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**Project DOT/11/2007/INM:
Revision of TRH 11(2000)
Project Report**

FINAL DRAFT

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<p>Abstract:</p> <p>TRH11 was first published in 1974 and since then there have been seven revisions. The seventh revision was published in March 2000 as a draft. The existing draft document TRH11 (2000) is currently being used by all nine provinces as a basis for the issuing of abnormal load permits. Through the use of the document useful feedback has been obtained and deficiencies have been identified and the stage was reached where there was general consensus that the document needs a major revision.</p> <p>This project (DOT/11/2007/INM) was commissioned by the DoT with the intention of reviewing and revising the Draft TRH11 (2000), improving the layout and structure and incorporating new local and international information and research findings. CSIR was awarded this project which commenced on 13 March 2008.</p> <p>This Project Report reviews the tasks identified as the key focus areas of the project and gives information on how each task was addressed and the outcome for each task.</p>				
<p>Keywords:</p> <p>Abnormal vehicles, abnormal loads, permits, fees, road damage costs, road usage fees, abnormal loads escorts; bridge formula, pavement damage</p>				
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TERMS OF REFERENCE

In 1970 a committee was appointed to draw up uniform rules for the conveyance of abnormal loads across South Africa. The Committee on Abnormal Loads¹ was formally approved in 1973 as a sub-committee of the Committee of State Road Authorities and all provinces agreed to accept the recommendations of the ALC. The first TRH 11 (The Conveyance of Abnormal Loads) was published in 1974 by the CSIR on behalf of the ALC. Experience gained over the years in the application of these guidelines led to seven revisions of the document. The 7th revision was published in March 2000 as a draft and there was general consensus that the document needed a major revision. Against the above background, the DoT identified a need to update the current TRH 11 (March 2000 7th Edition) to reflect current best practice and to guide road authorities and industry stakeholders in the conveyance of abnormal loads on the South African road network.

The DoT identified the following tasks as the key focus area for the project:

- Consider comments from private sector;
- Review formula for Road Usage Factor (RUF);
- Review applicability of Abnormal/Load (A/L) bridge formula;
- Incorporate current A/L policy documents;
- Review applicability of default tyre pressures particularly with regard to mobile cranes;
- Review tables for speed limits;
- Review requirements for escorts;
- Simplify guidelines and eliminate contradictions, ambiguities and duplications;
- Review structure of document (separate fixed technical principles and standards versus policies and procedures) including all tables, diagrams, graphs and graphics;
- Clarify relevant definitions (e.g. effective width);
- Create clearly defined categories (e.g. 6) of A/L's based on dimensions and mass which should be used as a basis for assessing various requirements and conditions;
- Application procedures for travel on weekends (Condition 9a), night time (Condition 9b) as well as embargo dates;
- Procedures for cancellation of permits;
- Application procedures and required documentation; and
- Review A/L fees and fee structure, including principles of road damage cost recovery.

In addition to these tasks, consultation with the Project Steering Committee (PSC) at all stages of the project execution was an important requirement and therefore needed to be included in the project approach and methodology.

¹ This committee is currently known as the Abnormal Loads Technical Committee (ALTC)

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1. INTRODUCTION

1.1. Background

To protect the investment in roads as well as for reasons of road safety and traffic management, the permissible dimensions and masses of vehicles operating on public roads are limited by the National Road Traffic Act, 1996 (Act 93 of 1996) (NRTA), and the National Road Traffic Regulations, 2000 (NRTR).

Under special circumstances it may be necessary to accommodate vehicles or loads that are practically unable to comply with the provisions of the NRTA and the NRTR. In such cases Section 81 of the NRTA empowers an MEC to exempt a vehicle and load from provisions of the NRTA. Section 81 reads as follows:

*“81 Vehicle and load may be exempted from provisions of Act
An MEC may, subject to such conditions and upon payment of such fees or charges as he or she may determine, authorise in writing, either generally or specifically, the operation on a public road of a vehicle which does not comply with the provisions of this Act or the conveyance on a public road of passengers or any load otherwise than in accordance with the provisions of this Act.”*

The conditions and fees or charges referred to in Section 81 are contained in the document *“TRH 11: Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for Other Events on Public Roads.”*

TRH 11 was first published in 1974 and since then there have been seven revisions. The seventh revision was published in March 2000 as a draft and this is the version currently being used by all nine provinces as a basis for the issuing of exemption permits for abnormal loads. Through the use of the document useful feedback was obtained and deficiencies were identified and the stage was reached where there was general consensus that the document needed a major revision.

This project (DOT/11/2007/INM) was therefore commissioned with the intention of reviewing and revising the Draft TRH 11 (2000), improving the layout and structure and incorporating new local and international information and research findings.

This Project Report reviews the tasks identified as the key focus areas of the project and gives information on how each task was addressed and the outcome for each task.

2. PROJECT SCOPE AND OBJECTIVES

2.1. Project Scope

The Project Scope identified in the Invitation to Bid documentation outlined the following:

“The service provider is expected to make a comprehensive study of the existing TRH 11 and gather information on existing practices in processing and issuing permits at all the provincial abnormal loads permit offices. A brief study and information gathering of similar guidelines and practices in other countries (within Africa and overseas) is also required. The service provider has to also gather and analyse information and inputs from all the industry stakeholders (consignees, consignors, hauliers, manufacturers, industry associations and interested stakeholders/parties). Finally to develop the proposed revised TRH 11 based on the consolidation of information from the research and analysis done...”

The following tasks were identified as the key focus areas for the project:

- Consider comments from private sector;
- Review formula for Road Usage Factor (RUF);
- Review applicability of Abnormal/Load (A/L) bridge formula;
- Incorporate current A/L policy documents;
- Review applicability of default tyre pressures particularly with regard to mobile cranes;
- Review tables for speed limits;
- Review requirements for escorts;
- Simplify guidelines and eliminate contradictions, ambiguities and duplications;
- Review structure of document (separate fixed technical principles and standards versus policies and procedures) including all tables, diagrams, graphs and graphics;
- Clarify relevant definitions (e.g. effective width);
- Create clearly defined categories (e.g. 6) of A/L's based on dimensions and mass which should be used as a basis for assessing various requirements and conditions;
- Application procedures for travel on weekends (Condition 9a), night time (Condition 9b) as well as embargo dates;
- Procedures for cancellation of permits;
- Application procedures and required documentation; and
- Review A/L fees and fee structure, including principles of road damage cost recovery.

Consultation required in terms of the Project Scope included the following:

- Presentations to the Project Steering Committee;

- Circulating and presenting the first draft to the Abnormal Loads Technical Committee (ALTC) for further inputs and comments after approval of the first draft by the PSC;
- Consolidation of inputs and comments and presentation of the second draft to the Project Steering Committee and to the ALTC; and
- Final consolidation of the document and obtaining approval from the Project Steering Committee.

2.2. Objectives

The Project Objectives identified in the Invitation to Bid documentation outlined the following:

- To make a comprehensive study to identify the shortcomings of the existing TRH 11;
- To gather information on existing practices in processing and issuing permits at all the provincial abnormal loads (A/L) permit offices;
- To do a brief study and information gathering of similar guidelines and practices in other countries (within Africa and overseas) in order to update current procedures;
- To gather and analyse information and inputs from all the industry stakeholders (consignees, consignors, hauliers, manufacturers, industry associations and interested stakeholders/parties); and
- To revise the TRH 11 guideline, based on the consolidation of information from the research and analysis done.

3. PROJECT APPROACH AND METHODOLOGY

3.1. Project Approach

Based on the Project Scope as defined in the Terms of Reference and the key focus areas listed above, the following main tasks were identified:

- Project inception;
- General review and structure of the document;
- Specific review items;
- Stakeholder interaction and comments;
- Document preparation and feedback; and
- Training and promotion.

The various tasks, identified as the key focus areas of the project, were addressed under these main tasks as described below.

3.2. Project inception

1. A project inception meeting with members of the Project Steering Committee (PSC), to finalise the scope of the project and the project execution plan, was conducted on 13 March 2008.
2. A condensed literature study on similar practices internationally, using the internet as the main tool to obtain information; was conducted. Internet sites applicable to abnormal load policies and procedures visited are listed in Appendix B.
3. The current and previous versions of the TRH 11 were studied to obtain an in depth knowledge of the document and the development of the document since its inception in 1974. This study is summarised in Appendix A.

3.3. General review and structure of the document

1. Developed a framework for the document with the emphasis on user-friendliness and flow of information. To simplify the use of the guidelines, the document was split into two documents. The first document remained the TRH 11 and addresses the technical issues. The title of this document is "TRH 11 - Dimensional and Mass Limitations and Other Requirements for Abnormal Load Vehicles". The second document deals with the administrative and procedural aspects regarding the registration of abnormal vehicles and the issuing of exemption permits for the transport of abnormal loads. The title of this document is "Administrative Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads". It is envisaged that the latter document will be updated on a more regular basis. The ALTC would be responsible to advise the

DoT on the need to update the Administrative Guidelines document based on discussions and decisions taken at ALTC meetings.

2. A flow diagram was developed to guide users in the application of the document and included in the Administrative Guidelines;
3. All contradictions, ambiguities and duplications in the current TRH 11 document were identified and these were eliminated in the new documents;
4. All definitions in the current document were scrutinized and clarified where necessary. Definitions in the documents that are contained in the NRTA were checked to ensure that these are correct and such definitions are indicated as coming from the RTA;
5. The definition of an indivisible load and the rules applicable are clearly defined and explained and illustrated with a number of sketches;
6. The policy documents developed by the ALTC working group were studied and incorporated into the Administrative Guidelines;
7. All previous decisions taken by the ALTC were extracted from the minutes of meetings and are summarised in Appendix D.
8. All tables, diagrams, graphs and figures in the TRH 11 were scrutinized for technical accuracy;
9. The procedure and rules for the cancellation of permits was updated;
10. The current permit application procedures and documentation were reviewed and updated; and
11. A new layout for the actual permit documentation to make it more user-friendly was developed.

3.4. Specific review items

In addition to the general review of the document, specific technical issues needed to be reviewed. The general approach was to make use of specialists in the various fields to review the following specific technical issues:

- Formula for Road Usage Factor (RUF);
- Abnormal Load Bridge Formula;
- Applicability of default tyre pressures;
- Table for speed limits;
- Requirements for escorts;
- Categories of abnormal loads;
- Travel on week-ends and embargo dates; and
- Abnormal fees and fee structure, including principles of road damage cost recovery.

The specific review items were grouped together and undertaken by the specialists as indicated:

1. Traffic Related Aspects: (Mr PK Martin, Vela-VKE, Pretoria)
 - Categories of abnormal loads;
 - Formula for Road Usage Factor (RUF);
 - Table for speed limits;
 - Requirements for escorts; and
 - Travel on week-ends and embargo dates.
2. Abnormal fees and fee structure, including principles of road damage cost recovery. (Dr J Bosman, Namela Projects, Pretoria).
3. Abnormal Load Bridge Formula. (Mr J Anderson, Vela-VKE, Cape Town).
4. Recovery of road damage, including applicability of default tyre pressures. (Prof M de Beer, CSIR Built Environment, Pretoria -for report, see reference 10).

The review of these specific technical issues is described in separate chapters in this document.

3.5. Stakeholder interaction and comments

Comments from the industry were obtained at different stages during the execution of the project. Information on the project was presented to industry representatives at a meeting held at the Department of Transport in Pretoria on 4 July 2008. At this meeting the industry representatives were requested to submit comments in writing on issues to be addressed or changes required to the TRH 11 document and the process of abnormal vehicle registration and exemption permit issuing. Subsequent to this meeting, Draft 1 and Draft 2 of the revised TRH 11 document were circulated to industry representatives giving them a further opportunity to submit comments.

Consultation with the PSC took place by way of PSC meetings (5 meetings) and also by circulating the various drafts of the updated documents to members of the PSC and receiving comments back from them. The PSC consisted mostly of members of the ALTC Working Group and the PSC meetings were in general combined PSC/ALTC Working Group meetings.

A separate report on stakeholder interaction and comments has been prepared (Report CSIR/BE/ISO/ER/2008/0400/B; 2008). This report contains a summary of all project meetings; a summary of all comments received; a synthesis of the comments with a discussion and decision regarding the comments received; and the actual comments as received.

3.6. Documents

In addition to this Project Report, the following documents have been prepared as part of this project:

1. Project Inception Report; March 2008;
2. Progress Report; May 2008;
3. Draft 1 of the revised TRH11; issued on 4 August 2008;
4. Draft 2 of the revised TRH 11; issued on 26 August 2008;
5. Final Draft of the revised TRH 11; issued on 1 October 2008;
6. Final Draft of the Administrative Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads; issued on 1 October 2008;
7. Final Draft of the Report on Stakeholder Interaction and Comments; issued on 22 October 2008.
8. Final Draft of the revised TRH 11; issued on 30 October 2008; and
9. Final Draft of the Administrative Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads; issued on 30 October 2008.

The following reports on the specific review items have also been prepared:

1. Report on Road User Charges Applicable to Abnormal Heavy Vehicles; September 2008; by J Bosman, Namela Projects, Pretoria (see reference 5);
2. Report on Review of Load Limitations for Bridges; September 2008; by J Anderson, Vela VKE, Cape Town (see reference 6);
3. Discussion Document (Contract Report CSIR/BE/IE/ER/2008/0006/B-1, 2008) on a Provisional Basis for Possible New Estimation of Mass Fees; October 2008; by M de Beer, CSIR Built Environment, Pretoria (see reference 10);
4. Study into Conditions Relating to Weekend Travel and Embargo Dates; October 2008; by P Martin, Vela VKE, Pretoria; and
5. Study into Categories of Abnormal Loads, the Road Usage factor and Escort Requirements; October 2008; by P Martin, Vela VKE, Pretoria.

The report by J Bosman is included in this report as Chapter 5; while the two studies by P Martin are included as Chapter 4. Chapter 6 contains a summary of the report on the Review of Load Limitations for Bridges by J Anderson, while the discussion document on a Provisional Basis for Possible New Estimation of Mass Fees by M de Beer (reference 10), is summarised in Chapter 7.

4. SPECIFIC REVIEW ITEMS - TRAFFIC RELATED ASPECTS²

4.1. Classes for Abnormal Loads

The TRH 11 guidelines have always differentiated between dimensional abnormality (i.e. goods vehicle/combination wider than 2,m or higher than 4,3m or longer than 22,0m) and mass abnormality (actual vehicle or axle mass exceeding that allowed in the NRTR) of abnormal loads. This section deals with dimensional abnormality only, with the focus on the combination overall length and width.

Based on maximum overall width and length dimensions from historical data of these variables, obtained from permit records, the dimension classes, as presented in Table 1, are proposed.

Table 1: Proposed Dimension Classes

Dimension Class	Width Limit (m)	Length Limit (m)
D1	2,75	27
D2	3,00	30
D3	3,25	34
D4	3,75	40
D5	4,75	54
D6	>4,75	>54

These categories were chosen to yield a specific distribution of the historical width and length distribution of the abnormal loads vehicle population. In terms of traffic impacts, however, the width of the vehicle is generally the determining factor, and limits should possibly be chosen for the classes which are indicative of the severity of the impact. This should guide authorities in applying consistent and rational conditions on abnormal loads. It makes sense that vehicle width classes could be chosen on the basis of whether a particular load would occupy a lane, a lane plus the shoulder, two lanes, or two lanes plus the shoulder. The relevant pavement widths, assuming the SANRAL geometric design standards would be:

- One lane: 3,7m
- One lane plus shoulder: 6,1m
- Two lanes: 7,4m
- Two lanes plus shoulder: 9,8m

² This Chapter is based on the reports prepared by Mr P Martin, Vela VKE, Pretoria

If it is assumed that the abnormal load would require a minimum of 500 mm clearance on each side, the relevant load widths would be:

- Occupying one lane: 2,7 m
- Occupying one lane plus shoulder: 5,1 m
- Occupying two lanes: 6,4 m
- Occupying two lanes plus shoulder: 8,8 m

The first of these width categories agrees fairly closely with the upper limit for Class D1, but all the others fall in Class D6. They thus all fall into the highest 5% of the historic permit data, and could therefore be regarded as too coarse a classification. The use of the dimension classes as presented in Table 1 is therefore recommended. It is, however, relevant to bear the limits based on the load widths in mind when considering the effects of these loads on the different classes of road.

4.2. Formula for Road Usage Factor

The Road Usage Factor (RUF) is used as a basis to determine the escorting and warning apparatus requirements of such vehicles. The RUF has been used since the first revision in 1979 as an indicator of the potential extent of disruption of other traffic caused by an abnormal load with specific width and length dimensions. It has been used to determine the need for warning apparatus and escort requirements ever since. It also served as the basis for calculating the Road Usage Fee for abnormally dimensioned vehicles. The formula was slightly altered in the 6th Edition in 1997 by changing the power term for vehicle length from 4 to 3,76.

The current formula for the RUF is as follows:

$$\text{Road usage factor } RU = 1,61757 \times 10^{-3} \times W^{4.7} + 7,5 \times 10^{-7} \times L^{3.76}$$

Where: W = overall load/vehicle width, in m; and
 L = overall combination length, in m

Data for the 2007 financial year was obtained from the CSIR for Free State, Gauteng, KwaZulu-Natal and Western Cape Provinces. These included all types of permits issued by these provinces numbering over 38 000. Analysis was carried out on a subset of this data for trip permits only, which reduced the data set to 32 000 records, and the RUF was calculated for each case. In addition, the contribution of the width and length component to the RUF value was also studied. The value of the RUF and the contribution of the length component were plotted against the actual length of the combination, resulting in the graph presented in Figure 1 below:

It can be clearly seen from the graph in Figure 1 that for combinations up to about 40 m long, the width is the controlling variable (the few high RUF values in this zone are due to very wide vehicles), for combinations longer than 60 m, the length is the controlling factor. This characteristic of the formula complies with the logic of estimating the disruptive effects which abnormally dimensioned loads are likely to have on general traffic.

It is therefore concluded that no changes are required to the formula, and that the RUF is considered a reliable estimator of traffic impacts.

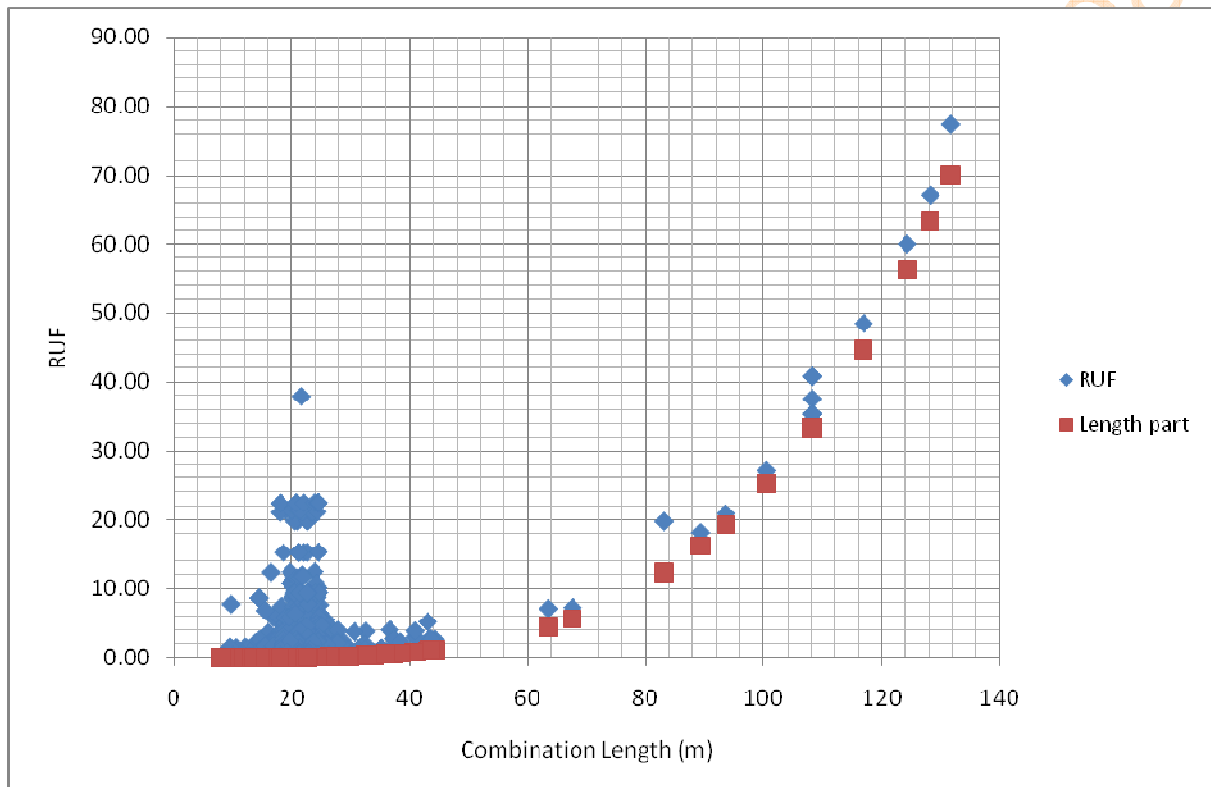


Figure 1: Plot of RUF versus Combination Length

4.3. Table for speed limits

The current speed limits are determined in compliance with the provisions of SANS 1550: Motor vehicle tyres and rims - Dimensions and loads; and SABS Recommended Practice ARP 007: The care, maintenance and use of motor vehicle tyres and rims (incorporating TREDCO guidelines). No change is proposed

4.4. Requirements for escorts

During discussions with representatives of officials from the various provincial administrations, it became clear that the overriding concern was the effect of abnormal loads on the safety of general traffic using the road system. Large, wide and slowly moving vehicles create increased friction in the

traffic streams on the facilities that they use. On two-lane undivided facilities this affects traffic in both directions, as passing manoeuvres require adequate decision sight distance to be safely carried out. This effect is reduced on multi-lane facilities, especially dual carriageway roads, but it is important to note that the width of the combination is the primary determining factor of the amount of disturbance which it causes in the traffic stream.

Escorting requirements have been specified on the basis of limiting values of the RUF since the first revision in 1979, and this practice has been continued in all subsequent revisions. The only change to the policy was in the 6th Edition of 1997, when the boundary value determining the need for traffic officer escorts was increased from 2,04 to 2,73. This adjustment was apparently made partly to address the logistical problems associated with securing the requisite traffic officer escort services, as well as changes in the abnormal vehicle fleet. The impact of this change can be evaluated by comparing the two threshold values for the 2007 data – if the lower limit were imposed in 2007, an additional 1 570 abnormal loads (or 65 % more) would have required traffic officer escorts.

The current boundary values, in terms of the RUF, are set at:

- $RUF \leq 0,54$ no escorts required
- $0,54 < RUF \leq 0,94$ one own escort required
- $0,94 < RUF \leq 2,73$ two own escorts required and
- $RUF > 2,73$ two traffic officer escorts or one traffic officer escort and one own escort required.

As was mentioned earlier, this “one-size-fits-all” may be adequate for routes with adequate width. A study of Figure 3 in the 7th edition shows that for a combination of average length of 20,7 m (from the 2007 permit data), these values would translate to widths of 3,35 m; 3,80 m; and 4,80 m respectively. This would indicate that the boundary values have probably been chosen for a two-way road with standard width (3,7 m) lanes and wide (2,4 m) shoulders. It is, however, probable that these boundaries are too lenient for a road with un-surfaced shoulders and too strict for multilane roads.

There is therefore a need to relate the width of a load to the width of the facility which is being used in order to estimate the traffic impedance. Regulatory regimes in Australia were studied to assess the approach to categorisation of routes and loads. The state of Queensland was used as an example of the approach. There the road network is divided into five classes, which allow:

- No road trains or B-doubles (prime mover and two trailers) allowed;
- 23 m B-doubles only;
- 23 m and 25 m B-doubles only;
- Type 1 road trains (up to three trailers) up to 36,5 m long; or
- Type 2 road trains – up to 53,5 m.

The maps are compiled by Queensland Transport and published on their website. Although the parameters for defining the hierarchy of routes are not clear, it is probable that these routes are categorised according to their structural and geometric design standards.

If we were to postulate such classification in South Africa, the logical starting point would be to classify routes according to their cross-sectional properties (indicative of the potential traffic disturbance by wide loads) and the design speed (indicative of availability of passing opportunities). To our knowledge, no formal records are kept of these items, but all provinces have GIS-based Road Network Management Systems. These systems should include two parameters for each road link which are indicative of the design standards. These are the paved width and the posted speed limit. A speed limit of 100 km/h or higher would ensure adequate sight distance for safe overtaking of abnormal load vehicles on two-way roads.

It is therefore proposed that the following classification process followed to categorize routes:

- If the paved width (both directions of travel) is equal or greater than 18 m (at least four lanes plus wide shoulders), the route is category A.
- If the paved width is between 13 m and 18 m (at least two lanes plus wide shoulders) and the posted speed limit is:
 - 100 km/h or higher, the route is Category B; or
 - Less than 100 km/h, the route is Category C.
- If the paved width is between 10 m and 13 m, and the posted speed limit is:
 - 100 km/h or higher, the route is Category C; or
 - Less than 100 km/h, the route is Category D.
- Roads with a paved width less than 10 m are Category D.

Based on this procedure, it would be fairly straightforward to prepare a map for each province showing the provincial and national roads classified according to this system. The road category could then be used to determine the escorting requirements applicable to the various dimension classes of loads.

If routes are classified according to the process outlined above, it may be more appropriate to specify the escorting requirements in terms of both the Dimension Class and the Route Category, as proposed in the matrix presented in Table 2.

Table 2: Escort Requirements for Wide and Long Loads in terms of Dimension Class and Route Category

Dimension Class	Route Category			
	A	B	C	D
D1	No escort	No escort	No escort	No escort
D2	No escort	No escort	No escort	One own escort vehicle
D3	No escort	No escort	One own escort vehicle	Two own escort vehicles
D4	No escort	One own escort vehicle	Two own escort vehicles	Two traffic officer escort vehicles
D5	One own escort vehicle	Two own escort vehicles	Two traffic officer escort vehicles	Two traffic officer escort vehicles
D6	Two traffic officer escort vehicles	Two traffic officer escort vehicles	Two traffic officer escort vehicles	Two traffic officer escort vehicles

Note: In all cases, the requirement for two traffic officer escorts vehicles includes the option of one traffic officer escort vehicle and one own escort vehicle at the discretion of the issuing authority.

It is assumed that these rules would apply in the absence of any requirement for tracking over bridges due to mass abnormality

4.5. Travel on week-ends and embargo dates

4.5.1 Introduction

Vela VKE recently carried out a study into Standard Permit Condition 9a relating to the prohibition of travel on weekends and public holidays for the Road Freight Association (RFA). The initial study comprised an analysis of traffic count data for 2006 from the SANRAL Comprehensive Traffic Observations (CTO) programme on 54 permanent counting stations on National Routes, in order to identify traffic patterns on various route types during the week and over weekends. This analysis culminated in a presentation to the ALTC on 27 March 2008.

4.5.2 Investigation of weekend and holiday travel patterns

Subsequent to the presentation to the ALTC and as a result of feedback received from members of the committee, traffic flow data for a further 29 permanent counting stations in Gauteng Province and 27 in the Western Cape were studied to confirm the trends and features observed on the 54 stations on national routes.

The ratios computed in order to identify relevant indicators of traffic patterns over weekends and public holidays were:

- The ratio of the highest Saturday peak to the highest weekday (Monday to Friday) peak. The latter was almost invariably the Friday afternoon peak. It appeared that a strong case could be made for allowing travel on a Saturday, as the Saturday peak volumes are significantly lower than weekday peaks.
- Similarly for the highest Sunday peak. It was observed that the Sunday afternoon peak often approaches or even exceeds the weekday peak.
- The ratios of the average daily volumes on a Saturday and a Sunday compared to the average normal weekday volume. The mean values indicate that this statistic would exhibit less variation than the peak hour ratios, and would thus probably be a less sensitive indicator, and it was thus not used in the further analysis.
- The ratio of the Annual Average Daily Traffic (AADT) to the average normal weekday volume, expressed as a percentage. This statistic also has a low variation, but it is significant if it is smaller or greater than 100. (Less than 100 indicates that traffic volumes during holiday periods are on average lower than in normal weeks, while a value greater than 100 indicates a road where average holiday traffic volumes are higher than normal.)
- The absolute value of the AADT is also an important indicator, as it shows the potential number of other road users who are likely to be affected by the passage of an abnormal load.

4.5.3 Results of initial data analysis

The analysis of the CTO data from a total of 110 stations on national routes and major provincial roads in the Western Cape and Gauteng Provinces was focused on calculating the key statistical indicators described above which would describe the traffic characteristics of that section of the route. The following results were obtained:

- | | |
|--|------|
| • Lower volumes over weekends | 64 % |
| • Significant Sunday peak | 13 % |
| • Weekend peak similar to weekday peak | 23 % |

It was further noted that the majority of the stations observed in the last category were stations on the periphery of metropolitan or built-up areas and generally characterised by low average daily traffic volumes. An estimate was therefore made of the critical hourly volume which would allow sufficient passing opportunities for an abnormal vehicle travelling at 60 km/h assuming sufficient decision sight distance were available. The threshold volume for this condition was found to be 160 vehicles per hour.

Further analysis of the weekend peak traffic volumes for this last category of stations showed that 60 % of them had weekend peak flows of less than 160 vehicles per hour.

It is clear from the analysis of these data that traffic patterns on these routes consistently indicate that:

- Traffic volumes are generally lower than normal on Saturdays;
- Weekend traffic volumes comparable to weekday averages are normally observed on roads carrying relatively low volumes;
- Sunday afternoon peak volumes can approach or even exceed weekday peak volumes in some cases; and
- Very few stations (12 in all) only on the N1 and N3 experience higher traffic volumes in holiday periods.

4.5.4 The N3 experiment with relaxation of Condition 9A

During the course of this investigation it was noted that the provincial administrations of KwaZulu-Natal and the Free State were executing an experiment on the N3 national route between Durban and the Free State border with Mpumalanga at Villiers. The purpose of the experiment was primarily aimed at reducing or eliminating the freight congestion in the Port of Durban. The experiment entailed permitting unescorted abnormal loads whose overall width did not exceed 3,35 m and height not exceeding 4,6 m to travel over weekends on the N3.

Although information concerning the success of this experiment is mainly anecdotal at this stage, feedback from the officials concerned, Road Traffic Inspectorate personnel and affected operators has been unanimously positive. Although the initial goal has been attained (clearance of the freight congestion at the port), all parties have supported the continuation of this arrangement. It should be noted that this is not in conflict with the existing TRH11 guidelines, as Condition 9a makes provision for the provincial authorities to issue permits for weekend travel for vehicles not requiring more than one self escort.

It may also be observed that based on the records of trip permits issued during the 2007 financial year in the Free State, Gauteng, KwaZulu-Natal and Western Cape provinces, comprising some 32 000 permits, over 54% of those loads would have qualified for the exemption if it were applied on a countrywide basis. It should also be noted that the N3 has the advantage of being at least a four-lane facility over its entire length.

4.5.5 Recommendations

Using the dual classification system described in Section 4.4, the requirements for loads allowed to travel on Saturdays and up to 14:00 on Sundays are as follows:

- On Category A routes: Classes D1 and D2 loads; and
- On Category B routes: Class D1 loads.

A proviso is that the overall height of the load does not exceed 4,6m and no mass exemption is applicable. Weekend travel should not be permitted on category C or D routes.

It is recognised that this system would take some time to implement, and it is desirable to allow all provincial authorities to gain experience with the system. It is therefore recommended as an interim measure that the N3 experiment be extended by allowing unescorted loads with a width not exceeding 3,35m and height not exceeding 4,6m to travel on Saturdays and on Sunday up to 14:00 only, on the following national routes:

- N1 from Cape Town to Beit Bridge;
- N2 between Port Shepstone and Richards Bay;
- N3 from Durban to Buccleuch interchange;
- N4 between Lobatse and Middelburg, Mpumalanga;
- N6 from East London to Bloemfontein, and
- N12 between Three Sisters and Warrenton.

It is further recommended that embargo days be applied on a per route basis rather than province-wide. Routes (or corridors) should be classified as holiday routes, based on the observed variations in travel demand over holiday periods.

An embargo is proposed on travel between 06:00 and 09:00 as well as between 16:00 and 18:00 in the peak direction on identified routes in all metropolitan municipalities. The appropriate routes should be determined in consultation with the appropriate metropolitan authority.

5. SPECIFIC REVIEW ITEM - ROAD USER CHARGES APPLICABLE TO ABNORMAL HEAVY VEHICLES³

5.1. Introduction

5.1.1 Background

The Moving South Africa (MSA) study (1998) found that in general the South African freight system is characterised by high systems costs and other costs that the system imposes on society in the form of externalities (e.g. safety and environmental damage). Externality costs related to road freight, in particular, include accident costs and environmental aspects (noise and air pollution through greenhouse gas emissions). These costs are not included in the fuel tax and should be passed in full to the road user.

Road User Charges (RUCs), which normally include infrastructure costs, congestion and externalities such as noise, air pollution or greenhouse gas emissions are one mechanism recommended by the MSA study through which users can pay for the full cost of using a road.

In the case of abnormal heavy vehicles the following "Road User Charges" are currently levied:

- Registration Fee;
- Administration Fee;
- Congestion Fee (also referred to as a Road Usage Fee);
- Mass Fee; and
- Escorting Fee.

The congestion fee can be regarded as partly paying for the externality costs caused by abnormal heavy vehicles. The environmental externalities (e.g. noise and greenhouse gas emissions) are however not included in this fee. This aspect is dealt with in Section 5.3. An overview of international RUC trends and practices is described in Section 5.2.

5.2. International RUC trends

5.2.1 Introduction

Heavy vehicle pricing measures exist, or are being developed and implemented in other countries over the last 10 years. There is much to learn from the experience of these countries in considering possible options for heavy vehicle and abnormal RUC systems in South Africa.

³ This chapter is based on the report by J Bosman, Namela Projects, Pretoria

This section provides a brief overview of the most significant recent developments in:

- Europe (Switzerland, Germany, Austria and the United Kingdom);
- USA; and
- Australia.

5.2.2 Europe

a. General

The 1995 European Union (EU) Green Paper on fair and efficient prices advocated the pan-European internalisation of external costs including air pollution, noise, congestion, accidents and impacts on human health. In 1998 the EU published a White Paper on Fair Payment of Infrastructure Use. This document proposed that transport infrastructure users should cover the infrastructure costs they cause, and showed how the different existing transport pricing systems in member countries could be adapted towards a more coherent system to achieve this.

The common objective of these initiatives appears to have been to achieve a more efficient transport pricing system, by contributing both to the competitiveness of the European economy and to a more sustainable transport system.

b. Switzerland

The first stage of the Swiss Heavy Vehicle Fee (HVF) was introduced in January 2001. The charge applied to all goods vehicles over 3,5 t, and to all distances driven within Switzerland. The introduction of the HVF was accompanied by an increase in the maximum mass of trucks from 28 t to 34 t.

The HVF is levied according to:

- The number of kilometres travelled on Swiss roads;
- Maximum gross laden mass of the total vehicle (including trailers); and
- The emission category of the heavy vehicle.

The rates charged vary from R 0.14/t-km (Euro 4, 5, 6) to R 0.19/t-km (Euro 0, 1, 2) depending on the heavy vehicle's emission class.

The HVF covers three externalities that could easily be given a monetary value:

- Health costs and damage to buildings caused by air pollution;
- The costs of noise; and
- The costs of accidents.

c. Germany

The objective of the German heavy vehicle charging system for motorways includes:

- Increasing the contribution made by heavy goods vehicles to the funding of infrastructure in line with the user pays principle;
- Increasing the contribution made by foreign heavy vehicles towards German infrastructure costs;
- Introducing a distance-related charge to establish fairer conditions of competition between road and rail freight transport; and
- Encouraging a shift to less polluting vehicles.

The toll applies to all vehicles 12 t and over using German motorways. Buses, military vehicles and police vehicles are exempted.

The intended road tax on all German motorways is due to apply to all heavy vehicles passing through the country, based on the following criteria:

- Number of kilometres driven on German motorways;
- Number of axles; and
- Emission value of engine.

There are three categories of vehicle, broadly corresponding to their Euro emissions class, and within each category there are two rates depending on the number of axles, i.e. the more axles, the higher the rate. Rates range from € 0,09 to € 0,14 per kilometre.

For a 40 t heavy vehicle travelling 100 000 km per year on German motorways the annual cost of the new charges will be approximately € 12 400. **(This is equivalent to R 0,04/t-km).**

d. Austria

Austria replaced the national vignette system for heavy vehicles over 3,5 t on motorways and expressways with a distance-based charge, whereby all vehicles, vehicle combinations and buses exceeding 3,5 t gross laden mass are subject to the charge.

Classification is based on the number of axles. Tariffs per kilometre are € 0,13 for vehicles with 2 axles, € 0,18 for 3 axles, and € 0,27 for vehicles with 4 or more axles. The average rate is € 22 per kilometre. **(This is equivalent to R 0,075/t-km).**

e. United Kingdom

The heavy vehicle road user charge will apply to all goods vehicles in excess of 3,5 t and will cover all roads in England, Wales, Scotland and Northern Ireland. The charge would be paid by all of the

430 000 goods vehicles registered in the U.K. and all foreign registered vehicles operating on UK roads.

The charge varies according to:

- Distance travelled;
- Vehicle type; and
- Road type.

Varying the charge according to distance travelled ensures that all vehicles contribute equally, irrespective of their country of registration, or where they last refuelled.

Distinguishing by vehicle type ensures that the charge relates both to road damage costs and to environmental costs, with the heaviest vehicles with the fewest axles paying most, and those vehicles with more environmentally friendly emission standards paying less.

Distinguishing by road type reflects the significant differences in costs between modern, high quality roads, usually constructed to provide for freight traffic and other roads where road damage, environment and safety costs are higher.

(The recommended UK fee is equivalent to R 0,04/t-km).

5.2.3 United States of America

The road user costs for the USA are based on a study comparing the external costs associated with both road freight and rail freight shipments specifically within the Middlebury-Burlington corridor in the state of Vermont. Values (cent/ton mile) for the seven different external costs were obtained from two separate studies, one from Canada and one from Australia.

The externality costs used in this study were equal to R 0,05/t-km.

5.2.4 Australia

The Australian National Transport Commission (NTC) released a draft Regulatory Impact Statement on the 3rd Heavy Vehicle Pricing Determination in 2005. In this statement an externality fee **equivalent to R 0,025/t-km** was recommended. (This value was adjusted for 5 % inflation per annum.)

5.2.5 Summary of externality costs

The externality costs/fees used or recommended by Australia, USA (Vermont), United Kingdom and various countries in Europe are summarised in Table 2.1.

Table 3: Summarised externality fees/costs

Country	Fees/Costs (R/t-km)
Switzerland	0,14 to 0,19
Germany	0,04
Austria	0,075
UK	0,04
USA	0,05
Australia	0,025

The findings of the International literature search on externality costs will be discussed in the next section and interim recommendations relating to the externality costs of the conveyance of abnormal loads in South Africa are proposed.

5.3. Proposed externality fees

5.3.1 Introduction

No comprehensive study exists to quantify the effect of transport externalities in South Africa. Preliminary estimates by the CSIR, based on European data, suggest a total externality cost (including safety) in the order of R 0,22/vehicle-km. The MSA-study therefore concluded:

“Current estimates are vague and based on analogues to European studies, and are insufficiently precise in the South African context. A detailed South African study on externality costs must therefore begin. Following the study, the costs must be prioritised and allocated accordingly through pricing mechanisms.”

In the following sub-sections of this chapter suggestions are made on applying international externality costs to the conveyance of abnormal loads in South Africa. In the light of the above MSA-statement these costs should be regarded as interim “default” values until such time as a detailed South African study has been done.

5.3.2 “Default” abnormal load externality costs

The externality costs for Switzerland in Table 3 are 3 to 4 times higher than the average costs applying to the other costs in the table. It is therefore recommended that the average externality cost of the other countries, namely 4,5 c/t-km be used in South Africa. Included in this amount are the externality costs for noise pollution and the emission of greenhouse gases.

The current congestion fee (Road Usage Fee) is approximately 5 percent of the proposed externality fee over a distance of 600 km. It is therefore recommended that the congestion fee be incorporated in the externality fee. An externality fee of 5 c/t-km is thus recommended.

5.4. Escorting fee

An escorting fee/vehicle/km for 2009/10 of R6.70 has been proposed to the Abnormal Loads Technical Committee for approval.

An escorting fee of R7.28/vehicle/km was calculated, based on the following assumptions:

Average salary of a traffic officer:	R 12,000/month
S & T rate:	R 650/day/officer
Cost of vehicle	R 2,31/km
Distance travelled/day:	300 km

The vehicle cost is the AA rate for a sedan with a purchase price between R 125 001 and R 150 000, an engine capacity between 1501 cc and 1800 cc, travelling an annual distance between 40 001 km and 45 000 km.

The proposed escorting fee of R 7,28/vehicle/km is an increase of 20 % compared to the 2008/9 fee of R6.00/vehicle/km. The increase of 20% is 50% above the current inflation rate. It is recommended that the assumptions should be cleared with the provincial authorities before the proposed escorting fee of R7,28/vehicle/km is approved.

5.5. Recommendations

It is recommended that an interim Externality Fee (which include the Road Usage Fee) of 5 c/t-km be introduced from 1 April 2009; and that the proposed escorting fee of R 7.28 /vehicle/km for 2009/10 be reviewed after consultation with the provincial authorities. It is further recommended that the DOT undertake a detailed South African study on transport externality costs.

6. SPECIFIC REVIEW ITEM - ABNORMAL LOAD BRIDGE FORMULA

6.1. Background

Section 3.4 of the TRH11 makes provisions for maximum permissible loads of axles and axle groups of abnormal vehicles crossing bridges and culverts. A maximum allowable load for a single abnormal vehicle is specified as 125 000kg (total vehicle mass) or 18 kN/m². In addition to these limits, the gross mass of a single group of axles is to be limited according to the bridge formula, stated in the following equation:

$$\text{Allowable load} = EW (6,850 + 0,00145 \times \text{distance between outer axles of group})$$

Where EW = effective width of axle group (mm)

The maximum allowable values of effective width and distance between outer axles of an axle group are given in Table 3 of TRH 11 as 4 700 mm and 6 000mm respectively. Table 3 also provides limits on the mass and dimensions of axle groups above which vehicles are subject to special tracking requirements, namely that the vehicle should proceed over a bridge in such a manner so that the centre of the load is not more than 1,0 m from the centre line of a bridge with a length exceeding 60m. In such cases, the structure will be temporarily closed to all other road users.

These provisions have not been changed since TRH 11 was revised in 1981. Since then, there have been many developments in the transportation industry and codes of practice for the design of bridges and culverts. Therefore there was a need to evaluate the applicability of TRH11 in the present and future road traffic environment.

6.2. Project Scope

This study was undertaken by Vela VKE Consultants and comprised the review of the provisions of TRH 11 for the control of the effects of abnormal vehicles on bridges and culverts. The review was limited to the evaluation of Section 3.4 of TRH 11 and specifically vehicles of laden mass less than 125 000 kg, vehicles with a maximum loading intensity of 18 kN/m² and vehicles satisfying the bridge formula as expressed by Table 3 of TRH 11.

6.3. Objectives

The provisions of TRH 11 for abnormal loading were reviewed with the objective to recommend whether the current provisions can be revised or replaced. In particular the review aimed to make recommendations with the regard to the following provisions:

- (i) Vehicle mass limitation;
- (ii) Vehicle loading intensity;
- (iii) Axle mass limitation as expressed by the bridge formula and tabulated in Table 3; and
- (iv) The application of the bridge formula to vehicle outside the bounds set out in Table 3.

6.4. Methodology

The current review dealt with Sections 3.4 (b), (c), (d), and (e) of TRH 11. In addition to a literature search, it was decided to carry out a parametric study comparing the effects of abnormal vehicles loaded according to Section 3.4 of TRH 11 to the effects of abnormal design vehicles specified in the codes of practice. Single, two span continuous and three span continuous bridges, with spans ranging from 5m to 40m, were considered. This set of spans covers most short to medium span bridges in South Africa and allows for a direct comparison between provisions of TRH 11 and the relevant design codes. The following codes of practice were selected; TMH 7, BS153, BS5400, MOT, and Natal. These codes of practice have been used to design bridges which may be affected by any revisions of TRH11.

6.5. Critical review of TRH 11: Section 3.4

In order to understand the basis for the permissible load limits set out in TRH 11, Section 3.4, a literature search for the origins of the allowable limits specified in TRH 11 was undertaken. Communication with people who might have the relevant institutional memory also took place. Although no documented literature was found on the development and rationale for the provisions of TRH 11, Section 3.4, reports that provided valuable information were found. Communication with staff at the CSIR and Provincial Government Western Cape provided further useful insights.

Following the review of literature and personal communication with individuals with relevant information and experience, the possible rationale for the various provisions given in TRH 11, Section 3.4 is provided.

The 125 000 kg limit is judged to be correlated to TMH 7's NB24 load model. If this is correct, the limit is only valid for structures designed for abnormal loads. Bridges designed for normal traffic loading models in the MOT(1931) or PWD (1912) loading would be unable to support an abnormal load that complies with these limits.

The method of deriving the 18 kN/m² limit in TRH 11 was not found. In the further review, an approach based on an equivalent base length of a vehicle and the effective width was adopted. This is considered to be the best available approach since the base length is chosen so as to produce the same load effects as the vehicle.

The basis for the bridge formula in TRH 11 was not found. Some of the reports found however provided some insight into the possible approach adopted for the derivation of the bridge formula. Based on these the assumption is that bridge formula in TRH 11 was derived from the mass of a vehicle based on axle spacing and this mass was then multiplied by a vehicle width factor to account for a vehicle's width. This assumption was tested and the hypothesis is that the bridge formula specified in Table 3 in TRH 11 is a lower bound of mass versus axle spacing graph corrected for vehicle width.

An important observation is that the width factor does not vary linearly with the vehicle width. This has implications on the extrapolating of the bridge formula. Thus in order to confidently estimate the allowable mass beyond effective width of 4,7 m, the vehicle width factors covering the required effective widths should be calculated. For this reason Table 3 should not be extrapolated beyond its current limits.

6.6. Evaluation of load effects

In South Africa bridge live load models have varied over the years and a number of main load models have been used. A comparison of the effects of TRH 11 permissible loads to the effects of abnormal load models specified in the relevant codes of practice was undertaken.

The aims of analysis were:

- (i) To compare the effects of TRH 11 to those of codes of practice;
- (ii) To investigate the effect of extrapolation on Table 3; and
- (iii) The investigation of the effect of overloading.

THM 7 NB36 & NB24 and BS153 NB30 were used in the analysis, as these were considered to be the least conservative codes. Partial factors of safety were not included in the analysis.

For the purposes of this review the analysis of the effects of abnormal vehicles was carried out for twelve virtual TRH 11 abnormal vehicles. Each of the virtual vehicles had three axles groups and the limits to axle spacing given in TRH 11 Section 3.4 (c) were followed. The effective width of these vehicles was limited to 3,7 m i.e. single lane. The effect of these vehicles was compared to that of the NB36 abnormal vehicle specified in THM 7, the HB (30 units specified in BS153) and TMH 7 NB24. It is worth pointing out that this approach is consistent with international norms for assessment of the to abnormal load effects. This approach has been used in the development and calibration of partial factors of safety in the Eurocodes. Two fully loaded abnormal vehicles were also considered. The one vehicle has a mass of 131 t and the effective width of the trailer is 4,7 m. The other vehicle has a mass of 123 t and the effective width of the trailer is 5,2 m.

The analysis was carried out in ADINA finite element package. The bridges were modelled using beam elements and the axle groups were modelled as constant moving forces. Maximum shear forces and bending moments were obtained using ADINA. The ratio of the effects due to abnormal vehicles to that of effects resulting from design abnormal vehicles gives an indication of capacity and hence the level of conservatism of TRH 11 if any. Simply supported and continuous beam type elements of spans ranging from 5 m to 30 m were analysed

The main findings were:

- (i) TRH 11 Table 3 compared to TMH 7 NB24: The un-factored moment and shear capacities of bridge structures designed to TMH 7 NB24 exceed the load effects of Table 3's virtual vehicles by approximately 5 % for shorter spans and approximately 40% for longer spans;
- (ii) TRH 11 Table 3 compared to TMH 7 NB36: The un-factored moment and shear capacities of bridge structures designed to TMH 7 NB36 exceed the loads effects of Table 3's virtual vehicles by margins ranging about 35% for shorter spans to about 48 % for longer spans; and
- (iii) TRH 11 Table 3 compared to BS153 HB30: Structures designed to BS153 have additional un-factored moment and shear capacities margins ranging from 8 % to 50 %.

Table 3 is therefore clearly within the design loading curves for abnormal loading. It should be noted that the actual capacity in the bridge structures would be higher than stated here due to partial factors of safety used in the ultimate limit state design of bridges. These limit states take account of any variation (possibly due to overloading) in the applied live load.

The main findings from the results of the comparison between TMH 7 NB24 and normal TRH 11 loading, an overloaded vehicle (5%) and a wide vehicle (11% wider than TRH 11 limit) are that the overloaded and wide vehicles generate load effects in excess of NB24's design effects for short spans up to 10 m; and there is a substantial decrease of both moment and shear forces generated by the two abnormal loads. It is, however, noted that that these two trucks would be within the limits if they were compared to TMH 7 NB36 and the factored ultimate limit state load effects of TMH 7 NB24.

6.7. Recommendations

1. It is considered that the bridge formula (Table 3, TRH 11) represents a lower bound of the mass versus axle spacing curve, scaled to account for vehicle width. The vehicle width factors do not follow a linear relationship. Therefore extrapolating beyond the Table 3 limits will not guarantee a reasonable estimate of the allowable mass;
2. The results of the analysis support the finding that abnormal load limits in TRH 11 Section 3.4 are correlated against THM 7's NB24 load model. In this regard Table 3 accurately simulates the load effects on short span bridges; and

3. An exhaustive literature search is required if any amendment is to be made to the existing requirements of TRH 11. However, it should be noted there is opportunity in developing alternative codes of practices based on rational limit state design principles. Specifically, partial factors relating to the allowable overstressing of the structure may be derived from the statistical analysis of abnormal vehicle survey data. This may in turn lead to the derivation of a rational partial factor for the ultimate limit state load effects of abnormal loads.

Final Draft Issued 17 Nov 2008

7. SPECIFIC REVIEW ITEM - RECOVERY OF ROAD DAMAGE

7.1. Background

The current basis for the calculation of abnormal load fees as contained in TRH 11 is strictly in accordance with the well known principle of Equivalent Single Wheel Mass (or Load), ESWM or ESWL. The basis for this calculation in South Africa was established in 1972. This principle has been the basis of mass fee calculation for the last 36 years in South Africa and elsewhere. It was reviewed for implementation in 1994, incorporating some of the mechanistic-empirical (M-E) approaches for road pavement design in South Africa. This reviewed method is currently being used.

The main drawback of the principle of ESWL (or ESWM) is that the response of a layered road pavement system is greatly altered by representing all the axles of an abnormal vehicle by a unique single wheel, especially if this is based on vertical elastic deflection alone (i.e. the "Equivalent Deflection Equivalent Damage", (ED-ED) approach). It is generally accepted that equal maximum elastic deflection of a pavement does not guarantee "similar damage", e.g. layered pavement systems with the same maximum deflection may have different radii of curvatures.

Since 1975, full-scale pavement research with the Heavy Vehicle Simulator (HVS) in the field of Accelerated Pavement Testing (APT), as well as detailed studies on tyre-pavement interaction, have resulted in new knowledge which was incorporated into and applied to the South African Mechanistic-Empirical Design Methodology (SAMDM). A new methodology for the determination of the associated road damage for mass fees of abnormal vehicles based on the South African Mechanistic-Empirical Design Method (SAMDM) was investigated.

As stated earlier, the review item on the recovery of road damage is described in a separate report (see reference 10).

7.2. Description of study

The proposed new methodology for the determination of the associated road damage by abnormal vehicles is based on the South African Mechanistic-Empirical Design Method (SAMDM) under static loading conditions. The proposed methodology is not based on the traditional Equivalent Single Wheel Load (or Mass) ESWL (or ESWM), nor on the well known 4th power law for relative pavement damage. The current SAMDM methodology is used instead to estimate the Load Equivalency Factors (LEFs) of each vehicle, based on the critical pavement layer life approach. The SAMDM used in this study is the latest procedure which has been used in practise for pavement design and analysis since 1996.

The LEFs were calculated from estimated ratios of critical pavement layer life for each individual AV relative to the Standard Axle (80 kN, 520 kPa) bearing capacities of a range of nine typical standard pavement structures found in South Africa. This was done for both relatively dry and wet pavement conditions under each of the most outside tyres and then summed for each vehicle. This study included examples of eleven selected mobile cranes and eight other selected abnormal vehicles.

The new methodology for the determination of LEFs discussed here also included the effect of tyre inflation (or contact pressure) (TiP), and a sensitivity analysis over a range of 520 kPa to 1 200 kPa for all the above vehicles and pavements was done. Each of the above vehicles was analysed at different tyre pressures, and for the nine different pavement types and tyre inflation pressures. The newly estimated LEFs were compared with the current ESWL method. It is clear that the new methodology results in different road damage values, i.e. LEFs (which is dependent on pavement type, moisture condition and tyre inflation pressure), compared with those determined with the current ESWL method.

7.3. Conclusions from the study

The following conclusions can be drawn from this study:

- The new methodology based on the principle of full mechanistic road pavement analysis for each mobile crane and each abnormal vehicle considered in this study allowed the variation of Load Equivalency Factors (LEFs) to be effectively quantified, for static loading only;
- This was demonstrated over a range of nine different pavement types, two pavement conditions and at different Tyre Inflation Pressures (TiPs);
- In general, the new LEFs compare favourably with those calculated with the existing ESWL method (i.e. current method) in terms of rating the different vehicles according to their road damage potential;
- The new method allows for different pavements with their moisture condition to be modelled effectively for the typical abnormal vehicles (including mobile cranes) found in South Africa;
- This study show that relatively higher LEFs were determined for the weaker pavements, and also those analysed in relatively wet pavement conditions;
- The LEFs determined for the stronger pavements were found to be lower compared with the current ESWL method for both relatively dry and relatively wet pavement moisture conditions, especially for the mobile cranes;
- Tyre Inflation Pressure (TiPs) plays a major role in the estimation of LEFs, and hence road pavement damage. The higher the TiP, the higher the LEF, and associated road pavement damage for all pavement analysed here;
- The new system of analysis provides for a more rational methodology for the estimation of road pavement damage, than perhaps given by the existing methodology based on ESWL.. Each tyre load (hence axle load, and hence total load) is directly considered at the given TiP in the new method.; and

- Variation in the structural road pavement systems is allowed for in the new method, introducing the effect of different pavement types and moisture conditions (albeit limited) to be considered.

7.4. Conclusion and recommendations

This study indicates that there appears to be a wide range in the new LEFs for the different vehicles based on the new and what is considered, more rational and fully mechanistic approach (i.e. the SAMDM). Although the new LEFs (hence the associated mass fees) are found to be different compared to those calculated according to the existing ESWL method, they are in principle, considered to be based on a more rational (mechanistic) methodology than before and it is suggested that they be refined and phased in over time, starting as soon as practical possible.

The introduction of the new methodology through a Geographical Information System (GIS) of road pavement types, which would allow the selection of the applicable pavement sections for a specific route to be used, will enable appropriate road damage (and hence permit fees) to be determined for each section of road structure on that route, resulting in a fairer and more appropriate road damage cost recovery for a particular road pavement.

For future evaluation, the methodology suggested above may need to include vehicle dynamic loading, as it is important to note that the current study in Reference 10 is based on static loading only.

Until the new methodology can be introduced, the current methodology based on the ESWM should remain in use.

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8. Administrative Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads - Final Draft; issued on 1 October 2008.
9. Contract Report CSIR/BE/ISO/ER/2008/0400/B; Project DOT/11/2007/INM: Revision of TRH 11 (2000) Report on Stakeholder Interaction and Comments - Final Draft; issued on 22 October 2008.
10. Contract Report CSIR/BE/IE/ER/2008/0006/B-1; October 2008. Revision of TRH 11 (1999-2000): Recovery of Road Damage - Discussion Document on a Provisional Basis for Possible New Estimation of Mass Fees - Under Review for TRH 11 (2000). Final Summary V1.0. Authors: De Beer, M., Sallie, I.M., and van Rensburg, Y.
11. TRH 11 Dimensional and Mass Limitations and other Requirements for Abnormal Vehicles, 8th Edition - Final Draft; issued on 30 October 2008.
12. Administrative Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads - Final Draft; issued on 30 October 2008.

Appendix A: Review of TRH 11 Versions - 1974 to 2000

TRH 11 Revisions

- First Published in 1974
- First revision in May 1979
- Second revision March 1981
- Reprinted in June 1982
- Third revision April 1987
- Fourth revision April 1992
- Fifth revision November 1992
- Sixth revision September 1997
- Seventh revision March 2000 (Draft only)

First Publication 1974

a. Title

Conveyance of Abnormal Loads

b. Structure of Document

	COMMENTS
Synopsis	
Foreword	
• Introduction	
○ Background	<i>TRH 11 is a guide and recommendations are not binding.</i>
○ Types of exemption permits	<i>Single trip and Period</i>
○ General rules	<i>Obtain 'Principle' approval before purchasing, importing or constructing. Only indivisible loads +ISO containers. Embargo days Use of appropriate vehicle: No 2-axle mass permits.</i>
• Abnormally heavy loads and vehicles	
○ The effect of vehicle loads on road pavements	
▪ The relation between tyre inflation pressure and tyre contact pressure	<i>Contact pressure = 145 + 0.67 * cold inflation pressure</i>
▪ The relative effect of single wheel massload	<i>Relative damage vs. load and tyre contact pressure</i>
▪ The relative damaging effect of a group of wheels	<i>ESWM concept Nomogram included to determine equivalency factors to calculate ESWM</i>

	<i>Graph to determine the ESWM adjusted to 520 kPa.</i>
○ Allowable massloads as determined by road loading	<i>Maximum ESWM of 5 000 kg</i>
○ The effect of loads on vehicles	<i>Manufacturer's ratings</i>
○ The effect of loads on tyres	<i>Limitations in TREDCO Data Book must be adhered to. Table with % increase in allowable tyre load at lower speeds.</i>
○ The effect of loads on bridges and culverts	
▪ Limitations imposed on bridges and culverts	<i>Concept of effective width introduced.</i>
▪ Allowable massloads as determined by bridge loading	<i>Bridge formula: Allowable massload_{kg} = EW * (6 850 + 1450 * distance between extreme axles) Bridge Formula table: Max EW=4.2m, max exdis=5.0m.</i>
○ The effect of loads on high fills	
○ The permit fee	<i>Nomogram to determine mass fee from ESWM and Total Mass. No dimensional fee</i>
• Abnormally dimensioned loads and vehicles	
○ General	
▪ Escorting of abnormal vehicles	<i>3 classes: one self, two self and two traffic officers.</i>
▪ Warning signs on abnormal vehicles	<i>Flags if Width>2.75m or speed < 50km/h. Flags on corners, warning boards and flashing amber lamp if escorting required.</i>
○ Abnormally wide loads and vehicles	
▪ Escort requirements	<i>Table with escort requirements according to width of load and width of road surface.</i>
○ Abnormally long loads and vehicles	
▪ Escort requirements	<i>Table with escort requirements according to length of combination.</i>
▪ Length limitations	<i>20m for rigid, 24m for articulated, 14.5m max wheelbase. Steerable rear axles or dollies for longer overall lengths.</i>
▪ Limitations on load projections and overhang	<i>Front overhang: max 3m more than legal provided a height > 2.5m. Front load projection: Max 1m. Rear overhang: Less than 70% of wheelbase. Rear projection: If overhang > 50% of</i>

	<i>wheelbase, max projection = 0.5m else max projections are tabled according to wheelbase.</i>
<ul style="list-style-type: none"> ○ Abnormally high loads and vehicles 	<i>Height>4.6m: Height of every overhead obstruction to be determined before passing under.</i>
<ul style="list-style-type: none"> • Speed restrictions on abnormal vehicles 	
<ul style="list-style-type: none"> ○ General 	
<ul style="list-style-type: none"> ○ Abnormally heavy vehicles 	<i>Ratio between maximum, actual and legal payload used to restrict speed.</i>
<ul style="list-style-type: none"> ○ Abnormally dimensioned loads and vehicles 	<i>Speed determined by requirement for warning signs and escorts.</i>
<ul style="list-style-type: none"> ○ Recording of speed and distance travelled 	
<ul style="list-style-type: none"> • Power/Mass ratio 	<i>Minimum kW = 52 + 0.00215 * total mass in kg.</i>
<ul style="list-style-type: none"> • Mass distribution 	
<ul style="list-style-type: none"> ○ Placement of load 	<i>Ensure even distribution of load.</i>
<ul style="list-style-type: none"> ○ Massload on driving axles 	<i>20% of GCM.</i>
<ul style="list-style-type: none"> ○ Massload on steering axles 	<i>15% of prime mover's gross mass.</i>
<ul style="list-style-type: none"> ○ Massload on tag axles 	<i>Tag axle only allowed on unit with 3 or more axles. Condition 18 always enforced (Weighing).</i>
<ul style="list-style-type: none"> • Operating conditions 	
<ul style="list-style-type: none"> ○ General 	
<ul style="list-style-type: none"> ○ Personnel 	
<ul style="list-style-type: none"> ○ Roadworthiness of vehicles 	
<ul style="list-style-type: none"> • Application form, the permit and conditions 	
<ul style="list-style-type: none"> • Non-compliance with regulations or permit conditions 	
<ul style="list-style-type: none"> • References 	
<ul style="list-style-type: none"> • Annexure 	
<ul style="list-style-type: none"> ○ Example to determine the allowable load on bridges 	
<ul style="list-style-type: none"> ○ Application for exemption 	
<ul style="list-style-type: none"> ○ Exemption permit 	
<ul style="list-style-type: none"> ○ Standard permit conditions 	<i>22 Standard conditions.</i>
<ul style="list-style-type: none"> ○ Register of vehicles used to convey abnormally heavy loads 	

First revision in May 1979

a. Title

Policy on the Conveyance of Abnormal Load

(New title)

a. Structure of Document

- The structure of the document was changed substantially.
- The legal requirements according to the regulations were listed where applicable.
- The marking and escorting of abnormal vehicles was moved to a separate section.
- The Road Usage Factor (RUF) was introduced.
- The standard permit conditions were revised to 23 conditions and grouped into the following sections:
 - Documentation
 - Movement restrictions
 - Warnings
 - Compliance with ruling laws
 - Responsibility

Foreword	
Synopsis	
Definitions	<i>New section with ±40 definitions.</i>
1. Introduction	
1.1. General	<i>Permit is a privilege, not a right. Uniformity among provinces.</i>
1.2. Types of permit	
1.3. General rules	
2. Load limitations	
2.1. General	
2.2. Manufacturer's rating	<i>Legal / Allowable under permit.</i>
2.3. Tyre loading	<i>Legal / Allowable under permit. Adhere to TREDCO limits.</i>
2.4. Pavement loading	<i>Legal / Allowable under permit. Max ESWM of 5 000 kg @ 520 kPa.</i>
2.5. Combination of tyre and pavement loading	<i>Tables with optimum values from TREDCO tables tabulates as Appendix C.</i>
2.6. Limitations imposed by bridges and culverts	<i>Legal: Max = 1.8 * (Dist. extreme axles) +16 000. Permit: Special investigation if gross mass >125t else Max=EW(6.85 + 0.00145*(Dist. extreme axles) Table: Max EW=4.7m, Max exdis=6.0m. Tracking required over bridges added. Distance between axle groups: last axle to</i>

	<i>first axle < 5m: one group.</i>
2.7. Limitations imposed by the prime mover	
2.7.1. Power/mass ratio	<p><i>Legal: Max Gross = kW * 240</i></p> <p><i>Permit: Gross > 23t</i></p> <p><i>Min kW = 50 + (Gross mass / 500)</i></p> <p><i>More than one hauler:</i></p> <p><i>GCM rating ≥ 54t, ≥220kW each and with compatible performance.</i></p>
2.7.2. Massload on driving axles	<p><i>Legal: 20% of Gross.</i></p> <p><i>Permit: 20% of Gross.</i></p> <p><i>(15% for drawbar on flat, dry road).</i></p>
2.7.3. Massload on steering axles	<p><i>Legal: 11%, 20%, 30% (vehicle type)</i></p> <p><i>Permit: 15% of Gross of drawing vehicle/s.</i></p>
2.7.4. Massloads on tag axles.	<i>Permit: Test results showing relation between air pressure & axle load.</i>
3. Dimensional limitations	
3.1. General	
3.2. Limits	
3.2.1. Width	<p><i>Legal: According to regulations (2.5m).</i></p> <p><i>Permit: Special provision when width > 2.75m (marking + escorts), Period permits if width>3m only up to 3 months,</i></p>
3.2.2. Height	<p><i>Legal: According to regulations (4.1m)</i></p> <p><i>Permit: >4.1m – establish height of overhead obstructions.</i></p> <p><i>>4.7m: escort with height gauge</i></p> <p><i>>5.4m: Permission from Eskom & Post</i></p>
3.2.3. Length	<p><i>Legal: According to regulations.</i></p> <p><i>Permit: Rigid 20m, Articulated 24m, With dolly 26m, Crane 20m, Foundation digger 23m.</i></p>
3.2.4. Front overhang	<p><i>Legal: According to regulations.</i></p> <p><i>Permit: Front overhang: max 5m over front axle provided a height > 2.5m.</i></p> <p><i>Foundation digger: 14m.</i></p>
3.2.5. Rear overhang	<p><i>Legal: According to regulations.</i></p> <p><i>Permit: 2m or 70% of wheelbase.</i></p>
3.2.6. Front load projection	<p><i>Legal: According to regulations.</i></p> <p><i>Permit: same as '74 (1m)</i></p>
3.2.7. Rear load projection	<p><i>Legal: According to regulations.</i></p> <p><i>Permit: same as '74</i></p>
3.2.8. Wheelbase	<p><i>Legal: According to regulations.</i></p> <p><i>Permit: >14.5m then steerable axles.</i></p>

	<i>No period permits if > 12m.</i>
4. The marking and escorting of abnormal vehicles	<i>New section</i>
4.1 General	
4.2 Description of warning devices and boards	
4.2.1. Flags	
4.2.2. 'Abnormal' warning boards	
4.2.3. Escort vehicle board	
4.2.4. Amber flashing light	
4.2.5. Marker lamps and retro-reflectors	
4.2.6. Speed restriction board	
4.3 Circumstances in which warning devices and boards are required	
4.3.1. In respect of long and wide loads	<i>Road Usage Factor (RUF) introduced: RUF=1.61757E-3*W^{4.7}+7.5E-7*L⁴ RUF<0.31 No warning devices RUF >0.31 to 0.54 Flags RUF>0.54 All warning devices.</i>
4.3.2. In respect of projections	<i>Rear proj.>1.8m => Flags</i>
4.3.3. In respect of night travelling	<i>Marker lamps and retro-reflectors</i>
4.3.4. In respect of speed restrictions	<i><60km/h: Speed board</i>
4.4 Escorting of abnormal vehicles	<i>Same 3 classes as '74</i>
4.5 Escort requirements	
4.5.1. Escort requirements in respect of length and width	<i>RUF<0.54: No escorts RUF>0.54 to 0.94: One self escort RUF>0.94 to 2.04: Two self escort RUF>2.04: TOE's</i>
4.5.2. Escort requirements in respect of height	<i>Same as '74 (escort with height gauge >4.7m height.</i>
4.5.3. Escort requirements in respect of overhang	<i>>4.5m : escort >6.0 m: police officer escort.</i>
4.5.4. Escort requirements in respect of mass	<i>TOE's if tracking over bridges required.</i>
5. Speed restrictions on abnormal vehicles	
5.1 General	
5.2 Speed restrictions due to tyre loading	<i>Speed restrictions were adjusted from '74.</i>
5.3 Speed restrictions due to bridge loading	<i>New table with restrictions according to mass.</i>
5.4 Speed restrictions due to abnormal dimensions	<i>Speed restrictions were adjusted from '74.</i>
5.5 Recording of speed and distance travelled	
6. Operating considerations and the administration of abnormal loads	
6.1 General	
6.2 Personnel	<i>Responsibilities are stated.</i>
6.2.1. The administrative officer	
6.2.2. The person-in-charge	

6.2.3. The driver	
6.3 Insurance	
6.4 Roadworthiness of vehicles	
6.5 Registration of carrier	
6.6 Register of vehicles used for the conveyance of abnormally heavy loads	
6.7 Non-compliance with laws, regulations or permit conditions	
7. Fees	
7.1 General	
7.2 Registration fees	<i>Registration fee introduced.</i>
7.3 Permit fees	
7.3.1. Massload fee for abnormally heavy vehicles	<i>Table with massload fees according to gross mass and number of axles (per km).</i>
7.3.2. Road usage fee for abnormally dimensioned vehicles	<i>Tables with width and length fees introduced per km.</i>
7.3.3. Minimum fee	<i>Minimum fee for trip & period permits introduced.</i>
7.3.4. Other fees	<i>Based on estimated costs e.g. strengthening of structures.</i>
7.4 Police escort costs	<i>40c/km with minimum of R25-00 Urban: R50-00 for 5 hours or R100-00/day</i>
7.5 Validity periods (for single trip permits)	<i>Table with validity period vs. distance.</i>
7.6 Area-period permit	<i>Table with distances according to vehicle type & period for use in fee calculation.</i>
7.7 Carriers exempted from fees	<i>List of institutions exempted from fees.</i>
8. References	
• Appendices	
○ A: Permit	
▪ Application	<i>New application form.</i>
▪ Sketch	<i>New sketch.</i>
▪ Exemption permit	<i>New layout for permit.</i>
▪ Standard permit conditions	<i>23 conditions grouped in sections. Control certificate added.</i>
○ B: Registration	<i>Separate application forms for registration of individual components.</i>
▪ Truck tractor	
▪ Semi trailer	
▪ Combination	
○ C: Allowable axle massloads	
▪ Tables C1 to C7 (Tyre ratings)	<i>Same as '74 (TREDCO Data Tables).</i>
○ D: Application for registration as an abnormal load carrier	<i>New application form.</i>
○ E: Speed restriction board for abnormal	<i>Sketch with design specifications.</i>

vehicles	
o List of tables	
o List of Figures	

Second revision March 1981

a. Title

Policy on the Conveyance of Abnormal Loads

(Same as 1979 version)

b. Structure of Document

The structure is identical to the 1979 version and even the wording is identical except for the following differences and/or additions:

- 3.2.2: Height: 5.5 m needs permission from Postmaster General and Eskom (was 5.4 m in 1979).
- 3.2.4: Mobile cranes and foundation diggers both allowed 14 m front overhang.
- 3.3: New section on stability.
- 4.2.4: Amber flashing light for mobile cranes added.
- 4.5.3: Escort requirements for crane overhangs adjusted.
- 5.4: Speed restrictions for truck-mounted cranes added as 60 km/h and centre-mounted cranes as 20 km/h.
- 7.3.1: New permit fee for combinations with more than 2 axles fitted with 4 in-line wheels.
- Added: Where the number of axles exceeds 12 the fee for 12 axles is applied with a minimum fee of 1c per axle.

Third revision April 1987

a. Title

Guidelines for the Conveyance of Abnormal Loads

(New title)

b. Structure of Document

The structure is identical to the 1981 version and even the wording is identical except for the following differences and/or additions:

- Definition for 'guidelines' added.
- Definition for 'policy' added.
- 1.2 Types of permit: Route-period permit type added.
- Section 2.7.4 (Massload on tag axles) in 1981 version was dropped from this version.
- 3.2.1 Width: Legal width now 2.6 m and certain agricultural and road construction machines may legally travel up to 3.5 m.

- Under permit: Period permits for vehicles wider than **3.5 m** (was 3.0 m) only considered for periods up to **6** (was 3) months.
- 3.2.4. Front overhang: Under permit the overhang is now a function of the wheelbase.
- 3.2.5. Rear overhang: Under permit: (added paragraph) for cranes etc., the rear overhang of the boom must be within the turning circle.
- 3.2.9. Turning radius (new section)
- 7. Fees: All fixed fee amounts were removed. The massload and width/length fee tables in the 1981 version do not appear in this version. Fees are now revised and approved annually by the authorities concerned and available as an extra annexure (F) from the authorities. This includes the minimum fee and escort fees.

Fourth revision April 1992

a. Title

Guidelines for the Conveyance of Abnormal Loads
(Same title as the 1987 version)

b. Structure of Document

The structure is identical to the 1987 version and even the wording is identical except for the following differences and/or additions:

- 1.1: References to the Road Traffic Ordinance (No 21 of 1966) were updated to the Road Traffic Act 1989 (Act 29 of 1989).
- South West Africa's contact details as a road authority does not appear in this version.
- The regulation numbers were updated throughout the document to reflect the new Road Traffic Act.
- 2.3 Tyre Loading: References to the TREDCO Data book in the 1987 version were replaced by SABS ARP 008/1989
- 2.4 Pavement loading: Legally permissible limits now reflect Regulation 365
- 2.6 Limitations imposed by bridges and culverts: Legal limits now reflect Regulation 365A. Total axle massload of group = $16\,000 + 1\,800 * (\text{Distance between extreme axles})$
- 2.7.3 Massload on steering axles: Reflect limitations in regulation 366. (12% for tractor added)
- 3.2.2 Height: Regulation 354 sets a limit of 4.3 m on height (was 4.1 m) and under permit: If height >5.5 m then approval required from Telkom & Eskom.
- 3.2.3 Length: Regulation 351 states 18.5 m for articulated vehicle (was 17.0 m) and 22.0 m for other combinations (was 20 m)
- 3.3 Stability of loaded vehicles: A ratio for height/wheeltrack of > 2 or a width/wheeltrack > 1.8 can trigger a stability calculation requirement.
- 4.3.5 Abnormal and escort vehicles where warning devices are not required (new section): Warning boards and flags should not be displayed and lights must be extinguished and covered.
- 4.4 Escorting of abnormal vehicles: The term 'traffic officer escort' is used instead of 'police officer escort'
- .7.6 Area-period permits: In Table 8 (Distances for Area-period permits) carriers of construction equipment and carriers of agricultural equipment are now in the same group.
- Appendix C now contains the tyre data from SABS ARP 008/1989.

Fifth revision November 1992

a. Title

Guidelines for the Conveyance of Abnormal Loads

(Same title as the April 1992 version)

b. Structure of Document

The structure is identical to the April 1992 version and even the wording is identical except for the following differences and/or additions:

- The definition for 'adjusted ESWM' does not appear in this version.
- 2.6 Limitations imposed by bridges and culverts – formula changed to:
Total axle massload of group = $18\,000 + 2100 * (\text{Dist. extreme axles})$
- 3.2.1 (b) Special provision must be made if the width exceeds 3,0m (was 2.75)
- 3.2.3 (b) (ii) Articulated vehicles shall not exceed 26m in length (was 24m).
- 3.2.4 Front overhang: Regulation 356 stipulates a max front overhang for a semi trailer as 1.8 m (was 1.5 m)
- 4.3.1 Warning devices in respect of long and wide loads: $RUF < 0.33$ - no warning devices (was 0.31); $0.33 < RUF < 0.54$ - flags; and $RUF > 0.54$ -all warning devices.
- The section '6.5 Registration of carriers' in the April 1982 version is not included in this version.
- 7.3.6 Repayment of permit fees (new section): Original permit must be handed in at the issuing office before the commencement date of the permit. An administration fee will be deducted.

Sixth revision September 1997

a. Title

Guidelines for the Conveyance of Abnormal Loads

(Same title as the November 1992 version)

b. Structure of Document

The structure is identical to the 1987 version and even the wording is identical except for the following differences and/or additions:

- Definitions: The following definitions do not appear in this version: allowable; damage; load centre of gravity; pavement; permissible; structures; underground services and structures; and un-laden mass.
- 1.2 Types of Permit: A list of vehicle types for which period permits could be issued is included. These are un-laden abnormal vehicles; car carriers; fully licensed vehicles; vehicles registered before the new length regulations with wheelbase between 9 m and 10 m; cranes; and carriers of own equipment.
- 1.3 General rules: Paragraphs (d) and (e) in the 1992 version were dropped; and the list of contact details for the old provincial authorities was dropped.

- 2.3 Tyre loading: SABS ARP 008/1989 used in 1992 version is replaced by SABS Recommended Practice 1550 and ARP 007.
- 2.4 Pavement loading: A new table with diagrams of maximum legal loads on axles and groups of axles is included in this version.
- 2.5: The limit on ESWM of 5 000 kg was removed by the ALTC in March 1996 and therefore the section on 'Combination of tyre and pavement loading' is no longer applicable.
- 2.6(c) Limitation on distance between axle groups: No reads '...**first** axle of leading group and first axle of trailing group...' where the previous versions read '... **last** axle of leading group and first axle of trailing group ...'.
- 3.2.1 Width limits: Under permit – the paragraph on period permits for vehicles wider than 3.5 m was removed.
- 3.2.8 Wheelbase: Under permit – the paragraph on period permits for vehicles with a wheelbase exceeding 12 m was removed.
- 4.3: The formula for RUF is slightly different from previous versions: $RUF = 1.61757E-3 * W^{4.7} + 7.5E-7 * L^{3.76}$ (3.76 used to be 4.0).
- 4.5.1: Escort requirements for length and width: $RUF < 0.54$: no escorts; $0.54 < RUF < 0.94$: one-self escort; $0.94 < RUF < 2.73$: two-self escorts (used to be 2.04 in previous versions); $RUF > 2.73$: one or more traffic officer escorts. The separate graphs for warning devices and escort requirements were combined into a single graph in this version.
- 7.3 Permit fees: The annexure with tables of mass and dimensional fees (adjusted yearly) is removed from this version. Fees are now calculated according to the formulae developed by Van Wyk & Louw Consulting Engineers in 1994.
- Appendices: Only the 'Standard Permit Conditions' and 'List of Provincial Offices' are included as appendices in this version. (No application forms or sketches).

Seventh revision March 2000 (Draft only)

a. Title

Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for Other Events on Public Roads

(New title)

b. Structure of Document

The structure was changed from the 1997 version by re-arranging sections and dividing the document into distinct chapters.

Foreword	
Synopsis	
Glossary	<p>Instead of 'Definitions' used in previous versions.</p> <p>A new definition for 'accredited escort' included.</p> <p>The definition for 'tachograph' is not included in this version.</p>
<ul style="list-style-type: none"> • Chapter I – Introduction 	

○ 1.1 General overview	
○ 1.2 Operating considerations and administration of abnormal loads	<i>This used to be a separate section in previous versions.</i>
▪ 1.2.1 Personnel	
• 1.2.1.1 Owner of vehicle	
• 1.2.1.2 The driver and person in charge	
• 1.2.1.3 Escorting personnel	<i>New section added.</i>
▪ 1.2.2 Insurance	
▪ 1.2.3 Roadworthiness of vehicle	
▪ 1.2.4 Registration of vehicle	
○ 1.3 Law enforcement	<i>New section replacing the section on 'Disregarding of laws, regulations or permit condition' in 1997 version.</i>
○ 1.4 Approval of routes	<i>New section added.</i>
• Chapter II – Permits	<i>This chapter combines sections used in the 'Introduction' and the section on 'Fees' in the 1997 version.</i>
○ 2.1 General rules	
○ 2.2 Types of permits	<i>New permit type for 'Special events' New permit type: 'One-off permits'</i>
○ 2.3 Permit fees	<i>'Administrative fee' introduced</i>
▪ 2.3.1 Registration fees	
▪ 2.3.2 Mass fee for abnormally heavy vehicles	
▪ 2.3.3 Road usage fee for abnormally dimensioned vehicles	
▪ 2.3.4 Minimum fee	
▪ 2.3.5 Other costs	
▪ 2.3.6 Accredited escort fees	
▪ 2.3.7 Re-payment of permit fees	
○ 2.4 Carriers exempted from fees	
○ 2.5 Permit fee structure	<i>New section explaining how the mass and dimensional fees developed by Van Wyk & Louw Inc is calculated. A table with constants and fee amounts is included (Fee structure)</i>
• Chapter III - Load limitations	
○ 3.1 Manufacturer's ratings	
○ 3.2 Tyre loading	
○ 3.3 Pavement loading	<i>An ESWM of up to 6500kg may be allowed.</i>
○ 3.4 Limitations imposed by bridges and culverts	<i>(b) Under permit: '...125 000 kg or 18.0 kN/sq m...'</i>

	<i>(e) Bridge clearance waived if UDL is less than 18kN/sq m</i>
○ 3.5 Limitations imposed by the prime mover	
○ 3.6 Massload on driving axles	
○ 3.7 Massload on steering axles	
• Chapter IV - Dimensional limitations	
○ 4.1 Width	
○ 4.2 Height	<i>b(ii) Height gauge if higher than 5,0m (used to be 4,7m) b(iii) Telkom/Eskom approval if higher than 5,8m (used to be 5,5m)</i>
○ 4.3 Length	
○ 4.4 Front overhang	
○ 4.5 Rear overhang	<i>(a) ‘...60% of wheelbase..’ (was 50% in 1997 version)</i>
○ 4.6 Front load projections	
○ 4.7 Rear load projections	
○ 4.8 Wheelbase	
○ 4.9 Turning radius	
○ 4.10 Stability of loaded vehicle	<i>The width/wheeltrack ratio of 1.8 was omitted in this version and only the height/wheeltrack ratio of 2.0 is used.</i>
• Chapter V - The marking and escorting of abnormal vehicles	
○ 5.1 Description of warning devices	
▪ 5.1.1 Flags	
▪ 5.1.2 Abnormal vehicle warning board	
▪ 5.1.3 Escort vehicle warning board	
▪ 5.1.4 Amber flashing lights	
▪ 5.1.5 Marker lamps and retro-reflectors	
▪ 5.1.6 Speed restriction board	
○ 5.2 Warning device and board requirements	
▪ 5.2.1 long and wide loads	<i>RUF < 0.23 No warning devices RUF > 0.23 to 0.54 Warning devices required 0.23 used to be 0.33 in 1997 version.</i>
▪ 5.2.2 Projections	
▪ 5.2.3 Night travel	
▪ 5.2.4 Speed restriction	
▪ 5.2.5 Abnormal and escort vehicle where warning devices are not required	
○ Escorting of abnormal vehicles	

▪ 5.3.1 Escort requirements	
• 5.3.1.1 Length and width	
• 5.3.1.2 Height	
• 5.3.1.3 Front overhang	
• 5.3.1.4 Mass	
• Chapter VI - Speed restrictions	
○ 6.1 Tyre loading	
○ 6.2 Bridge loading	
○ 6.3 Speed restrictions due to abnormal dimensions	
○ 6.4 Recording of speed and distance travelled	
• References	
• Appendices	
○ A: Standard permit conditions	
○ B: Diagrams	<i>New</i>
○ C: General exemption application form	<i>New</i>
○ D: List of embargo days	<i>New</i>
○ E: List of provincial traffic control offices	
○ F: Abnormal load / vehicle permit application	
List of tables	
List of Figures	

Overview of major changes (1974 to 2000)

- The **title** changed from 'Conveyance of Abnormal Loads' to 'Policy for the Conveyance of Abnormal Loads' to "Guidelines for the Conveyance of Abnormal Loads'. In 2000 the document included permits for other events on public roads and changed to 'Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for Other Events on Public Roads'
- The **structure** of the document changed significantly in 1979 from the original 1974 document.
- All applicable legal limitations are also listed in the 1979 version.
- Since 1979, only minor changes were made to the overall structure and in most instances the structure from version to version was identical.
- The **Road Usage Factor (RUF)** was introduced in the 1979 version to determine the warning and escort requirements.
- Tables with '**width and length fees per km**' were introduced in the 1979 version.
- All fixed **fee amounts** were removed in the 1987 version and replaced by a separate annexure of **fees that are revised and approved annually** by the authorities concerned. a
- References to the Road Traffic Ordinance (No 21 of 1966) were updated to the **Road Traffic Act 1989** (Act 29 of 1989) in the April 1992 version.
- The TREDCO Data book used for tyre loading up to the 1987 version was replaced by the **SABS ARP 008/1989** in the April 1992 version.
- The formula to determine the legal permissible limitation on bridges and culverts changed from April 1992:

*Total axle massload of group = 16 000 + 1800 * (Dist. extreme axles in meters)*

To November 1992:

*Total axle massload of group = 18 000 + 2100 * (Dist. extreme axles in meters)*

- The 2000 version included permits for **special events** on public roads and the title of the document was changed to reflect this.
- The structure of the 2000 version was changed from the 1997 version by re-arranging sections and dividing the document into **distinct chapters**.
- A non-refundable '**Administrative fee**' was introduced in the 2000 version.
- An **ESWM of up to 6500kg** may be allowed since the 2000 version.
- A new section explaining the **mass and dimensional fee calculation** developed by *Van Wyk & Louw Inc* is included in the 2000 version.
- A table with constants and fee amounts is included in the 2000 version (**The fee structure** that is adjusted from year to year)
- References to the Road Traffic Act 1989 (Act 29 of 1989) in the 1992 and 1997 versions were replaced by references to the **Road Traffic Act 1996** (Act 93 of 1996) in the 2000 version (section 139 was replaced by section 81) and the relevant regulation numbers updated to reflect the new regulations.

Appendix B: Internet Sites applicable to Abnormal Load Policies and Procedures

Australia:

[Vic Roads: VicRoads](#)

VicRoads is the registered business name of the Roads Corporation, a statutory corporate within the Victorian Government Infrastructure Portfolio.

[Permit Applications Frequently Asked Questions: VicRoads](#)

Permit applications frequently asked questions

[Queensland Transport](#)

Queensland Transport Home Page

[Heavy vehicle guidelines—information bulletins and forms](#)

[RTA Home Page](#)

New South Wales: Roads and Traffic Authority

Canada:

[Government of New Brunswick - Department of Transportation](#)

The official home page of the Department of Transportation, New Brunswick, Canada.

[TransLink - South Coast British Columbia Transportation Authority](#)

European Commission:

[European Commission - Transport](#)

[European Commission - Road Safety -](#)

The Netherlands:

[Nederland - Abnormal Permits](#)

Norway:

[vegvesen.no - Norwegian Public Roads Administration](#)

The Norwegian Public Roads Administration is responsible for the planning, construction and operation of the national and county road networks, vehicle inspection and requirements, driver training and licensing.

Sweden:

[Welcome to the Swedish Road Administration / Vägverket](#)

United Kingdom:

[British Highways Agency](#)

[Highways Agency - Research Compendium - Project Search](#)

Contains details of all transportation related research undertaken by the Highways Agency for the UK government.

[UK Transport Office](#)

Government portal for the commercial vehicle owner, driver and operator.

[ESDAL, Highways Agency](#)

A guide for any accessibility queries regarding the highways agency website

United States of America:

[1997 Federal Highway Cost Allocation Study - Summary Report](#)

[Directory of Transportation Libraries and Information Centers](#)

US Department of Transportation

[AASHTO - Freight Transportation Network](#)

AASHTO's Freight Transportation Network consisting of the Rail, Intermodal, Water, and Highway Transport Committees

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Appendix C: International practice with regards to certain aspects of abnormal loads and permits

	South Africa	Australia	New Zealand	USA	Canada	UK	European Union	Namibia
Single policy for all provinces / regions	X		X					X
Abnormal vehicles/loads divided into categories		X	X	X				
Special conditions for special purpose vehicles e.g. mobile cranes/farm- and construction equip.		X	X	X	X	X		
Free permits up to certain limits or for certain categories		X	X				X	
Free permits for certain agencies e.g. military	X			X				
Permit fee based on distance travelled	X							X
Pre-paid permits in book form				X				
Year long permits up to certain limits	X	X					X	X
Multiple trip and/or period permits	X	X		X	X		X	
Electronic permit application (internet or e-mail)				X			X	
Permit application by post/fax		X		X		X		
Routes classified according to certain mass/dimensional limits (A/L corridors)		X	X		X	X	X	
Embargo periods	X	X	X	X	X	X		
Travel time restrictions	X	X	X	X	X			

	South Africa	Australia	New Zealand	USA	Canada	UK	European Union	Namibia
Multiple items with a single over dimension allowed (legal mass)		X	X	X				
Accredited self-escorting with powers to stop/direct traffic						X		
Different permit required for dimensions and mass				X				
Sealed containers regarded as indivisible	X			X				
Special registration of vehicles used for abnormal load conveyance	X						X	X
Electronic route planning and automated notification system						X		

Appendix D: Summary of ALTC decisions (Updated: 2008/07/14)

DECISIONS	DATE	REF
FEEDBACK FROM ALTC MEETINGS		
1 ALTC minutes are not confidential documents and should be made available as soon and as widely as possible.	2001-03-08	6.15
UNIFORMITY OF FEES AND CONDITIONS		
1 An issuing office may issue trip permits after consulting the other provinces involved – not period permits except for car-carrier permits.	2003-08-21	5.4
2 The basic fee for a permit application is also levied by certain provinces for AVR registration on top of the registration fee. This was not the intention of the basic fee.	2003-08-22	5.4
3 Fees to be based on AVR tyre pressures, minimum of 600kPa, pressures less than 600kPa can be considered for mobile cranes if it could be shown that the actual pressures used are less.	2003-03-14	5.8
4 It is a basic function of the Committee to foster uniformity of fees and conditions.	2002-03-08	6.2
5 Decisions will be based on consensus. Failing this, proposals will be put to the vote and all members are expected to abide by the majority's decisions.	2001-08-02	6.2
FEES AND FEE CALCULATION		
1 Better co-operation between provinces is necessary to ensure all permits issued on behalf of others are referred and to enable all to reconcile month-end payments.	2003-08-21	5.9
2 If funds are available, an investigation into the revision of the factors used for the fee calculation (originally done by Africon in 1992) should be done as soon as possible.	2002-03-08	6.5
3 A differentiation is made in the basic fee (non-refundable) for routine permits and permits that require technical input / further analysis.	2002-03-08	6.1
4 The tyre pressure as stipulated on the applicable AV must be used.	2002-03-07	6.7
5 The permit fee now makes provision for a fixed cost for the administrative element and a cost recovery element.	2001-03-08	6.1
6 Charges for empty leg trips are included in the area/period permit fees but permits will be required for the empty leg of trip permits (if abnormal).		
7 The K factor is soundly based to provide for costs due to congestion and should be retained.	2001-03-09	6.16.3
8 Unless it could be shown otherwise, the default tyre pressure for all vehicles including mobile cranes will be 600kPa.	2001-03-09	6.16.5
9 The ability to distinguish between fully licensed and AV registered vehicles in the fee calculation may be introduced.	2000-05-30	3.1
10 The default value for dual wheel spacing should be changed to 325mm.	2000-03-10	5.2
AREA / PERIOD PERMITS		
1 Referred to WG – Comprehensive list of plant & equipment appended to permit (make, model, mass & dimensions). 80% AVR mass limitation.	2003-08-22	4.3.2

DECISIONS		DATE	REF
2	Period permits to transport own equipment still requires a list of equipment to be transported as part of the application and amended to the permit.	2001-03-09	6.16.2
3	Clause 2.2 of TRH 11 would be reaffirmed, 4 600 mm height limit, maximum of one self escort, legal axle load not to be exceeded unless AV registered in which case 80% of the allowable load may not be exceeded.		
AV AND SEQUENCE REGISTRATIONS			
1	There was an agreement that the minutes of March 2007 were wrong on this point and it was noted for ratification	2008-03-27	6.4
2	The committee decided that foreign AV registrations will be recognized in RSA as they do with RSA AV Registrations	2007-03-08	6.3.2
3	The three months grace period as per the previous meeting resolution has expired. No new permits based on expired AV's shall be issued.	2005-08-12	5.5
4	If not renewed within the grace period of 3 months, no permits will be considered until renewed.	2004-03-11	5.3
5	Semi trailers older than 15 years need a SABS certificate stating fitness of vehicle.	2003-03-14	5.5
6	A 3 months grace period allowed after registration period of 5 years, vehicles to be checked for compliance with data on previous registration before renewal, full registration fees charged.	2003-03-13	5.5
7	Vehicles and combinations of vehicles should be re-weighed on renewal.	2001-03-09	6.14
MASS REGISTRATION OF VEHICLE FLEETS			
1	Mass registration or re-registration of vehicle fleets should be dealt with on merit	2002-03-08	6.6
2	In general the basic fee will only be charged once and the full registration fee can be charged per category or group of (virtually) identical vehicles.		
EMBARGO DATES			
1	Embargo lists must be forwarded to the CSIR to make it available on the website	2006-03-10	5.4
2	There is some merit to warrant travel on some embargo days on some selected routes. There should be a motivation, No blanket approval will be granted.	2005-08-12	5.4
3	KZN & W/Cape embargo days include the summer school holiday period but applications will still be considered on merit.	2003-03-14	5.1
4	All provinces to submit proposals for embargo days at least two weeks before next meeting for discussion at the meeting.	2003-03-13	5.12
COUNTRY WIDE PERMITS			
1	Only allowed for 3 month period with the following restrictions: 4,6m max height, 3,5m max width, 10m max wheelbase, no mass exemption, only applicable to legal vehicles. Trip permits and car carriers excluded.	2004-03-11	5.2.5
2	Provinces must refrain from issuing permits for other provinces if the trip is only within the boundaries of that province	2003-08-21	4.1.8
3	All provinces to notify other provinces that are involved in the permit. This must be done by the permit office and not the consultant or applicant.	2003-03-13	5.13

DECISIONS		DATE	REF
4	Permits may only be granted cross-border if the trip originates or ends in the province. Normally the permits may only be granted in the province of origin only.	2002-08-02	4.7
ROUTE CLEARANCES			
1	Route clearances require a registered professional structural engineer with appropriate experience, accept full responsibility and must therefore carry sufficient liability insurance.	2004-03-12	3.6
2	The map by Bott, Drennan & Maud is just an assistance tool and not a route clearance. Carriers still responsible to ensure that the route is clear of obstructions.	2003-08-22	4.5
3	If an old route clearance is used, the person that did the clearance initially must confirm in writing that the clearance is still valid. No clearance older than three weeks will be accepted. The following time limits apply: (i) Routes: 3 days prior to transportation (ii) Escort with height gauge: per job only	2003-03-14	5.12
CONTAINERS			
1	Only indivisible loads in or on containers will be considered for permits (open top or flat-rack)	2004-03-11	5.2.1
2	A national policy for containers was developed at MINCOM & COTO and is supported by the ALTC. Containers are considered as divisible and must be corrected at weighbridges to be legally transported.	2003-08-21	4.7
3	The permit system may not interfere with the normal rail/road modal competition. Containers that cannot be legally carried by road should go by rail. Only in cases where it can be shown that Spoornet is unable to transport the container may a permit be issued.	2002-08-02	4.8
4	Need to be defined as ISO freight containers.		
5	Trailers to be AVR registered. Stepped deck trailer for over-height containers.		
6	Over-height container loads can have conditions 9A and 9B waived.		
7	Single trip permits should be applied for mass exemptions where the travelling radius exceeds 25 km.		
8	Period permits to be considered up to height of 4600mm and mass within legal limits.	2001-08-02	6.15
9	Containers are granted mass permits for a maximum of 25 km, i.e. only to the nearest railhead or container depot.		
NIGHT/WEEKEND TRAVEL			
1	Conditions 9a and 9b would be reviewed and revised if necessary when the TRH 11 is being updated	2007-09-06	6
2	Weekend travel was handled in the same manner as embargo days – permits will be considered if motivation has been found to be acceptable.	2006-03-10	5.14
3	If conditions 9a) and/or 9(b) is revoked for a permit, traffic officials and permit offices must communicate and ensure such request is submitted prior to departure.	2004-03-12	5.12.2

DECISIONS		DATE	REF
4	Each province to use own discretion to allow abnormal loads during night times or over week ends.	2002-08-01	7.5
5	Special written motivations are required.	2001-03-09	6.17
6	Routes must be specified.		
7	Escorting: Own escorts may be allowed. When official escorting is required, the applicant must notify, obtain permission and make the necessary arrangements in all provinces affected.		
STABILITY			
1	The wheel axle width/height ratio is not a definite limit but just an indication that the application should be referred to the technical division to decide whether further analysis is necessary.	2002-08-02	4.11
ESCORTING			
1	Operators had paid for escort and the service was not rendered. If the prescribed number of traffic officers did not arrive, the issuing authority and relevant traffic centre manager must be notified. RFA should report at every ALTC meeting and send a report to provinces every week or every month	2007-09-06	12
2	It was proposed that a rear self-escort should be provided where the rear projection exceeds 1.8 m. After voting on this aspect, the proposal was accepted.	2006-03-10	5.2
3	Rear escort shall only apply to loads where the rear load projection exceeds 2 500 mm.	2004/03/11	5.2.7
4	Depending on the route & dimensions a third traffic officer escort may be needed in the interest of road safety.	2003-08-21	4.2.6
	If a chevron board and amber light cannot be fitted to rear projection as the required area is too small, a rear escort will be required.	2003-08-21	4.3.3
5	A rear self-escort should be specified if a rear projection exceeds 2 500 mm and the height above ground level is less than 1 800 mm and the projection itself is essentially less than 500 mm in height.	2001-03-09	6.16.8
EMERGENCY VEHICLES (RECOVERY)			
1	WG decided to refer the matter to the Vehicle Technical Committee via Mr Gash of SANS. (WG minutes)	2005-05-17	9
2	Year permits to be issued for towing vehicles.	2002-08-02	4.12
3	Should be registered as abnormal vehicles.		
4	A typical tariff will be calculated based on the maximum manufacturer's rating and a distance of say 5 000 km.		
EXTRA ITEMS AND MULTIPLE LOADS			
1	Legal loads on abnormal vehicles are contrary to the principles of granting exemption permits and should not be allowed.	2002-03-08	6.12
2	Only the necessary dunnage will be allowed with an abnormal load.		
3	On the empty leg the only items allowed will be the dunnage used for the abnormal load, the escorting vehicle and dolly (if applicable).		
URGENT PERMITS			

DECISIONS	DATE	REF
1 The experimental use of urgent permits was not successful and was stopped from 6 August 2001.	2001-08-02	6.9
INTERLINK VEHICLES		
1 Referred to WG – Provinces requested to refrain from issuing permits for interlink/superlink combinations immediately until WG recommendation.	2004-03-11	5.11
2 Not more than one own escort.	2001-03-09	6.9
3 Not over legal mass limit.		
4 Laden height not to exceed 4 600 mm.		
5 AV warning boards to be displayed.		
6 Only indivisible loads allowed.		
2-AXLE SKELETON TRAILERS FOR FREIGHT CONTAINERS		
1 Eskom replied to KZN that they will no longer use 2-axle trailers	2004/03/11	4.3.1
2 Permits could be issued with a sunset clause for a period of 3 years to enable operators to conform to the policy/principles of the ALTC.	2003-08-22	4.3
3 Period permits granted for 2-axle skeleton freight container trailers should in future not be granted or renewed when they lapse.	2001-03-09	6.16.1
WARNING DEVICES ON AWKWARD VEHICLES		
1 Permit offices should use their discretion and may waive the requirement for the large "ABNORMAL VEHICLE" sign provided amber flashing lights and red flags are used.	2001-03-09	6.16.7
UNREALISTIC AV COMBINATIONS		
1 No combination should be registered or allowed if the potential payload of a trailer is reduced by 50% or more by using an under-sized truck tractor.	2001-03-09	6.16.9
PERMIT DOCUMENTS		
1 Permits should clearly state: registration numbers, valid dates, routes and load description. Abbreviations should be avoided.	2001-03-08	6.1
2 Faxed permits should be sent to a provincial office where it has to be officially stamped and signed by a responsible official.	2001-03-08	6.18.2
LAW ENFORCEMENT AND TRAINING		
1 The committee should embark on an in-service training programme of traffic officers through training and lectures.	2000-03-10	5.5
SOUTH AFRICAN DEVELOPMENT COMMUNITY (SADC)		
1 The summarised version of the TRH 11 will be made available for the neighbouring states.	2000-03-10	5.6
HEIGHT PERMITS		
1 Telkom & Eskom clearances: Eskom amended to 5.8 m; Telkom remains at 5.5 m	2003/08/22	4.4
2 A special new category for minor infringement of the legal height is introduced on a countrywide basis. Maximum height of 4 600 mm. (Car carriers and over-height containers).	2001-08-02	6.3
3 4.7 m height: Written confirmation by operator that route is clear, front escort with insulated bar.	1999-03-12	5.4
4 5.8 m height: Eskom involvement	1999-03-12	5.4

DECISIONS		DATE	REF
5	6.0 m height: Telkom involvement.	1999-03-12	5.4
AMENDMENTS TO PERMITS			
1	Delays may occur depending on kind of amendment (engineer's input & referrals). Applications are handled on a first come first serve basis.	2003-08-21	4.1.10
CAR CARRIERS			
1	A time-frame for the phasing out of AV permits for car carriers needs to be compiled and supplied to industry	2007-03-09	7.6
2	It was decided that letters will be sent too all car carrier operators to inform them that no abnormal load permits will be issued for them in future.	2006-09-01	7.8
3	From now on, only permits for 22 m vehicles with a maximum of 500 mm front or rear overhang will be issued. Permits for existing over-length will be renewed for a period of 3 months. (WG minutes)	2005-05-17	19
4	Referred to WG – In the meantime authorities are requested not to exceed 22.5 m length (including 500 mm rear load projection) and 4,6m height.	2004-03-11	5.2.2
UNLADEN VEHICLES			
1	Previous decision to include the empty leg to period permits is revoked. Empty A/L permits will allow escort vehicle and/or dolly to be carried.	2004/03/11	5.2.3
SUPER LOADS			
1	Exceed 6 m in width, 6 m in height, 35 m length, 125 t total mass, pressure over 18kN/m ²	2004-03-12	5.2.1(k)
2	Principle approval at design stage must be obtained from relevant authorities.		
MOBILE CRANES			
1	(WG meeting) It was agreed that mobile cranes that do not comply with the A/L bridge formula should not be re-registered once the AV has expired. These cranes would either have to be moved without the counterweights or be transported on a suitable low-bed trailer.	2007-05-11	6
2	The working group needs to investigate mobile cranes that do not comply with the bridge formula and to recommend a solution for this issue.	2007-03-09	8.6
3	Mobile cranes may not travel by night.	2005-03-10	5.2.4
4	Tyre pressure to be calculated at 60 km/h	2005-03-10	5.2.4
5	Referred to WG – Authorities to use 700 kPa from 1 April 2004 and 800 kPa from 1 April 2005 as upper limit for mobile crane fee calculation.	2004-03-11	5.2.4
BRIDGE FORMULA			
1	Authorities must carefully evaluate applications to ensure compliance with the bridge formula.	2004-03-11	5.12.3
NON-COMPLIANCE WITH PERMIT CONDITIONS (LAW ENFORCEMENT ACTION)			
1	No permit if load do not qualify in terms of TRH 11	2004-03-12	4.3
2	Applications dealt with in a first come first serve basis		
3	Enforcement officials to check correctness of permit and compliance with conditions.		

DECISIONS	DATE	REF
4 Communicate any discrepancy to permit office and not allow vehicle to proceed until a valid permit is issued.		
5 Permit fees should be calculated on the full length of the trip.		
INCOMPLETE INFORMATION ON APPLICATION		
1 Refer application back to applicant with a list of omitted information.	2004-03-11	4.2
2 Route and load descriptions must be in detail.		
FAXED PERMITS		
1 The resolution was for the Working group address this issue in their final report	2007-09-06	7
2 Photocopies are not acceptable as it can easily be an invitation for corruption. The Committee finally decided that only original permits should be used as stated in standard permit condition 1a	2006-03-08	6.4.1.5
3 This practice is already in use but must be validated with official stamp and signed by an authorised officer	2004-03-12	5.12.1
4 Copy of permit conditions must also be attached		
PRINCIPLE APPROVAL		
1 A Standard letter shall be prepared by the Working Group for use by all authorities.	2007-09-06	5
2 (WG Meeting) After reviewing the input from SABS, it was agreed that each province should follow up with their respective licensing sections for input	2007-05-11	9
3 A process needs to be prescribed for importing vehicles	2006-08-31	5.4
4 There is standard requirement/process in SA to import/build and register new vehicles in SA. A memo will be send to SABS to verify the processes.		
TRH 11 REVISION		
1 The tender was awarded to CSIR revise the TRH 11. The revised TRH 11 document will be out on 1 st October 2008	2008-03-27	8.1
2 (WG Meeting) The proposed categorisation (on A/L width) should be used as a guideline by the firm appointed to revise the TRH 11 with regards various policies such as weekend and night travel.	2007-05-11	4
3 The March 2000 edition of the TRH 11 and current policy document will stay in force until the revised TRH 11 is drafted and approved by the Transport Authorities.	2006-08-31	5.3
COMPANIES EXEMPTED FROM FEES		
1 SADF vehicles - Although these vehicles are exempted from paying abnormal load fees, they should still be registered as abnormal vehicles if they are over the legal mass and should travel under permit.	2006-09-01	8.8
ANNUAL REPORTING		
1 The DoT and CSIR shall motivate a Joint Venture project to publish a status report	2008-03-27	10.7
2 CSIR to collect and collate all existing data from the provinces into a national permits database.	2006-09-01	8.5
3 An annual report on trends and statistics in abnormal load movements are to be produced.		

	DECISIONS	DATE	REF
4	First report to be ready for comments before the ALTC meeting in March 2007.		
	ALTC VOTING MEMBERS		
1	It was decided that in future the ALTC voting system will consist of nine votes (one per province). Each province will have to nominate three members: 1 Permanent member 1 Alternate member 1 Ordinary member (no voting rights).	2006-09-01	8.2
	INDIVISIBLE LOADS		
1	The blade or bucket of a machine could be transported with the machine under an abnormal load permit provided that it can be shown to be part of that specific machine and that no additional abnormality is created. (WG minutes)	2006-05-04	3.4
	ELECTRONIC APPLICATIONS		
1	There was no objection by provinces with regard to receiving applications via fax or e-mail. All applications should however be treated on a 'first come first serve' basis.	2007-03-08	6.4.1.6
	TRAINING		
1	There is a need to train traffic officers in the principles and law enforcement issues involved in abnormal load movement. An abnormal loads training manual was developed by the ALTC training group	2007-03-09	9.3