

Policy issues — the way forward

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This paper provides an overview of the achievements of the conference as they relate to policy matters and suggests some guidelines to be followed in the future.

1. BACKGROUND

The first policy question that must be asked is "Why?" Why must we have trucks? If we ignore them, except to regulate and tax them, will they go away? Do we need them in the first place?

Wright stated, "goods vehicles perform a function that is part of the wealth generating activities of a nation." Hahn told us, "Commercial vehicles are important for each economy. In Germany about 80% of the total transport performance is produced by about 2.8 million commercial vehicles. About 5% are so called Heavy Goods Vehicles (HGV) with total weight of over 14,000 kg." We were also told that highway goods transportation by commercial vehicles plays a most important role in long distance transportation in Japan.

The fact is, in whatever country we live, most of the goods we use in our everyday lives are at one point transported by trucks. Trucking provides an efficient and economical means of goods distribution, a system upon which commerce and our standards of living depend.

Let's agree then that trucks are important to our lives and to our transportation system. We can then get on with developing policies that will help reduce their impact on our highways and make them more productive, more efficient and better suited to our modern-day demands of safety and protection of the environment.

2. UNIFORMITY

What are our goals for uniformity?

Pearson told us uniformity may not be appropriate in a country the size of Australia, with its variety of climate, geography and population density. This implies that, where different shipper demands exist in various regions of a country or market place, the regulations and subsequent vehicle types might be varied to suit those diverse demands.

We were told by Berry that, in the European Community, a Directive has been established, and no vehicle having dimensions or weights equal to or lower than the ones mentioned in the Directive can be prohibited from circulating in the Community. The original aim for total harmonization of national and international regulations has now been tabled.

It appears a fair level of flexibility of truck size and weight will remain in the European Community within the context that trucks specified in the Directive must be allowed.

These examples suggest a policy which will provide minimum standards that must be recognized by all jurisdictions within a trading area. This policy will also have the flexibility to provide additional allowances where they are justified by special needs and economic conditions.

3. ENVIRONMENT

People around the world are concerned over the deterioration of our environment. This concern places pressure on all industries, including trucking. People perceive trucks as a cause of excessive noise, vibration and pollution and as a threat, particularly where motorists, pedestrians or cyclists, must share space with them.

Pearson, Ogden and Sweatman demonstrated a methodology that can be followed when assessing the environmental impact of longer vehicles in an urban environment. Their examples were based on experience in Australia but can be applied to many typical situations.

Gurney discussed the environmental impacts of trucks on a broader scope. The point was made that safety and environmental impact are largely perceptual judgements. He suggested several ways of easing those concerns.

The perception that trucks are detrimental to the environment will continue to receive a high level of concern from the public and from officials who are called upon to approve truck regulation.

The environmental impacts of any proposed increases in truck size or weight must be addressed in terms which are not only factual, but also convincing and easily understood by the public and the politicians.

4. ECONOMICS

Increases in truck size and weight limits are usually justified on the basis of economics. The justification requires demonstrating a positive trade-off between benefits produced by improvements in truck productivity and increases in infrastructure costs resulting from the less restrictive regulation.

This requires making assumptions about how the trucking industry will react to the availability of increased payloads and the impact that the revised loading regime will have on the highway infrastructure.

Anderson, Bervell and Teply outlined the increases in truck volumes and equivalent single axle loads that resulted from recent increases in truck weights in Canada. These increased weights were allowed on the basis that they would produce benefits in excess of the resulting highway infrastructure costs.

In the economics workshop, Hasluck described procedures followed in assessing the economics of several truck weight increase proposals in South Africa. Barry provided an overview of factors to consider when assessing the economic impact of truck weight increases.

Resulting costs and benefits should be examined as an integral part of any proposal to revise truck regulations. A policy should be adopted to assure that funds are allocated to offset any increased costs which will occur.

5. INTER-MODAL GOODS MOVEMENT

Only one paper dealt with inter-modal goods movement. In that case, Nix, Billing and Clayton discussed the ability of trucks to legally transport cargo containers within existing truck weight limits in various jurisdictions.

6. ENFORCEMENT

Clayton, Robinson and Fekpe discussed the effect enforcement can have on the incidence of axle weight overloads. They established an inverse relationship between inspection rate (the percentage of trucks passing a point weighed for enforcement purposes) and violation rate.

Wright covered the subject of enforcement in broader terms. He examined several scenarios and levels of enforcement and discussed trade-offs between level of enforcement and fine structure.

Several authors discussed the advantages of weigh-in-motion systems and the ways they can be applied to enforcement.

Where vehicles operate within a trading area spanning several jurisdictions, such as the European Community, a consistent method and level of enforcement should be applied. An enforcement policy should be based on a consideration of enforcement costs and the cost of roadway damage that will occur in the absence of enforcement. Highway safety must be an overriding consideration in the development of any enforcement policy.

Current technologies of weigh-in-motion scales and other traffic measuring devices provide effective means to evaluate the effectiveness of enforcement policies. Enforcement practices and policies must take advantages of all available advancements. Enforcement can not be allowed to inhibit advances in truck design and regulation.

7. VEHICLES

Approximately half the papers dealt, to some degree, with trucks. In some cases, the primary subject was pavement or bridge structures, but reference was made to the impact of trucks on those structures. The authors covered a wide array of truck related subjects, ranging from overall design concepts to the advantages of specific components and improved performance evaluation techniques.

Policy concerns relating to vehicles are divided into subheadings as follows:

7.(a) Vehicle Suspensions

Several papers dealt with the relative degree of roadway impact that can result from the use of various types of suspensions. Gillespie and Karamihas stated, "Typical leaf-spring type suspensions appear to be about 15% - 25% more damaging than an optimal passive suspension. Waling beam tandem suspensions may be nearly twice as damaging as optimal suspensions, as a result of poorly damped 'tandem hop' vibrations.

Several other authors indicated the same general trend.

Berry told us that the European Community now allows increased axle weights on "road friendly" suspensions, and he spoke to the need for a performance standard for suspensions, as opposed to the design restrictive criterion now used.

Opportunities exist to adopt policies which recognize the advantages of "road friendly" suspensions. This may be done through allowing additional weight on approved axle systems, through licensing concessions or by other means. The long term effect of a policy such as this will be to promote the development and use of suspensions having minimum impact on the roadway infrastructure.

7.(b) Tires

Several authors addressed the relatively aggressive nature of "Super Single" wide based tires and the effect of tire pressure on roadway wear. Some authorities now apply a weight penalty to the use of wide base single tires, as opposed to twin tires. It is interesting to note that, in the European Community where wide based single tires have been the standard, they are being discouraged in favor of twin tires. At the same time, we are told that, in the United States where twin tires have been the standard, a move to wide based single tires is very likely.

The operational efficiencies of wide base single tires must be recognized. If they are to be allowed, it should be on the basis of their benefits exceeding the cost of increased infrastructure wear that will result. The effect their use will have on highway design and the ability to undertake and fund the associated highway maintenance and upgrading must be considered.

7.(c) Vehicle Performance Measures

Several authors addressed methods of evaluating vehicle performance. From the policy perspective, it suffices to say

available methods for evaluating vehicle performance measures are advancing at a rapid rate, and they currently cover a wide range of vehicle performance characteristics.

Performance measures can be very effective tools for policy makers, if applied in a proper manner. Billing provided a list of performance measures that can be considered. He also pointed out pitfalls that can result from a policy based on a less-than-complete set of performance measures.

Policy makers should adopt the development of truck regulations based on performance measures as a goal, remembering that a policy based on less than a complete set of these measures will almost certainly be unsatisfactory. If a performance measure system is to be used, standards for those measures must be agreed upon, and practical methods of enforcement must be developed.

8. HIGHWAY INFRASTRUCTURE

Highway infrastructure costs continue to be a primary consideration in the development of policies relating to trucks. Several papers and much discussion related to the effect truck loading have on bridge and pavement structures and their implications on bridge and pavement design. The fourth power law, developed as a result of the AASHTO Road Test in the United States, was the subject of considerable discussion. Opponents of the use of this law were very vocal.

It was generally agreed that pavement wear varies in a non-linear relationship to axle loading and the type of failure that results depends on various factors including the relative thickness of the pavement and roadway structure. It was also agreed that the fourth power law should not be abandoned until a suitable replacement is agreed upon.

Policy makers must agree on a method of predicting the amount of roadway wear and cost, which will result from increased axle weight allowances. They must also have guidelines for the optimum designing of pavements to meet changing loading requirements.

The strengthening and maintenance of existing highways were well addressed. As the maturity of our highway systems increases, economical methods of highway strengthening and maintenance are increasingly important considerations.

9. THE WAY FORWARD

The questions, "Are trucks necessary to our economy and standard of living?" and "Should we promote their use?", have been answered in the affirmative. We must continue to develop policies that encourage the use of safer, more productive and less damaging trucks.

Scientists tend to conduct their research under a bushel. Their efforts may well be known within the research community but are given relatively little exposure to the general public. Every effort should be made to inform the public of measures being developed to improve the efficiency, safety and productivity of trucks. This should be part of an overall effort to promote the importance of trucks and to acquaint the public with the need to have trucks on their highways.

When making policy decisions, we should each ask ourselves, "Who are our customers?" It would be easy to believe that our customers are the companies that manufacture and operate trucks. We must realize that the trucking industry is a service industry; it provides transportation for the shippers and consumers of goods. These end users are our customers. They are the ones who place demands on the trucking industry. The trucking industry simply attempts to satisfy those demands within the existing regulatory structure. Policies that control the trucking industry should be designed to accommodate the requirements of the shippers and consumers.

A policy on uniformity may not take a universal shape, and it probably should not because shipping demands, infrastructure capacities and other economic factors vary around the world. However, a common policy must be adopted within a jurisdiction, between neighbouring jurisdictions or within trading areas where several jurisdictions are involved. That policy must encourage the use of the most stable, safe, productive vehicles that are friendly to the environment and the roadway infrastructure. The policy must provide guidelines for heavy vehicles that transport general commodities but should not inhibit the accommodation of individual local needs that can be economically justified within the jurisdiction or trading area.

The policy followed in the European Community has been provided as an example. Guidance can also be obtained from the model adopted in Canada. In that case, a performance window has been established through which trucks meeting the required standards can pass. Within that window, weight and dimensions advantages are given to trucks that are the most stable and the most friendly to the highway infrastructure. Safety is an overriding criterion. Performance standards have not been applied directly. Weight, dimensions and truck design standards have been applied as surrogate measures to maintain performance standards./

The trend to the use of standards based on performance measures for the design and evaluation of trucks should be encouraged. Where they are used, care must be taken to ensure that a less than complete set of performance measures does not contain loop holes which will allow the design of unsatisfactory vehicles.

It is probably premature to adopt a policy based entirely on performance measures at this time.

It was somewhat surprising, from a policy perspective, that there were not more papers relating to inter-modal transportation.

Many opportunities exist to improve overall transportation efficiency and to conserve energy through the development of inter-modal transportation policies. This facet of the overall transportation picture should be considered when dealing with truck policies.

New methods that will make roadways stronger, easier to maintain and repair and less costly must continue to be developed. Weigh-in-motion scales and other technology are now available to aid in the task of designing and maintaining roadways.

When considering the use of performance standards, allowing additional weights on approved axle types, etc., we are undoubtedly increasing the complexity of the enforcement operation. Enforcement officials now have advanced technology available to them, and they must develop ways to adjust to these somewhat more complex demands. Difficulties arising from enforcement must not be allowed to inhibit the application of new technologies to trucks.

Communication must be maintained within the community of truck and highway researchers and policy makers. The proposal to form a permanent organization to run the International Symposia on Heavy Vehicle Weights and Dimensions, with its associated computerized information exchange system, will be a valuable aid in accomplishing this communication.

Trucks on our highways today are very primitive machines. They don't know if their brakes are in adjustment or if they are in adequate repair. They don't know what pressure is in their tires or what force they apply to the roadway surface. If they have self-steering axles, there must be a side force generated by roadway friction to make the turn. If a trailer has more than one axle, tires slide and scuff when a corner is turned. Technology that can provide a better way to design and build trucks is now available.

A challenge exists for policy makers to adopt rules that promote the use of better technology in the trucking industry.

HEAVY VEHICLES AND ROADS

TECHNOLOGY, SAFETY AND POLICY

EDITED BY D. CEBON AND C. G. B. MITCHELL

With the advent of the single European market and new legislation on vehicle weights and dimensions, the issues affecting road infrastructure, heavy goods vehicles and the interaction between the two are of great importance to highway authorities and operators. This book looks at the civil engineering and mechanical engineering aspects of the heavy vehicle/infrastructure systems.

The state of the art in research and implementation on issues such as highway geometry, traffic management, enforcement technologies and safety are reviewed.

This book will be of interest to academics, the road industry, the heavy vehicle industry, government regulators and fleet operators.

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