



**Economic and Social
Council**

Distr.
GENERAL

TRANS/AC.7/2001/1
5 December 2000

Original: ENGLISH

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

Ad hoc Multidisciplinary Group of Experts on
Safety in Tunnels

(Third session, 20-21 March 2001)

JOINT POSITION PAPER

Transmitted by the International Road Transport Union (IRU) and the
International Road Federation (IRF)

General statement

1. The International Road Transport Union (IRU) is a confederation of more than 150 national road transport associations from more than 60 countries, comprising together the entire road transport industry worldwide. It speaks for the operators of coaches, buses, taxis and trucks, from large transport fleets to driver-owners. The International Road Federation (IRF) is a non-governmental, not-for-profit organization with over 650 members worldwide from both public and private sectors. Its mission is to encourage and promote development and maintenance of better roads. Road safety, in general as well as in tunnels, is a matter of top priority and concern for both the IRU and the IRF. Together, they call on the responsible authorities:

- to take all necessary measures to equip all tunnels with the best possible safety devices available in terms of modern construction and monitoring techniques, in order to eliminate risks for all road users, be they commercial or private, and
- to comprise for safety reasons and, more importantly, for strategic reasons tunnels wherever possible, but in any case, where major traffic flows are involved, with two separate tubes for traffic in each direction.

2. The following comments refer to the measures listed in the final report of the Tunnel Task Force implemented by the Swiss Federal Roads Office, which were proposed by the Chairman of the UN Multidisciplinary Group of Experts on Safety in Tunnels to serve as a basis for the group's work and recommendations. These measures were discussed at the group's meetings in Geneva on 10-11 July 2000 and 10-11 October 2000.

I. MEASURES FOR ROAD USERS

Measure 1.01

The driving test should include specific questions concerning the behaviour of road users in the event of a traffic jam or fire in a tunnel.

Position of IRU and IRF

The IRU and IRF, in principle, welcome this proposal to increase road users' preparedness in the event of a traffic jam or fire in a tunnel. Specific questions regarding speed, distances to be respected, lighting, emergency procedures, etc. should be introduced internationally in a harmonised and non-discriminatory way in the examination for the driving licence of all categories of vehicles.

Measure 1.02

If a vehicle catches fire, it is strongly recommended that the driver should drive his vehicle out of the tunnel whenever possible.

Position of IRU and IRF

The IRU and IRF consider this measure as a complementary one to measure 1.01 and recommend the incorporation of appropriate questions in examinations for the driving licence as well as the promotion of such behaviour in information campaigns to be undertaken by road tunnel authorities.

Measure 1.03

Inspections of heavy good vehicles and of vehicles carrying dangerous goods are to be intensified, and the necessary funding is to be made available to the authorities concerned.

Position of IRU

Since the ADR Convention entered into force in the late 1950s, the inspection of vehicles carrying dangerous goods has been intensified both from a qualitative and quantitative point-of-view. The IRU supports harmonised and non-discriminatory enforcement of regulations in the transport of dangerous goods.

Measure 1.04

Instruction of drivers of vehicles carrying dangerous goods has to include specific aspects of behaviour in tunnels.

Position of IRU

The IRU has participated actively by defining the subjects to be dealt with in the training of drivers in transporting dangerous goods, and the IRU has also established standard questions to be used in tests in training institutes. The IRU supports the idea of introducing specific aspects regarding tunnel safety among the issues covered in training to a greater extent than today.

Measure 1.05

Truck drivers are to be tested periodically with respect to their knowledge of safety-relevant aspects of vehicles and equipment.

Position of IRU and IRF

In most European countries, trucks represent only between 5 and 10% of all vehicles involved in an accident. In relation to their mileage driven (15-20% of total road mileage), trucks are, thus, under-proportionally involved in road accidents. Also, according to a recent survey, there is no positive correlation between the share of trucks in total traffic through a tunnel and the total number of accidents in the tunnel. As such, there is no sound basis to limit such a proposal only to truck drivers. If such periodical tests are to be introduced, then drivers of all road vehicles should be tested.

Measure 1.06

Regulations governing the transport of dangerous goods through tunnels are to be tightened at the international level.

Position of IRU

The IRU, in general, does not advocate further restrictions on the transport of dangerous goods. The effect of restrictions is often that another route is chosen where the infrastructure is less suited to cope with lorries carrying dangerous goods, and where an accident could have even worse implications. Without totally denying that, in some cases, further restrictions on the transport of certain types of dangerous goods could serve a safety purpose from a tunnel safety point-of-view, particularly where alternative routes exist, the IRU strongly feels that training of and repeated appeals to drivers have greater effect.

Measure 1.07

For the transport of certain types of particularly dangerous goods, regulations should require the formation of convoys and accompanying vehicles.

Position of IRU

This measure would have enormous impacts on transport organisation and free traffic flow, would cause extra costs, and would need appropriate road space for the formation of convoys. Limiting the transport of certain types of dangerous goods to specific times or conditions that go beyond existing ADR regulations would only be feasible if:

- adequate space for waiting before entering the tunnel is available;
- co-ordination with other tunnels (also in neighbouring countries) is possible in order to allow for fluid traffic;
- an escort is provided at no extra cost for transport operators and users;
- co-ordinated with ADR experts.

As local conditions vary, recommendations about the formation of convoys must be drafted in a very prudent way. All the more, there has been no analysis undertaken about the benefits of such a measure (in terms of improved safety records) and the economic cost of such a measure. On the contrary, it should be taken into account that, if an accident happens in a convoy of lorries carrying dangerous goods, this would more than multiply the implications of the accident, as can be learnt from accidents that happened in the past in the transport of dangerous goods by rail.

Measure 1.08

In certain cases, it should be possible to prohibit trucks from overtaking in tunnels with more than one lane in each direction.

Position of IRU

If such prohibitions are to be introduced, the “certain cases” should be well defined in advance. Moreover, the IRU is in favour of introducing flexible (and variable) rules for overtaking in tunnels by means of modern telematics.

Measure 1.09

For safety reasons, road users should maintain an adequate distance from the vehicle in front of them in the event of a traffic jam in a tunnel.

Position of IRU and IRF

This measure is part of measures 1.01 and 1.02 and should consequently be incorporated therein. Appropriate knowledge of this behaviour should be asked for in examinations for the driving licence and should be promoted in information campaigns to be undertaken by road tunnel authorities. Since, after testing, training and campaigning, retention drops below 75% if not repeated, re-enforcement and reminder strategies have to be developed and implemented. This could be done on signs at the entrance of tunnels.

Measure 1.10

The proposal to restrict the maximum speed of trucks in tunnels to 60 km/h should be rejected.

Position of IRU and IRF

The IRU and IRF support this measure as there would be no benefit in terms of improved safety records or traffic flow if a speed limit of 60 km/h for trucks was implemented in tunnels. However, the IRU and IRF believe that safety in tunnels can be improved if the speed of all vehicles is limited in an appropriate way and infringements are strictly penalised.

Measure 1.11

The proposal to introduce a compulsory distance of 100 metres between trucks in all tunnels is to be rejected.

Position of IRU and IRF

The IRU and IRF support this measure as there would be no benefit in terms of improved safety records or traffic flow if a compulsory distance of 100 metres only between trucks was introduced in tunnels. However, the IRU and IRF believe that safety in tunnels can be improved if a safe distance between cars, trucks and coaches is maintained in an appropriate way and infringements are strictly penalised.

GENERAL REMARKS BY IRU AND IRF ON THE GROUP OF MEASURES FOR ROAD USERS

Oil products are the most common dangerous goods that are transported through tunnels. According to figures from a Dutch IRU Member Association, 80% of all dangerous goods transported through tunnels are products related to the energy sector. Shipments by road of other types of dangerous goods already avoid tunnels wherever possible.

Due to UN initiatives and the active participation of Governments, transport of dangerous goods by road is the most regulated part of the road transport market, with the ADR Convention in force in 35 countries and UN recommendations followed to a broad extent in the individual countries.

Any further special regulations on the transport of dangerous goods in tunnels should be integrated within the framework of the ADR Convention and UN recommendations, as all parties involved (drivers, road haulage companies, forwarding agents, transport users) are expecting these texts to be complete.

II. MEASURES FOR OPERATION

Measure 2.01

A Swiss supervisory body should be created for co-ordinating the handling of incidents in road tunnels.

Position of IRU and IRF

The IRU and IRF support efforts for a better and more effective coordination of traffic and safety control mechanisms. Better coordination of responsible bodies should be achieved for each tunnel, including border-crossing coordination if a tunnel links two countries, as well as for all tunnels. The IRU and IRF recommend the implementation of regional or European-wide “Best Safety Practice” committees that identify and promote the implementation of such practices. Particularly where road tunnel authorities from two countries are involved, joint safety committees and emergency action plans need to be introduced.

Measure 2.02

A safety officer should be appointed in all tunnels with a length of over 600 metres.

Position of IRU and IRF

All tunnels should have an emergency service which can be mobilised immediately at all times, comprising fire-fighters and medical personnel and appropriate equipment. If, in addition, the appointment of a safety officer contributes towards preventing accidents or facilitates coordination of services and accident preparedness, the IRU and IRF support such a measure. These safety officers should be trained to inspect tunnels, equipment and infrastructure. This training should be made compulsory in all countries with tunnel infrastructure.

Measure 2.03

Regulations should be drawn up governing periodical exercises for fire and rescue crews in tunnels in circumstances that are as realistic as possible.

Position of IRU and IRF

For the mobilisation of immediate and effective help in the case of an emergency it is essential that all relevant services undertake periodical exercises under circumstances that are as realistic as possible. Particularly where fire and rescue teams from different countries or tunnel authorities are involved, these exercises should be carried out as joint exercises in accordance with a single public emergency action plan.

Measure 2.04

A tunnel that is not part of the road network should be constructed for, or placed at the disposal of, emergency services for carrying out exercises and trials.

Position of IRU and IRF

The IRU and IRF consider this measure as a complementary measure to 2.03, which would help to simulate various scenarios under realistic circumstances. However, the cost of constructing a tunnel for training purposes should be compared to the cost of developing a test and training site. Whichever option is chosen, the exercises/training should be extended to all countries concerned to make it a cost efficient training and testing infrastructure.

Measure 2.05

Details of all fires in tunnels should be recorded and evaluated.

Position of IRU and IRF

The IRU and IRF support all efforts for improving the quality and availability of road accidents statistics in general and particularly in tunnels. These efforts should particularly focus on identifying the causes of accidents or fires. Citing “unknown” or “a collision” as a cause for a fire is insufficient. In the latter, statistics must identify who collided with whom and who caused the collision. A burning truck might have caused a fire in a tunnel but might have been itself victim of a preceding accident that was caused by another road user, insufficient road infrastructure or inappropriate signalling. The IRU and IRF consider this measure a priority issue for taking preventive action and for improving effectively and efficiently road safety in general and in tunnels in particular.

Measure 2.06

The suitability of using high-performance ventilators should be closely examined, and a scheme for equipping all tunnels’ fire brigades should be drawn up.

Position of IRU and IRF

In principle, all tunnels should be equipped with the best possible safety devices available to be harmonised and standardised at European level. This refers to modern construction, devices for the prevention of accidents, monitoring techniques as well as to all devices that help fighting fires and other emergencies in tunnels. The IRU and IRF welcome the proposal to set up schemes for the fast introduction of these modern safety devices, which should also include an investment plan.

Measure 2.07

Tunnel fire-fighting crews should be equipped with a heat searching camera.

Position of IRU and IRF

There should be no doubt that what applies to safety devices in tunnels (see measure 2.06) should also apply to the equipment of fire-fighting brigades, in order to make their work more effective.

Measure 2.08

Complete or partial closure of lanes must always be made outside the tunnel.

Position of IRU and IRF

All road and tunnel works should be appropriately indicated, by internationally standardised signs, both before entry into the tunnel and inside the tunnel itself in such a manner as to ensure full visibility by all road users. The IRU and IRF agree that there should be no reduction of lanes inside the tunnel, but that all necessary closures are made outside the tunnel.

III. MEASURES FOR THE INFRASTRUCTURE

Measure 3.01

The existing guidelines for single-tube tunnels are being reviewed and should be coordinated with those of other countries. They specify the circumstances under which escape routes are necessary.

Measure 3.02

In double-tube tunnels, in the event of an incident in one tube the other tube should be used as an escape route as in the past.

Position of IRU and IRF

The other tube should also allow for continued operation of the tunnel in case of an incident in one of the two separate tubes (see in detail: measure 3.05 below).

If, in the case of an accident, a single-tube tunnel has to be closed completely over a longer period, authorities should provide efficient alternative itineraries. This might also include temporary exceptions from existing regulations and directives.

Measure 3.03

The present-day use of traverses to provide access for emergency services has been examined and confirmed as suitable.

Position of IRU and IRF

Tunnels should be equipped with easily identifiable and accessible escape tubes, which can be used even in the most extreme circumstances as well as with fire extinguishers, a water supply and emergency ventilation systems.

Measure 3.05

Whether a tunnel should be single or double-tube, the main criterion should be the projected traffic volume.

Position of IRU and IRF

In addition to the projected traffic volume, there are additional “main” criteria that must be considered in the decision-making process. Tunnels should be equipped, wherever possible, with two separate tubes, one for each direction, for safety reasons and, likewise important, for strategic reasons. The closure of the Mont-Blanc Tunnel has demonstrated the significant impact of such closure on traffic flows, particularly the burdens that occur for alternative routes, and the immense economic costs that occur in the case of an incident that results in a closure of a tunnel over a long period. The economic cost of the closure of the Mont-Blanc Tunnel on the Italian economy alone has been estimated at over 500 million Euros per year.

If tunnels are equipped with two separate tubes, one for each direction, an incident in one of the tubes would not lead to a complete closure of the tunnel and, thus, would - strategically important - allow continued operation of the tunnel.

Measure 3.08

The guidelines and specifications for the installation of equipment in tunnels need to be adapted to the current status of technology.

Position of IRU and IRF

All tunnels should be equipped with the best possible safety devices available in terms of modern construction and monitoring techniques.

Measure 3.09

Signalisation of escape routes should be harmonised at the international level.

Position of IRU and IRF

Tunnels should be equipped with easily identifiable and accessible escape tubes, which are indicated by internationally standardised signs and which can be used even in the most extreme circumstances.

GENERAL REMARKS BY THE IRU AND THE IRF ON THE GROUP OF MEASURES FOR OPERATION AND FOR THE INFRASTRUCTURE

Responsibility for infrastructure, equipment, manning, regulations and their enforcement to ensure safety in tunnels, even when they are operated by private companies, lies with the public authorities which should have adequate resources and financial means to fulfil such obligations.

In tunnels where there is more than one authority responsible for operation and safety, these authorities should develop a unified investment plan aimed at setting up one single command centre with a fully computerised and automated command and security system, the use of fire-proof electric networks, the introduction of new ventilation standards, the reconstruction of the signalling and the public communication system, an increase in the number and surface of escape areas and the improvement of road alignment.

IV. MEASURES FOR VEHICLES

Measure 4.01

It should be made compulsory for all heavy goods vehicles to be equipped with a fire extinguisher.

Position of IRU and IRF

In most European countries, trucks represent only between 5 and 10% of all vehicles involved in an accident. In relation to their mileage driven (15-20% of total road mileage), trucks are, thus, under-proportionally involved in road accidents. Also, the share of trucks in total traffic through a tunnel varies significantly (from very low to more than 50%). It would be ineffective to limit such a proposal only to heavy goods vehicles. If fire extinguishers would become compulsory, then all road vehicles should be equipped with fire extinguishers.

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