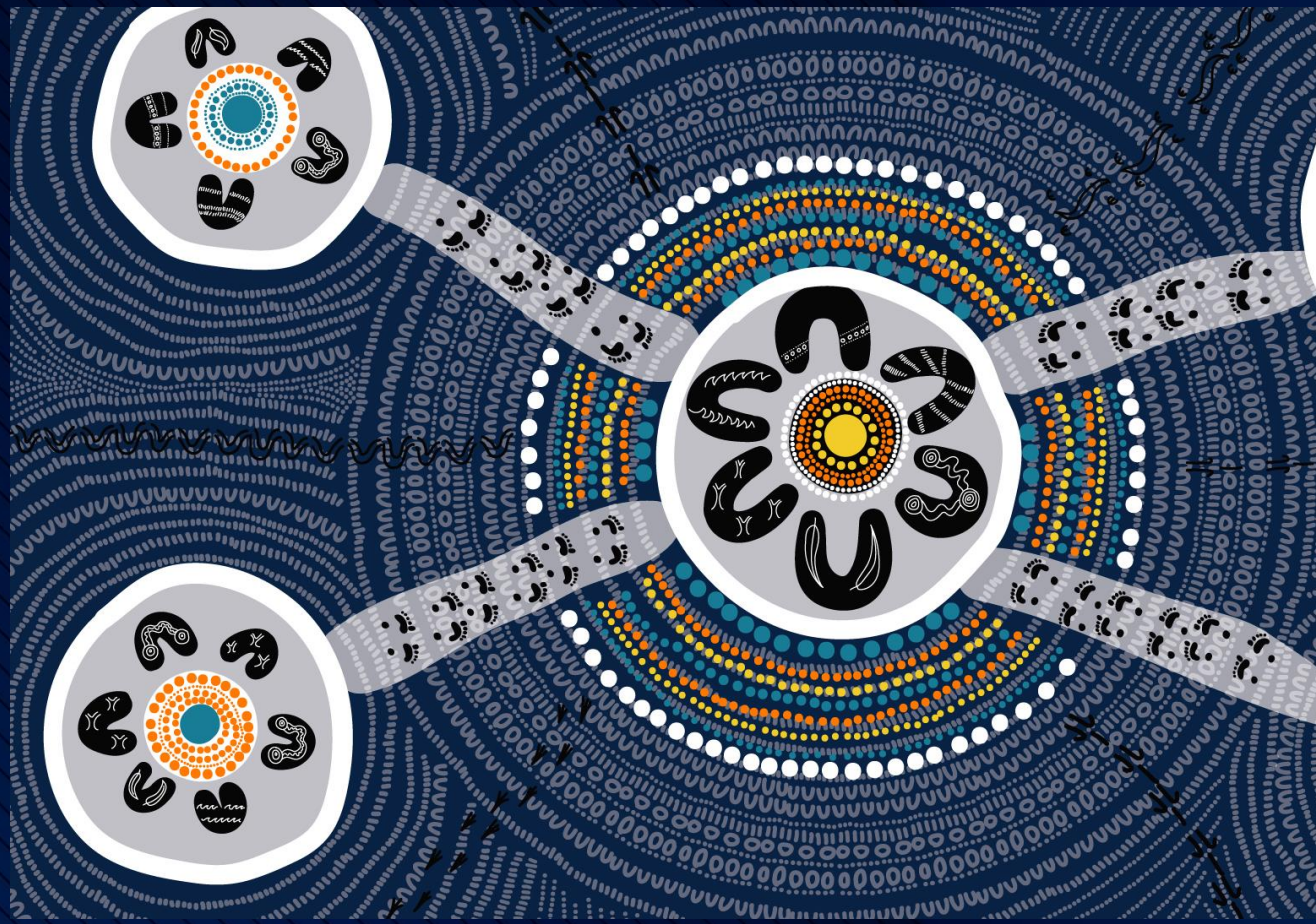
Infrastructure Sustainability Rating Scheme

Case Study Webinar Series

Thursday 12 September 2024 | 1:00 – 2:00 PM (AEST)

Acknowledgment Of Country

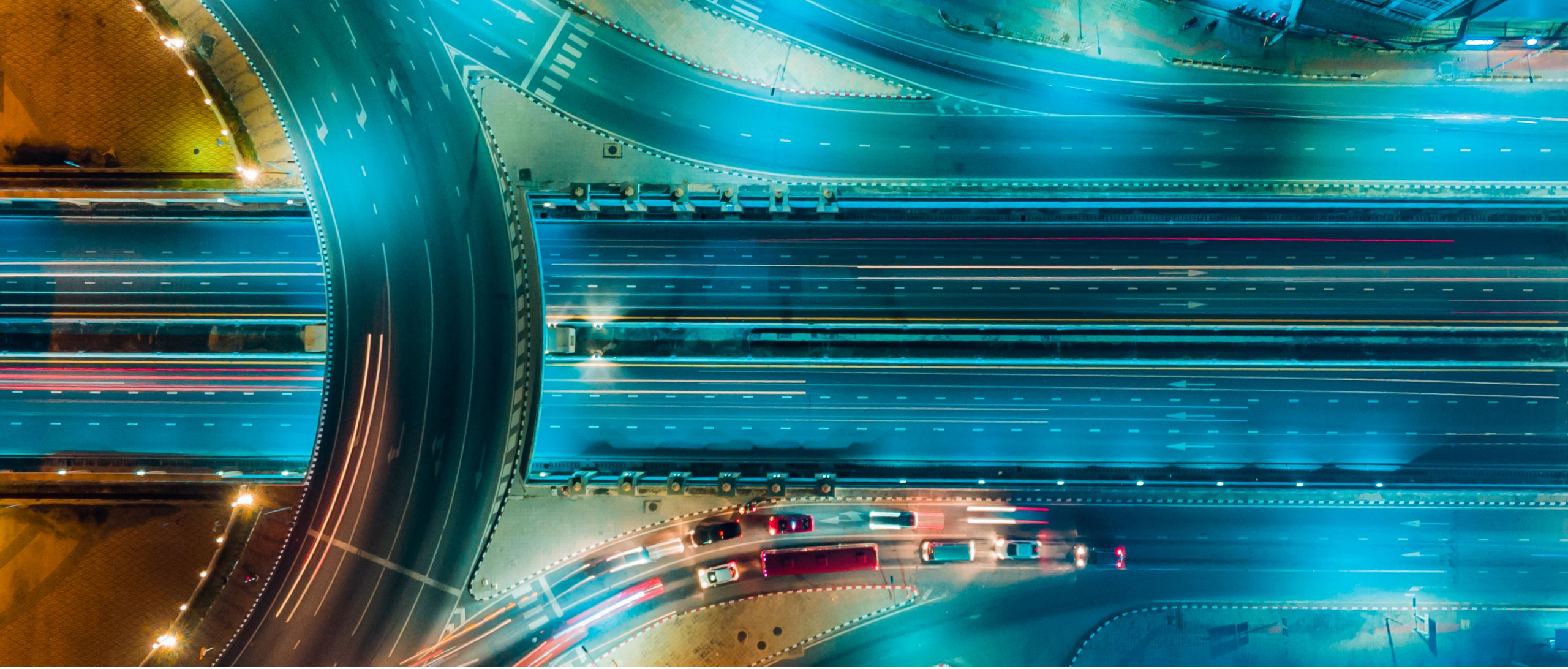
The Infrastructure Sustainability Council would like to begin by acknowledging the Traditional Custodians of the land on which we meet today. We acknowledge their deep connection to land, water and culture, and pay my respects to their Elders past, present and future.



Agenda

1. Introduction to Ecn-1 – Dr Kerry Griffiths & Declan Collins
2. East Link WA Project – Sophie Wallis
3. MelCONNX/MetCONNX Projects – Leigh Penney
4. Laing O'Rourke Responsible Decision-Making Framework – Sam Donaldson
5. Question & Answer

Please add any questions to the Q&A function, we will answer these at the end of the presentations



Overview of the ECN-1 Credit

Dr Kerry Griffiths, Infrastructure Sustainability Council

Ecn-1 : Strategic Options Assessment

Intent:

To incorporate sustainability criteria and whole of life considerations into the strategic planning decision making process.

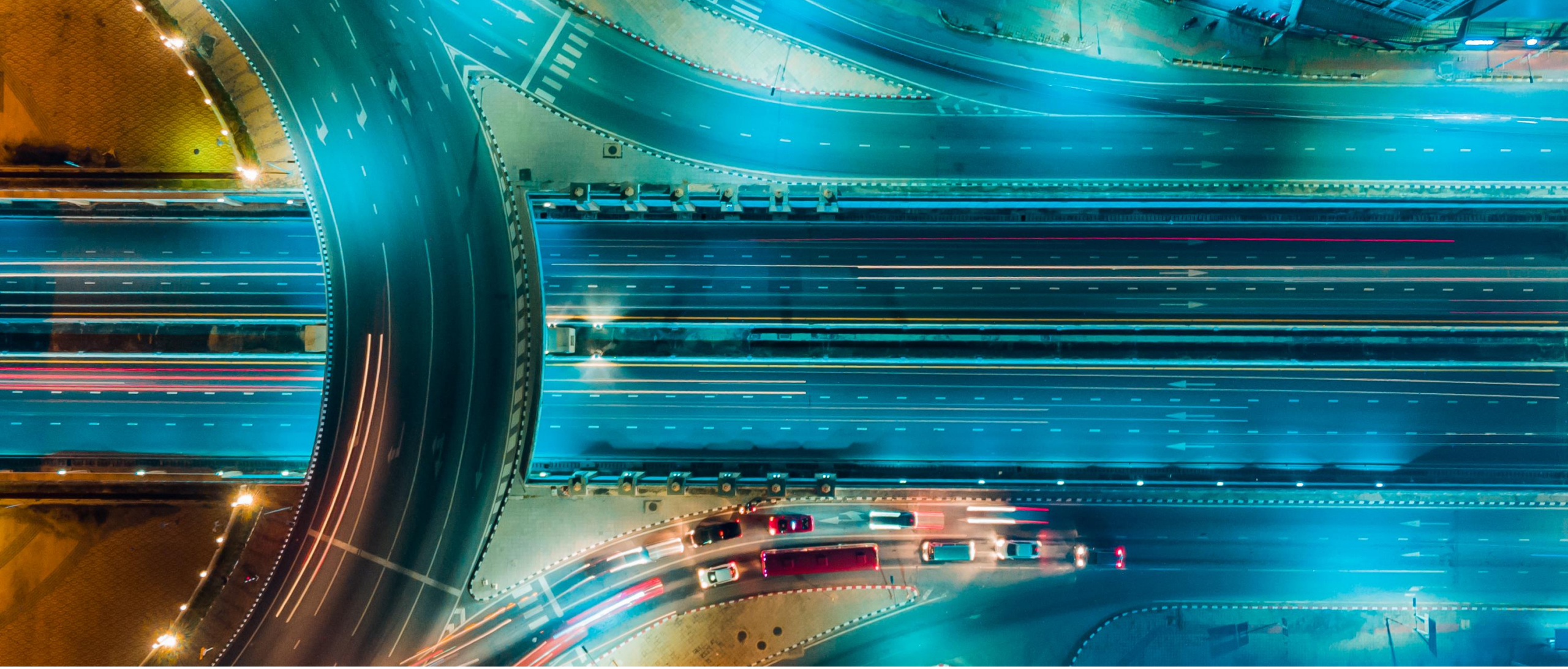
- Range of strategic options identified
- Formal assessment – considers material externalities and whole of life costs AND informs the preferred option
- Carbon specifically called out
- Qualitative / quantitative elements

Ecn-1 : Options Assessment & Significant Decision-making

Intent:

To incorporate sustainability criteria and whole of life considerations into decision making processes for significant project initiatives developed in the [planning / design and construction] phases and hence increase sustainability outcomes.

- Clear parameters for significant decisions / initiatives defined
- Formal assessment – considers material externalities and whole of life costs
- Carbon specifically called out
- Qualitative / quantitative elements



Current Use, Observations and Insights

Declan Collins, Infrastructure Sustainability Council

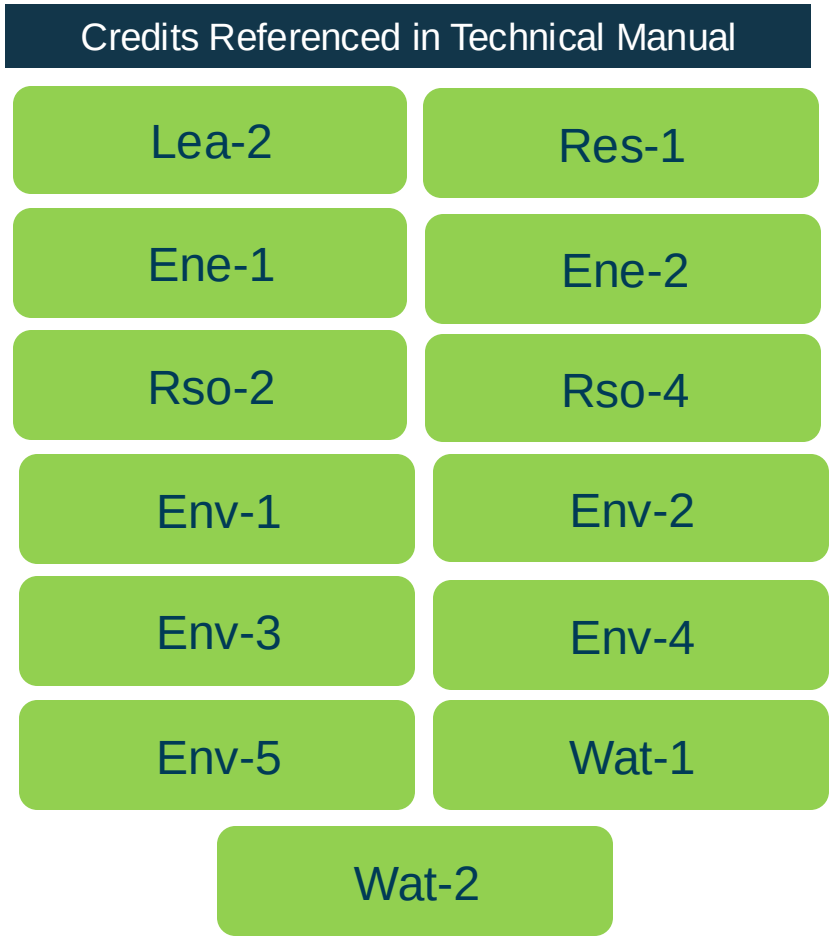
ECN-1: Observations & Insights

*A **systematic** approach to sustainable **decision-making***

1. Specialised – Requires **SQP involvement**
2. **Must** be developed and implemented early
3. The Golden Goose or Poisoned Chalice
   - Fit-for-Purpose
   - Practical
   - Value-adding

This credit applies to:

- Project optioneering across the infrastructure lifecycle
- Opportunities, Initiatives & Treatments (IS Credits)
- ALL significant decisions as **defined by the Project**.



EastLink WA Case Study

Sophie Wallis, BG&E

Sustainable Decision Making

Application during the Planning Phase

September 2024

Sophie Wallis, BG&E

OPPORTUNITIES THROUGH EXCELLENCE

bgeeng.com

BG&E

Session introduction

Sophie Wallis – Sustainability Lead, BG&E

- Sustainability and systems thinking
- 20+ years in government, resources and infrastructure sectors
- NorthLink WA, EastLink WA, transmission lines, water, resources projects

Today’s presentation

Overview:

- Nature of the decisions required for EastLink WA, and the process we developed

Planning phase:

- Opportunities, constraints and risks specific to earlier project phases

Considerations for the Ecn-1 credit

Key benefits for EastLink WA project

- Value of taking holistic view

Overview of decision-making process for EastLink WA

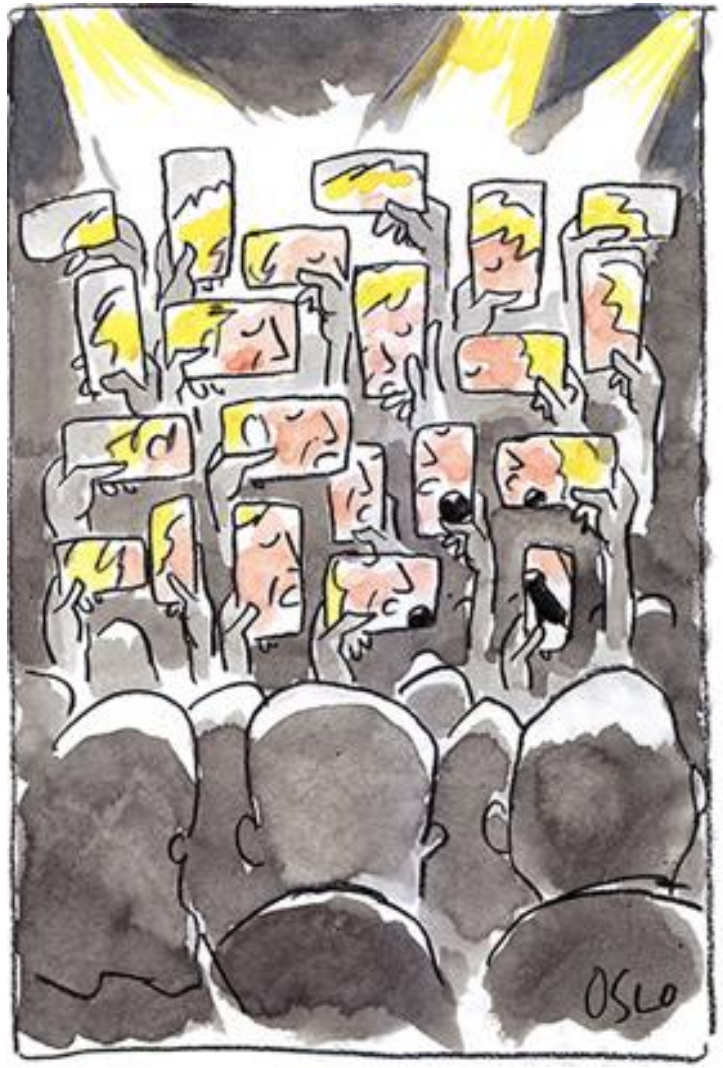
Why did we need a decision-making framework?

EastLink WA:

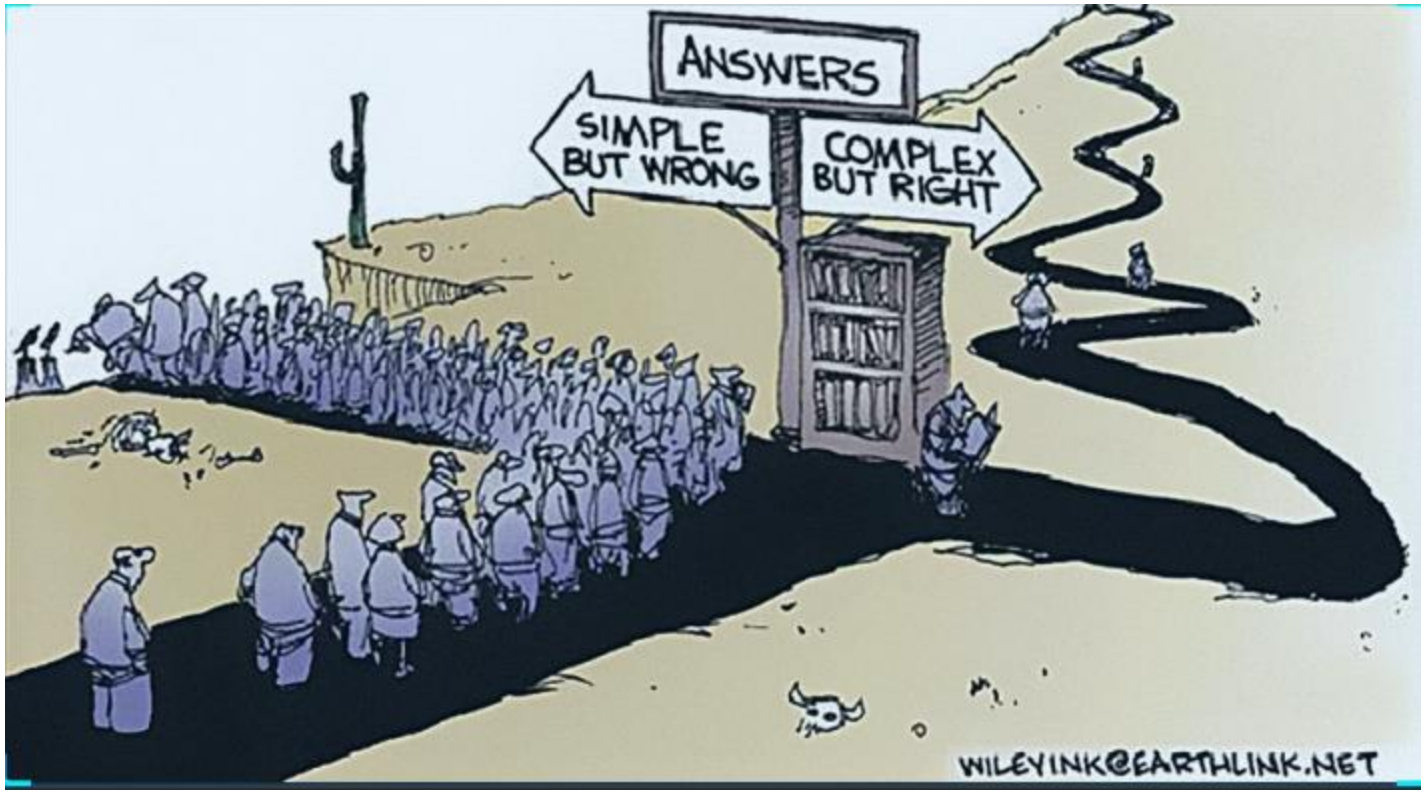
- Planning and development – many different decision types
- High uncertainty / mixed certainty
- Achieved a Silver rating, including Ecn-1 credit

Drew on models which started with context before moving to MCA/ scored method

For real projects, conditions are not perfect and time is short



It’s not all about MCAs



- Multicriteria Assessments can help to make sense of multiple aspects

BUT

- Tools like MCAs should not **make** decisions, they should **inform** decisions
- Outputs should be discussed and tested
- They need upfront work to be most useful

Overview of 6 steps

- Can be scaled up or down
- Is not ‘perfect’ but is practical – use as a starting point to do better when possible
- Is based on strategic guidelines e.g. from ATAP and IA but adapted for project-level decisions (rather than funding decisions)

1 Problem identification

- State required decision
- State project phase
- Determine ‘significance’
- Involve range of specialists

2 Problem definition

- Define scope, context, constraints
- Understand available data and limitations
- Consider risks from incomplete data or information availability

3 Options identification

- Identify range of options with sound environmental, social, economic and technical outcomes
- Identify preferred option(s)

4 Options assessment

- Assess options with appropriate tools
- Seek input from range of specialists
- Identify preferred option(s)

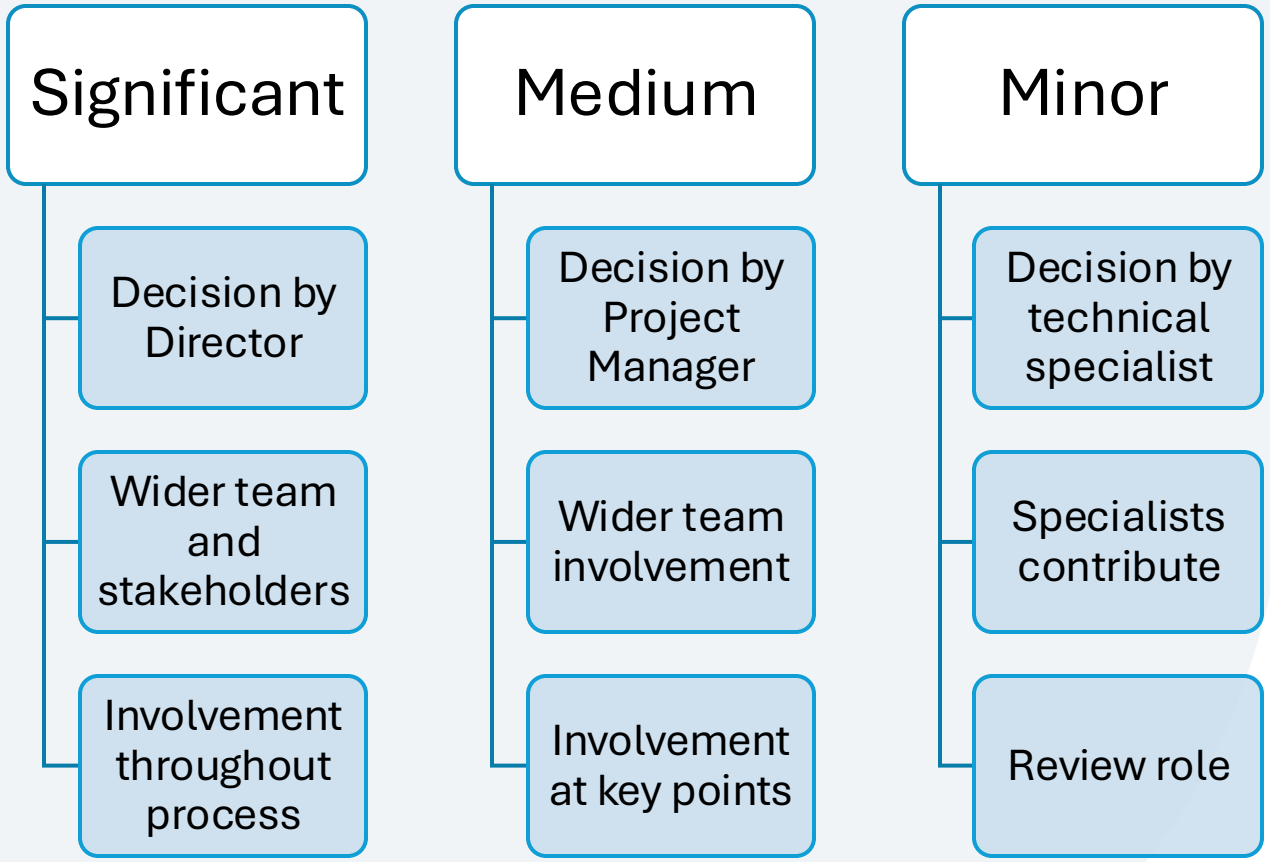
5 Test preferred option(s)

- Refine option with feedback from decision makers
- Document risks from uncertainties

6 Select option

- Document decision

Significance of decision



A tiered approach was used to determine who needed to be involved in the decision.

If an options assessment is required, the assessment tool to assist this should suit:

- The significance of the decision
- The level of risk
- The level of detail available

Opportunities, constraints and risks specific to planning phase

Planning and development phase

Activities to prepare project for delivery

Funding/ business case

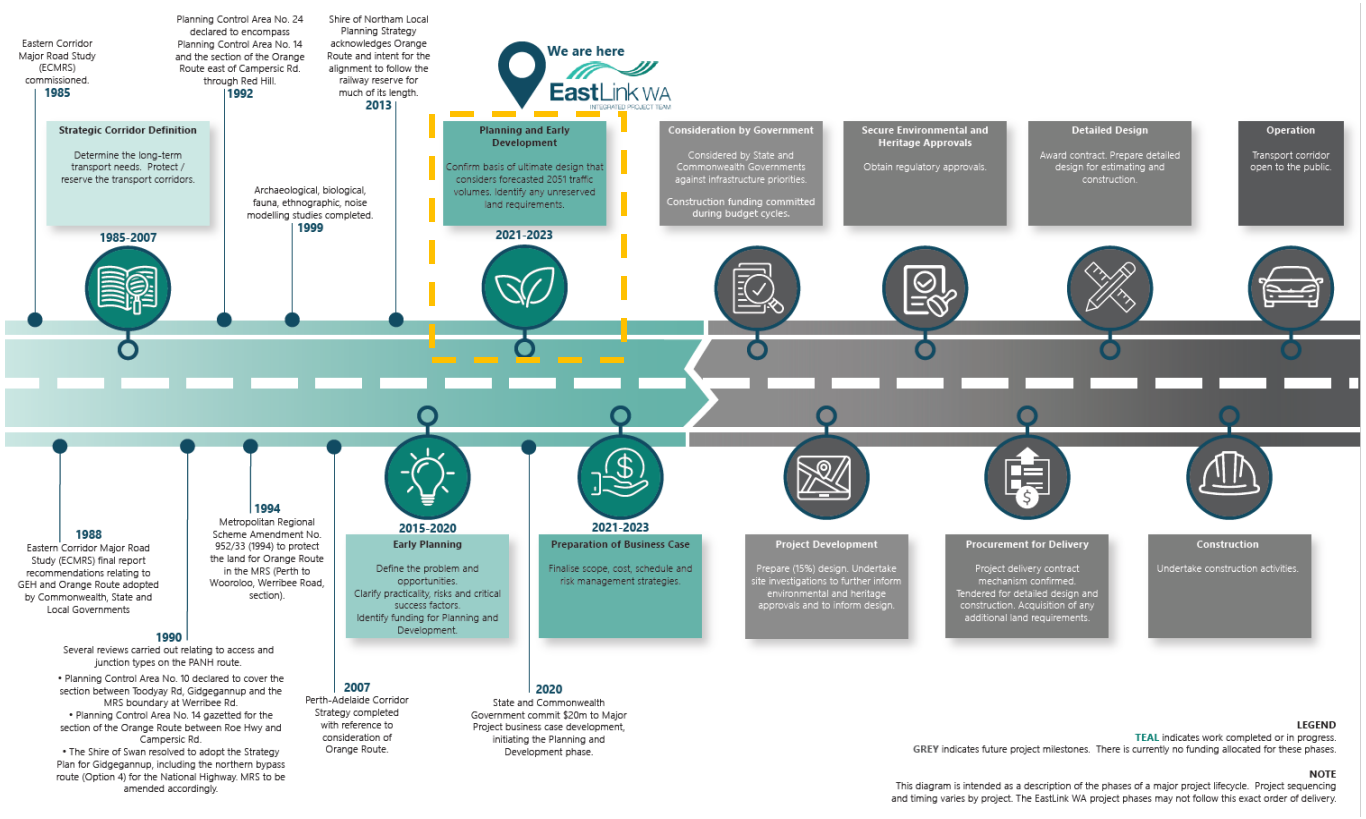
Establish partnerships, stakeholder engagement, field surveys

Options assessment

Develop scope and requirements for delivery phase

Considering environment and social outcomes in:

- Alignment of highway
- Access strategy
- Design of interchanges
- Highway over vs under



Streamlining decision making

Upfront review of decision types informed the process best suited to the project

- Some engineering and traffic decisions were relatively simple – less input needed from multi-disciplinary team. Adopted a streamlined process.
- Connection and network decisions involved a systematic engineering process – some input from multidisciplinary team on constraints in the broader area.
- Alignment decisions were more complex, and interdependent. Multidisciplinary team helped to develop shared understanding of pros and cons.
- Opportunities – explored with wider team and external stakeholders

Problem identification

Time can be wasted if we start to answer the wrong question, e.g.

- Design to optimise safety, business access, environmental outcomes
- Review the design for new issues
- Develop alternative design
- Connection/ no connection…

Articulate question being asked and define scope of decision.

Another danger is starting to answer the next perceived question before finding an answer to the current one.

In planning the end point can be a little unclear!

"The answer to the great question…of Life, the Universe and Everything…is 42…"

"…I think the problem, to be quite honest with you, is that you've never actually known what the question is."

— Douglas Adams, The Hitchhiker's Guide to the Galaxy

Example – Bakers Hill Alignment

Problem definition/ context

- **Seek input from range of specialists about what is important to them**
- **Identify potential risks arising from incomplete data or information availability.**
- **Consider objectives and criteria**

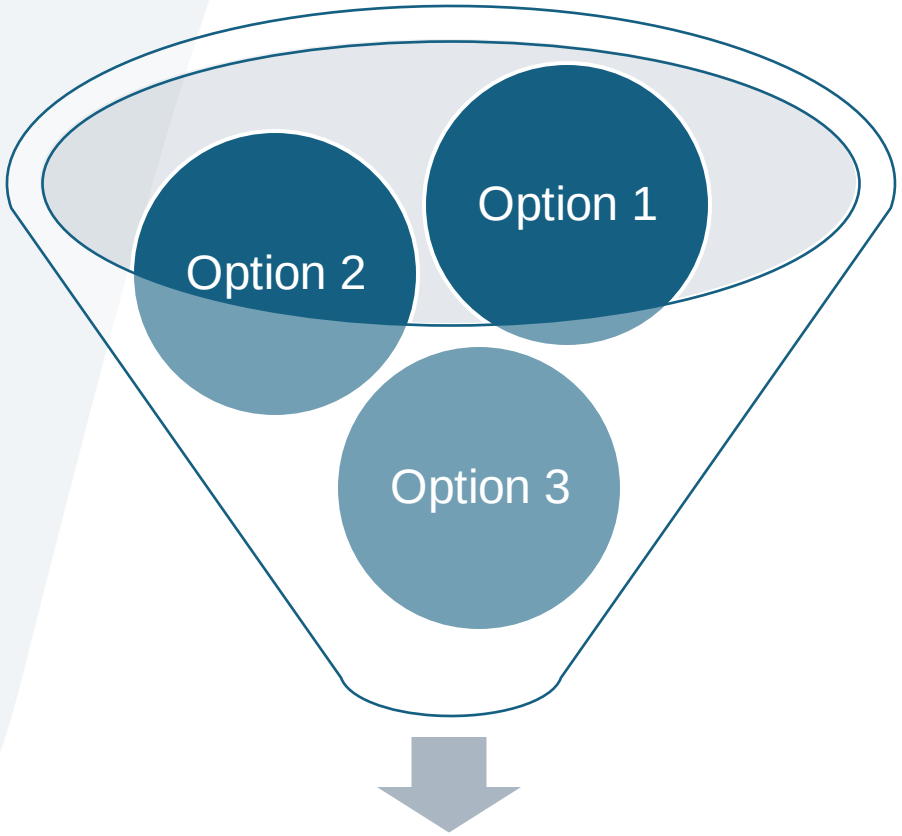
Options identification

We don’t just want to assess some options, we want to assess some **good** options

This step is about developing that short list of good options.

Sometimes we can eliminate bad options and explain why they should not be taken forward.

- **Identify an appropriate range of options that meet the scope**
- **Seek input from range of specialists to identify options with sound environmental, social, economic and technical outcomes**
- **Agree criteria**



Preferred option

Considerations for application of the Ecn-1 credit

Options assessment

- Assess options using appropriate methods and tools
- Seek input from range of specialists on:
  - Weightings
  - Criteria
  - Assessment and scoring
- Identify preferred option(s)

After options assessment, test outcomes with decision makers, and to confirm the decision.

Document outcomes in line with Ecn-1

Value of taking holistic approach

Ecn-1 credit aims to incorporate sustainability criteria and whole of life considerations into decision making processes for significant project decisions.

In other words:

- Understand what is important in the project's wider context
- Make decisions with long term benefits

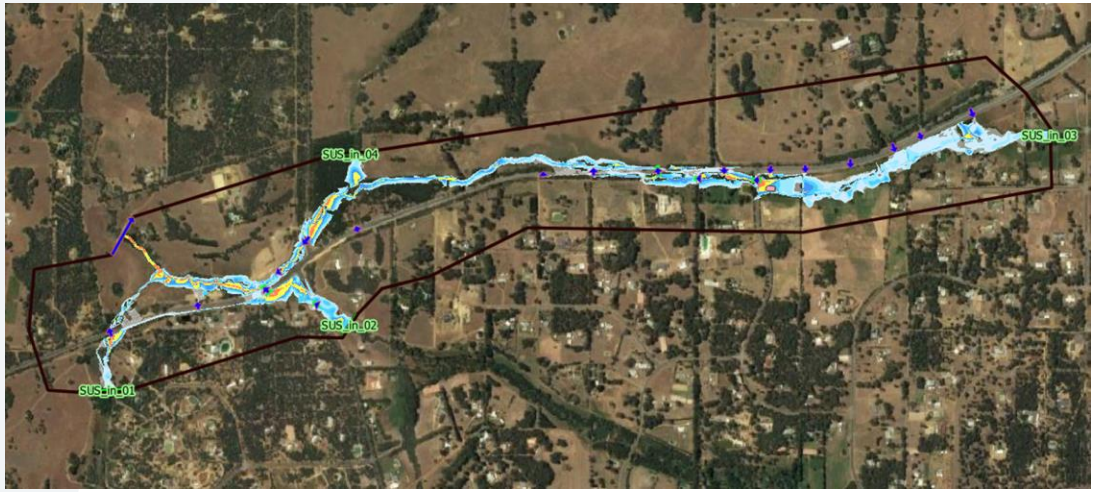
To do this we needed

1. Clarity on what problem we were trying to solve
2. **Good** options (not just lots of options)
3. To look beyond the project boundaries – zoom out
4. To look beyond just an engineering solution to get the best long term outcomes from a broad range of perspectives
5. Templates that capture information to meet credit requirements – adopted as routine by the team.

Key benefits for EastLink WA project

Benefits

- Collaboration
- Future phases have sufficient information
- Major decisions could be made early, even without perfect information
- Streamlined approach to ‘routine’ interchange decisions. Team could allocate time to more important decisions.
- Bakers Hill – sense-making for a complex section of highway.
- Susannah Brook – land-use planning constraints and environmental impacts to Susannah Brook. Retained ~1.4km of the existing tributary, avoiding waterway diversion.
- Altone Road interchange – considered local amenity alongside technical criteria. Solution more suited to local residential area.



MelCONNX/MetCONNX Case Studies

Leigh Penney, Laing O'Rourke

Ecn-1 Project IS D&AB Case Studies

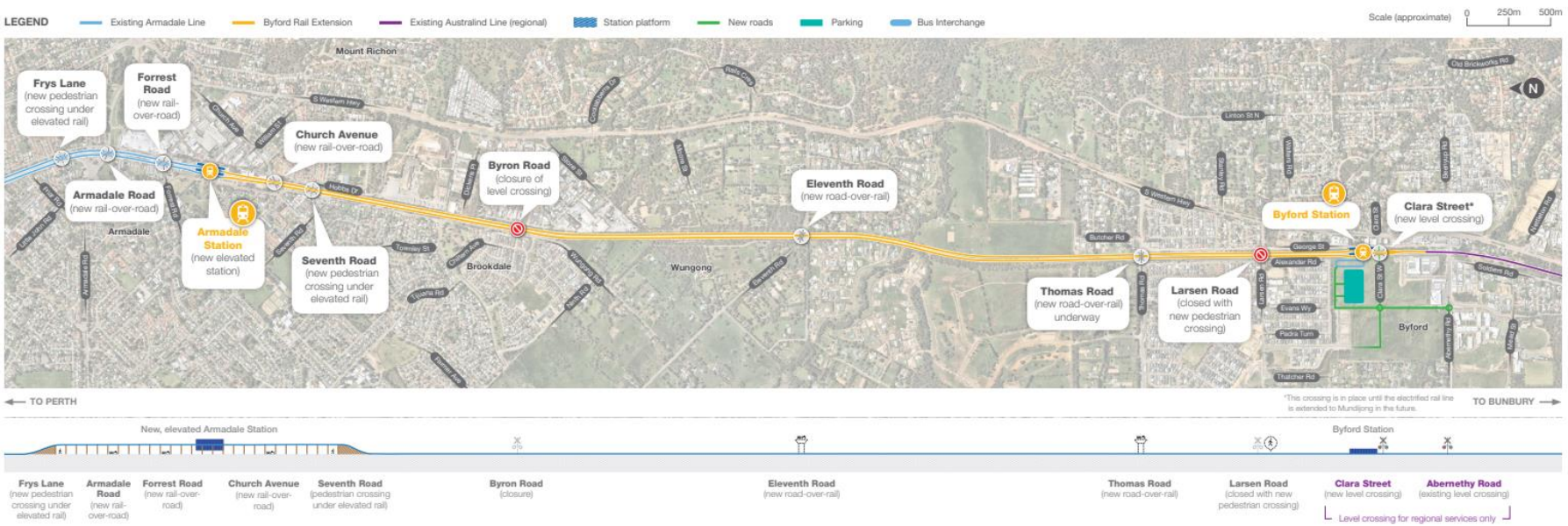
LEIGH PENNEY – SENIOR SUSTAINABILITY MANAGER

12 SEP 2024

ACKNOWLEDGEMENT OF COUNTRY

I would like to begin by acknowledging Aboriginal and Torres Strait Islander Peoples as the Traditional Custodians and First Nations Peoples of Australia. We pay our respects to their ancestors and Elders both past and present and support those emerging. We thank them for enriching our nation with their cultural practices.

PROJECT OVERVIEWS



Byford Rail Extension

- 8km rail line extension - south
- 2 new stations
- 1.6km elevated viaduct to remove level crossings
- Upgrade of local roads
- 6 Ha of new public open spaces created

Morley-Ellenbrook Line

- 21km new double-track rail line
- 5 new stations
- Road-over-rail bridges, two elevated viaducts, Bridge and rail tunnel portals into busy Tonkin Hwy
- >36,000sqm of landscaping footprint, in Station precincts

Agenda

- Overview of Process
- Dealing with different types of decisions
- Social Cost of Carbon (Level 2 – Ecn-1, v2.1)
- Examples of initiatives & outcomes realized
- Lessons Learned - Opportunities/Constraints/Risks

Significant Decisions Process

MCA tool is required where one of the following is true:

- **>$2,000,000 change to project cost**
- **>6 weeks impact to project timeline**
- **Options assessments for:**
  - ✓ **Lea-2** (Risks & Opportunities adaptation treatment options for high/extreme risks identified),
  - ✓ **Res-2** (climate change adaptation treatment options for high/extreme risks identified)
  - ✓ **Ene-1/2** (energy reduction/ renewables options for high/extreme opportunities identified),
  - ✓ **Wat-1/2** (water reduction/substitution options for high/extreme opportunities identified),
  - ✓ **Rso-1/4** (materials/waste recycling or reuse options for high/extreme opportunities identified)
  - ✓ **Rso-2** (remediation adaptation treatment options for high/extreme opportunities identified)
- **Significant positive/negative impact on Environmental/Social Outcomes** (including Indigenous People of the Land)
- **Significant stakeholder risk or opportunity**
  (as identified in Sta-1)
- **No clear consensus by internal stakeholders**

Multi criteria analysis – key decisions

Develop Options

Multi-disciplinary workshop to identify options

Finalise Options List

Appraisal of options in workshop to delete unfeasible options

Establish Evaluation Criteria with Weightings

Use MCA template to agree criteria based on contract, including social, environmental and economic criteria

Rank Options via MCA

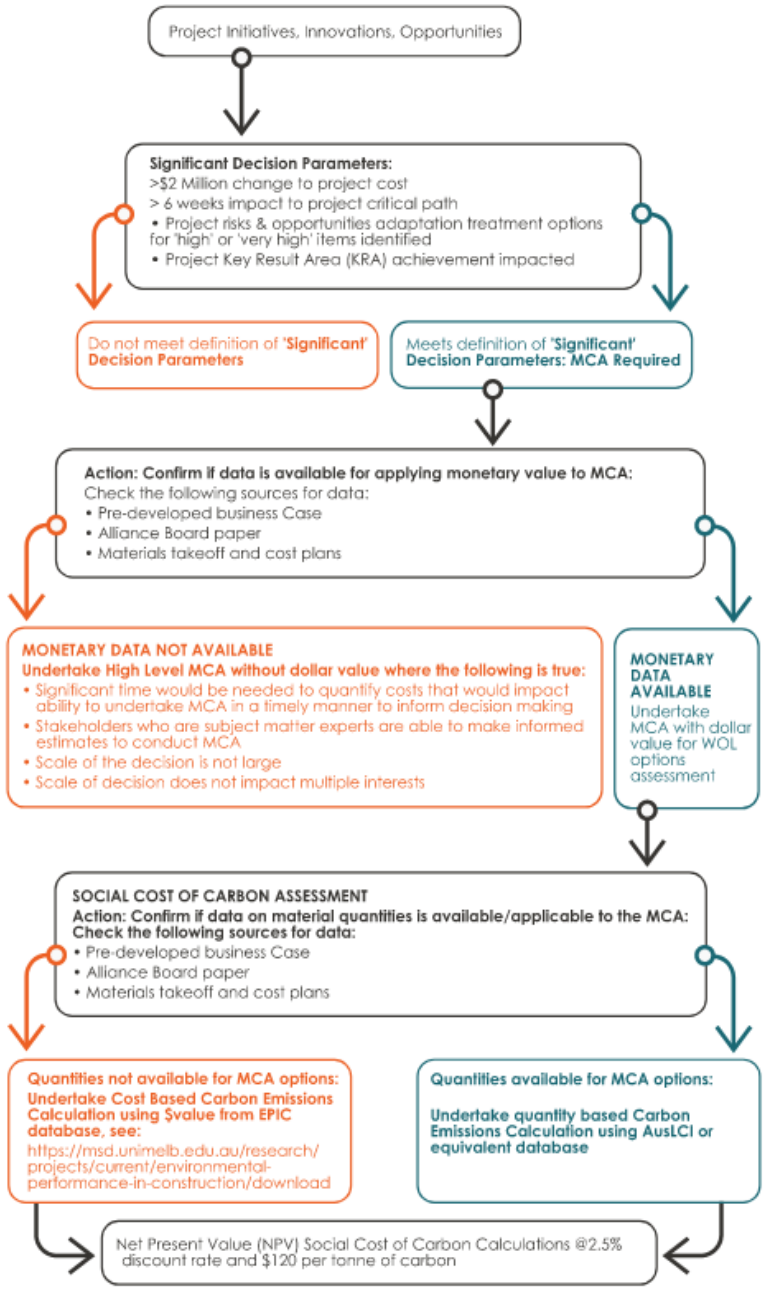
Following MCA analysis of all feasible options, rank to allow decision making by AMT

Example Decision: Power Supply to Site Offices

- Option 1: Diesel fuelled generators
- ~~Option 2: Bio-diesel fuelled generators~~
- Option 3: Grid electricity connection
- **Option 4: Grid connected GreenPower electricity**

Process Flow

for Multi Criteria Analysis (MCAs), Monitised MCAs and Social Cost of Carbon (SCC)



Dealing with different types of decisions

Cross-disciplinary Engagement for MCAs

Minor

Seek advice from relevant stakeholders where applicable
Required when decision:

- only impacts one discipline
- is straightforward
- can be solved with a discussion/short meeting

Medium

Input required from relevant stakeholders at key steps
Required when decision:

- has several factors and impacts more than one discipline
- is not straightforward
- opportunity is 'High' or above risks

Significant

Relevant stakeholders required to provide input into MCA process
Required when decision:

- scale is large and impacts various interests
- has significant cost impact
- situation is evolving/uncertain
- is technically complex

The cost of carbon has been assessed quantitatively in the options assessment: Ecn-1, Level 2

What $ value to use?

- **ACT - first jurisdiction to put $ value on carbon (A$20/tCO2e-)**
  - ✓ **USA:** Recommended US$51/tCO2 (2020) & US$85/tCO2 (2050) - discount rate of 3%. US EPA proposed $190tCO2.
  - ✓ **Canada:** Recommended $38/tCO2 (2020) and $45/tCO2 (2030) at 3% discount Rate.
  - ✓ **UK:** set a value for the SCC in 2007 of US$50/tCO2, increasing at 2% per year, in 2009 moved away from SCC
  - ✓ **Germany:** The German Environment Agency continues to use an SCC for project/policy decisions. SCC estimate $218/tCO2 (2020) and $248/tCO2 (2030) - discount rate of 3%.
- **NSW Government Guide to Cost-Benefit Analysis: TPG23–08 value of SCC (A$123/tCO2 FY23) & (A$128 tCO2 FY2025)**

BRE project: A$120/tCO2 - discount rate of 2.5% for lifecycle of the initiative/decision.

The cost of carbon has been assessed quantitatively in the options assessment: Ecn-1, Level 2

What happens when you don't have carbon values?

SOCIAL COST OF CARBON ASSESSMENT

Action: Confirm if data on material quantities is available/applicable to the MCA: Check the following sources for data:

- Pre-developed business Case
- Alliance Board paper
- Materials takeoff and cost plans

Quantities not available for MCA options:

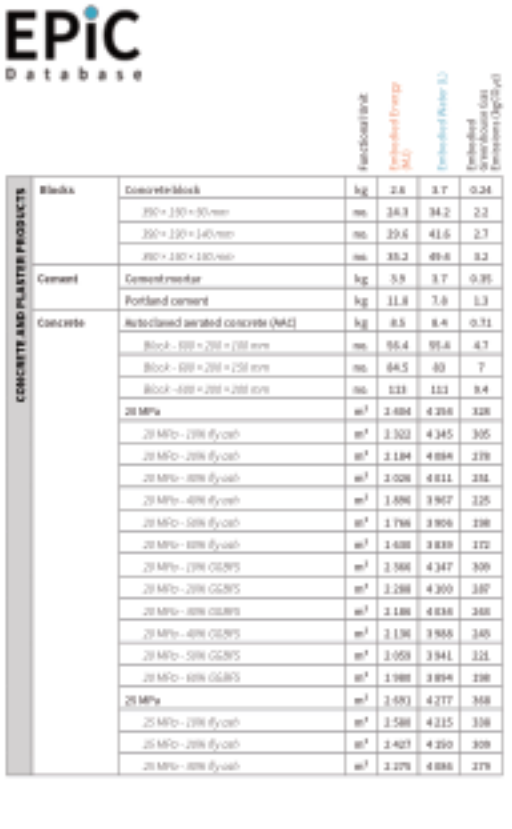
Undertake Cost Based Carbon Emissions Calculation using $value from EPIC database

(https://msd.unimelb.edu.au/research/projects/current/environmental-performance-in-construction)

Quantities available for MCA options:

Undertake quantity based Carbon Emissions Calculation using AusLCI or equivalent database

Net Present Value (NPV) Social Cost of Carbon Calculations @2.5% discount rate and $120 per tonne of carbon



Significant Decisions Process

MCA tool values externalities as well as BaU criteria:

Categories	Category Weightings
Cost	50%
Economic	10%
Environmental	10%
Social	10%
Technical	20%

Financial aspects:

- ✓ CAPEX
- ✓ OPEX

Technical aspects:

- ✓ Constructability
- ✓ Resources
- ✓ Safety in Design
- ✓ Construction Safety
- ✓ Operational Life
- ✓ Maintainability
- ✓ Adaptability

Economic aspects:

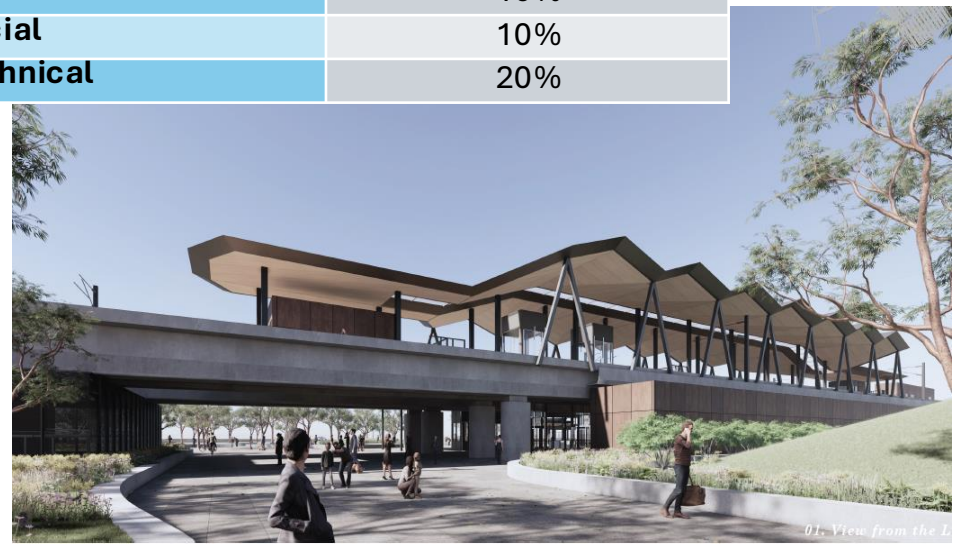
- ✓ Local industry participation
- ✓ Local supply chain impact
- ✓ Aboriginal supply chain impact
- ✓ Reputational impact

Social aspects:

- ✓ Local business impacts
- ✓ Local industry participation opportunities
- ✓ Aboriginal employment opportunities
- ✓ Community impacts
- ✓ User impacts
- ✓ Heritage impacts

Environmental aspects:

- ✓ Energy & Carbon
- ✓ Material quantity reductions
- ✓ Waste quantity reductions
- ✓ Climate Change resilience
- ✓ Water use reduction
- ✓ Pollution (air, land, water, noise, vibration)



Significant Decisions - MCA Template

Options Assessed	Brief Description	Assess via MCA below (Y/N) Justify if No
Option 1:		
Option 2:		
Option 3:		
Option 4:		

Date of MCA Analysis	
Contributors	
Author	

Category	Criteria	Option 1 - Base Case (considerations, explanation and justification)	Unweighted criteria score	Category Weighting	Weighted score	Option 2 (considerations, explanation and justification)							
Cost (CAPEX, OPEX, Externalities)	CAPEX			50%	0								
	OPEX												
	End of life decommissioning												
	Organisational benefits												
	Social Cost of Carbon												
Economic	Local industry participation			10%	0								
	Diverse workforce participation												
	Local supply chain impact												
	Aboriginal supply chain impact												
	Reputational impact												
Environmenal	Energy and Carbon			10%	0								
	Materials quantities/reduction												
	Waste quantities/reduction												
	Resilience to Climate Change												
	Water use/reduction												
	Pollution (air, land, water, noise, vibration)												
Social	Local business impacts			10%	0								
	Community impacts		0										
	User impacts												
	Heritage impacts												
	Climate change and resilience adaptation												
Technical	Constructability			20%	0								
	Safety in Design												
	Operational Life							20%	0			20%	0
	Maintainability												
	Adaptability												
		TOTAL SCORE	0		0		0		0		0		0
				100%				100%				100%	

MCA Criteria Assessment Information

Assessment rating	Description	Score
Strongly negative	·Major negative impact/outcome ·Long term effects ·Possibly irreversible effects	-3
Moderately negative	·Moderate negative impact/outcome ·Impacts may be manageable	-2
Slightly negative	·Minimal negative impact/outcome ·Short term impact/outcome ·Impacts can be managed or mitigated	-1
Neutral	·No discernible impact/outcome	0
Slightly positive	·Minor positive impact/outcome ·Possible only short term ·Confined to a limited area	1
Moderately positive	·Moderate positive impact/outcome ·May provide new opportunities or improvements	2
Strongly positive	·Major positive impacts/outcomes ·Long-term improvements	3

MCA Example - Steel Selection

Category	Criteria	Multi Criteria Analysis											
		Option 1	Unweighted criteria score	Category Weighting	Weighted score	Option 2	Unweighted criteria score	Category Weighting	Weighted score	Option 3	Unweighted criteria score	Category Weighting	Weighted score
		Steel supplied by Bestbar				Steel supplied by Infrabuild				Steel supplied by Plascorp			
Cost (CAPEX, OPEX, Externalities)	CAPEX (Quote for total C054 package) budget to build =	[redacted]	-3	50%	0	[redacted]	-2	50%	-2.5	[redacted]	-3	50%	-1
	Operational Expenditure	N/A	0			N/A	0			N/A	0		
	Social Cost of Carbon ($120/T)	[redacted]	3			[redacted]	-3			[redacted]	1		
Economic	Local industry participation	Bestbar is an Australian company, however steel is sourced from mill in Singapore (Natsteel).	1	5%	0.15	Infrabuild is an Australian company and owns steel mills within Australia	2	5%	0.1	Plascorp sources steel from many international mills	1	5%	0.05
	Diverse workforce participation	N/A	0			N/A	0			N/A	0		
	Local supply chain impact	N/A	0			N/A	0			N/A	0		
	Aboriginal supply chain impact	N/A	0			N/A	0			N/A	0		
	Reputational impact	Positive, best bar are recognised industry leaders for low carbon steel.	2			N/A	0			N/A	0		
Environment	Energy and Carbon	Impacts accounted for in row below.	0	20%	1	Impacts accounted for in row below.	0	20%	-0.2	Impacts accounted for in row below.	0	20%	0.4
	Material Impacts (embodied carbon) TCO2e-	2103	3			6590	-3			2258 - if steel is procured from Celsa mill in Spain. This is unconfirmed.	1		
	Sustainability Certifications	EPDs for products available	2			EPDs for products available	2			EPDs for product, dependent on source mill.	1		
	Resilience to Climate Change	N/A	0			N/A	0			N/A	0		
	Water use/reduction	N/A	0			N/A	0			N/A	0		
	Pollution (air, land, water, noise, vibration)	N/A	0			N/A	0			N/A	0		
Social	Local business impacts	No differentiation	0	5%	0	No differentiation	0	5%	0	No differentiation	0	5%	0
	Community impacts	No differentiation	0			No differentiation	0			No differentiation	0		
	User impacts	No differentiation	0			No differentiation	0			No differentiation	0		
Technical	Capacity to supply required volume of material	[redacted]	0	20%	0	[redacted]	0	20%	0	[redacted]	0	20%	0
	Experience with similar scale jobs		0				0				0		
	Performance with similar scale jobs		0				0				0		
		TOTAL SCORE	8		1.15		-4		-2.6		1		-0.55

MCA Example – Byford Compound Rooftop Solar

Package	Temporary Works
Decision Reference	MCA015
Drawing/ sketch	SELECT Compund Drawings
Decision Description	All site office/crib compounds are powered by diesel generator until the switch can be made (with Western Power Approval) to mains electricity. This switch can take anywhere between 6-12 months. This MCA is for the purpose of determining the most sustainable option for powering these sites, in consideration of the switch. This is specifically for the Byford Site Compound

Options Assessed	Brief Description	Assess via MCA below (Y/N) Justify if No
Option 1:	Diesel Generator, switch to mains in nine months.	Y
Option 2:	Ground solar and hybrid battery, switch to mains in nine months	Y
Option 3:	roof-mounted solar and hybrid battery, switch to mains in nine months	y
Option 4:	Solpod offering 38.5kW (long term rental model for roof-mounted solar and hybrid battery) would commence with connection to the grid.	Y

Date of MCA Analysis	December 2023
Contributors	Bryan Keeler (Senior Project Engineer), Michael Crocetta (Construction Manager), Damien McKay (Commercial Manager), Ashley Wallace (Environmental Manager), Tania Anglin (Comms/Stakeholder Manager)
Author	Leigh Penney (Senior Sustainability Manager)

Options Item	Estimated Weekly Hire Cost (AUD)	40% savings HF Estimated Weekly Fuel Consumption (L)	Diesel Cost Estimated Weekly Carbon (kg)	per L $2.20 Estimated Weekly Operating Expense (AUD)	Total Weekly Generator Run time(h)	$ savings	WoL cost while not connected to mains (3 months)	Savings	Estimated Weekly Social Cost of Carbon @$120/T ($)	Estimated Social Cost of Carbon (3 Months) @$120/T ($)	Carbon saving (t/CO2)	Estimated Social Cost of Carbon Savings @$120/T ($)	
60kVA generator BAU 100% diesel	$400.00	1800	4806	$3,960	168		$ 52,320.00	$ -	$ 576.72	$ 6,920.64	0.00	$ -	
60kVA hybrid generator (@40% Savings against BAU)	$1,699.00	1080	2883.6	$2,376	80	-40%	$ 48,900.00	$ 3,420.00	$ 346.03	$ 4,152.38	199.93	$ 23,991.55	
60kVA hybrid generator (@30% Savings against BAU)	$1,699.00	1260	3364.2	$2,772		-30%	$ 53,652.00	$ (1,332.00)	$ 403.70	$ 4,844.45	149.95	$ 17,993.66	
60kVa hybrid generator with ground mounted solar array	$1,944.00	720	1922.4	$1,584	60	-60%	$ 42,336.00		$ 230.69	$ 2,768.26	299.89	$ 35,987.33	Additional c
60kVa hybrid generator with 2 x ground mounted solar array	$2,189.00	450	1201.5	$990	45	-75%	$ 38,148.00		$ 144.18	$ 1,730.16	374.87	$ 44,984.16	Additional c
60kVa hybrid generator with roof mounted solar (50kW)	$1,900.00	450	1201.5	$990	25	-75%	$ 112,710.00		$ 144.18	$ 1,730.16	374.87	$ 44,984.16	Additional c

LONG TERM OPTION	Estimated Weekly Hire Cost (AUD)	Elec costs (annual)		Cost per year	Green Power offset Cost (LOR Min Stds) $	WoL costs per year	% Savings against BAU
BAU Grid connection only)	$ -	$ 51,530.00	tba	$ 51,530.00	$ 5,153.00	##########	na
SolPod option (38.5kW solar + grid connection)	$ 242.31	$ 49,130.00	tba	$ 61,730.00	0	##########	-8.2
SolPod option (38.5kW solar + grid connection) NEW $	$ 282.77	$ 49,130.00	tba	$ 66,886.50	0	##########	-15.3
~~SolPod option (65kW solar + grid connection)~~	~~$ 415.38~~	~~$ 47,430.00~~	~~tba~~	~~$ 69,030.00~~	~~0~~	##########	~~no~~
~~SolPod option (65kW solar + grid connection)~~	~~$ 623.08~~	~~$ 45,430.00~~	~~tba~~	~~$ 77,830.00~~	~~0~~	##########	~~no~~

	~~WoL cost while not connected to mains (6 months)~~	~~Savings~~
~~60kVA generator + fuel cell~~	~~$ 113,360.00~~	~~$ -~~
~~60kVA hybrid generator (@40% Savings against BAU)~~	~~$ 116,246.00~~	~~$ (2,886.00)~~
~~60kVA hybrid generator (@30% Savings against BAU)~~	~~$ 116,246.00~~	~~$ (2,886.00)~~

New LORA PS

- All off-grid site facilities must utilise a generator with a battery energy storage system to achieve a 40% reduction in diesel consumption.

Category	Criteria	Multi Criteria Analysis											
		Option 1 – Base Case Diesel Generator, switch to mains in nine months.	Unweighted criteria score	Category Weighting	Weighted score	Option 2 Ground solar and hybrid battery, switch to mains in nine months	Unweighted criteria score	Category Weighting	Weighted score	Option 3 roof-mounted solar and hybrid battery, switch to mains in nine months	Unweighted criteria score	Category Weighting	Weighted score	Option 4 Solpod offering 38.5kW (long term rental model for roof-mounted solar and hybrid	Unweighted c score

MCA Example – Electric Vehicle Chargers

MEL connect

Multi Criteria Analysis

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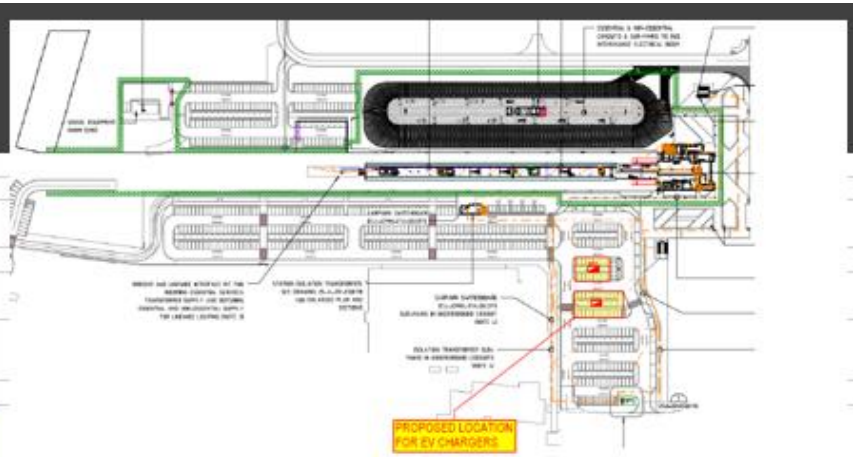
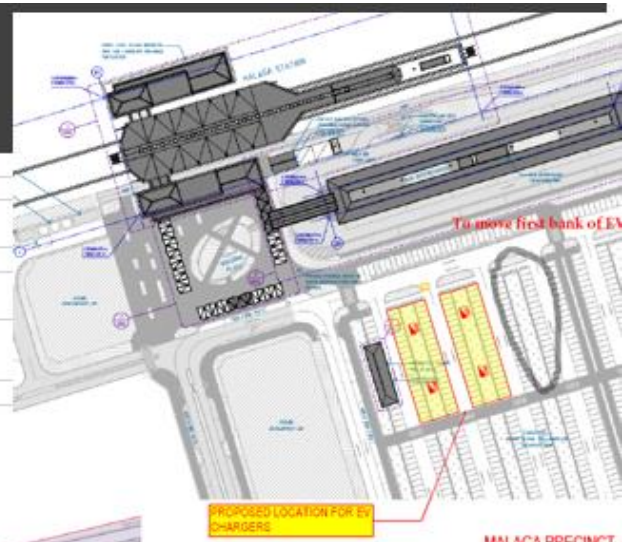
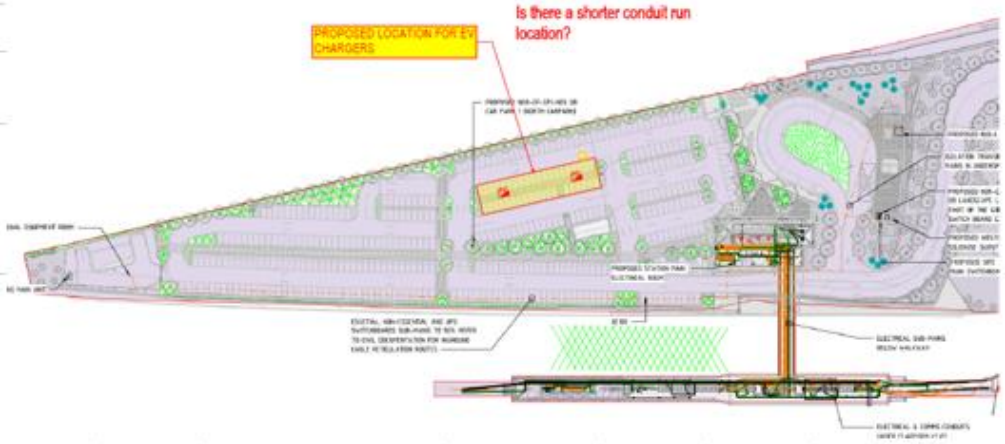
MCA SUMMARIES

Package	Feasibility Study for installation of Electric Vehicle Charging
Decision Reference	MCA-023
Drawing/ sketch reference	Report Feasibility Study
Decision Description	To install 7kW chargers and infrastructure Day one at all MEL stations at 5 EV chargers (10 of) per stations

Options Assessed	Brief Description	Assess via MCA below (Y/N) Justify if No	Total weighted score
Option 1:	BAU – provision for only	Y	-1.3
Option 2:	5 No. dual port 7kW AC EV charging stations per MEL Station	Y	3.6
Option 3:	Max No of 7kW EV charging stations to suit limitations of current electrical design	Y	1.3
Option 4:	Max No of 22kW EV charging stations to suit limitations of current electrical design infrastructure per MEL Station	N – No MCA undertaken as 22kW chargers were not seen as suitable for the function of the stations	n/a
Option 4:	Dual port 7kW AC EV charging stations to suppor t10% of the total number of car bays (inclusive of modiification to electrical infrastructure)	N – program did not allow for additional significant redesign. Significant numbers of EV chargers, was seen as over extending PTA	n/a







MEL connx

MORLEY - ELLENBROOK LINE

Multi Criteria Analysis

MCA SUMMARIES

Package	**Site Energy Options - Whiteman Park Compound**
Decision Reference	\\group.local\dfs\data\AU\Construction\West\Projects\K97\1450 Sustainability\1452 Project Supporting Docs_Interconnected credits_NET ZERO STRATEGY\Opportunities\Whiteman Park Site Energy
Drawing/ sketch reference	**See options**
Decision Description	**Site compound power options for Whiteman Park as cannot connect to grid**

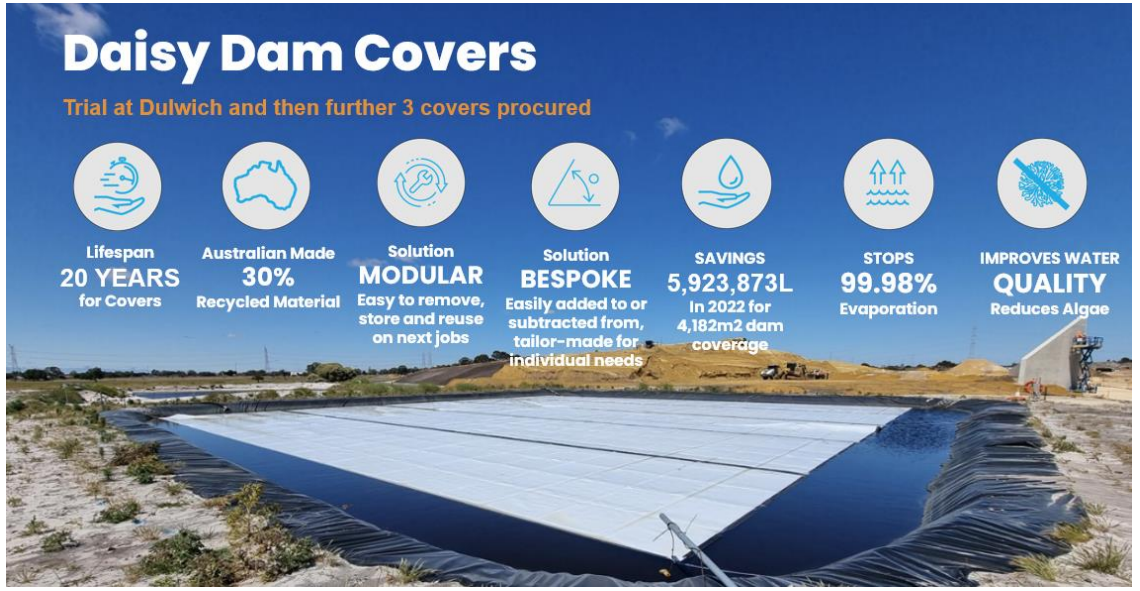
Options Assessed	Brief Description	Assess via MCA below (Y/N) Justify if No	VoL Cost	Total weighted score
Option 1:	**SELECT - BAU Diesel Generator (2200L)**	**Y**	**$415,850**	**-3.5**
Option 2:	**SELECT - BDM 45kVA hybrid battery and UPS with 100kVA Prime Power Diesel Generator**	**Y**	**$449,914**	**-1.3**
Option 3:	**SELECT - BDM (Akuo) 75kW Solar Array with 110kVA Generator Microgrid (with 60kW Battery)**	**Y**	**$480,933**	**6.9**
Option 4:	**SELECT - BDM (Akuo) 75kW Solar Array with 110kVA Generator Microgrid (without Battery)**	**Y**	**$368,181**	**5.8**
Option 5:	**Black Stump 6kWp solar Microgrid array with 50kWh LiFePo4 battery bank with 50kVa (Bio)Diesel generator**	**Y**	**$437,401**	**5.9**
Option 6:	**Hybrid Systems Solar 22.2 kWp solar PV Microgrid with 53.2kWh battery with 22kVA diesel back up genset (max continuous 85A single phase output)**	**N Requires 3 phase for site compound and system likely too small**	**$157,002**	**n/a**
Option 7:	**Hybrid Systems 40 kWp solar PV Microgrid with 73kWh battery with 44 or 66kVA diesel back up genset (max continuous 404A three phase output)**	**Y**	**$417,243**	**7.6**

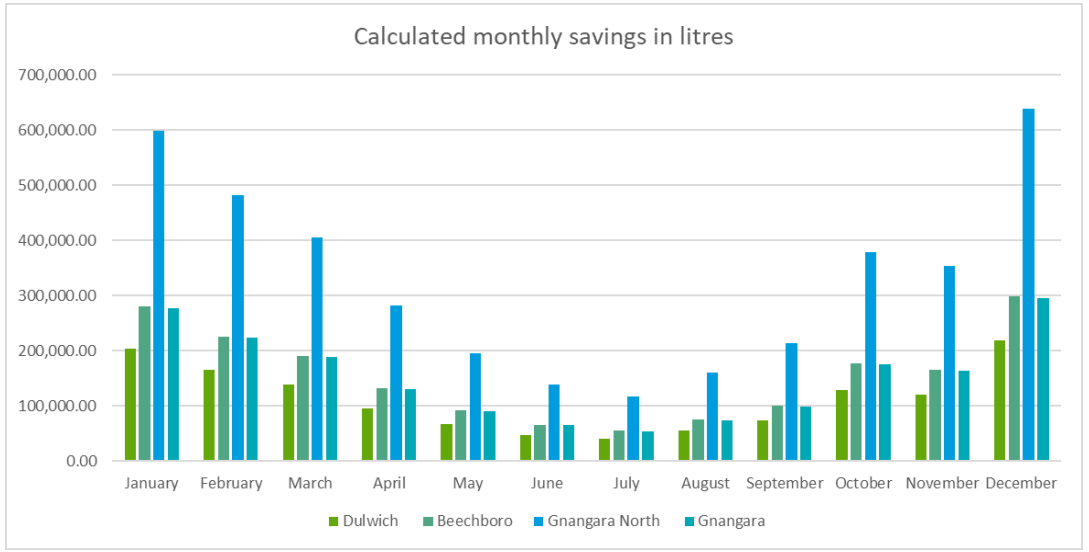
MCA Example – Site Energy Options

Lessons Learned

Opportunities / Constraints / Risks

- Embed the process early and get SLT buy-in to develop
- Tag on to existing processes to ensure it happens as required!
- Make it fit the project and decisions – needs to be agile!
- Hold teams accountable and ensure widespread use (disciplines)
- Define how you will implement SCC, make this workable/agile for your project
- Helps to get innovations/initiatives up, particularly when comparing with traditional BaU CAPEX only (i.e. renewables)





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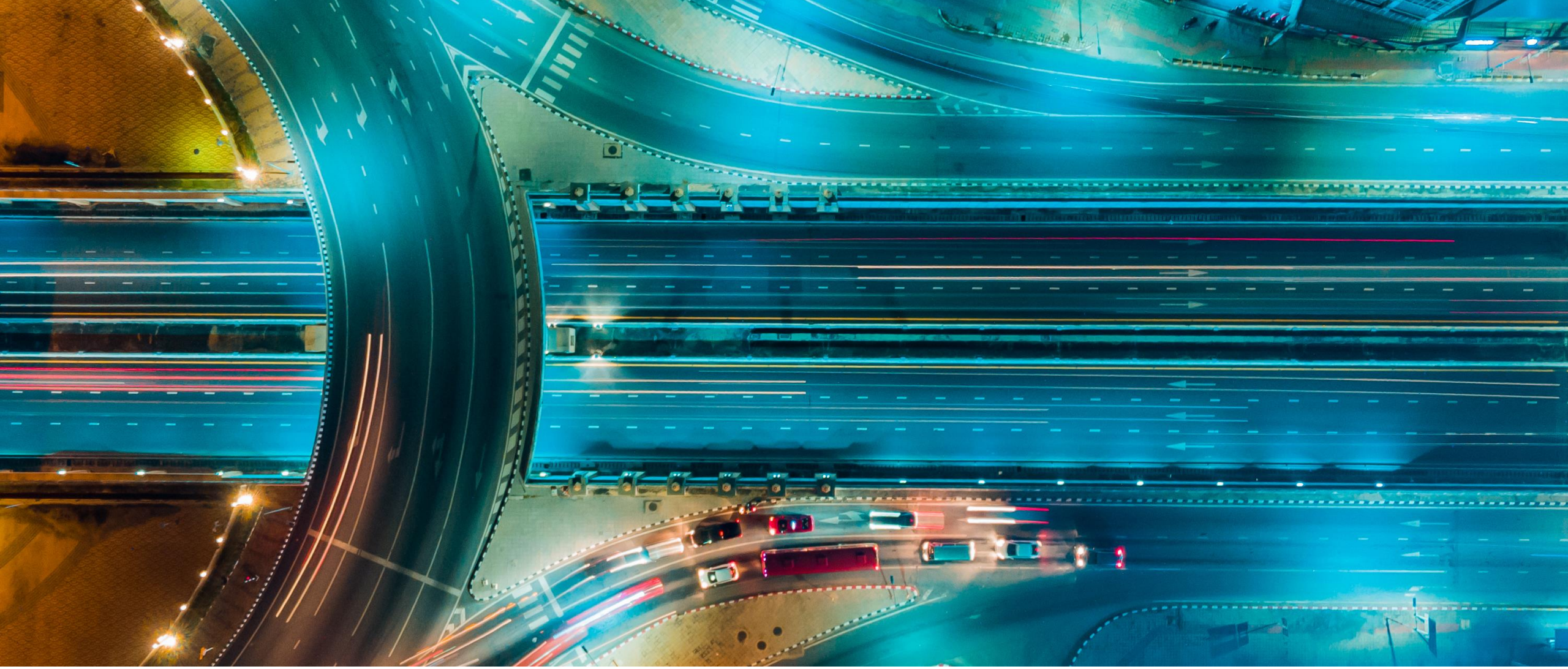
Thank You



Laing O’Rourke’s Responsible Decision-Making Framework

Sam Donaldson, Laing O’Rourke

LAING O'ROURKE

ISC Webinar

RESPONSIBLE DECISION MAKING

Introduction to responsible decision?

Methods to Responsible Decision Making

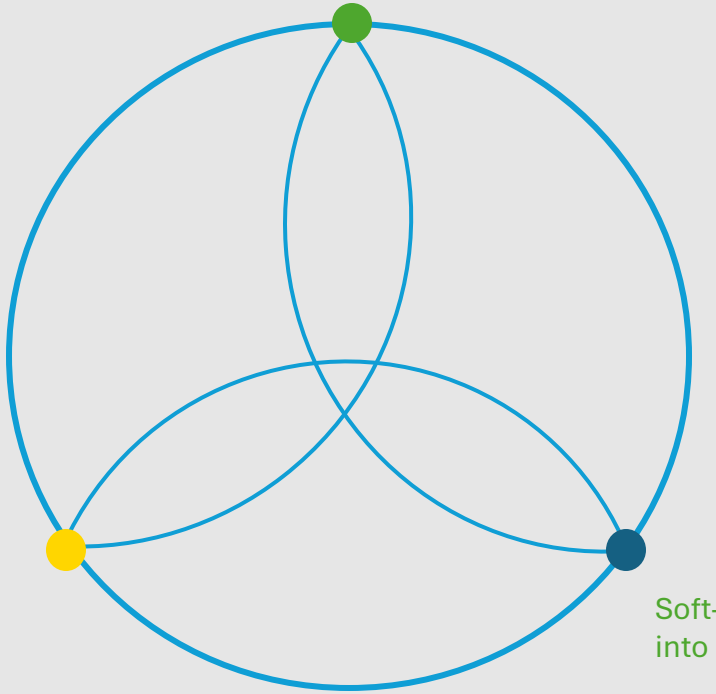
RDM underpins Laing O'Rourke's operating philosophy

Our operating philosophy

- The RDM framework ensures decision makers consider Laing O'Rourke's mission, purpose and values in their decision making.
- The framework outlines a clear process for decision making, underpinned by universal principles of sustainability (i.e. systems thinking).

We have identified three areas of embedment:

Identifying triggers for a formal RDM process



Hard-wiring RDM philosophy into our policies, systems and processes

Soft-wiring RDM philosophy into our culture

Steps to Responsible Decision Making

Inform

Inform the problem

Understand the problem with the right people, information and identify options

1

Decide

Make the decision

Considers Laing O'Rourke's mission, values & principles in light of the problem

2

Act & Communicate

Act and Communicate

Agree on the steps and communicate the decision

3

Reflect

Measure Impact

Measure the actions to ensure its desired impact on the business, people and environment

4

Making project decisions with purpose

How corporate MCAs help shape project-based MCAs

Alignment with strategic goals

- Projects align their decisions with the businesses mission, purpose and values
- Act as a useful tool to support balanced scorecard requirements in the IS rating

Consistency and efficiency in decision making

- Unifies MCA approaches that lead to more consistent decision making
- A ready-made tool to save projects developing MCAs from scratch

Culture and stakeholder buy-in

- Improved understanding leading to increased buy-in and faster decision making
- Easier for projects to justify decisions and for the business to compare outcomes across all projects

Considerations

- Projects need to be flexible and adjust to suit other stakeholders values and processes
- Need to adjust values and weightings to suit the type of situation or problem being addressed

Question & Answer