ROAD INFRASTRUCTURE MANAGEMENT FORUM

Our Carbon Equation

People First - Higher Competency Leads to Lower Carbon Emissions

Jeremy Hughes | Company-X

Roger Brady | Road Efficiency Group (REG)
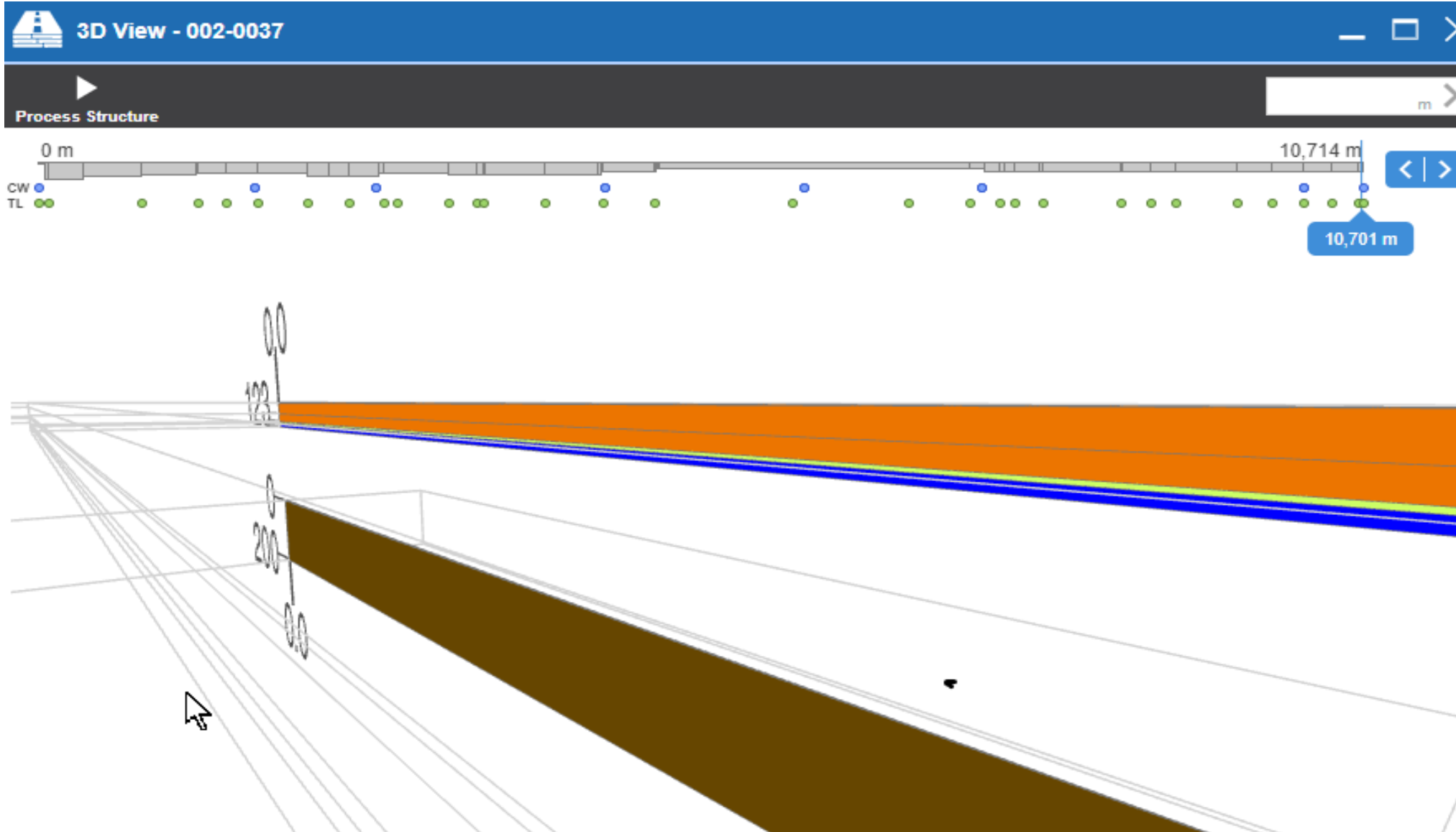
RIMS
Roading Infrastructure Management Support

in association with

IDS
Infrastructure Decision Support

RAMM Pavement Structure
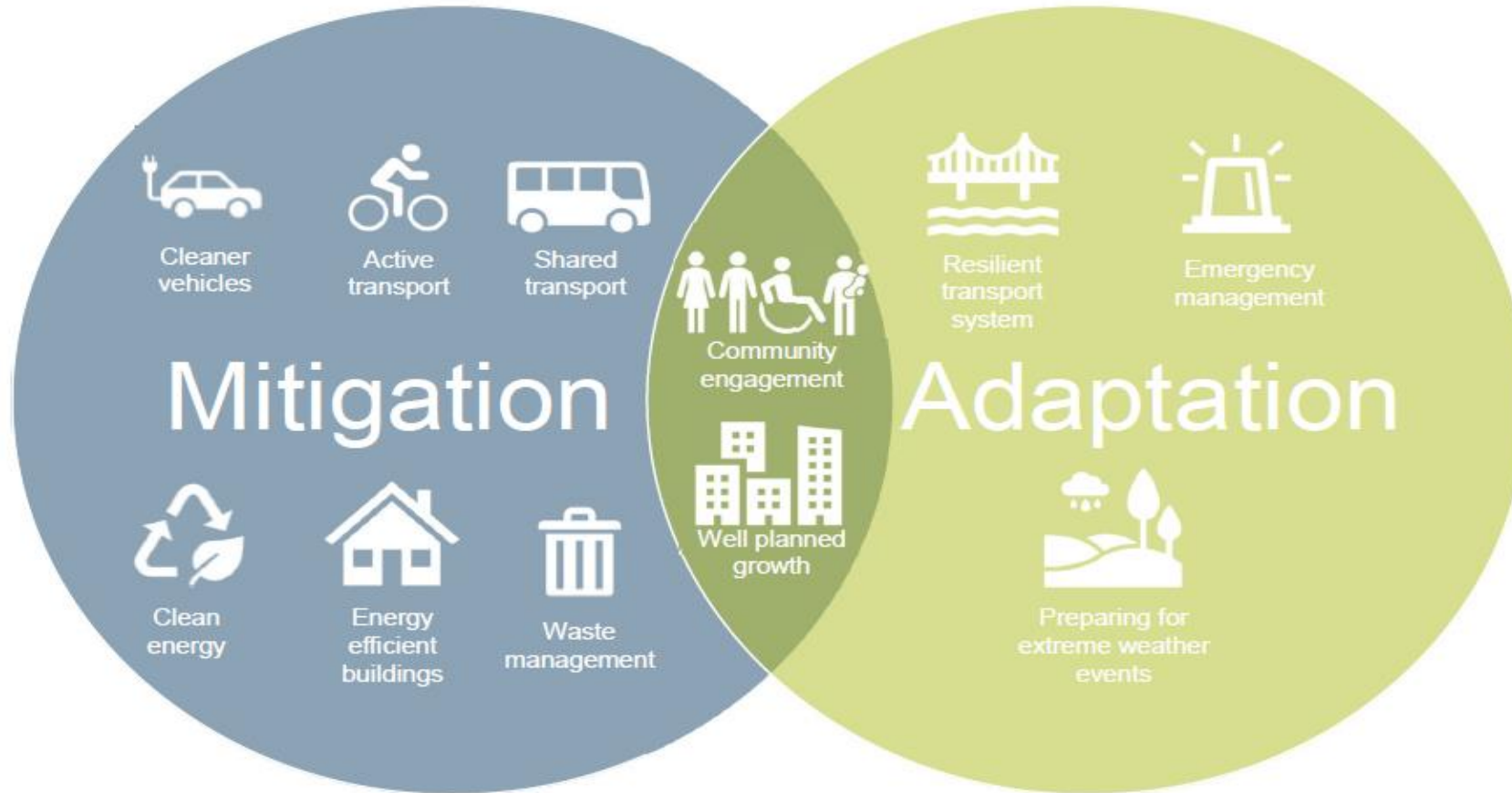
Our Carbon Equation

The climate challenge

Mitigation

Cleaner vehicles

Active transport

Shared transport

Clean energy

Energy efficient buildings

Waste management

Community engagement

Well planned growth

Adaptation

Resilient transport system

Emergency management

Preparing for extreme weather events

Our Carbon Equation

What do we mean by emissions?

For road transport projects

Construction (embodied) emissions – emissions released while the infrastructure is being built	**Operational** emissions – emissions created to keep the infrastucture up and running	**Enabled** emissions - those created by the vehicles using the infrastructure
Construction materials (extraction and manufacturing)	Materials, including re-sealing	Emissions from vehicles using infrastructure
Transport of materials	Maintenance fuel use	Avoided emissions from increased active transport and PT patronage
Onsite fuel and electricity use	Electricity use (eg. Traffic and street lights)	

Our Carbon Equation

USA View Emissions from Construction

EMISSIONS FROM ROAD CONSTRUCTION
KtCO$_2$e*

Asphalt is an important building material, but is often overlooked in terms of the emissions it produces, especially compared to other sources of emissions such as vehicles.

Asphalt-paved surfaces make up approximately 45% of surfaces in U.S. cities.

45%

28% Asphalt

6% Galvanized Steel

18% Concrete

Plastic Piping 2%

13% Trucks

Geotextile 1%

10% Crushing Plant

16% Excavators and Haulers

6% Reinforced Steel
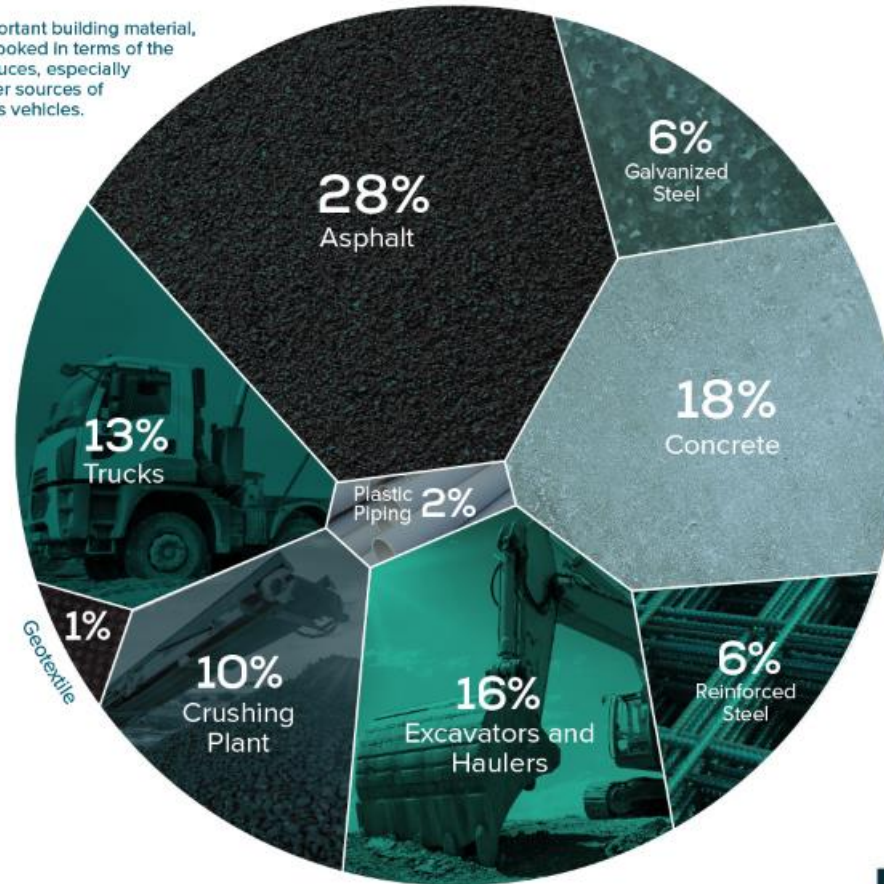
Pollution from vehicles is declining in many places, as internal combustion vehicles are replaced with electric vehicles.

But pollution from asphalt could actually increase in the next decades because of higher temperatures in some parts of the Earth.

Source: Chalmers University of Technology, University of Gothenburg.
*Kilotonnes of carbon dioxide equivalent.
Emissions based on the construction of a 8km stretch of road.

Our Carbon Equation

Management

- Task-oriented
- Transactional
- Doing things right
- Events and tasks
- Rational thinking
- Instructs people
- Cognitive intelligence
- Relies on authority
- Push-approach
- Status quo

Leadership

- People-oriented
- Transformational
- Doing the right things
- Attitudes and behaviours
- Inspirational and visionary
- Listens and empowers
- Emotional Intelligence
- Leads through others
- Asks people
- Pull-approach
- Risk taking

Manage tasks and lead people

Our Carbon Equation

Our Carbon Equation

Our Carbon Equation
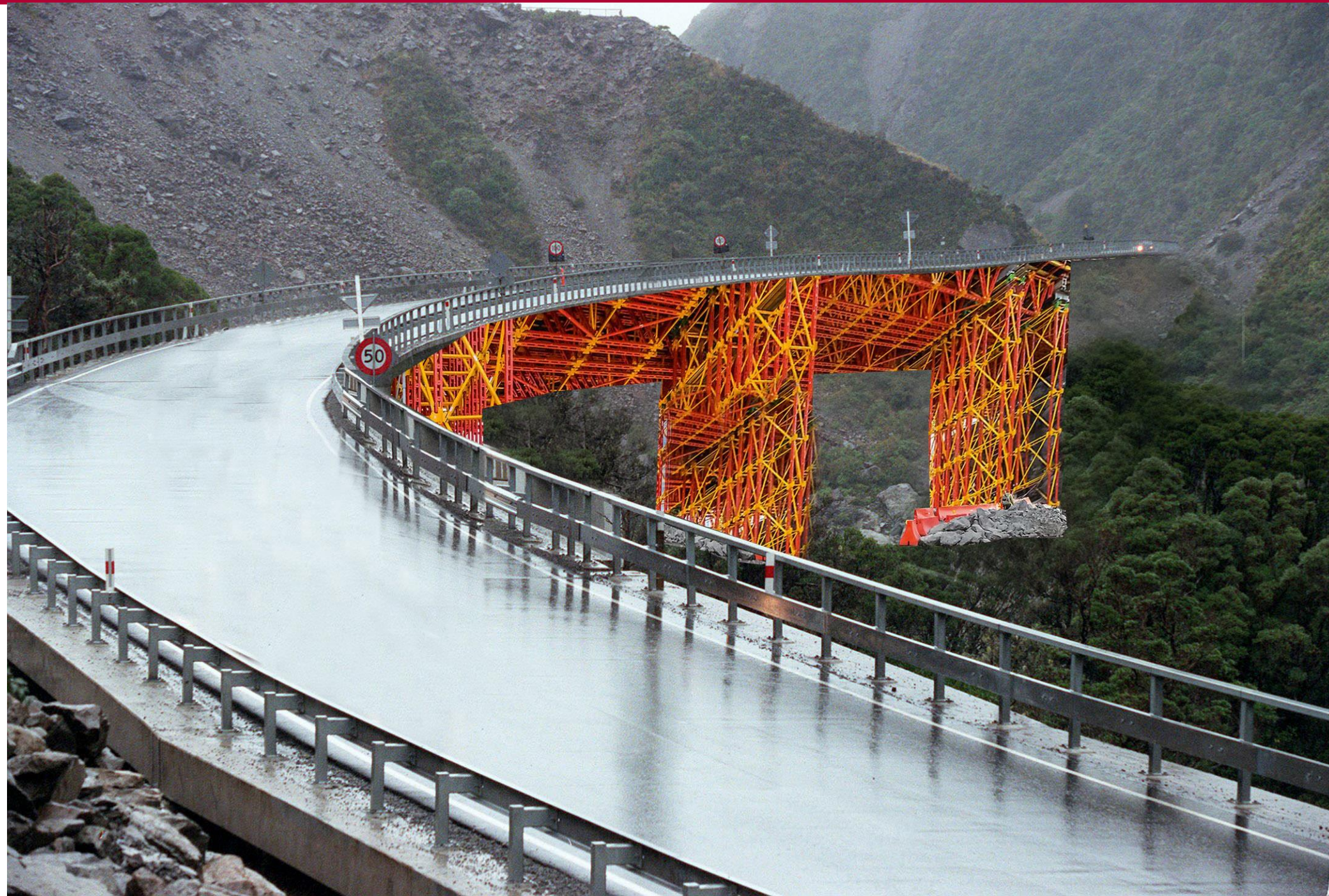
People First - Higher Competency Leads to Lower Carbon Emissions

- Thoughts leaders are standing up and owning accountability for lowering carbon emissions.

- This is putting people first and empowering them to make a difference.

- Each person in this room today is able to make better decisions relating to carbon emissions.

- Activity Managers can lower emission in both the operation and renewals of assets.

Our Carbon Equation

"We are living on this planet as if we had another one to go to."

TERRI SWEARINGEN

ecowarriorprincess.net

Our Carbon Equation

Where do your asset management skills sit?
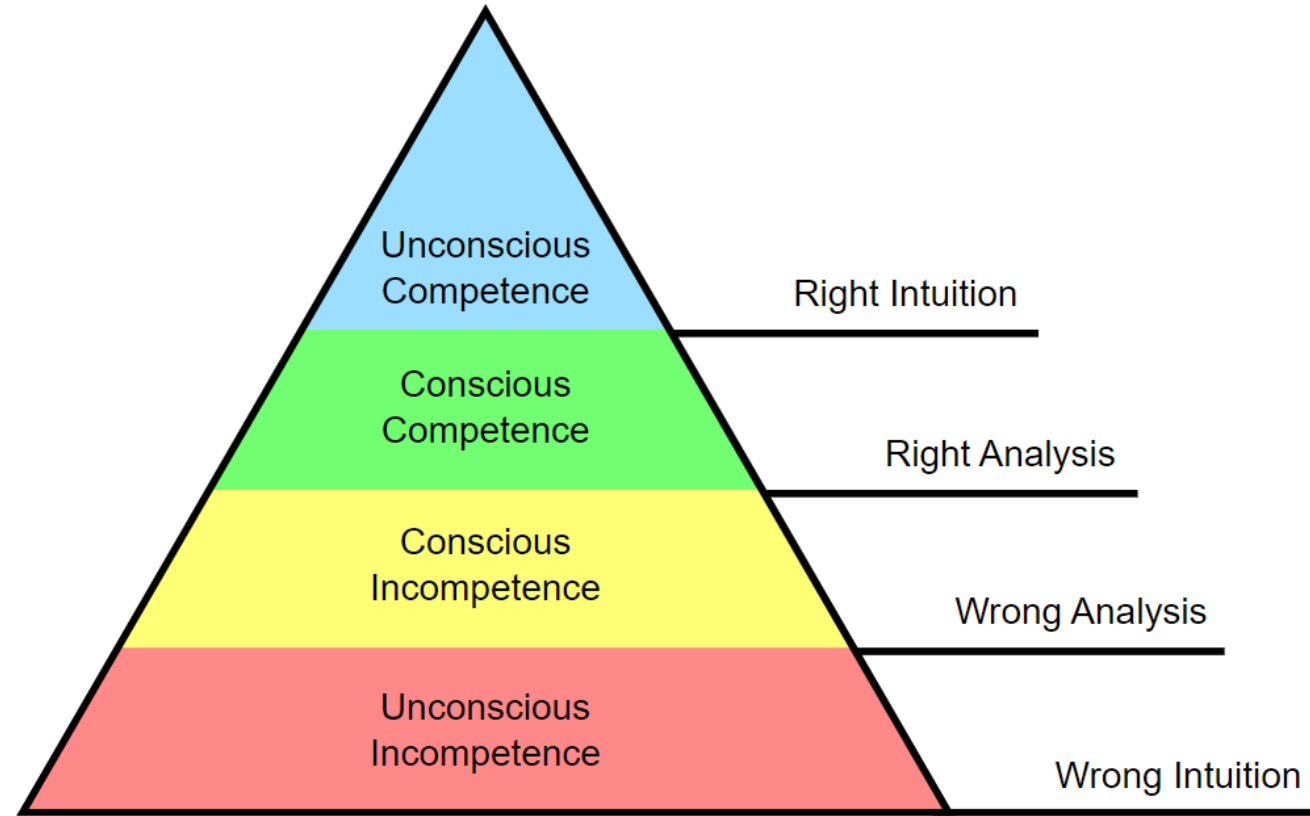
Hierarchy of Competence

Competence_Hierarchy_adapted_from_Noel_Burch_by_Igor_Kokcharov

Our Carbon Equation

Different Thinking is Needed

Concrete by Volume — aggregate, sand, cement, water admixtures

Concrete by Carbon — aggregate, sand, cement, water admixtures

Aurecon
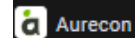
Decarbonising materials: The pathway to low or zero carbon concrete

Our Carbon Equation

Different Thinking is Needed

THE HIGH IMPACT OF LOW CARBON CONCRETE

GLOBAL EMISSIONS

LOW CARBON CONCRETE INDUSTRY

Japan
Russia
India
China
US

CONCRETE INDUSTRY
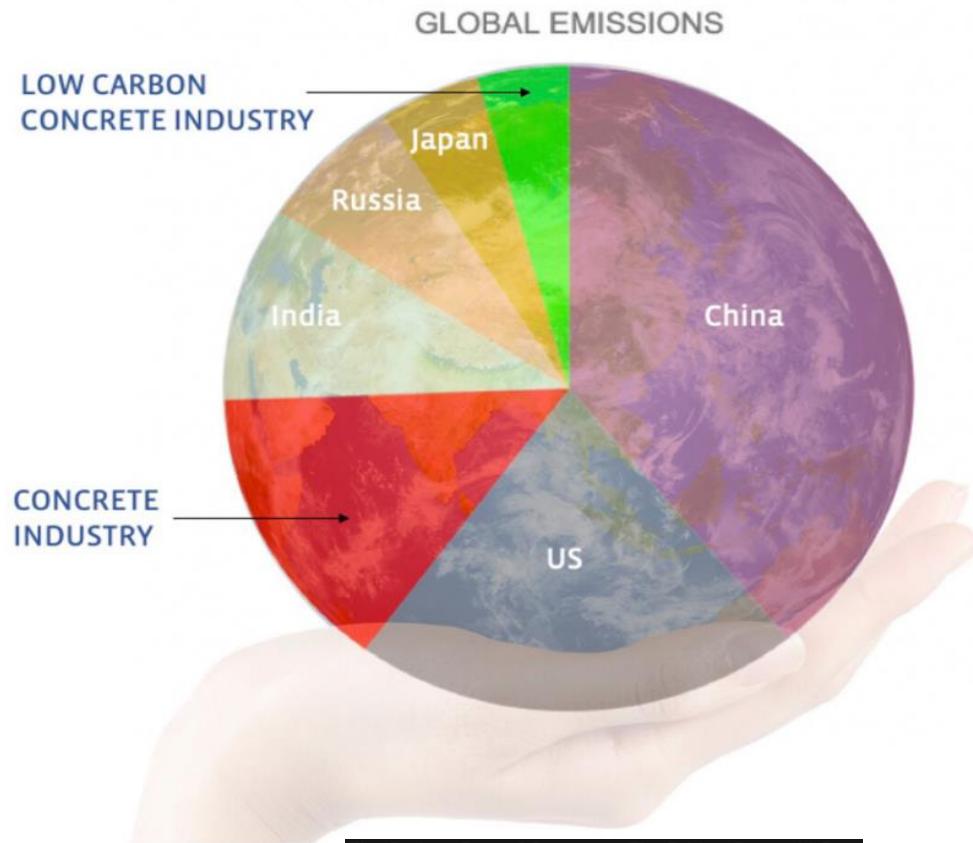
The Carbon Cost of Concrete - The Bridge Group, LLC

Our Carbon Equation

Carbon Reduction Potential

Build nothing – challenge the root cause of the need; explore alternative approaches to achieve the desired outcome — 100%

Build less – maximise the use of existing assets; optimise asset operation and management to reduce the extent of new construction required — 80%

Build clever – design in the use of low carbon materials; streamline delivery processes; minimise resource consumption — 50%

Build efficiently – embrace new construction technologies; eliminate waste — 20%

Carbon reduction potential (y-axis): 100%, 80%, 50%, 20%, 0%

x-axis phases: Planning, Design, Construction, Commissioning, Operation and maintenance

The greatest opportunities to reduce whole of life embodied carbon and operational carbon are at the planning and design phases of a project.

Our Carbon Equation

What will the future look like?

A typical working day in Oxford Street at the end of the 19th century, looking east, with New Bond Street off to the right. We can see omnibuses, hansom cabs, and delivery carts.

Our Carbon Equation

What will the future look like?

Our Carbon Equation

Advanced Air Mobility? Brazil 2026?

Helisul Aviation, a Brazilian helicopter charter operator, intends to use Eve's eVTOL aircraft for air taxi services in Brazilian cities from 2026. (Image: Eve Urban Air Mobility Solutions).

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Advanced Air Mobility? California 2024?

Archer on track to complete type certification of the full-scale,
four-passenger aircraft by the end of 2024

Our Carbon Equation

New Zealand Innovation – Sacha Wetzel, founder of Avfoil, has some ideas on urban aviation.... What if we didn't need to build and maintain as many roads?

- Electric rotary wing drones are becoming a more and more viable possibility for transporting people.

- Safety is paramount – few hazards exist more than 100m into the air. Technology is such that unpiloted vehicles can remove human error – the cause of most accidents. (The road to zero, more quickly?)

- Sea level rise is threatening many state highways in New Zealand.

- Our thinking is changing to shared asset use rather than ownership – do we need a car or can we Uber?

- Investing in the vehicle rather than the asset – a different thinking? A more cost-effective solution as the technology continues to evolve?

Our Carbon Equation

Different Thinking is Needed

Our Carbon Equation

Making It Real

How can we make a meaningful difference?

- Knowing and understanding our current skill set

- Finding and fixing any relevant skill deficiencies

- Taking the time to stop, think and apply what we know through a different paradigm.

- Leadership in action

Our Carbon Equation

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Competency Assessment ⌄

Asset Management

Performance ⌃

ONRC ⌃

Data Quality ⌃

Procurement ⌃

Help & Support ⌃

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My Profile

Full name

John Doe

Age range

60 - 65 ⌄

Highest level of academic achievement

Certificate (levels 1-4) ⌄

Typical asset management role

Asset analyst ⌄

Location / Region

Bay of Plenty ⌄

Employer organisation

ABC Ltd ✕ ⌄

Type of organisation

Contractor ⌄

Organisation field of work

Project or contract management ⌄

Update Profile

Why are we collecting this information?
Phase 1 of the REG AMCF survey and reporting portal is intended achieve a baseline of competency information. Once this is complete REG will be able to undertake analytics to better understand sector capability and capacity.

Findings of this process will be incorporated into Phase 2 of the project, which will likely include updates to the typical asset management role types, and communication with employer organisations regarding training options.

For further information please refer to our privacy policy

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✓ AMCF ⌄

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🏅 Performance ⌃

🕐 ONRC ⌃

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$ Procurement ⌃

❓ Help & Support ⌃

AMCF Survey

SUBMITTED

Last submitted: **13/05/2022, 11:50:34 am** | Save Draft | Submit |

✓ Organisational Strategy

✓ Organisational culture, leadership and people

✓ Knowledge management

4 **Asset management strategy**

● Define the scope of an asset management system

● Identify stakeholders and their requirements

❯ **Identify risks and opportunities**

● Define asset management objectives

● Identify investment needs and constraints

● Define an asset management system performance framework

● Defined the planned approach to procurement

Asset management strategy

4.3 Identify risks and opportunities

Please rate your level of competence for each statement ⓘ

4.3.1 Define risks and opportunities relevant to the asset management strategy

N/A —— 1 —— 2 —— 3 —— 4 —— 5

4.3.2 Assess the potential future impact of mega trends on asset and service performance (e.g. environmental, social, economic, and technological mega trends)

N/A —— 1 —— 2 —— 3 —— 4 —— 5
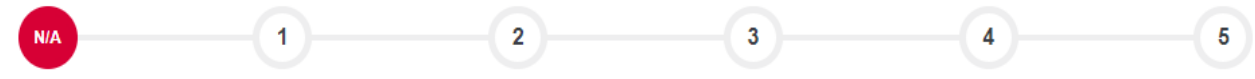
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Competency Assessment ⌄

Asset Management

Performance ⌃

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Data Quality ⌃

Procurement ⌃

Help & Support ⌃

AMCF Report

Your role: **Asset information or data specialist**

Compare data for the [Entire Sector ⌄] role   **32** Entire Sector submissions

Your Competency Summary
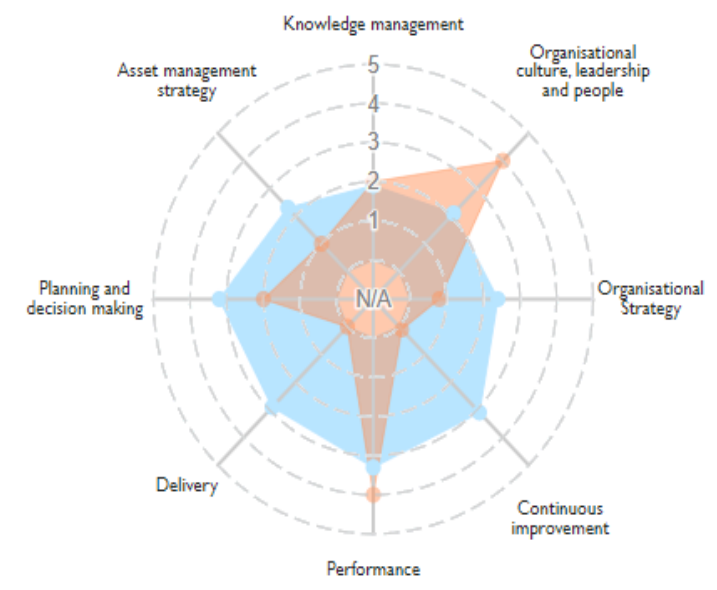
Individual ▭   Summary ▭

Peer group competency results - Entire Sector

- Your result
- Organisational Strategy
- Organisational culture, leadership and people
- Knowledge management
- Asset management strategy
- Planning and decision making
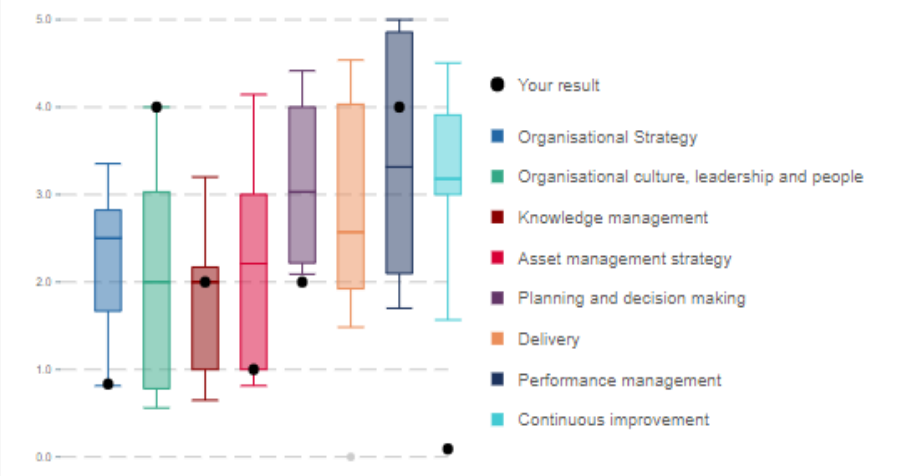- Delivery
- Performance management
- Continuous improvement

🏠 Home

✓ Competency Assessment ⌄

Asset Management

🎗 Performance ⌃

◔ ONRC ⌃

📈 Data Quality ⌃

$ Procurement ⌃

❓ Help & Support ⌃

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AMCF Report

Your role: **Asset information or data specialist**

Compare my data to the | Asset information or data specialist   ⌄ | role

3 Asset information or data specialist submissions

| Asset information or data specialist |
| Asset analyst |
| Asset or roading engineer |
| Asset manager |
| Maintenance engineer |
| Network / contract or project manager |
| Advisor |
| Manager |
| Entire Sector |

Your Competency Summ

Asset manage
strategy

2
1
N/A

Planning and
decision making

Organisational
Strategy

Delivery

Continuous
improvement

Performance

Individual ▭   Summary ▭

Peer group competency results - Asset information or data specialist

5.0

4.0

3.0

2.0

1.0

0.0

● Your result
■ Organisational Strategy
■ Organisational culture, leadership and people
■ Knowledge management
■ Asset management strategy
■ Planning and decision making
■ Delivery
■ Performance management
■ Continuous improvement

Home

Competency Assessment ∨

  Asset Management

Performance ∧

ONRC ∧

Data Quality ∧

Procurement ∧

Help & Support ∧

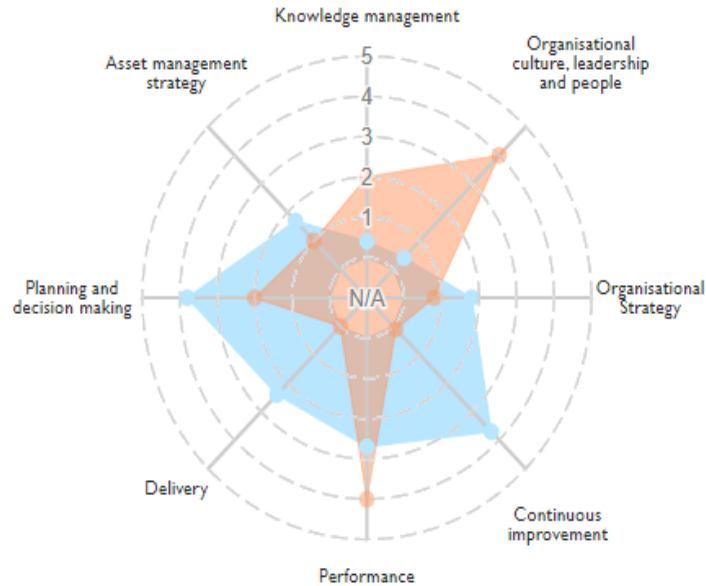**Home**   **Survey**   **Report**   **My Profile**   **Privacy**

AMCF Report

Your role: **Asset information or data specialist**

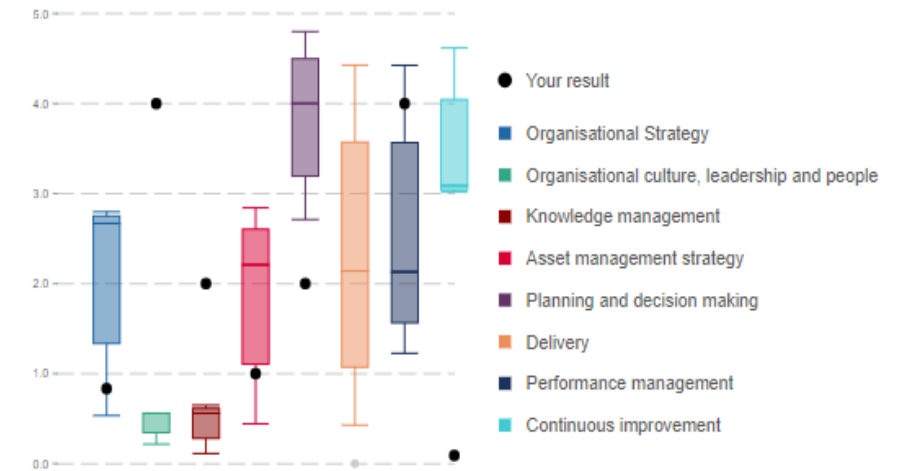Compare my data to the [Asset or roading engineer ▾] role

3 Asset or roading engineer submissions

Your Competency Summary

Knowledge management
Organisational culture, leadership and people
Asset management strategy
Organisational Strategy
Planning and decision making
Continuous improvement
Delivery
Performance
N/A

Individual [   ]   Summary [   ]

Peer group competency results - Asset or roading engineer

● Your result
■ Organisational Strategy
■ Organisational culture, leadership and people
■ Knowledge management
■ Asset management strategy
■ Planning and decision making
■ Delivery
■ Performance management
■ Continuous improvement

Asset Management Competency Framework – Why?

- For individuals – identify your strengths and weaknesses. It's likely you know more than you realise.

- For organisations – build synergies and allocate tasks with a greater confidence across your team.

- For the industry sector – better inform funding and national training conversations.

- Applied Leadership.

Our Carbon Equation

Contact Us...

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