



**Asia-Pacific
Economic Cooperation**

2017/TPTWG/WKSP1/003

The Economic Costs of Overloading – Case Studies

Submitted by: Australia



**Workshop on Regulating High Mass Heavy Road
Vehicles for Safety, Productivity and Infrastructure**

**Outcomes
Brisbane, Australia
3-6 April 2017**

The economic cost of overloaded vehicles: Case studies

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APEC Transportation Working Group Workshop
April 2017

Format

1. Broad policy considerations of road network use and resulting vehicle overloading
2. Case study: Indonesia
3. Case study: Australia
4. Case study: High productivity vehicles

Heavy Vehicle Overloading

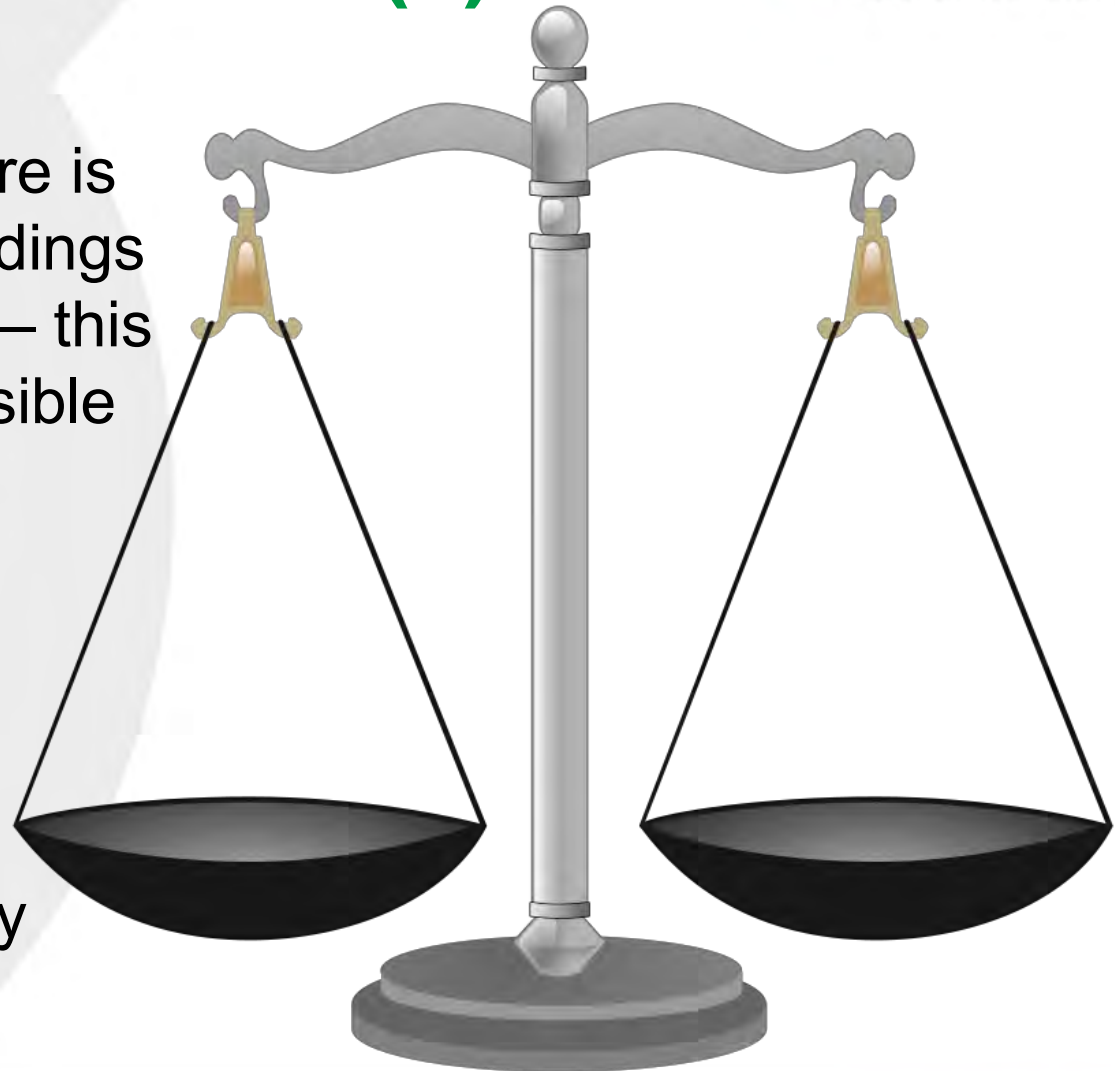


1. Overloading is an ongoing phenomenon
2. Overloading is an inevitable outcome of economic growth. Each economy faces this problem with the only difference being its size or degree
3. Some economies require both funding (for improved infrastructure) and technology to manage the problem
4. Some economies tend to manage more through road safety, enforcement and education
5. While some are increasingly through the use of technology aiming to better 'harness' the overloading

Broad Considerations (1)

Whilst the general desire is to 'balance' vehicle loadings and network capability – this may simply not be possible across:

- Freight tasks
- Geographical regions
- Internal and external factors
- The need for economy wide prosperity



Broad Considerations (2)



Policy decisions

What are the overarching policy outcomes to be sought?



Economic impact

What economic outcomes are you looking for?



Immediate or long term

Short term economic benefits vs long term infrastructure management



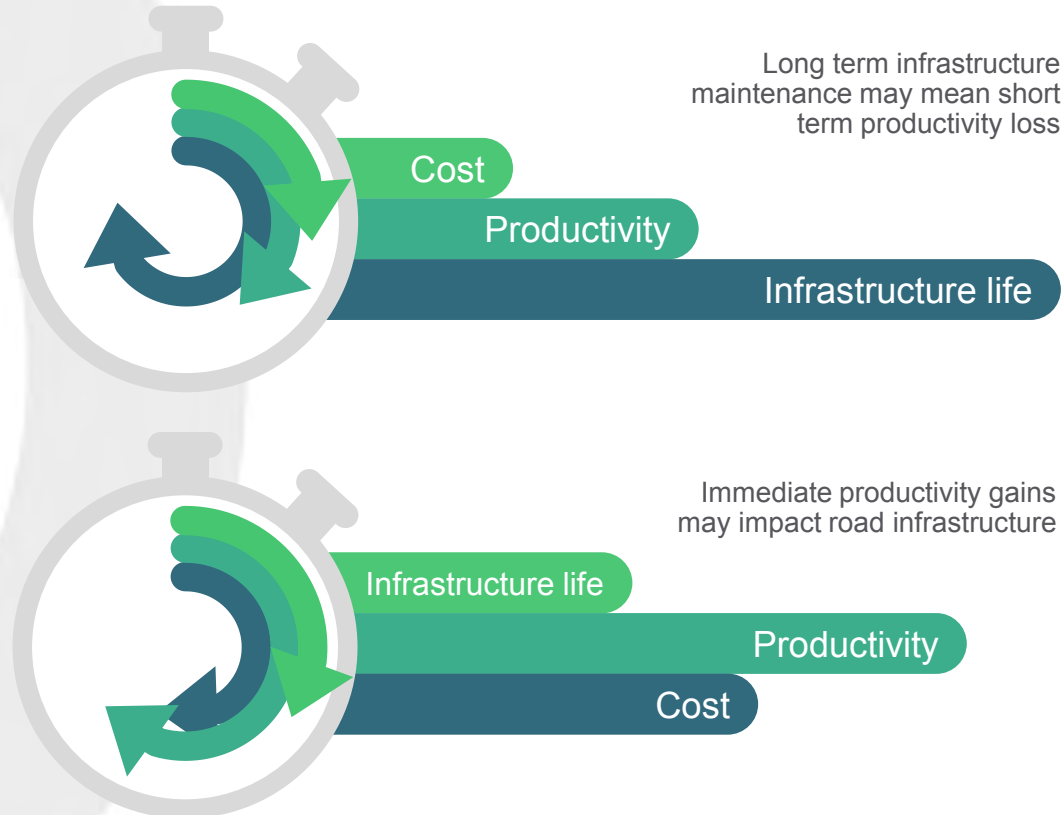
Productivity

Productivity for transport operators vs future road maintenance



Cost

To agency or to transport operator – user pays?



Case Study: Indonesia (1)

- Central Weighbridge Unit - ADB funded project
- Major Weight Study in 1992 to 1993
- 157 key freight routes surveyed with portable high speed weigh in motion comprising 2.6 million trucks
- Environment
 - Entry to trucking industry relatively inexpensive
 - Truck fleet - 30% owned by government, 45% owned by driver operators, and 25% owned by government owned corporations
 - Significant number of vehicles with single axle dual tyres (legal limit 10 tonne)
 - Very competitive industry – commodity and ability to backload are varied
 - Geographically diverse road network with challenging enforcement oversight due to limited resources
 - No effective disincentive for overloading
 - Significant pavement damage evidenced on key freight routes
 - No real ability for cost recovery from industry apart from the limited number of toll road operations

Case Study: Indonesia (2)



Case Study: Indonesia (3)

- Findings
 - 22% of trucks exceeded the 10 tonne single axle dual tyre limit
 - In Central Java, 38% of trucks exceeded the pavement design limit
 - 6.5% of the axle loadings that exceeded the 10 tonne limit caused 90% of the pavement damage
 - No effective way to cost recover from industry, given environment (above)
 - Noted the significant economic growth of Indonesia
 - Proposed to improve the pavement design limits to better accommodate the overloading
 - It was noted that this would increase the capital and maintenance costs which (in many areas) would be economically challenging given the low vehicle volumes
 - Proposed program of increased enforcement (including increased sanctions) and driver / operator awareness to compliment the increased limits to better manage the excessive overloading

Case Study: Australia (1)

- Study in 1996 / 97 (repeated in 2005)
- Environment
 - Freight costs passed along the supply chain
 - Program of both administrative, legislative and on-road compliance and enforcement strategies
 - We know that operators generally take compliance seriously, and invest in people, products and procedures
 - But we also know that tight margins and competition can make overloading attractive
 - Always another *company* who will take the risk (organisation)
 - Always another *driver* who will take the risk (individual)
 - Prosecutions are successful – between 88-98% across Australia

Case Study: Australia (2)

- Findings

- 104 road sites across Australia and 5.6 million individual HV combinations (note: Austroads class 8 and above – 5 axle articulated or greater)
- Urban: Under 2% loaded more than 5% of legal limit
- Rural: Under 2% loaded more than 17% of legal limit
- Nationally: 0.16% loaded more than 30% of legal limit and 0.01% loaded more than 50% of legal limit
- Rural has a slightly higher incidence of overloading compared to urban (1 to 4.5)

Case Study: Australia (3)

- In a 2002 / 03 study
 - Of the 62,000 articulated vehicle fleet at the time, given the existing compliance levels (note today there are 90,000 articulated vehicles).
 - If 95% compliance was achieved across the fleet then the annual benefit (\$M) would be for:
 - Infrastructure (pavements and bridges) 20 to 30 (based on previous compliance levels)
 - Safety (speed and driving hours) 90 to 170
 - Environmental Effects 8 to 12

Case Study: High Productivity Vehicles (1)

- However, the truck fleet has and is significantly changing including:
 - Use of quad axle groups (i.e. with increased axle group loadings)
 - Longer and multi - combination vehicles (i.e. with existing axle group loadings)



Case Study: High Productivity Vehicles (2)

- **Benefits**

- Stimulated economic flow-on benefits
- Lowering community freight exposure
- Lowering infrastructure maintenance costs
- 8% switch to HPV on highways equivalent to removing 5% of trucks off the highways

Case Study: High Productivity Vehicles (3)

- Innovative freight vehicle with Intelligent Access Program (IAP) in urban environment - Quad axle - steerable – 19 m long
- Economic productivity increase of 14.6% per load or an additional four pallets for each trip
- Fewer journeys resulting in reduced emissions and less trucks on the road
- IAP used to ensure route compliance

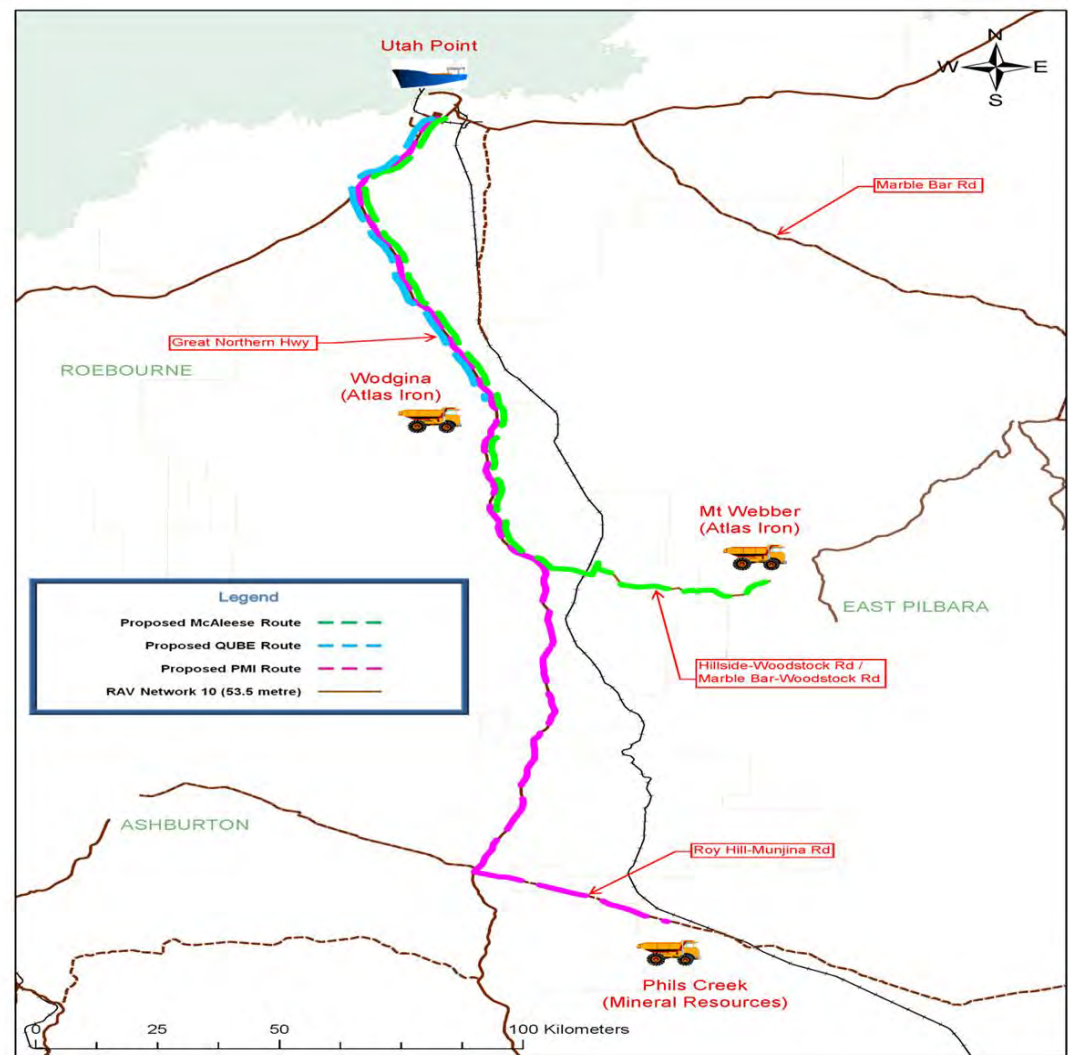


Case Study: High Productivity Vehicles (4)

Mines in far north Western Australia

Iron ore and other commodity pricing has significant impact on mining efficiency

Broader, international economic conditions impacting national economy, and local operations



Case Study: High Productivity Vehicles (5)

- Road network is limited – single carriageway public road
- Performance Based Standards (PBS) approved vehicles - Super Quads are 60 metres in length
- The basic combination has a gross mass of up to 199 tonnes, 140 tonne payload (confirmed loading)
- All vehicles operate on approved routes, at a maximum speed of 90km/h and headway compliance (monitored by IAP)
- An industry adopting technology in ways we never contemplated, and represents a genuinely innovative approach to regulation
- Mine has remained economically viable given reduced commodity pricing

Case Study: High Productivity Vehicles (6)



Conclusion

1. Overloading is ubiquitous – wherever there are roads and trucks, and both in developed and developing countries
2. Broadly, overloading percentage in developed economies is less than 5%; in developing economies it can be 50% of the total number of trucks on the road
3. For operators, overloading has immediate gains – running and overhead costs
4. For road managers, pavement service life has a direct relationship with net present value of investment, annual maintenance etc
5. A multifaceted problem, no single cause nor single solution
6. It cannot be eliminated, but it can be managed – and even used to the advantage in specific areas