Heavy Vehicles – Safety and Profit

Friends or Foes?

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ACRS Conference 2012
Outline

• “Safe System” thinking

• Heavy vehicles – their key role

• Heavy vehicles and road trauma
  – Speed and safety
  – Speed and mobility
  – Speed and environment
  – Speed and economy

• Next steps
“Safe System” thinking

• “the human” is at the centre of thinking
• Humans make mistakes
• Humans are vulnerable
• We all have responsibilities
  – system builders
  – system users

vehicles

humans

roads
Heavy vehicles – their key role in society

- Key generator of economic growth
  - > 550,000 trucks on Australia’s roads
  - ↑ 22% since 2005
  - ~ 16,000M kms per annum
  - 190,000M tonne-kms per annum
  - Long-haul routes - ↑ 3% to ↑4.6% per annum

Freight task set to double by 2030
Heavy vehicles and road trauma

- 250 people died in 209 crashes (Oct ‘09 – Sept ‘10)
  - 16% of the national road toll
  - 60% (articulated vehicles)
  - 32% (rigid trucks)
  - 8% (buses)

- 60% of fatalities occur on rural and remote roads
Heavy vehicle speeds and safety

Stopping Distances

100km/h truck speed when 90km/h truck comes to a halt → 49km/h
Heavy vehicle speeds and safety

The causal chain

On-road behaviour
• high travel speed ↑

Pre-crash
• pre-brake distance ↑
• Braking distance ↑
• Risk of losing control ↑
• Chance of regaining control ↓

Crash
• Crash impact ↑↑
• Crash energy ↑↑↑↑
• Risk of death or serious injury ↑↑↑↑
Heavy vehicle speeds and safety

Small drop in trauma speeds $\rightarrow$ large drop in serious trauma

**Nilsson’s Law:**
Deaths drop according to a 4th power law!

$100\text{km/h} \rightarrow 90\text{km/h}$

New death number $= \text{old death no.} \times (0.9)^4$
$= 0.66 \text{ old death no.}$

Reduction in deaths $= 34\%$
Heavy vehicle speeds and mobility

Scania B-double Fuel Duel
Heavy vehicle speeds and mobility

**Scania Fuel Duel**

- Melbourne - Sydney (90km/h v 100km/h) – 40 minute saving
- Sydney – Melbourne (90km/h v 100km/h) – 53 minute saving

**Simon National Carriers**

- Melbourne – Sydney (90km/h v 100km/h) – 15-20 minute saving

The mobility costs are not significant
Heavy vehicle speeds and business viability

As speed increases:

– Aerodynamic drag and tyre drag increase

– Transients (accelerations and decelerations) can be steeper/last longer

– Fuel economy decreases

– GHG emissions increase
Heavy vehicle speed and business viability

Scania fuel duel (90km/h v 100km/h)

- 6% fuel saving overall
  - $10,000 per vehicle per annum (2011)
  - $1M saving for a 100 vehicle fleet

Mercedes Benz

- 6.6% fuel saving overall
  - $16,000 per vehicle per annum (2008)
  - $1.6M saving for a 100 vehicle fleet
Heavy vehicle speeds and business viability

Simon National Carriers (100 trucks)

- 7% fuel saving over all trips
- Created a business ‘niche’ – fragile products
- Improved culture/driver retention
- Low insurance premium rates
Heavy vehicle speeds and environment

GHG emissions linked to fuel usage

• Scania fuel duel – extra 148kg of carbon dioxide emitted during Melbourne – Sydney round trip

• Reduced GHGs
  – Good corporate citizenship
  – Improved environment
  – Improved bottom line
Heavy vehicle speeds – social proof

**Australia**

- Simon National Carriers (100 → 90)
- Ryan’s Transport (100 → 90)

**International**

- Sweden – 80km/h top speed
- Norway – 90km/h top speed
- Shell global policy – 90km/h top speed
Challenges

• Inertia

• Driver perceptions

• Variations in travel speeds

• Management perception of the link between mobility and profitability
Next steps

• Demonstration trial on Geelong Road
  – Supported by VTA and TAC

• Encourage ‘big operators’ to trial and assess the business model – 90km/h on multi-lane roads

• Promote outcomes to industry

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