

MAPPING VALUE/S - ALIGNING PROJECT OUTCOMES WITH BRISBANE CITY COUNCIL'S "LIVING IN BRISBANE 2026" THEMES

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PAPER

This paper reports on current doctoral research being undertaken in conjunction with the Cooperative Research Centre for *Construction Innovation*, at the Queensland University of Technology. It details the development and implementation of a value-mapping framework, in collaboration with the Major Infrastructure Projects Office (MIPO) of Brisbane City Council (BCC), on three case study projects. The value-mapping framework places the eight BCC "Living in Brisbane 2026 (LiB2026)" themes (BCC 2006) as central to the monitoring of long term project performance against a set of project specific indicators which are reported on at key project milestones. The paper will detail how the application of this framework can assist in embedding local distinctiveness in urban infrastructure project outcomes.

Two key outcomes of this research include firstly, the linking of project-specific objectives with BCC's LiB2026 corporate objectives to provide greater decision-making transparency; increased rigor in establishing objectives; and greater awareness of project opportunities beyond those delivered within the project budget and contractual arrangements. Secondly, the research demonstrates the use of an iterative process to identify the project-specific stakeholder footprint, accountabilities, and project objectives, at the pre-feasibility phase, to better inform the subsequent project phases of corporate values and desired project outcomes and impacts.

Tracking the delivery of project outcomes to stated corporate objectives and values is complex. Major urban infrastructure projects involve lengthy time frames for design and delivery (i.e. 5-10 years); associated changes in project team composition; multi-layered project decision-making; and diverse procurement arrangements (e.g. D&C, alliances, public private partnerships). Initial investigation revealed insufficient formal tracking mechanisms exist to assure both the project proponent and the community that corporate objectives play a consistent and influential role in the decision-making process. This research provides project teams with a framework for assuring this.

Keywords: corporate social responsibility, urban infrastructure, local distinctiveness, value mapping

DISCUSSION

The academic basis for this research derives from literature on corporate responsibility (i.e. accepting accountabilities beyond the traditional economic imperatives) and lean thinking (i.e. understanding the value stream to reduce waste and enhance value). The value maps which are the outcome of this research integrate tools from both these areas into a framework appropriate for application in the construction sector. This value-mapping framework bases its interpretation of value upon that expressed by Emmitt et al (2005). These authors clarify the distinction between differing types of value, and how it may be interpreted by different players in different situations:

“The distinction between client values as the focus and end goal of our efforts and internal values of the delivery team is made ... external value is separated into (i) process value and (ii) product value. Process value is about giving our customers the best experience during the design and construction of the project. It comprises:

- ‘Soft values’ such as work ethics, communication, conflict solving etc. between the client and the delivery team.
- ‘Hard values’ such as the delivery teams ability to keep agreed time limits, cost estimates, quality of the product and workers safety etc.” (Emmitt et al 2005, p.59)

An understanding of this interpretation of value is an important basis for implementing the value-mapping framework.

The research methodology underpinning this work is based on Checkland’s soft system methodology (SSM) (1984, 2000), engaging in an action-research based collaboration on three major economic infrastructure case study projects. This methodology enables the researcher to contribute to the knowledge base in the construction sector, based upon both a sound academic and industry tradition. Three practice-based case studies (Dul and Hak 2008) have been undertaken, by way of ‘exploration’ (case study 1), ‘testing’ (case study 2) and ‘implementation’ (case study 3) of the value-mapping framework under development. The exploratory study was based on Eleanor Schonell Bridge, Brisbane, Australia. This study was part of the initial action-planning phase, in which the conceptual model for both the process maps and the value-mapping framework was developed. The ‘test’ study was based on the Hale Street Link, Brisbane, Australia. This constituted the initial action-taking phase wherein the draft models were applied to a real-life situation to test the framework. The final ‘implementation’ study was based on the Northern Link, Brisbane, Australia. This study enabled the learnings from the first two studies to be applied as part of a second round of action-taking, prior to a final evaluation of the framework wherein key findings and learnings will be considered. ‘

Fieldwork for the exploratory case study was undertaken in November to December 2006 on the Eleanor Schonell Bridge, which is a cable-stay bridge spanning 390 metres, taking public transport only (bus, pedestrian and cycle). It was delivered via a modified Design and Construct contract and completed in January 2007 for a total project cost of AUS\$57million. The test case study was undertaken from June to December 2007 on the Hale Street Link, once the draft framework and method had been established and verified. This project is a 60km/h four-lane tolled cross-river bridge currently in implementation phase, and due for completion in 2010. The project is being delivered by an alliance contract to a budget of AUS \$250million. Collaboration on the implementation case study occurred from July to December 2007 on the Northern Link. The project is currently in detailed feasibility with a target opening of 2014 and a budget of, AUS\$2billion. This dual lane toll road

way including 5km of two dual lane tunnels is likely to be delivered via a public private partnership.

Corporate Overview - Objectives, Values and Outcomes

Prior to detailed work on the three case studies it was necessary to understand the corporate context in which the case study projects were being delivered. This required an understanding of the corporate responsibilities and values that guided decision-making, and the linkages between the corporate structure and the sub-agency delivering the infrastructure project. This was explored through a series of five semi-structured interviews with BCC staff, from which draft process maps were developed and then verified. The process mapping method used was derived from the lean thinking discipline, which emerged in the vehicle manufacturing sector in the early 1990's, as a way of easily capturing and communicating key processes (Kraatz et al 2008). This approach involves constructing high-level maps of the key processes, highlighting key decision-points, to enable a better understanding of the delivery process.

The highest level of corporate objectives established within the case study agency, (Brisbane City Council) are the eight themes of the Living in Brisbane 2026 (LiB2026) document. These themes are Accessible City, Active and Healthy City, Sub-tropical City, City of Inclusive communities, Clean and Green City, Creative City, Regional and World City and Smart and Prosperous City. The value-mapping framework delivered by this research addresses each of these themes in a substantive way. It thus facilitates dialogue about the less tangible aspects of urban infrastructure, such as local distinctiveness, which can be addressed through the themes of creative city, sub tropical city, and clean and green city. The framework also acknowledges that such outcomes may not be directly deliverable by the project team, or within the project budget, but may be present or developed as project opportunities to be acknowledged, facilitated and reported upon throughout the project's development and delivery.

Additionally, BCC has defined a set of twenty 'city-wide outcomes' which are used to both guide policy and decision-making, and measure performance and outcomes (BCC 2006); and a set of eight value and behaviours which guide corporate decision-making and interactions. These three elements, the themes, outcomes and values of the corporate context are developed through a rigorous process of community and organisational consultation, and hence formed a valid basis upon which to develop and implement the value-mapping framework.

Once this corporate overview was established, collaboration began on the three selected case study projects.

The exploratory study

The research objectives of the exploratory case study were three-fold:

- to test and consolidate the proposed research direction
- to understand the delivery of a major project in this public sector agency, and map these processes
- to develop the draft project-specific value maps for further testing

A review of the project, the Eleanor Schonell Bridge, enabled the researcher to identify what gaps, if any, existed in the process of linking project and corporate objectives and outcomes. This review included personal interviews of at least thirty minutes each with eighteen project team members, including consultants, contractors and client representatives. A review of project documentation from the pre-feasibility (limited), detailed feasibility and implementation phases were also undertaken.

This case study provided a well documented opportunity to build a series of process maps which represent a high level overview of project decision-making for that project. It also revealed little in the way of formal, documented linkages between the two throughout the planning and procurement process, and that decision-making in the pre-feasibility phase of the project in this regard, was largely intuitive and informal.

The test study

The research objectives of the Hale Street Link study were to:

- test the applicability of the generic process mapping process developed on the pilot case study
- test the practicality and applicability of the draft value mapping process on a current project

This project was in the early stages of the implementation phase when fieldwork was undertaken. Six personal interviews of at least forty-five minutes were conducted with four project team members, representing the client, in mid to late 2007. Case 2 confirmed the relevance and applicability of the proposed framework, but demonstrated the difficulties in implementing such a framework once the project has progressed to the implementation phase, when project teams are focused on project delivery rather than project strategy.

The implementation study

The Northern Link project provided the opportunity to implement the value-mapping framework. Senior project team members agreed to participate in this research as they recognised its ability to assist with stakeholder identification, accountability assignment, objective clarification, opportunity exploitation and outcome identification. Their interest enabled the researcher to work intensively with fourteen key project team members over two months, providing the opportunity to refine the framework in an implementation environment. Knowledge and information relevant to the construction of the value maps was gained from review of project documentation by the researcher; fourteen semi-structured personal interviews were undertaken between the researcher and project team members (representing the client and project consultants); a project team workshop; direct input by project team members; and by further review of academic and technical literature.

The project is a proposed tolled vehicle tunnel extending from the inner western suburbs of Brisbane to the inner city providing a missing link in a CBD bypass for both freight and passenger vehicles. At present, it is estimated that seventy percent of the vehicles that are required to use inner (suburban) city route do not have the CBD as their destination (Brisbane City Council 2007a). The six kilometer long link includes two separate parallel tunnels each with two lanes of traffic with electronic tolling.

The Value-Mapping Framework

Two key elements of corporate responsibility, as promoted by the World Business Council for Sustainable Development (WBCSD), are integral to the value mapping framework being developed. These are (i) accountability and (ii) stakeholder foot-printing. Engen and DiPiazza (2005) discuss the relationship between business, accountability and sustainability. Holme and Watts (2000) introduce their stakeholder foot-printing tool as a part of the WBCSD suite of tools, and suggest that corporations need to better recognise and understand their engagement with external stakeholders. Emmitt et al (2005) further highlight the need to better understand stakeholder needs and drivers, based on the premise that "... they all have a different set of values and interests in the project. When we know that the perception of value is subjective and

individual, and that it changes over time, how do we map the values and satisfy all the stakeholders? (Emmitt et al 2005, p.59)

The value-mapping framework, in part, adapts these tools to assist with identifying project objectives, then derives project indicators, aligned to corporate values and objectives, and thus maps project value/s. The key activities in this process are:

- Identifying project-specific objectives, aligned with corporate objectives at pre-feasibility phase.
- Identifying accountabilities and stakeholders for each objective.
- Using an organisation's stated corporate objectives and outcomes to establish a set of project-specific indicators, with associated measurables and targets.
- Reviewing, monitoring and reporting on these indicators at key project decision points to assure on-going alignment.

These activities are documented using a series of Excel worksheets including a Project Objectives worksheet; an Accountability Map; a Stakeholder Footprint; an Indicators Matrix and a final Value Map.

This paper will now discuss the development of the project objectives, indicators and measurables for the Northern Link case study. The intent is to demonstrate how this framework can be used by an organization to address less tangible corporate and community considerations in the context major economic infrastructure projects. In the context of this conference, the issue of how the framework can contribute to local distinctiveness will be addressed. As one of the eight BCC LiB2026 themes, City Design for Sub-tropical Living, becomes a corporate objective against which project objectives, indicators and measurables are established for monitoring project performance.

Establishing project objectives which contribute towards local distinctiveness

Information obtained from a review of project documentation by the researcher was used to establish the first draft of the project objectives; and to align corporate and strategic project objectives with the project objectives. In addition to the corporate objectives previously outlined, other strategic project objectives were identified for the Northern Link project. These included service requirements as detailed in the TransApex Pre-feasibility Report (BCC 2005); strategic project objectives as listed in the Initial Advice Statement to the State Government in mid 2007 and the Preliminary Assessment Report (BCC 2007b); and four strategic project objectives developed in project team workshops held in September 2007. All of the above objectives were developed with specific intent, and are strategic in nature. The value-mapping process is a hierarchy of aligned objectives from corporate, to strategic, to project. It is then against the project objectives that indicators and measurables can then be attributed, which are readily aligned back to the overarching corporate framework, in a reportable and transparent manner.

A draft set of project objectives for the value mapping framework was thus developed based on the above, along with knowledge and information gained from a variety of other sources (i.e. previous projects, technical experts and academic literature). These were then developed and verified in interviews and in a workshop with project team members. Thus the final set of project objectives derived for the Northern Link project (Table 1 below) links directly to the BCC corporate objectives.

Table 1 - Northern Link - Value-Mapping Project Objectives

Accessible City	<ul style="list-style-type: none"> • Improve cross city and orbital traffic flow • Improved freight network efficiency • Improve local traffic accessibility on the local road network. • Improved opportunities for public transport service • Maximise tunnel access without negative impacts on local network • Provide opportunity to improve pedestrians/cycle accessibility
Active & Healthy City	<ul style="list-style-type: none"> • Improve opportunities for pedestrian/Cycle connectivity
City Designed for Sub-tropical Living	<ul style="list-style-type: none"> • Maximise beneficial environmental outcomes • Improve Brisbane's livability • Provide opportunity to improve surface corridor to enhance sub-tropical local environment
City of Inclusive Communities	<ul style="list-style-type: none"> • Effectively manage the impact on local community • Provide a safe project in all project phases • Provide effective stakeholder and community consultation
Clean & Green City	<ul style="list-style-type: none"> • Provide best practice environmental outcomes. • Minimise and manage of impacts of air pollutants • Assist in the development of sustainable urban environment for inner western suburbs
Creative City	<ul style="list-style-type: none"> • Provide high quality, innovative design solutions
Regional & World City	<ul style="list-style-type: none"> • Deliver a legacy project as per project vision statement • Contribute to the effectively servicing of high density urban development in Toowong and Milton
Smart & Prosperous City	<ul style="list-style-type: none"> • Provide innovation in delivery • Project affordability • Economic growth and employment facilitated

Establishing the indicators, measurables and targets

To obtain the project specific indicators, a matrix was established between these project objectives and Brisbane City Council's city-wide outcomes. Primary and secondary linkages were highlighted between the two (by the researcher and verified by project staff). When operationalised it is anticipated that this process would be undertaken by a team representing both stakeholders and knowledge experts.

A total of fifty-four primary linkages were identified (i.e.3-4 per objective), with these then becoming the key performance indicators against which measurables and targets were established for the project-specific value map. These indicators were then used to establish a set of measurables and targets; to identify associated tools to assist with their capture; and to detail actions associated with their implementation (Table 2 below).

Table 2 - Subtropical city - Value Mapping objectives, indicators and measurables.

INDICATOR	MEASURABLES**
Objective - Improvements to local streetscapes	
Outstanding city profile	Legibility of network (Q) Recognisable precinct character (Q) Establishment of sub-tropical boulevards (QP)
Well designed responsive built environment	Enhanced desirability through better design (QM & Q) Community acceptance (Q)
Objective - Provide a sense of spaciousness, context & responsiveness to the Brisbane region	
Green & biodiverse city	Maximise advantage of prevailing breezes & solar access (QP) Passive ventilation of buildings and structures (QP) Sub-tropical landscaping (QP)
Objective - Manage relationship between built form, urban edge & the surrounding terrain	
Green & Biodiverse City	Integration of vegetation at building interfaces (QP)

Objective - Maximise beneficial environmental outcomes	
Sustainable water use	Contribution to storm-water harvesting (QP) Engagement with community re storm-water harvesting project (Q)
Green & biodiverse city	Calculate ecological losses/gains where land is paved/where green space is preserved (QM)
Objective - Improve Brisbane's livability	
Active & healthy communities	Pedestrian & cycle path accessibility - both physical & environmental (QP, Q)
Connected & engaged communities	Participation & usage rates (QP, Q)
Objective - Provide opportunity to improve surface corridor & to enhance sub-tropical local environment	
Green and biodiverse city	Description of significant impacts on lands of high biodiversity value (QM, QP, Q) Shade in the City (QP, Q) Sub-tropical planting (Q)
Well designed responsive built environment	Enhance local microclimate - reduce heat sink effect (QP) Land use conversion costs (QM) Land use impact cost estimates (QM) Reduction in surface traffic enabling other pedestrian/cycle friendly activities (QP, Q) Modal Choice (QP, Q)

** Q-Qualitative, QP - Quantitative Physical, QM - Quantitative Monetised

The data for the final map was collated by the researcher from agency knowledge experts, academic literature and industry knowledge. Measurables were segregated into three categories including two quantitative categories (monetised and physical) and a third qualitative category. Of these, the later two are the most applicable in the context of the softer, more intangible values associated with local distinctiveness. The effort to monetise or physicalise the indicators, where possible, is not intended to diminish the value of qualitative assessment, but to further strengthen the case for continued focus on these intangible aspects of project impacts, through increasing the data available in support of qualitative aspects of project impacts and outcomes.

Data related to the monetisation of the less tangible indicators related to local distinctiveness are currently being drawn from a variety of sources including:

- Sinha and Labi (2007) who discuss the measurement of indicators relating to visual impacts, energy intensity and impacts, land-use and social/cultural Impacts (with specific reference to environmental justice).
- Peter Bein (1997) who reports on the monetisation of environmental impacts of roads and how these can be incorporated in decision-making.
- Todd Litman (2007) who reviews the costs and benefits of transportation, and how this can be applied in planning decision-making.

All these documents are relevant to Canadian and United States conditions, but provide the basis for future research in the Australian context.

CONCLUSION

The outcome of this research, a value-mapping framework for urban infrastructure projects, addresses a current gap in the literature which links corporate responsibilities to project outcomes, in the construction sector. This value-mapping framework clearly links project objectives (via a set of project-based indicators) to pre-existing corporate objectives against which performance of Brisbane City Council, as an organization and a community agent, is measured. This framework is currently

being implemented in an on-going manner on the AUS\$2billion Northern Link project, with the support of both project team members, and agency executive.

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Bein, P. (1997). Monetization of Environmental Impacts of Roads. Highway Planning and Policy Branch, Information Management Section, Victoria, British Columbia.

Bertlesen, S. and L. Koskela (2004). Construction Beyond Lean: A new understanding of construction management. 12th annual conference in the International Group for Lean Construction, Elsinore, Denmark.

Brisbane City Council (2005). TransApex - Strategic Context Report.

Brisbane City Council (2006). Our shared vision - Living in Brisbane 2026. Brisbane, Brisbane City Council.

Brisbane City Council (2007a), Northern Link Newsletter November/December 2007.

Brisbane City Council (2007b). Northern Link Preliminary Assessment Report. Major Infrastructure Projects Office, Brisbane City Council.

Checkland, P. (1984). Systems Thinking, Systems Practice, John Wiley and Sons.

Checkland, P. (2000). "Soft Systems Methodology: A Thirty Year Retrospective." Systems Research and Behavioural Science 17(S1): 11-58.

Dul, J. and T. Hak, Eds. (2008). Case Study Methodology in Business Research, Elsevier.

Emmitt S., D. Sander, et al. (2005). The Value Universe: Defining a value based approach to lean construction. IGLC - 13, Sydney Australia.

Engen, T. and S. DiPiazza (2005). Beyond Reporting : Creating Business Value and Accountability. Global, World Business Council for Sustainable Development.

Holme, R. and P. Watts (2000). Corporate social responsibility: making good business sense, World Business Council for Sustainable Development.

Jones, D. and J. Womack (2002). Seeing the Whole - Mapping the Extended Value Stream. Brooklyn, Massachusetts, The Lean Enterprise Institute.

Klotz, L., M. Horman, et al. (2007). "A Lean Modelling Protocol for Evaluating Green Project Delivery." Lean Construction 3(1).

Kraatz, J., Kajewski, S. and Manley, K. (2008) Value mapping for major economic infrastructure projects for the Australian public sector. Clients Driving Innovation -

Benefiting from Innovation. Third International Conference of the CRC Construction Innovation.

Litman, T. A. (2007). Transportation Cost and Benefit Analysis. V. T. P. Institute: 275.

Major Infrastructure Projects Office (2007). Northern Link - Initial Advice Statement. Brisbane City Council.

Rother, M. and J. Shook (2003). Learning to See - Value-Stream Mapping to Create Value and Eliminate Muda - A Lean Tool Kit Method and Workbook. The Lean Enterprise Institute.

Sinha, K. C. and S. Labi (2007). Transportation Decision Making - Principals of Project Evaluation and Programming, John Wiley and Sons.