



THE UNIVERSITY OF  
MELBOURNE

# Two Regulatory Mechanisms for Introducing High Productivity Vehicles

**City Logistics IV  
Langkawi MALAYSIA  
July 12<sup>th</sup>-14<sup>th</sup> 2005**

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# Australia's National Transport Commission has a charter:

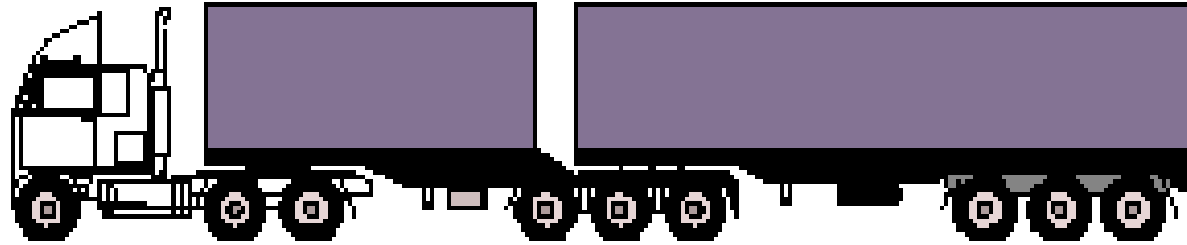
- Make Regulation more efficient and effective; Harmonization and productivity
- To make road and rail safer and
- To reduce transports environmental impacts.

This presentation is concerned with two particular productivity initiatives. Both have differing impacts on the Urban task

# Case I – The introduction of the B-Double

- The B-Double was an adaptation of the Canadian B-train which began operations from the mid 1970s.
- The class of vehicles had a good safety record and the productivity was obvious.
- The vehicle was piloted in Australia between 1986 to 1988. (Not without problems)

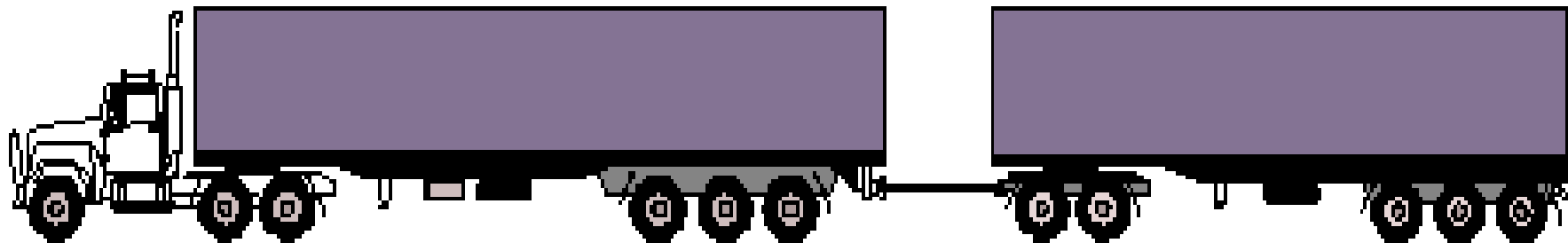
# B-Double vs Road train Dimensions



**B-Double: 9 axle configuration**

**Length 25m, Width 2.5m Height max 4.3m**

Weight 62.5 tonnes GVM (68 Tonnes with mass management accreditation)

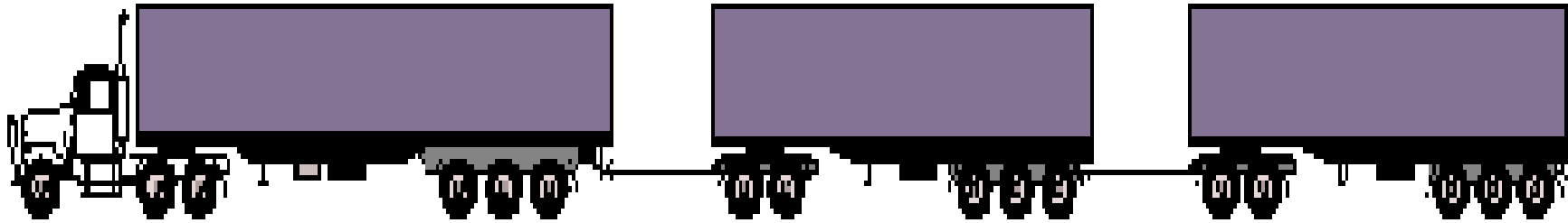


**11 Axle Double Road Train**

**Length 36.5m, Width 2.5m Height max 4.3m**

Weight 79 tonnes GVM (85.7 Tonnes with mass management accreditation\*)

**A B-Double is not a road train !!**

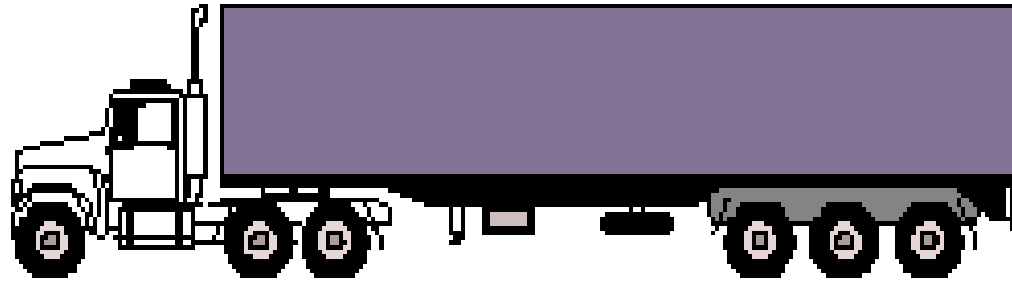


**Triple Road Train:**

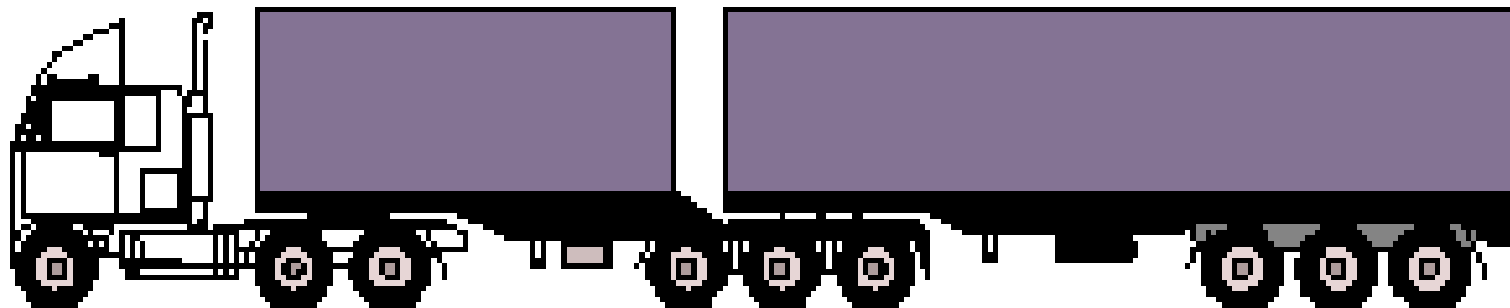
**Length 53.5m, Width 2.5m Height max 4.3m  
Weight 115.5 tonnes GVM**

**(125.2 Tonnes with mass management accreditation\*)  
Benefit = 11.75% excluding Tare weight**

# The B-Double was the alternative to the single “semi trailer”



Length 19m, Width 2.5m Height max 4.3m  
Weight 42.5 tonnes GVM (45.5 Tonnes with mass management accreditation)



**B-Double: 9 axle configuration**  
Length 25m, Width 2.5m Height max 4.3m  
Weight 62.5 tonnes GVM (68 Tonnes with mass management accreditation)

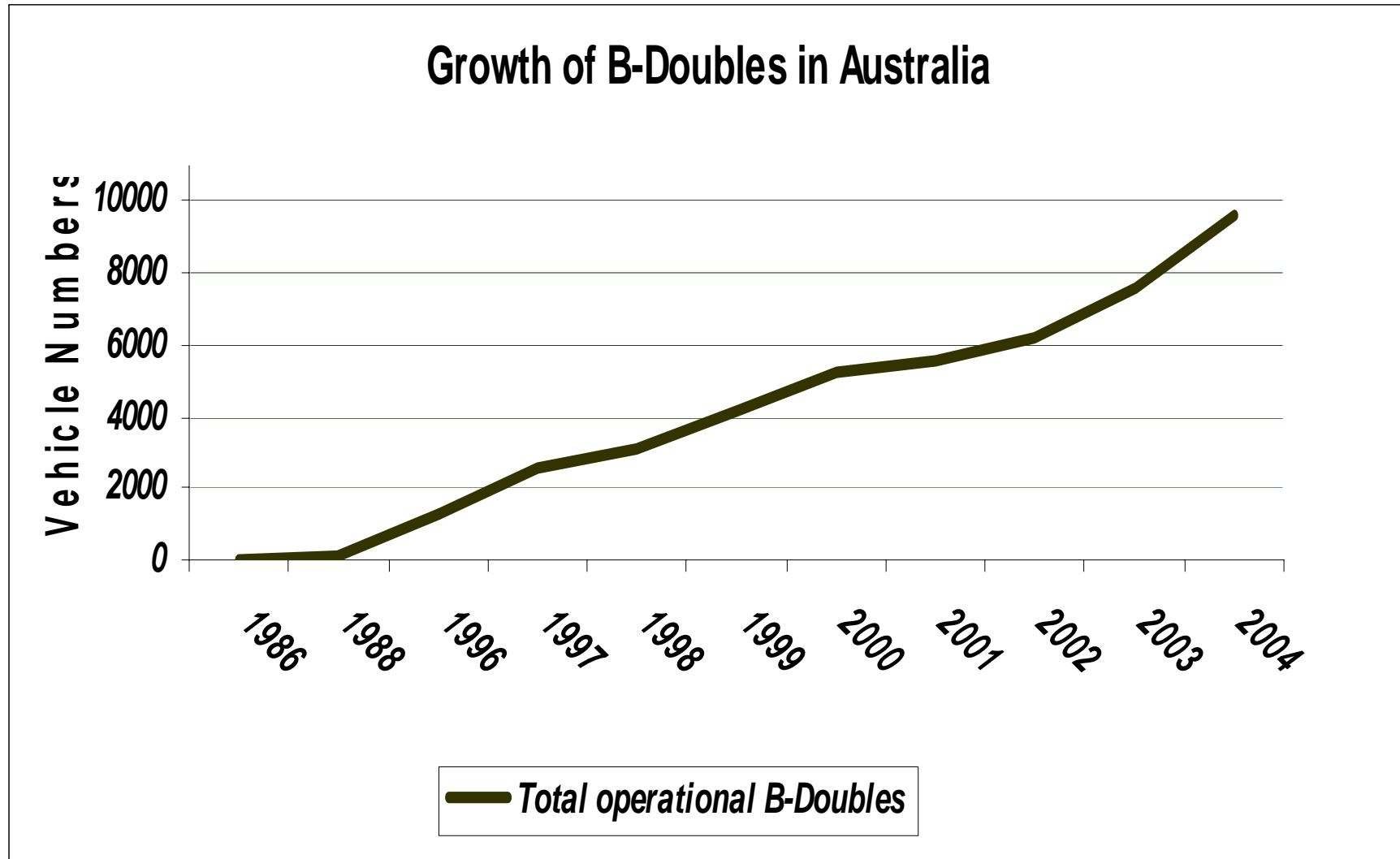
# Growth of the Australian B-Double

1986	1988	1996	1997	1998	1999	2000	2001	2002	2003	2004
7	70	1265	2604	3130	4161	5247	5507	6233	7548	9578
% Urban Travel				13.4%	20.1%	16.3%	16.1%	15.9%	13.7%	16.1%

Since regulatory acceptance in 1989 growth intensified from 1995. from 1995 to 2004 there were some 1000 extra vehicles registered each year. Average kms initially around 203,000 kms per annum now some 198,000 kms per annum. But the task have mushroomed.

528M kilometres to 1,812 M kilometres per annum 1997 to 2003

# From caution to an unstoppable tide:



## **From one of Australia's largest operators:**

### **B-Double impacts**

- Instant productivity gain of 33%
- From 1996 to 2003 the numbers of interstate trips was held constant at 325 trips per week with 55 (tractors) prime movers.
- 6% cargo volume growth was catered for by adding A trailers (front trailers)
- No extra trips in this period.
- In 2004 eight more trips were added to the interstate network.

# Standardization Approach: Drop Deck 25 m B-Double

Normal 25 meter B-Double

A trailer = 12 pallets (24 half pallets)

B Trailer = 22 pallets (44 half pallets)

= **68 Half pallets = 34 pallets**     *This is a standard configuration*

With **drop deck** and **half pallet** approach Australia Post  
achieved

A trailer = (30 half pallets)

B Trailer = (60 half pallets) = **90 Half pallets = 45 pallets**

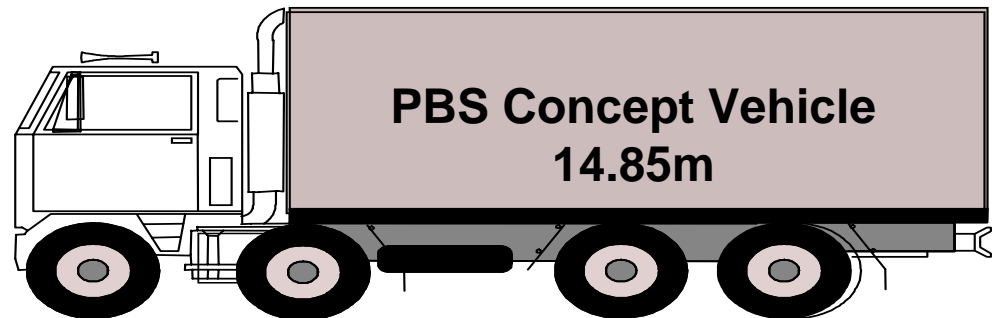
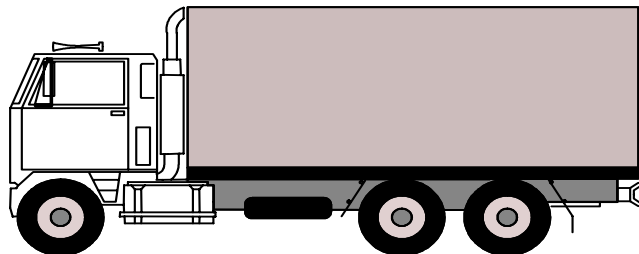
# From a regulatory perspective

- The B-Double has been a safe and efficient vehicle.
- With “Road friendly” suspension systems extra mass with minimum road damage (OECD Divine project)
- Very high productivity.
- Without these vehicles there would have been some **4,500** extra semi trailers on Australian roads in the last 10 years.
- This would have had a profound impact on both long distance and the urban interface.

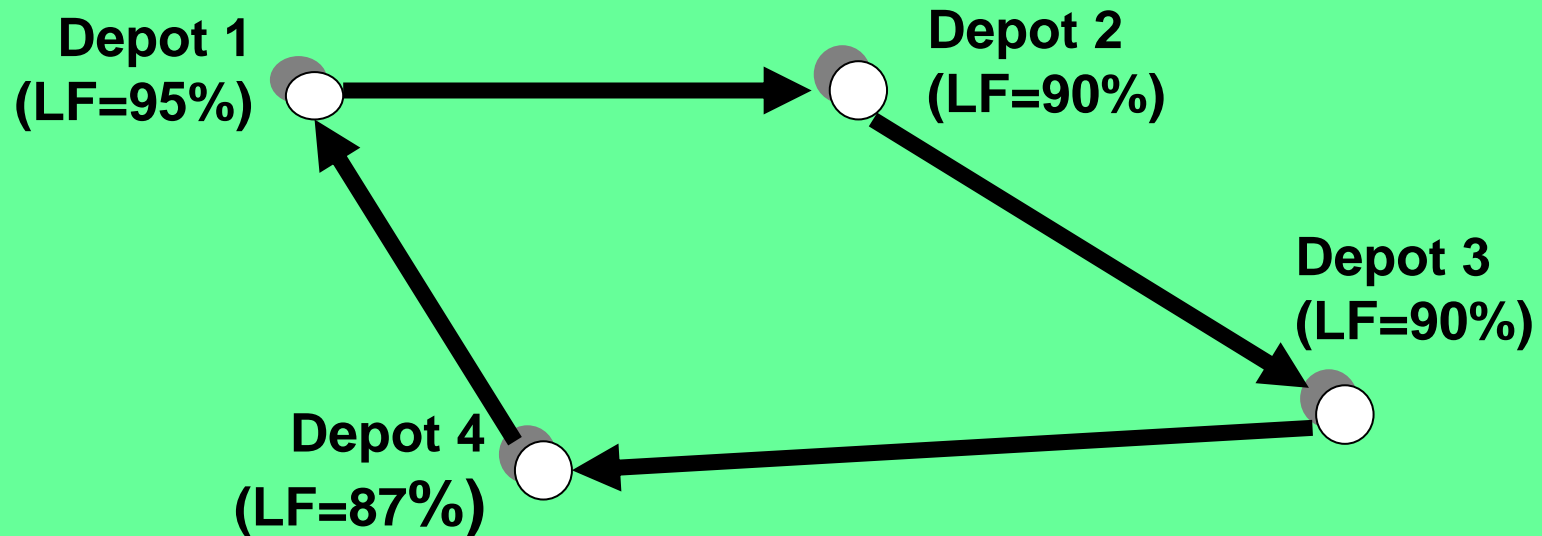
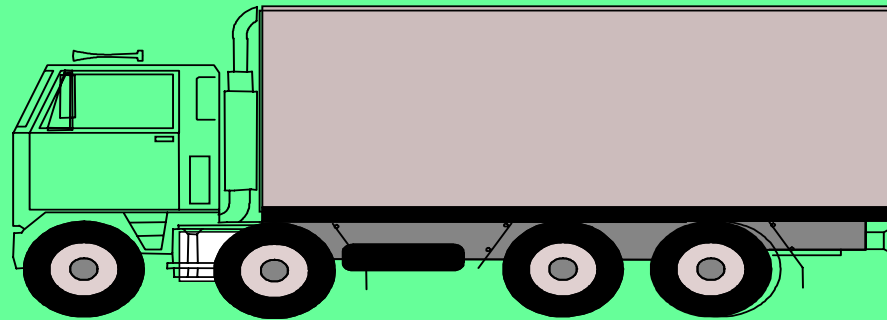
# Case Study two – Performance Based Standards

Australia has viewed PBS as the next innovative direction for Vehicle Productivity

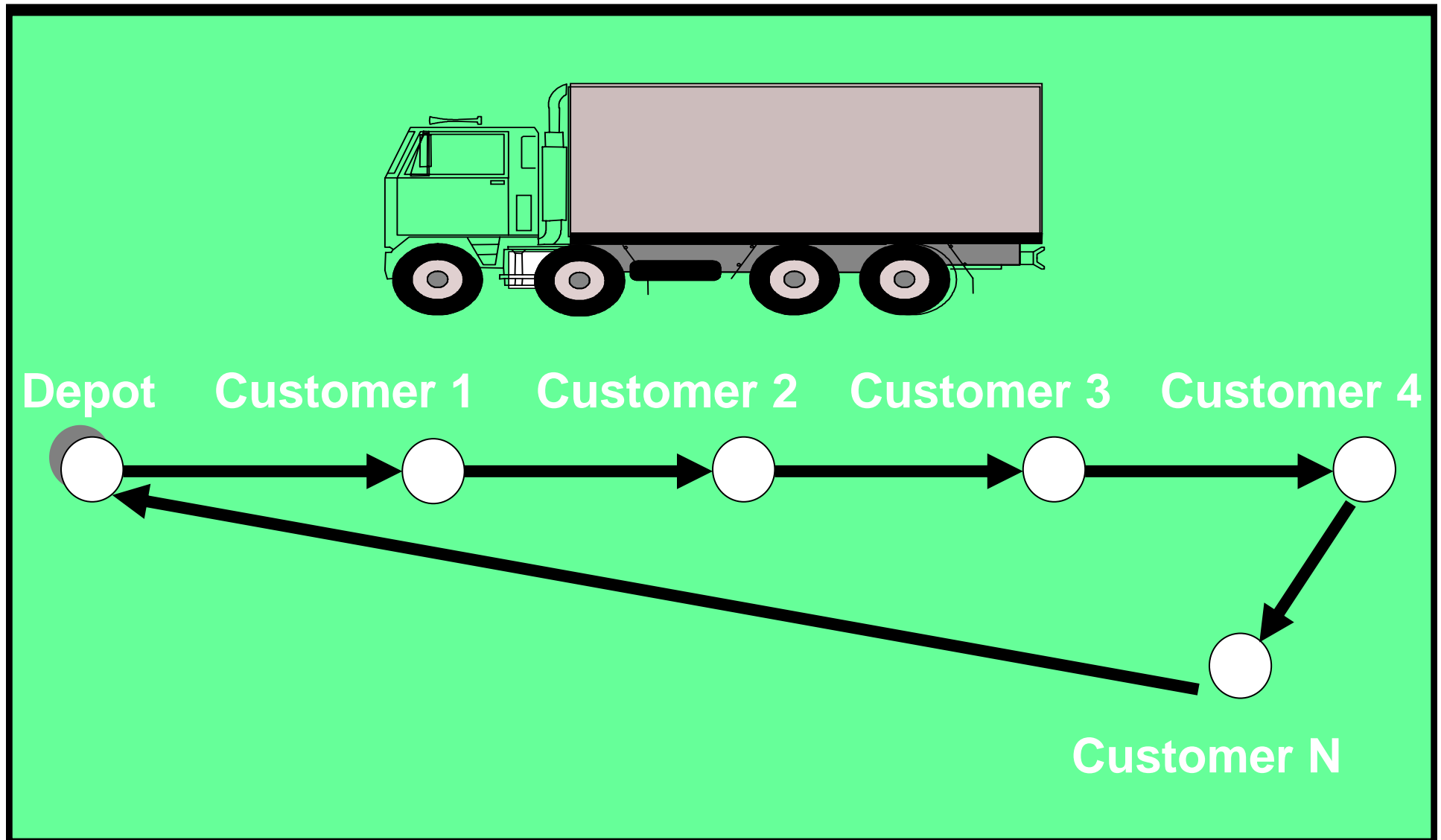
Australia Post High Productivity Vehicle



# Envisaged 4 Axle Rigid “Depot Transfer” Operation



# Envisaged 4 Axle Rigid “Multi Drop” Operation



# Proposed PBS Vehicle Performance Criteria

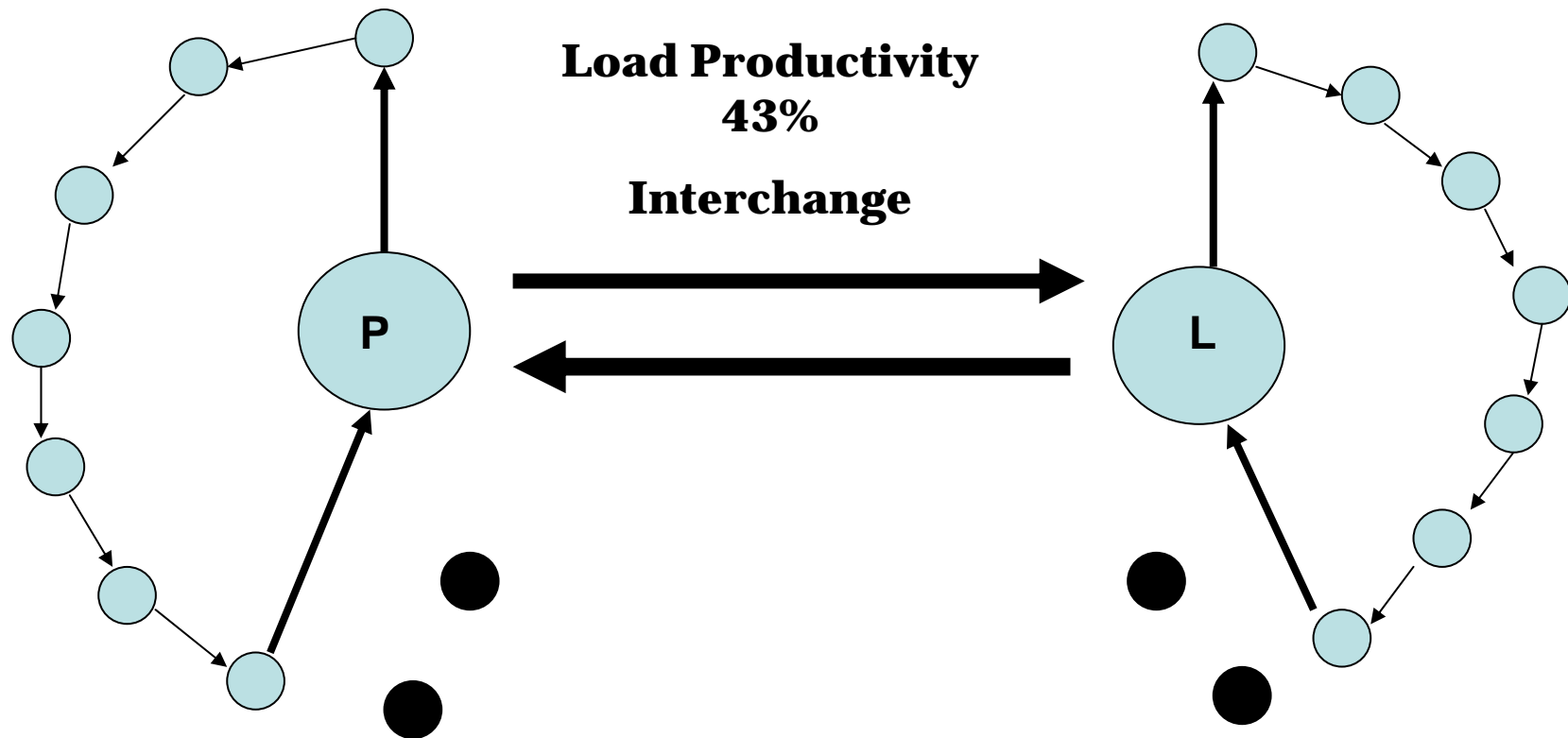
<b>1. Startability</b> <b>2. Gradability</b> <b>3. Acceleration</b> <b>4. Overtaking</b> <b>5. Tracking ability</b> <b>6. Low speed off tracking</b>	<b>7. Frontal Swing</b> <b>8. Tail swing</b> <b>9. Steer tyre friction</b> <b>10. Static Rollover</b> <b>11. Rearward amplification</b> <b>12 Yaw Damping</b>	<b>13. High Speed Transient Off tracking</b> <b>14. Standard axle repetition</b> <b>15. Horizontal Tyre forces</b> <b>16. Bridge weight limits</b> <b><u>17. (Australian Design Rules, and</u></b> <b><u>18. Australian Vehicle</u></b> <b><u>standards.)</u></b>
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**PBS Vehicles must behave as well or better than their smaller dimension brothers. A PBS Urban Rigid must be almost no different in performance characteristics.**

# Insertion of a rigid PBS vehicle into the Domestic Postal Fleet

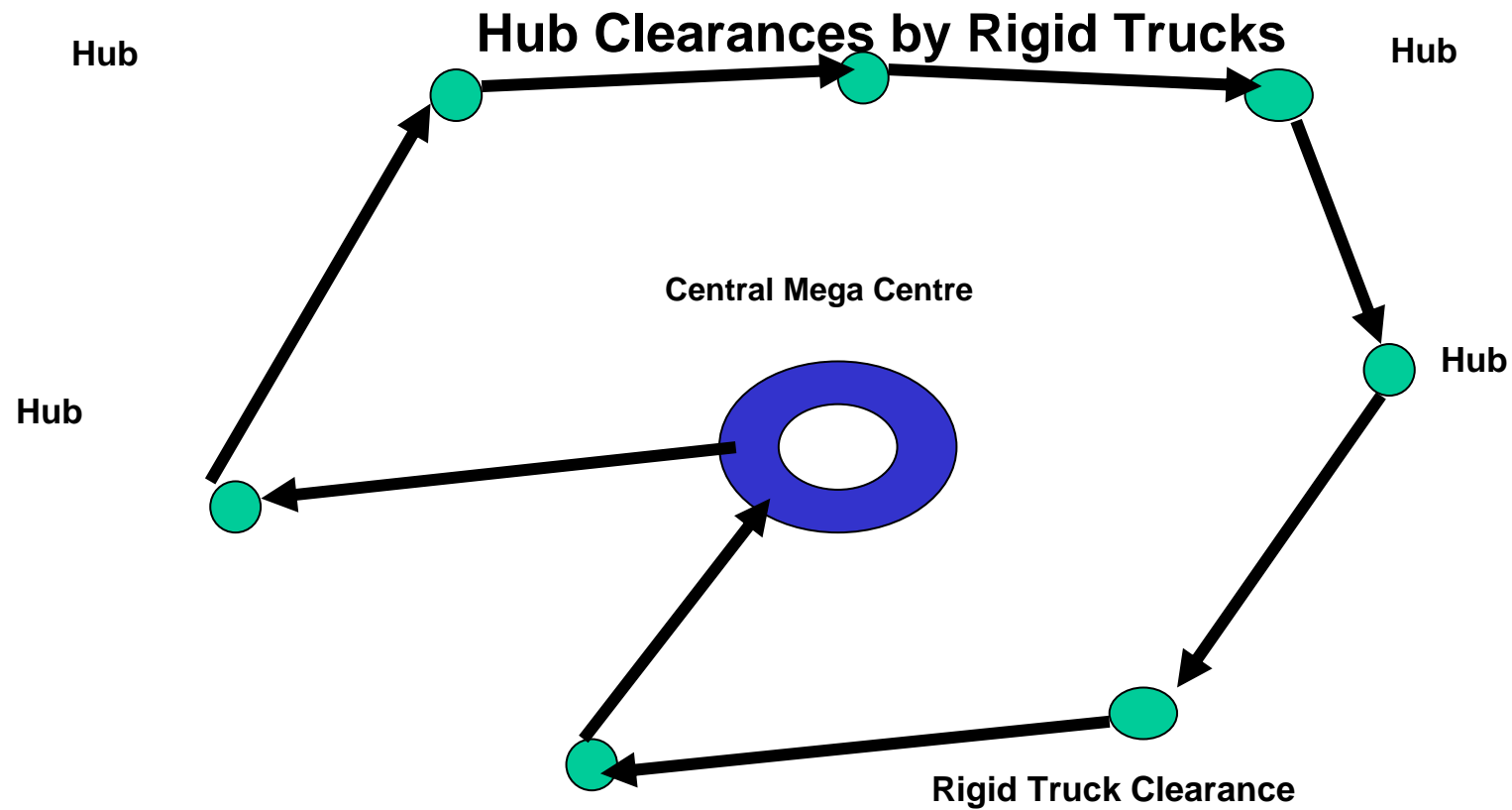
- Estimated Kilometer reduction 29%
- Average Load Productivity increase 37%
- Cost reduction -8% +
- Rigid truck numbers -20% (over 7 years) in Urban areas.
- Project has generated high interest and has attracted a government and Industry scholarships.

# PBS Impact on Bi Polar Network: Parcels & Letters



**Load Productivity “Milk Runs” =  
+2 nodes per duty = 28%**

# Postal Case study: New Hub and Mega Consolidation network



Truck sweeps generated significant savings in a consolidated network.

**Table 7: Fleet Vehicle Numbers: 1994 to 2004  
(City & Regions: New South Wales and Victoria)**

<b>Vehicle type</b>	<b>Gross Vehicle Mass (tonnes)</b>	<b>Number of Vehicles 1994/95</b>	<b>Number of Vehicles 2004</b>	<b>% Change</b>
Light Comm Vehicle	1.0 – 2.5	1027	759	-26.1%
Medium 2-axle Rigid	11.9 – 13.0	343	115	-66.5%
<b>Heavy 2 &amp; 3 -axle Rigid</b>	15.0 – 23.0	247	279	+12.9%
Local/Regional Articulated	39.0 - 43.0	0	44	New Category
<b>Sub-Total</b>	<b>1.0 to 43.0</b>	<b>1,617</b>	<b>1,197</b>	<b>-25.9%</b>
Linehaul Articulated <i>Long distance national</i>	42.5- 63.0 T	26	35	+29.1%
<b>Total</b>	<b>..</b>	<b>1,643</b>	<b>1,232</b>	<b>-25.0%</b>

# PBS is going to be the next explored leap in network productivity.

- Have obtained significant benefits from a decade long network restructure
- PBS is the next tool in the productivity basket.
- Full fleet seeding will take some seven years.
- The regulators have to be involved in the process from the outset.
- An Industry and regulatory steering committee exists to guide the proposed regulations.

# Australian Performance Based Standards

## Case studies:

**NRTC (December 1999),**

Title: "*Performance-Based Standards for Heavy Vehicles: Assembly of Case Studies*", Report, National Transport Commission Melbourne.

All cases are for articulated vehicles some 12+ actual examples.

# New National Transport Commission Discussion Papers: on PBS

- [PBS Assessment Rules Discussion Paper & Appendices A & B - June 2005 \(144.79 KB\)](#)
- [PBS Assessment Rules Discussion Paper Appendix C - June 2005 \(1.61 MB\)](#)
- [PBS Assessment Rules Discussion Paper Appendices D-G \(323.96 KB\)](#)
- We all await the OECD PBS report.... OECD (2005)  
*Performance Based Standards for Road Transport*, OECD, Roads and Transport Research Program, Paris (forthcoming)