Payload management of forestry trucks using different weighing systems in Australia

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Background

• Trucking cost 40-60% of total harvesting costs.

• Load variation:

**Over load:** Safety issues, Accidents/fines

**Under load:** Lower productivity, Higher transport cost
Payload management

• To reduce cost (and risks):
  - Keep the empty weight and tare as low as possible (CRC Forestry trial).
  - Increase gross mass vehicle limit (GMVL): Gazetting roads.
  - Load more accurately to GMVL using on-board scales.
Case study

- 21,500 loads transported from 1 July 2010 to 30 June 2011.

- Fleet included: 6-axle semi trailers (17%)

- 7-axle semi trailer (83%)
Truck’s GVML

- GMVL for non-gazetted road:
  - 6-axle 42.5 to 44.0 t
  - 7-axle 50.0 to 50.1 t
- 7-axle trucks: 5.5-6.0 t increase in GMVL on gazetted roads.
- 70% of loads over gazetted roads.
In-forest weighing technologies

- 6-axle trucks;
  - Loader scale
  - Loader/truck scale
- 7-axle trucks;
  - Loader scale
  - Loader/truck scale
  - Truck scale (contractor)
  - Truck scale (owner/operator)
Data analysis

• Over/under load = Gross weight – GMVL

• Weighbridge info separated into 6-axle and 7-axle trucks.

• T-test and Analysis of variance (ANOVA)/Post-hoc test (Duncan)
Significant impact of route type and technology on under/over load
7-axle trucks on gazetted roads

Significant impact of route type and technology on under/over load.
## Duncan test

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<td><strong>Truck scale (owner contractor)</strong></td>
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7-axle trucks on standard roads

Significant impact technology on under/over load
## Duncan test

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Potential industry saving by improving payload management

- Southern US: $44.1-87.1 million
- Case Study: $3-7 million
- Australia: >$70 million
Maximum payload for any extraction machine!

\[ y = 52.655 \ln(x) + 243.28 \]
Conclusions

- Use the potential gain of gazetted routes.
- Accurate load weights with in-field weighing systems (over/under loads < 500kg for truck scales and loader scales).
- Applying efficient work methods and techniques.
Thank you!

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