



**Australian Government**  
**Chief Scientist**

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**Australian Road Transport Suppliers Association**

**Global Leaders' Summit**

***Delivering the future***

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To the best of my knowledge, I am the first Chief Scientist to appear at a trucking convention. So let me tell you how I got here.

It was November 2016. I'd been invited to give a talk to the leaders of our universities about the way we ought to ensure quality teaching and learning across the sector.

I promised the organisers that it would be a fascinating speech. And it would be particularly exciting, because I was going to talk for half an hour about regulation.

It's one of my favourite topics. In all seriousness, I've said for a long time that regulation – *good* regulation – is a business' best friend.

You know regulations are good if they do two things.

First, protect the public. Second, facilitate progress.

They're both important. They're equally important.

But I needed an example that would sum up all the benefits of regulation done right.

So I got in touch with my friend Peter Hart, the chairman of the Australian Road Transport Suppliers Association.

And Peter said to me, "Alan, have you ever considered trucking?"

To my shame, I hadn't.

Peter proceeded to deliver Trucking 101.

And I quickly realised that there was a gap in my awareness so big you could drive a 60 tonne truck through it. Or as I now think of it, thanks to Peter, a 60 tonne higher productivity freight vehicle.

And ever since that day, I've been looking for an opportunity to meet with the industry and say: well done.

You know the story, but let me tell you how I explained it to the higher education experts, and the lessons that I wanted to highlight.

Anyone who looks at a map can see that Australia is a country that's going to suit big trucks: long distances, low rural population density, big cities.

As the population boomed in the aftermath of the Second World War, so did the demand for road freight.

More trucks on the road meant more congestion, more pollution and inevitably, more accidents.

Then the B-train emerged in Canada in the 1970s: two trailers behind a single prime mover.

Here was an answer to the problem: a vehicle only slightly longer than existing semitrailers, but carrying a much greater payload.

Resistance was fierce, particularly in Victoria, where the headlines were filled with dire warnings about these Canadian “road monsters”.

That’s not a truck, they said. That’s “sheer murder”.

Every state and territory government had to be separately convinced.

And then, in 1989, right as Victoria – the last great stronghold of the resistance – was finally prepared to come to the table, more than a decade after the idea was first floated, the Grafton tragedy occurred.

A collision between a semitrailer and a bus that claimed 21 lives.

It was the worst road accident that the nation had ever seen, and it put the spotlight on all the reasons to be afraid of big trucks.

The trucking industry could see the advantages of B-double combinations: improved productivity, reduced congestion, fewer crashes. But you had to make the case on evidence, to Ministers and to the public. And you did.

Today there are more than ten thousand B-doubles on the roads and they carry more freight than any other vehicle configuration in Australia.

But even more extraordinary than that success was the follow-up.

Because you didn’t do what human beings normally do, after they achieve something that took a lot of effort and a very long time.

You didn’t stop. You saw the need to keep going.

And you took that twofold objective of good regulation – remember, protect the public, facilitate progress – and turned it into the Performance Based Standards.

This was a world-first: a comprehensive legal framework for higher productivity vehicles in exchange for more stringent safety requirements, operating right across the country, and governed by a national regulator.

It puts the focus where it needs to be for an Australian industry to be genuinely competitive: a focus on quality and on innovation.

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But that’s not all that I discovered about Australian trucking. The more that I looked into it, the more impressed I was.

If you read the newspapers, you could conclude that we don’t make vehicles in Australia.

We do.

We make trucks and trailers.

And it’s a \$7 billion manufacturing industry, centred right here in Victoria.

Another interesting fact that we ought to know: this country is the global leader in autonomous trucks.

Rio Tinto has almost 400 giant haul trucks operating in the Pilbara. And twenty per cent can drive themselves, with supervision from the control centre in Perth.

This year the company clocked up one billion tonnes of material, moved by autonomous haulage, with zero injuries.

There's more: Australia is also a global leader in driver monitoring.

Many of you will know of the company Seeing Machines. It was formed as a spin out from the Australian National University. It got its commercial kick start working with Caterpillar making driver fatigue technologies for the mining sector

Today Seeing Machines is enjoying the first sales of its driver monitoring system for use in passenger vehicles and it's working with Monash University to develop the gold-standard platform for heavy vehicle fleets.

Another opportunity: blockchain. Consumers overseas will pay a premium for Australian produce if they can trace the provenance. Blockchain means that a buyer in China can pick up a T-bone steak, scan the barcode, and get the history of the cow: date of birth, name of the farm, type of feed.

Look at the technologies at the core of each of these initiatives. Artificial intelligence. Data and analytics. Blockchain.

That's the twenty-first century frontier.

And we are getting to that frontier in trucks.

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Now it ought to be impossible for success in the form of a very big truck to fall off the national radar.

But as we know, it's really not so surprising at all.

It's simple: you don't make headlines with truck crashes that didn't happen.

And even when we do pause to acknowledge progress, we just adjust our expectations.

The CEO of Amazon, Jeff Bezos, wrote about this phenomenon in his latest annual letter to shareholders.

In his words: "We didn't ascend from our hunter-gatherer days by being satisfied. People have a voracious appetite for a better way, and yesterday's 'wow' quickly becomes today's 'ordinary'."

Now this is the leader of a company that sends out over five billion parcels, every year.

So Jeff Bezos understands at least two things. Trucks. And customers.

His ethos, as he explains it, is straightforward. *Have high standards.* Widely deployed, relentlessly enforced, to the point where other people may conclude you're being unreasonable.

I was lucky. I got that advice at the crossroads of my life.

I was a nervous young man, newly arrived in San Francisco, and trying to establish my own medical device company Axon Instruments.

There was a time when I'd close my eyes when I went to an ATM because I lived in terror that there would be nothing in the account for the machine to give me.

I'd worked very hard and I knew I had designed a quality product: better than anything else on the market.

But it was also a lot more expensive: twice as expensive as the competition.

I made a desperate phone call to a very wise mentor, Eric Charles, back home. And he gave me some of the best advice I've ever received. "Quality is remembered long after price is forgotten".

We could write that on the side of Australian trucks.

And perhaps that's a good theme to take into today's conference, as the leaders of a \$7 billion industry, at the heart of Australia, and vital to its prosperity.

How are we going to carry that expectation of high standards into the future, and not just for trucking, but as a standard-bearer for all Australian industry?

Let me suggest that it's worth thinking about the challenge as a combination of two important dimensions.

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The first is the way that every player in the industry conducts themselves day to day, as custodians of the public trust.

Trucks are visible to the public in a way that other technologies are not.

Every truck is a mobile window into the industry.

So you know better than most that public trust is a slippery commodity. The instant you relax your grip, it's gone.

I have been reflecting this week on what happens when you relax your grip in another tightly regulated field: the field of medical research.

Like trucking, it's regulated for a reason. If you think that securing approval for a new vehicle configuration is hard, try getting approval for putting new drugs into human beings.

There's a second important quality assurance filter for scientists, in the form of peer review. Before your work is published in a journal, other experts in your field will scrutinise it to ensure that every single contribution to the great repository of our scientific knowledge is sound.

But very occasionally, something slips.

And twenty years ago, something did slip. A paper was published in the medical journal The Lancet. It claimed to show evidence of a link between vaccination and autism.

Sadly, it didn't meet the definition of "science".

The author was an ideologue out to make a point. He engineered the study to give him the outcomes he wanted. And even then, he didn't get them. So he took the next step and manipulated the data.

This wasn't science. This was fraud. It should never have been published in a journal.

But it was.

Twenty years later we have a resurgence of measles due to poor immunisation coverage in developed countries – including close to 15,000 cases and at least 37 fatalities in Europe, last year alone.

Scientists call that paper a zombie: it doesn't matter how many times you kill it, it always rises again. And it comes back with an army of undead zombie friends, spreading fear across the community, not just of one vaccine, but of all vaccines.

The hard lesson of that story is that the cost of a lapse in standards is always too high.

The best protection against criticism is to always do whatever it is you're doing extremely well.

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So that's the first dimension to consider: how to embed high standards across the industry, so that every person adheres to them, every time.

The second dimension is the work you do as an industry to ensure that regulation keeps pace with technology.

In many ways, trucks are going to get to the future first.

We had autonomous trucks on mine sites long before we saw the first hint of autonomous cars on suburban roads.

And we've had routine driver surveillance and monitoring technologies in trucks for some time.

But getting to the future first means steering into unknown territory – and trying to haul the community along.

For example, I think about platooning: a convoy of heavy vehicles, linked by vehicle-to-vehicle communication, following closely one after the other, and automatically accelerating and braking together.

What the industry sees is the capacity to improve fuel efficiency, reduce costs and boost the safety of road freight.

What the public will see is a line of tailgating trucks.

And what governments will see is a significant risk in the event of a malicious hack, or a simple computer glitch.

Regulators will need to be satisfied that the industry can align the very high standards that we expect in trucks, with the rapid response capacity that we expect in software.

So look at our history of performance based standards, and our expertise in autonomous trucks.

Which country is better placed than Australia to work out how to regulate effectively in the intersection between trucks and tech?

Another example: improving fuel economy.

Today road freight accounts for around one-fifth of global oil demand. Growth in demand has outpaced all other sectors every year this century.

And there are many ways to tackle the problem. Light-weighting is one. Better vehicle design is another. Driver training is a third.

In all of these areas, we should be looking to find niches for Australian companies: not just to develop the technologies, but to pioneer the business models that get the technologies onto the roads.

I take a particular interest in the potential for hydrogen as a low-emissions fuel.

I'm currently leading a small group reporting to energy ministers on the potential for hydrogen across the economy: both here in Australia and as an export industry.

So it interests me that Toyota is currently trialling hydrogen B-doubles in California. What is of particular interest is that Japanese companies are looking to Australia as a hydrogen supplier.

There are projects underway across Australia: some making hydrogen from coal, and some using excess energy from solar and wind farms to make hydrogen from water.

The intention is to send it to Japan, South Korea and other countries that are determined to reduce their carbon footprint but do not have the abundant scope for renewables that we enjoy in Australia.

I call the export of hydrogen made from renewable electricity "Shipping Sunshine".

Now running trucks on Australian sunshine might or might not be commercially viable: but the commitment of nations like Japan is very clear. And if the world wants to buy Australia sunshine, by all means, let's cheer them on.

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The opportunities in your industry are boundless. So thank you for opening my eyes to the successful story of trucking in Australia. You are doing a great job.

Enjoy the conference!

And forgive me for saying it: keep on trucking.

**THANK YOU**