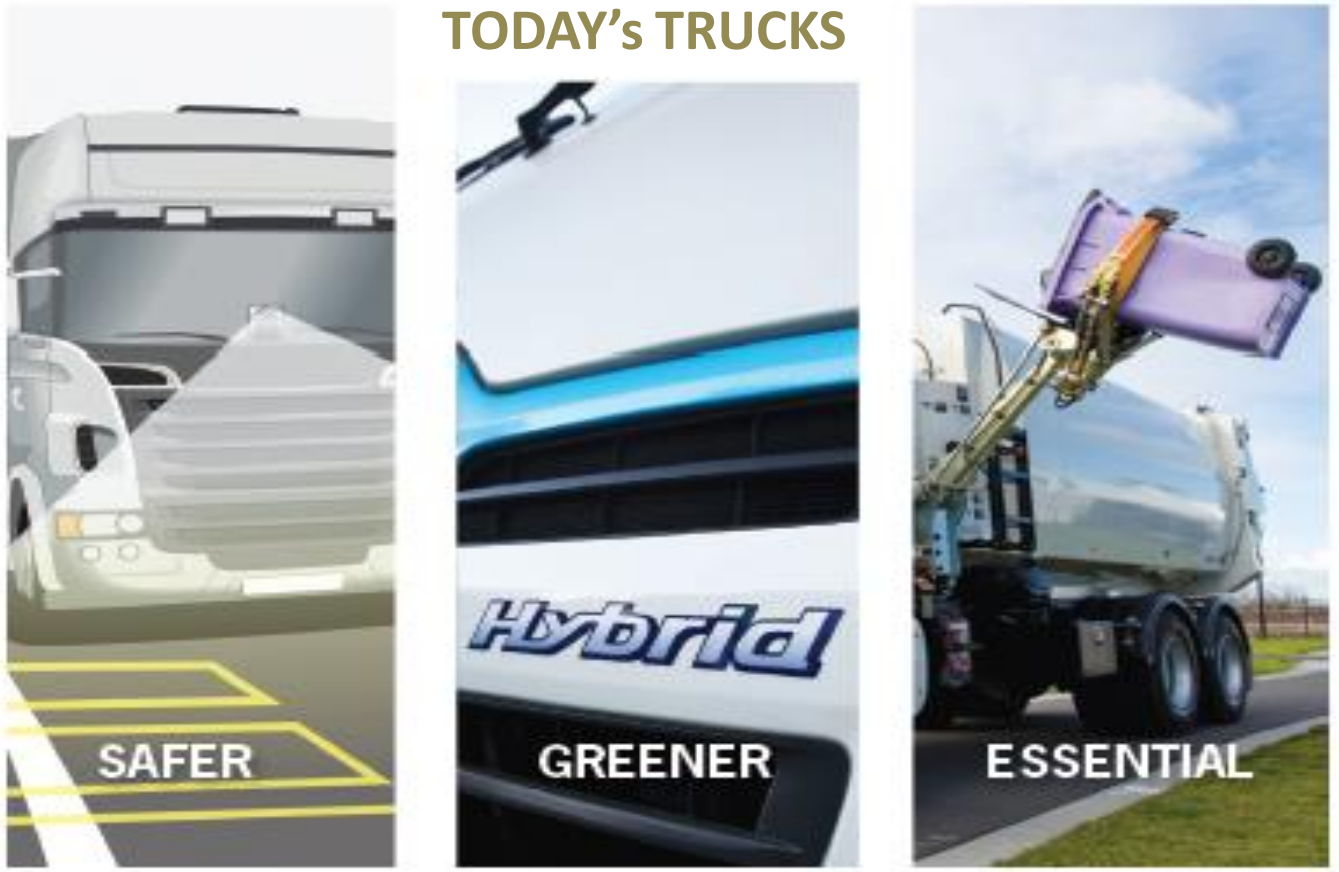


Improving Heavy Vehicle Energy Productivity

Mark Hammond, Chief Technical Officer - TIC

TIC
TRUCK INDUSTRY COUNCIL
SAFER GREENER ESSENTIAL

Who is TIC?

Truck Industry Council (TIC) was formed in 2001

Industry organisation representing the truck manufacturers and importers in Australia

Positioning Statement:

"Today's Trucks: Safer, Greener, Essential"

8 Corporate Members, → 17 truck brands

5 Associate Members (engine & major system suppliers)

In 2017 TIC members supplied over 99% of all on-road trucks sold in Australia

TIC
TRUCK INDUSTRY COUNCIL
SAFER GREENER ESSENTIAL

Our Members

TRUCK INDUSTRY COUNCIL
SAFER GREENER ESSENTIAL

The Future

The Future

TOYOTA

HINO

TRUCK INDUSTRY COUNCIL
SAFER GREENER ESSENTIAL

The Future

Cummins
ELECTRIFIED POWER

TRUCK INDUSTRY COUNCIL
SAFER GREENER ESSENTIAL

The Future

NIKOLA ONE™

TRUCK INDUSTRY COUNCIL
SAFER GREENER ESSENTIAL

The Future

The Future

Heavy Vehicle Energy Productivity

Energy Productivity is the relationship between economic output and energy used (COAG 2015)

$$\text{Energy productivity} = \frac{\text{Economic output (GDP)}}{\text{Energy used (PJ)}}$$

For trucks, moving  with LESS  

Heavy Vehicle Operator Productivity

MUST consider Operator Productivity (financial bottom line $)

Linehaul operations +250,000km/year ($):

Fuel costs, Driver wages……..Other

Urban distribution ($):

Driver wages…….Vehicle cost, Fuel costs….Other

Australian operator's don't like buying new trucks:

- Australia's average truck fleet age is 14.0 years (Europe ~7 years)
- Alternate energy trucks made up 0.1% of new truck sales in 2017

Heavy Vehicle Energy Productivity

TIC has modeled 7 Energy Productivity strategies:

A. Additional 500kg Front + Rear axles
B. Incentivise fuel efficient trucks
C. Night-time deliveries (urban trucks)
D. Incentivise zero-emission urban trucks
E. A-Double / B-Triple vehicles for linehaul
F. B-Doubles replacing Semi-trailers
G. More High Productivity Vehicles

Heavy Vehicle Operator Productivity

These 6 offer Operator Productivity benefits too:

A. **Additional 500kg Front + Rear axles**

B. **Incentivise fuel efficient trucks**

C. **Night-time deliveries (urban trucks)**

D. Incentivise zero-emission urban trucks

E. **A-Double / B-Triple vehicles for linehaul**

F. **B-Doubles replacing Semi-trailers**

G. **More High Productivity Vehicles**

Heavy Vehicle Operator Productivity

These 3 offer STAND OUT Energy and Operator benefits:

A. Additional 500kg Front + Rear axles

B. Incentivise fuel efficient trucks

C. Night-time deliveries (urban trucks)

D. Incentivise zero-emission urban trucks

E. A-Double / B-Triple vehicles for linehaul

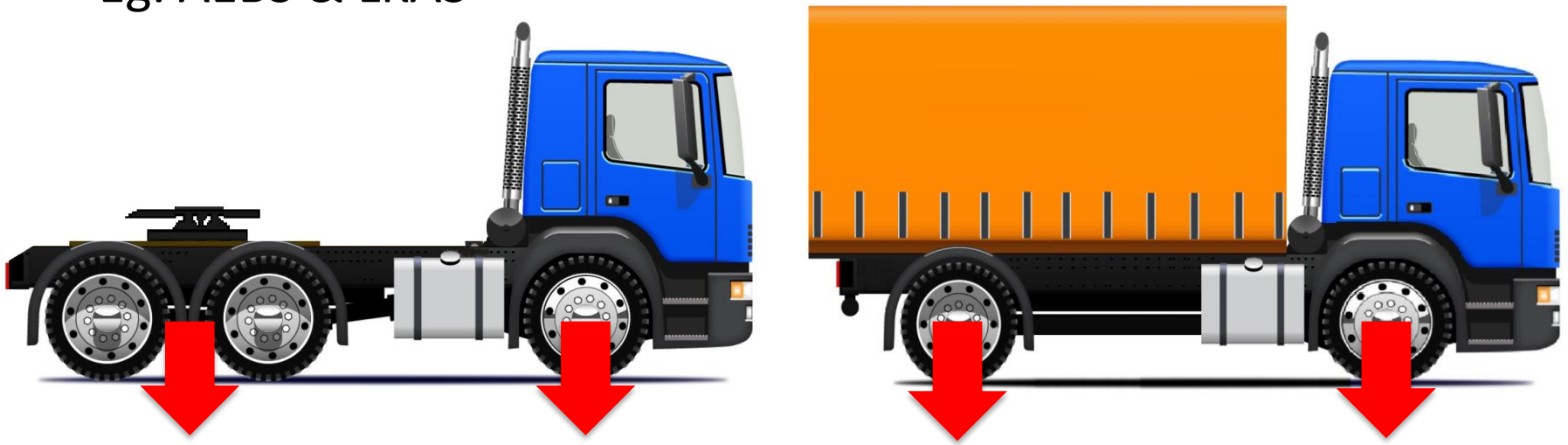
F. B-Doubles replacing Semi-trailers

G. More High Productivity Vehicles

More Axle Mass

Key assumptions:

- 500kg Front + 500kg Rear more axle mass on new trucks >15t GVM
- 65% of the trucks fleet is MASS constrained
- New trucks with advanced safety features (beyond current regulations) Eg. AEBS & LKAS



+500kg = **17t** +500kg = **7t** +500kg = **9.5t** +500kg = **7t**

More Axle Mass

Benefits:

- ✓ Readily Deployable Technology
- ✓ Increased heavy vehicle safety
- ✓ Energy Productivity saving would lead to 0.9Mt less CO_2/year
- ✓ Operational Benefits of up to $390 Million/year

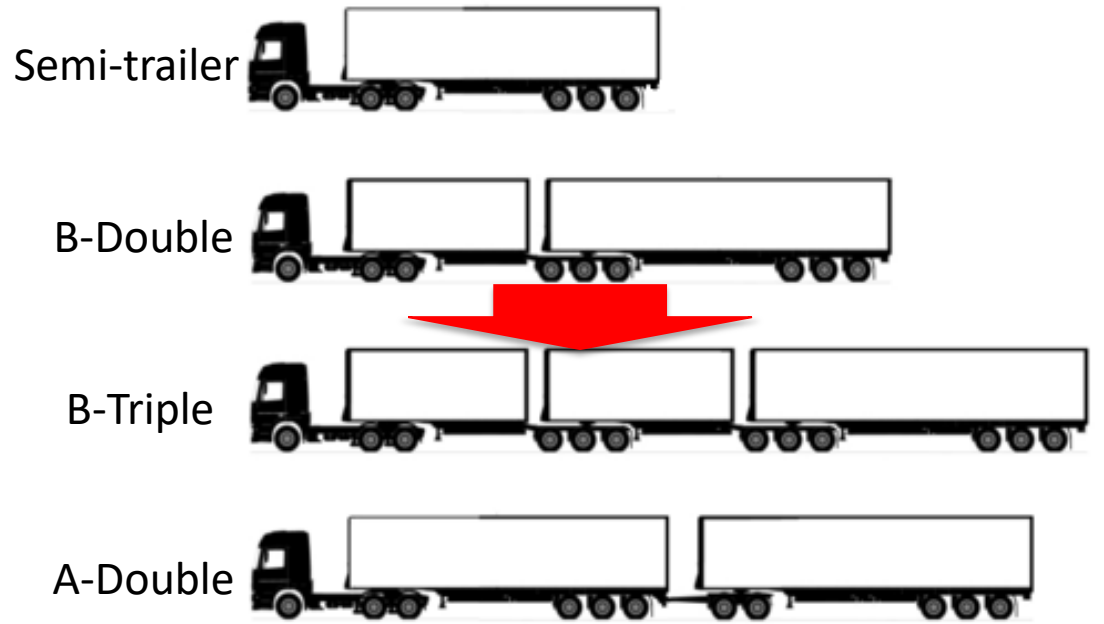
Speed bumps:

- ❖ State Government's control axle mass limits and do not currently support change

A-Doubles and B-Triples

Key assumptions:

- 30% of the existing linehaul movements would be replaced by A-Double and/or B-Triple vehicles
- New Prime movers with advanced safety features (beyond current regulations) Eg. AEBS & LKAS
- Current axle mass limits



A-Doubles and B-Triples

Benefits:

- ✓ Readily Deployable Technology
- ✓ Less linehaul trucks on our highways
- ✓ Increased heavy vehicle safety
- ✓ 93% and 32% mass increase vs Semi-trailer and B-Double
- ✓ 100% and ~28% volume increase vs Semi-trailer and B-Double
- ✓ Energy Productivity saving would lead to 1.7Mt less CO_2/year
- ✓ Operational Benefits of up to $727 Million/year
- ✓ Less pavement (road) damage

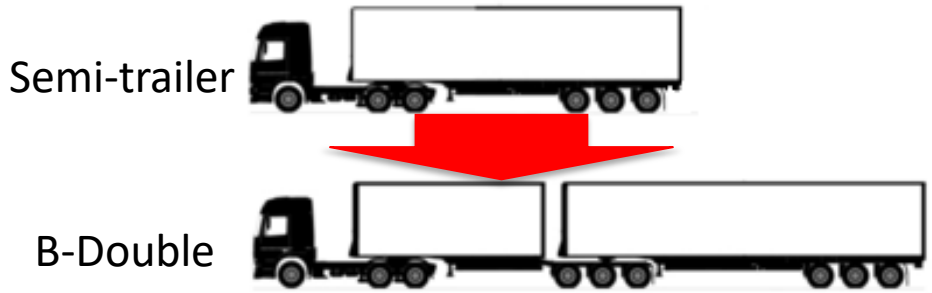
Speed bumps:

- ❖ State Government road infrastructure (principally some bridges)
- ❖ State Government's control dimensional limits and don't support change
- ❖ Negative public perception (bigger trucks)?

B-Doubles replacing Semi's

Key assumptions:

- NSW-RMS data shows that 50% of heavy vehicle combinations running between Sydney and Melbourne are Semi-trailers
- 50% of the existing linehaul Semi-trailer combinations would be replaced by B-Double vehicles
- Current axle mass limits



B-Doubles replacing Semi's

Benefits:

- ✓ Less heavy vehicle combinations on our highways
- ✓ B-Doubles are 30% less likely to be involved in a major crash than a Semi
- ✓ 45% mass increase vs Semi-trailer
- ✓ ~42% volume increase vs Semi-trailer
- ✓ Energy Productivity saving would lead to 1.3Mt less CO_2/year
- ✓ Operational Benefits of up to $554 Million/year
- ✓ Less pavement (road) damage

Speed bumps:

- ❖ National B-Double registration charges 3 times higher than a Semi-trailer
- ❖ Smaller operators struggle to fully load a B-Double combination
- ❖ Negative public perception (more "big" trucks)?

TIC's National Truck Plan

TIC will be releasing the 2018 edition of our National Truck Plan within the next 2 months:

- Update of the age of the Australia truck fleet
- Fully detail all 7 Energy Productivity scenarios
- New Heavy Vehicle safety improvements and technologies
- Avoided health cost benefits of retiring older more polluting trucks
- Review global incentive schemes and propose Federal and State Government initiatives

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