The OECD/ITF study

Moving Freight with Better Trucks

Conference on Future Heavy Trucks
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Key Messages

Jørgen Christensen
Counsellor to OECD/ITF Joint Transport Research Centre
OECD Analyses of Heavy Vehicle issues

- Impacts of Heavy Freight Vehicles [1983]
- Dynamic Loading of Pavements [1992]
- Dynamic Interaction between Vehicles and Infrastructure Experiment (DIVINE), Technical Report, [1998]
- Dynamic Interaction between Vehicles and Infrastructure Experiment (DIVINE), Policy Implications, [1999]
- Performance-based Standards for the Road Sector [2005]
- Moving Freight with Better Trucks [2010]
Membership

- Australia (4)
- Belgium (1)
- Canada (2)
- Czech Rep. (1)
- Denmark (1)
- EU-Commission (1)
- France (2)
- Germany (1)
- Mexico (1)
- Netherlands (2)
- Poland (2)
- Russia (1)
- Republic of South Africa (1)
- Sweden (1)
- UK (1)
- USA (2)
- JTRC Secretariat (2)
The purpose of the study was to

- provide insights into heavy road transport to facilitate development of policies to improve its productivity and social and environmental sustainability;
- document the current situation and identify realistic short-to-medium term opportunities for improving performance;
- examine how the safety and environmental performance and productivity of this industry can benefit from new technologies;
- highlight how a modern regulatory framework can improve compliance, provide for better safety and environmental performance and deter operators from gaining competitive advantages through non-compliance.
Vehicles and time perspective considered

- Much of the discussion and analysis includes all “heavy freight vehicles” but main findings focus on “trucks”.
- “Trucks” are “heavy freight vehicles” with a permissible mass greater than 12 t and trailers with a mass greater than 10 t (UNECE Classes N3 and O4 or Classes 7 and 8 trucks in North America).
- “Heavy freight vehicles” with a permissible maximum mass below 12 t, typically used in urban areas, are not considered, although they present many of the same policy challenges.
- The report is aimed at the situation in the developed, industrialised economies of the OECD/ITF member countries, although many observations apply also in countries with developing economies.
- The time perspective of the report is the short to medium term future, i.e. the 10 years to 2020
Publications

- Reports now available on
  
  http://internationaltransportforum.org/jtrc

2. Assessment of the International Truck Fleet: A Comparative Analysis

- To be published:

3. Moving Freight with Better Trucks. Final report
Key Message 1

The freight transport task is growing rapidly in most regions and requires the most effective utilisation of all modes of transport.

Road haulage is most suited to serving much of the growing demand for transport.

Other modal options provide competitive services on key freight corridors but cannot serve all of the locations required.
Key Message 2

- The safety and environmental impacts of road haulage require regulatory intervention for optimal outcomes.

This includes controlling access to the road network and prescriptive safety and emission standards.

Regulatory systems can be improved both through more effective compliance regimes and through performance based standards that provide flexibility to enable technological innovations to deliver better safety and environmental protection.
Key Message 3

Compliance can be improved greatly through legislation that assigns responsibility

for respecting regulations to actors across the supply chain,

and grants powers to compliance agencies to use alternatives to roadside checks.

This includes inspecting the financial and loading records of shippers and receivers and transport companies to control overloading.
Key Message 3

The following 3 slides illuminate the “chain of responsibility” concept.
Chain-of-responsibility concept and procedure

- “all who have control, whether direct or indirect, over a transport operation bear responsibility for conduct which affects compliance and should be made accountable for failure to discharge that responsibility”

- Records identify carriers, transport types or industry sectors with high propensity for breaches

- Warrants to inspect and search vehicles for documents

- Warrants to inspect and search premises of carriers, consignors and customers

- Compulsory acquisition of business records from responsible parties

- Enforcement along the entire chain of responsibility
Compliance assurance: Chain of Responsibility

Traditional offences are prescriptive, behavioural and focus on this part of the chain.
### NSW Grain Harvest: Impact of Sector-wide Investigations

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<th>Legal</th>
<th>Minor Overload (up to 5%)</th>
<th>Substantial Overload (5% to 20%)</th>
<th>Severe Overload (more than 20%)</th>
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Key Message 4

- **Compliance regimes can be enhanced by exploiting technological innovations**

  ....such as GPS tracking for route access compliance and advanced weigh-in-motion systems to monitor truck loading without the need to stop vehicles at the roadside, and the use of remote checking of on-board diagnostic systems.

  **Enforcement can be automated with vehicle recognition systems.**

  **Information technologies can be used to target high risk drivers and operators.**

  **Accreditation schemes can be used to promote the uptake of these systems.**
Key Message 5

A performance based approach to regulation offers the potential to meet community objectives for road freight transport more fully.

Such an approach defines the objectives to be attained whilst leaving the means for achieving them unspecified.

This allows industry to innovate to increase productivity whilst meeting sustainability and safety goals.

In Australia performance based standards have been used to authorise access to suitable parts of the road network for unconventional vehicles that do not conform to current limits on mass or dimensions.
Key Message 6

- Many higher capacity vehicles have equivalent or even better intrinsic safety characteristics in some respects than most common workhorse trucks.

This is suggested by the literature and by computer modelling undertaken for this report of 40 heavy truck types and confirmed by a number of case studies of HCVs on the road.

Their dynamic stability tends to be superior.

Their axle load distribution, on a greater number of axles, often enhances brake capability, with shorter stopping distances and reduced brake fade.

For HCVs on the road today, driver selection, operational controls and higher levels of safety equipment contribute to significantly better safety records for these vehicles.
Key Message 6

The next slide defines the vehicle categories used in the benchmarking analysis of the 40 trucks.

It is followed by a slide which exemplifies the type of output obtained from the computerised test of critical vehicle dynamic performance.
Truck categories

- Each of the 40 trucks in the benchmarking analysis was classified in one of the following three general categories:

  **Workhorse vehicles**: - the trucks most commonly used for long haul transport, with a gross combination mass of less than 50 tonnes and a length of less than 22 metres.

  **High capacity vehicles**: - with a GCM of up to 70 tonnes and a length of up to 30 metres, typically operated under limited access conditions dependant on the road network.

  **Very high capacity vehicles**: - with a GCM of at least 52 tonnes and a length of at least 30 metres and typically operated under permit conditions and often in rural and remote areas.
Load transfer ratio
Key Message 7

- Truck crash energies mean safety regulation must pay particular attention to managing truck speeds and driver alertness and impairment.

Safety barriers and bridge piers are vulnerable to the energy of impacts from all categories of heavy trucks and most are fitted with guard rails designed to redirect large vehicles away from critical structures. Bridge piers might need to be protected with additional barriers.

Lane departure warning systems promise to reduce risks of collisions for all types of trucks. Modifying regulatory frameworks to deploy such electronic safety systems and incentivise uptake ahead of prescription is a clear priority.
Key Message 8

- **Further research is needed into other safety aspects of trucks,**

  ....including the potential aggravation of the consequences of accidents when HCVs are involved, and possible countermeasures. Vehicle length also presents risks for overtaking and blocks visibility for other road users. The impacts of vehicle length on safety and congestion are yet to be fully quantified.
Key Message 9

- Higher capacity vehicles have potential to improve fuel efficiency and reduce emissions.

Basic aspects of truck design such as length, wheelbase, width, height, axle loads, axle spacing and gross vehicle weight are limited by size and weight regulations.

These factors directly influence fuel consumption. Computer analyses show that in many instances higher capacity vehicles performed equally if not better than workhorse vehicles in terms of fuel efficiency and emissions.
Key Message 10

Higher capacity vehicles can result in fewer vehicle-kilometres travelled for a given amount of freight

This is particularly true in relation to the volume of goods that can be carried per truck. Load volume rather than weight now most often determines the number of trucks required.

The reduction of truck numbers is contingent on avoiding a major decline in vehicle load factors. Modular systems that couple standard trailers provide valuable flexibility for matching loads and for facilitating intermodal transfers.

Case study results suggest that the use of higher capacity vehicles has reduced the amount of truck travel in these cases, with benefits for safety and environment, including reducing the growth of fuel consumption and CO$_2$ emissions.
Key Message 11

- The lower unit costs offered by higher productivity trucks could result in increased overall demand for road freight transport and a transfer of freight from other modes.

Even if this has not so far been the case where higher capacity trucks have been introduced, it could be the case in other regions or countries depending on the local conditions.

Induced demand effects are likely to be small but the potential for modal transfer varies greatly between commodities and markets. This can introduce an inter-modal component to truck regulation.

Policies to shift freight from roads to rail and IWW may lead some governments to prohibit HCVs from the road network or from specific corridors, foregoing possible efficiency gains.
Key Message 12

Road pricing systems can be developed to manage use of the transport network more efficiently,

... including with respect to the choice of mode for freight transport where alternative options are available.

Fixed road network access charges, tolls and electronic kilometre charges can be differentiated to link them to truck road wear and productivity, safety and environmental characteristics, and provide incentives for the use of low impact vehicles.

Electronic kilometre charges provide incentives for improving truck load factors and can be varied to manage congestion if they are applied to passenger cars as well as heavy vehicles.

Efficient pricing for the use of all transport infrastructure, including in relation to environmental and safety costs, is critical if the modes are to compete on an equal footing.
Key Message 13

The capacity of the road system is not uniform. Optimising the use of higher productivity trucks will in most regions involve limiting their access to the network...to links where their performance is compatible with strength and geometry of the infrastructure.

Technology is available to monitor and control access.

Higher capacity vehicle access to the road network needs to be based on a balance of productivity benefits, infrastructure costs and safety and environment costs and benefits.

Such investments, however, need to be considered carefully as in some cases the costs of adjusting infrastructure to accommodate HCVs could outweigh the benefits of their introduction.
Key Message 14

Road infrastructure and trucks need to be developed in concert.

The benefits from the higher productivity of HCVs sometimes justify investment in parts of the main road network to accommodate them. In these cases the productivity benefits might provide resources to finance these investments.

Bridges are often the weak points, but appropriate regulation of vehicle design, targeted bridge protection or strengthening programmes and intelligent truck traffic management can provide the necessary protection for bridge assets.
In many areas further research and better data to support such research is needed.

In order to properly evaluate the impact of road freight operations, the safety and compliance performance of the whole truck fleet should be consistently measured and monitored.

The output of such monitoring would better inform the public of the performance of the trucking industry, support policing and enforcement and facility evidence driven policy development.
Key Message 16

- **Significant opportunities for improvement of the regulation of heavy trucks have been identified.**

  With more flexible regulation and enhanced compliance systems improvements in safety, sustainability and productivity of the general heavy vehicle fleet can be achieved.

  Appropriate use of HCVs, subject to route restrictions and enhanced road access and safety compliance regimes will lead to improved productivity and sustainability.

  Flanking measures are a potential means to guard against a shift from rail to road markets where this might occur and is counter to national transport policy.
Key Message 16

- Significant opportunities for improvement of the regulation of heavy trucks have been identified. (continued)

HCVs have been operated extensively for a variety of freight tasks in some areas of the world with available evidence indicating significant safety, sustainability and productivity improvements. The experience also demonstrates that effective regulation is essential to benefiting from this potential, which may not be achievable everywhere, depending on geographical, road infrastructure and economic conditions.
Thank you for the attention