

## **Infrastructure safety and productivity – what can be learnt from the mining industry?**

**Chris Salisbury, Iron ore chief executive  
Roads Australia Forum, Perth**

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**\*\*Check against delivery\*\***

Thankyou for the introduction, and good morning everyone.

Let me start by acknowledging the Traditional Owners of this land, the Whadjuk people of the Noongar nation, and pay my respects to their elders, past, present and emerging.

I would like to pay my respects to the Pilbara Traditional Owners on whose land our operations are based.

Let me acknowledge:

- Ian Webb, Chief Executive Roads Australia
- David Stuart-Watt, President Roads Australia
- And other distinguished guests.

It is my great pleasure to be able to speak to you today.

I understand many of you may be surprised to have an iron ore miner addressing a Roads Australia forum.

So, let me be upfront with you.

I am certainly not a road builder, nor a civil engineer, but a miner with a passion for safety and productivity who can offer some comments from my 30 years of practical experience from a wide range of Rio Tinto leadership and operational positions, including my present role as chief executive of the iron ore business.

Yes, we are from different industries.

However, we share similar goals - to safely operate productive infrastructure to deliver value not just to our customers and shareholders, but to the communities in which we operate, and to the broader WA and Australian economy.

Rio Tinto is a miner operating one of the world's largest supply chains.

We produce and distribute close to a million tonnes of high quality iron ore every day to over 100 customers located globally.

I could argue therefore that our operation is as much a logistics business as it is a resource business – and is from that viewpoint that I will make my observations.

We are a organisation who consistently looks for innovative solutions to optimise our infrastructure, and as we look to operate our assets safely and efficiently.

Today, I intend to share with you the Rio Tinto Iron Ore journey - and our vision to continue to improve the safety and productivity of our business.

### **Rio Tinto Iron Ore is a fully integrated and agile network**

Now, for a little context.

Our integrated network of 16 mines, four independent ports and one of the world's largest and most productive private rail networks, has been built from the ground up, over more than 50 years.

Our system is extensive by any measure.

Take our 1700 kilometre rail network. This alone, is the same length as the Eyre Highway on the Nullarbor Plain.

The integrated Pilbara network has cost us more than \$40 billion, and has come about through a pioneering spirit, hard work, and innovative thinking.

To date, our network has transported over 5 billion tonnes of Iron Ore to customer's right across the world. That iron ore has produced more than 3.3 billion tonnes of steel. To put that in context, it is the equivalent of 62,000 Sydney Harbour bridges.

This steel has literally been used for nation building in Japan, Korea, Taiwan, and of course more recently in the phenomenal progress in China.

In addition to our infrastructure in the Pilbara, located 1500 kilometres away from our assets is our Operations Centre in Perth. It is run by 400 digitally empowered employees, processing some 15 terabytes of data each month.

But, the operations centre is more than a data processing facility, we co-ordinate our supply chain from there. A state-of-the-art real time nerve centre, running around the clock, 365 days a year enabling our mines, ports and rail system to operate cohesively as a single network – an iron ore export machine. Our strategy is built on a portfolio of world class assets; our highly valued Pilbara Blend product and an exclusive, fully integrated system. Of course, our strategy would not be possible without our 11,500 employees, and supportive partners.

It is this foundation which enables us to maximise cash from our assets by pursuing a value -over-volume approach.

Today we operate a dynamic and agile system, better equipped to maximise opportunities when they arise.

The system is designed to deliver the right product, at the right time, to the right customer - our Operations Centre provides full oversight of the system, and supports our goal to maximise overall value across the network.

Having said this, our supply chain is certainly not yet perfect, and my organisation is driven to continuously optimise and innovate.

We have a clear vision to achieve a fully flexible system, from mine to customer, with integrated systems supported by automation, technology and sophisticated decision making.

**Our motivation to innovate is driven by safety**

Underpinning this vision, is our number one priority – safety.

Whilst already a world leader in safety performance in the resources sector we are driven by the goal of achieving zero harm through our strategy of focusing on fatality prevention, reducing injury and illness, preventing catastrophic events, and supporting positive health.

Ensuring every one of our employees and contractors goes home safe every day.

And, we are relentless in our pursuit of zero harm.

A goal I am sure resonates with you in your professions.

It was this goal which sparked the motivation to further improve safety through engineering and technology, including the use of automation.

And we started with vehicles and driving, our number one critical risk.

By implementing technology, we have been able to automate our trucks, drills and trains, reducing the exposure of employees to critical hazards in the workplace.

Perhaps unsurprisingly, as well as the safety advantages, we have seen significant improvement in productivity, and a reduction in operating costs.

For instance, our autonomous haul trucks can operate for an additional 1,000 hours per year each, and has reduced operating cost by 15% in comparison with conventional manned haul trucks. And in ten years of operation we have experienced a perfect safety record.

In addition to autonomous equipment, we are also adopting real time technology to support our people.

In all of our operations today, we have adopted real time monitoring systems to alert drivers to issues for example, when they have operated at excessive speed; and fatigue management tools to alert a driver to the likelihood of a micro sleep.

Technology supports our employees and contractors to go home safe.

**We have been busy building our integrated system; underpinned by pioneering advancements and technology.**

The journey to optimise our business has taken many years and has come about through a deliberate strategy.

We started with the adoption of a vision that we called “the mine of the future”.

This is how we visualised our infrastructure and assets - our future business of mining.

Ideas were developed from our own people and we sought the best partners - be it suppliers, universities or other technology partners.

And we continuously scoured the world for ideas and developed connections to many of the critical players in innovation.

One major innovation was AutoHaul®.

We wanted to establish the world’s first fully autonomous heavy haul train, to build capacity in our rail network, and improve productivity of the existing rail system, rather than invest further capital in tracks and trains.

To this day, I still find the concept awe inspiring – imagine a 2.5 kilometre long train, made up of 240 ore cars and 3 locomotives, operating autonomously with an on-board artificial intelligence system.

The AI system, safely and efficiently drives the trains using data such as track topography, grades, curves, signalling information, and track condition.

It has the smarts to use the characteristics of the locomotives and the ore cars, like weight and rolling resistance, to inform the driving strategy of the train.

We collaborated with purpose and turned our aspirational goal into reality.

Just recently, on the 10<sup>th</sup> of July 2018, we completed the first autonomous journey of the world’s largest and longest robot, right here in Western Australia.

Once fully commissioned, AutoHaul® will be a key lever to support our business to unlock further value for our shareholders through productivity.

It is an achievement my team and I are very proud of. This world first reminds me of the pioneering spirit of our forefathers, who laid the foundations of our infrastructure network back in the 1960s. It was this vision to open up the Pilbara, way back then, which has resulted in the success of our business today. So what’s next for our operations? Well, we have set the bar high, and we remain motivated to find the next big step change innovation for our business.

We are continuing to reshape our future and the next milestone is our new mine Koodaideri, which we expect to approve in the second half of this year.

Koodaideri will be our first intelligent mine, adopting over 100 innovative solutions from everything we have learnt on our technology journey to date - to operate more effectively and efficiently.

This new hub of the Pilbara will be the worlds most advanced mine, completely reshaping how we will build and operate tomorrow’s mines.

In conjunction with our intelligent mine, we are also progressing with the next generation technology in all of the existing business.

Big data, artificial intelligence and cognitive technology, are just some of the applications we are implementing.

Systems with the capability to analyse data quickly, assess multiple complex scenarios and continuously decide on the most value accretive solution.

A dynamic system which optimises value across our entire supply chain.

### **Underpinning our success are our people and partners**

As we reshape how we operate in the future, it is important not to lose sight of the most valuable asset in any business – our people.

In my business, our people are our innovators. They look to improve their part of the business through ideas that result in improved safety and productivity.

And I firmly believe our success with the next technology horizon, will only come with greater emphasis on developing the skills of our people.

Rio Tinto already heavily invests in apprenticeships and science, technology, engineering and maths (or STEM) to ensure that our people are adequately skilled for the “new jobs” innovation is creating.

Just one practical example of this development is that in October last year, we announced that we’re contributing two million dollars towards the Vocational Education and Training (VET) initiative, partnering with the Western Australian Government and South Metropolitan TAFE to pioneer a new curriculum required for the mining industry’s jobs of the future.

A curriculum which will teach skills and competencies in robotics, data analytics and digital inclusion.

This landmark partnership will ensure our current and future employees are skilled to take up the jobs that automation and the future advances in technology will create. And we hope the curriculum will be delivered through a range of new industry traineeships and post-secondary courses envisaged to commence in 2019.

If there are some final parting words, I can give you today, it’s don’t be afraid to be innovative and challenge the way you operate your infrastructure.

Automation and technology is having a profound impact on our industry’s future, and by embracing the change with an open mind, you can deliver your business further value.

We are driven by productivity – how do we get more out of our existing orebodies and assets - doing more with the same, or the same with less. Rio Tinto has committed to its shareholders to deliver \$5bn of productivity improvement by 2021.

Utilise your networks, such as forums like these today, to connect and solve problems together. The rate of change is incredible and you cannot do it all alone.

And most importantly recognise your most valuable assets are your people - and upskilling your workforce with new skills is critical to ensure you have a workforce not only ready for the future, but a workforce willing and wanting to embrace the change.

One final reflection.

Building an integrated system like ours, takes vision, time, resilience and discipline.

To succeed you must stay committed to your priorities and values and continuously strive to challenge everything you think you already know.

Thank you for your time today.

ENDS

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