Bigger is Better

Globally we are seeing a trend towards bigger aircraft, bigger trains, bigger ships and bigger trucks. As freight transport units get bigger the transport costs per tonne of freight reduces. While they may have a higher capital cost their operating costs offset this. With the ever-increasing cost of fuel many transport operators are quickly discovering they can no longer compete with their current less efficient freight carriers. Of course bigger freight units require freight facilities and transport infrastructure that can accommodate them (such as expanded container terminals and bigger cranes, deeper shipping channels, longer runways, improved roads and improved rail corridors).

The environmental impact of bigger freight units is positive. Bigger units, operating with reasonable loadings mean less transport journeys to carry out the freight task resulting in (on a per tonne moved basis) in lower air emissions, lower greenhouse gas emissions, reduced fuel and energy consumption, less journeys, less congestion and reduced noise.

In recent years some of the greatest gains in productivity and environmental performance in the road freight industry have been achieved through the use of larger and more fuel efficient truck combinations. Higher productivity vehicles were first introduced into Australia during the 1980's and over the resulting years Australia is generally acknowledged to have adopted the most progressive approach to these vehicles throughout the OECD. The chart appearing on the next page, produced by the Australian Trucking Association (ATA), outlines the benefits of larger and more fuel efficient trucks.

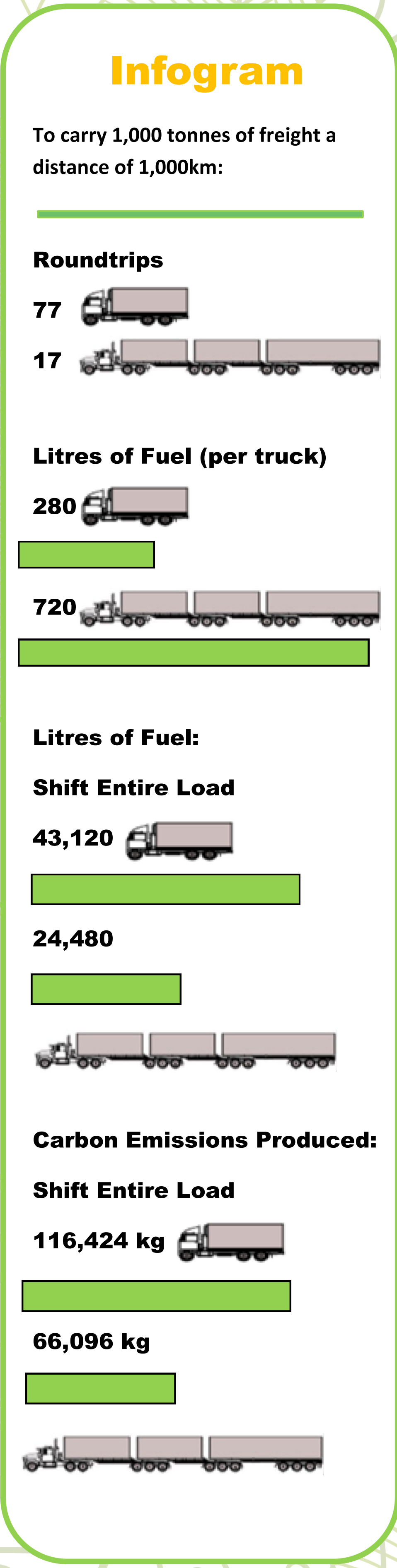
The productivity results between a B-triple and a 6x4 rigid truck are notable. To carry 1,000 tonnes of freight a distance of 1,000km would take a 6x4 rigid 77 round trips to move the load, a B-triple by comparison would do it in 17. While a B-triple will use 72-litres of fuel per 100km, a rigid will use 28 but due to the less trips taken to move the cargo a B-triple would use only 24,480l to shift the load compared to the rigid's 43,120l. At $1.49 per litre, a truck operator could save as much as $27.77 per tonne.

Analysis by the Australian Trucking Association says that if moving a thousand tonnes of freight "by using 20 B-triples you would emit 32% less carbon dioxide than the 42 semitrailers you would otherwise need". In the previous example the B-triples would generate only 57% of the emissions produced by the rigid trucks.

Bigger freight units also result in improved safety outcomes. Studies on the safety of higher productivity vehicles, where they have been permitted, have generally concluded that their safety performance is no worse than that of traditional trucks. In fact on key manoeuvrability and stability measures that most influence crash risks, higher productivity vehicles often perform better.

Proposals put forward by the NTC in 2012 to allow modular B-Triples to run on the existing type 1 road train network included the NTC lists of benefits estimated as (assuming a scenario of median B-triple take up over the period 2011 to 2030):

- At least 1,000 fewer heavy vehicles on the road
- At least 1 billion fewer vehicle-kilometres travelled
- At least 25 fewer road fatalities
- At least 1.1 million fewer tonnes of CO2 emissions
- Total monetised savings of almost $1.1 billion Net Present Value (NPV), of which $1 billion derives from direct financial savings brought about by reduced vehicle numbers and reduced vehicle kilometres travelled.



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Road is not alone in terms of productivity gain and reduced emissions: improvements to a number of rail corridors has resulted in longer and more fuel efficient trains (1,800 metres) and new fuel efficient aircraft such as the Boeing 747-8 Freighter.

The 747-8 Freighter, for example, was designed to be the world's most efficient freighter with the lowest operating cost and best economics of any freighter airplane on the market, while providing enhanced environmental performance. With 747s carrying half of the world's air freight, the 747-8 Freighter was implemented to maintain their dominance. It provides customers with 16 percent more revenue cargo volume compared with the 747-400 freighter but yet upholds its predecessor's legendary efficiency, with nearly equivalent trip costs and lower ton-mile costs. In fact Boeing claim the 747-8 Freighter will enjoy the lowest ton-mile costs of any freighter, allowing operator's unmatched profit potential.

The investment in bigger, more fuel efficient transport options is most evident in the shipping industry. The past few years has seen varying shipping lines, from Maersk to China Shipping Container Lines, put in orders for what will be the world's largest container ships at over 18,000 TEUs. Despite the mammoth capital costs of purchasing a ship of these sizes, many shipping lines feel with high fuel costs and low freight rates the only way a company can remain competitive is by ordering larger ships designed with fuel efficiency in mind. Less fuel-efficient vessels simply can't compete in today's market. With the arrival of Ultra Large Container Vessels, carrying more containers per voyage, it will result in fewer ships on the route and lower operating costs for the shipping line.

To get an idea of their carrying capacity if all the containers on a Maersk Triple E, a ship designed to be the most efficient container ship per TEU of cargo, were stacked one on top of the other they would touch the stratosphere, 46km above the earth. If they were put side to side they would stretch over 100km.

The increase in ship size does not seem to be abating anytime soon. 30 years ago ships were typically in the order of 4,000 TEUs, and 10 years ago they had grown to 10,000 TEUs. Fuel and other operational costs will continue to make bigger ships all that more economical.

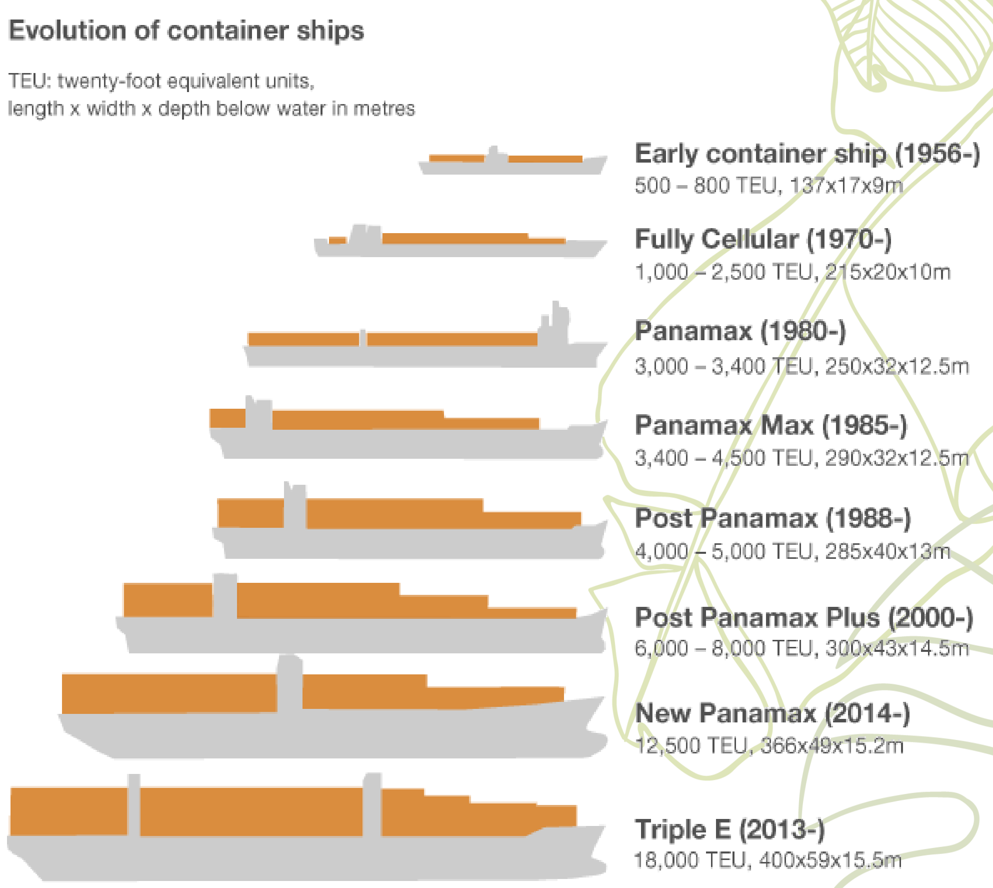
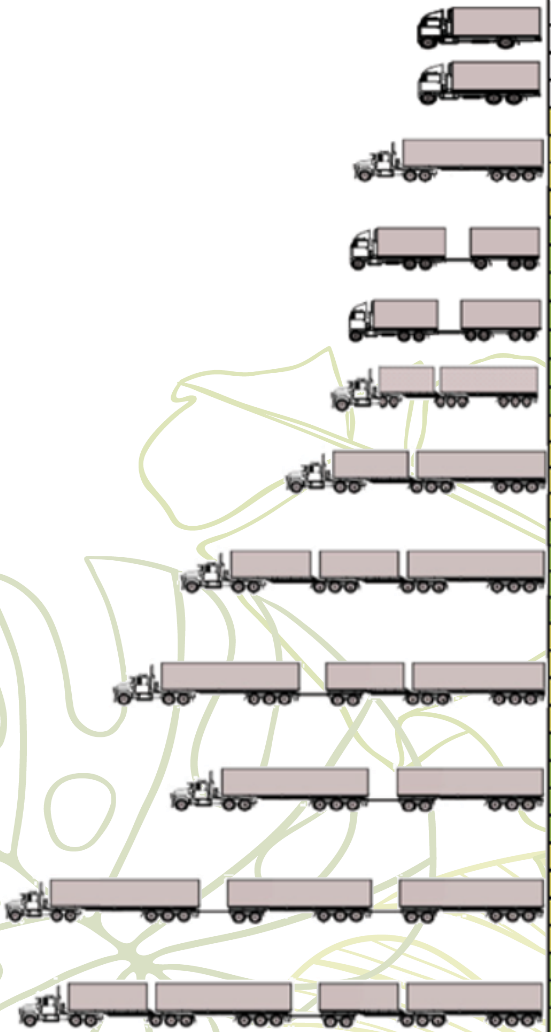


Image from The Geography of Transport Systems, Jean-Paul Rodrigue



	GCM	Payload	No Trips per 1000 tonnes	Nom Fuel / 100k	Fuel Required per 1000k	Driver Requirement	Overall Length (metres)	Emissions / 1000 tonnes
Two Axle Rigid GML	15.0	7.00	143	23	65780	186%	<12.5 metres	153%
Two Axle Rigid Euro4	15.5	7.63	132	23	60720	171%	<12.5 metres	141%
Three Axle Rigid GML	**22.5**	**13.12**	**77**	**28**	**43120**	**100%**	**<12.5**	**100%**
Three Axle Rigid Euro4	23.0	13.69	74	28	41440	96%	<12.5 metres	96%
Six Axle Artic GML	42.5	24.13	42	47	39480	55%	19.0	92%
Six Axle Artic HML (RFS)	45.5	27.13	37	50	37000	48%		86%
Six Axle Artic CML (Non-RFS)	43.5	25.13	40	48	38400	52%		89%
Six Axle Artic HML (Non- RFS)	45.5	27.13	37	50	37000	48%		86%
Truck & Dog (6 Axle - 45T)	45.0	30.09	34	49	33320	44%	19.0	77%
Truck & Dog (6 Axle - NSW)	48.0	33.09	31	49	30380	40%	19.0	70%
Truck & Dog (7 Axle)	50.0	34.19	30	51	30600	39%	19.0	71%
Truck & Dog (20M - PBS)	55.5	38.69	26	53	27560	34%	20.0	64%
Truck & Dog (20M PBS CML)	57.0	40.19	25	55	27500	32%		64%
19M B.double GML	55.5	35.68	29	53	30740	38%	19.0	71%
19M B.double CML & HML	57.0	36.20	28	55	30800	36%		71%
B.double GML	62.5	38.93	26	62	32240	34%	26.0	75%
B.double HML (RFS)	68.0	44.43	23	65	29900	30%		69%
B.double CML (Non-RFS)	64.5	40.93	25	63	31500	32%		73%
B.double HML (Non - RFS)	68.0	44.43	23	65	29900	30%		69%
B-triple GML	82.5	52.44	20	68	27200	26%	35.0	63%
B-triple HML (RFS)	90.5	60.44	17	72	24480	22%		57%
B-triple CML (Non-RFS)	84.5	54.44	19	69	26220	25%		61%
B-triple HML (Non-RFS)	90.5	60.44	17	72	24480	22%		57%
AB-triple GML	99.0	64.20	16	75	24000	21%	42.5	56%
AB-triple HML (RFS)	107.5	72.70	14	79	22120	18%		51%
AB-triple CML (Non-RFS)	101.0	66.20	16	76	24320	21%		56%
AB-triple HML (Non-RFS)	107.5	72.70	14	79	22120	18%		51%
Type 1 R/train - GML	79.0	47.77	21	68	28560	27%	36.5	66%
Type 1 R/train - HML (RFS)	85.0	53.77	19	72	27360	25%		63%
Type 1 R/train - CML (Non-RFS)	81.0	49.77	21	69	28980	27%		67%
Type 1 R/train - HML (Non-RFS)	85.0	53.77	19	72	27360	25%		63%
Type 2 R/train - GML	115.5	71.41	15	80	24000	19%	53.5	56%
Type 2 R/train - HML (RFS)	124.5	80.41	13	83	21580	17%		50%
Type 2 R/train - CML (Non-RFS)	117.5	73.39	14	81	22680	18%		53%
Type 2 R/train - HML (Non-RFS)	124.5	80.41	13	83	21580	17%		50%
BAB Quad - GML	119.0	77.37	13	81	21060	17%	51.5	49%
BAB Quad - HML (RFS)	130.0	88.37	12	85	20400	16%		47%
BAB Quad - CML (Non-RFS)	121.0	79.37	13	82	21320	17%		49%
BAB Quad - HML (Non-RFS)	130.0	88.37	12	85	20400	16%		47%

Legend

GCM Gross Combination Mass

HML Higher Mass Limits

GML General Mass Limits

CML Concessional Mass Limits

PBS Performance Based Standards

RFS Road Friendly Suspension

The Assessment process assumes that the vehicle is dedicated to a specific task, operating travel being 50% laden and 50% unladen. The task relativities are 1000 tonnes with a lead of 1,000 kilometres.

Adopted from Australian Trucking Association's Truck Impact Chart, June 2010

See: http://www.atatruck.net.au