

INNOVATION AND CREATIVITY IN BUSINESS CASE DEVELOPMENT

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BCA Practice Notes are a collection of papers designed to explore specific themes or topics of business case development in depth. They are written with Business Case Approach (BCA) practitioners in mind, but may be of relevance and interest to anyone involved in business cases – whether through development, assessment or decision making. They are not intended as strict guidance in the traditional sense and do not represent formal NZ Transport Agency policy.

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In 2013 the NZ Transport Agency introduced the Business Case Approach (BCA) to land transport investment. The BCA, together with the investment management principles on which it is founded, signalled a significant change in the way transport investment operates in New Zealand.

Although implementation has not been without its challenges, there were some important reasons to adopt a better approach to the way we manage our transport investments. Among these reasons was an acknowledgement that the transport problems we face today are becoming increasingly complex, and that yesterday's solutions won't solve today's problems – let alone the ones we'll face tomorrow. Intervention-led approaches, such as continuing to simply add road capacity in order to meet rising demand, are no longer sufficient to meet society's needs. Essentially, we needed to get smarter about how we respond to transport problems; the BCA was introduced to help us achieve that.

The transport sector was seeking an approach to transport planning and investment that encouraged and enabled more innovative ways of responding to transport problems. Yet simply using the BCA will not, by itself, guarantee a steady stream of smart, innovative ways to address the transport issues faced every day by New Zealanders.

This practice note takes a deeper look at some of the key characteristics of innovation and creativity and how they can be better integrated into the practice of business case development. The aim is to prompt practitioners to look more deliberately at how they can actively foster innovation and encourage creative thinking in how, as a sector, we choose to respond to the nation's present and future transport challenges.

The nature of innovation and creativity

Before looking at the expectations for business cases and investment decisions, it's important to think about what 'innovation' and 'creativity' might actually mean.

This is a deceptively simple question, but what do transport decision makers – or anyone else, for that matter – really mean when they talk about wanting to see more innovation? After all, while it's an easy word to throw into a conversation, it often isn't clear how to respond when someone says 'Be innovative'.

Simple definitions for innovation and its close companion, creativity, are surprisingly hard to pin down; the internet is awash with definitions, many of which are less than helpful. Perhaps the most useful view comes from analyses that seek to find common themes across multiple definitions. Typically these emphasise three aspects that can be thought of as essential components of innovation:

- » the result is something new (or original, or fresh)
- » the result has some value
- » there is often also a sense that some form of process is involved.

These ideas were summarised by Sir Ken Robinson, a leading thinker on the role of creativity in education, when he said: 'I define creativity as the process of having original ideas that have value.'

Some caution needs to be used around concepts such as 'new' and 'original' ideas. In reality, when most innovations are analysed objectively they are really different ways of using or combining things that we already know about. A familiar example of this is the combination of the pain relief drugs paracetamol and ibuprofen into a single tablet to increase the effects beyond what either one could achieve in isolation. Both drugs had existed for many years, but the innovative step of combining them allows their benefits to be maximised.

Similarly, the growing use of GPS-based systems in vehicles to allow drivers to navigate more reliably and safely is simply an extension of more basic systems that have been used in the maritime industry for years, based on existing satellite technology originally introduced for military purposes. Further innovations using the same technology platforms, along with other existing systems, are being used to enable improvements such as advanced in-car driver information systems, and, ultimately, autonomous vehicles.

An important point to take from this is that 'new' or 'original' don't have to be challenging – or even particularly radical. Mostly what they require is an open-minded approach and a willingness to invite ideas and consider them – no matter how crazy they may initially seem. Often it comes down to using what we already know about, but in a different way or context. It also points to a need to integrate effectively across areas of expertise, to maximise the chances of new ideas being generated.

A further important point is that innovation doesn't have to involve technology. Sometimes it will, but the most effective innovations often involve relatively simple changes in the way we do things, such as our practices and policies, and using them in different ways that better support the outcomes we want.

Ultimately, each organisation needs to consider what innovation means in its own context, but this should at least include the core aspects outlined above.

Bringing innovation and creativity to business case development

Background

Perhaps the first question to answer here is, 'How does the BCA support innovation and creativity?' After all, this was a key reason for adopting it.

To understand this, let's take a look back to why the BCA was introduced in the first place. In 2012, a sector-led review of transport planning practice in New Zealand concluded that, when seeking ways to respond to transport problems, too little emphasis was being placed on identifying genuine **alternatives**.^{*} This meant that too often assumptions were made early on that if a problem was a transport one, the solution must also be transport based.

The result of such thinking, still reflected in our transport programmes today, is an over-emphasis on supply-side solutions. These are solutions that seek to address a problem by providing more of something, usually either new infrastructure or new services.

In recent years in New Zealand it has become best practice to think more broadly about how we can respond to transport problems, for example, by looking at the decisions we make around land use, and whether they are able to support good transport – and other – outcomes. This is often referred to as an integrated approach to planning, and has underpinned several established strategies developed to manage the effects of rapid population growth in areas of New Zealand, including Auckland, parts of the Waikato and Bay of Plenty regions, and Canterbury. Such integrated approaches rely on considering demand- and productivity-side responses equally, alongside the more traditional supply-side ones.

The problem identified in the 2012 review was that, despite recognition of the need for a more integrated approach, the sector was still not showing a strong ability to think

^{*} In this context, an alternative can be thought of as a strategic way of responding to the problems and delivering the benefits identified in a business case. An alternative is a higher-level response than an option, and is generally taken to mean an alternative to conventional, supply-focused approaches that require new infrastructure, but can also mean an alternative to a transport-based solution. It involves exploring a range of strategic alternatives, for example different land-use arrangements, policy or regulatory changes, encouraging more use of other modes or greater use of technology to address transport problems such as safety or projected growth in network demand.

beyond responses that mainly aim at increasing supply in some way: new or wider sections of road, improved connections that allow more vehicles to pass at efficient speeds, new bus services, and so on.

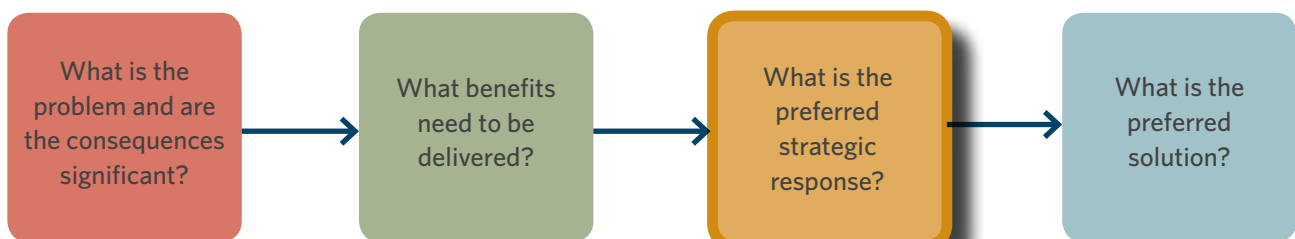
While all of these responses have their place, alternative approaches that seek to manage the rate at which the demands for travel increase, or to use the existing transport system more efficiently so it can accommodate more use, have only infrequently been developed into effective proposals or, for that matter, implemented. Indeed, a quick read of a range of recent business cases suggests that true alternatives are rarely, if ever, being identified alongside traditional supply-focused responses. Even where they are being identified initially, it is not clear that they are then fairly evaluated against more conventional responses.

Identifying the strategic response

The BCA provides plenty of opportunity to address this imbalance. The structured approach to building a case for investment includes a clear requirement to look in more detail at the ways we might respond to transport problems. It requires us – after first gaining a clear understanding of the problems and potential benefits involved – to identify our strategic response and, in doing so, to look at alternative ways of responding.

In other words, we now need to be up-front about the way we are going to respond, and why that is the best approach, before locking down a specific solution. This means looking equally at supply-, demand- and productivity-based responses and deciding on the appropriate way forward, without having the distraction of a preconceived solution already on the table. The diagram below shows where this consideration fits in the overall line of enquiry common to all business cases.

The line of enquiry common to all business cases



So, although opportunities to apply creative thinking exist all the way through development of a business case, when it comes to shaping the response at a strategic level there is a wide-open door to innovation – if we choose to use it. This is where the crazy ideas should be most welcome – actively invited, even – because if the only approaches that get proposed are ‘tried and tested’ ones, new and original ideas will remain unexplored and innovation will be stifled.

The programme business case phase is perhaps where the greatest opportunity exists to identify new approaches, and this is arguably where the greatest efforts to innovate should be taken. Yet programme business cases being submitted to the Transport Agency mostly show little or no sign of having pursued this opportunity. In particular, there is little evidence that realistic alternatives to supply-side responses are being evaluated on a level playing field alongside those which simply add capacity to the transport network. The question needs to be asked: ‘What is holding people back?’

Of course, the programme business case isn’t the only opportunity to actively pursue innovation through the BCA; even if the investment doesn’t call for a programme to be developed, the shaping and evaluation of options in the early part of a single-stage business case can be just as rich a hunting ground for new and creative ways of dealing with transport problems. Yet here also there is little evidence that this is happening in practice.

It doesn’t stop there either; innovation can be used in what can seem like relatively small ways to help develop and communicate the investment story. A good example of this is the adoption of the concept of ‘storyboarding’ from the communications and media industry to develop an A3 infographic that presents a ‘programme on a page’. This has

quickly become a popular and powerful communication tool that also forces business case writers to pare their story down to what really matters: there isn't much room for redundant information on a sheet of A3 paper, especially if you're going to keep it readable.

A cognitive model for creative thinking

Before looking at how we can better harness innovation in business case development, it's useful to take a look at how creative processes actually work. Contrary to the way creativity has traditionally been thought of, which often verges on the mystical, recent research in fields including psychology and cognitive neuroscience has revealed a lot about how we use our minds to think creatively. For example, when we engage in creative problem-solving. Creativity is not limited to the domain of the artist, writer or musician; it is available to everyone.

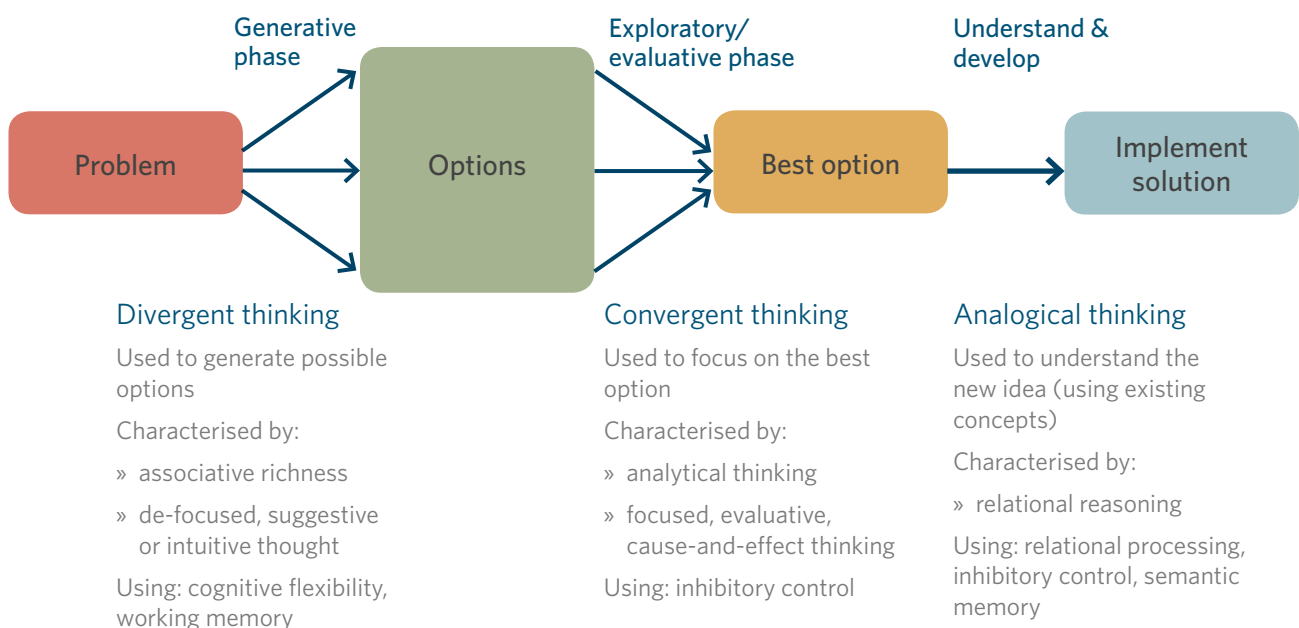
One of the enduring ways to explain creativity over the years has been the concept of a **creative process**. Many models have been developed to try to capture or explain the creative process; one of the better known (and better studied) was proposed by psychologist Mihaly Csikszentmihalyi, who identified five key steps:

- » **Preparation** - becoming immersed in problematic issues that are interesting and arouse curiosity.
- » **Incubation** - ideas churn around below the threshold of consciousness.
- » **Insight** - the 'Aha!' moment when the puzzle starts to fall together.
- » **Evaluation** - deciding if the insight is valuable and worth pursuing.
- » **Elaboration** - translating the insight into its final work.

More recently, cognitive neuroscience has proposed a simple cognitive model which brings together a number of these concepts, as shown in the diagram below. Starting with a clearly described problem, a phase of **divergent thinking** takes place - where the aim is to think as widely and imaginatively about the problem as possible, creating a wide range of options (and types of options) without attempting to judge what is produced. The idea is to generate as many options as possible, without thinking at all about whether they are good, bad or indifferent, as this might inhibit the generation of ideas.

The divergent thinking phase is followed by a phase using **convergent thinking** - where the aim is to think much more analytically, using critical thinking skills to evaluate ideas and focus on the best option. The final phase involves **analogical thinking**, where we try to develop and clearly explain our new idea in terms of concepts that are already known and understood.

A cognitive model for creative problem-solving



Perhaps unsurprisingly, this model bears many similarities to the problem-benefit-response-solution line of enquiry embodied by the BCA. For example, notice how the process starts with a (hopefully well-defined) problem. This highlights why it is so important not to rush the step of problem definition, and to gain confidence that we are tackling the right problems, before going further; get the problem wrong, and all your creative efforts will be taking you in the wrong direction!

Divergent and convergent thinking

To help understand the distinction between divergent and convergent thinking, consider the following examples of a problem:

Convergent example

I live six kilometres from work. My car uses 10 litres/100km. I want to use less fuel in my commute for conservation reasons. Money is no object.

Find the three best replacement vehicles for my car.

Divergent example

I live six kilometres from work. My car uses 10 litres/100km. I want to use less fuel in my commute for conservation reasons. Money is no object.

What options do I have to reduce my fuel consumption?

The problem is essentially the same, but the questions have subtly changed. The convergent example specifically asks for a vehicle, whereas the divergent example opens the door to less obvious options, such as relocating closer to work, telecommuting, walking, carpooling, taking public transport, and so on.

It isn't much of a stretch of the imagination to appreciate that the same principle applies to how we formulate questions in business cases. Frame a problem as a convergent question, and you will limit the range of responses people generate. Frame the same problem in a divergent question, however, and you invite people to engage their imagination.

This is not to say that one form of question is better than the other; as shown in the cognitive model, **both** divergent **and** convergent thinking are required to generate and evaluate ideas in a creative process. The important thing is to recognise that these are needed **at different times**, and use them accordingly.

Harnessing the power of innovation in business cases

So, if innovation isn't something that simply happens because we want or need it to, or because we code it into a process or guidance, how can we make a deliberate, sustained effort to achieve what highly innovative organisations or creative individuals appear to do effortlessly?

There is much that can be done to make sure innovation is encouraged and supported in the context of business case development. There are a number of ways to break this down: here I have chosen to look at **people, places, processes** and **products**, but other categories could be just as useful.

People

Innovation is driven by people, so making sure people are empowered to innovate and think creatively is a critical first step.

Creativity is not a mysterious force only available to a selected few; it's a teachable and learnable skill.

We have a tendency to view only a few individuals as being highly creative or good innovators, yet there is a growing body of evidence to show that we are all, as human

beings, capable of being creative – and we often demonstrate this creativity every day. Why, then, are we so often reluctant to see ourselves as being capable of bringing this innate ability to our work?

Part of the issue could be that many senior managers still believe only a few individuals are natural innovators – a view that becomes self-reinforcing, especially when executives are bombarded with poorly formed, poorly articulated ideas on a regular basis. The possibility that most of these ideas come from highly capable and intelligent workers, who simply haven't been trained or encouraged to fully develop their innovation and communication skills, is usually overlooked.

Leadership that exemplifies and supports efforts to innovate is essential to enable a creative workforce. People will be reluctant to challenge – or even question – the status quo if they are quickly labelled as troublesome or a barrier to progress; yet all too often this happens at all levels of an organisation.

In the context of business case development, this can quickly result in potentially good ideas being sidelined without receiving the attention they deserve, simply because they are different or unusual. Often, the drive to deliver becomes so strong that any attempt by individuals to suggest other ways of looking at problems or responses is seen as a threat.

*If you're not prepared to be wrong, you'll never come up with anything original.
(Ken Robinson)*

Problem owners, business case developers and workshop facilitators need to work collectively to create an environment that actively encourages alternative ways of looking at things. This includes making sure the environment feels safe to those who may be easily discouraged from speaking up; for example, if they believe their ideas will be laughed at or scorned.

Included in this is a need to make sure that the pressure to 'deliver' does not become a barrier to innovation. An often unspoken assumption is that traditional responses are quicker to implement, but again this is flawed thinking. Not only is there a need to look more widely at how we deal with transport problems, as shown earlier, but focusing only on tried and tested approaches often leads to simpler, quicker and cheaper alternatives being overlooked. How is it possible to say that we have the most cost-effective approach, if we haven't genuinely looked at what else could be done?

Decision makers are placing increasing scrutiny on the need for investment proposals to consider real alternatives to traditional transport interventions. Lightly skimming over the idea generation needed to create alternatives and options is likely to result in real delays and expensive rework later, as decision makers question whether 'enough has been done' in this respect. Seeking to get to implementation quickly by avoiding the relatively small amount of extra effort involved in creative idea generation is a false economy.

Places

What sort of environment is best to encourage innovation and creative thinking? Answers to this deceptively simple question are many and varied, but there is strong evidence to suggest that genuinely new creative insights are associated with situations where people are more relaxed and can give thoughts a chance to incubate. Anecdotally, some places are strongly associated with the moment of insight, such as while taking a shower or bath (look at Archimedes).

From a business perspective this might not appear very practical, but it can help to realise that creative ideas are most easily produced when people are relaxed and there is some humour present; these are both things that can be built into group exercises such as options workshops. Taking this a step further, the creative process outlined by Csikszentmihalyi involves an intense period of studying an idea or concept in detail (preparation), followed by a period of incubation where the aim is to allow ideas or concepts to simmer away in the subconscious.

While for some people this may mean taking a shower, having a nap or going for a long walk on a beach, in the context of a workshop or team-based exercise it could involve something as simple as following a discussion period with a coffee or lunch break. This gives participants time to reflect in an informal way on what they have been discussing, as in the example in 'A problem of ice, bears and honey pots' on the following page.

The goal here is to allow time for ideas to be connected in the brain, to achieve what is often described as the illumination step in the creative process – more commonly known as an ‘Aha!’ moment.

A problem of ice, bears, and honey pots

In studies of the most creative work groups, there are nearly always three things present. The first is a team that works well together. The second is laughter, suggesting a connection between humour and creativity. And the third is a level of informality. All three of these were present in one of the most creative brainstorming sessions ever held by a major utility company, Pacific, Power and Light (PP&L). The following story relates how a flash of insight on one of their brainstorming sessions solved one of the organisation's most costly, difficult and unsolvable problems.

PP&L was the electric utility responsible for providing power to the North West Cascade Mountain area of the United States. This area faces severe weather in spring and autumn each year resulting in heavy ice deposits on power transmission lines. Lines frequently come down under the weight of the ice.

The company's method of removing the iced lines was to send linesmen through the snow and up the icy pylons and to physically shake the ice off the lines. It was a long, arduous, costly and unpleasant way of dealing with the problem.

A brainstorming session was held to look at what could be done.

The PP&L group spent a whole morning looking at the problem but got nowhere. Frustrated and running out of ideas, the group decided to take a coffee break.

During coffee, Bill, a linesman, had everyone in fits of laughter.

‘Last week I was chased by a bear. It even climbed a pylon after me.’

As the laughter died down, someone suggested, ‘Why don't we get the bears to climb for us?’

‘How?’

‘We could put honey pots on top of the pylons.’

‘No, the raccoons would get there first.’

‘Anyway we'd need helicopters to put the pots in place and they'd frighten the bears,’ said one of the secretaries. ‘I remember the vibrations from helicopters in the Vietnam war when I was a nurse.’

There was silence as everyone realised they'd struck gold.

It became standard practice in PP&L to use hovering helicopters to remove ice from frozen cable lines through the downforce from their swirling rotor blades.

(Adapted from <http://www.managetrainlearn.com/page/group-creativity>)

Processes

There is a tendency in business circles to think in terms of processes that are a series of prescribed, tightly defined steps aimed at delivering a predictable result. Often these are closer to what are more properly known as procedures. However, for creativity to flourish it is important that processes allow room for divergent, free-flowing thought and interaction; clenching to fixed, intransigent procedures can be highly counter-productive.

In the context of the BCA, the term ‘process’ can often better be thought of as ‘aiming to do things in the right order’. For example, before doing anything else, make sure you are starting with a clear understanding of the **problem**.^{*} This sits right at the front of the cognitive model on page 4, and is the starting point for thinking about options; put simply, the problem is what any successful response must address.

There is a balance to be found here; from the cognitive model, the use of idea-generating workshops that are deliberately staged to encourage non-judgemental, divergent thinking,

^{*} For more information about understanding problems, see *BCA Practice Notes 2: How problem statements are used in practice* and *BCA Practice Notes 3: Root cause analysis in business case development*

alongside more convergent, evaluative steps, can be a powerful combination. Rigid, multi-criteria analysis (MCA) frameworks fall squarely in the latter category; start focusing on these too early, and you will close down the opportunities for really 'outside the square' thinking – that's not innovating.

The design and facilitation of idea-generating exercises becomes extremely important; nowhere is this more apparent than in workshops intended to identify alternatives and options for addressing the problem. Too often, little thought is given to how participants can be encouraged to consider anything other than conventional, supply-focused, transport-based responses. Anecdotal evidence suggests that less conventional ideas **are** being proposed, but then quickly judged and dismissed out of hand – perhaps because the knowledge of how to evaluate them properly is not available to the participants. Every time this happens, there is a lost opportunity for potential innovation.

Ways to better support creative thinking in workshops

- » Plan workshops carefully; think about who should be involved, including whether they will bring a range of perspectives into the room. Bear in mind that specialists will most easily come up with solutions that reflect their own specialism – this is just an extension of the principle that if you have a hammer, everything looks like a nail.
- » Using the BCA capability of groundwork, consider who you can recruit to help think about option generation and talk to them well before the workshop; you don't have to wait until everyone's in the room!
- » Think about how you will ensure that participants are familiar with the problems and benefits beforehand; not just the problem statements, but a description, including what the evidence tells us about the problem.
- » As facilitator, it's important to create an environment that **tolerates** ideas, rather than one that **judges** them. Consider setting some ground rules, such as 'No comments on other peoples' ideas', or 'Respect other peoples' ideas – the crazier the better!'
- » Separate workshops into distinct phases. Start with free-form thinking exercises designed to get ideas flowing – even if these are not connected to the defined problem, they will help people get into a divergent mindset. This is also a good opportunity to bring some humour into the situation! Several examples of free-thinking exercises have been included at the end of this practice note: choose one to suit your audience, or see if you can find your own.
- » Follow this with a period devoted purely to generating ideas, with no evaluation – a good starting point could be as simple as asking, 'What's the most unusual way you can think of to solve this problem?' Finally, bring people back to the convergent task of evaluating all the ideas and deciding which ones should be investigated further. Bear in mind the comments under 'Places' on page 6 about the need to allow people time to let ideas connect and incubate, and aim to fit that breathing space into the schedule. Ideally the evaluative phase will be a separate session, even if there's only a lunch break in between.
- » Although it may sound counter-intuitive, it's important to set some boundaries. Completely unconstrained thinking is often harder than working within some well-designed limits – too much choice becomes overwhelming and it's hard to decide where to start. It is also important that the workshop stays focused on the task at hand! Start with making sure the problem is clearly framed and there are some clear objectives relevant to the problem.
- » You can also use boundaries to broaden thinking around a range of genuine alternatives, for example, starting with an instruction to 'Think of how you could solve this if you couldn't change the road network' for the first 10 minutes. At the same time, if someone comes up with something else, capture it; be tolerant of people pushing the limits.

This is by no means an exhaustive list; practitioners are encouraged to search out and use their own ways to encourage divergent thinking, and not only in workshop situations. The golden rule here is to keep divergent and convergent exercises separate; no one can think in both ways at the same time – our minds simply aren't structured that way. As soon as a group begins to evaluate ideas, the ideas themselves will stop flowing.

Products

Organisations frequently state that they place a high value on innovation, yet are unable to say what this means in practice. Often, the result is a significant disconnect between the stated desire and actual behaviour, as discussed earlier in this note. As a sector, we can do much more to understand and articulate what innovation means to us by developing a working definition, developing and using innovation metrics, and producing guidance that sets clear expectations.

Organisations can also help themselves significantly in this space by asking:

- » If innovation is truly important, who in the organisation is accountable for ensuring it happens?
- » How will the organisation measure innovation?
- » What support mechanisms are in place so that employees coming up with radically new ways of doing things are encouraged to develop and evaluate their ideas, without exposing themselves to the risk of being seen as disruptive or, possibly worse, simply ignored?

Tackling questions such as these needs to be done at senior levels within an organisation; it's not enough to simply say 'Go forth and innovate', then expect people to magically comply. Setting some parameters, on the other hand, gives everyone a clear steer of what's expected, and empowers individuals to become effective innovators who are able to give expression to their innate creativity through their work.

Lastly, it's important to use the outcome of executive-level discussions on these matters to develop clear, accessible resources – the products, if you like – that can then be communicated with the workforce.

Conclusion

As noted in the introduction, simply adopting the BCA **enables** but does not by itself **ensure** that we benefit from innovative, creative approaches to solving transport problems. For innovation to flourish, it must be actively sought and nurtured. Nor is there a formulaic approach that will guarantee a creative outcome; ability to innovate is highly context specific and much will depend on the people involved, their personalities and preferences, and the nature of the problem they are tasked with solving.

However, there is much that can be done to encourage creativity and innovation while developing business cases. This practice note is written as a starting point to prompt those involved in planning, running or simply being involved in workshops and other business case work to think more deliberately about how they might actively plan to encourage creativity. Achieving this in reality takes considerable time and effort; lack of immediate success must not be seen as an out-and-out failure, and it is important to learn from each attempt.

It is also hoped that this note will help senior managers find ways in which they can create an environment where business case practitioners are empowered to experiment and try out new approaches. This includes being able to insulate business case teams now and then from the constant pressures to deliver, and deliberately creating 'space' for creative thinking.

How much effort is put in to this search should be dictated by the scale and complexity of the problem, in keeping with the BCA principle of 'fit-for-purpose effort'. Beware, however, of making too many assumptions about how much scope there is for innovation; some of the most ground-breaking ideas in history have come about because someone, somewhere looked for a different way of achieving something simple.

I leave you with some questions to reflect on – used in the right way, questions can be highly effective tools to open up thinking and focus on what's relevant:

- » What is the most creative thing you have ever done?
- » What most helped you achieve an innovative outcome?
- » Where were you when you had the 'Aha!' moment?
- » How can you encourage those you work with to exercise their innate creativity?
- » What stops you or your team coming up with creative ideas?
- » If generating 'outside the square' ideas is already something you are doing well, what stops more of these ideas being adopted?
- » How will you build on the ideas in this practice note to bring creativity and innovation to the business cases you are involved in?

Examples of divergent thinking exercises

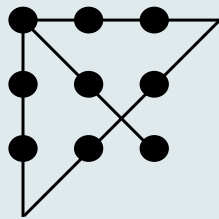
1. One-handed paper aeroplanes

Form pairs or groups of three. Each participant has a sheet of A4 paper. Ask everyone to hold out their dominant hand, then ask them to place it behind their back. The task is to use your other hand to make a paper aeroplane; collaboration is allowed, but no-one can use their dominant hand.

Allow five minutes, then get people to line up and see how far they can make their plane go – using their non-dominant hand only! The plane that goes the furthest wins.

2. Join the dots

This is a variation on the nine-dot problem; given a picture of nine dots in a square grid, participants are asked to connect all the dots using no more than four straight lines, and without leaving the paper.



Many of the participants will likely have seen something like this – according to some, it's where the expression 'thinking outside the square' came from. But the bit most people miss is that four lines is a maximum; what are the ways you can think of to join the dots using only three, two or even just one straight line? Again, form people together into groups of four or five and give everyone a pen!

After five minutes or so, give people a hint; there's more than two dimensions!

3. The theoretical machine

If you could make a machine to do anything, what would you make it do? Make this as outrageous and imaginative as you can.

- » Why would you make this machine?
- » What would the consequences be – for you? For others?

(Note: 'Making money' or 'My early retirement plan' aren't that outrageous or imaginative!)

4. Completing the statement

Take a simple statement, then remove a key part of it. For example, 'New Zealand has _____ motor vehicles'. Groups then brainstorm different ways to fill in the blank – the more ways, the better. Allow five minutes, then ask groups to feed back their ideas.

Point out that responses don't need to be true – allow imagination to run riot!

5. Coat hanger repurposing

Ask groups to imagine alternative uses for an everyday item, like a coat hanger. Don't specify (wire, wood, plastic, etc) – leave that up to them. The group that comes up with the most uses, however bizarre or impractical, wins. Look for ideas that completely rethink what a coat hanger is, such as made of gold, one the size of a tower crane, etc.

References and recommended further reading

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