

# Land and Poverty Conference 2017: Responsible Land Governance - Towards an Evidence Based Approach

**Presentation Title:** Best Practice in Business Case Preparation: Valuing Social and Economic Benefits of Investment in Geospatial Projects

**Author:** Andrew Coote, Chief Executive, ConsultingWhere, London, UK

**Relevant Topic Areas:** Research on rigorous impact evaluation

Harnessing geospatial data – spatial data infrastructure

Delivering land administration services at scale – business models

## Abstract

This paper provides advice on best practice in the preparation of business cases for investment in geospatial projects, based on the author's experience over many years at the interface between this domain and that of the economist and funding agencies. It explains the concepts and language of business case development, the five case model for ensuring all perspectives of an investment are considered and the fundamental role of people and relationship building in successful investment strategies.

A simplified approach that can be adopted in developing countries is introduced and the techniques used within it are explored. These include value chain mapping, cost-benefit analysis, using qualitative benefits to strengthen the business case, creating meaningful implementation options, using sensitivity analysis to take account of risks and how to construct strategies for the continuous monitoring of benefits realisation during the project itself.

The paper then considers strategies for successfully communicating the business case and the importance of storytelling, whilst acknowledging that economics can only inform decisions on investment that will ultimately depend on political judgement.

## Introduction

There is a growing movement across the world towards standardisation of the procedures by which bids for funding are evaluated in both public and private sectors. Normally referred to as the business case, this presents the justification for proposed actions on the basis of their expected benefits. Standardisation of the procedures for creating business cases allows decision makers to balance multiple competing priorities more objectively across many sectors based on financial and other evidence.

If we need any further convincing about the importance of this process then, it would be worthwhile reading the recent annual letter from Bill and Melinda Gates Foundation, one of the largest private sources of funding for projects in the developing world, entitled "why measurement matters"<sup>1</sup>. They make the clear link between what is measured, in this case quantification of benefits, with changing behaviour.

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<sup>1</sup> Why Measurement Matters. Bill and Melinda Gates Foundation. <http://www.gatesfoundation.org/Who-We-Are/Resources-and-Media/Annual-Letters-List/Annual-Letter-2013>

It is therefore critically important that those working in the field of land governance, particularly those involved in geospatial projects, can share the lessons gained from adopting best practice when working across the interface between finance and delivery. Just as technical standards promote data reuse and efficiency, the evolution and application of business case standards can have a similarly positive effect.

The author has been working at this interface for many years and in this paper will attempt to share the lessons learned from experience in many countries, both developed and developing.

## Objectives

The objectives of this paper are to:

- Explain the concepts and language of business case development in the context of investment in geospatial projects in the land domain, particular National Spatial Data Infrastructures (NSDI);
- Introduce value chain mapping techniques used by economists to identify the key actors and processes that add socio-economic value;
- Assess the principles of cost and benefit measurement for both “tangible” and “intangible” factors and also non-market factors;
- Introduce discounted cash flow as the standard method for presenting the financial aspects of a business case;
- Offer advice on how to communicate business cases to senior decision makers to maximise impact;
- Layout the requirements for the continuous monitoring of benefits realisation during the project itself.

## Financial and Economic Concepts

The language of the business case includes many accounting and economic terms commonly used in such work but unfamiliar to the land management practitioner. It is important to be able to clearly articulate your business case using the terms that decision makers and their advisors (who often have economic and financial backgrounds) can understand. In our experience, establishing a common vocabulary is an important pre-requisite to any substantial engagement – it is far too easy to think we have a shared understanding with other stakeholders only to find well into a project that terms were being used differently.

An often quoted example is the concept of a public good. To the economist there is a very specific meaning to this term: “a good which is available to everyone in society and whose consumption (usage) does not reduce its availability to others, e.g. public parks, street lighting”. In more common parlance it might however be interpreted as meaning anything that is good for the public.

A useful introductory resource is the Economist A-Z of economic terms<sup>2</sup>.

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<sup>2</sup> <http://www.economist.com/economics-a-to-z> . Adapted from "Essential Economics", by Matthew Bishop - Bloomberg Press; Economist Books. (Reference retrieved 14th February 2017)

## Business Case – Five perspective Model

In recent years, a group of national public sector financial authorities, including the United Kingdom, New Zealand and Canada have worked together to create what is known as the Five Case Model, illustrated in Figure 1 below.

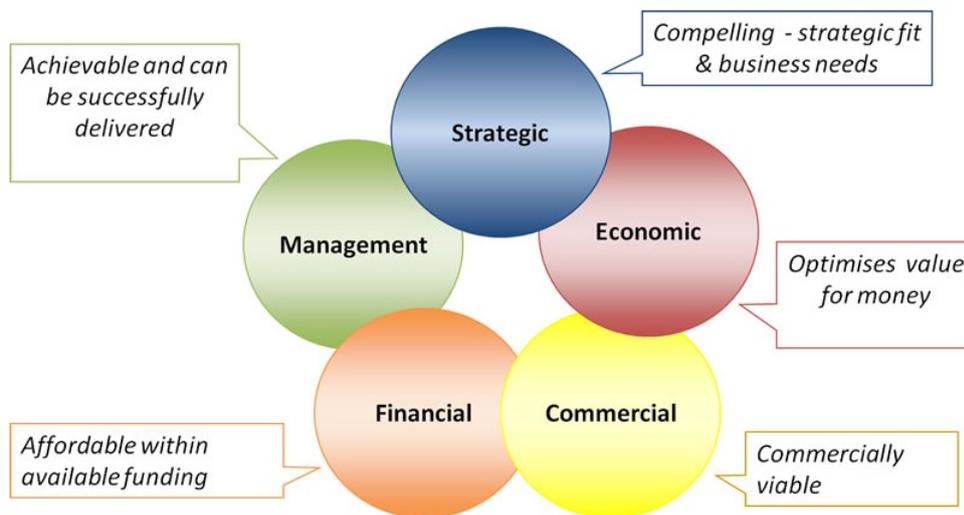


Figure 1: Five Case Model

The Five Case Model is designed to ensure that all necessary perspectives are considered in the business case presented to decision makers, these are as follows:

1. Strategic Case – covers the business need and how it contributes to an organisation’s business strategy or a nation’s political objectives. It also sets out why the project is being considered and why is it necessary now. It also provides a high level summary of benefits, risks, dependencies and constraints.
2. Economic Case - presents the costs and benefits to show value for money and how alternative options for achieving the objectives have been considered. This is where much of the effort is concentrated, researching and compiling quantitative and qualitative information.
3. Commercial Case – explains how engagement or partnering with the commercial sector will be handled and the potential costs where external procurement is proposed.
4. Financial Case – separates costs into capital v operational expenditure and its affordability - what funding will be necessary and when.
5. Management Case – assesses the ability of the organisation(s) that will be responsible to deliver a successful project.

For further information on the five case model, the reader should refer to the UK Treasury Green Book<sup>3</sup> and its supplemental guidance.

## People

Just like all projects, making the business case is about people. Identification of all the stakeholders and the impacts (both positive and negative) that your proposal will have upon them all is vital to its success. Whilst this may sound obvious, we have observed very many business cases that, in their enthusiasm to tell a compellingly positive story, fail to explain the potential dis-benefits to, for

<sup>3</sup> UK Treasury Green Book <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government>

instance, groups of individuals or to those working in Government. Finishing the process of land restitution more quickly, whilst benefiting the land owners, will remove the need for the agency responsible with potential loss of employment for its staff.

Ultimately, such issues are the responsibility of politicians to weigh up when making judgements. However, many business cases are ultimately rejected because of failure to properly recognise human factors and bring them to the attention of the decision makers.

### Simplified Business Case Methodology

There are many complex approaches available to creating business cases, whilst rigorous and comprehensive, may cost more than the project they are seeking to justify. This paper outlines a simplified six stage methodology that can be used by land professionals for creating business cases consistent with the standards that are emerging internationally for their presentation, illustrated in Figure 2. The methodology does not require an excessive level of time and effort and, crucially, can be completed without specialist consultancy assistance.



Figure 2: Simple Methodology for Business Case Development

Explaining this methodology and how it can be applied in developing countries will form the core of the rest of the paper. At each stage, case studies from geospatial projects will be used as illustrations of the topics discussed.

#### Stage 1: Value Chain Mapping

This is a technique used to create a visual representation of the connections between organisations (actors) on the supply side (creating the product or service) and the demand side (those that consume the product or service). It is essentially a flow diagram used to identify and describe what each component of the chain does to “add value” and where the most significant socio-economic benefits can be found. It is applied to each specific use case (application) for which the investment will be used.

The reason why understanding the value chain is important for business case development lies in its use as a graphical tool for dialogue with experts in the use case domain being studied, e.g. flood management or urban planning. The key deliverable is a “break down” the use case to a level of detail that allows the “value adding” processes to be identified, and by doing so, is more easily understood and quantified.

In a recent series of value chain workshops for EuroSDR<sup>4</sup> as part of a project to assess the economic value of 3D geo-information<sup>5</sup>, the delegates found the exercise valuable as it:

- Helped to clarify the scope of the value chain and the interfaces to other related value chains, for instance clearly establishing the linkage between flood management data in forestry planning;
- Identified stakeholder organisations (actors) that had not previously been recognised as beneficiaries;
- Clarified the processes that would change as a result of the intervention – i.e. availability of higher resolution 3D models.

## Stage 2: Cost-Benefit Analysis<sup>6</sup>

This is the standard approach for analysing the impact of the proposed business improvement in quantitative terms. The cost components need to be comprehensively accounted for and often include consequential negative as well as positive effects. In assessing the “upside” of the equation, focus is generally on the largest and most irrefutable benefits identified from the value chain analysis. Since enhanced information is only a contributing component to any observed benefits, a logical approach is also required to the attribution of enhanced value to the information, system and other components of the improved process.

The following outlines the steps in a conventional cost-benefit analysis<sup>7</sup>:

**1. Evaluation criteria.** It is important to define the evaluation criteria based on the customers’ expectations and local standards, such as the period over which the costs and benefits are to be evaluated, often referred to as the project life-cycle, the discount rate<sup>8</sup> to be adopted and the form of presentation of the results. For instance, the World Bank has its own guidance document that sets out discount rates to be applied to different types of projects. Using a longer project-life cycle (>10 years) is often a good mechanism for ensuring that the positive impacts of the investment are sustainable, since it forces consideration of maintenance costs after donor funding has been completed.

**2. Identify project impacts.** All costs and benefits resulting from the project’s implementation are identified. In doing so it is important to understand the causal relationship between the measure and its various impacts (positive and negative). Usually, impacts for public investments will include the impacts on the organisation itself, other public sector organisations, citizens and businesses. For a comprehensive approach, indirect impacts, where economic effects in one context lead to impacts in a seemingly unrelated context, will also be relevant. Local guidance maybe required as to whether citizen benefits will be considered valid. In some instances, we have found that only benefits to the organisation making the investment are to be considered.

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<sup>4</sup> EuroSDR is a not-for-profit organisation linking National Mapping and Cadastral Agencies with Research Institutes and Universities in Europe for the purpose of applied research in spatial data provision, management and delivery <http://www.eurosdrr.net/>

<sup>5</sup> Assessing the Economic Value of 3D Geo-information – EuroSDR research report (in preparation)

<sup>6</sup> In some countries this type of analysis is referred to a benefit-cost analysis

<sup>7</sup> TIDE Methodologies for cost-benefit and impact analyses in urban transport innovations

<sup>8</sup> In cost-benefit analysis cash flows are discounted back to a reference year (usually the date of evaluation or the commencement of a project) to calculate the present value of the net cash flows. Discounting recognises the opportunity cost of investing in the project as opposed to an alternative use of the finance.

**3. Prioritising measurement effort.** Each impact is considered and the most significant, either in terms of monetary or socio-economic consequences are identified. Criteria for prioritisation of the potential impacts need to be agreed with stakeholders<sup>9</sup>. Clearly, the more impacts you attempt to measure the more effort is required. Furthermore, if the investment can clearly be demonstrated with a small number of positive impacts then it is often easier to explain to decision makers and establish credibility.

**4. Quantify monetary valuation of impacts.** Instruments for measurement of market impacts, such as increases in productivity are often evaluated by directly measuring performance gains by reducing the work required for particularly manually intensive processes. Another relatively easy benefit in NSDI evaluation is removing duplication in data acquisition by improving interoperability and data sharing. In other cases, measurement may be only be possible by an indirect method, such as measuring something that has been shown to have strong correlation with the impact in question. For instance, in the insurance market there is a well-established correlation between the time required by the customer to get an online quote and likelihood of acceptance – the shorter the period the greater the sales conversion rate. An additional consideration is what is referred to as apportionment. As the geospatial systems and its information is usually only a component of an impact, a defensible method (using expert opinion commonly) of assigning a percentage of the impact to it, must be determined. The Delphi approach of “normalising” expert opinions is a useful technique in such cases<sup>10</sup>.

**5. Create financial model.** There are many standard models available. A number of software packages are available and widely used, for instance, in the transport sector<sup>11</sup>. However, simple spreadsheet packages, such as Microsoft Excel are sufficient in most cases. Excel supports the necessary calculation of indicators such as Net Present Value, Benefit-Cost Ratio (BCR) and Internal Rate of Return (IRR). Often the NPV (Net Present Value) is used to justify adopting or rejecting a project – all other things being equal, a positive NPV indicates an investment has a positive impact. The BCR is often used to rank different projects in order of benefits per unit of invested capital as it allows comparisons across different project types, sizes and durations.

**6. Sensitivity analysis.** As impact values are associated with predictions of future behaviour, they are innately uncertain. The risks of being smaller or larger than predicted must be taken into account. This is achieved by sensitivity analysis, whereby usually the largest contributing impacts are varied by making pessimistic and optimistic assumptions, so providing upper and lower bound measures of the performance of the investment.

This is also the stage at which risk should be factored into the business case. Some components of the costs or benefits may have a higher risk of variation than others, a key example is often where productivity of large groups of operators is forecast to improve. It is a well-known effect<sup>12</sup> that merely observing someone undertaking a routine task will increase their productivity. Taking a conservative approach to the benefits predicted in such cases by “writing-down” the impacts claimed is recommended.

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<sup>9</sup> Douglas W Hubbard. How to Measure Anything: Finding the Value of Intangibles in Business. Wiley

<sup>10</sup> The Delphi Technique: Making Sense of Consensus, Chia-Chien Hsu. Practical Assessment, Research & Evaluation. Volume 12, Number 10, August 2007.

<sup>11</sup> University of California at Berkeley. Transportation Benefit-Cost Analysis primer.

<http://bca.transportationeconomics.org/>

<sup>12</sup> Hawthorne Effect. <http://www.economist.com/node/12510632>

### Stage 3: Qualitative Impacts

In value chain mapping, we gather many benefits that cannot be quantified easily for many reasons. Some could be quantified but due to time or effort constraints or strategic reasons we choose not to. However, there are another class of benefits, often referred to as non-market benefits where quantification is more problematic. A non-market impact is one where the commodity we are seeking to improve cannot be directly traded. Some classic examples are:

- Social impacts – equality, ethnicity, disablement
- Personal impacts – injury, loss of life
- Environmental impacts – pollution, loss of amenity

Although there are well-rehearsed techniques for quantifying some of these impacts, most through what are called “willingness to pay” surveys<sup>13</sup>, in business cases these are usually used to qualitatively strengthen the business case. They are normally included in the business case in tabular form, as illustrated in Table 1 overleaf developed for an urban planning use case.

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<sup>13</sup> Economic and Financial Modelling of the Impact of Geospatial Information - Techniques and Results for Land Administration in Developing Nations. Smart A and Coote A. Land and Poverty conference 2017.

Actor	Process	Impact	Source
Local Authority (own housing stock)	Property Management	i) Desktop (virtual) inspections ii) Better targeted renovations	Dublin CBA Workshop
Solar panel vendors	Installing Solar panels	i) Environmental costs reduces ii) New sales	Dublin CBA Workshop
GSI (Geological Survey Ireland)	Sharing between LA and GSI of borehole information	i) GSI build more granular 3D models and supply to LA, others ii) Reduced duplicated capture in local authority	Dublin Value Chain Workshop
Civil Aviation Authority	Obstacle identification	i) Reduced costs of acquisition and make records comprehensive	Dublin Value Chain Workshop
Property Sales Agents	Better visualisation of developments	i) Easier sale ii) Less physical viewings	Knight Frank
Fire Service	Response to emergencies	i) Dispersion of smoke from fires and noxious chemicals in the case of escape. Buildings affect the plume propagation, both horizontally and vertically.	Dublin Fire Service
Software Companies	Standardising of data models	i) Allows companies to develop a software platform for one city but sell across Europe and wider because if the data is created using standards for data content, quality and transfer (interoperability)	City Manager, Helsinki
Local Authority / Environment Agency	More accurate noise mapping	i) Noise propagates in 3D, so the models are more accurate. ii) EU requirement for cities to create noise maps.	Virtual City SYSTEMS, Berlin

Table 1: Qualitative Benefits Table: Urban Planning

## Stage 4: Implementation Options

There are almost always a range of options to achieve the objectives of a particular investment. In this stage you are looking to identify and assess a relatively small number, usually 3-4 options, of varying complexity and include a “do nothing” or “do minimum”, scenario. The “do nothing” might be thought of as the reference base and might have negative impacts, particularly if the investment is required to respond to regulatory requirements.

Some of the criteria to consider in framing options are:

- Varying scope and scale: often a staged approach where a small initial investment, covering perhaps a pilot area, is more easily justified and can be used to build confidence with decision makers;
- Open source v proprietary solutions: - it is tempting to think that open source software is always the best solution but may not be sustainable if the bespoke code cannot be maintained when key staff members leave;
- Varying quality targets – investments can involve over-engineering of the solution and inadequate funding for long-term incremental improvement;
- Improving existing processes – many solutions do not require automation but better design of existing manual processes, particularly if they are only performed periodically.

One of our key observations from business case development exercises is that it is often too easy to fall into the trap of being obviously biased in your presentation of options. List the evaluation criteria used in your analysis of the options and mark each option against them objectively.

## Stage 5: Benefits Realisation

Showing how the investment has delivered the expected benefits during and after implementation needs to be an integral part of the business case. Too often, a business case is approved and the basis on which it was approved is never revisited by those working on the implementation. Most governments and donors are becoming much more rigorous in wanting to see proof of tangible benefits. In a recent case in the United Kingdom<sup>14</sup>, the National Audit Office delivered a very critical report on the Department for Environment, Food and Rural Affairs (Defra) for not managing benefits realisation on its GIS investment, they concluded:

“The Department for Environment, Food and Rural Affairs has delivered some value from the £39.3 million spent on its geographic information strategy and activities. However, the Department has not tracked the full cost of geographic information and systems to it or its arm’s length bodies, or systematically measured benefits. The Department has been able to identify savings of only approximately £9 million. The figures for costs and benefits are both likely to be underestimates. This lack of financial information means that the NAO cannot determine that value for money has been achieved.”

An important consequence of such audit reports is that subsequent investments in this area are less likely to be approved.

Our experience in creating the benefits realisation component of a business case indicates that it is necessary to put in place methods of measurements before the implementation commences. This enables a benchmark of current practice to be established, that can then be compared regularly over

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<sup>14</sup> National Audit Office Report: Defra Geographical Information Strategy  
<https://www.nao.org.uk/report/department-for-environment-food-and-rural-affairs-geographic-information-strategy/>

the course of the project. The Danish Basic Data initiative<sup>15</sup> was amongst the first in the NSDI field to undertake a benchmark study which they have recently followed up with an “ex-post” examination against the same criteria. The key is to pick aspects of the benefits that reflect the main components of the business improvement and can be measured in a timely and repeatable manner from existing systems, so not generating the need to capture new data.

## Stage 6: Reporting and Presentation

All the effort in developing the business case is often dissipated by ineffective communication with decision makers. The structure of the formal written report, when based on the five case model outlined above can be constructed by following a template. If there is nothing available or prescribed in the country in which you are working, then we would advise adopting that provided on the New Zealand Treasury website<sup>16</sup>.

However, going back to our core principle that “projects are about people”, then it is the face to face meetings with decision makers that are crucial. In the remainder of this section, we share some of the key principles of good communication, in particular as applied to business cases.

A strategy for communications should underpin your presentations, there are many books published on the subject but this is one of the better summaries<sup>17</sup>:

- 1) Articulating key priorities and imperatives – in as few words as possible.
- 2) Defining and understanding key audiences – what is the value proposition for each stakeholder present?
- 3) Selecting and building distinctive messages – this is the essence of storytelling
- 4) Delivering messages through the right channels and at the right time
- 5) Assessing the impact of the message
- 6) Continuously refining the approach

The time spent preparing a business case can be extensive but the argument can be lost in a few minutes. Often the time you have to present your case is very short. It is not uncommon to be given only 5 minutes with the most senior decision makers. So, the maxim “time spent of reconnaissance is seldom wasted” is relevant here - spend time with key stakeholders well in advance of the key presentation, make sure they are supportive of your proposition.

Make sure you understand your audience, they will focus on the strength of your economic analysis but what are the other “hot buttons and red flags” that you should be aware of – make sure you have a clear picture of what their current priorities are and how the strategic case addresses them.

Tell a compelling story, our field has a great set of tools for doing this – they are called maps! It is remarkable how infrequently we use them. Focus on no more than three key benefits, make sure

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<sup>15</sup> The Basic Data Programme – A Danish Infrastructure Model for Public Data, Horst, NL, Bjerre, S, Lind, M and Hvingel, L. <https://journals.aau.dk/index.php/gfp/article/view/637> (retrieved 15th February 2017)

<sup>16</sup> Guidelines for using the Better Business Cases template <http://www.treasury.govt.nz/publications/guidance/planning/costbenefitanalysis/cbax/cbax-guide-oct15.pdf> (retrieved 15th February 2017)

<sup>17</sup> Strategic Communications, GeoValue workshop Boulder, Colorado (2012). Matt Hirschland, Director of Communications, University Corporation for Atmospheric Research (UCAR).

they are understandable to your audience, so avoid “tech talk” and focus on making them as irrefutable as possible.

Test your arguments by thinking of potential objections in advance and take a few extra slides with you to present if the audience raises these topics.

Do not be disappointed if your first presentation does not immediately yield approval, and sceptical feedback is better than no reaction. Sometimes the timing is not right - it is an unfortunate fact of life that often projects are approved when something bad, such as a natural disaster, occurs and politicians are forced by public pressure to “do something”. The business case for the Canterbury Spatial Data Infrastructure project in New Zealand<sup>18</sup> was considerably easier to promote after the earthquakes in the region in 2011.

Alternatively, your message may not fit with the decision maker’s view of the world, it is important to remember that economics only informs politics.

### Summary and Conclusions

The business case as a standard mechanism for setting out the value of investments is fast gaining traction in developed and developing countries;

Quantification of benefits is becoming indispensable to securing investment in NSDI – the attraction of innovation is no longer sufficient in a cash-strapped world;

We are not alone in seeking solutions to quantification - transport engineers, environmentalists have been here before us and there are important lessons we can learn from them;

Story telling is the essential partner to economic analysis and this is a skill inadequately developed within our sphere of practice;

Economics can only ever inform the politics in decision making.

### Tailpiece

There is a developing community of practice, known as the GeoValue group that seeks to share and enhance best practice. The community is open and welcomes new members, there is a dedicated LinkedIn group and extensive resources are available from its home page <http://www.geovalue.org>

A book, provisionally titled “Data to Decisions” based on the most recent meeting of the group in April 2016, is in the final stages of preparation and will cover the topics in this paper and others, in greater depth.

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<sup>18</sup> Canterbury Spatial Data Infrastructure Programme <http://www.linz.govt.nz/about-linz/our-location-strategy/canterbury-spatial-data-infrastructure-sdi-programme>