

Title: **TOWARDS A HEAVY VEHICLE SAFETY STRATEGY**

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**Abstract:** The draft National Road Safety Strategy sets an overall target for reducing the road toll by 2010, but does not specify targets for reductions in crashes involving trucks and buses. This paper describes the formulation of a Heavy Vehicle Safety Strategy. Only marginal improvements in heavy vehicle safety have occurred since the early 1990s and substantial increases in heavy vehicle traffic are forecast. Consequently, the overall burden of heavy vehicle crashes may increase. The aim of the strategy will be to reduce both fatal crashes and crashes involving serious injuries, where a truck or bus is involved.

The strategy is to be jointly developed by the National Road Transport Commission (NRTC), Australian Transport Safety Bureau (ATSB), Department of Transport and Regional Services (DoTRS), industry representatives and State and Territory government agencies. The strategy will be research based and will review both Australian and overseas initiatives to improve heavy vehicle safety. Consultations and negotiations will form a vital part to acceptance of the strategy, which will incorporate both an action plan and a research plan.

Formulating the strategy is in its very early days, but is expected to provide a significant plank in support of the draft National Road Safety Strategy.

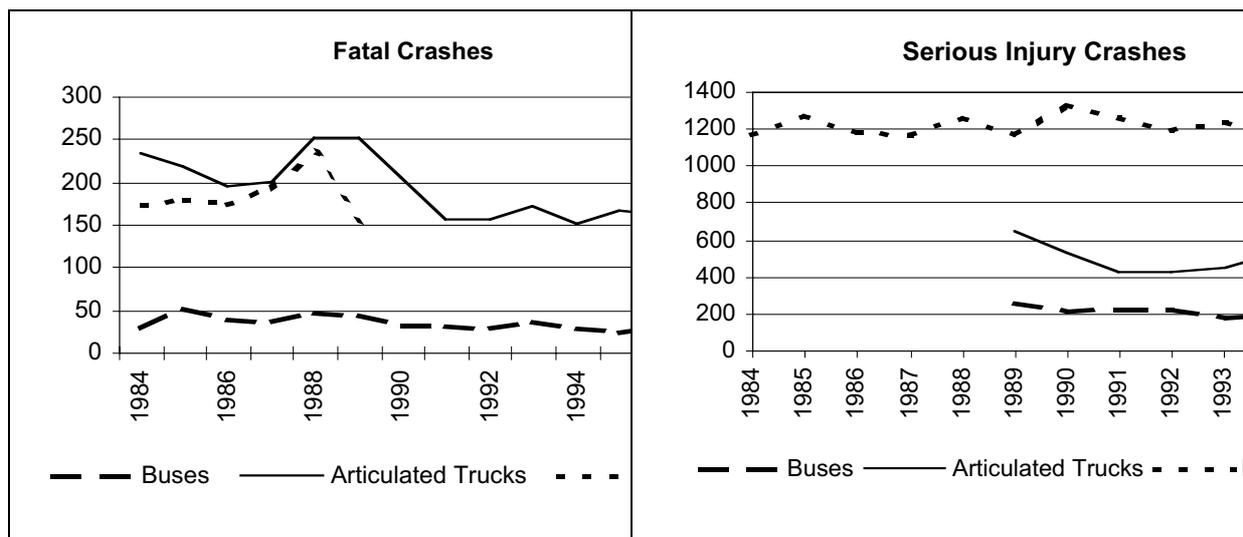
## **1 THE NEED TO ADDRESS HEAVY VEHICLE SAFETY**

### **1.1 Australian Heavy Vehicle Safety Performance**

In 1996 there were almost 280 fatal crashes involving heavy vehicles and a further 1 800 crashes that resulted in serious injuries. More than 85 truck drivers and almost 200 other road users were killed in crashes involving trucks alone. The number of people killed in crashes involving buses is not known. FORS reported in 1997 that 20 per cent of fatal crashes involved a heavy vehicle (FORS 1997).

A national road safety strategy is being prepared which aims to reduce the road toll by 40 per cent in the next ten years. The Bureau of Transport Economics (BTE) forecasts that the amount of truck traffic will double in the next fifteen years, and increase by 75 per cent in the next ten years, unless there is a significant improvement in vehicle productivity (BTE 1995 and BTE 2000). Car traffic is forecast to increase at a lesser rate of 20 to 40 per cent over the same period. This suggests there will be more trucks on roads, forming a greater proportion of the traffic stream unless other changes occur.

Significant reductions in fatal truck crashes occurred at the start of the 1990's, but there have been only marginal reductions in fatal truck crashes since then, and little reductions in bus crashes or truck crashes resulting in serious injuries, as shown in [Figure 1.1](#) (Calvert 1999). Consequently, traffic growth might see the total burden of truck crashes increasing by 2010. This would not be consistent with an overall national target of reducing the road toll by 40 per cent by 2010.



**Figure 1.1: Fatal and Serious Injury Crashes Involving Heavy Vehicles by Year**

## 1.2 The Need for a Strategy

A strategic approach to road safety was adopted over the 1990s. A new draft National Road Safety Strategy setting out the policies and approaches to road safety through to 2010 is currently being finalised. As noted, the Australian Transport Council has already agreed that the National Strategy should adopt a target of reducing the road toll by 40 per cent over this period. The National Road Transport Commission has been closely involved in the process of preparing the strategy, which has been drafted by the ATSB. This National Strategy provides an approach to and framework for addressing all road safety problems, but naturally does not focus in detail on heavy vehicle safety performance. A Heavy Vehicle Safety Strategy could be prepared to directly address heavy vehicle safety in support of the objectives and policies outlined in the National Road Safety Strategy.

The NRTC, along with ATSB and State and Territory road safety authorities, has also pursued a road safety strategy for heavy vehicles over the past nine years. This has involved progressing national reforms in relation to:

- drivers, through improved driver licensing systems, restrictions on blood alcohol levels, regulations on driving hours and improved controls on speeding;
- operators, through extended compliance responsibilities, greater responsibilities in minimising both driver fatigue and speeding offences; and
- heavy vehicles, through reforms to vehicle standards and registration systems.

Most recently, the focus of existing work on heavy vehicles has shifted to concentrate on performance-based standards, heavy vehicle driver fatigue and driver health and safety issues.

The current approach to regulating heavy vehicles is being reviewed in a major joint NRTC/Austrroads study with a view to introducing performance-based standards. To implement this approach, explicit objectives regarding heavy vehicle safety must be incorporated, and the extent to which different levels of performance-based standards (for vehicle mass, size and configuration) can contribute to these objectives must be understood. Broader reviews of truck safety are also currently in train, with the NSW Motor Accidents Commission inquiry into long distance trucking and the Commonwealth Parliament inquiry into fatigue in transport. These broader reviews are evidence of some community disquiet over truck safety.

A wide-ranging analysis of truck and bus safety has not been undertaken in Australia since the late 1980s and early 1990s, when a New South Wales truck safety study was undertaken and an industry-supported Australia-wide review of heavy vehicle safety was prepared. One of the reasons for initiating these studies was the very bad safety record of trucks in 1988 through to 1990. Since then, the only other major study of heavy vehicle safety was an analysis of the safety performance of heavy vehicles in urban areas and potential countermeasures

undertaken on behalf of Austroads by a broad consortium of consultants. The results of this substantial study have not been acted on or formulated into strategies for reducing crashes involving heavy vehicles.

The lack of substantial progress in reducing the total number of fatal and serious injury crashes involving heavy vehicles since the early 1990s, forecasts of substantial growth in road freight, the needs highlighted by the investigation of performance-based standards and broader community concerns all indicate a need to address heavy vehicle safety. This suggests that there is a need to examine heavy vehicle safety in detail to determine what needs to be done to improve safety of these vehicles within the context of the national road safety strategy. In determining appropriate actions, research will be necessary to confirm problem areas and the best countermeasures. To ensure that this can occur, a research plan or research strategy is needed. For research to be translated into reductions in fatalities and serious injuries from crashes involving heavy vehicles, an action plan is necessary which ensures proven countermeasures are adopted and future heavy vehicle policy initiatives reflect new directions to improve heavy vehicle safety.

The ATSB and the DoTRS are both supportive of the development of a heavy vehicle safety strategy in conjunction with the NRTC. The potential for a strategy has also been raised with the Australian Trucking Association (ATA), who have expressed interest.

## **2 WORK CURRENTLY IN-TRAIN**

While there is a need for a Heavy Vehicle Safety Strategy, this does not mean that work to improve heavy vehicle safety has all stagnated. Instead it indicates that there is a need to assess the results of work currently in train and look to where alternative approaches or gaps in policies may exist. There is a significant body of work currently in train that would form a valuable input to the development of a Heavy Vehicle Safety Strategy. For example:

- ***Truck Crash Statistics***

ATSB is currently collating and analysing details of truck crash statistics. This work will provide significant insights into the nature and causes of truck crashes in Australia. It will also provide some indication of trends over time. Consequently, this work could be used as the fundamental building block of a Heavy Vehicle Safety Strategy. It could form the basis for identifying the problem areas in truck safety that need to be addressed, and provide guidance on appropriate means of reducing truck crashes, thereby forming the foundation work underlying a Heavy Vehicle Safety Strategy.

However, the work is focussed on fatal truck crashes (due to data availability) and does not address the road safety performance of buses. Consequently, some additional analysis will be necessary to assist in the development of a Heavy Vehicle Safety Strategy that aims to reduce both fatal and serious injury crashes involving heavy vehicles and include actions, policies and research to address both truck and bus safety performance.

- ***International Benchmarking***

Early results of work to compare the safety performance of Australian trucks with trucks in other countries suggests that Australian trucks may have a worse safety record than trucks in some other countries, but are better than others. Prof Peter Vulcan, Dr Narelle Howarth and Dr Peter Sweatman are undertaking this international benchmarking study for the NRTC. Early results have also suggested that there may be some significant differences in the types of crashes.

The next stage of the study will confirm these results and provide greater detail on the differences in safety performance. It will also investigate the reasons for these differences, assessing differences in infrastructure, road use, vehicle design and regulatory controls. The preliminary results suggest that there is room for improvement in Australian truck safety, and further work in the study will provide an indication of the specific nature of truck safety problems and successful approaches to addressing these problems that have been adopted overseas.

- ***3<sup>rd</sup> Heavy Vehicle Reform Package***

In March 2000, the Australian Transport Council approved a programme of work that is to form the focus and priority for heavy vehicle reforms over the next three years. This package follows from two previous programmes of priority heavy vehicle reforms. The 3<sup>rd</sup> Heavy Vehicle Reform Package will form the

basis of the NRTC's work programme over the next three years. A number of other government agencies and the ATA are contributing to the package, either through resources or by acting as lead agencies to progress various elements of the work involved.

A number of elements of this reform package have a significant focus on or bearing on heavy vehicle safety. They include:

- a major programme of work to reduce and manage fatigue;
- the development of a health and safety code to provide guidance to operators and drivers on meeting legislative requirements that are important for health and safety;
- elements of the programme aimed at improving compliance with road transport laws and simplifying enforcement; and
- the development of a 'best practice' code for operator and driver performance.

The fatigue work programme and health and safety code are expected to have the greatest bearing on a Heavy Vehicle Safety Strategy. The fatigue work programme is the subject of a separate paper to this conference, so will not be detailed here.

The scope of the health and safety code is currently being explored. It will focus on issues relevant to both occupational health and safety and road safety, and is intended to be referenced under laws relating to both occupational health and safety and road transport. The code is expected to provide guidance on achieving minimum acceptable standards for health and safety, so that those following the code meet the relevant legislative requirements. Anyone not following the code may need to prove that their practices were at least as safe as those in the code. Consequently, the code may not advance additional legislative requirements but it may help achieve higher levels of road safety performance by improving compliance with existing requirements.

### 3 THE US EXPERIENCE

As in Australia, there is continuing concern in the US about heavy vehicle safety. As a result of these concerns, the Federal Motor Carrier Safety Administration is in the process of developing a strategy to improve US truck and bus safety. A target of reducing truck and bus crashes by 50 per cent by the year 2009 has been set (FMCSA 2000a). To achieve this target, a substantial body of research on truck and bus safety issues has been initiated. All aspects of truck and bus safety are being explored through this research programme. Initial discussion documents have been prepared on:

- the number and nature of truck crashes in the US, in a report titled *The Large Truck Crash Picture* (FMCSA 2000b);
- trends in road use by US trucks and buses and the potential impacts of these trends on their road safety performance in the future, in a report titled *Truck and Bus Traffic Characteristics and Safety Trends* (Fekpe 2000);
- the implications of the structure of the US road freight industry for its safety performance, in a report titled *Motor Carrier Industry Profile* (Corsi 2000a);
- the potential for preventing adverse safety outcomes by improving or altering the management of road freight operators, including both management of the industry by industry regulators and management within road freight firms, in a report titled *Safety Issues in Motor Carrier Management* (Corsi 2000b);
- the implications of current US insurance practices for the safety performance of road freight operators and the potential for insurance practices to work counter to improving road safety, in a report titled *Insuring the Safety of Motor Carrier Operations* (Corsi 2000c);
- the potential for improving the safety of US trucks by changing the design and operation of road infrastructure, including an assessment of the potential for altering geometric standards, access controls and designs, controls on road use (including route restrictions), incident management and facility improvements such as improvements to rest areas, in a report titled *Highway Infrastructure Design and Operation* (FMCSA 2000c);
- assessing the attitudes and opinions of other road users regarding heavy vehicles to assist in formulating effective public policies about heavy vehicle safety and to help reduce crashes involving trucks and other

road users resulting from errors on the part of the other road users, in a report titled *Public Awareness and Opinion on Truck and Bus Safety* (FMCSA 2000d);

- the effectiveness of current and alternative approaches to enforcement and the potential for technology to be used to ensure greater compliance, in a report titled *Enforcement Technologies and Practices* (FMCSA 2000e);
- institutional and other barriers to the introduction of technologies that can assist in reducing heavy vehicle crashes, in a report titled *Institutional Barriers to Implementing Technology in Fleets* (FMCSA 2000f);
- the need for greater uniformity in standards relating to truck and bus safety between the fifty states in the US and the potential for greater uniformity to enhance road safety, in a report titled *Compatibility of Motor Carrier Safety Regulations* (FMCSA 2000g);
- the potential for reducing truck crashes by moving freight to other modes of transport and ensuring that intermodal freight is moved safely, in a report titled *Intermodal Freight Capabilities and Alternate Delivery Systems* (Matson 2000); and
- improving the safety behaviour and performance of commercial drivers through such means as education, training, selection, medical qualifications, licensing, safety management, driver-performance-related vehicle design, and highway design, in a paper titled *Commercial Driver Safety Behaviour and Performance* (FMCSA 2000h).

This comprehensive programme of research will provide an invaluable source of information to build on in formulating a Heavy Vehicle Safety Strategy for Australia. Clearly, not everything in the US research will be able to be translated directly into Australian experience and conditions, however, there is sufficient commonality between the problems faced in the two nations to mean that the US experience will add significantly to the value of the Heavy Vehicle Safety Strategy. This work can provide a significant insight into the potential for new approaches and directions in addressing heavy vehicle safety issues. It is unlikely that the resources being utilised to prepare the US strategy to reduce truck crashes will be available within Australia. Consequently it will be important to draw extensively on this work, and similar work undertaken in other countries, as far as it is relevant.

## **4 WHAT SHOULD THE STRATEGY ENCOMPASS?**

### **4.1 Contents**

It is proposed that a Heavy Vehicle Safety Strategy should be prepared in support of the draft National Road Safety Strategy. The Heavy Vehicle Safety Strategy should establish and obtain agreement to a target for reducing fatal and serious injury crashes involving heavy vehicles by the year 2010 that will help achieve the target set for the National Strategy. The target agreed by the Australian Transport Council (the council of Australia's transport ministers) is for an overall reduction of 40 per cent by the year 2010. Consequently a target of similar magnitude can be envisaged for a Heavy Vehicle Safety Strategy.

If a Heavy Vehicle Safety Strategy is to be agreed and is to be successful, it will be important that it is solidly founded in research. Research is essential to come to an understanding of the causes of crashes involving heavy vehicles, and even more important to finding effective countermeasures that can ensure crashes are reduced. New directions to improve heavy vehicle safety should be explored. This will enable a Heavy Vehicle Safety Strategy to develop measures and outcomes that can change the emphasis of policies regarding heavy vehicles to new directions.

A Heavy Vehicle Safety Strategy will also only be successful if it is founded in sound evaluations. Evaluations should be used to identify the most effective mix of countermeasures to reduce fatal and serious injury crashes involving heavy vehicles. They should also be used to ensure that the mix of countermeasures selected is cost-effective. Unless they can be shown to be cost-effective, resources to implement them are not likely to be forthcoming and the Strategy will be ineffective.

Where evaluations point towards cost-effective countermeasures that are already sufficiently developed to put in place they would be included in an Action Plan, which will form the central component of the Strategy.

A Research Plan would also be developed to progress understanding of the causes of crashes involving heavy vehicles and potential countermeasures where these are currently not known. Perhaps even more importantly the research plan would develop cost-effective countermeasures where none exist at present.

Another important component of a Heavy Vehicle Safety Strategy is that it would be agreed or endorsed by a range of parties with an interest in the safety performance of trucks and buses. This could include government transport agencies, representatives of truck operators and the public and private bus industries. By endorsing the strategy, these parties would be agreeing to implement the elements of the Action Plan and Research Plan under their control. It is also envisaged that the Australian Transport Council would endorse the Strategy, giving it the highest level of government support and impetus.

## 4.2 Scope

If a Heavy Vehicle Safety Strategy is to be developed, it should be broadly based. That is, it should not concentrate solely on changes to truck and bus design and operation, the traditional factors considered when examining potential means of improving truck and bus safety. Instead, the Strategy should encompass issues associated with improving the behaviour and performance of other road users, infrastructure factors and heavy vehicle exposure issues as well as countermeasures aimed at improving the performance of heavy vehicles and their operators/drivers.

The main reason that a broad scope is necessary is that other road users (not the truck or bus) are found to be 'at fault' in a significant proportion of crashes involving heavy vehicles<sup>1</sup>. Therefore measures are needed that can improve the ability of heavy vehicles and other road users to share road space safely. This suggests that a range of policies and countermeasures should be explored including:

- education, training and regulatory approaches to changing the behaviour of other road users in relation to the way they interact with heavy vehicles on the roads;
- changes to infrastructure standards and operations, including geometric design, traffic controls, access controls and route restrictions so that a mix of heavy vehicles and other road users can more safely utilise the same road space;
- improvements to the compatibility of light and heavy vehicles so that in the event of an incident occurring, the occupants of both light and heavy vehicles are more protected.

The impacts of changes in the exposure of heavy vehicles to risks of crashes should also be assessed if a Heavy Vehicle Safety Strategy is to be developed. This would include investigating the impacts of changes to:

- the aggregate level of road use by trucks and buses;
- the pattern of road use by vehicle type, such as greater use of some types of heavy vehicles (such as B-doubles and truck-trailers) and less use of others (such as rigid trucks); and
- the pattern of heavy vehicle road use by time of day and type of road.

An understanding of the impact of these changes will allow policies regarding heavy vehicles to be developed and included in the Strategy that recognise the potential impacts on safety of changing exposure.

Some changes in exposure can be expected to occur as a result of market pressures and forces, including economic growth and demand for freight and passenger movements. Other changes can be achieved through regulatory changes that discourage use of less safe heavy vehicle designs or use of heavy vehicles in unsuitable conditions. For example, use of vehicles with a high tendency for rollover on heavily trafficked roads or at high speed might be discouraged through access or speed restrictions. A further example might be discouraging use of vehicles when drivers are at high risk of fatigue such as in the early hours of the morning before daybreak. However, the effects of changes such as these may be complex, and require careful consideration and evaluation. Regulatory changes can also be used to encourage improved matching of vehicles with the road and traffic conditions in which they are to be used (as is proposed under the investigation of performance-based standards for the regulation of heavy vehicles).

The development of a Heavy Vehicle Safety Strategy will also provide a mechanism for assessing, placing in context and focussing on the work to improve heavy vehicle safety through measures aimed at heavy vehicles

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<sup>1</sup> A 1997 report indicated that car drivers were at fault in more than 80 per cent of crashes involving articulated trucks and cars, with car drivers considered at fault in two-thirds of crashes involving rigid trucks and cars (FORS 1997).

themselves and the way in which they are driven and operated. A range of these measures is already under development as part of the 3<sup>rd</sup> Heavy Vehicle Reform Package, as discussed in Section 2. Clearly a Heavy Vehicle Safety Strategy might identify further areas of improvement to the performance of heavy vehicles and the way they are operated which could reduce their involvement in fatal and serious injury crashes. The Strategy should be forward looking, seeking new directions and emphases for heavy vehicle safety to underpin heavy vehicle policy initiatives.

One such area that might be investigated further in the development of the strategy is the need to introduce tighter controls on heavy vehicle operations than currently exist, to ensure that operators maintain a high focus on achieving safety outcomes and complying with safety regulations. As noted in Section 3, this is a significant focus of the work under way to develop a safety strategy for reducing truck crashes in the US. The cost and benefits of operator licensing, economic controls on freight operators and safety rating systems in support of the current Australian approach to enforcing safety controls may warrant further investigation.

## 5 NEXT STEPS

If a Heavy Vehicle Safety Strategy is to be developed, a key factor in its success will be the involvement of a variety of stakeholders, including:

- National Road Transport Commission;
- Australian Transport Safety Bureau;
- Federal Department of Transport and Regional Services;
- State and Territory government transport and safety agencies;
- trucking industry representatives;
- bus industry representatives;
- representatives of other road users;
- local government road safety officers/traffic engineers;
- enforcement agencies; and
- the road safety community.

The following steps would be necessary in order to develop the Strategy:

1. obtain stakeholder input;
2. review work on other inputs already in train (see Section 2);
3. review current research and initiatives in Australian jurisdictions and overseas developments;
4. evaluate options for the Action Plan;
5. prepare a Research Plan;
6. obtain national endorsement of the strategy; and
7. incorporate the elements of the Strategy (the Action Plan and Research Strategy) into the work programmes of stakeholders.

At this stage the development of a Heavy Vehicle Safety Strategy has in-principle support at officer level within some of the key stakeholders. Clearly a commitment of resources and priorities will be necessary if it is to proceed in the immediate term. Without a Strategy, some improvements in heavy vehicle safety may continue to be made, but there is also a risk that crashes involving heavy vehicles will become a significant impediment to the achievement of the draft National Road Safety Strategy target.

### References:

Bureau of Transport Economics (1995), Building for the Job: Commissioned Work Volume 1, National Transport Planning Taskforce, DoTRS Canberra

Bureau of Transport Economics (2000), private communication

Calvert, Fiona (1999), "Are Trucks and Buses Getting Safer?", *Road Safety Research, Policing and Education Conference Proceedings*, Canberra

Corsi, (2000b) *Safety Issues in Motor Carrier Management*, <http://spp.fmcsa.dot.gov>

Corsi, (2000c); *Insuring the Safety of Motor Carrier Operations*, <http://spp.fmcsa.dot.gov>

Corsi, Thomas (2000a), *Motor Carrier Industry Profile*, <http://spp.fmcsa.dot.gov>

Federal Motor Carrier Safety Administration (2000a), <http://spp.fmcsa.dot.gov>

Federal Motor Carrier Safety Administration (2000b), *The Large Truck Crash Picture*, <http://spp.fmcsa.dot.gov>

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Page 7

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Federal Motor Carrier Safety Administration (2000c), *Highway Infrastructure Design and Operation*, <http://spp.fmcsa.dot.gov>

Federal Motor Carrier Safety Administration (2000d), *Public Awareness and Opinion on Truck and Bus Safety*, <http://spp.fmcsa.dot.gov>

Federal Motor Carrier Safety Administration (2000e), *Enforcement Technologies and Practices*, <http://spp.fmcsa.dot.gov>

Federal Motor Carrier Safety Administration (2000f), *Institutional Barriers to Implementing Technology in Fleets*, <http://spp.fmcsa.dot.gov>

Federal Motor Carrier Safety Administration (2000g), *Compatibility of Motor Carrier Safety Regulations*, <http://spp.fmcsa.dot.gov>

Federal Motor Carrier Safety Administration (2000h), *Commercial Driver Safety Behaviour and Performance*, <http://spp.fmcsa.dot.gov>

Federal Office of Road Safety (1997), *Trucks and Road Trauma*, FORS Monograph 18, Canberra

Fekpe, Ed (2000), *Truck and Bus Traffic Characteristics and Safety Trends*, <http://spp.fmcsa.dot.gov>

Matson, Christopher (2000), *Intermodal Freight Capabilities and Alternate Delivery Systems*, <http://spp.fmcsa.dot.gov>