In addition to the time for documentation, 9-to-15-passenger van carriers will be required to conduct a driving test and make an inquiry into the driving record of a potential driver. Further, the 2003 rule does not take into consideration a rule published in 2004 (§ 391.23) that required motor carriers to inquire into the safety performance history records of a potential driver. This rule requires the motor carrier to conduct an investigation into the safety performance history of a new or prospective driver, which involves phone interviews or written requests of information from previous employers. There is also a process whereby a driver is allowed to review and dispute the results of the investigation. It is also required that the information collected be retained in a driver safety performance file; however, regulations allow this documentation to be included into the DFQ and interviews with carriers revealed that these files are kept together.

Overall, the completion time for a DQF may take up to a couple of weeks due to the different timelines for each component of the file. However, the actual work time spent by a motor carrier supervisor to complete the requirements and obtain the documentation was reported by carriers to average at 1.5 hours. This estimate would include an average of 40 minutes to perform an investigation in the driver's safety performance, 10 minutes to inquire into the driver's State driving record(s), 25 minutes to perform a driving test and 15 minutes to compile any additional paperwork for the file. The average wage plus fringe benefits of a supervisor compiling a DQF was determined using the wage of $21 from the "First-Line Supervisors/Managers of Transportation and Material-Moving Machine and Vehicle Operators" from the Transit and Ground Transportation industry (U.S. Department of Labor, 2004). Since this is only an hourly wage estimate and does not include fringe benefits, this wage was multiplied by a factor of 1.412, which represents the employer costs of benefits as a percentage of the wage (BLS, 2005). Therefore, the wage of a supervisor is estimated to be $31.16 using the 2006 CPI as an inflation factor (BLS). Assuming 4,616 drivers, the costs of supervisor time for setting up DQFs is $215,763 in 2006.

To calculate the costs of the driving test in terms of driver time, 4,616 total drivers were multiplied by a test time of 25 minutes and the driver wages plus fringe benefits of approximately $16. Therefore, the total costs for driving tests in terms of driver time for 2006 are $30,794.

Some providers of transportation compliance products sell DQF folder packages that include a file folder, a check-off list, and forms. The material costs per DQF were estimated to be $7.79

by using the average price per file for a pack of 10 files (J.J. Keller; Trans Products; Foley Services). Assuming 4,616 drivers in 2006, the materials' costs for DQF would be $35,940.

In general, a fee is charged for each State driving record requested but this cost item was not included in the 2003 Final Rule. The amount of the fee ranges from $1.25 to $18 depending on the State for the record is requested or whether a third-party bulk record provider is used (Softech International). For the purposes of this analysis, State fees were averaged to $6.63 per record. Assuming 4,616 drivers, the driving record fee costs would be $30,591 for 2006.

A driver-supplied list of violations that occurred within the previous 12 months must be included into the DQF. Although there is no single form required for collecting driver-listed violations, Figure 7 shows a form that contains the required information used to comply with this requirement. Carriers stated that it takes no more than 5 minutes for a driver to complete a list of violations. The total 2006 costs for each driver to provide a list of violations would therefore be $6,159, assuming 4,616 drivers and an hourly wage plus fringe benefits of $16.

I certify that the following is a true and complete list of traffic violations (other than parking violations) for which I have been convicted or forfeited bond or collateral during the past 12 months.	
Date of conviction	Offense
Location	Type of motor vehicle operated
If no violations are listed above, I certify that I have not been convicted or forfeited bond or collateral on account of any violation required to be listed during the past 12 months.	
(Date of certification)	(Drivers signature)
(Motor carrier's name)	
(Motor carrier's address)	
(Reviewed by: Signature)	(Title)

Figure 7. Example Driver Violations Form (FMCSA)

To expand the initial DQF setup costs over the 10-year time frame, the number of drivers is assumed to grow by the previously calculated industry growth rate of 1.7 percent and a driver turnover rate of 25 percent. A discount rate of 7 percent was used to construct the net present value estimate (OMB, 2005). Table 23 shows the initial DQF costs.

Table 23. Initial Driver Qualification Costs

Year	Total Number of New Drivers	Supervisor DQF Setup Time Costs	DQF Material Costs	MVR Pull Fees	Driving Test Costs for Driver	Driver-Supplied Violations Costs	Total Initial Costs
2006	4,616	$215,763	$35,940	$30,591	$30,794	$6,159	$319,246
2007	1,231	$53,798	$8,961	$7,628	$7,678	$1,536	$79,601
2008	1,252	$51,123	$8,516	$7,248	$7,296	$1,459	$75,643
2009	1,273	$48,581	$8,092	$6,888	$6,934	$1,387	$71,881
2010	1,295	$46,165	$7,690	$6,545	$6,589	$1,318	$68,307
2011	1,316	$43,870	$7,307	$6,220	$6,261	$1,252	$64,910
2012	1,338	$41,688	$6,944	$5,911	$5,950	$1,190	$61,683
2013	1,361	$39,615	$6,599	$5,617	$5,654	$1,131	$58,615
2014	1,384	$37,645	$6,271	$5,337	$5,373	$1,075	$55,701
2015	1,407	$35,773	$5,959	$5,072	$5,106	$1,021	$52,931
TOTAL	**16,473**	**$614,022**	**$102,279**	**$87,056**	**$87,634**	**$17,527**	**$908,518**

NOTE: Numbers may not add to totals due to rounding.

5.2.4 Ongoing DQF Maintenance Costs

Motor carriers are required to update the DQF annually with a new driver-supplied list of violations, documentation of the driving record from the previous 12 months. This means that yearly cost includes driver time to furnish a violations list, supervisor time to submit a driving-record inquiry, and fees associated with each driving-record inquiry. The 2003 Final Rule estimated that the time needed to conduct a driving record investigation was 5 minutes. However, as stated in the previous section, carriers interviewed for this study estimated that it took approximately 10 minutes to do this. Further, in most cases, motor carriers will be charged a fee for the annual driving record pull; this was estimated to be $6.63 per file. Driver time to complete this list was estimated to be 5 minutes, as stated in the previous section. Table 24 shows the costs for ongoing driver qualification activities. It should be noted that the costs borne in the first year for this analysis will be borne as part of the initial compliance costs.

Table 24. Ongoing Driver Qualification Costs

Year	Annual Driving Record Inquiry	MVR Pull Fees	Driver-Supplied Violations Costs	Total Ongoing Costs
2006	$0	$0	$0	$0
2007	$16,804	$21,442	$4,317	$42,563
2008	$15,968	$20,376	$4,102	$40,447
2009	$15,174	$19,363	$3,898	$38,435
2010	$14,420	$18,400	$3,704	$36,524
2011	$13,703	$17,485	$3,520	$34,708
2012	$13,021	$16,615	$3,345	$32,982
2013	$12,374	$15,789	$3,179	$31,342
2014	$11,759	$15,004	$3,021	$29,783
2015	$11,174	$14,258	$2,871	$28,302
TOTAL	**$124,397**	**$158,733**	**$31,957**	**$315,087**

5.2.5 Total Costs for Driver Qualifications Requirements

Table 25 shows the total initial driving DQF setup costs and the ongoing DQF maintenance costs expressed in real 2006 dollars. Over the 10-year analysis time frame, the cost of driver qualification requirements is $1.2 million.

Table 25. Driver Qualification Costs

Year	Total Initial DQF Costs	Total Ongoing DQF Costs	Total DQF Costs
2006	$319,246	$0	$319,246
2007	$79,601	$42,563	$122,164
2008	$75,643	$40,447	$116,089
2009	$71,881	$38,435	$110,317
2010	$68,307	$36,524	$104,831
2011	$64,910	$34,708	$99,618
2012	$61,683	$32,982	$94,665
2013	$58,615	$31,342	$89,957
2014	$55,701	$29,783	$85,484
2015	$52,931	$28,302	$81,234
TOTAL	**$908,518**	**$315,087**	**$1,223,605**

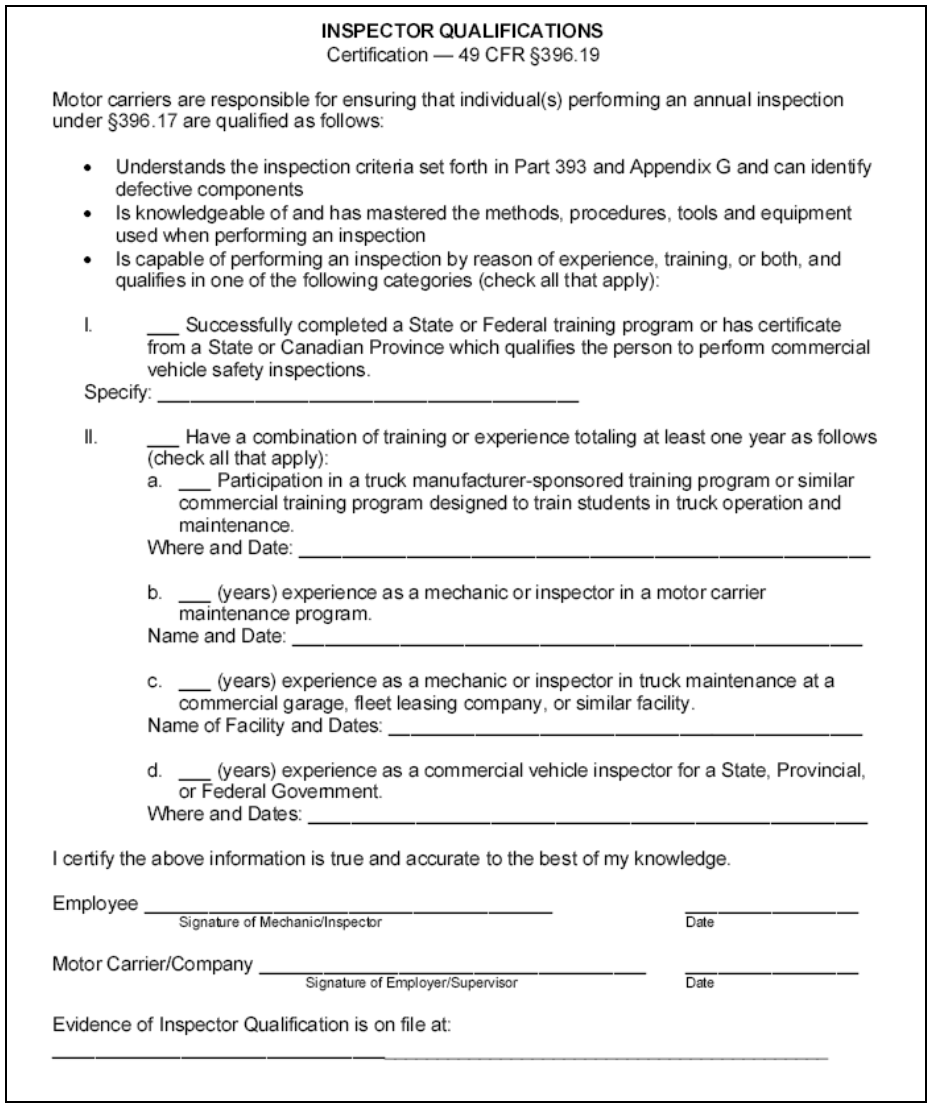
5.2.6 Vehicle Inspection, Repair and Maintenance

In order to ensure that Federal vehicle inspection, repair, and maintenance requirements are followed, interstate carrier operations are required to retain documentation regarding systematic and periodic vehicle inspection, repair, maintenance, qualifications for vehicle and brake inspectors, and driver vehicle inspection reports.

CFR 396.21 requires records to be retained regarding periodic (i.e., annual) inspections, and CFR 396.3 requires records to be retained regarding systematic (i.e., ongoing) maintenance, repair and inspection activities. Carriers indicated that the actual documentation portion of the inspections was minimal, taking an inspector an average of 5 minutes to complete for both systematic and periodic inspections. Therefore, the annual time spent for periodic inspection documentation is 5 minutes. However, there is no specification from the CFRs as to how often systematic inspections are to occur; only that documentation be retained on those that do occur. The number of systematic inspections can be calculated by dividing the annual average number of miles per 9-to-15-passenger van by the service interval. Of the passenger van carriers interviewed, the minimum and maximum yearly average miles traveled per van were 30,000 and 350,000, respectively. The average number of miles per van was 93,300. If a 3,000-mile service interval rate is assumed, then the number of systematic maintenance, repair, and inspections per year is 31.[5] This would amount to 2.67 hours or 2 hours and 40 minutes in time spent by a mechanic for documentation. The wage rate for vehicle mechanics/inspectors has been calculated at $22.14, resulting in approximately $61 per vehicle per year in vehicle inspections documentation costs. In accordance with the Paperwork Reduction Act of 1995 (OMB 2126-0003) "FMCSA is requiring that motor carriers operating CMVs designed or used to transport 9-to-15-passengers be required to meet the recordkeeping requirements of 49 CFR parts 391, 395, and 396."

An additional documentation requirement is that a motor carrier must retain evidence of the qualifications of mechanics to inspect vehicles and brakes. This evidence is required to be retained by the motor carrier unless the motor carrier outsources the maintenance, repairs, and inspections of its vehicles. In the case that a motor carrier does outsource these functions to an independent shop, the shop can retain this documentation and make it available on request of the motor carrier. Given that the average number of 9-to-15-passenger vans for the population of operations considered in this analysis is 2.4 vans, it is very likely that most of the carriers in question do not have an internal mechanical shop. Further, it is reasonable to believe that the majority of mechanical shops that service these vans also work on other vehicles where the qualifications documents are already required. For these reasons, we believe that no more than 10 percent, or 159 carriers out of the population of 1,590 passenger van carrier operators, would be affected by this rule. While there is no specific form necessary for documenting evidence of qualifications, Figure 8 presents an example of the content that must be present.

[5] The Chevrolet Express Passenger and the Ford Super Club E-350 both suggest a minimum service interval of 3,000 miles.



INSPECTOR QUALIFICATIONS
Certification — 49 CFR §396.19

Motor carriers are responsible for ensuring that individual(s) performing an annual inspection under §396.17 are qualified as follows:

- Understands the inspection criteria set forth in Part 393 and Appendix G and can identify defective components
- Is knowledgeable of and has mastered the methods, procedures, tools and equipment used when performing an inspection
- Is capable of performing an inspection by reason of experience, training, or both, and qualifies in one of the following categories (check all that apply):

I. ___ Successfully completed a State or Federal training program or has certificate from a State or Canadian Province which qualifies the person to perform commercial vehicle safety inspections.
Specify: _____

II. ___ Have a combination of training or experience totaling at least one year as follows (check all that apply):
a. ___ Participation in a truck manufacturer-sponsored training program or similar commercial training program designed to train students in truck operation and maintenance.
Where and Date: _____

b. ___ (years) experience as a mechanic or inspector in a motor carrier maintenance program.
Name and Date: _____

c. ___ (years) experience as a mechanic or inspector in truck maintenance at a commercial garage, fleet leasing company, or similar facility.
Name of Facility and Dates: _____

d. ___ (years) experience as a commercial vehicle inspector for a State, Provincial, or Federal Government.
Where and Dates: _____

I certify the above information is true and accurate to the best of my knowledge.

Employee _____ _____
Signature of Mechanic/Inspector — Date

Motor Carrier/Company _____ _____
Signature of Employer/Supervisor — Date

Evidence of Inspector Qualification is on file at:
_____

Figure 8. Inspector Qualifications Documentation (Iowa DOT)

Carriers contacted who already comply with the FMCSRs stated that documenting brake inspector qualifications and vehicle inspector qualifications would not take more than 5 minutes for each document. Therefore, assuming a supervisor paid $31.16 hourly and 169 companies spent 10 minutes obtaining these two documents, the costs for 2006 would be a total of $826.

Finally, the last documentation requirement considered in this analysis is that motor carriers have their drivers complete a driver inspection report at the end of each work day. The cost of this requirement would be a function of the time needed to complete documentation, the wage of the driver, and the annual number of times a driver completes this documentation. Motor carriers who already operated under the FMCSRs estimated that, on average, this would take approximately 3 minutes to complete. The average wage rate of a driver has been estimated to

be approximately $16 (see Section 5.2.1). To estimate the number of times a driver conducts a driver inspection, it is assumed, based on responses from passenger van carriers that 90 percent of the estimated 3,508 fleet of vans operate daily. Further, it is assumed that this fleet operates 365 days a year and there is one driver per vehicle each day. Based on these assumptions, it is estimated that the costs of driver inspections for these carriers would be $922,598 in 2006.

Table 26 presents the inspection, repair, and maintenance costs expressed in real 2006 dollars. Over the 10-year analysis time frame, the cost of inspection, repair, and maintenance is $9 million.

Table 26. Vehicle Inspection, Repair, and Maintenance Qualification Costs

Year	Total Number of Carriers	Total Number of Vehicles	Systematic and Periodic Inspections Records Costs	Documented Evidence for Vehicle and Brake Inspectors Costs	Driver Inspections Costs	Total Costs
2006	1,590	3,508	$207,456	$826	$922,598	$1,130,880
2007	1,617	3,567	$197,140	$13	$876,722	$1,073,875
2008	1,644	3,627	$187,337	$12	$833,126	$1,020,476
2009	1,671	3,688	$178,022	$12	$791,699	$969,732
2010	1,700	3,750	$169,169	$11	$752,331	$921,512
2011	1,728	3,813	$160,757	$11	$714,921	$875,689
2012	1,757	3,877	$152,764	$10	$679,371	$832,145
2013	1,787	3,942	$145,167	$10	$645,589	$790,766
2014	1,817	4,008	$137,949	$9	$613,487	$751,445
2015	1,847	4,075	$131,089	$9	$582,981	$714,079
TOTAL	**17,157**	**37,853**	**$1,666,851**	**$922**	**$7,412,826**	**$9,080,599**

5.3 Benefits Assessment

The primary expected benefits from implementation of the proposed regulation are a reduction in crashes leading to fewer injuries and fatalities. The costs of fatalities and injuries due to motor vehicle crashes have previously been estimated by the National Safety Council (NSC) in 2004 to be $3,760,000 per fatality and $188,000 per incapacitating injury (NSC, 2004). These costs include wage and productivity losses, medical expenses, and administrative expenses. In addition to the economic cost components listed above, these costs also include the value of lost quality of life which is appropriate since this analysis estimates the future benefits of a proposed safety improvement. For the purposes of this analysis, these costs were adjusted for inflation and are $3,947,100 for fatalities and $197,355 for injuries for 2006. NSC periodically studies and updates the economic and comprehensive costs associated with fatalities, injuries, and non-injury vehicle crashes. With each new study, the costs increase. For example, the 1999 study estimated the comprehensive cost of a fatality at $3.1 million while the 2004 study estimated the cost at $3.76 million. Thus, each study represents a snapshot in time based on the data collected for that

study and current price levels. As with all benefit-cost analyses, each cost element used in this study must be inflated or deflated in order to normalize the costs, bringing them into base-year dollars. For this analysis, 2006 was used as the base-year. If the 2004 study had never been completed, the 1999 study could have been used by inflating the dollars into 2006 dollars. This procedure has been applied to the other cost elements used in this project. This basic tenant of benefit-cost analysis ensures a level basis of analysis. It removes the impact of price escalation or inflation from the analysis. The results of the NSC study must be brought into base-year dollars to prevent an "apples-to-oranges" comparison of cost items.

As discussed earlier, the research team found that adopting the safety regulations contained in 49 CFR parts 390, 391, 392, 393, 395, 396, as well as the safety fitness procedures in part 385, results in an average reduction in fatal crashes by 40 percent and injury crashes by 10 percent.

5.3.1 Fatalities Avoided Benefits

The estimation of the potential monetary benefits of a 40 percent reduction in fatality crashes is as follows. If there are 1,590 passenger van carriers traveling less than 75-air-miles in 2006, the yearly crash rate for carriers is 0.56 (see Section 4.3.3.4) and the fatality-to-crash ratio is 3 percent (see Section 4.3.3.2), there would be an estimated 27 crashes attributed to these carriers (1,590 x 0.56 x 3%). If 40 percent of those 28 crashes could be prevented, this would reduce the number of crashes by 11 and the number of fatalities to 13 assuming a 1.24 fatality per crash ratio. Therefore, the avoided costs for 2006 resulting in fewer fatalities is 13 multiplied by $3,947,100, or $52 million. Holding the crash reduction rate constant at 40 percent and assuming an annual industry growth of 1.7 percent, the potential monetary benefits from reduced fatalities resulting from the proposed elimination of the 75-air-mile criterion would be $420 million over a 10-year time frame. These findings are shown in Table 27.

5.3.2 Injuries Avoided Benefits

Table 28 depicts the potential reduction in injuries resulting from a 10 percent reduction in crashes. An estimated 534 crashes are attributable to the estimated 1,590 passenger van carriers considered in this analysis since the average crash rate is 0.56 and the injury to crash ratio is 60 percent (see Section 4.3.3.4). If 10 percent of 534 crashes were to be avoided and the average number of injuries per crash is two, then approximately 117 fewer injuries would result in 2006. Holding the crash reduction rate constant at 10 percent and assuming an annual industry growth of 1.7 percent, the potential monetary benefits from reduced injuries resulting from the proposed elimination of the 75-air-mile criterion would be $186 million over a 10-year time frame.

Table 27. Estimated Avoided Fatalities – Benefits

Year	Total Number of Carriers	Fatal Crashes[6]	Fatalities Avoided[7]	Avoided Fatalities: Benefits	Discounted Benefits
2006	1,590	27	13.2	$52,295,728	$52,295,728
2007	1,617	27	13.5	$53,173,968	$49,695,297
2008	1,644	28	13.7	$54,066,957	$47,224,175
2009	1,671	28	13.9	$54,974,943	$44,875,930
2010	1,700	29	14.2	$55,898,178	$42,644,452
2011	1,728	29	14.4	$56,836,917	$40,523,936
2012	1,757	30	14.6	$57,791,421	$38,508,864
2013	1,787	30	14.9	$58,761,954	$36,593,992
2014	1,817	31	15.1	$59,748,787	$34,774,338
2015	1,847	31	15.4	$60,752,192	$33,045,167
TOTAL	**17,157**	**288**	**143**	**$564,301,044**	**$420,181,878**

Table 28. Estimated Avoided Injuries – Benefits

Year	Total Number of Carriers	Injury Crashes[8]	Injuries Avoided[9]	Avoided Injuries: Benefits	Discounted Benefits
2006	1,590	534	117.5	$23,195,686	$23,195,686
2007	1,617	543	119.5	$23,585,228	$22,042,269
2008	1,644	552	121.5	$23,981,312	$20,946,206
2009	1,671	562	123.6	$24,384,047	$19,904,646
2010	1,700	571	125.6	$24,793,547	$18,914,878
2011	1,728	581	127.7	$25,209,923	$17,974,326
2012	1,757	590	129.9	$25,633,291	$17,080,544
2013	1,787	600	132.1	$26,063,770	$16,231,206
2014	1,817	610	134.3	$26,501,478	$15,424,101
2015	1,847	621	136.5	$26,946,537	$14,657,130
TOTAL	**17,157**	**5,765**	**1,268**	**$250,294,818**	**$186,370,994**

[6] Fatal crashes anticipated under the current regulatory environment
[7] Fatalities avoided if for-hire interstate carriers operating 9-15 passenger vans within 75 air-miles of the driver's reporting location come under the FMCSRs
[8] Injury crashes anticipated under the current regulatory environment
[9] Injuries avoided if for-hire interstate carriers operating 9-15 passenger vans within 75 air-miles of the driver's reporting location come under the FMCSRs

5.4 Benefit-Cost Findings

The findings of this analysis are presented in Table 29. The benefits of reduced fatalities and injuries resulting from a reduction in passenger van crashes is estimated to be approximately $594 million over the 10-year analysis period. Therefore, the estimated benefits of the proposed rule outweigh the estimated costs of complying with additional safety and documentation requirements by 47 to 1.

Table 29. Benefit-Cost Summary (in thousands)

Year	Medical Certification Costs	Repair and Maintenance Costs	DQF Costs	Total Costs	Total Discounted Costs	Avoided Fatalities: Benefits	Avoided Injuries: Benefits	Total Benefits (Avoided Costs)	Total Discounted Benefits	Net Benefits
2006	$356	$1,131	$319	$1,806	$1,806	$52,296	$23,196	$75,491	$75,491	$73,685
2007	$95	$1,149	$131	$1,375	$1,285	$53,174	$23,585	$76,759	$71,738	$70,453
2008	$364	$1,168	$133	$1,665	$1,454	$54,067	$23,981	$78,048	$68,170	$66,716
2009	$370	$1,188	$135	$1,693	$1,382	$54,975	$24,384	$79,359	$64,781	$63,399
2010	$376	$1,208	$137	$1,721	$1,313	$55,898	$24,794	$80,692	$61,559	$60,246
2011	$382	$1,228	$140	$1,750	$1,248	$56,837	$25,210	$82,047	$58,498	$57,250
2012	$389	$1,249	$142	$1,780	$1,186	$57,791	$25,633	$83,425	$55,589	$54,404
2013	$395	$1,270	$144	$1,809	$1,127	$58,762	$26,064	$84,826	$52,825	$51,698
2014	$402	$1,291	$147	$1,840	$1,071	$59,749	$26,501	$86,250	$50,198	$49,128
2015	$409	$1,313	$149	$1,871	$1,018	$60,752	$26,947	$87,699	$47,702	$46,685
TOTAL	**$3,537**	**$12,195**	**$1,578**	**$17,310**	**$12,889**	**$564,301**	**$250,295**	**$814,596**	**$606,553**	**$593,664**
									Benefit-Cost Ratio	**47.1**

Because there is great uncertainty concerning: (1) the number of 9-to-15-passenger van carriers that operate interstate under a 75-air-mile-radius, and (2) the percent reduction in fatal crashes and injury crashes, sensitivity analysis was performed to examine the effects of varying these parameters on the monetary impact of the proposed rule. An upper and lower bound for the number of carriers affected was generated by a bracket of 50 percent above and below the average estimate of 1,590 yielding 2,385 and 795, respectively (see Section 3.2.4). As discussed in Section 4.3, there is some uncertainty concerning the expected benefits resulting from the implementation of the FMCSRs to all interstate motor carriers. Consequently, a sensitivity analysis was performed using an upper bound of 73.5 percent for fatality crashes and 18.4 percent for injury crashes and a lower bound of 6.5 percent for fatality crashes and 1.6 percent for injury crashes.

Table 30 presents the lowest case scenario assuming 795 affected carriers and a reduction in 6.5 percent in fatality crashes and 1.6 percent in injury crashes. The net benefits over the 10-year analysis time frame are estimated to be $42 million and the benefit-cost ratio remains positive at 7.6.

Table 30. Lower Bound Benefit-cost Summary (in thousands)

Year	Medical Certification Costs	Repair and Maintenance Costs	DQF Costs	Total Costs	Total Discounted Costs	Avoided Fatalities Benefits	Avoided Injuries Benefits	Total Benefits (Avoided Costs)	Total Discounted Benefits	Net Benefits
2006	$178	$565	$160	$903	$903	$4,249	$1,856	$6,105	$6,105	$5,202
2007	$47	$575	$65	$687	$642	$4,320	$1,887	$6,207	$5,801	$5,159
2008	$182	$584	$66	$832	$727	$4,393	$1,919	$6,311	$5,513	$4,786
2009	$185	$594	$68	$846	$691	$4,467	$1,951	$6,417	$5,239	$4,548
2010	$188	$604	$69	$861	$657	$4,542	$1,983	$6,525	$4,978	$4,321
2011	$191	$614	$70	$875	$624	$4,618	$2,017	$6,635	$4,731	$4,107
2012	$194	$624	$71	$890	$593	$4,696	$2,051	$6,746	$4,495	$3,902
2013	$198	$635	$72	$905	$563	$4,774	$2,085	$6,860	$4,272	$3,708
2014	$201	$646	$73	$920	$535	$4,855	$2,120	$6,975	$4,059	$3,524
2015	$204	$656	$75	$935	$509	$4,936	$2,156	$7,092	$3,857	$3,349
TOTAL	**$1,769**	**$6,097**	**$789**	**$8,655**	**$6,445**	**$45,849**	**$20,024**	**$65,873**	**$49,049**	**$42,605**
									Benefit-cost Ratio	**7.6**

Table 31 presents the upper bound scenario assuming 2,835 affected carriers and a reduction in fatality crashes of 73.5 percent and injury crashes of 18.4 percent. Using these assumptions, the net benefit of the proposed rule over the 10-year time frame is 1.7 billion.

Table 31. Upper Bound Benefit-cost Summary (in thousands)

Year	Medical Certification Costs	Repair and Maintenance Costs	DQF Costs	Total Costs	Total Discounted Costs	Avoided Fatalities Benefits	Avoided Injuries Benefits	Total Benefits (Avoided Costs)	Total Discounted Benefits	Net Benefits
2006	$534	$1,696	$479	$2,709	$2,709	$144,140	$64,020	$208,160	$208,160	$205,451
2007	$142	$1,724	$196	$2,062	$1,927	$146,561	$65,095	$211,656	$197,809	$195,882
2008	$545	$1,753	$199	$2,497	$2,181	$149,022	$66,188	$215,210	$187,973	$185,792
2009	$555	$1,782	$203	$2,539	$2,073	$151,525	$67,300	$218,825	$178,626	$176,553
2010	$564	$1,812	$206	$2,582	$1,970	$154,069	$68,430	$222,500	$169,744	$167,774
2011	$573	$1,842	$210	$2,625	$1,872	$156,657	$69,579	$226,236	$161,303	$159,431
2012	$583	$1,873	$213	$2,669	$1,779	$159,288	$70,748	$230,035	$153,282	$151,504
2013	$593	$1,905	$217	$2,714	$1,690	$161,963	$71,936	$233,899	$145,660	$143,970
2014	$603	$1,937	$220	$2,760	$1,606	$164,683	$73,144	$237,827	$138,417	$136,811
2015	$613	$1,969	$224	$2,806	$1,526	$167,448	$74,372	$241,821	$131,534	$130,008
TOTAL	**$5,306**	**$18,292**	**$2,367**	**$25,965**	**$19,334**	**$1,555,355**	**$690,814**	**$2,246,168**	**$1,672,510**	**$1,653,177**
									Benefit-cost Ratio	**86.5**

The total compliance costs estimated for eliminating the 75-air-mile criterion for the entire industry of interstate 9-to-15-passenger van operators range from $13 to $19 million over the 10-year analysis time frame. In 2006, the estimated cost burden estimated for affected operations would be an average of $1,136 per operation.

To estimate the regulatory impact on small businesses, business information was available and obtained for 22 9-to-15-passenger van operators chosen from the MCMIS Census File. Because the Census File can recognize only 9-to-15-passenger van carriers that operate within or outside a 100-statute-mile radius, there may be carriers in this list that already operate under the Federal safety regulations because they run more than 75-air-miles but fewer than 100-statute-miles from their reporting location. As mentioned previously, four businesses of this sample of 22 reported annual revenues higher than $6.5 million. This implies that small businesses account for approximately 82 percent of the total businesses affected by eliminating the 75-air-mile criterion. However, a simple percentage of the number of small businesses out of the total industry affected may not be an appropriate measure of the percentage of costs imposed on these businesses because it does not take into account the relative market share of the small businesses to the total industry. Further, total revenues may not be representative of only the 9-to-15-passenger van carrier operations since some carriers may have other revenue sources, such as motor coach services.

A more appropriate measure of the proportion of regulatory burden on small business would be the percentage of 9-to-15-passenger vans operated by small businesses compared with those operated by all businesses. Out of the 22 representative carriers, there were 505 9-to-15-passenger vans. Of those, 383, or 76 percent, were operated by small businesses. Tables 32 through 34 present the costs of the proposed rule change on small businesses based on this percentage of vans for three cost scenarios that vary depending on the number of estimated vans (lower bound of 795 carriers, expected case of 1,590 carriers, and an upper bound of 2,385 carriers).

Table 32. Small Business Cost Impacts (in thousands)

Year	Medical Certification Costs	Repair and Maintenance Costs	DQF Costs	Total Costs	Total Discounted Costs
2006	$271	$859	$243	$1,373	$1,373
2007	$72	$873	$99	$1,045	$976
2008	$276	$888	$101	$1,265	$1,105
2009	$281	$903	$103	$1,287	$1,050
2010	$286	$918	$104	$1,308	$998
2011	$291	$933	$106	$1,330	$948
2012	$295	$949	$108	$1,352	$901
2013	$300	$965	$110	$1,375	$856
2014	$305	$981	$112	$1,398	$814
2015	$311	$998	$114	$1,422	$773
TOTAL	**$2,688**	**$9,268**	**$1,199**	**$13,155**	**$9,796**

Table 33. Lower Bound Small Business Cost Impacts (in thousands)

Year	Medical Certification Costs	Repair and Maintenance Costs	DQF Costs	Total Costs	Total Discounted Costs
2006	$135	$430	$121	$686	$686
2007	$36	$437	$50	$522	$488
2008	$138	$444	$51	$633	$553
2009	$141	$451	$51	$643	$525
2010	$143	$459	$52	$654	$499
2011	$145	$467	$53	$665	$474
2012	$148	$475	$54	$676	$451
2013	$150	$483	$55	$688	$428
2014	$153	$491	$56	$699	$407
2015	$155	$499	$57	$711	$387
TOTAL	**$1,344**	**$4,634**	**$600**	**$6,578**	**$4,898**

NOTE: Numbers may not add to totals due to rounding.

Table 34. Upper Bound Small Business Cost Impacts (in thousands)

Year	Medical Certification Costs	Repair and Maintenance Costs	DQF Costs	Total Costs	Total Discounted Costs
2006	$406	$1,289	$364	$2,059	$2,059
2007	$108	$1,310	$149	$1,567	$1,465
2008	$415	$1,332	$152	$1,898	$1,658
2009	$422	$1,354	$154	$1,930	$1,575
2010	$429	$1,377	$157	$1,962	$1,497
2011	$436	$1,400	$159	$1,995	$1,423
2012	$443	$1,424	$162	$2,029	$1,352
2013	$451	$1,448	$165	$2,063	$1,285
2014	$458	$1,472	$167	$2,097	$1,221
2015	$466	$1,497	$170	$2,133	$1,160
TOTAL	**$4,032**	**$13,902**	**$1,799**	**$19,733**	**$14,694**

NOTE: Numbers may not add to totals due to rounding.

6.0 CONCLUSIONS

Based on a Federal regulation implemented in December 2003, for-hire 9-to-15-passenger vans operating interstate greater than 75-air-miles from the drivers' reporting location are required to comply with the FMCSRs. Those for-hire carriers operating interstate less than 75-air-miles from the driver's reporting location were exempt from this requirement. A potential change in the regulations is mandated by the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) that was passed by Congress in 2005. Section 4136 of this Act addressed interstate van operations and stated:

> The Federal motor carrier safety regulations that apply to interstate operations of commercial motor vehicles designed to transport between 9 and 15 passengers (including the driver) shall apply to all interstate operations of such carriers regardless of the distance traveled.

FMCSA is considering the potential benefits and costs of regulations to implement the provisions of this statute. This report presents the results of a project designed to analyze the potential costs and benefits that would result from requiring those carriers that are currently operating 9-to-15-passenger vans interstate but are not covered under the FMCSRs to comply with the regulation. The analyses in this report are directed at assisting the FMCSA in making the evaluations associated with amending the regulations.

6.1 Findings

If the FMCSRs are applied to interstate carriers that are currently not covered by the regulations, an estimated 1,590 new carriers would come under the regulations. The total estimated compliance cost for those carriers in 2006 would be $1.81 million or $1,135 per carrier. Over a ten-year period, assuming a 1.7 percent growth rate in the number of new carriers in 2015, there will be an estimated 1,847 carriers. Assuming a 7 percent discount rate, the total discounted cost to those carriers over the ten-year period will be $13 million or $7,000 per carrier.

Benefits were estimated based on calculated reductions in injuries and fatalities stemming from compliance with the FMCSRs. By including these 1,590 carriers under the regulations, there would be a 40 percent reduction in the fatal-crash-to-crash ratio and a 10 percent reduction in the injury-crash-to-crash ratio. Assuming average annual miles traveled, fleet size, and accident rates remain unchanged, an estimated 13 fatalities and 117 injuries will be prevented each year by bringing the 1,590 carriers under the regulations. If 13 fatalities are avoided, costs would be reduced by $52 million. If 117 injuries are avoided, costs would be reduced by an additional $23 million, with an annual total estimated reduction of $75 million for fatality and injury damages. Holding the crash reduction percentage constant and assuming a 1.7 percent growth rate and a discount rate of 7 percent results in a total cost reduction over a 10-year period of $606 million. Of this total, $420 million can be attributed to the reduction in fatalities and $186 million to the reduction in injuries. The net benefit-cost ratio is a positive 47 to 1.

A sensitivity analysis was performed to look at the effect of possible changes in the number of carriers and the fatal and injury crash ratios. Assuming a standard deviation in the number of carriers coming under the regulations of 25 percent, and a 42 percent standard deviation for the crash ratio estimates, then it can be stated with 95 percent confidence that the number of carriers will be between 795 and 2,385. Furthermore, the reduction in the crash ratio could be between 6.5 and 74 percent for the fatal-crash-to-crash ratio and between 1.6 and 18.4 percent for the injury-crash-to-crash ratio. Since the benefit-cost ratio is so high, and both the costs and benefits are proportional to the number of carriers, the ratio will be minimized by using the low bound numbers. When the lower numbers are put into the equations, the benefit-cost ratio is reduced to 7.6. Therefore, this data analysis shows with greater than 95 percent confidence that the benefit-cost ratio is positive by more than a factor of 7.6 to 1.

A survey of motor carriers showed that 76 percent of the carriers operating vans that will be affected by including all interstate for-hire carriers under the FMCSRs will be small businesses. The expected total discounted cost to small businesses over the 10-year period from 2006 through 2015 was estimated to be $9 million. Based on the sensitivity analysis performed using all potentially covered carriers, the impacts on small business could range from $4.0 million to $14.6 million over the 10-year period.

6.2 Recommendations

Five major recommendations were developed after an analysis of the project results:

1. All for-hire passenger van carriers operating in interstate commerce should be included under the FMCSRs. Not only would this be cost-effective but it also would result in the avoidance of a considerable number of fatalities and serious injuries.

2. To further increase the safety of 9-to-15-passenger vans, improvement in driver capabilities should be made. Upgraded driver training programs should be considered.

3. Additional research should be conducted to collect data and analyze the operational and safety performance of the “camioneta” industry. Many carriers involved in this industry currently are not complying with the FMCSRs even when operating in interstate commerce beyond the 75-air-mile threshold.

4. One of the major uncertainties associated with this study was the underreporting of reportable 9-to-15-passenger van accidents. FMCSA should study ways to increase the percentage of these accidents that are reported in MCMIS. Until this is done, uncertainties in assessments of regulatory changes directed at improving the safety of 9-to-15-passenger vans operations will continue to be significant.

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APPENDIX A: MCMIS REPORTING RATE

The following analysis was performed by the University of Michigan Transportation Research Institute (UMTRI). The objective is to estimate the annual number of 9-to-15-passenger buses involved in crashes that are required to be reported to the MCMIS Crash File.

Table A-1 shows counts of crash involvements in the MCMIS Crash File by bus size and year. The counts vary widely year-to-year. The number of 9-to-15-passenger van involvements *reported* more than doubled between 2001 and 2004, while the overall number of bus involvements actually declined over that period. Total bus involvements *reported* dropped from 9,293 to 6,044 between 2001 and 2002. Clearly, the numbers of involvements reported annually are not stable and likely are not reliable, simply based on the evidence of their instability. Safety does not vary by 50 percent, year to year. The more likely explanation of the observed variation is problems reporting the data.

Table A-1. Crash Involvements by Bus Size and Year, MCMIS Crash File

Bus Size	2001	2002	2003	2004
9-15 pass.	394	494	701	898
>15 pass.	9,399	5,550	5,861	8,077
Total	**9,793**	**6,044**	**6,562**	**8,975**

Table A-2 shows fatal bus involvements reported in MCMIS and UMTRI's Buses Involved in Fatal Accidents (BIFA) survey, for 9-to-15-passenger buses and larger buses. The BIFA survey is derived from the FARS census of fatal motor vehicle crashes, and represents the best available count of the true number of fatal bus involvements. However, the limitations of the BIFA survey should be recognized. Nine-to-fifteen-passenger vans are difficult to identify correctly and exhaustively in the crash data because the vehicle type employed overlaps in size and seating capacity with private vehicles used for personal transportation. Many of the same models used for 9-to-15-passenger buses are also used by families and private individuals as personal transportation. It is therefore likely that the number identified in BIFA, even with the data collection methodology employed to confirm the identification, undercounts the true number of such vehicles. There are probably an underdetermined number of buses, identified only as large vans in FARS, with no indication that they were used as buses.

Table A-2. Fatal Bus Involvements Reported in MCMIS and BIFA, 2001-2003 by Bus Seating Capacity

Bus Type	MCMIS	BIFA	Reporting Rate
9-15 pass. vans	48	60	0.80
>15 pass. bus	450	824	0.55
All buses	498	944*	0.53

*Bus capacity could not be determined for 60 cases.

Table A-2 shows the number of 9-to-15-passenger buses and larger buses identified in the MCMIS Crash File and the BIFA survey for 2001 through 2003. Only the total count is shown. Cases in the two files were not matched to test if the same vehicles were reported in each file. Overall, 80 percent of 9-to-15-passenger buses fatal involvements were reported in the MCMIS Crash. The reporting rate for larger buses is actually lower. Only 55 percent of fatal involvements of larger buses were reported to MCMIS over those years.

The higher reporting rate for smaller buses is anomalous. Generally, reporting rates vary by vehicle type (with trucks reported at a much higher rate than buses), vehicle size (with large vehicles reported at a much higher rate than small vehicles), and crash severity (with more serious crashes reported at a higher rate than less serious). Since buses and small vehicles are reported at a lower rate, one would expect small buses to be even more under-reported than large buses. But that does not appear to be the case here. However, given the uncertainties with both the BIFA and MCMIS files, not too much should be inferred from this finding.

Reporting rates to the MCMIS Crash File can be estimated from a set of evaluations of reporting by individual States performed by UMTRI. In these evaluations, UMTRI acquired several States' Crash Files for all motor vehicle crashes in the State. UMTRI developed algorithms in each State to identify records that qualified for reporting to the MCMIS Crash File. Reportable cases involve either a truck, bus, or placarded light vehicle involved in a crash in which there was either a fatality, injury transported for treatment, or a vehicle towed due to disabling damage.

The States evaluated were selected as part of a continuing FMCSA program to improve State reporting to the MCMIS Crash File. As such, States were targeted based on their size and known rates of underreporting of fatal crash involvements in comparison with NHTSA's FARS file. However, as a practical matter the availability of State crash data for comparison also played a role in selecting States for evaluation. Accordingly, the rates of underreporting are probably somewhat higher than the overall rate for all States.

Table A-3 shows reporting rates for six States in 2003 by various items and includes a column showing the weighted reporting rate estimated from the six States (or in the case of trucks and buses, five), weighted by the number of reportable cases in the State. Overall, only 27.6 percent of reportable bus involvements are actually reported, compared with 56.6 percent of truck

involvements. Fatal involvements tend to be reported at a higher rate than nonfatal (injury or towaway) involvements.

Table A-3. State Reporting Rates to MCMIS Crash File

	California	Florida	Michigan	New Jersey	New Mexico	North Carolina	Weighted Reporting Rate
Crash Year	**2003**	**2003**	**2003**	**2003**	**2003**	**2003**	
Overall	72.0	24.0	73.7	82.5	9.0	48.2	56.1
Fatal	84.2	55.6	92.4	67.4	27.5	63.3	69.5
Injury	73.9	26.5	73.1	81.5	11.0	49.4	57.2
Towaway	70.9	20.0	73.4	83.2	6.8	47.1	54.7
Trucks	75.5	27.0	n/a*	82.7	10.5	52.5	56.6
Buses	24.8	2.8	n/a	82.2	3.3	9.9	27.6
Reportable Cases	11,944	13,797	5,911	10,103	1,042	8,517	

* Vehicle type could not be cleanly distinguished in Michigan.

Three methods were developed to estimate the total number of 9-to-15-passenger bus involvements that met the MCMIS reporting criteria:

1. Estimate the total number of recordable crash involvements from the known number of fatal crash involvements:
   a) Use the BIFA estimate of the total number of fatal 9-to-15-passenger bus involvements.
   b) Determine the ratio of fatal to injury to towaway involvements in the MCMIS Crash File.
   c) Apply those ratios to the BIFA total.

2. Apply the inverse of the reporting rate for buses in the five States for which a vehicle type reporting rate can be determined to counts of 9-to-15-passenger vans reported to the MCMIS Crash File for a three-year average.

3. Apply the inverse of the reporting rates by crash severity (for all vehicle types) in the six States to a three-year average of buses reported by crash severity to the MCMIS Crash File.

Table A-4 shows the derivation of an annual estimate of the number of 9-to-15-passenger van crashes that meet the MCMIS reporting criteria from the total number of fatal involvements in BIFA. On average, twenty 9-to-15-passenger buses were involved in a fatal crash from 2001 to 2003. The table also shows the annual average number of reportable crash involvements for all reportable vehicle types by crash severity. These numbers were used to calculate the ratio of fatal-to-injury and fatal-to-towaway involvements. These ratios are shown in the column headed

"ratio." Using the ratios of fatal-to-injury and fatal-to-towaway crashes estimated to be reportable from the six States evaluated by UMTRI, we can estimate that there are 286 injury involvements and 576 towaway involvements annually reportable to the MCMIS Crash File nationally for 9-to-15-passenger buses. The primary limitation of this method of determination is that it depends critically on the accuracy of the number of such involvements identified in BIFA. As noted above, the 9-to-15-passenger bus type is the most difficult to identify accurately. Accordingly, this estimate is a lower bound for the true number.

Table A-4. Estimate of Annual Number of MCMIS-reportable 9-to-15-Passenger Bus Crash Involvements

Crash Severity	Annual Average Number of Cases Reportable to MCMIS, 2001-2003	Ratio	Applied to BIFA
Fatal	194	1.0	20*
Injury	2,765	14.3	286
Towaway	5,578	28.8	576
Total	**8,536**	**44.1**	**882**

* Annual average number of 9-to-15-passenger buses in BIFA, for 2001-2003.

NOTE: Numbers may not add to totals due to rounding.

The second method of estimating the total number of 9-to-15-passenger bus involvements reportable to the MCMIS Crash File simply applies the inverse of the reporting rate for bus crashes, as estimated from analysis of the five States for which a bus reporting rate could be determined, to the number of bus involvements actually reported. A three-year average is taken because of the fluctuation of cases reported year to year. The evaluation of the individual States showed that 27.6 percent of reportable bus involvements are actually reported to the MCMIS Crash File. The inverse of this is 3.62, the factor applied to the number of bus cases actually reported.

Table A-5 tabulates the result, and shows 9-to-15-passenger buses separately from larger buses. The method produces an estimate of 1,919 9-to-15-passenger bus involvements reportable to MCMIS annually. This is about twice the estimate produced by estimating from the count of involvements in BIFA. The primary limitation to this approach is whether the reporting rate for buses in one year for the five is representative of the national reporting rate for buses. The States selected, as noted above, probably have somewhat higher rates of underreporting but it is clear that the amount of underreporting is substantial. However, note the extent of the variance in the reporting rates in Table A-3. There is considerable uncertainty in the estimate.

Table A-5. Estimate of Annual Number of MCMIS-reportable Bus Crash Involvements Adjusted by Bus-reporting Rate

Bus Type	2001-2003 Average Reported to MCMIS	Estimated from Bus Reporting Rate
9-to-15-passenger bus	530	1,919
>15-passenger bus	6,937	25,134
Total	**7,466**	**27,053**

NOTE: Numbers may not add to totals due to rounding.

The third method of estimating the number of MCMIS-reportable 9-to-15-passenger buses adjusts for the different reporting rates by crash severity. Analysis of reporting by the six States evaluated showed that fatal involvements are reported at the highest rate while injury and towaway crashes are reported at lower rates. In this procedure, the number of bus involvements actually reported is adjusted to account for underreporting by injury level.

Table A-6 provides the numbers used in the adjustment, along with the results. Using this method, we estimate that there are 944 MCMIS-reportable crash involvements of 9-to-15-passenger buses. Note that this number is close to the 882 bus involvements estimated using the BIFA file. However, the reporting rates used in the adjustment here are for *all* reportable vehicles, trucks as well as buses. Thus, it is likely that the reporting rates used here overestimate the reporting rate by crash severity for buses, and the total number estimated is low rather than high.

Table A-6. Estimate of Annual Number of MCMIS-reportable Bus Crash Involvements Adjusted for Crash-severity Reporting Rates

Crash Severity	3-year Average, 2001-2003, Cases Report to MCMIS			Adjustment Factor	Adjusted Estimate		
	9-15 Passenger	>15 Passenger	Total		9-15 Passenger	>15 Passenger	Total
Fatal	16	150	166	1.44	23	216	239
Injury	321	3,778	4,100	1.75	562	6,604	7,165
Towaway	193	3,008	3,201	1.83	352	5,503	5,855
All	530	6,937	7,467	1.78	944	12,359	13,303

NOTE: Numbers may not add to totals due to rounding.

In sum, the three methods used here produced three different estimates, ranging from 882 to 1,919. All three methods have significant limitations. The primary conclusion is that the annual number of 9-to-15-passenger bus crash involvements is uncertain. A secondary conclusion is that it likely ranges from 900 to 2,000, but it is unknown where in the range the true number lies.

APPENDIX B: COMPARISON OF MCMIS AND GES

The following tables provide estimates of bus involvements in crashes from NHTSA's General Estimates System (GES) file. GES is a nationally representative sample of police-reported motor vehicle crashes.

Table B-1 shows crash involvements that meet the MCMIS Crash File criteria (i.e., a fatality, injury transported for treatment, or at least one vehicle towed due to damage). The MCMIS reporting criteria can be adequately approximated in the GES file. A variable in GES records for each involved person whether the person was transported for immediate medical attention. The towaway criterion is not precisely reproduced in the GES file. A variable records whether an involved motor vehicle was towed due to disabling damage or for another reason. However, an analysis done several years ago showed that the distinction in the GES file was not reliable.[10] This filter is the best available approximation for the Crash File criteria.

Table B-1. MCMIS Reportable Crash Involvements by Bus Type, Estimated from GES

Bus Type	Crash Year			Average
	2001	2002	2003	
Van-based school	182	181	534	299
Van-based other	922	1,860	2,154	1,645
School bus	8,991	7,713	9,197	8,634
Other bus type	7,427	9,056	7,361	7,948
Unknown bus type	191	130	324	215
Total	**17,713**	**18,939**	**19,570**	**18,741**

NOTE: Numbers may not add to totals due to rounding.

The bus types shown in Table B-1 (and Table B-2 as well) are those identified in GES. The van-based school and van-based other bus type is a not-entirely unreasonable surrogate for 9-to-15-passenger buses. The annual estimate for van-based buses reportable to MCMIS in GES is 1,944, which is very similar to the estimate from method 2 in Appendix A.

There is some uncertainty associated with estimates from GES. The standard error for estimates of small numbers in GES is relatively large. The standard error for an estimate of 2,000 is 613;

[10] The analysis was done by UMTRI in the mid-90s while preparing a Truck Factbook for FMCSA. Based on consulting with Terry Shelton, now at FMCSA but then overseeing the GES program, it was concluded that the distinction of towed due to damage or towed for some other reason was not reliable. It is unknown whether it is reliable in recent years, but the small percentage of cases for reasons other than disabling damage is not large enough to make a material difference in the results presented here.

twice the standard error is the 95 percent confidence interval, so the estimate of MCMIS-reportable crash involvements of van-based buses from GES is 2,000 ±1,226.

Table B-2 shows estimates of all police-reported crash involvements for buses. Since GES is a nationally representative sample of police reports, there is some variation in the reporting threshold between jurisdictions; however, this is the best available estimate.

Table B-2. Crash Involvements by Bus Type Estimated from GES

Bus Type	Crash Year			Average
	2001	2002	2003	
Van-based school	966	1,499	1,564	1,343
Van-based other	4,546	7,078	5,676	5,767
School bus	25,959	27,134	29,252	27,448
Other bus type	26,206	28,839	27,016	27,354
Unknown bus type	2,078	1,847	1,585	1,837
Total	**59,756**	**66,397**	**65,092**	**63,748**

NOTE: Numbers may not add to totals due to rounding.

APPENDIX C: MCS-150 FORM

OMB No. 2126-0013

U.S. Department of Transportation
Federal Motor Carrier Safety Administration

MOTOR CARRIER IDENTIFICATION REPORT
(Application for U.S. DOT Number)

REASON FOR FILING *(Check Only One)*

☐ NEW APPLICATION ☐ BIENNIAL UPDATE OR CHANGES ☐ OUT OF BUSINESS NOTIFICATION ☐ REAPPLICATION (AFTER REVOCATION OF NEW ENTRANT)

1. NAME OF MOTOR CARRIER			2. TRADE OR D.B.A. (DOING BUSINESS AS) NAME		
3. PRINCIPAL STREET ADDRESS/ROUTE NUMBER	4. CITY		5. MAILING ADDRESS (P O BOX)	6. MAILING CITY	
7. STATE/PROVINCE	8. ZIP CODE+4	9. COLONIA (MEXICO ONLY)	10. STATE/PROVINCE	11. ZIP CODE+4	12. COLONIA (MEXICO ONLY)
13. PRINCIPAL BUSINESS PHONE NUMBER	14. PRINCIPAL CONTACT CELLULAR PHONE NUMBER		15. PRINCIPAL BUSINESS FAX NUMBER		
16. USDOT NO.	17. MC OR MX NO.	18. DUN & BRADSTREET NO.	19. IRS/TAX ID NO. EIN# SSN#	20. INTERNET E-MAIL ADDRESS	

21. COMPANY OPERATION *(Circle all that apply)*

A. Interstate Carrier B. Intrastate Hazmat Carrier C. Intrastate Non-Hazmat Carrier D. Interstate Shipper E. Intrastate Shipper F. Vehicle Registrant Only

22. CARRIER MILEAGE (to nearest 10,000 miles for Last Calendar Year) YEAR

23. OPERATION CLASSIFICATION *(Circle All that Apply)*

A. Authorized For-Hire D. Private Passengers (Business) G. U. S Mail J. Local Government
B. Exempt For-Hire E. Private Passengers (Non-Business) H. Federal Government K. Indian Tribe
C. Private Property F. Migrant I. State Government L. Other _____

24. CARGO CLASSIFICATIONS *(Circle All that Apply)*

A. GENERAL FREIGHT
B. HOUSEHOLD GOODS
C. METAL; SHEETS; COILS; ROLLS
D. MOTOR VEHICLES
E. DRIVE AWAY/TOWAWAY
F. LOGS, POLES BEAMS, LUMBER
G. BUILDING MATERIALS
H. MOBILE HOMES
I. MACHINERY, LARGE OBJECTS
J. FRESH PRODUCE
K. LIQUIDS/GASES
L. INTERMODAL CONT.
M. PASSENGERS
N. OIL FIELD EQUIPMENT
O. LIVESTOCK
P. GRAIN, FEED, HAY
Q. COAL/COKE
R. MEAT
S. GARBAGE, REFUSE, TRASH
T. U.S. MAIL
U. CHEMICALS
V. COMMODITIES DRY BULK
W. REFRIGERATED FOOD
X. BEVERAGES
Y. PAPER PRODUCTS
Z. UTILITY
AA. FARM SUPPLIES
BB. CONSTRUCTION
CC. WATER WELL
DD. OTHER _____

25. HAZARDOUS MATERIALS CARRIED OR SHIPPED *(Circle All that Apply)* C – CARRIED S – SHIPPED B(BULK) – IN CARGO TANKS NB(NON-BULK) – IN PACKAGES

C	S	A. DIV 1.1	B	NB	C	S	K. DIV 2.2A (Ammonia)	B	NB	C	S	U. DIV 4.2	B	NB	C	S	EE. HRCQ	B	NB
C	S	B. DIV 1.2	B	NB	C	S	L. DIV 2.3A	B	NB	C	S	V. DIV 4.3	B	NB	C	S	FF. CLASS 8	B	NB
C	S	C. DIV 1.3	B	NB	C	S	M. DIV 2.3B	B	NB	C	S	W. DIV 5.1	B	NB	C	S	GG. CLASS 8A	B	NB
C	S	D. DIV 1.4	B	NB	C	S	N. DIV 2.3C	B	NB	C	S	X. DIV 5.2	B	NB	C	S	HH. CLASS 8B	B	NB
C	S	E. DIV 1.5	B	NB	C	S	O. DIV 2.3D	B	NB	C	S	Y. DIV 6.2	B	NB	C	S	II. CLASS 9	B	NB
C	S	F. DIV 1.6	B	NB	C	S	P. Class 3	B	NB	C	S	Z. DIV 6.1A	B	NB	C	S	JJ. ELEVATED TEMP MAT.	B	NB
C	S	G. DIV 2.1	B	NB	C	S	Q. Class 3A	B	NB	C	S	AA. DIV 6.1B	B	NB	C	S	KK. INFECTIOUS WASTE	B	NB
C	S	H. DIV 2.1 LPG	B	NB	C	S	R. Class 3B	B	NB	C	S	BB. DIV 6.1 Poison	B	NB	C	S	LL. MARINE POLLUTANTS	B	NB
C	S	I. DIV 2.1(Methane)	B	NB	C	S	S. COMB LIQ	B	NB	C	S	CC. DIV 6.1 SOLID	B	NB	C	S	MM. HAZARDOUS SUB (RQ)	B	NB
C	S	J. DIV 2.2	B	NB	C	S	T. DIV 4.1	B	NB	C	S	DD. CLASS 7	B	NB	C	S	NN. HAZARDOUS WASTE	B	NB
															C	S	OO. ORM	B	NB

26. NUMBER OF VEHICLES THAT CAN BE OPERATED IN THE U.S.

	Straight Trucks	Truck Tractors	Trailers	Hazmat Cargo Tank Trucks	Hazmat Cargo Tank Trailers	Motor Coach	School Bus			Mini-bus	Van		Limousine		
							Number of vehicles carrying number of passengers (including the driver) below								
							1-8	9-15	16+	16+	1-8	9-15	1-8	9-15	16+
OWNED															
TERM LEASED															
TRIP LEASED															

27. DRIVER INFORMATION	INTERSTATE	INTRASTATE	TOTAL DRIVERS	TOTAL CDL DRIVERS
Within 100-Mile Radius				
Beyond 100-Mile Radius				

28. IS YOUR U.S. DOT NUMBER REGISTRATION CURRENTLY REVOKED BY THE FEDERAL MOTOR CARRIER SAFETY ADMINISTRATION? Yes _____ No _____

If Yes, enter your U.S. DOT Number. _____

29. PLEASE ENTER NAME(S) OF SOLE PROPRIETOR(S), OFFICERS OR PARTNERS AND TITLES (e.g. PRESIDENT, TREASURER, GENERAL PARTNER, LIMITED PARTNER)

1. _____ *(Please print Name)* 2. _____ *(Please print Name)*

30. CERTIFICATION STATEMENT(to be completed by an authorized official)

I, _____ *(Please print Name)*, certify that I am familiar with the Federal Motor Carrier Safety Regulations and/or Federal Hazardous Materials Regulations. Under penalties of perjury, I declare that the information entered on this report is, to the best of my knowledge and belief, true, correct, and complete.

Signature _____ Date _____ Title _____ *(Please print)*

Form MCS-150 (Rev. 3-24-2005) Expiration Date: 07/31/2007

APPENDIX D: COMPARISON OF INSPECTION DATA

One component of MCMIS is the Inspection File, which contains records for driver and vehicle inspections performed as part of compliance reviews, roadside inspections, and other safety programs. These inspections form a rich resource of information about the driver and vehicle condition and their compliance with driver and vehicle standards. The purpose of the analysis in this section is to compare inspection results for carriers subject to safety regulations and those that are not subject to those regulations. This is of interest because it is expected that carriers operating vehicles and drivers that meet the standards will have higher levels of safety than carriers that do not. Inspection results were compared for two groups of bus operators: those which FMCSRs apply, and those which FMCSRs do not apply.

The Inspection File does not include variables that describe the type of carrier, so it is necessary to match the Inspection File to the Census File by the USDOT number to get the necessary information. First, for-hire bus operators were identified in the MCMIS Census File using criteria consistent with those used in Section 2.3.1. In the MCMIS Census File there are 4,662 bus for-hire operators that can be clearly identified as for-hire. The following criteria were used to identify for-hire bus operators:

1. Authorized, exempt, migrant carrier, with no other classification claimed.
2. Transports only passengers.

To identify the for-hire bus operators to whom safety regulations apply:

1. Interstate operations and either no information on drivers or one or more drivers who drive beyond 100-statute-miles of their reporting location,

   or,

2. Interstate operations but no drivers driving beyond 100-statute-miles of their reporting location and operates buses seating more than 15,

   or,

3. Intrastate operations but one or more drivers driving interstate beyond 100 miles of their reporting location.

To identify for-hire bus operators to whom safety regulations do not apply:

1. Intrastate operations and no interstate drivers,

   or,

2. Interstate operations and no interstate drivers driving interstate beyond 100-statute-miles of their reporting location and at least one interstate driver driving interstate less than 100-statute-miles of their reporting location and the carrier does not operate buses larger than 15 passengers.

In brief, the safety regulations do not currently to apply to (1) intrastate carriers operating any bus type, or (2) interstate carriers operating within 100-statute-miles of their reporting location and operating only 9-to-15-passenger vans. A carrier marked as intrastate but which had drivers who drive interstate was considered as an interstate carrier. If the drivers only drove within 100 miles interstate and the carrier did not operate buses larger than 15 passengers, then the safety regulations would be considered not to apply.

The safety regulations do apply to (1) any interstate carrier either with no driver information or interstate drivers >100 miles, (2) any intrastate carrier with interstate drivers > 100 miles, (3) any interstate carrier with no interstate drivers >100 AND interstate drivers <100 AND operating buses bigger than 15 passenger capacity. Interstate carriers with no driver information are included in the regulated category because it was judged they would most likely fall into that category if complete information were available. Note that this category includes carriers that operate buses with capacities larger than 9 to 15 passengers. The purpose here is to compare bus carriers to which the safety regulations apply to those to which the regulations do not apply.

All carriers that operate ONLY 1-to-8-passenger vehicles are deleted. There are 182 such carriers, leaving 4,480 for-hire bus operators for analysis.

The purpose of selecting the 4,480 is (1) to identify any differences in safety between those subject to FMCSRs and those that are not, and (2) to describe the characteristics of the two groups. Accordingly, the 4,480 carriers should be considered to be a sample of the true bus population, rather than an estimate of the true bus population.

These 4,480 for-hire bus carriers were matched to the file of Inspection records. There are approximately 10.4 million inspection records, covering the period from 2001 to 2005. The 4,480 for-hire bus carriers were matched to the Inspection records using the USDOT Number. In the Census File, this number is recorded in a variable called CENSUS_NUM. In the Inspection File, it is recorded in a variable called DOT_NUMBER. The USDOT number is assigned by the FMCSA and uniquely identifies a carrier.

Table D-1 shows the results of the match. Overall, inspection records were found for 2,281 of the 4,480 or 50.9 percent of carriers. The match rate was higher for carriers under the safety

regulations than those who are not. Inspection records were found for only 24 percent of carriers not subject to the safety regulations, compared with 57.4 percent of the regulated carriers. If most inspections take place at weigh stations, one possible explanation is that the unregulated carriers are less likely to operate on roads that expose them to the risk of inspection. Unregulated carriers also may be allowed to bypass the inspection stations because no State regulations apply.

Table D-1. Match Results by Carrier Type

Carrier Type	Not Matched	Matched	Total
Safety Regulations Apply	1,535	2,071	3,606
Safety Regulations do not Apply	664	210	874
Total	**2,199**	**2,281**	**4,480**

Table D-2 shows the number of inspections found for the two carrier types.

Table D-2. Inspections by Carrier Type

Carrier Type	Total	Inspections/ Carrier
Safety Regulations Apply	50,883	24.6
Safety Regulations do not Apply	2,099	10.0
Total	**52,982**	**23.2**

Note that the inspections are classified by the carrier characteristics, not the vehicle inspected. Carriers are classified by whether the safety regulations apply. The inspection data do not identify the size of the bus, and only identify a few bus types: bus, limousine, motor coach, and school bus. These bus types are not further defined in the documentation for the Inspection File (MCMIS, 2004). Thus, in the analysis of the inspection results that follows, the actual inspection may have been of a type of bus or even another vehicle type. The comparisons made are proper to the carriers, not vehicles.

Table D-3 shows the distribution of the types of units inspected. Note that the "bus" category accounts for a bit more than 50 percent of both carrier types, but the motor coach category accounts for 40.8 percent of the units inspected for carriers subject to the safety regulations. However, but only 18.9 percent of carriers not subject to the regulations. Limousines, school buses, and "vans" are proportionately higher for carriers not subject to the regulations.

Table D-3. Unit Inspected by Carrier Type

Unit Type	Safety Regulations Apply		Safety Regulations Do Not Apply		Total	
	N	%	N	%	N	%
Missing data	124	0.2	1	0.0	125	0.2
Bus	26,737	52.3	1,200	56.4	27,937	52.5
Dolly Converter	2	0.0	0	0.0	2	0.0
Full Trailer	15	0.0	4	0.2	19	0.0
Limousine	143	0.3	126	5.9	269	0.5
Motor Carrier*[*sic*]	20,861	40.8	401	18.9	21,262	39.9
Other	114	0.2	11	0.5	125	0.2
Pole Trailer	0	0.0	1	0.0	1	0.0
School Bus	1,760	3.4	201	9.5	1,961	3.7
Semi Trailer	200	0.4	21	1.0	221	0.4
Straight Truck	270	0.5	44	2.1	314	0.6
Truck Tractor	509	1.0	21	1.0	530	1.0
Van	382	0.7	95	4.5	477	0.9
Invalid data	1	0.0	0	0.0	1	0.0
Total	**51,118**	**100.0**	**2,126**	**100.0**	**53,244**	**100.0**

* Labeled as such in the inspection data, though no doubt a misprint for motor coach.

The inspections evaluate compliance of both the vehicle and driver with applicable standards. Violations are recorded for each, as well as whether the violations are sufficient to put the vehicle or driver out-of-service. In the inspection data, there are six variables that capture counts of ordinary violations and out-of-service conditions for the driver, the vehicle, and the aggregate of violations and out-of-service conditions identified in the inspection.

Table D-4 shows the available variables and the definitions of the variables as described in the file documentation. These six variables—driver violations, driver out-of-service conditions, vehicle violations, vehicle out-of-service conditions, total violations, and total out-of-service conditions—are used here as indicators for the carriers.

Table D-4. Variable Definitions for Results of Inspections

Total Violations (VIOL_TOTAL)	Indicates the total number of violations for the inspection.
Total Out-Of-Service Violations (OOS_TOTAL)	Indicates the total number of out-of-service violations for the inspection.
Total Driver Violations (DRIVER_VIOL_TOTAL)	Indicates the total number of driver violations for the inspection.
Total Driver Out-Of-Service (DRIVER_OOS_TOTAL)	Indicates the total number of driver out-of-service violations for the inspection.
Total Vehicle Violations (VEHICLE_VIOL_TOTAL)	Indicates the total number of vehicle violations for the inspection.
Total Vehicle Out-Of-Service (VEHICLE_OOS_TOTAL)	Indicates the total number of vehicle out-of-service violations for the inspection.

Table D-5 shows the overall results of the inspections for all matched carriers. There were a total of 52,982 inspections of the carriers. Overall, the inspection resulted in the vehicle or driver placed out-of-service in 9.9 percent of the inspections. At least one violation was discovered in 49.8 percent of the inspections. Vehicle violations were much more common than driver violations. Violations were recorded for only 13.6 percent of the drivers, compared with 42.6 percent of the vehicles.

Table D-5. Inspection Results for All Matched Carriers

Inspection Result	None	One or More	% One or More
OOS_TOTAL	47,739	5,243	9.9%
VIOL_TOTAL	26,592	26,390	49.8%
VEHICLE_OOS_TOTAL	48,874	4,108	7.8%
VEHICLE_VIOL_TOTAL	30,430	22,552	42.6%
DRIVER_OOS_TOTAL	51,652	1,330	2.5%
DRIVER_VIOL_TOTAL	45,773	7,209	13.6%

Exempt and Non-exempt Carriers

The comparison involves two types of carriers—those to which the safety regulations apply and those to which the safety regulations do not apply. The most specific goal of the project is to identify any safety differences between for-hire operators of 9-to-15-passenger vans in interstate commerce that are exempt from Federal safety regulation and for-hire operators of 9-to-15-passenger vans in interstate commerce that are not exempt from regulation. Both the overall comparison between regulated and not-regulated groups and the more specific comparison of unregulated 9-to-15-passenger vans in interstate commerce and regulated 9-to-15-passenger van carriers in interstate commerce are addressed in this report. Arguably, we are concerned with the effect of Federal regulation on the behavior of for-hire bus carriers. There is no a priori reason to

think that the effect would be different on carriers that operate 9-to-15-passenger buses than on those who do not operate such buses, so a comparison of regulated to not regulated is a reasonable approximation of the ideal comparison.

These results are reflective of the operations and standards of the bus operators, but they are not themselves a measure of safety. While it is expected that operators with high rates of noncompliance with vehicle and driver standards also have higher rates of traffic crashes (and there is some literature that indicates such a relationship), safety is not directly measured here, just compliance with applicable vehicle and driver standards. The safety comparison must be made with different data.

Overall, bus carriers subject to safety regulations have higher rates of violations and out-of-service conditions for drivers, vehicles, and combined. Table D-6 shows the percentage of inspections that resulted in violations or out-of-service conditions for carriers to which the safety regulations apply and those to which they do not. The difference in the percentages is also shown along with the results of a test of significance. The test of significance tests whether the two percentages are statistically different, in other words, whether the percentage shown in the difference column is reliably different from zero. The usual significance level used to identify statistically significant results is 0.05; significance levels higher than 0.05 are not judged statistically reliable, while those below are considered reliable.

Table D-6. Difference in Inspection Results by Carrier Type

Inspection Result	Safety Regulations Apply		Safety Regulations Do Not Apply		Difference (Reg – Not)	Significance
	Inspections	% One or More	Inspections	% One or More		
OOS_TOTAL	50,883	9.9%	2,099	8.9%	1.0%	0.1063
VIOL_TOTAL	50,883	50.4%	2,099	35.0%	15.4%	<0.0001
VEHICLE_OOS_TOTAL	50,883	7.8%	2,099	7.7%	0.1%	0.8838
VEHICLE_VIOL_TOTAL	50,883	43.0%	2,099	31.0%	12.1%	<.00001
DRIVER_OOS_TOTAL	50,883	2.6%	2,099	1.4%	1.1%	<0.0001
DRIVER_VIOL_TOTAL	50,883	13.8%	2,099	8.1%	5.8%	<0.0001

In some cases the differences observed are statistically significant. Over half of the inspections of the vehicles of the regulated for-hire carriers identified at least one violation, compared with 35 percent of the inspections of carriers not subject to the safety regulations. This difference is significant at the 0.001 level. Carriers not subject to the safety regulations also had lower rates of vehicle violations, drivers out-of-service, and driver violations. The differences for overall out-of-service and vehicle out-of-service were not significant, but the difference for driver out-of-service is statistically significant, though of marginal practical significance. Note that,

contrary to anecdotal lore, drivers for carriers to whom the safety regulations apply actually have much higher rates of violations that those to whom the regulations do not apply.

Table D-7 shows the same comparison between bus operators subject to safety regulations and those that are not, but this time it is restricted to carriers that include 9-to-15-passenger buses in their fleets. Note that the number of inspections in the comparisons are based on many fewer inspections than in Table D-6. In this subset, the carriers that are not subject to the safety regulations have slightly higher rates of OOS and vehicle OOS, though both differences do not attain significance at the 0.05 level. Overall, regulated carriers have significantly higher rates of violations and vehicle violations. Driver violations are also higher for the regulated carriers, and the difference is statistically significant. The difference for driver OOS is slight and not significant.

Table D-7. Difference in Inspection Results by Carrier Type Operators of 9-to-15-Passenger Buses Only

Inspection Result	Safety Regulations Apply		Safety Regulations Do Not Apply		Difference (A – B)	Significance
	Inspections	% One or More	Inspections	% One or More		
OOS_TOTAL	8,123	9.2%	484	11.0%	-1.7%	0.2424
VIOL_TOTAL	8,123	50.1%	484	40.7%	9.4%	<0.0001
VEHICLE_OOS_TOTAL	8,123	7.0%	484	9.5%	-2.5%	0.0703
VEHICLE_VIOL_TOTAL	8,123	43.0%	484	36.8%	6.3%	0.0058
DRIVER_OOS_TOTAL	8,123	2.5%	484	1.7%	0.9%	0.1454
DRIVER_VIOL_TOTAL	8,123	13.5%	484	10.3%	3.2%	0.0263

Table D-8 compares most directly the target group of bus operators with a comparable group. The target group consists of operators of 9-to-15-passenger buses that travel interstate but do not go beyond 75 miles. In the Census File, carriers with drivers that stay within 100-statute-miles of their reporting location serve as a surrogate for this group. The obvious comparison group is interstate operators of 9-to-15-passenger buses that go beyond a 100-statute-mile radius of their reporting location. Both groups might operate the same bus type in interstate commerce, but one stays within close proximity of its reporting location and is therefore not subject to the safety regulations. In the comparison that follows, carriers that operate buses larger than 9 to 15 passengers were excluded.

Table D-8 shows the results. Only 237 total inspections were available, 164 for the regulated group and 73 for the unregulated. Because the number of inspections is so few, none of the differences are statistically significant, except for the proportion of carriers with driver violations. Over 35 percent of the regulated group had one or more driver violations, compared with only 11 percent of the unregulated carriers. This difference is large enough to be

statistically significant. Vehicle violations were found at a higher rate for the unregulated carriers, but the differences were not large enough to be statistically significant.

Table D-8. Inspection Results for Interstate Operators of 9-to-15-Passenger Buses within 100 Miles and More than 100 Miles

Inspection Result	Drivers Go More than 100 Miles from Reporting Location		Drivers Stay within 100 Miles of Reporting Location		Difference (A – B)	Significance
	Inspections	% One or More	Inspections	% One or More		
OOS_TOTAL	164	17.7%	73	17.8%	-0.1%	0.9816
VIOL_TOTAL	164	69.5%	73	58.9%	10.6%	0.1227
VEHICLE_OOS_TOTAL	164	7.9%	73	13.7%	-5.8%	0.2093
VEHICLE_VIOL_TOTAL	164	54.3%	73	57.5%	-3.3%	0.6421
DRIVER_OOS_TOTAL	164	11.0%	73	5.5%	5.5%	0.1319
DRIVER_VIOL_TOTAL	164	35.4%	73	11.0%	24.4%	<0.0001

Changes within the Same Carrier after they Adopted the Federal Regulations

Overall, the inspection results do not support the notion that the carriers not subject to FMCSRs have higher rates of violations, either by the vehicle, driver, or both, than carriers that are subject to the regulations. One part of the explanation for this finding may be that the 9-to-15-passenger vans are required to submit to relatively few inspections. They may not stop at weigh stations where a large proportion of the inspections are administered. Moreover, it is possible that the inspections are more cursory. Furthermore, those carriers not under the Federal safety regulations are not required to undergo compliance reviews. The number of inspections recorded in MCMIS is relatively low, which makes reliable comparisons difficult.

Conclusions

Though the MCMIS Crash File includes many elements that are relevant, underreporting of crashes is a serious limitation. Evaluation of the level of reporting from seven States shows that the States on average report fewer than 30 percent of reportable bus crash involvements. Reporting rates for bus involvements ranged from 2.8 percent in Florida to 82.2 percent in New Jersey. Reporting rates to the MCMIS Crash File are associated with vehicle type, such that rates are higher for larger vehicles, so it is likely that the reporting rate for 9-to-15-passenger vans is even lower than the rate for buses overall. However, the ability to identify the carrier and link to the MCMIS Carrier File is a major strength of the Crash File.

Several performance measures were considered. These included the OOS rate, the ratio of fatal crashes to crashes, and the ratio of injury crashes to crashes. Perhaps because it is too early to see the effect of the new regulations on the OOS rate, it was not shown to be an effective measurement of improved performance. However, the fatal and injury crash to total crash ratios

were found to be useful measures. Based on 5 years of data, the differences in the ratios between carriers not covered by the FMCSRs and those covered by the regulations is 50 and 10 percent for the fatal and injury crash to total crash ratio.

If the improved performance is applied to interstate carriers that are currently not covered by the FMCSRs because of the 75-air-mile exclusion rule, then it is estimated that annually, about 16 fatalities and 115 injuries will be prevented.

APPENDIX E: EXAMPLES OF REPORTABLE ACCIDENT RECORDS

This appendix shows examples of the reportable accident records used to tabulate crashes and fatalities. Table E-1 shows about 20 carrier records where a USDOT number was listed and the vehicle configuration was specified as a "3." Also listed is whether the crash resulted in a fatality and the number of fatal or non-fatal crashes listed for the carrier. It would not be expected that some of the carriers listed actually own 9-to-15-passenger vans (e.g., Dick Simon Trucking). However, there are other fields that would indicate the vehicle configuration was not a 9-to-15-passenger van, specifically the bus/truck field that indicates whether the vehicle listed was a truck or a bus. In all the cases shown in Table E-1, the record was for a bus, not a truck. Clearly many of these motor carriers are for-hire carriers and are, therefore, subject to the FMCSA regulations.

Table E-1. Example of Carriers with Reportable Accidents Having USDOT Numbers

DOT Number	Carrier Name	City	State	Vehicle Configuration	Fatal Crash	# Crashes
337	ANDERSON COACH & TRAVEL	GREENVILLE	PA	3	No	2
9354	C & W TRANSPORTATION INC	LEXINGTON	MA	3	No	1
9766	D&H PRODUCE CO	SHERMAN OAKS	CA	3	No	1
12016	GRAY LINE OF SEATTLE (EVERGREEN TRAILS INC)	SEATTLE	WA	3	No	1
12096	AIRBORNE EXPRESS	SEATTLE	WA	3	No	1
16130	RYDER TRUCK RENTAL INC	MIAMI	FL	3	No	1
21331	DICK SIMON TRUCKING INC	WEST VALLEY CITY	UT	3	No	1
22471	OAK HILL PARTS INC	OAK HILL	OH	3	No	1
23858	CAPE ANN TRANSPORTATION AUTHORITY	GLOUCESTER	MA	3	No	1
25197	THE HERTZ CORP	PARK RIDGE	NJ	3	No	1
27935	SYSTEM TRANSPORT INC	CHENEY	WA	3	No	1
29272	WESTERN ENGINEERING COMPANY INC	HARLAN	IA	3	No	1
30118	KARST STAGE INC	BOZEMAN	MT	3	Yes	1
30118	KARST STAGE INC	BOZEMAN	MT	3	No	1
30158	RIMROCK TRAILWAYS	BILLINGS	MT	3	No	1
31806	COLONIAL COACH CORP	MAHWAH	NJ	3	No	1
34733	PILGRIMS PRIDE CORPORATION	PITTSBURG	TX	3	No	1
40032	GREGG BUS SERVICE	YORKLYN	DE	3	No	1
40959	SMITH TRUCKING CO INC	PAGELAND	SC	3	Yes	1
44110	GREYHOUND LINES	OKLAHOMA CITY	OK	3	No	1
44110	GREYHOUND LINES INC	DALLAS	TX	3	No	14
44952	NORTH PARK TRANSPORTATION CO	DENVER	CO	3	Yes	1

The crashes and fatal crashes reported for the carriers like those listed in Table E-1 were used to evaluate the fatal-crash-to-crash and injury-crash-to-crash ratios for 9-to-15-passenger van carriers subject to the FMCSA regulations at the start of 2004. The accident record is much more extensive than the few columns shown. One of the fields is the accident date. If it occurred before calendar year 2004, reportable accidents involving 9-to-15-passenger vans were to be reported but the carriers were not subject to the FMCSA regulations. The fatal-crash-to-crash and injury-crash-to-crash ratios were tabulated yearly and the ratios for 2002 and 2003 were compared to the ratios for 2004 and 2005 and the percentage change between the two biennial periods was used to evaluate the effectiveness of the FMCSA regulations on these carriers.

Table E-2 shows a few of the reportable accident records where the USDOT number field was blank. It can be seen that many of these motor carriers are local service organizations providing regional transport services for specific groups of people. Clearly many of these motor carriers are not for-hire carriers and therefore not subject to the FMCSA regulations. The crashes and fatal crashes reported for these carriers were used to evaluate the fatal-crash-to-crash and injury-crash-to-crash ratios for carriers not subject to the FMCSA regulations. Since it is believed that none of these carriers come under the FMCSA regulations, the biennial performance of these ratios over the four-year period were used as a reference data. If the fatal and injury ratios did not change for these carriers and did change for the carriers that came under the FMCSA regulations after the first biennium, then the change could be attributed to the effectiveness of the regulations. This is just what was observed and is the basis for the benefit side of the benefit-cost analysis.

Table E-3 lists the 14 carriers that stated on the Census record that although they were interstate carriers, they could be excluded from meeting the FMCSA regulations because they operate no vans more than 100 miles from the normal work reporting location. Thus it is believed that these carriers might be affected if the 75-air-mile exclusion were removed. Any reportable accidents recorded for these carriers were not included in the calculation of the fatal and injury crash ratios for carriers covered by the FMCSA regulations at the beginning in 2004.

Tables E-1 through E-3 raise several questions regarding the criteria used to select which carrier was covered by the regulations at the start of 2004 and which still are not included based on the 75-air-mile exclusion. In Section 4.3, reference was made to a Serious Crash Analysis performed on HM Carriers that found the USDOT number blank in many of the records only to find out that in 15 percent of the crashes, the number was filled in on the Police Accident Report. For this reason, a 30 percent standard deviation was used in the sensitivity analysis to cover the uncertainty in identifying the 9-to-15-passenger van operators covered by the FMCSA regulations or those still not covered by the regulations. Table E-2 presents about 20 of the more than 1,500 9-to-15-passenger van carriers that have had reportable crashes in the last 4 years. About 500 were checked against the census records to see if the 15 percent of them might be for-hire carriers and have to get USDOT numbers if the 75-air-mile exclusion were removed. At least 50 percent of the carriers appeared to be private carriers and could therefore be excluded. For the remaining 50 percent of the carriers it was difficult to judge who might be operating

under the 75 mile-exclusion criterion. Out of approximately 1,500 reportable accidents where no USDOT number was listed, there were over 200 records where the crash State was different from the State given in the Carrier File as the carrier's mailing address. These 200 records make up about 15 percent of the reportable accidents where no USDOT number was listed. As a result of this finding alone, use of a standard deviation of 30 percent in the estimate of the number of reportable accidents by carriers covered by the FMCSA regulations was, therefore, judged to be unreasonable.

Table E-2. Example of Carriers with Reportable Accidents and No USDOT Number

DOT Number	Carrier Name	City	State	Vehicle Configuration	Fatal Crash	# Crashes
	10-15 REGIONAL TRANSIT AGENCY	OTTUMWA	IA	3	No	1
	36TH ST GROUP HOME	KANSAS CITY	MO	3	No	1
	3A EDJ TRANSIT (SEATTLE SCHOOL DISTRICT)	SEATTLE	WA	3	No	1
	5TH & OAK ENTERPRISE INC	WASHINGTON	MO	3	No	1
	A & E WESTCOAST TRANSPORT	SAN CARLOS	CA	3	No	1
	A & K TRANSPORTATION	TUCSON	AZ	3	No	1
	A L E TRANSPORTATION	HAZELWOOD	MO	3	No	1
	A TO Z TRANSPORTATION	DALLAS	TX	3	No	1
	A TO Z TRANSPORTATION	DALLAS	TX	3	Yes	1
	ABC PARKING LOT MAINTENANCE INC	CORONA	CA	3	No	1
	ABC TRANSPORTATION	DETROIT	MI	3	No	2
	ACADIANA MEDICAL TRANSPOR	LAFAYETTE	LA	3	No	1
	ACE PARKING MANAGEMENT INC	SAN DIEGO	CA	3	No	1
	ACE RENTAL	PLAINFIELD	IN	3	No	1
	ACTON AGUA DULCE UNIFIED	ACTON	CA	3	No	1
	ADAMS BROWN HEAD STA	GEORGETOWN	OH	3	No	1
	ADAMS CO BD OF ED	WEST UNION	OH	3	No	1
	ADAMS CO OHIO VALLEY	WEST UNION	OH	3	No	2
	ADAMS PRODUCTS COMPANY	MORRISVILLE	NC	3	No	1
	ADVANTAGE TRANSPORTATION LLC	VAN NUYS	CA	3	No	1
	AGENCY ON AGING	PHOENIX	AZ	3	No	1
	AH SUE DAVID & SOPO	PAGO PAGO	AS	3	No	1
	AIRPARK ST LOUIS LLC	ST LOUIS	MO	3	No	2

Table E-3. Carriers Who Might be Operating under the 75-Air-Mile Exclusion

DOT Number	Carrier Name	Street	City	State
709384	ANTELOPE VALLEY AIRPORT EXPRESS INC	42540 6TH STREET EAST STE B	LANCASTER	CA
533058	AWARDS LIMOUSINE SERVICE INC	ONE BETHESDA METRO CENTER	BETHESDA	MD
698922	EAST ARKANSAS AREA AGENCY ON AGING INC	2005 EAST HIGHLAND DRIVE	JONESBORO	AR
892937	HAMILTON & HAMILTON	1000 SHEPARD LANE	CINCINNATI	OH
348603	HAMILTON TOURS INC	203 S LOCUST ST	OXFORD	OH
867636	HUDSON CHICAGO TOURS INC	3700 NORTH MANHEIM	FRANKLIN PARK	IL
1028951	KANSAS CITY SHUTTLE LLC	1300 LYDIA	KANSAS CITY	MO
738955	LOCAL MOTION INC	161 NORTH ST	NEWTONVILLE	MA
87845	MISSISSIPPI COAST LIMOUSINE INC	9257 W OAKLAWN RD	BILOXI	MS
255740	REHBEIN TRANSIT INC	6298 HODGSON ROAD	CIRCLE PINES	MN
724383	RIVER BEND TRANSIT	7440 VINE STREET COURT	DAVENPORT	IA
896559	ROBERTS TOURS & TRANSPORTATION INC	680 IWILEI ROAD STE 700	HONOLULU	HI
649970	TRANSIT AUTHORITY OF NORTHERN KENTUCKY	3375 MADISON PIKE	FT WRIGHT	KY
825084	VELV LLC	5350 E SPEEDWAY	TUCSON	AZ