Heavy Vehicle Overloading - Implications of Overloading: Impact on Safety, Productivity and Maintenance Costs

Submitted by: Australia
Heavy vehicle overloading

Implications of overloading: Impact on safety, productivity and maintenance costs

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Our values, our diversity

Customers first
Unleash potential
Be courageous
Ideas into action
Empower people
Queensland Government’s objectives for the community

- Integrity and accountability
- Creating jobs and a diverse economy
  - increasing workforce participation
  - ensuring safe, productive and fair workplaces
  - stimulating economic growth and innovation
  - delivering new infrastructure and investment
- Delivering quality frontline services
  - achieving better education and training outcomes
  - strengthening our public health system
  - providing responsive and integrated government services
  - supporting disadvantaged Queenslanders
- Protecting the environment
  - protecting the Great Barrier Reef
  - conserving nature and heritage
  - ensuring sustainable management of natural resources
  - enabling responsible development
- Building safe, caring and connected communities
  - ensuring an accessible and effective justice system
  - providing an integrated and reliable transport network
  - encouraging safer and inclusive communities
  - building regions

Advance Queensland
Our strategic plan

Our vision
Creating a single integrated transport network accessible to everyone

Our purpose
We bring Queensland closer together

Contemporary workforce
Continue to skill our people to provide excellent customer service and deliver the transport network of the future

Innovation
Lead emerging technologies as our transport network meets the needs of customers now and into the future

Liveable regions and active cities
Deliver a single, integrated transport network that promotes prosperity in our cities and regions

Sustainable funding
Ensure our funding model is equitable, serves our customers' needs and is responsive to our future network

Regulation
Build with our customers a regulatory framework that is fair and reasonable

Our customers
Create a customer-centric culture that meets our customers' needs first time every time
About us…

Creating a single integrated transport network accessible to everyone

As at 30 June 2016 we manage:

- 33,343km state-controlled roads
- 3,029 bridges
- 20 ports

As at 30 June 2016:

- 3.5m drivers licensed
- 5m vehicles registered
- 3,260 taxis licensed
- 256,151 recreational vessel registrations
- 997,289 boat licenses
- 180m trips taken annually on bus, rail, ferry and light rail in SEQ
- 12.1m trips taken annually outside SEQ

As at 30 June 2016 there were:

- 3.63m customers served face-to-face at 59 Customer Service Centres
- 2.5m go cards in use
- Over 490,000 passengers travel on the south-east Queensland network on average each day
Objectives

• Foster productivity
• Keep industry moving
Australia-wide freight task

• 204,575 million tonne-kilometres in 2015–16
• More than 75% undertaken by articulated trucks
• Loads:
  ▪ 30% crude materials
  ▪ 14% food and live animals
  ▪ 12% manufactured goods.

Source: ABS
2010–2013 major disaster events
Roads closed or with limited access

- 16 disaster events over four years
- All of Queensland disaster declared
- 27,304km (82%) closed or with limited access at least once over the four summers due to natural disasters.

Pavement vulnerability

- Weather
- Pavement type
- Loads
Heavy vehicles on light pavements

Orion Ten Chain Road
Neville Hewitt Bridge
Managing heavy vehicles at roadworks

Peak Downs Highway
Loss of productivity
Flood damage and heavy vehicles = dangerous combination
Cloncurry–Dajarra Road
Asset management response to pavement overloading

- Case study – severe overloading of pavement
  - Life cycle cost comparison
- Considering increased axle mass <10% for productivity
  - Marginal costs – low volume roads versus heavy volume/high strength
- Freight productivity improvements at reduced life cycle costs
  - An asset manager’s view of concessional mass limits.
Case study – overloaded pavement

Orion Ten Chain Road
Case study – overloaded pavement

Orion Ten Chain Road
Life cycle costs – pavement overloaded

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Road Section 4503 - ORION 10 CHAIN ROAD (19.3 km) from Roadlink refreshed on 23 Mar 2017 21:37

Asia-Pacific Economic Cooperation (APEC) Transportation Working Group (TPTWG) workshop | 3-6 April 2017
Life cycle costs – normal loading

Construction history

Routine Maintenance Costs

Maximum Deflection

Rutting

Asia-Pacific Economic Cooperation (APEC) Transportation Working Group (TPTWG) workshop | 3-6 April 2017
Life cycle cost comparison

- Maintenance life cycle with pavement overloaded
  - 5 reseals, 4 pavement repair projects, routine maintenance approx. $1000/km per annum
  - annualised total cost $10,000/km
- Maintenance life cycle without pavement overloading
  - 3 reseals, routine maintenance approx. $700/km per annum
  - annualised total cost $3700/km.
**Increased axle mass for productivity**

- Marginal costs vary from:
  - \(~1\) cent/SAR.km for strong, high-volume arterials
  - \(30+\) cents/SAR.km on weak, low-trafficked roads.

*Source: ARRB 2017*
Damage comparison under alternate mass limits and controls

GML vs CML

- Based on this theoretic GML distribution with mode 42.5 tonnes and a tail of overloaded vehicles, estimated SARs/1000 tonnes of freight is 241.

- Compare then to the distribution targeted by concessional loading schemes allowing in this case a 2 tonne increase over GML, but with additional mass controls. SARs/1000 tonnes of freight is 227, which is equivalent to 6% less damage.
Thank you and stay connected

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