

Road Pavements Forum, CSIR, Pretoria, 10 - 11 November 2009

National and Regional Axle Load Limits: Quo Vadis?



Paul Nordengen
SARF Past President
Chairman: RTMS National Steering Committee
Research Group Leader: Network Asset Management Systems
CSIR Built Environment

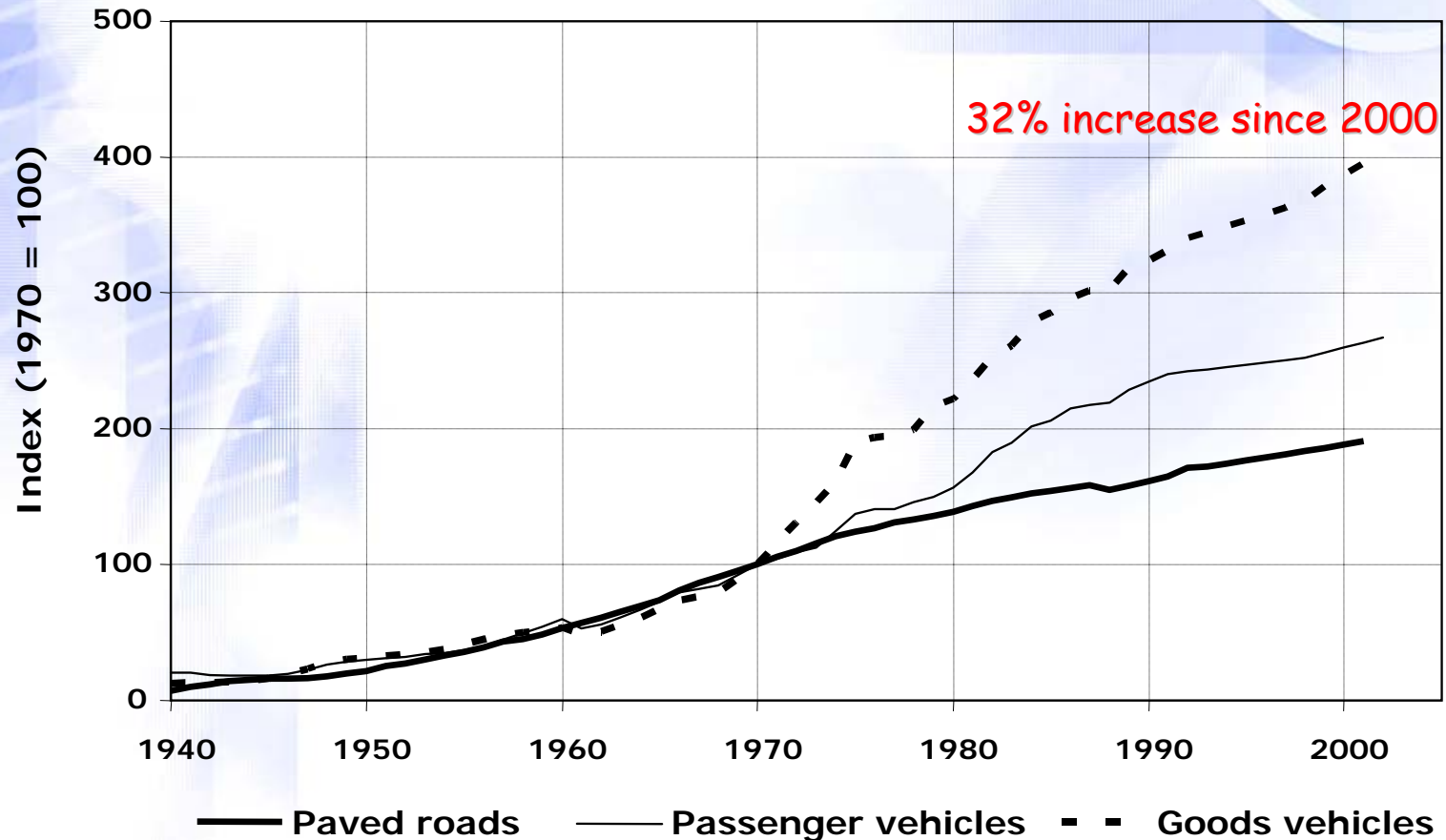


Contents

- Background
 - History of axle load limits in SA
- Regional developments
- DoT "Letter of Intent"
- Key issues
- Conclusions

Growth in Freight in South Africa

Paved national and provincial roads, passenger vehicles and commercial vehicles for transport of goods





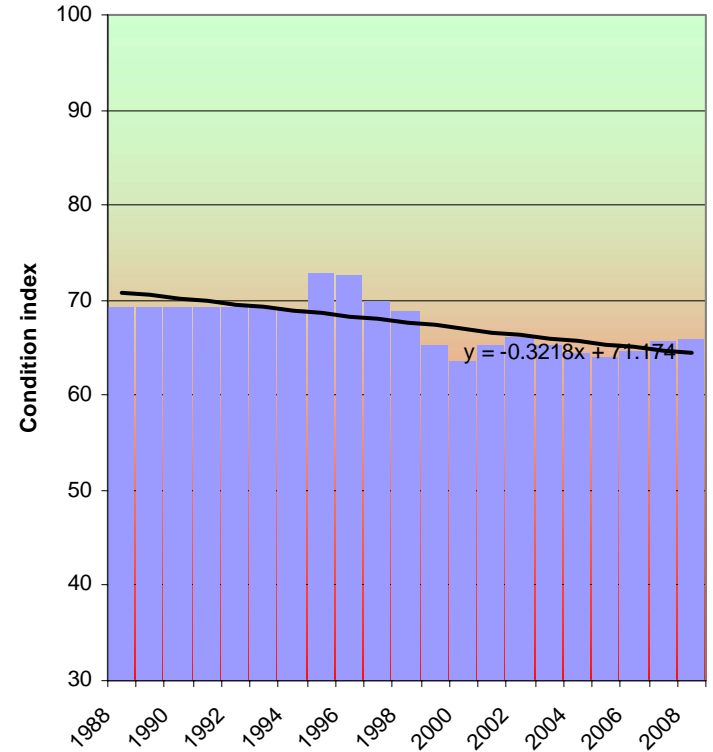
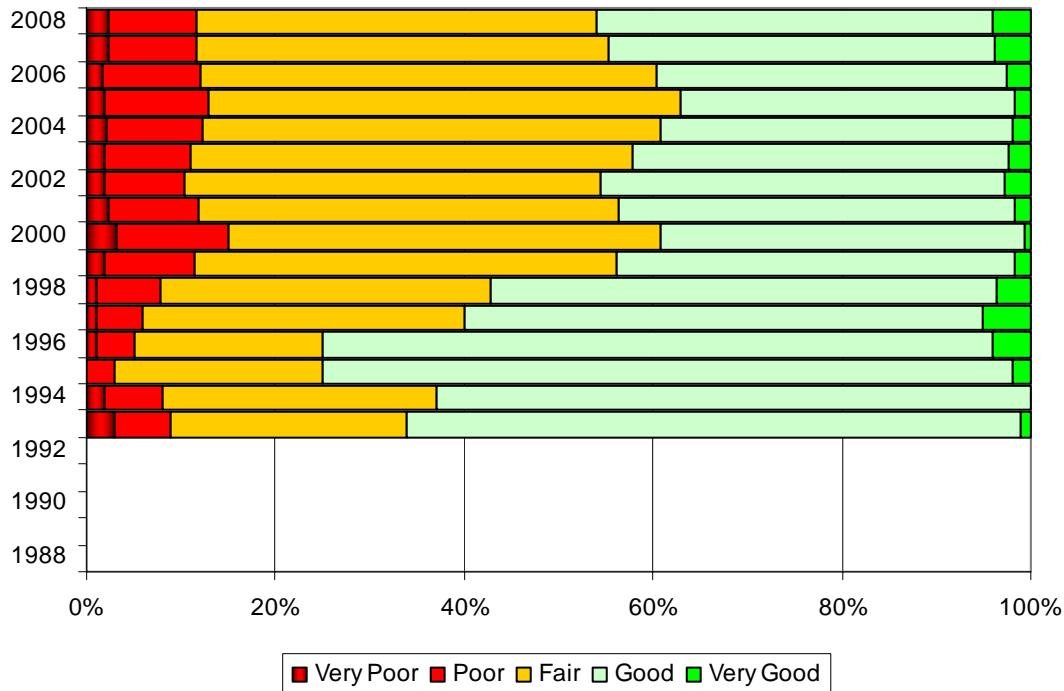




Road deterioration - long-term trends

National Roads

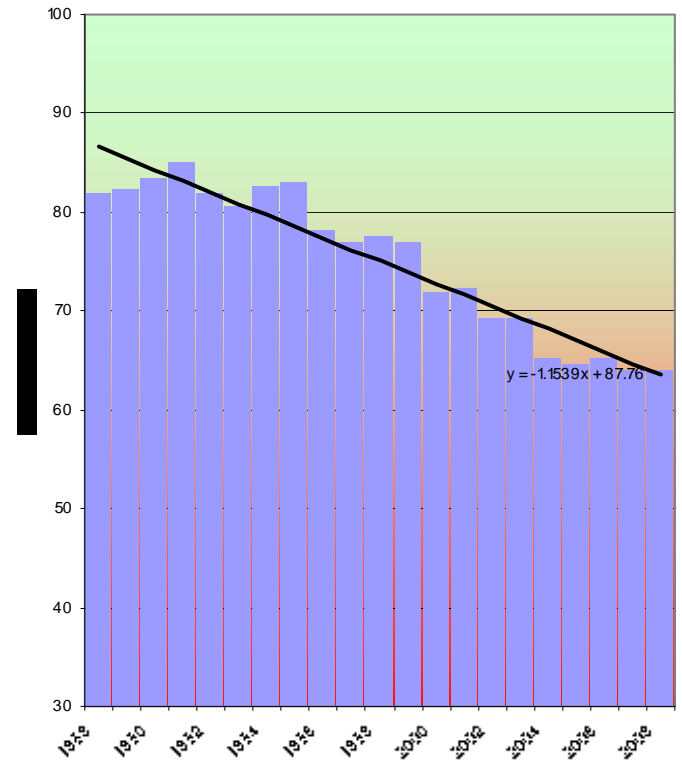
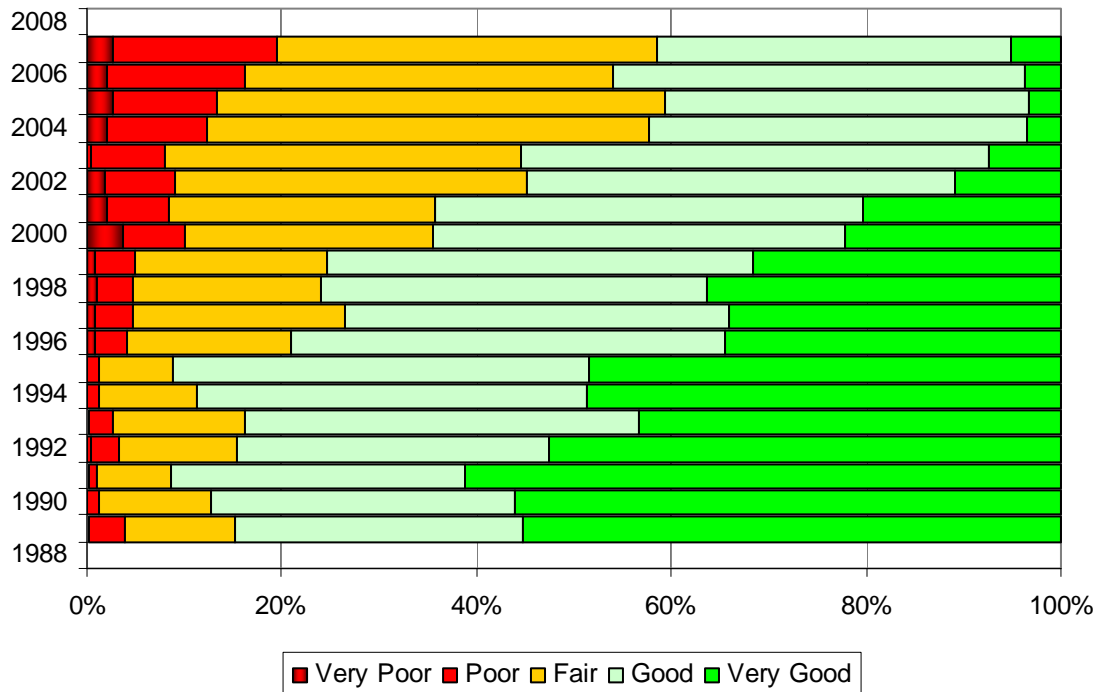
Condition of surfaced roads



Road deterioration - long-term trends

Provincial Roads: N. Cape

Condition of surfaced roads



SANRAL Report: May 2009

V. Poor 4%; Poor 9%; Fair 42%
 Good 44% V. Good 1% (2007)













Heavy Vehicle Mass Limits

▶ Axles and axle units

- Tyre manufacturer's ratings
- Vehicle manufacturer's ratings
- Road damage limitations

Axle and Axle Unit Load Limits

WHEEL AND AXLE MASSLOADS REGULATION 240



Steering wheel

3850 kg wheel massload
Regulation 240 (a) (i)



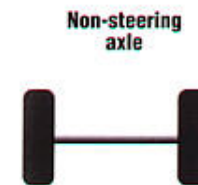
Non-steering wheel

4000 kg wheel massload
Regulation 240 (a) (ii)



Steering axle

7700 kg axle massload
Regulation 240 (b) (i)



Non-steering axle

8000 kg axle massload
Regulation 240 (b) (ii)

AXLE UNIT MASS LOADS REGULATION 240

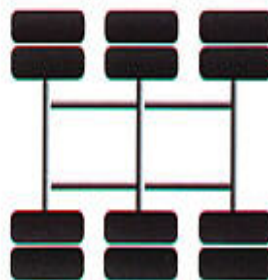
Non-steering axles



9000 kg axle massload
Regulation 240 (c) (v)



18000 kg axle unit massload
Regulation 240 (c) (iii)

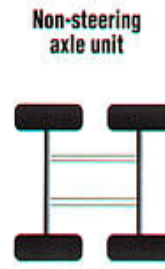


24000 kg axle unit massload
Regulation 240 (g)



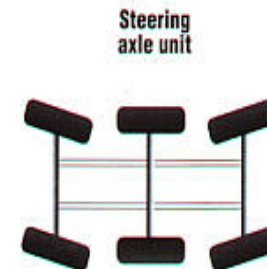
Steering axle unit

15400 kg axle unit massload
Regulation 240 (d) (i)



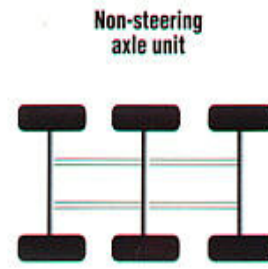
Non-steering axle unit

16000 kg axle unit massload
Regulation 240 (d) (ii)



Steering axle unit

24000 kg axle unit massload
Regulation 240 (f) (ii)
These are not steerable axles in terms of the definition of steering axle



Non-steering axle unit

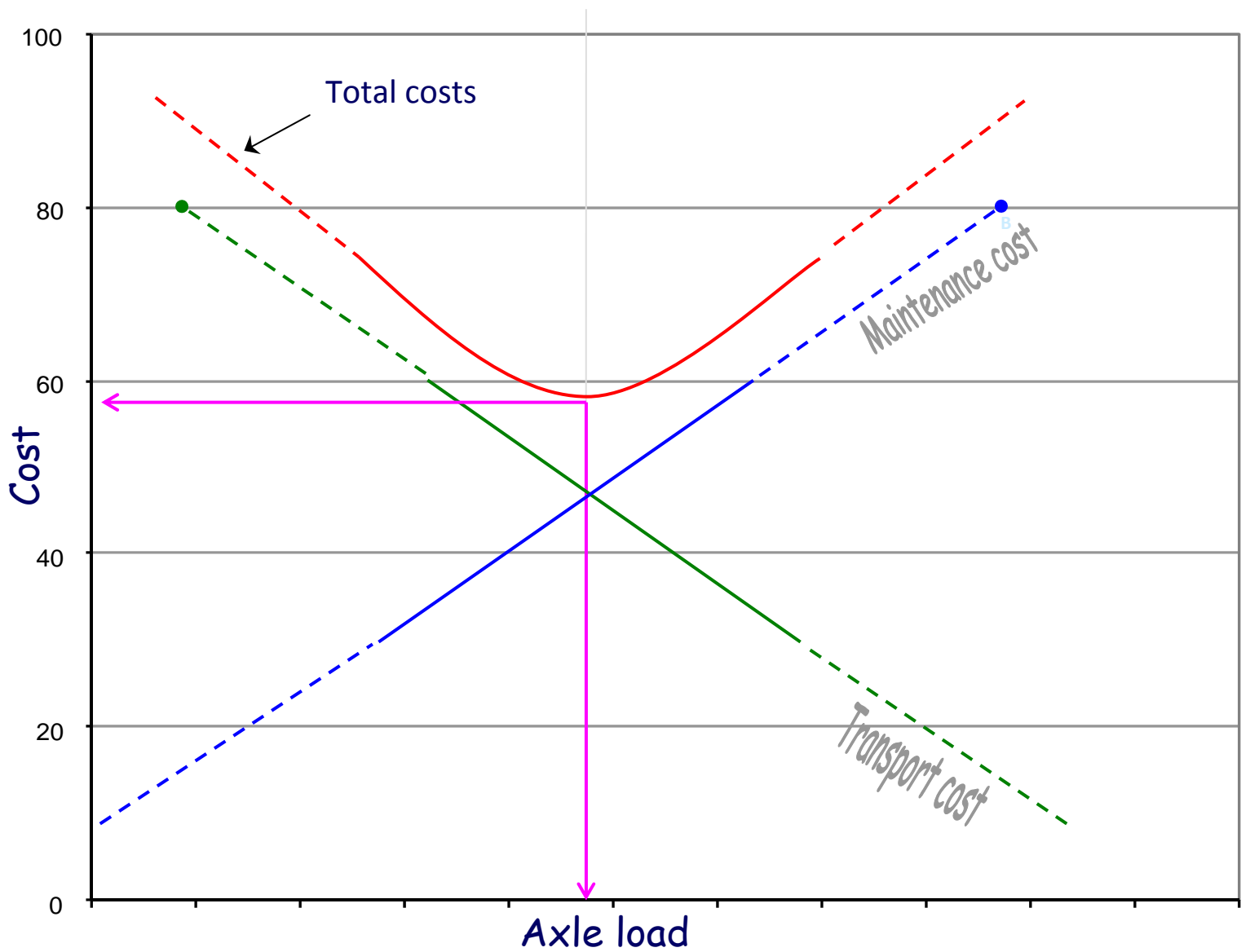
24000 kg axle unit massload
Regulation 240 (f) (i)

Heavy Vehicle Mass Limits

▶ Vehicle/Combination Mass

- Sum of permissibles
- Traction – 5 times mass on drive axles
- Power – 240 times power rating (kW)
- Manufacturer's GVM/GCM
- Bridge formula 'first to last'
($P=2.1L+18$)
- 56 ton limit

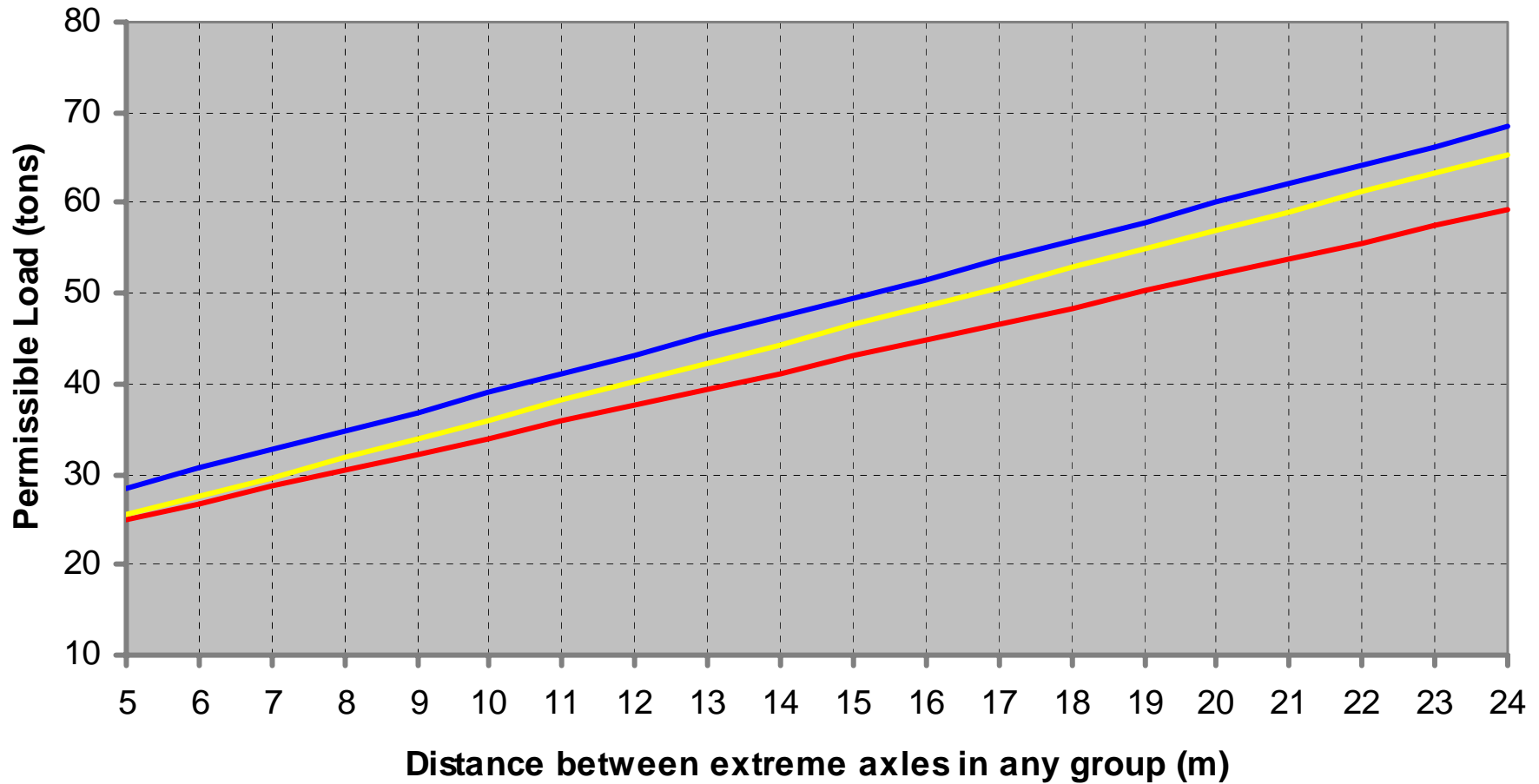
Optimum axle load limit



Increased Axle Loads in S.A.

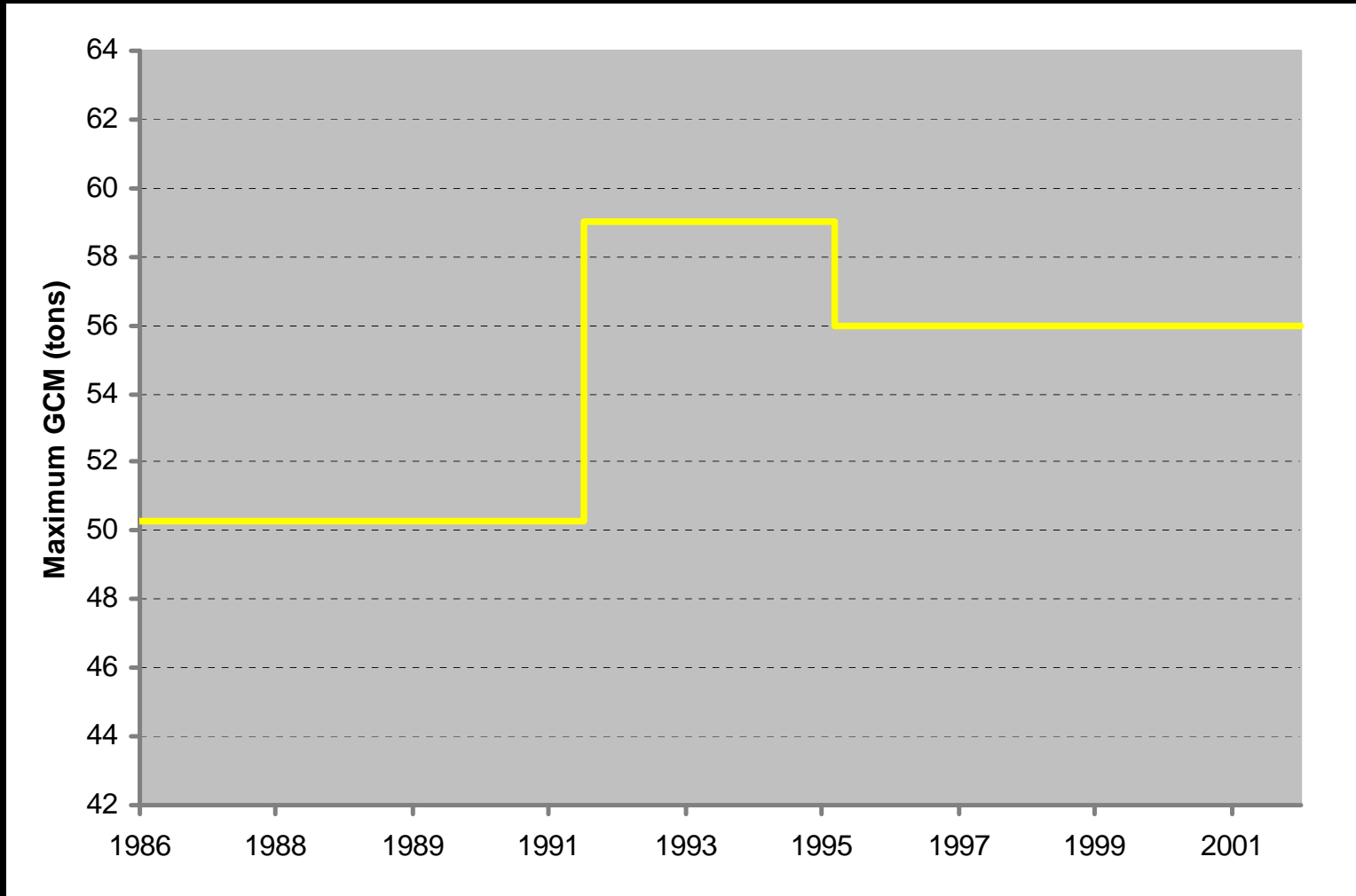
Axle/Axle unit Description	Maximum permissible mass before 1 March 1996 (kg)	Maximum permissible mass after 1 March 1996 (kg)
Single axle with four wheels	8 200	9 000
Tandem axle unit (four wheels per axle)	16 400	18 000
Tridem axle unit (two or four wheels per axle)	21 000	24 000
Any group of axles (Bridge formula)	2 100 L + 15 000	2 100 L + 18 000
Max. combination mass	none	56 000

Historical development of the bridge formula



— 1.8 L + 16 (pre-July 1992) — 2.1 L + 15 (July 1992) — 2.1 L + 18 (1 March 1996)

Historical development of the permissible maximum combination mass for heavy vehicles



**A Study To Investigate The
Implications Of Lowering
Permissible Gross Vehicle
Mass Limits For Road Haulage
Final Report**

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SADC Protocol



SOUTHERN AFRICA TRANSPORT AND COMMUNICATIONS COMMISSION (SATCC)

ENABLING LEGAL REFORM:
CONTROL OF VEHICLE LOADING

Endorsed by Roads SCOM 1999 (subject to further consultation)

May 1999

SADC Protocol



EXPLANATORY MEMORANDUM

Introduction

1. This memorandum introduces the **Model Legislative Provisions on Management of Vehicle Loading (MLP)** which provide a framework for a proposed new approach to vehicle loading management in the SADC region. The model provisions, in turn, inform the multilateral **Memorandum of Understanding on Vehicle Loading (MoU)**.
2. This memorandum comprises the following sections:
 - ❑ Review of current overloading control practices and responses
 - ❑ A proposed regional approach
3. The MLP and the MoU aim, in particular, to give effect to the recommendations of the SATCC 5 Country Special Working Group on Overload Control (5C report).

"9, 18, 24, 56 tons"



Preparation of a Synthesis Report and Guidelines on Overload Control

Trust Fund #: 052640

- Synthesis report
- Guidelines on overload control
- Six case studies
- Reports presented at a Regional Workshop in July 2008 in Nairobi
- SADC, COMESA, EAC

Regional Workshop on Harmonisation of Key Elements and Implementation of Best Practice in Overload control: Recommended Resolutions

1. Guidelines on Aspects of Overload Control

1. The workshop recommended that the three RECs adopt the attached draft guidelines on aspects of vehicle overload control.

2. LEGISLATION AND REGULATIONS

- (1) ESA Inter-REC standardised vehicle and axle/axle unit load limits as follows:

Steering:	Single	8 000 kg
Non-steering: Single	Single tyres	8 000 kg
	Dual tyres	10 000 kg
Tandem	Single tyres	16 000 kg
	Dual tyres	18 000 kg
Tridem	Single tyres	24 000 kg
	Dual tyres	24 000 kg
(2) Permissible maximum combination mass		56 000 kg

Regional Workshop on Harmonisation of Key Elements and Implementation of Best Practice in Overload control: Recommended Resolutions

- (3) The introduction of a common Bridge Formula as follows:

$$P = 2.1 \times L + 18$$

- (4) Mass Tolerance: 5% on axle, axle unit, vehicle and vehicle combination mass.
- (5) No quadrem axle units
- (6) Only one axle or axle unit per semi-trailer
- (8) A desk-top study be carried out to determine recommended load limits for axles fitted with “super single” (wide-based) tyres based on tyre width categories; e.g. <350 mm, 350 to 400 mm; >400 mm
- (10) Interlinks (truck-tractor plus two semi-trailers) should be accepted throughout the region.

MEETING OF THE MINISTERS RESPONSIBLE FOR TRANSPORT AND METEOROLOGY 15 MAY 2009, SWAKOPMUND, NAMIBIA



Draft Annotated Record

- 2.3.1.4.5 **Ministers endorsed the above recommendations;**
- 2.3.1.4.6 Ministers also endorsed the Guidelines on Aspects of Overload Control in the Region;
- 2.3.1.4.7 Ministers directed the Secretariat to work closely with COMESA and EAC Secretariats to develop expeditiously the action plan which entails collaboration and cooperation of the three RECs on harmonisation of key elements and implementation of best practice in overload control in the Eastern and Southern African Region; and
- 2.3.1.4.8 Ministers urged Member States to initiate a process towards the harmonization of overload control fees structure to run concurrent with the decriminalization process.

MEETING OF THE MINISTERS RESPONSIBLE FOR TRANSPORT AND METEOROLOGY 15 MAY 2009, SWAKOPMUND, NAMIBIA



Extract from FESARTA report

Vehicle overload control

- FESARTA recommended overloading fees or fines should be harmonized in the region. The meeting agreed that member states would work towards harmonization of these.
- The meeting re-confirmed what was agreed at the overload control workshop held in Nairobi in July 2008, other than the 9 or 10 tons on a single axle with dual tyres. **The meeting agreed that the regional recommendation remain at 10 tons and that member states that are still on 9 tons, work towards adopting 10 tons.** Noted that in most member states, the load limit on a bus axle, is 10 tons.
- With respect to the weighbridge allowance/tolerance. Whilst the recommendation from the 2008 Nairobi meeting was for 5%, some member states either have zero or 2%. The outcomes of the Ministers meeting on the 15th would determine the final agreement.



DoT Letter of Intent: Axle load limits

Road Freight Association
P.O Box 511
Isando
1600

ENQ Mr N.A Thoka
TEL 012 309 3764
FAX 012 309 3962
Email thokan@dot.gov.za

Attention:Mr Gavin Kelly

Fax: (011) 974-4903

RE: LETTER OF INTENT OF LAW MAKING ON THE NATIONAL ROAD TRAFFIC ACT, 1996 (ACT NO 93 OF 1996)

1. The above matter refers.
2. Kindly find enclosed herewith a letter of intent for your attention.

3. The Department of Transport is currently looking at reviewing the current axle mass limits in a bid to relieve the burden off the secondary road networks infrastructure. Most of the secondary road networks has reached a state of disintegration, thus necessitating measures to be put in place in order to salvage these road networks.
4. The current axle massload of an axle fitted with four wheels as provided in regulation 240(c)(v) of the National Road Traffic Act, 1996(Act No 93 of 1996) is 9000 Kilograms, the DOT seeks to reduce this to 8000 Kilograms in a bid to try and take the load off the secondary road networks and to prohibit the operation of certain axle loads from the secondary networks and to migrate them to the primary networks.
5. It is further the intention to prohibit the transportation of certain commodities on both the primary and secondary road networks and the migration of same to the rail branchlines in order to save adjacent or surrounding road networks through the revitalization of those branchlines.
6. Please be advised that this is due to the fact that there needs to be a reduction in the damage to the road networks infrastructure.

Axle and Axle Unit Load Limits

WHEEL AND AXLE MASSLOADS REGULATION 240



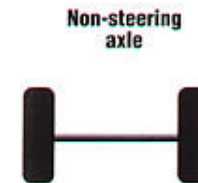
3850 kg wheel massload
Regulation 240 (a) (i)



4000 kg wheel massload
Regulation 240 (a) (ii)



7700 kg axle massload
Regulation 240 (b) (i)



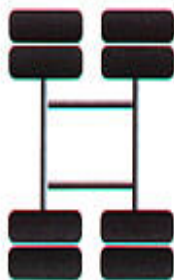
8000 kg axle massload
Regulation 240 (b) (ii)

AXLE UNIT MASS LOADS REGULATION 240



9000 kg axle massload
Regulation 240 (c) (v)

Non-steering axles



18000 kg axle unit massload
Regulation 240 (c) (iii)



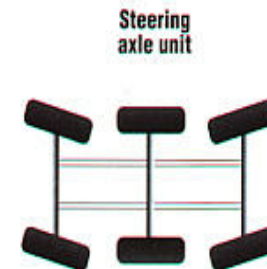
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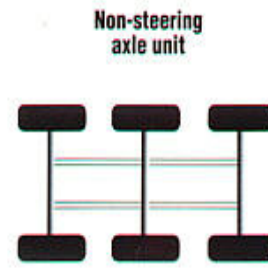
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24000 kg axle unit massload
Regulation 240 (f) (ii)

AXLE UNIT MASS LOADS REGULATION 240

Revved up over bid to curb truck transport

Operators say a new government plan to save the country's back roads from heavy vehicles is fatally flawed, writes **Paul Ash**

Without trucks, South Africa stops

THE letter from VM Pillay published on October 27 refers. Pillay raises a number of issues to which the Road Freight Association (RFA) would like to respond:

We are aware that there are a number of unroadworthy vehicles on our roads and that the number of vehicle breakdowns is high. The RFA has a Code of Good Practice to which our members subscribe, which includes compliance with road traffic legislation. However membership of the RFA is not compulsory and there are many trucking companies operating which are not members of the association.

Some unroadworthy vehicles are also from outside of South Africa's borders and do not comply with our traffic legislation – including road safety, securement of loads, driver hours and loading to the maximum permissible mass.



KEEP ON TRUCKING: Trucks keep the wheels of our economy turning, says the reader.

MIRROR, THE
Wednesday, 28 October 2009, p. 25

Freight truck ban on certain roads could cost more

A BAN on certain trucks using the country's roads is coming. A new government freight strategy plans to prohibit certain commodities from being transported by road as it seeks to revitalise the branch rail lines and reduce damage to the road infrastructure.

Sharmini Naidoo, chief executive of the Road Freight Association, said that this legislation, if implemented, could have a serious impact on the road freight industry.

"It will affect operators, suppliers, manufacturers, as well as customers. Possible effects include higher pricing, lower gross vehicle mass and reduced payloads, doubling of



Freight trucks could soon be banned on certain roads.

no funds were available to sustain or repair roads. Research showed the network had a five-year life span left before collapse.

Naidoo said the secondary network referred to all public roads not proclaimed as national roads. Transport stakeholders have until November 6 to comment on the strategy. She said there was no intention to reduce the number of passenger-carrying vehicles, such as buses, on these routes, nor was it aimed at bus rapid transit system vehicles that would use parts of the secondary network as transit routes for the 2010 Soccer World Cup. Peter

Mountford, the chief executive of Super Group, said the plan was "hugely concerning" and could have a significant influence on the long-distance transport industry. Mountford said it could certainly lead to escalating costs if transporters were forced to use longer routes. He said the critical elements in the industry were distance travelled and time. Products could end up costing more if transported ineffectively. He said the new measures would create problems for drivers because on any trip they travelled on a combination of primary and secondary roads. — Motoring.co.za

Key Issues

- Clarification: "reduction in axle load limit"
- Timely road maintenance for roads in fair condition
- Rehabilitation of roads in very poor and poor condition

3. The Department of Transport is currently looking at reviewing the current axle mass limits in a bit to relieve the burden off the secondary road networks infrastructure. Most of the secondary road networks has reached a state of disintegration, thus necessitating measures to be put in place in order to salvage these road networks.



Key Issues

- Clarification: "reduction in axle load limit"
- Timely road maintenance for roads in fair condition
- Rehabilitation of roads in very poor and poor condition
- Law enforcement on secondary routes



National Department of Transport

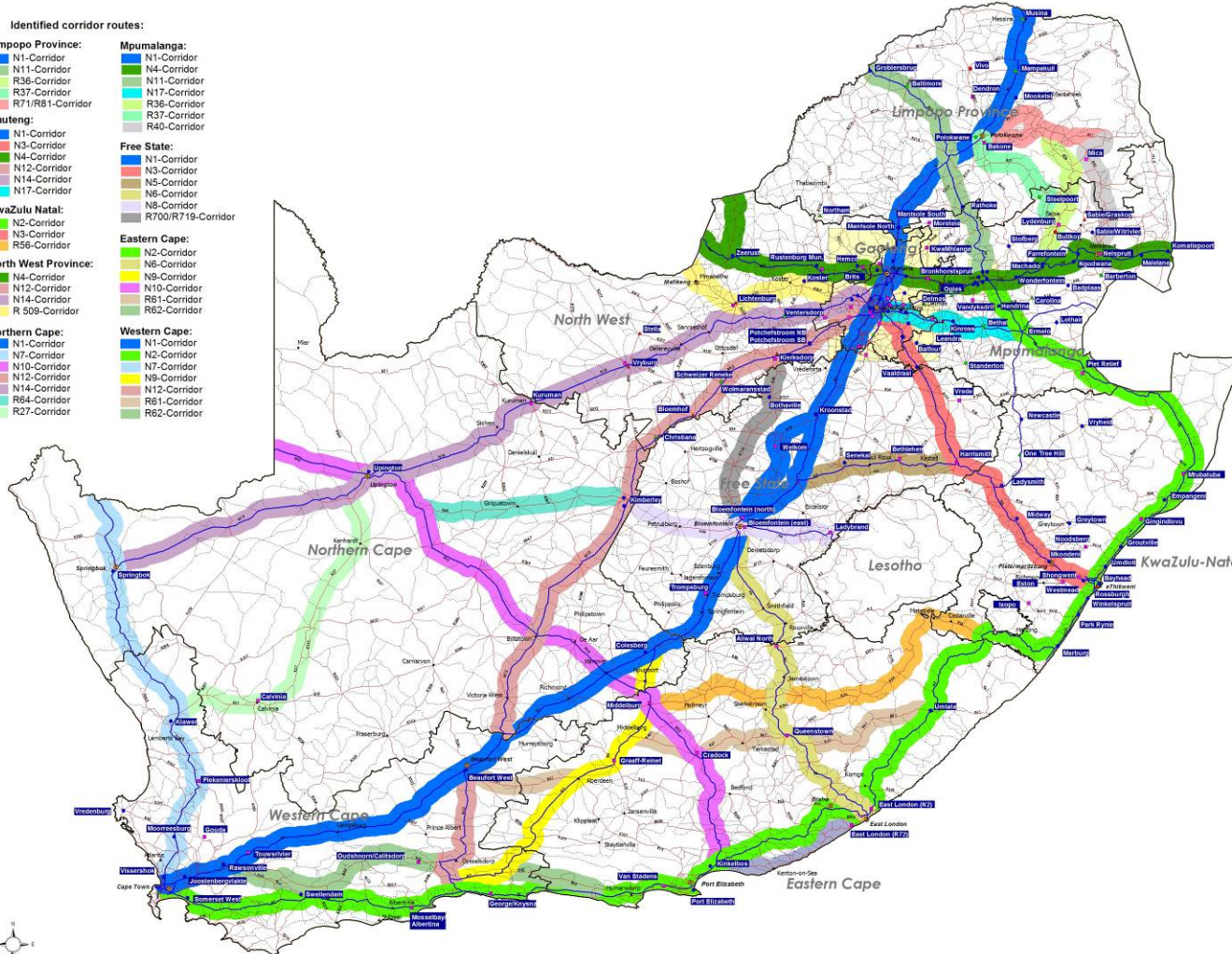
South African Weighbridges

Operational, non-operational and proposed facilities

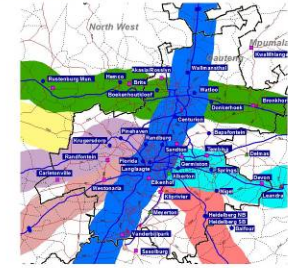
Overload management corridors

Identified corridor routes:

- Limpopo Province:**
 - N1-Corridor
 - N11-Corridor
 - R36-Corridor
 - R37-Corridor
 - R71/R81-Corridor
- Gauteng:**
 - N1-Corridor
 - N3-Corridor
 - N4-Corridor
 - N12-Corridor
 - N14-Corridor
 - N17-Corridor
- KwaZulu Natal:**
 - N2-Corridor
 - N3-Corridor
 - R56-Corridor
- North West Province:**
 - N4-Corridor
 - N12-Corridor
 - N14-Corridor
 - R 509-Corridor
- Northern Cape:**
 - N1-Corridor
 - N7-Corridor
 - N10-Corridor
 - N12-Corridor
 - N14-Corridor
 - R84-Corridor
 - R27-Corridor
- Western Cape:**
 - N1-Corridor
 - N7-Corridor
 - N10-Corridor
 - N12-Corridor
 - N14-Corridor
 - R84-Corridor
 - R27-Corridor
- Mpumalanga:**
 - N1-Corridor
 - N4-Corridor
 - N11-Corridor
 - N17-Corridor
 - R36-Corridor
 - R37-Corridor
 - R40-Corridor
- Free State:**
 - N1-Corridor
 - N3-Corridor
 - N5-Corridor
 - N8-Corridor
 - N9-Corridor
 - R70/R719-Corridor
- Eastern Cape:**
 - N2-Corridor
 - N6-Corridor
 - N9-Corridor
 - N10-Corridor
 - R61-Corridor
 - R62-Corridor
- Western Cape:**
 - N1-Corridor
 - N2-Corridor
 - N6-Corridor
 - N9-Corridor
 - N12-Corridor
 - R61-Corridor
 - R62-Corridor

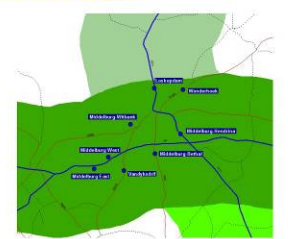


INSET A - Gauteng



50 0 50 100 150 Kilometers

INSET B - Mpumalanga



10 0 10 20 30 40 Kilometers

LEGEND:

- Roads:**
- National
 - Main
 - Secondary
 - Selected Main Towns

- Weighbridges:**
- Operational (to be replaced)
 - Operational (to be upgraded)
 - Non-Operational (in disuse)
 - Non-Operational (to be upgraded)
 - Proposed

Prepared by Transportek, CSIR.
April 2004

South African Weighbridges Operational Corridors and Weighbridges to be Proposed (April 2004) (enr-34647) 1/3/2004

Key Issues

- Clarification: "reduction in axle load limit"
- Timely road maintenance for roads in fair condition
- Rehabilitation of roads in very poor and poor condition
- Law enforcement on secondary routes
- Rail capacity on branch lines
- Quantify benefit of axle load reduction vs increases in cost of logistics and congestion
- Consideration of regional initiatives (SADC Protocol)

ROAD TRANSPORT MANAGEMENT SYSTEM



Road Transport Management System

RTMS

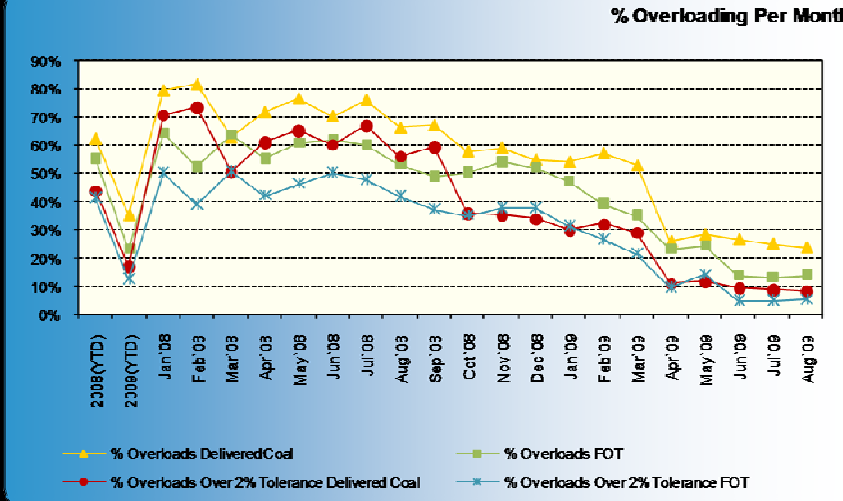
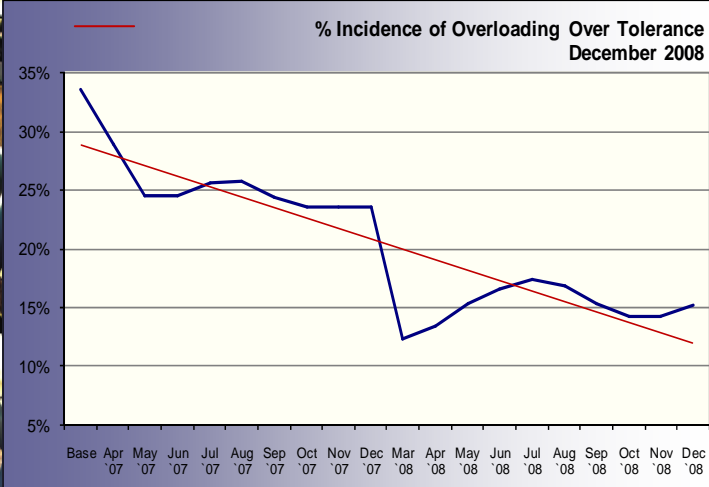
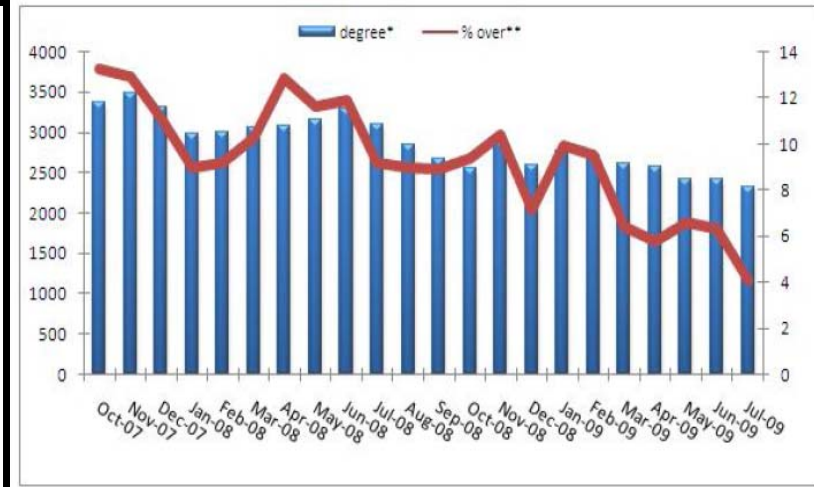
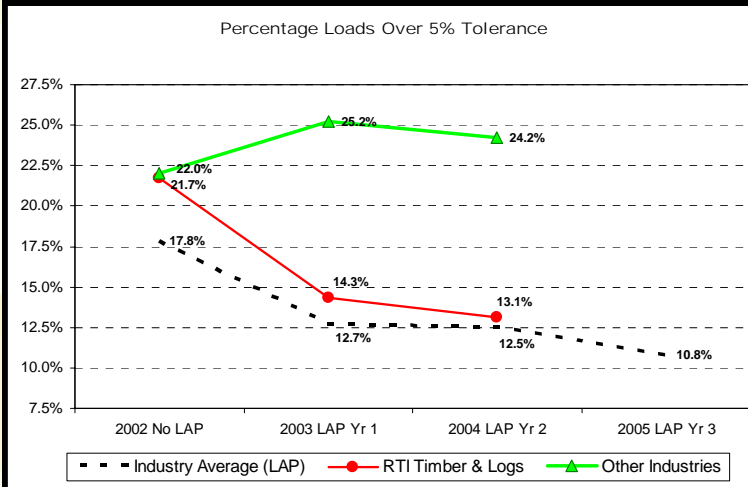
Driver Wellness • Safety • Loading • Productivity



Driver Wellness
Productivity
Loading
Safety



Overloading trends



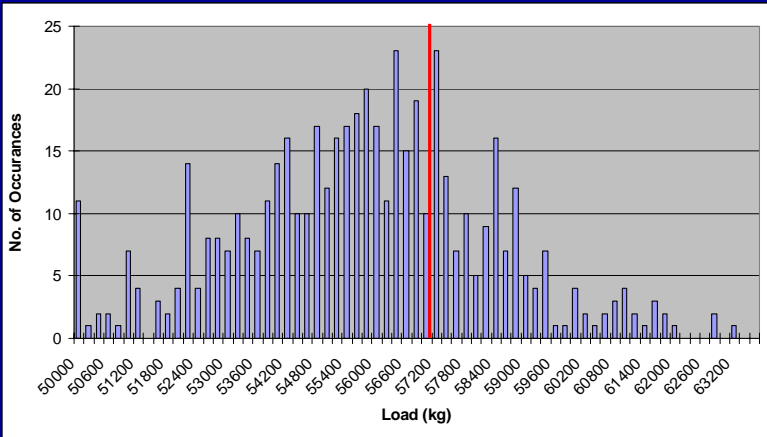
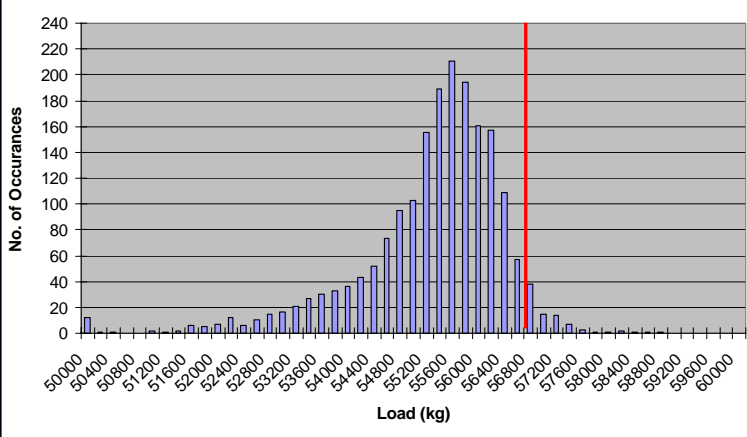
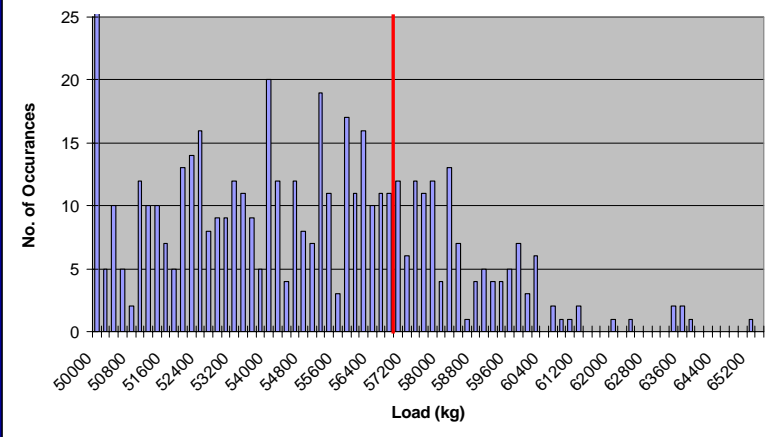
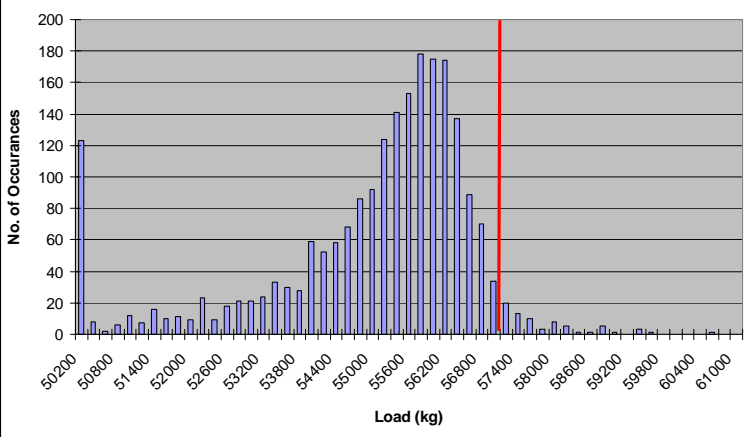
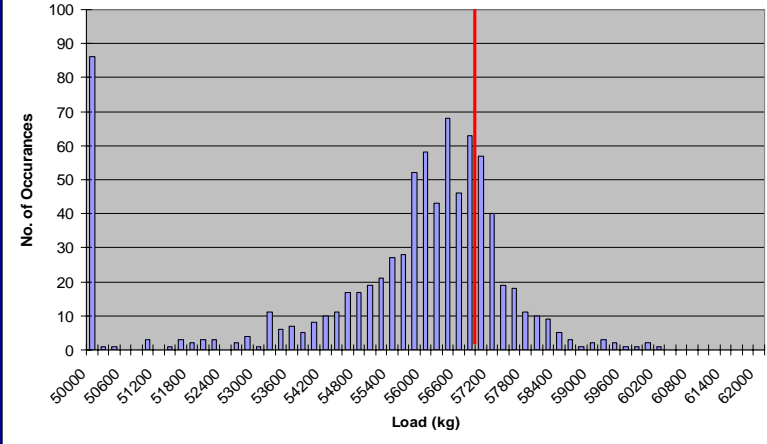
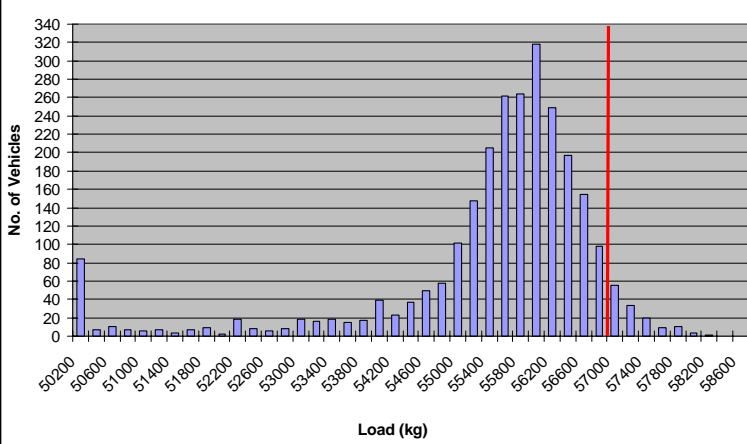
ROAD TRANSPORT MANAGEMENT SYSTEM



Road Transport Management System

RTMS

Driver Wellness • Safety • Loading • Productivity

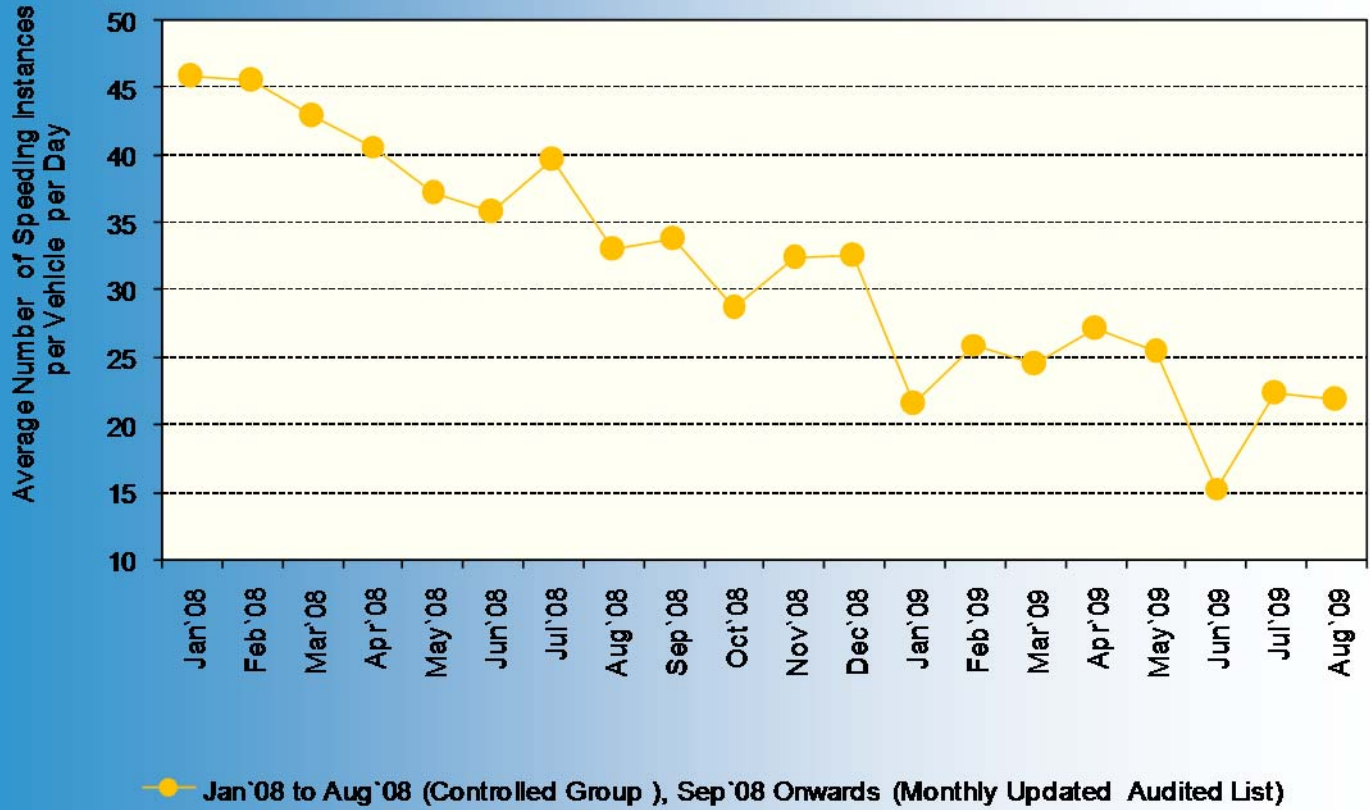


Driver Wellness
Productivity
Loading
Safety



Speeding trends (Coal)

Speeding Status Per Month



Driver Wellness
Productivity
Loading
Safety

National Road Traffic Amendment Act (No. 64 of 2008)



Government Gazette Staatskoerant

REPUBLIC OF SOUTH AFRICA
REPUBLIEK VAN SUID-AFRIKA

Vol. 524 Cape Town, 17 February 2009 No. 31907
Kaapstad, 17 Februarie 2009

THE PRESIDENCY

No. 165 17 February 2009

It is hereby notified that the President has assented to the following Act, which is hereby published for general information:—

No. 64 of 2008: National Road Traffic Amendment Act, 2008.

DIE PRESIDENSIE

No. 165 17 Februarie 2009

Hierby word bekend gemaak dat die President sy goedkeuring gegee het aan die onderstaande Wet wat hierby ter algemene inligting gepubliseer word:—

No. 64 van 2008: Nasionale Padverkeerswysigingswet, 2008.



AIDS HELPLINE: 0800-0123-22 Prevention is the cure

National Road Traffic Amendment Act (No. 64 of 2008)

- Deals with numerous issues in the RTA including:
- Responsibilities of consignors and consignees with regards actions and omissions;
- Proof of certain facts (goods declaration or any other document relating to the load of a vehicle is adequate proof)

National Road Traffic Amendment Act

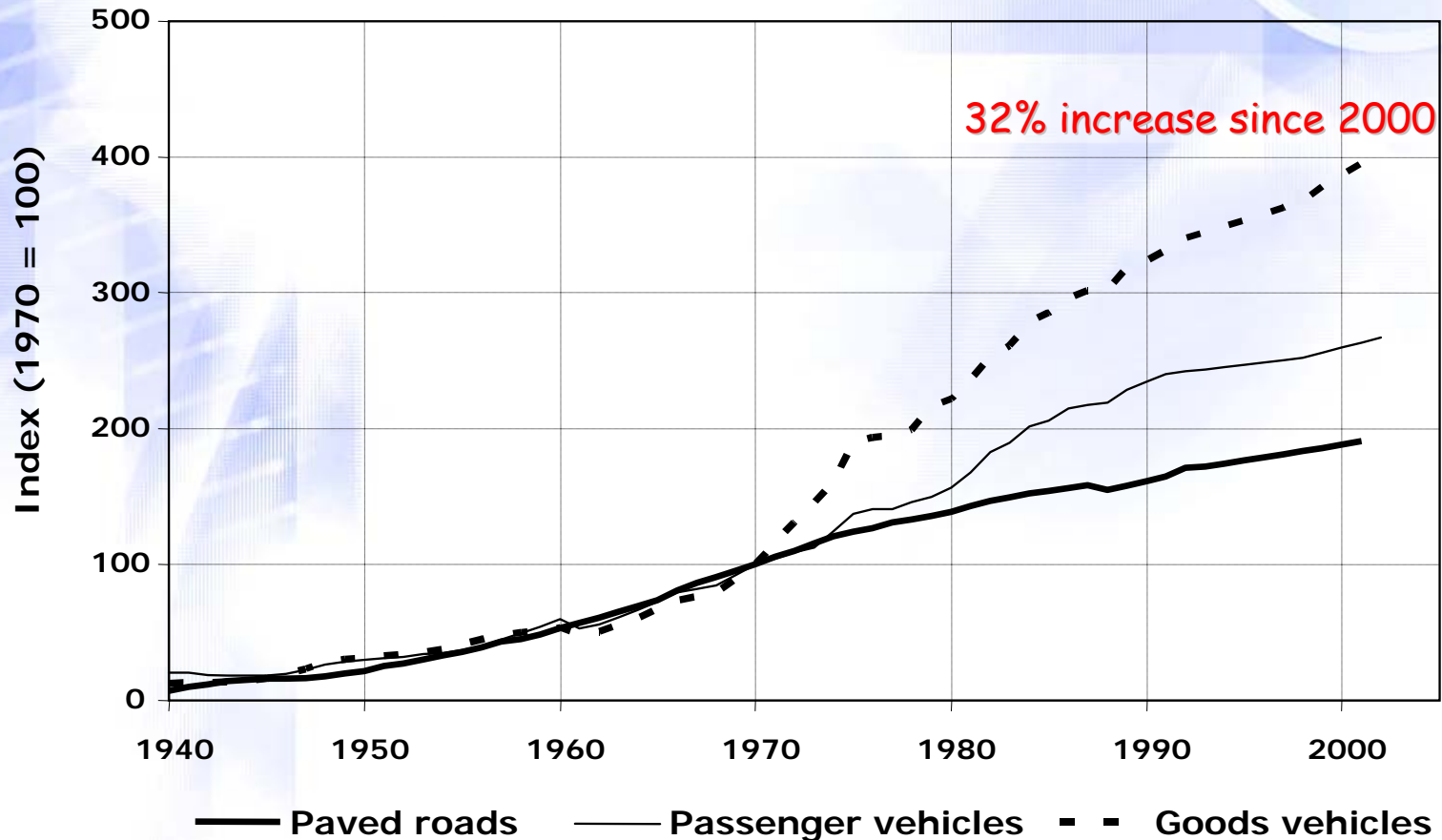
Section 74A (Act or omission)

74A. (1) Whenever any manager, agent or employee of a consignor or consignee, as the case may be, does or fails to do anything which, if the consignor or consignee had done or failed to do it, would have constituted an offence in terms of this Act, the consignor or consignee, as the case may be, shall be regarded to have committed the act or omission personally in the absence of evidence indicating —

- (a) that he or she did not connive at or permit such act or omission;
 - (b) that he or she took all reasonable measures to prevent such act or omission; and
 - (c) that such act or omission did not fall within the scope of the authority of or in the course of the employment of such manager, agent or employee,
- be deemed to have committed or omitted that act and be liable to be convicted and sentenced in respect thereof.

Growth in Freight (the Economy) in South Africa

Paved national and provincial roads, passenger vehicles and commercial vehicles for transport of goods



Conclusions

- Clarify "reduction in axle mass limit"
- Careful assessment of macro-economic implications required before changing the legislation
- Does not negate the urgent need to address maintenance of provincial roads
- Law enforcement on secondary routes must be addressed
- "Freight back to rail" is a worthwhile concept, but branch (and main) line capacity must be addressed
- The initiative goes against regional initiatives with regards harmonisation of axle load limits



THANK YOU