CRC Construction Innovation

BUILDING OUR FUTURE

Final Report: Stage 1: Results

Research Project No: 2004-016-A-3

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PREFACE

The research project is an academic and industry collaboration combining the following partners: Queensland Department of Main Roads, Brisbane City Council, Queensland Department of Public Works, Ryder Hunt, the University of Newcastle and Queensland University of Technology. The project is lead by the University of Newcastle.

The project is lead by the University of Newcastle.

EXECUTIVE SUMMARY

This research project aims to improve economic, social and environmental sustainability of the pre-cast concrete and construction and demolition waste supply chains through the development, trial and evaluation of an innovative supply chain management strategy. The long-term goals are to improve competitive behaviour and market sector performance and improve business process efficiency and effectiveness of public sector program delivery by influencing policy development, changing organisational behaviour and implementation development to achieve more economic, social and environmental sustainable markets.

The general research question that will be addressed is "*How do public sector clients develop sustainable supplier group strategy maps?"*

The research objectives are to:

- investigate the productivity and performance problems and the associated actions or changes of two supply chains (pre cast concrete and construction and demolition waste) to indicate to industry and government what can be achieved,
- develop, trial and evaluate a Supplier Group Strategy Map for the two chains,
- document the development, trial and evaluation *process* to develop a Supplier Strategy Map (practice),
- develop a benchmarking guide to monitor market performance post implementation (monitor policy and practice) to inform decision-making to monitor business environmental changes triggered by federal, state and local government policy,
- develop a best practice guideline for government supply chain management (policy and practice)

The study will promote business process efficiency improvement in program delivery by Brisbane City Council and Queensland Department of Main Roads through policy and implementation development and also promote improved competitive behaviour.

The study seeks to address the Brisbane City Council (BCC)'s strategic objective of increased recycled materials content of construction projects through the expansion of the construction and demolition waste sector through market diversification. The study will also investigate strategies for economic sustainability of the pre-cast concrete sector through a state-wide smoothing of Queensland Department of Main Road (QDMR)'s market investment strategy with the long term benefits of stabilisation of employment levels, reduction in high staff turnover and flow on improvements in skill levels and occupational health and safety. Short term benefits will include improved product quality and reduction in remedial work and wasted government resources to monitor a poor performing sector.

This is the third report for the study and it includes results from the "intelligence capturing phase".

More specifically, this report includes:

- a description of the objectives of the "Intelligence Capturing Phase" as well as the specific data collection and analysis techniques employed throughout the phase
- a presentation of the results and findings from this phase
- a preliminary "action" outline for both case studies as a results of key findings

1. INTELLIGENCE CAPTURING PHASE

This section aims to provide a broad description of the key objectives of this phase as well as the specific role of researchers throughout this process. This is then followed by a description of the data collection and analysis techniques, which have been utilised in this study.

1.1 Objectives

The objective of this stage of the project is for participants to:

- describe their work context in detail, and
- define the problems related to the two sectors; precast concrete and resource recovery sectors, in their own terms clearly and comprehensively.

The role of the researcher is therefore to assist this process of bringing the participants assumptions, views and beliefs out in the open. Through this exploration, participants' visions and worldviews of the sectors in question and of themselves are revealed and displayed for inspection by not only the researchers, but also the participants themselves. As pointed out by Stringer (1996),

> *"As people struggle to realize a collective vision/version of their world, they will discover perspectives that reveal new possibilities for resolving their problems. These collective visions may involve minor adjustments to people's own perspectives or may result in transformations that dramatically alter their worldviews. At best, this activity is liberating, enabling people to master their world as they see it in a different way – a tangible process of enlightenment"*

Researchers can facilitate the process of constructing the participants' descriptive accounts of the situation at hand through the following steps (Stringer, 1996):

- Intelligence capturing: interviewing participants, participating in participants' work to observe activities/events, reading documents/records, sorting and assembling information;
- Development of descriptive accounts: helping each participant (or each participant group) develop a descriptive account of the problem and context;
- Formulation of a joint descriptive account with combined participants (or participant groups): interviewing participants of multiple perspectives to build a more complete picture of the sector and developing joint descriptive account of the sector.

1.2 Intelligence capturing techniques

1.2.1 Interviews

A common issue faced by researchers during the interview process is that questions can often be flavoured with pre-conceived biases, interests and/or notions. As such it is important for questions to be framed in such a manner that participants perceptions will not be governed by the 'flavours' imposed by the researchers.

A framework of neutral and non-leading questions was developed specifically for the workshops (Spradley, 1979) to minimise the potential 'better word for flavouring' participants perceptions. This framework includes the employment of three types of questions (Stringer, 1996):

- Grand tour/global: enable participants to describe the situation in their own terms

- Typical: enable participants to describe the typical events that occur
- Specific: enable participants to focus on specific events or phenomena

- Activity: enable participants to visualize their situation more clearly
  - Guided tour: enable participant to show researchers around their workplace setting and provide further details relating to the people and activities involved
  - Task: enable participants to demonstrate particular features of their work
- Prompts: enable participants to reveal more details of the phenomena discussed
  - Extension: enable participant to further extend accounts
  - Encouragement: provide encouragement to participant
  - Example: aids the participant

Internal staff members: demand perspective

Two facilitated workshops were held with participants from the two case study organisations. The primary aim of these workshops was to gain a deeper understanding of the participants perspectives of the sector and of themselves, with the two case study organisations' role as major clients within the two sectors. The workshops were largely centred around four key themes, which include chain analysis, demand analysis, strategic alignment and supplier strategies.

Participants were taken through a PowerPoint presentation, which was divided into four parts:

- Overview of research project aims and specific workshop aims
- Chain analysis and strategic alignment
- Demand analysis and supplier strategies
- Wrap up

The PowerPoint slides acted largely as a tool to guide the broad direction of the discussion outlining key interview questions related to each part and it was intended to be a loosely structured workshop. The entire duration of the workshops were video recorded whereby the video recorder was placed in a distant position so as not to disrupt the flow of the conversations and discussions. Further to that, follow-up interviews were also held with the participants to confirm the researchers' interpretations from the workshops and also to obtain further information relating to the key themes.

The following table summarises the types of questions asked at the workshops and interviews.

Table 1.1 Framework of interview questions: Internal staff workshops & interviews

Question types		**Interview questions**
Grand tour /Global	Typical	▪ Tell us about your work in relation to the precast concrete / c&d waste sector ▪ How does your group usually work? Describe a typical day in your office ▪ What are your stories/experiences in relation to the sector? ▪ What are some of the problems related to the sector? ▪ Are there any success stories? ▪ What are the current product/process flow? ▪ Who are the key players involved?
	Specific	▪ Can you tell us more about what happened here? ▪ Can you tell us what is QDMR?BCC's role in relation to the sector?
Activity	Guided tour	▪ Can you show us around your workplace?
	Task	▪ Could we draw a map of the events that you've just described?

		▪ Could you draw us a map of the product/process flow that you've just described?
Prompts	Extension	▪ Are there any strategies in place to manage the risks associated with the problems you've mentioned previously? ▪ How do you measure achieving these objectives?
	Encouragement	
	Example	

The analysis of the data collected from the workshops and interviews is documented in the *section 4.2 and 4.3: Results: Case studies 1 and 2* of this report.

External industry suppliers (PCC & CDW): supply perspective

Individual interviews were held with suppliers from the two markets sectors; pre cast concrete and construction and demolition waste sectors. The interviews were carried out at the participants' workplace and the following framework acted as a guide/tool to

Table 1.2 Framework of interview questions: external industry suppliers' interviews

Question types		**Interview questions**
Grand tour /Global	Typical	▪ What is your role in the company & then more specifically what is your company's role in relation to the sector (PCC/CDW)? ▪ Who are your customers? ▪ What do you think are some of the problems of the sector? ▪ Do you know of any success stories in the sector?
	Specific	▪ Do you see any suppliers as key competitors in the sector? ▪ Can you tell me how much of your company's percentage of sales is attributed to QDMR/BCC – what about the other customers? ▪ What is it that your company wants to achieve in relation to the PCC/CDW sector? ▪ What do you see as barriers to achieving these objectives? ▪ Where do you see opportunities to achieving these objectives? ▪ What do you see as the role of large customers like QDMR/BCC in achieving change in the sector?
Activity	Guided tour	▪ Can you show me around your workplace/setting? (for eg. resource recovery facility – C&DW, precast concrete yard – PCC)
	Task	▪ What other suppliers do you normally work with? Who are they and what are your relationships with them? ▪ Can we draw a map of these relationships?
Prompts	Extension	▪ Are there any strategies in place to manage the risks associated with the problems you've mentioned previously? ▪ How do you measure achieving these objectives?
	Encouragement	
	Example	

1.2.2 Interview coding

All interviews conducted for both case studies have been recorded (either through voice recorder or video recorder), transcribed and subjected to two stages of coding; open coding and axial coding. Prior to that, a coding schema has been developed for the analysis of the data collected through interviews. The first stage of coding involved the loose association of themes and concepts as revealed by the individual interview transcripts (refer to Table 2.3). The second stage progressed to the arrangement of data according to dominant themes that have emerged (refer to Table 2.4).

Table 1.3 Open coding: themes arising from interview transcripts

Organisation 1	**Organisation 2**	**Organisation 3**	**Organisation 4**	**Organisation 5**

Table 1.4 Axial coding: Dominant/common themes emerging

Themes	**Organisation 1**	**Organisation 2**	**Organisation 3**	**Organisation 4**	**Organisation 5**

Various data displays have also been developed to draw and verify conclusions (Miles & Huberman, 1994). The analysis of the data collected from the interviews is documented in the *section 4.2 and 4.3: Results: Case studies 1 and 2* of this report.

1.3 Observations

Observations of the settings, places or conditions in which participants work can provide researchers a clearer picture of the context in question, which in this case include the characteristics, behaviour and problems related to the two sectors. When provided the opportunity, researchers should record their observations to provide ongoing records of key elements related to the settings. More specifically, information relating to the following have been recorded for this study (Stringer, 1996):

- Places: offices, locations of activities and events, physical layouts
- People: types of people, formal positions, roles
- Objects: buildings, furniture, equipment, materials
- Acts/activities: actions and sets of acts people take
- Events: set of related activities
- Purposes: what are people trying to accomplish
- Time: frequency, duration, sequencing of events and activities
- Feelings: emotional responses and orientations to people, events, activities, etc

Observations, which have been recorded for the study to date is documented in the *section 4.4: Results: Observations* of this report.

1.4 Document analysis

Document analysis involves the collection, review, interrogation and analysis of various types of documents in the form of 'text' (O'Leary, 2004). There are a wide variety of document types that are suitable for analysis ranging from reports to photographs, and letters to television programmes. All these "documents" are considered sources of data, which is similar to data collected through interviews, surveys and observations. The key distinguishing factor between the data sources for document analysis and other modes of analysis is that the data for document analysis are composed of pre-produced texts that have not been generated by the researcher whereas in other methods of analysis, data is primarily generated by the researcher (for eg. interview transcripts, observation notes, etc). As such, in document analysis the researcher's role is limited to gathering, reviewing and analysing relevant documents, which have already been produced.

More specifically, some of these document types include (O'Leary, 2004):

- *authoritative*: these include documents that are produced by authorities with the aim of gaining unbiased knowledge. For example: surveys, reports, journals, books, etc
- *agenda-based*: these include documents that have an 'agenda' or documents produced by those with a vested interest in the outcomes. For example: political campaign/promotional materials, etc
- *personal*: these include documents that are personal and subjective by nature. For example: letters, emails, sketches, diaries, photographs, memos, etc

- *multimedia*: these include documents that are multimedia-based. For example: newspaper/magazine column/articles, current affairs shows, news reports, TV sitcoms/commercials, etc

- *historical:* these include documents that have been produced within a particular historical period of interest to the topic in question. For example: organisation's records, minutes, policy documents, etc

The process of analysing documents typically involve the following activities:

- Plan: *What are the types of documents that are to be explored? How will these documents be accessed? What types of data will be gathered from the documents?*

- Gather: *How will the documents be managed/organised?*

- Review: *What is the "agenda" of the document?*

- Interrogate: *What is the content of the document? Who is the author/audience and what is the purpose and style of the document? What is the "witting evidence" (what is the document meant to impart?) and "unwitting evidence" (what other background information is related to the document?)*

- Reflect/refine: *Were there any difficulties associated with gathering the data, reviewing the sources or exploring the content? Are there additional documents that need to be gathered/reviewed/interrogated?*

- Analyse data: *What conclusions or interpretations can be drawn from the document?*

2. RESULTS

This section presents the results of the first stage of the study, which is Intelligence capturing phase and is divided into two parts including:

- Case study 1: internal & external perspectives
- Case study 2: internal & external perspectives

2.1 Case study 1: Pre cast concrete sector

2.1.1 PCC: Government/client perspective

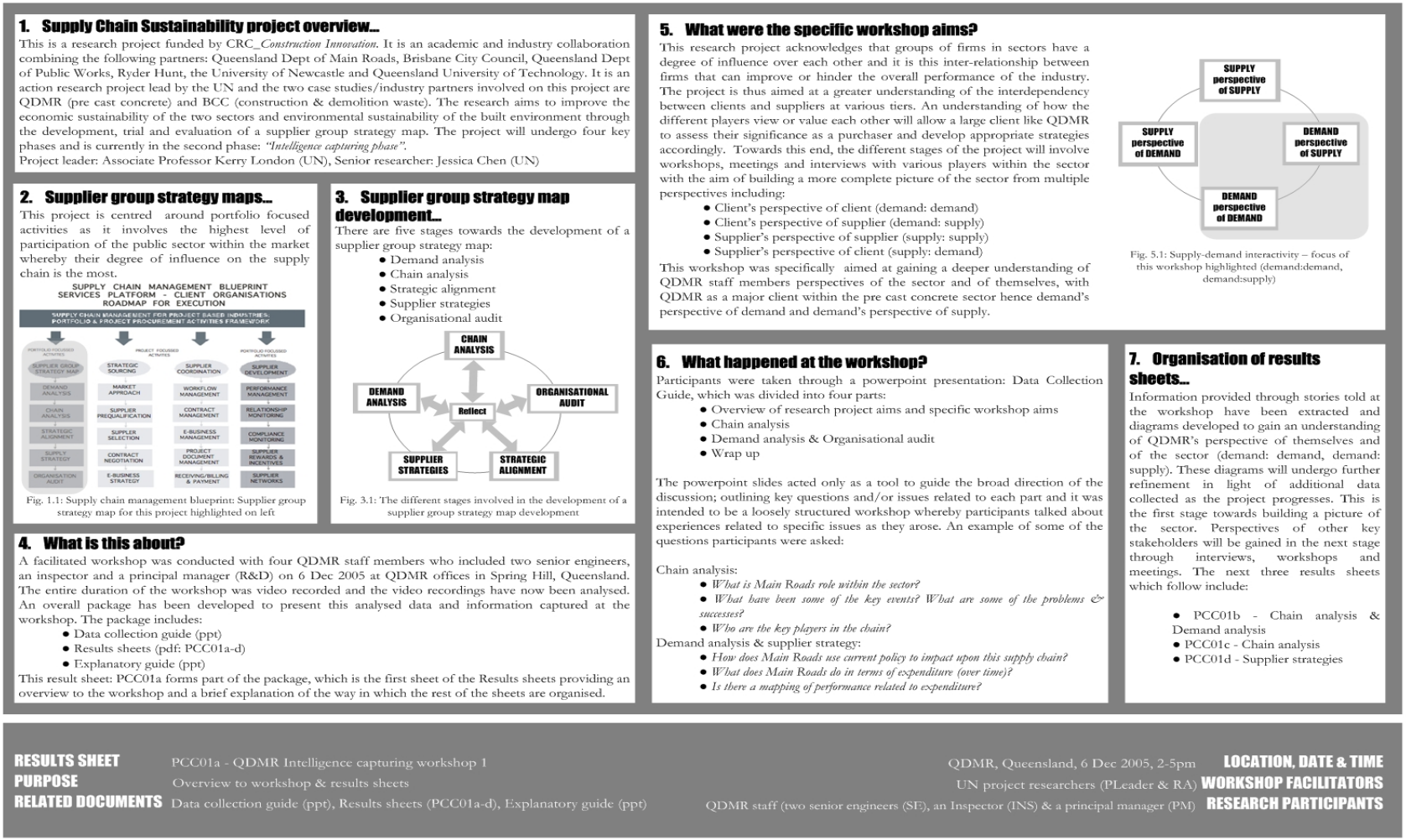

Figure 4.1 PCC01a: Overview to workshop and results sheets

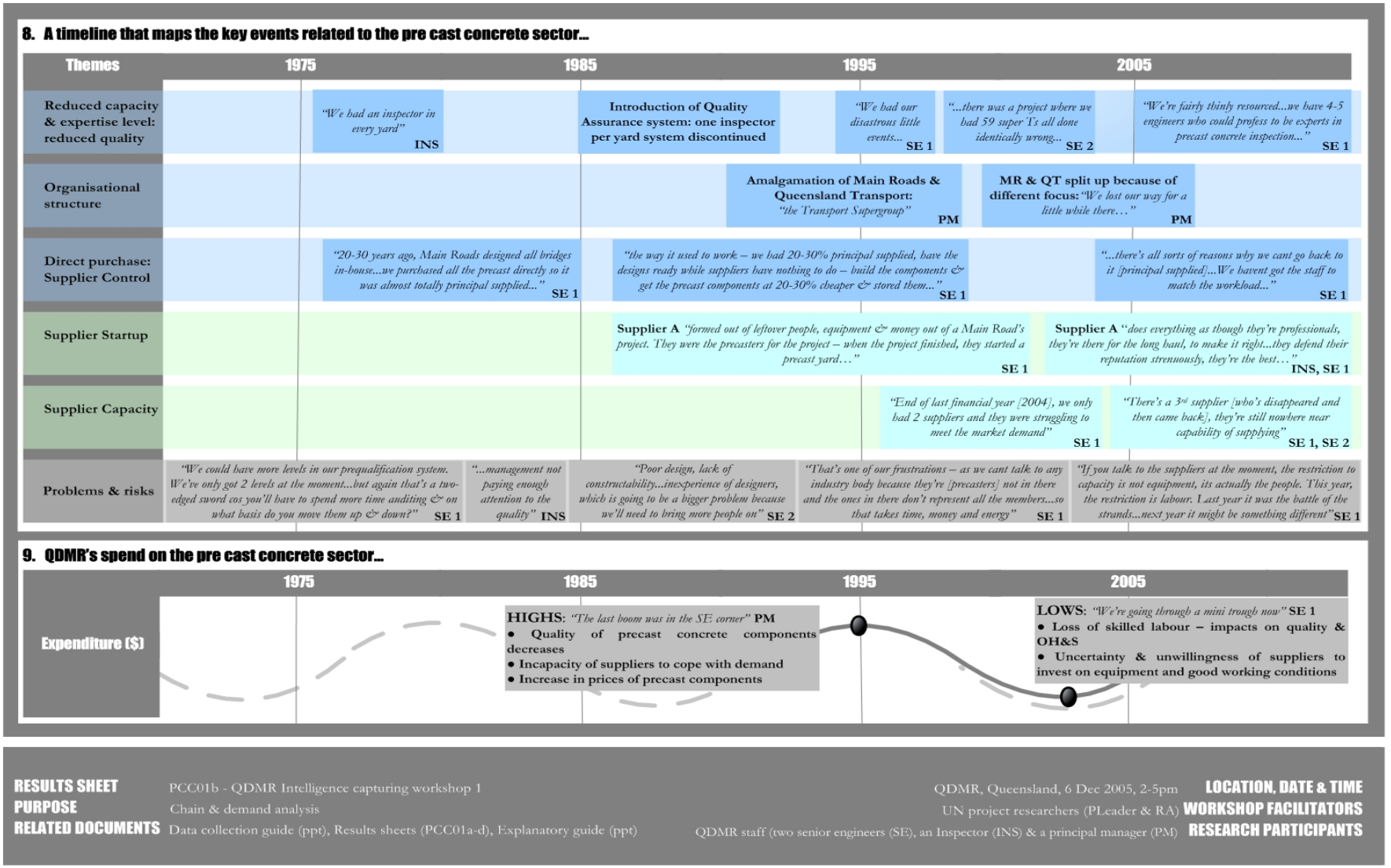

Figure 1.2 PCC01b: Chain and demand analysis

10. Industrial organisation of the pre cast concrete chain...

This diagram begins to map the industrial organisation of the various pre cast concrete chains. The model for this was developed by London's study on Construction Supply Chain Modeling. Figure X indicates that the process of mapping the industrial organisation of the various players has only just began and is a work in progress. QDMR's position in the chains in the sector are identified and the key suppliers identified. At this stage, the map only presents the perspective of QDMR and as such is limited to the contractual relationships that QDMR has with their suppliers based on information captured at the first workshop. This process of mapping will undergo further development to include other key suppliers as the research project progresses and additional interviews, meetings and/or workshops are conducted. It is therefore an ongoing process and will be guided by the information obtained from these various sources. Suppliers E-I are indicative, suppliers A-D were identified. This diagram maps distribution channels but lacks detail about expenditure levels.

Client: Queensland Department of Main Roads (QDMR)
- purchase customised pre cast components
- purchase standardised drainage components

Supplier A	Supplier B	Supplier C	Supplier D	Supplier E	Supplier F
-supply customised pre cast bridge components	-supply customised pre cast bridge components	-supply standardised pre cast bridge components	-supply architecturally designed pre cast bridge components	-supply standardised pre cast drainage components?	-supply standardised pre cast drainage components?

Supplier G	Supplier H	Supplier I
-supply concrete?	-supply concrete?	-supply concrete?

Fig. 10.1: Structural organisational channel map for primary commodity pre cast concrete

11. Supplier performance indicator rating..

"One yard does everything as though they're professionals, they're there for the long haul, to make it right. They take pride in their work – you can just see the way their stuff's made, it all fits perfectly. The other one, you wouldn't know whether they're going to fold their tent & become a farmer cos they're already part-time this & part-time that. They don't really care. At the end of the day as long as they're making enough money for their hobbies – but they're the second best we've got, that's the reality." **INS**

This leads to the development of a supplier performance indicator rating:

HIGH	MEDIUM	LOW
Professional Long-haul mentality Pride		Profit-only focus Part-time mentality Don't care attitude

Fig. 11.1: Supplier performance indicator rating

12. Market segmentation..

"There are two market segments – the commodities that we basically buy off the shelves and then the bigger components that get built and designed. So as well as the geography, there are two market segments within that geography. Different authority, council or local government market will be interested in small products whereas again we're into both." **SE 1**

Large & Standardised?	**Large & Customised**
Small & Standardised	**Small & Customised?**

Fig. 12.1: Market segmentation of the pre cast concrete sector

13. Geographical dispersion of players within the chain...

The following map locates the geographical dispersion of the different pre cast concrete suppliers associated with QDMR.

Fig. 13.1: Geographical dispersion of the different pre cast concrete suppliers in Queensland

"The market is only competitive in the South-East corner. Once you get out of SE Queensland, there's two suppliers in Rockhampton and there's one in Mackay, one supplier in Townsville and one supplier in Cairns. So once you get out of the SE corner the competition disappears...In Rockhampton there are two suppliers where you get some competition but once you get north of Rockhampton there's basically no competition..."

RESULTS SHEET PCC01c - QDMR Intelligence capturing workshop 1
PURPOSE Chain analysis
RELATED DOCUMENTS Data collection guide (ppt), Results sheets (PCC01a-d), Explanatory guide (ppt)

QDMR, Queensland, 6 Dec 2005, 2-5pm **LOCATION, DATE & TIME**
UN project researchers (PLeader & RA) **WORKSHOP FACILITATORS**
QDMR staff (two senior engineers (SE), an Inspector (INS) & a principal manager (PM) **RESEARCH PARTICIPANTS**

Figure 1.3 PCC01c: Chain analysis

14. At the workshop...

As well as the questions asked, anticipants were shown a procurement management tool often used by organisations to map the levels of risks associated with key players within a sector to develop relevant supplier strategies in relation to purchasing and/or selling. The tool has also been suggested for use by all government agencies and departments in Queensland in the State Purchasing Policy, *"using a procurement management tool called supply positioning, goods and services are plotted according to their relative expenditure & difficulty in securing supply. This is a good way to determine where the procurement effort should be focussed in the Corporate Procurement Plan for the year"* (QDPW, 2001, p12).

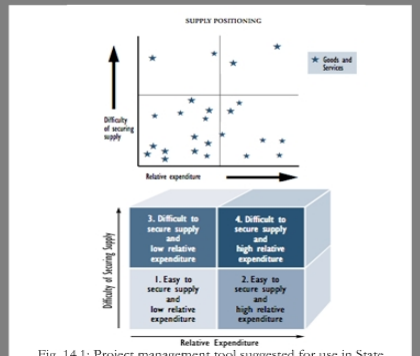

Fig. 14.1: Project management tool suggested for use in State Purchasing Policy (*Source: Corporate Procurement Planning, 2001, p12*)

This chart maps expenditure level against risk to customer for all the customers major supplier groups. It was shown to the participants as an example of what is done by a large organisation in Australia in relation to supply chain management

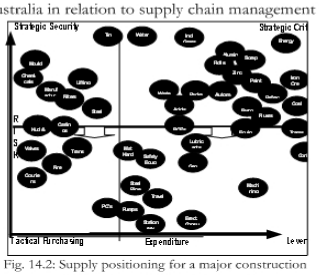

Fig. 14.2: Supply positioning for a major construction organisation (*Source: London, 2005*)

15. What were the participants' reactions?

The participants suggested that the typical procurement management tool (as shown in Fig. 14.1 & Fig. 14.2 above) is perhaps too generic and may not be suited for the different types of players within the construction industry, including the pre cast concrete sector. As a result, the tool (in its existing condition) appeared to be of little use to the participants who attended the workshop as it does not take into account the specific characteristics of the sector and the roles and risks associated with QDMR. QDMR not only is a large scale client but also is an owner; therefore they purchase, construct and maintain. The positioning of QDMR within the supply chain therefore adds an extra layer of complexity to risk as demonstrated by the reactions of the participants:

"There's long-term risks & short-term risks. With a pipe, there's the short-term risks where if the pipe doesn't fit then we could just get another one & refund it... then there's the long-term risks where if in 20 years time the pipes are no good then we've got to dig it up & put in a new one." **SE 1**

"Because of where we sit in the industry & on the supply chain...if you're purely a distributor or a wholesaler or if all you're doing is buying or selling then there's different risks. We're not just buying or selling, we're buying, building & owning...so there are different levels of risk…its dependent on where you are on the supply chain..." **SE 1**

17. Modifying the tool...

"I'm just wondering if there's another dimension to the risk part of it…[Main Roads] as an owner, there just may be another dimension to it…maybe it needs to be tailored to this particular project" **SE 1**

The following is the first stage towards the development of a more tailored tool, which includes an added dimension of risk in relation to time. Within time, there are two key elements to consider - liability and function/role. With QDMR's role as an owner, its degree of control over the suppliers are dependent upon the time factor whereby its liability increases with time – the more time it takes to identify an error, the higher the costs and risks involved..

"Most of the industry's focus is always on the short-term, can we build it fast, make more money & getting it done quicker. Whereas when it comes to concrete structure by cutting off the hydration process you're making something that lasts a 100 years last 50 years because you didn't do it right to start with." **SE 2**

This added dimension of time-risk-expenditure is further explained in the *Expenditure-Risk-Time Spectrum* below. This is a work in progress and will need to be further refined based upon feedback obtained.

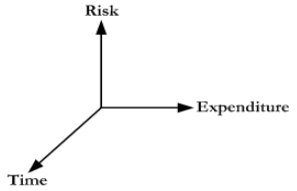

Fig. 17.1: 3D Expenditure-Risk-Time (ERT) tool

16. Risk-Time-Expenditure Spectrum...

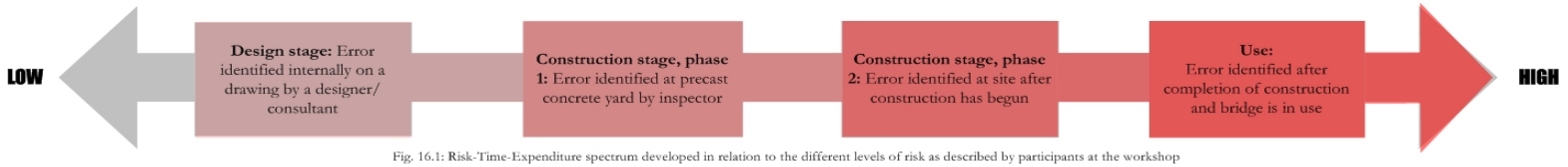

Fig. 16.1: Risk-Time-Expenditure spectrum developed in relation to the different levels of risk as described by participants at the workshop

RESULTS SHEET PCC01d - QDMR Intelligence capturing workshop 1
PURPOSE Supplier Strategies: Risk vs expenditure
RELATED DOCUMENTS Data collection guide (ppt), Results sheets (PCC01a-d), Explanatory guide (ppt)

QDMR, Queensland, 6 Dec 2005, 2-5pm **LOCATION, DATE & TIME**
UN project researchers (PLeader & RA) **WORKSHOP FACILITATORS**
QDMR staff (two senior engineers (SE), an Inspector (INS) & a principal manager (PM) **RESEARCH PARTICIPANTS**

Figure 1.4 PCC01d: Supplier strategies: risk vs expenditure

2.1.2 PCC: Industry/supplier perspective

OVERVIEW OF PARTICIPANTS

Table 2.1 Key characteristics of pre cast concrete supplier organisations interviewed

	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5	Org. 6
Business type	Privately owned	Part of a larger multinational group which consists of two main businesses (premixed concrete & precast concrete products)	Part of a larger multinational corporate entity (New Zealand owned)	Privately owned	Part of a larger national group of precast concrete products supplier	Part of larger national pre cast concrete company
Role	Founder/Director/ Manager	Manager for SE Qld	Area manager for North Qld	Manager	General manager, Business development manager, Operations manager	Operations Manager
Products/ services supplied	Specialised Supplier to civil infrastructure, ie, bridges, walls and piers. Prestressed concrete piles, bridge deck units and bridge girders.	Standardised Pre cast concrete products, which has applications in infrastructure, road furniture, drainage, sewerage, etc. Drainage pipes (access chambers, manholes, oil & sediment traps, etc), bridge structures (culverts, decks, arches), building products (floor panels, walling products), road furniture (road barriers, picnic tables, park benches)	Standardised Supplier to civil construction industry Bridges & earth retention, stormwater (pipes and box culverts), sewerage, building products, water quality products, etc	Specialised Service public infrastructure requirements. Pre cast concrete beams, piles and other pre cast elements to the civil engineering sector	Specialised (Parent company: standardised) Specialise in prestressed flooring units, associated beams & also supply noise barriers for roading	Specialised Predominantly pre cast walls for industrial subdivisions and commercial developments (Newcastle, Sydney, Melbourne). 60/40 mix of walling & structural pre cast (Brisbane)
Size/ Annual turnover	8-10 mil	1.5 bil (for whole group) 3 factories in SE Qld	5 bil (for whole group) “could be 2-300 mil” (for org. 3) 11 operations in Australia (3 manufacturing outlets, 1 distribution outlet)	- 30 staff on yard	5-10 mil 34 staff on 2 yards	45 mil (for whole group)

DEMAND ANALYSIS: significance of various client types

Table 2.2 Key client of PCC suppliers

	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5	Org. 6
Main Roads (direct)	10%	Occasionally	?	9%	-	-
Contractors: Infrastructure (for eg., JH, Leightons, Thiess, JFHollett, Gabridge, QBuild, Abi Group)	90%	20-50%	30-65%	90% 7-12 consistent clients	20-45%	50%
Contractors: Subdivisional market Multiplex, Abi Group, Balderstone	-	50-80%	35-70%	-	55-80%	50%
Others		Occasionally		1%		
Main Roads in total (indirect & direct)	70-80%	20-50%	30-65%	99%	20-45%	Up to 50%

CHAIN ANALYSIS: Key problems related to the sector

Table 2.3 Suppliers' perspective on the key problems related to the sector

Themes	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5	Org. 6
Payments	Ensuring payment by large contractors					
Industry cycles	Skilled labour issues – wasted resources on training & impact on ability to take on more work	Skilled labour issues – wasted resources on training	Skilled labour issues – incentives to maintain workforce an added cost	Skilled labour issues – enhanced pay structures & work conditions to maintain workforce an added cost	Skilled labour issues	Skilled labour – risks involved with training, pay structures
			Lack of lead time – stock of materials, planning	Lack of lead time – stock of materials, planning		
MR's requirements		MR's specifications higher than Australian standard – onerous, less cost effective & disadvantages existing precast concrete suppliers	MR's specifications higher than Australian standard – onerous & less cost effective	QA not reflective of product/supplier performance	Specialised vs standardised specifications – increased complexities associated with specialisation (re-evaluation by suppliers as to the viability of supplying to MR) QA systems onerous & complex	MR's specifications higher than Australian standard – onerous & less cost effective (re-evaluation as to viability of supplying to MR)
		MR's prescriptive vs performance specification -'overspecified', less cost effective & limits innovation			MR's prescriptive specification (instead of performance specification) – 'overspecified', less cost effective & limits innovation	
		Inconsistency in specifications – performance/material/both			Inconsistency in specifications – performance/material/both	
Communication / understanding	Indirect line of communication with MR – lack of clarity				Communication with various parties & distance from MR – complexities & time consuming	Indirect line of communication – creates inflexibility, ie inability to make changes
		Lack of communication /consultation in relation to specifications (changes, etc) – limits innovation & imposition on suppliers	Lack of communication /consultation in relation to specifications (changes, etc) – imposition on suppliers		Delayed communication – lack of input at early stages of design resulting in higher costs	
		MR's lack of understanding of supplier's perspectives & unwillingness to co-operate	MR's lack of understanding of supplier's expectations/ perspectives/ objectives	'Meat in sandwich' metaphor – contractors backcharging mentality and suppliers protecting downstream suppliers	MR's lack of support for suppliers – increased difficulties/ complexities	
Supplier selection			Price as key criteria – disadvantages some suppliers	Price as key criteria – impact on quality and disadvantage to suppliers who focus on quality		
Downstream suppliers	Ensuring consistent supply of materials – logistics etc	Ensuring consistent supply of materials		Ensuring consistent supply of materials - Downstream suppliers facing similar skilled labour issues – impact on supply/quality		Ensuring consistent quality of materials (concrete)
Storage	Storage issues					

Ensuring payment from upstream clients

Lack of cash flow could potentially lead to inability to pay downstream suppliers:

> *"I suppose the biggest commercial risk we all take in any business is getting paid. We spent a lot of money to make this product if we don't get paid it could spell the end of this company so I'm not suggesting it's a problem but there is a variety of rules that seem to be applied…**When we work for larger contractors they tend to wanna be a bit authoritative, dictatorial, and there's "you'll work to our rules or not at all" so payments tend to get extended 45 to 50 days and they argue about paying for product that's held in our yard**…with Main Roads you almost get paid at 28 to 30 days. The others can be 60 days. The actual cost of that I've never actually measured…you could sit down and how much is this money gonna cost you in loss of interest. It's not so much that**, it's the lack of cash flow because we must pay our suppliers at 30 days, it's an agreement we have and if we don't pay them they're likely to cut off our supply**, now the cost of that it's unmeasurable…They wouldn't do it for being late once but if it's an ongoing saga then I can understand why they'd be asking the question and they have a right to, they don't need to have suppliers on board who are not paying them on their accepted terms so we make all attempts to pay our own suppliers in 30 days, to do that we need other people to pay us so that we can pass the money on" (Org. 1)*

Industry Cycles

Themes	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5	Org. 6
Industry cycles	Skilled labour issues – wasted resources on training & impact on ability to take on more work	Skilled labour issues – wasted resources on training	Skilled labour issues – incentives to maintain workforce an added cost	Skilled labour issues – enhanced pay structures & work conditions to maintain workforce an added cost	Skilled labour issues	Skilled labour – risks involved with training, pay structures
			Lack of lead time – stock of materials, planning	Lack of lead time – stock of materials, planning		

Skilled labour most significant issue as a result of industry cycles

Loss of skilled labour during trough periods, time required to up skill:

> *"**Labour's our biggest issue**. Mm we like to maintain a steady workforce...Unfortunately the peaks and lows are quite large sometimes and our workforce has to be double and it's just not there…there's no trade in it **but it's the kind of work that you get good at by doing it and if you're not doing it you lose the ability and they go off and do something else and you can't get them back**, you know it's very difficult that type of thing, variable work load…" (Org. 1)*
>
> *"**The impact is most outspoken on the labour front in skills**. It's very difficult to, although it's a fairly simple manufacturing process, yeh we operate to some very tight tolerances and very strict quality requirements and there's a lot of science behind what we do but it's still an art and so **you can't just go and pick up people off the street and put them in the factory, you spend quite a lot of time training them up**…if you have a large project it takes you a while to train people up to the standard that you can employ them with confidence to do a job but during that time they're very hard, if the work is not there you can't sustain those costs…and **during the trough periods those people then leave our employment and do something else but obviously when that happens the skills that you've spent months building up walk out the gate**" (Org. 2)*
>
> *"…**when you find people you can't keep them because they're being offered more money in more lucrative jobs** where they'll pay big money just to have the people do the job…some of those mine sites are you know 50, 60, 80, 100 people, 200 people, in fact some sites have got over a 1000 people on them, they have camps and cities near their mines, so there's a huge draw on…" (Org. 3)*
>
> *"…if anything concerns me about the next three or five years in this industry it will be where do we get the people and how do we keep the people OK. People say you'll find them, you pay them the right amount of money they'll stay, no, people are not what they were 10 or 15 years ago, they're itinerant, they move, they're flexible, it's very hard to find anyone that can make a career of this. **We're not an employer of choice and none of our competitors are employers of choice**…we can't attract people into this industry at the national payment award rates that we're deemed to comply with. We don't have an EBA…because we work to an award and most of our competitors work to similar sort of pay structures, those pay structures are significantly below what the mining sector pays for unskilled labour. It's below what Greenfield construction sites pay for labour." (Org. 4)*
>
> *"Well **staff issue's a big issue**. I mean it's not only this industry any industry to find good people and if you wanna have good people some of the guys here we just have to bite the bullets and justify it, if someone like if you're a big company and somebody plays up and says you out you can sack him." (Org. 5)*

Inability to take on more work:

> *"Probably our worry is generated by we do connect to doing projects **and if our labour doesn't perform we fail**. And we've got projects on board now that one early into next year…if our labour fails us by attendance, by performance then we're contractually committed to perform that work so we gotta do it somehow …**So we have a little bit cautious about what we take on…we have the structure to do more work but we don't have the personnel to manage it, to do the work physically**" (Org.1)*

Provide incentives to workers through enhanced pay structures, training opportunities, improved processes, enhanced work conditions – added costs/risks to suppliers:

> *"…**we pay our people an agreed above award rate and then we pay a production incentive on top of that**…we do skill our people, we value add their expertise as labourers, we give them training and certificates in certain training, whether it be tickets in machining operations such as fork lifts, cranes, doggers tickets, we give them training in concrete technology, we also put them through front line management training…we're just about to undertake another new training programme with all our employees through a national training organisation to give them certificate 3 in process manufacturing. **So we have all these training, and we have to do that to provide the incentive for people to wanna work here and stay here**, they can't see the benefit…Oh we've improved our processes over the years as much as we can do and we've invested money and our organisation's invested capital in new manufacturing techniques and new machinery to keep up to date productivity wise if you know **the highest investment in our product now is our labour**…" (Org. 3)*

> *"…one of the issues we're contending with in the next three or four years of heavy demand is what pay structure will we have to end up having here to maintain human resource levels …We've got 30 men in the factory at the moment, we can run this factory with 60 men and if they have the work to do I can run the factory with 60 men but I have to find another 30 men and **I have to potentially match payment structures outside the factory to keep them, that's a very serious issue for the short term**…that's not uncommon to do over**, in a month you might do 20 inductions. We're lucky if we end up with two or three in that month with those people**…it gets hot here in Queensland and you know when you're out in 40 degree heat in the shade it's hard, hot, dirty work, we can't find the people who'll work in those sort of conditions. **People say put up another structure, OK I'll amortize the cost of the structure to give another shade, who's going to pay for that when contractors all they're interested in is the bottom line, they don't care if we keep our workers in the shade.**" (Org. 4)*

> *"you've just gotta have your good people, **reward them more** and they just work more you know and you just gotta obviously factor in that you're gonna have more problems than you're normally gonna have in your factory…we have been successful with apprenticeship, more so than with traineeships including government. We've got one guy that's been with us a couple of years now in a traineeship he's good you know, we're about to start another one so you know we're doing certain things like that just trying to fill the gaps there but it's hard work that because you're taking the guy out of school that's got no idea about you know certain things and working in a work force, **it's a high risk investment for us** you know to do that" (Org. 6)*

Lack of lead time as a result of industry cycles

Ensuring supply of materials, etc for continual production

> ***"with the Main Roads…you're not involved in the planning so all of a sudden it's out so there's peaks and troughs of demand** and in a business like ours that's so reliant on the Main Roads as a supplier, if their business operates peak and trough stuff it makes it very difficult for us to manage our business and manage our margins and manage our people and our training and everything…cos we're so far away from the market of supply in some instances, especially in cement and steel **we can't afford a just in time process… if I don't get my steel supply here on time to make the products I need I stop**, I can't do anything so it's important that I get that good chain of supply and I don't want too much in stock, no sense having a million dollars worth of steel sitting out there if I don't need it…the peaks and troughs of the process of purchasing, of ordering things can sometimes be a bit abrupt from a Main Roads' perspective" (Org. 3)*

> *"**We're in an industry here where you just can't turn on the tap and the water starts to flow, we've got a factory and we've got a good momentum up but it can take anywhere from two months to eight months of lead time, planning and procurements of downline items to get set up for major projects**…without a word of a lie in the current market we might anywhere up to six to eight months to get up to start a job, now if the contractors come to us two months before they need products and we need six months to get ready to start to supply the products, well we're gonna say to the contractor "no you'll have to wait another four months or pay three times the cost to try to compress six months of work into two months" and we'd strongly suggest to them that they ignore the offer to pay three times the cost cos they can't swallow it and nor could we cos that would mean we'd have to pass that onerous requirements down to our suppliers and it just won't happen… **the problem with the upside clients also is that they don't understand sometimes the real timing that you need when decisions really should be made**, when commitments have to be made to their downline suppliers so that their downline suppliers have got a hope in meeting the milestones. So that's pretty symptomatic of an industry too where there's a lot of work around, people are missing the picture, they're not programming it correctly, perhaps not as experienced as much as they should be, they don't understand what to do, a bridge that's 300 metres long requiring 200 girders weighing 60 tonne each, they just don't happen overnight you know there's a lot of planning…" (Org. 4)*

MR's requirements/specifications

Themes	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5	Org. 6
MR's requirements		MR's specifications higher than Australian standard – onerous, less cost effective & disadvantages existing precast concrete suppliers	MR's specifications higher than Australian standard – onerous & less cost effective	QA not reflective of product/supplier performance	Specialised vs standardised specifications – increased complexities associated with specialisation (re-evaluation by suppliers as to the viability of supplying to MR) QA systems onerous & complex	MR's specifications higher than Australian standard – onerous & less cost effective (re-evaluation as to viability of supplying to MR)
		MR's prescriptive vs performance specification - 'overspecified', less cost effective & limits innovation			MR's prescriptive specification (instead of performance specification) – 'overspecified', less cost effective & limits innovation	
		Inconsistency in specifications – performance/material/both			Inconsistency in specifications – performance/material/both	

MR's specifications higher than Australian standard

Disadvantages existing suppliers and favours new manufacturing processes/entrants:

> *"The feeling that we get recently is that **Main Roads have dictated their own requirements for standards upon the industry** and basically said you know, pipes 100 years we want 300 going on to a 1000…**So that's my biggest concern is that the industry seems to be targeted in favour of the new entrants into the market who have these super duper new manufacturing processes** that haven't been around and have no proven record whereas we have the proven record and yet we're the ones who seem to be suffering…" (Org.2)*

Onerous:

> *"Main Roads are about supplying the infrastructure to everybody to support that secondary activity as it comes along so they're driven by a whole lot of different issues but with them driving those issues they bring with them a whole lot of other different type of concerns from our point of view as a supplier. **They're a lot more technically demanding than normal customers…our requirements to supply to their specifications at times seem onerous but they're difficult to achieve**… " (Org. 3)*

> *"I **guess one of the biggest issues there is the contractual complexity that's coming into a lot of these projects now, enormous for small companies like ourselves, we're expected to have complete QA systems you know and we just don't have the resources to do it**, we're expected, you know you're expected to wade through that *** job was a 74 page document and another 70 pages of specifications and the specifications were written with absolutely no understanding of the product they were buying so they take it off the shelf bang and see to do it properly you'd have to go through and ask for 400 variations which they won't give you because they don't understand the variations cos they didn't understand your product in the first place so the contractual requirements that are placed on a lot of small suppliers is really quite high. Put it this way – it's too complex…Just too hard to keep them going…" (Org. 5)*

Prevents standardisation – re-evaluation of viability to supply to MR, erosion of profit margins/less cost-effective for suppliers:

> *"when you start to have different segments of the market are broken up into certain specifications and other markets in another specification, especially in the type of product that we make…our market is not big enough to split…so I make the higher standard, stack it and store it, and then when the orders come I can supply any particular market segment I like with that one product. So as the Main Roads impose new levels - you keep having to lift the marker…unfortunately in the real market you can't demand more cost…**As a sector of the market the Main Roads may be prepared to pay but they aren't our only sector in the market. The other part of our market that we need to keep our business buoyant and viable will not pay the extra bit that the Main Roads wants**…in a real competitive environment every supplier's gotta have the same vision or view that that additional requirement is a cost impost, will the bloke down the street add the cost onto when I tender this, mm he may not, no he won't so I won't I'll*

absorb the cost so ***what it does is…our margins have been eroded by continual review and change of specifications****." (Org.3)*

"Now ***we're certified to supply Main Roads and that takes quite a lot of effort and we can do it but we can do it because we make the same product for them each time and we know exactly what we're doing but when they call for specials it makes it very difficult****. A lot of people just don't want to deal with Main Roads now cos it's too hard, you've never been involved, Joe Bloggs down the street there uses the same quality he does everything…Main Roads is just too hard." (Org. 5)*

"…it's you know ***every Main Roads' job's difficult for a precaster who doesn't just do that work day in day out****…cos the normal procedures we follow in the standard quality system for developers and you know obviously other commercial clients that look for economies of scale and they're obviously looking for a product which is economically viable to the development so we can't do everything that's required that a Main Roads' job requires OK? Only on Main Roads' jobs do we follow Main Roads' contracts right and other jobs we follow our own quality system which not necessarily has any specifications attached to it OK?Main Roads' jobs are quite separate. You can say we have separate management tools to manage Main Roads' criteria compared to the RTA…when it comes to Main Roads' jobs it's always difficult because you've got different people on site who can see different things…We feel that if that's the way Main Roads are****, if that's the direction Main Roads are doing then one we've gotta think about what jobs we do target, you know two our pricing and three our level of resources whenever we need to carry to win two or three Main Roads' jobs a year you know so you know they're all the decisions we've gotta look at just because of the specification****…we precast for ten clients every day, ten different clients every day, ten different jobs in the factory every day. Right so you know we're dealing with a whole range, the landscape is we're dealing with architects, we're dealing with builders, we're dealing with developers you know, we're dealing with road builders, bridge builders, so all sorts of things. So it's different for us,* ***see we are as a precast factory our main aim is product in product out so we pour one day we strip the next day so we can, our efficiency is that we can pour another lot of products the same day. Main Roads don't allow that****…" (Org. 6)*

QA not reflective of supplier performance/product quality

"What we fear is starting to happen is that those QA documents are not that difficult to put together like you don't have to be a specialist in this game to put the quality assurance documents together to become accredited with the state government*, you can be a banker and appoint the correct consultants, here write me a set of documents for this industry and the current processes in the roads authorities is they don't really care about your track history or your record or how many years you've been doing it****, they look at the paperwork and if the financials are correct, if you've addressed all the systems, you could own just a house in the suburbs and you could be prequalified as a supplier".****(Org. 4)*

Prescriptive vs performance based specifications

Limits potential innovation/cost savings:

"there's a few considerations to be taken into account when taking this very prescriptive approach you know for instance a prescriptive approach that says you will have that many millimetres reinforcement and your reinforcement will be this and you will steam it for this long and you will have a of this… as a manufacturer it makes it very easy, we just look at what we have to do step by step and we do it but it also means that if the specification changes, any technological advances any add mixtures that we could add to the concrete, any concrete technologies or from a slab of concrete or, is basically not allowed for, we can't use it because we have such a prescriptive approach. ***How can you be innovative if you have all these hurdles to jump through? There's immediate benefits by going from a prescriptive standard to a performance based standard cos it allows us to be innovative****, all we have to do is basically certify the product to a performance…the beauty of a performance standard is it allows me to be creative in the factory and go and test all different kinds of different approaches to see what works best from our point of view whilst still ensuring the product performs to a standard" (Org. 2)*

"The thing there is it's not a performance specification it's a material specification. *Most people have moved towards performance specification…QMR has the reputation of being the most difficult organisation in the country to get product specified for, which I guess means they are the most careful of the tax payers' money if you like as long as they are building equally for the 50 years but very often they are building 50 year structures in 20 years plans…so* ***very often the pace of change and development in the industry is moving much faster than the understanding and knowledge inside a large organisation and there are better cheaper products available in terms of performance but Main Roads takes the attitude that unless they understand every last component that goes into a design unless they specify and approve it can't be put in****" (Org. 5)*

Inconsistency in specifications

Disadvantages some suppliers:

"my argument is allow us to be creative on the square products as well, why just the round products not the rectangular products, so we're saying alright well make up your mind, have a performance standard on the square products the same as the round products or have a prescriptive standard on the square and the round products but make up your mind… I'm ***like have some consistency between the two so that we as an industry then don't feel disadvantaged*** *and so yeh so it's really it's a lot of trouble at the moment. The problem with the approach on the circular products on the pipes is that it's only prescriptive to a certain extent and it allows people a way out" (Org. 2)*

Increased complexity:

*"****It varies from project to project yeh some projects they just want to go with the performance of the product and they let you do whatever you want****, describe the product well we've complied with performance specification.*

Some will specify both which makes it sometimes very difficult because although you're complying with performance the actual materials that we're using do not comply with the material specifications" (Org. 5)

Communication/understanding

Themes	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5	Org. 6
Communication /understanding	Indirect line of communication with MR – lack of clarity				Communication with various parties & distance from MR – complexities & time consuming	Indirect line of communication – creates inflexibility, ie inability to make changes
		Lack of communication /consultation in relation to specifications (changes, etc) – limits innovation & imposition on suppliers	Lack of communication /consultation in relation to specifications (changes, etc) – imposition on suppliers		Delayed communication – lack of input at early stages of design resulting in higher costs	
		MR's lack of understanding of supplier's perspectives & unwillingness to co-operate	MR's lack of understanding of supplier's expectations/ perspectives/ objectives	'Meat in sandwich' metaphor – contractors backcharging mentality and suppliers protecting downstream suppliers	MR's lack of support for suppliers – increased difficulties/ complexities	
	Importance of constant communication re design changes & delays etc – significant impact on costs, storage, etc		Importance of communication - information/delayed decision-making within MR & significant impact on suppliers	Lack of understanding of real timing & decision-making processes	Decision-making process within MR – lacks clarity	

Indirect contractual relationship with MR

Indirect line of communication causing delays/complexities on production:

"I guess the lines of communication can sometimes be drawn out… we can be fairly way down the pecking order if we're a supplier to a subcontractor who in turn goes through a contractor who has to work through a superintendent to the designer ***we can be fifth in the line on the information chain so if we have a problem with a drawing we don't know who to ask anymore****…****we don't have a direct contact to somebody that can give us an answer quickly****, so we tend to cut corners as most people do, we'll often go directly to the Main Roads ourselves… we may get an answer but then we have to confirm that answer right back through the circuit of information again and it can take a long, long time, if we're going that way you know we can have a long delay in our works if there is a problem we need to get sorted out…" (Org. 1)*

"…in any give ***project you've got a designer say an architect, you've got a specifier like an engineer, you've got a developer who owns the product and is paying the money and you've got the builder who has to put it together. Now unless all four of them at least are open to a new way of construction you're gonna have troubles.*** *So we need to make sure that not only is it specified but the developer is happy with it, they understand the finish they're gonna get, the engineer is happy with how it's gonna fit into the structure and the builder knows how it's gonna work so the other issue we have is not only educating people about it but make sure when you get any given development that those group of people that very often haven't worked together before, if you've got a design builder developer that's different but if you've got somebody who gets a different architect, a different builder in to do his designs and his contract* ***you need to get them all thinking the same way****…don't forget Main Road will often hire an architectural firm or they'll hire an engineering firm, in this particular case *** will hire the designer and then they hired *** to do so *** is having to deal with Main Roads, with ***'s designer and God knows how many other people you know* ***so for us to know who the client is is very difficult so at any given time there can be 8, 9, 10, 12, 15 different parties involved in the final finished product. It's getting worse, it's getting more complex****. (Org. 5)*

Inflexibility on projects run by consultants:

"…Main problems we do run into are when Main Roads' contracts are run by consultants…we're finding that jobs now that when I'm pricing jobs always try and find out who runs the job, if it's a consultant then that we try and factor a

price to that cos they actually cost us money. Oh well if you kind of look at the way it ***is they don't have any flexibility the way we see it. They have a contract with Main Roads, they just stipulate it, they've gotta deliver that contract so they get paid you know and so therefore we're kind of piggy in the middle and we've gotta do everything that opens and shuts by the book and certain contracts sometimes you just can't do that, you've gotta compromise and it just becomes a massive battle to get anything changed*** *…so that's probably our biggest problem is trying to manage contracts managed by consultants because there's another tier of contracting above that… We try and work closely with the client, it forces us to spend more time and money on you know on projects that probably don't, that shouldn't require much management time…because we've been doing Main Roads' jobs for 14 years and this is what we've done and agreed you know certain things are done this way and now the consultants get involved it's all gone back 14 years and here we are trying to justify all this again. Over and over and they won't change, they just say that's our contract with Main Roads so we're kind of piggy in the middle that we don't get any compromise out of that." (Org. 6)*

Lack of input from suppliers re specifications/non-cooperative approach

Suppliers uninformed of objectives, limits potential innovation/cost efficiencies:

"I think it's more a question of they take the asset manager's view. To ensure that the assets they inherit from the third parties are up to the standard they require they set the standard the products have to be built to which is fair enough, we don't have a problem with that. Because they take that view they want everything built to withstand World War 3 and 4 and ***we're saying that if we have a cooperative effort from the start we can actually help you save money along the way and make sure that you still end up with a product that's fit for the purpose right.*** *Right now the increases in the standards have gone to increase to such an extent that we're saying well where's the logic…and why have these inconsistencies in one standard versus another for a square product versus a round product, what's the difference. So one of our main concerns is that yes we understand the asset manager's point of view…but on the other hand we can assist them in making sure that what they buy is installed properly, cos a lot of problems have to do with you know installation practices, people putting them in are trained properly and that the purchasing decisions and clear and concise and well defined up front right so that in the end they end up a product that is fit for the purpose…Well we've tried to get in touch with them to set up meetings and get them to respond to our concerns about the discrepancies and inconsistencies in the standard but they're not returning our calls …The concern is that if there's no input from industry into standards and that in the end industry will just go off and do its own thing" (Org. 2)*

"What will happen is ***the cost for that project will be higher than it would have been otherwise*** *[if don't get to the design earlier on projects]." (Org. 5)*

"when they do increase their specification they generally do it not with consultation but generally for a reason and they tend to consult after they've actually changed it rather than consult before they change it…well that's my opinion from where I sit you know, they may put it out in some draft form you know we've just amended this new specification for I don't know for some product or other, there's the new draft specification and it might be out there for 12 months before they actually make it you know the only specification but in that 12 months there's generally few forums for you to argue about whether or not it's appropriate or not because ***they only argue from their point of view but from a durability point of view or from a structural point of view they don't have any cost point of view because as a Main Roads, as a government entity they don't have any cost issues****, they'll pay, they've got propensity to pay to which the private sector hasn't and doesn't want to pay" (Org. 3)*

Transition space between upstream clients and suppliers

Absence of cooperative approach/ MR's lack of skill/understanding of suppliers' perspectives:

"we are dealing with materials that can vary from day to day and you can have people who are sick and not on the job and they make a mistake and ***and there is absolute realisation on our part that we're not perfect, in fact far from it but when a problem happens you want a cooperative approach to fix it and that's what seems to have suffered a little bit*** *is that you know I have made some fantastic mistakes in my time and you just learn but if there's someone you can go to and say look we stuffed up…at least then there's that cooperative approach and we can say "right the problem is this, what do we want to achieve, how do we fix it to ensure the product still achieves what it is that you want it to achieve" and we feel that's fallen by the wayside a bit****, they expect us to be perfect which we're not****. So and in a sense to have that expectation is great you know, they are paying a price for a product and it is up to us to ensure that we supply fully to their expectations and our realisation is that it doesn't always happen but if it does there needs to be someone for us to go and talk to instead of trying to bury it or try and get it through and hope they don't. Cos what most problems - they end up being discussions about very little cos there's never an issue with the performance of the product, there is so many safety factors and so many tick boxes along the way that the product will perform because otherwise the risk of it not performing, there's too many balances, too many checks and balances in the system to ensure that doesn't" (Org. 2)*

"The specifications, not only are the specifications too tight but the difficulty of deeming when you miss one, usually with a builder if we have a panel or something that doesn't quite meet the specs they'll go oh it's OK we can make it fit and then they'll go she'll be right. Not QMR, they will raise a non conformance report under the QA system, often it means nothing*....result of simple problems you can resolve it the next day, that one drags into meetings, I've got emails, I've got reports and you know…When you're dealing with what we call the buck stopper, the buck stops, you go out with the developer, you go to site and you can say we've got a problem here, you can stand with them, you can say well this, this, that done and they'll either accept it, I'll accept it but it's five bucks left for what else, you cannot do that the amount of management time that's soaked up". (Org. 5)*

*"…****we're expected to do everything correctly the first time. We make a dud product you know out of tolerance or whatever all our client base is very quick to reject it OK. Yet we are then held responsible for our downline suppliers,*** *we've gotta correct all their mistakes. In other words no we won't charge you for the three hours it took to*

find the mistake and the crane to unload it and to put it back on the truck and send it back to you… but our client base is not afraid to backcharge us OK…So we have to be very careful that things are correct here before they go out so it's still very cut throat. If our suppliers let us down what can we do? We're gonna put em against the wall and shoot them? No cos if we shoot them who're we gonna shoot next OK. ***We have that philosophy that our clients should have cos if they put me against the wall, the bullet will ricochet and hit them. That's all we ask of our clients is that they recognise that*** *you know that if we put an effort in that we're diligent, we're conscientious, we try to achieve targets, budgets, and not withstanding I still have my commercial issues and arguments, they shouldn't put me against the wall and try to shoot me if I let them down once…" (Org. 4)*

*"****I don't think they've ever bothered to find out what the expectations of their suppliers are****. And one of the reasons is I think is because Main Road are losing people to the private sector, there is very little traffic back the other way. What's happened is there are few people that come from the private sector back into the public sector, there are a lot of people that come out of the public sector and go into the private sector, so we know in the private sector how the Main Roads operates…They don't know how we work because no one's gone back the other way to really tell em…Well there's a couple of issues, one some of them just aren't nice people to talk to.* ***I think that some of them don't have the understanding, if it's a skill call it that, they don't understand the structure of private enterprise, they don't know what drives us****. The dollar is not what drives us, what I said was I'm here sure to make as much money for the people that own us I do but that's a behind the scenes sort of issue, that's the backdrop to the scene that we live in, the living scene is we're out there trying to do the best we can every day. Now we get that interaction from our customers at the private level because they know, they run a business for the same reason. So when they think about what we want it's all about protecting yourself, it's only about the dollar, it's not about the dollar you know there's an ownership like everybody in their jobs you know, they're not about losing their jobs but there's more ownership" (Org. 3)*

Importance of constant communication [design changes, decisions, approvals on projects]– lead time, storage, production delays

*"Oh no I don't think we ever not get them [design changes]… I guess it's just the way of the world…everything wants to be built quickly and very little thought put into things…when it makes a little impact it's more the construction issue that the contractor may have done something slightly wrong and all of a sudden our precast element's not gonna fit too well. And he may have done a survey that morning and said wow hang on we'll put this out of position and hop on the phone and stop you know gotta make this change. The big ones is if it involves the design and all of a sudden the product cannot meet that new design criteria then the impacts are huge cos we may have already procured an awful lot of material that's necessary to make it… if we don't produce on a particular bed on any one day then there's a non return of investment so there's a big dollar impact from that****. If it gets to the stage where they ring up and say you can't pour today because –something's wrong…you've got these guys standing around scratching themselves and there's no return, no productivity now we can't just go and do another job because we weren't prepared for it so that has a big impact because it impacts the job that somebody's rung us up to stop and the next job and the next job and the next job****". (Org. 1)*

*"****it's something you've gotta work at, if you don't keep up to date with who's there and who's not there you can certainly lose touch of who the boss is and who makes the decisions and who's the person you go to to get some information****… and* ***that's another thing that the Main Roads doesn't like doing, they don't like making decisions in a hurry either****, especially when there's difficulties you know, because it's a public institution I suppose that's why you know there's structure, they've got a hierarchy of control that says it's that shape and it's not gonna change you know, whereas when you get into private markets and the private businesses now they tend to be a lot flatter, even our business is very flat, so you haven't got to go too far before you get to a decision maker****. We've had issues and problems over the years but we generally manage those fairly well and I think the Main Roads for their own part I mean most of their guys understand that process and they try to manage it well themselves so I think we all understand the obstacles with the shape of what it is both from their side and our but, depending on the local managers and how well I get on with the local manager in town, and if I don't get on with him there's no, you don't manage anything it's formal, written, there, next step, there, rubber stamp, come back down through the channels you know". (Org. 3)*

*"…****they have their rules but what you can never find is who makes the rules****... They chop and change them… it just goes round whereas people in the RTA are able to say in their system they have the authority to say that's OK I can approve that variation or I can waive that condition of the specifications, you can't find those people in QMR…the example I gave you of the patterns on the highway, somebody sat in a drawing room and said I think precast patterns look like this and I'm gonna draw them that way but at the time it goes out to tender and they buy a slightly different product their expectation and they get a totally different look and they go but that's not what I expected, but it meets your specification. That's when you can be right and wrong at the same time. We've gone to enormous expense to produce drawings, scanned their patterns and said this is how it's gonna look in perspective and nobody had done that and they'll gone oh but it's got all the way through at least seven different parties… I actually don't know who the designer is, the drawing of the pattern has got some private design company.* ***That's gone through the consultant engineers which has gone through the civil contractors but where do you find who can change the pattern?" (****Org.5)*

*"it's not necessarily anyone's fault, the bottom line now is that we have these standard changes and design changes which again there's not much we can do about it… so the design changes as such are a problem in the sense that what we make the design has to be approved by Main Roads, for instance for large box culverts the design that we come up with we have to submit to Main Roads before we can produce****. The concern with that is twofold, one is the delay in getting the approval****, it means that our engineers have to spend time you know doing up the drawings and doing up the designs and sending them to Main Roads and they then have to get their engineers to approve it and they may have a workload banked up for other projects and it could take two to three weeks to get approval.* ***The additional problem with that is that it basically puts the onus on Main Roads from an insurance and professional indemnity basically if they say yep this is good and the thing ends up failing, whose fault is it?*** *It's mine, but I could go back to Main Roads and say but you approved it and they'll come back to me and say but you designed it and I'll go back to them and say you approved it and then our lawyers will talk to their lawyers and have an absolute field day so whereas in other states you know there is a specification that is set up front saying these are the*

parameters that you have to design to and you certify that you have designed to these parameters, that it will perform in this manner and last this long, end of story and the onus is on the manufacturer to comply." (Org.2)

*"So we often talk to the contractors who we're working for at the department you know we regularly talk to them …**give us an update, give us an update and we'll try to delay making the product so we try to employ the adjustments** on the principal but you know we try lots of things, not always successfully" (Org. 1)*

Supplier selection process

Price as key criteria a problem:

*"They have a purchasing policy that's known to us all…they might have five different elements of awarding a project it might be you know they might load the price, might represent 60% of it, quality may represent some of it, if you're prequalified as a supplier so you've been through some audit process and you've been given a rubber stamp, that might be another requirement and all of these things are weighted and at the bottom when you put the tender in with your price, your price might be higher but if your weightings are better than someone else's whose price was lower you may be afforded the work., I have yet to see that happen**, it's invariably the lowest price is the one that wins it**. **Because the Main Roads only put out invites to tenders to people they know that are suppliers, that are qualified suppliers anyway…and they know who they are, so invariably price has everything to do with it…**.And that's unfortunate in some ways because like for instance in south east Queensland the bigger operators are protected and some of our competitors can come into those other operations that don't have any other sites in Queensland, they can supply to here at a different rate to what we can supply to here because they have different cost levels, I mean the purchasing power in Brisbane is better than here so the cost of buying materials in Brisbane is cheaper than here for instance, the cost of labour is cheaper in Brisbane than it is here, their volume, their business volume it's higher because it's a much bigger business in Brisbane it's higher volumes so they can afford to in some instances manufacture the product and sell it all the way to Cairns and keep their margins in that, in that same as what they're giving in south east Queensland and sell up here cheaper than we can. So we're not protected by any local area incentive…" (Org. 3)*

*"Our client base come from a school of thought that the most important measure on a contract that they're involved in is the profit. So what we've seen for many years and it is changing however, but what we've seen for many years that cost is paramount to the point that only lip service is paid to safety records or paid to quality records or paid to track history. **We can lose a job on half a percent price difference to someone who may have a bad track record, someone who's potentially trading insolvent…so one of the biggest problems we've faced over the years is that what drives the selection process of these larger contractors is the price**. Never the tendered price cos the tendered price is a part commitment from us that we'll partake in a Dutch auction that should eventuate and nearly always does when they win the contract. That can distort the pricing market because you can take pricing to two extremes. You can take the view that the price is only a claim by you that you wanna be involved in the job so you put any price in, as long as it's high. Or you might choose to be ethical and say I'm interested in this job, I'll put in a competitive offer and lodge that. I've come to the slow realisation that to be ethical and put a fair price in that you're willing to take on the job is really cutting your nose to spite your face because they would never sign you up on that low price that they would have used in their tender to get the job, they always conceive that there's room to move and revisit the price. That sort of philosophy doesn't lend to a good market because what's to stop every supplier just inflating the prices…**We've always had the view here to put in a competitive offer, a fair offer and if need be negotiate at some stage, if need be but really that's probably lost us more jobs than won us more jobs** because contractors then take the view that why didn't you leave some fat in the price so that we could talk a discount and they could pocket the discount… it's like going to the market…and that really sticks in my craw because it avoids any recognition of other factors like your track history, your performance and quality levels, your OH&S". (Org. 4)*

Downstream suppliers

Ensuring consistent quality and supply of materials (logistics, labour shortage):

*"I'm getting that feeling not just from our shortage of labour but also from our suppliers**… for instance *** have said to us yes we can make all the concrete they want but how do we get it there you know** we've gotta put it into the back of a truck so there'll be truck drivers, there's gonna be trucks, there's traffic problems all over Brisbane, how're they going to get it from their plants to the sites? We share a common fence, we don't have that problem but yeh cos we're set up here. But certainly if that concrete has to be supplied to the centre of the city and there's a massive traffic jam. Not a problem I have to contend with but it's certainly one that needs to be considered…and reinforcing is the same cos there is, tends to be a fairly shortage of reinforcement available now also. It's available but they can't process it quickly enough, we rely on *** to supply us processed reinforcement ready to use but they're struggling to keep up with the market now and we're not even busy yet so what are they gonna do when that happens" (Org. 1)*

*"…**our suppliers to us would be in the same position like when we were ramping up for the larger capacity we had difficulties with I think primarily steel supply was a major issue**. As the mining boom, especially iron ore boom hit this country with you know China quadrupling it's demand and the prices for iron ore going through the roof, obviously it had an impact on the steel prices and it had an impact on the availability of steel as well so our steel costs have gone up by 30/40% - in the last 18 months…That's a very significant …it's basically an external shock to the system because of the way the Chinese economy's been going so that's you know that's just the situation that we're faced with, it's similar to the fact that our transport costs have gone up significantly because of fuel, again it's an external shock to the system, nothing we can do about it…" (Org. 2)*

*"…those sorts of issues are the same that our downline suppliers face OK, we use steel fabricators who have trouble getting tradespeople, we use reinforcing suppliers who also have an itinerant casual baseload that you know they're either there or they're not or they've been put off and put on and all the problems that come with it…**and invariably the quality issues we face is because there's not a stable workforce employed by our downline suppliers in that sector** and they're having to try to train people all the time on what's expected and we have jobs sent to us sometimes three or four times, the same job first time wrong, second time wrong, third time wrong, fourth time*

*eventually someone's paid notice to it and fixed it…**there's a lot of issues with the suppliers that supply us and the issues are related to volatility in the market, strong demands from the mining sector, resource sector.** We compete for service from our suppliers, we compete with BHP Billiton, in round terms we compete with the mining, we have the need to get steel fabricated items made or reinforcing steel and we're sourcing those items from the same companies that service the mining boom and I don't mind telling you that if they have to decide between us they generally run with the mining companies cos the mining companies at the moment are paying anything to get things done." (Org. 4)*

*"We don't have many problems with our major suppliers with the way you know if you look our major suppliers are reinforcement and concrete so they're our two major suppliers…**we do have our teething problems with ***** you do, because concrete is you're mixing, it's not like steel so you do have your problems you know your plant breaks down, you've got human factors involved where truck drivers are you know are doing certain things you know**…but we pick it up in the processes when all the product goes out." (Org. 6)*

Storage

*"**If there's any problem that we as a supplier has, and our biggest problem and it's a problem all precasters have, is storage, we are too often expected to manufacture product and hold it in our yard for a length of time**. We all talked about charging storage and Main Roads contracts where we're tendering directly to the department now, they're put in the schedule of rates an allowance for storage so we can charge the storage. But you cannot charge anything like the possible cost if it gets to the stage where we can't produce because if we do produce we've got nowhere to put it, those costs are 20 times what we could ever charge for storage, the best we could ever charge for storage is realistic cost of relocating that to another patch of land and lets say your backyard might become available, I'm gonna deliver a bunch of beams and put em on your yard and you're gonna charge a $1000 a week and I can pass it onto the client, that potential's there. If the land was available, if everybody could make it happen you know we could do all those sorts of things but it's impractical so we tend to pretend that we're gonna charge storage but we never do…our yard now it's jam packed, some of it's our fault because we've made things to suit ourselves, some of it's the client's fault because they've delayed a project for one reason or another**, that's a real problem the cost of real estate the way it is around here, you can't afford to have a spare block of land just to put product on**. We're lucky we have it but it's nowhere near enough, it's an ongoing problem. It's not just the cost of the land to relocate these monstrous great things there's big cranes involved so the cost actually putting the beam somewhere else you know is quite prohibitive. Transport it, unload it and then get another crane to put it back on the truck to deliver it to the site" (Org. 1)*

STRATEGIC ALIGNMENT

Table 2.4 Key objectives of suppliers and various barriers and opportunities associated with achieving those objectives

Themes	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5	Org. 6
Objectives	Profit driven				Profit-driven	
		Maintain competitive advantage – safety, environment, professionalism	Maintain competitive advantage – relationship-building	Maintain competitive advantage – quality	Maintain competitive advantage – niche market	
					Growth/expansion	
Barriers	Uncertainty of workload		Uncertainty of workload		Uncertainty of workload	
	Ensuring payment					
					MR's requirements	
Opportunities		Increase supplier involvement in design				
	Ensure more consistent workload		Ensure more consistent workload			

Objectives

Profit-driven

*"Well **our main objective is minimum turnover**, we have a minimum turnover which we must turnover just to break even and without that we go backwards and that's related to the labour force, if we've got that minimum turnover we*

can ensure that that labour force is maintained, not just at the workplace but at the you know the thinking end of the establishment as well then we can all justify our existence and then at the end of the month there's still a few dollars to make it worthwhile coming in and doing it, that's obviously our ultimate objective, we don't do it for love, that's strange that isn't it? Yeh and when you own a business I can assure you that reason becomes a little bit more valid. So that's our ultimate aim to generate enough work to get the minimum turnover" (Org. 1)

"…make money, keep us employed. Our objective is to keep ourselves employed and happy. ***It is to maximise what comes out of here…Production, our production which means you also maximise your profit and everything****." (Org. 5)*

Maintain competitive advantage – safety, environment, professionalism, relationship-building, niche market, quality,

"Well I think being such a large operator in an industry with relatively low barriers to entry it means we are constantly competing with people who have different standards when it comes to safety and health, environment, product quality, product delivery and service and so I'd say our objective is ***to be different to these people by being more professional, more thorough, more safe and more environmentally conscious*** *and more of this and not the other, it's the only avenue we have cos we get the impression that the smaller operator is favoured because of the fact of what we call they're not squeezable alright, you go and squeeze one of these backyard precasters because of a quality non conformance and they fold up, they just go broke…whereas you know we're the 15th or 16th largest company in the country, if we don't perform we have queues of lawyers lining up outside the gate so that the rules are a bit different for us because we're such a big kid on the block, we're the biggest kid on the block we make a very good target. It gives specifiers and customers assurances that if we don't perform at least there is some financial backbone that they can rely on and it gives them some guarantees as to the performance as well cos it's backed by you know their integral that again the playing field we get the impression is not level because we get the impression that the playing field is a bigger pitch. Levelled towards the smaller end of town, so the smaller competitors survive" (Org. 2)*

*"Customer relationships, it might be a personal thing but generally it's like we've supplied them for many years or something or we'll always bring their products back and we won't charge them for return costs or we'll give them credit for anything that they don't want that they bring back, we'll offer them technical support on occasions, we'll facilitate delivery for them, you know we'll do a lot of things, it's all part of that service delivery issue…****I've found that in a strictly really open competitive environment you really need to have a relationship building…so we really sell the service delivery issue and we like to think that that's where we try to focus our business****." (Org. 3)*

"So at the moment in Brisbane there's actually three companies that do this work religiously, ***we're probably at the forefront in terms of capacity what we can supply and also of quality, we're not the leader in terms of cost competitiveness because some of our competitors are a bit leaner than us in terms of their costing structures but we've got a good reputation****, we think we have, with our clients in terms* ***of commitment to quality, commitment to confidence in achieving milestone dates****. We've never let, we've never let a client down on a milestone delivery date in 25 years. Well it's a function of never promising things you know you can't achieve. I've made promises on things I knew I couldn't achieve but I made it on the basis that I knew that the dates they were asking things to be ready by were unrealistic cos I come from a background of bridge building, I come from a background of heavy construction and when someone tells me they want a certain range of products by a certain date I can usually tell whether they're overly optimistic or living in utopia or a bit idealistic and I won't say no I can't do it, I'll say yes I can do it but it'll take us a little bit longer can you live with that? They're long life structures, they're committed to design lives of 50 or 100 years so that's why the quality levels are so demanding here that when we make a product we're deemed to comply with a document that says we take every measure to assure that if we do our thing, our side of the works correct and the designer has done his side of the works correct, there's some strategy or hope there that that bridge will still be there in 100 years time, maybe 200 years time, builders don't have that attitude, builders wanna get in, get out, turn over the practical completion, argue for 10 years about defects in their buildings, that's a market we choose not to get involved in cos we don't agree with the ethics." (Org. 4)*

"I mean basically it's to ***make sure in a growing market that we are the biggest and best in our particular niche****…" (Org. 5)*

Growth/expansion

*"…****our next two growth strategies involve setting up additional yards****. Well when you get to I mean we're in the middle size ultimately let's say in a few years time if you had four yards here that were all doing slightly different things but one central administration that could cope with everything and then those, that labour force if one yard was down could move people you've done your, you've had time and you've had the money to be able to do your multi skilling and your training, your cross training and all that sort of thing, one QA system can run it all and then you start specialising, then you're big enough to have a QA manager and a safety manager and a you know but getting to that stage from where one person does everything is difficult" (Org. 5)*

Barriers

Uncertainty of workload/skilled labour:

"The biggest barrier to meeting an objective comes from the principal, if he doesn't want a bridge built we don't build stock, we can't just keep making it for no return ***so workload is the biggest barrier to any objective if we don't have the orders then there's no objective to meet****…but the biggest barrier to us meeting our needs is simply put down to the workload that is there and being only two competitors in the industry it's fairly easy to keep constant at the lower level because there's always some work around and he gets one, we get the next and there's some work that he does better than we do and vice versa but that's just to meet that bottom line and obviously to make more then we depend on the department putting or the principles putting out the required workload so we can get our fair share of it to develop enough turnover to actually make a dollar." (Org. 1)*

*"**A lot of it's the volume of the labour market, it's the quality of the labour market too, we don't have quality people, we don't have the quality people to pick from that we used to**…We can only grow so fast and at the moment I think we're trying to grow faster than we have you know the capacity to be able to meet that growth…I think a lot of people are treating this with a bit of caution you know, it's always great to have your order book full but then what that encourages you to do is to look at the longer term aspects and say well should I be growing my business so for the people out there that grow their business and take the punt and then the business falls away sometimes they've grown their business by investing heavily in the growth and if you invest heavily there's gotta be some return and if there's no return because the growth walks away you're gonna be, have this investment that's not worth anything so there's a risk of people going broke and losing money cos you know the potential of having more people in the country than we've got jobs for the employment rate goes through the roof and next thing you know you've got employable and you, all sorts of things so it's a very, very difficult thing to control I understand sort of so apart from that most of the things that affect us are out of our control." (Org. 3)*

*"…**growth requires money, cash flow is always an issue when you're a small company if you're reliant on your own cash flow I mean if you're gonna make 300,000 worth this month and 500,000 worth the next month, then where does that extra 100,000 come from**, what are you gonna need for materials you know and if you keep growing so you know a supermarket takes cash in today, pays their creditors on the 60 days, they have other people's money, we're the other way round, we buy things this month but we don't get that invoiced so our working capital is always a hindrance to growth, any business, small or medium sized business you talk to. And then I guess finding people. It's not delays in payments it's funding growth, funding growth is the hardest thing and I guess people's part of that, when you need more people, if you're just ticking along you're too, and you're profitable, when you're making profit every month you pay for next month but if you're growing fast you need more money every month and it doesn't come in for a couple of months so cash flow for growth is difficult. **Also if you're growing you need more people so it's not just a matter of holding onto your good people, you need to train them** you know and at the moment in Queensland in the construction industry it's incredibly difficult finding good people" (Org. 5)*

Ensuring payment

*"…obviously **we've gotta get paid but that's just a function of what we do you know we try to spread ourselves thinly enough through different clientele so that if one guy doesn't pay us the other one else does,** we get paid eventually, you work around those things, it's frustrating but we select who we're gonna work for, it's a commercial decision you know I'd rather work for somebody I know's gonna pay for it than somebody that's gonna give me a hard time that's common sense…" (Org. 1)*

MR requirements

"Main Roads. Yeh I'll tell you what quality assurance requirements hinder it to a degree, they do…" (Org. 5)

Opportunities

Increase supplier involvement:

*"As much as we want to improve as well cos you know there's a lot of areas that we can improve on and you know obviously precast concrete for them is a major expense when they have subcontractors and I'm just thinking off the top of my head, their biggest concern is that they're faced with a situation where they inherit stuff built by other people. So their main concern that the products they inherit are not being manufactured to the standard they want and they want to ensure they have all those places covered so I think **that there's probably opportunity for us to be more involved in an alliance** or you know public guided partnerships with Main Roads as the driver. We're actually now going to be doing our first alliance with them for a bridge replacement programme. And so that's [alliance project] gonna be a good learning experience for us cooperating with them on building bridges and the beauty of that is that it gives us an input into the design process from day one instead of normally when we get involved in the design, or we don't actually get involved in the design but the people that build it come to us and say well we want six of these and we look at it and we go like my God who designed that." (Org. 2)*

Upstream clients ensure more consistent workload:

*All we can do is hope that probably you know **I would like to see the, from a Main Roads' perspective I'd like to see them plan a bit longer term and have projects out there in the market place so there is some sustainability**. We're prepared to invest in people, in training and developing people, in career development but we're not prepared to invest in bad risks and I think investing in business that we don't know what's happening with and it isn't long term and it isn't developing is a bad investment and you wouldn't do it. (Org. 3)*

*"It has to come from the top, it has to come from the **principals who recognise that there's a bit of a downturn and maybe we should be working for that industry to keep them fluid, sort of level**." (Org. 1)*

UPSTREAM CLIENT/DOWNSTREAM SUPPLIER STRATEGIES

MR's role as large client/regulator

Themes	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5	Org. 6
MR's requirements	Increase standardisation	Increase standardisation				
				Align QA systems with performance		
Communication		Provide opportunities for supplier involvement/ input		Increase understanding of suppliers' perspective	Provide opportunities for supplier involvement/ input Increase understanding of suppliers' perspective	
		Increase clarity: specifications/ changes etc			Increase clarity: processes/etc	
			Awareness/ education programmes			
Industry cycles			Ensure more consistent workflow, ie			
Supplier selection	Increase principal supplier contracts					Fair award of contracts & prequalification process

MR's requirements

Increase standardisation:

> *"**The answer I guess if there is one is to make us more efficient, reduce our labour component of our work**…But we seem to have gone the other way in recent times…the product has become harder to make … and definitely our labour component has had to rise because of that. So if they could make the product easier or really small standards so that we're doing the same thing every day and not having down time then possibly our productivity will increase and we may be able to assist the industry a little bit more than we do now…**standardisation's a big thing**. We very rarely make the same product twice. Well from the outside looking in you go out in the field, there's always little intricacies and they may only be the smallest thing but everything has a function of labour so if we have to change a mould set up somebody's gotta physically go up and do it and while that guy's doing that, what are the other six or eight guys doing, standing around twiddling their thumbs waiting for him to complete his task, therefore we lose our efficiency but **take that function out of our manufacturing process and the guy today does exactly the same as the guy did yesterday, then we'll become a little bit more efficient**. I'm sure these changes are necessary to the project – Yeh I don't think they're as necessary as they make out sometimes, there are ways around these things…why build every span different just because it does that or because it goes around in a curve, rationalise, build them all the same so at least we get repetition. **I think Main Roads must take more control of the design to implement standardisation as much as possible and simplification**. They are letting too much work go out to consultants who are trying to recreate the wheel to put it quite frankly and although the Main Roads then sign off on those drawings they don't have the checking functions that's necessary to pick up these problems. We don't pick up these problems until such a time as we go to make the product" (Org. 1)*

> *"And I suppose the issue we have is that if we deal with Main Roads we have to deal with them on a different basis to which we deal with other customers…it requires to do all kinds of things over and above what I do for my normal customers and **so the cost of running two product lines concurrent to each other is huge. If we could amalgamate that into one the benefits would be huge** and so that's basically what we're saying is that **either Main Roads imposes its will on the entire industry, including all the subdivisional contractors…or they adopt the standard that is good enough for the rest of the country…**but having the two standards in existence concurrently is making life very difficult. And the cost of just leaving aside the cost of running two concurrent product lines but just*

the cost of setting up to produce that second line will be astronomical and I will have no choice but to pass that on. ***I suppose the biggest thing that we can do is have consistency of quality, consistency of supply, consistency of service and that requires a consistency on behalf of the purchaser to consistently buy on the same parameters and according to the same rules****…we've already pulled out of the prestress market because of the fact that the prices were driven down and but the issue then is purely price, it's a very high risk business and if you don't get the returns then why bother because we're the biggest target we can't afford to hurt people in this manufacturing process and it's a very high risk process so* ***we would like for the purchaser to consider other parameters other than price when they make their purchasing decision and you're looking at consistency of supply, consistency of quality, consistency of service, consistency of product…****if the decision is that no we can't physically make it work or the cost to do so is too high for them to accept it and they decide to go with an alternative product, everybody loses out. (Org. 2)*

QA process – more aligned to quality & performance of suppliers

*"So Main Roads is an ally to us and we just wanna maintain that, but they are they're not our enemy, they do things sometimes it makes it hard for us to operate you know … it's the way the Main Roads' systems are, if their QA accreditation process is such that someone who doesn't have any idea of precast can get accreditation that upsets me, but that's the Main Roads' system. OK but it comes back to what perhaps they should really start looking at before they accredit anyone in a particular sector****, just don't look at the paper work, start looking at track history, look at credentials, look at performance levels****, for goodness sakes the Main Roads are the last people they need cowboys on the block to jump into this game on the back of a QA accreditation. Main Roads are, we certainly don't care if it happens, we'll make our thoughts felt if it happens because* ***all that will cause is a decline in the quality of the work, won't affect us because we'll maintain our quality levels and our price levels but we will lose market share because quality will be thrown out the door for the sake of assurance of supply, that's what Main Roads is facing****." (Org. 4)*

Communication

Increase supplier involvement

*"****If we had some input earlier in the piece….More consultation*** *they'll love that one as an answer" (Org. 5)*

"we have little choice but to comply and so that's what we're saying ***is involve us from the start and in the end we will be happy to do whatever they want.*** *The danger by going away from that cooperative forum and setting your own standards is that you just put the entire industry off side because we just spent I don't know how many years – building up to a consensus view where you walk out of the room and all of a sudden the consensus view just gets chucked out the window and we get this new standard imposed on us which produces extra cost and so our argument is that…all we want is a level playing field, we don't want to be advantaged, we don't want to be disadvantaged…****we have to be careful what it is that we're trying to achieve for the sake of increase in longevity of the product****…so we're saying well alright* ***we've had all these extra requirements imposed upon us maybe now's the time to say well before we take it any further let's engage in a dialogue to see what it is that you want to achieve and maybe there are other ways of achieving your increased design life****, we can add additives to the concrete, we can galvanize the steel, we can use stainless steel, there are other ways to achieve that but simply mandating an increase in the wall thickness we believe is not the answer. Part of the problem is having that dialogue in the first place. So we feel that it's not a cooperative effort anymore, we walk out of the cooperative forum, the next day a fax lands on our fax machine saying a unilateral decision has been made that the standard will be this so instead of producing culverts to the Australian Standard 1597 we produce culverts to the Main Roads' standards MRS1124." (Org. 2)*

Increase understanding of suppliers' perspective,

"Main Roads can best help themselves by having people in their organisation who are familiar with the particular industry sector and by being familiar they may have even come from it because it's not that easy, they've gotta understand it, they've gotta understand the problems the sector faces, *they've gotta understand the technology of the sector, they've gotta understand commercial aspects, if they get people on board that understand what's truly involved in running an operation like this and they recognise that not only is there a culture required but there is a major capital investment required both in intellectual development as well as financial****,*** *then they're over the first hurdle of getting some assurance level…if there was a true recognition of other factors beyond cost like what's your safety policy like, what's your yard like, are your blokes having to work out in the sun all day, what's your incentive scheme, all these sorts of things, we'd win every job because we can show what we do to improve the work area for the workers" (Org. 4)*

"Well there is no solution it would take some very, very powerful motivation to come both politically and socially and it would take a long time to do. My biggest problem would be the people who've been there for 20 or 30 years cos they're not gonna wanna change… in many cases they're not gonna be able to change." (Org. 5)

Increase clarity: processes, decisions, etc

"The other thing I would say is ***put some points of accountability into the organisation, at the moment you've gotta go all the way to the director to find someone who's accountable****. Put some accountability, RTA has it…Put some account, the levels of authority that some people have are far clearer and far lower in the organisation, give some accountability and some authority to act lower in the organisation, put several points in and tell them what those points are because when you ask who can change this design nobody knows and it's shocking, that really is disgusting. What we'd love to hear is me, I can be, you'd love to have somebody say I can change it or at the very worst I can't but this is the person that can, this is their title, this is where they sit and that's the format that you have to present it to them, you don't have that in Queensland Main Roads…Look our interest is always if we can simplify the process we don't mind high hurdles to jump over as long as they're clearly able to be seen and as long as we know what the process is if we wanna shift them. But when you can't see them for the trees and the bushes and you*

know they keep shifting that's what makes it difficult, I don't mind how high the hurdles are if you can sort of, when you have the choice to say I'm gonna be the organisation that jumps the highest as long as they're clear and simple" (Org. 5)

*"**tell us where all the problems are and why you feel the need to change it? …We don't get a response**. We've never had that argument, we've never had that discussion about tell us where the failures are because…I have never heard of a catastrophic failure of a concrete product in operation anywhere in Australia, where it was installed for the purpose that it was installed for. Yes there have been failures where people have poured battery acid through the pipes and yes the pipes have failed right, how do you cater for that, I don't know and there have been instances of steel pipe failing and steel arches failing, there was one at I think just north of Gympie about two years ago where a truck actually fell through, the rear axle fell through the road where the steel arch underneath had corroded away and that produced a ban on steel arc on products and I understand that, we fully endorse that because you know if that's how the product performs you shouldn't be using it but no one has ever brought a failure to our attention anywhere in the country and **so we're sitting here scratching our heads, you know why are we spending so much energy you know fixing something that isn't broke?"** (Org. 2)*

Awareness/education programmes:

*"And I think the government's role also, apart from Main Roads, is to education and those sort of things, is **not to fill young people's heads full of nonsense that an education is the only thing…and the ones that are being left by the wayside are, don't seem to get the assistance**, we're the ones that seem to be dragging those people out from that and trying to, I mean I'm not actually training people in some instances now, I'm actually educating these young people, I'm educating them. They come to us and they've got no understanding of workplace health and safety issues at all, they've got no understanding of their own body mechanics and their own body movements… we've taught people how to pick up something off the floor, how to handle something, how to move, how to hold a shovel, how to hold a trowel, how to present themselves, their posture and all that sort of, I mean simple education issues that should be taken up at a younger age" (Org. 3)*

Industry cycles

Ensure a more consistent workflow (manage peaks & troughs more) – long-term vs short-term solutions:

*"we find periods where we've got no Main Roads work to speak of at all, six months ago I had more than I could handle and they have no concept about…trying to spend more money as fast as we can make it… **they're gonna race out and throw all this money but they should have been thinking about this and planning this…**and say OK the infrastructure out there is capable of doing so much, I mean there's only so many civil contractors that do the work, that build bridges and build roads… so just use it as a hypothetical. If there were ten contractors that built roads and bridges and you put the work out to keep enough out there and you knew what was happening for the next ten years with your infrastructure you'd say right we need to keep those 10 or 11 or whatever it is contractors busy, now that has some stability issue doesn't it, if it increases slightly it increases the growth bit and improves their bottom line, makes things more competitive cos it's a bit flatter…there's people development and all that sort of stuff…**the Main Roads part of that is if they can manage that supply and demand requirement more we would find that we would be able to manage our business a bit easier the way we do things as well.** Why would I throw thousands of dollars of training and developing new people into roles in the factory when I know that Main Roads are gonna blow it all away when they don't spend any money this year? I would rather train people for the long term, give them the skill, give them the career path, grow my business value and have a process where the supply and demand chain, it doesn't have to be sort of flat or ever increasing but it needs to be not so peak and trough driven…" (Org. 3)*

*"Main Roads tend to drive the industry because they're the big player in the industry…So that's the part that I think in the supply and demand chain that the Main Roads needs to think more clearly about. It's a bit like they're so far removed from you know the part of the political arms…I mean I get this every year…It's called a Road Implementation Programme 2005/06 to 2009 and 10, now it's a beautiful document, it's huge, good reading, very detailed, many many years of developing it to the document it is today, I will bet that the day that that's printed it's not working. Because too many political decisions to make and change all this, I'm not saying it's the Main Roads' fault but I'm saying it as a person on the outside looking in**, whatever it is this document is not something that I can use to manage and plan my business where it's gonna go in the next 12 months let alone in five years**…when I sit down once a year to do my forecast for the year sometimes I can't see past three months…**for budgetary processes and planning processes longer than about three months to see anything from the Main Roads** whereas in the land development area you can actually see what's happening because of the tenders that are out there, the jobs that are being done you know subdivisions don't get done in two days…so you can see that they've got a fairly long period of supply and of order and supply whereas the Main Roads tends to be a bit more shorter block, tender goes out in the paper, it closes in four weeks so you put your tender in, four weeks and then two weeks later you're told you've been the lowest price and then oh yeh and because it's over a certain value it's gotta go to the minister in Brisbane for approval that could take another six weeks so you sit back for another six weeks and you wait and then all of a sudden you get the order and yes we want you to start yesterday so up goes production requirements straight away, you've gotta find five people or six people, peak demand drops away…It is difficult" (Org.3)*

*"…there's a big project and it's really large, probably two years' worth of work, that's if we win it of course it's gotta be tendered but it's high demand for a period of up to 18 months, really more demand than what I've got the capacity to do now so I've gotta grow my capacity to do that job. And I think to myself OK **why would I invest another million dollars just for a two year project when this should have been done over the last four years,** where are we gonna get the extra 20 people in my factory, I can't get two without worrying about them leaving within a week so where am I gonna get the extra 20 people, it's gonna be a difficult ask…As the Main Roads have a responsibility out there the larger corporate businesses such as ours and some of our competitors and many others out there I'm sure, they feel that they do have a responsibility to train and develop people because it's in their interest to do so and I **mean I'm happy about training people and skilling people as long as I get something in return out of them and it doesn't do me any or give me any satisfaction to know that we've had to train and upskill people for six***

months and then terminate their employment because the work's turned around because the Main Roads stopped spending money *or they took the money from this place and put it somewhere else…we challenge ourselves regularly to make sure that we contribute as much as we can… that's shown by the amount of training and development we are committed to in our employees…" (Org. 3)*

*"The other fact is you know the government's gotta deliver infrastructure in a certain amount of time and sometimes you've just gotta do it and probably what you're doing is trying to give them heads up on which direction they take with the precast industry knowing there's going to be high demand. Another problem we have like we have been approached by a lot of people saying oh look we've got this big project coming up and you know we need to look at this and these are you know you need to set up a factory to do that but a lot of the information coming out at the moment's all wishy washy…**it's a little bit hard to make a decision to a target or to go along with the ride and then get kicked in the guts at the end of it*** *when they set up their own precast yard you know" (Org. 6)*

Supplier selection/contracts

Ensure fairness in award of contracts and in prequalifying suppliers

"the other thing we're happy with Main Roads too is they're reluctant to keep non performers on the preferred supplier list, ***they take a hard line… which I hope they continue to do you know it only helps the precasters that have invested the money to do the work****. So if they take that line we're happy with, at the same time you know there's gotta be compromise, we've gotta help other precasters get there. Double standards you know we have a guy here in this precasters doing a Main Roads' job but they're not precasters, they're not certified right. Oh I'm pretty sure that there would be out there you know they'd be doing it under someone else's banner or and they're not actually Main Roads Prequalified but they might be doing it through other channels and I think not so much on big, big jobs is where mainly Main Roads you know …could be just a small bread and butter job $30,000 which we live off and you know if something like that happens you know we get a bit annoyed and ask ourselves is it all worth it, we don't like dobbing people in but we'll come to a point where we might make a phone call and we just kind of move on…." (Org. 6)*

Offer more principal supplied contracts:

"they should ***go back to offering more contracts direct to suppliers*** *such as ourselves where they buy the product and it becomes principally supplied, then it becomes principally product, not all of it but they should implement a little bit more of that, they don't do enough of that but if they do that then they must be aware of our storage problems so they don't go buying product just to leave it sitting here (Org. 1)*

Ensure consistent supply of downstream material, logistics, storage, etc:

*"****If they're going to impose all these rules that you must use their strand, they have to be aware of what could happen when we run out or take on some buying power of their own to make sure that there's sufficient stocks available to keep us working****… they've got to be aware of the logistics of getting product like ours to the sites, at the moment there're only two haulage contractors who have capabilities to cart a lot of our product, they need to sort of make it aware that they'll need more than that or possibly lighten the rules, I don't know what the rules are but there has to be some thought put into the logistics of getting the stuff to the site." (Org. 1)*

"it is becoming harder and harder to get in south east Queensland, we're developing as well putting another big factory where you find now land's so expensive you know do you put in an investment that's gonna last a couple of years and then what do you do after that so you know with certain things ***Main Roads will probably have to look at certain storage areas for precast products for these jobs****." (Org. 6)*

2.2 Case study 2: Resource recovery sector

2.2.1 RR: Government/client perspective

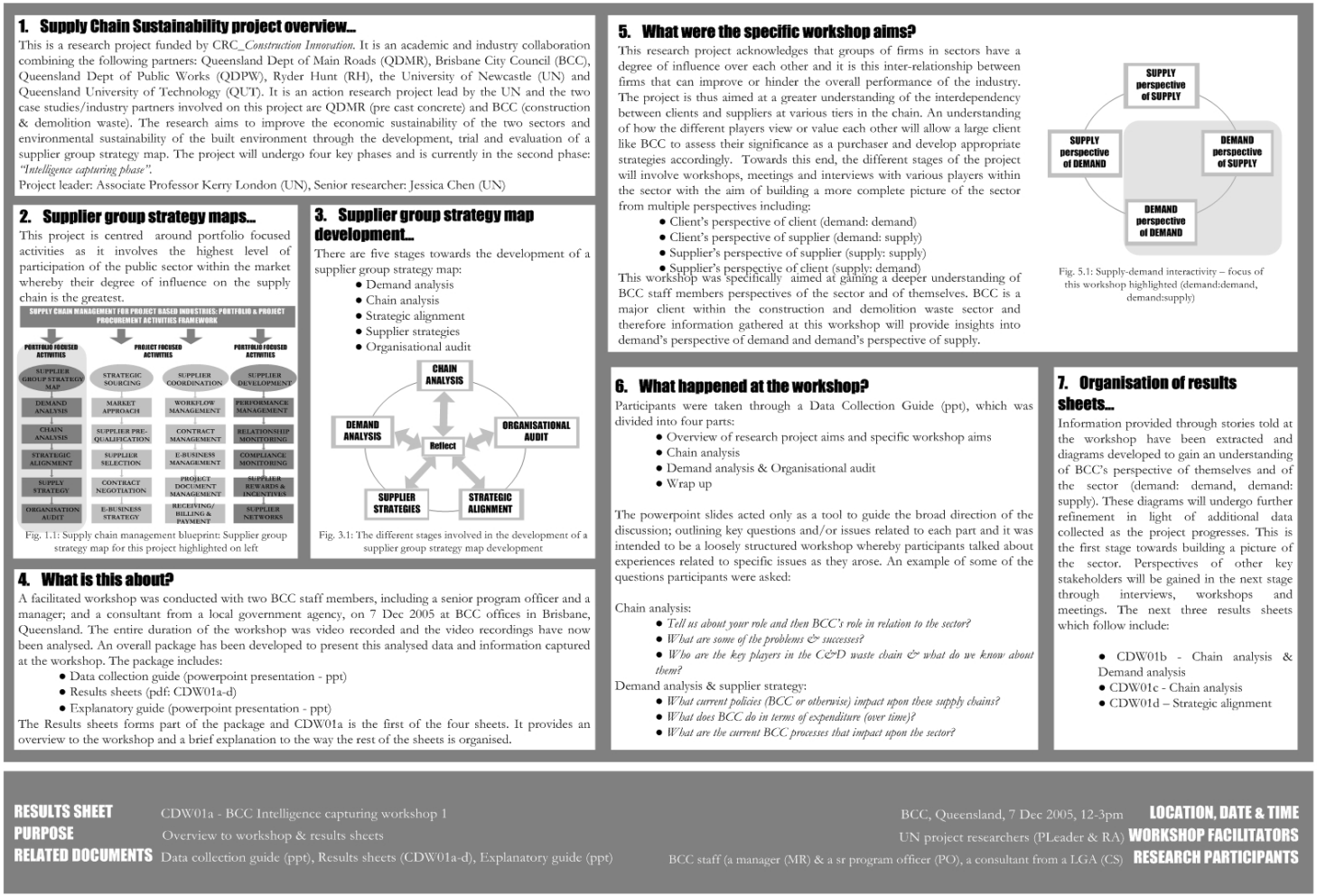

Figure 1.5 RR01: Overview to workshop and results sheets

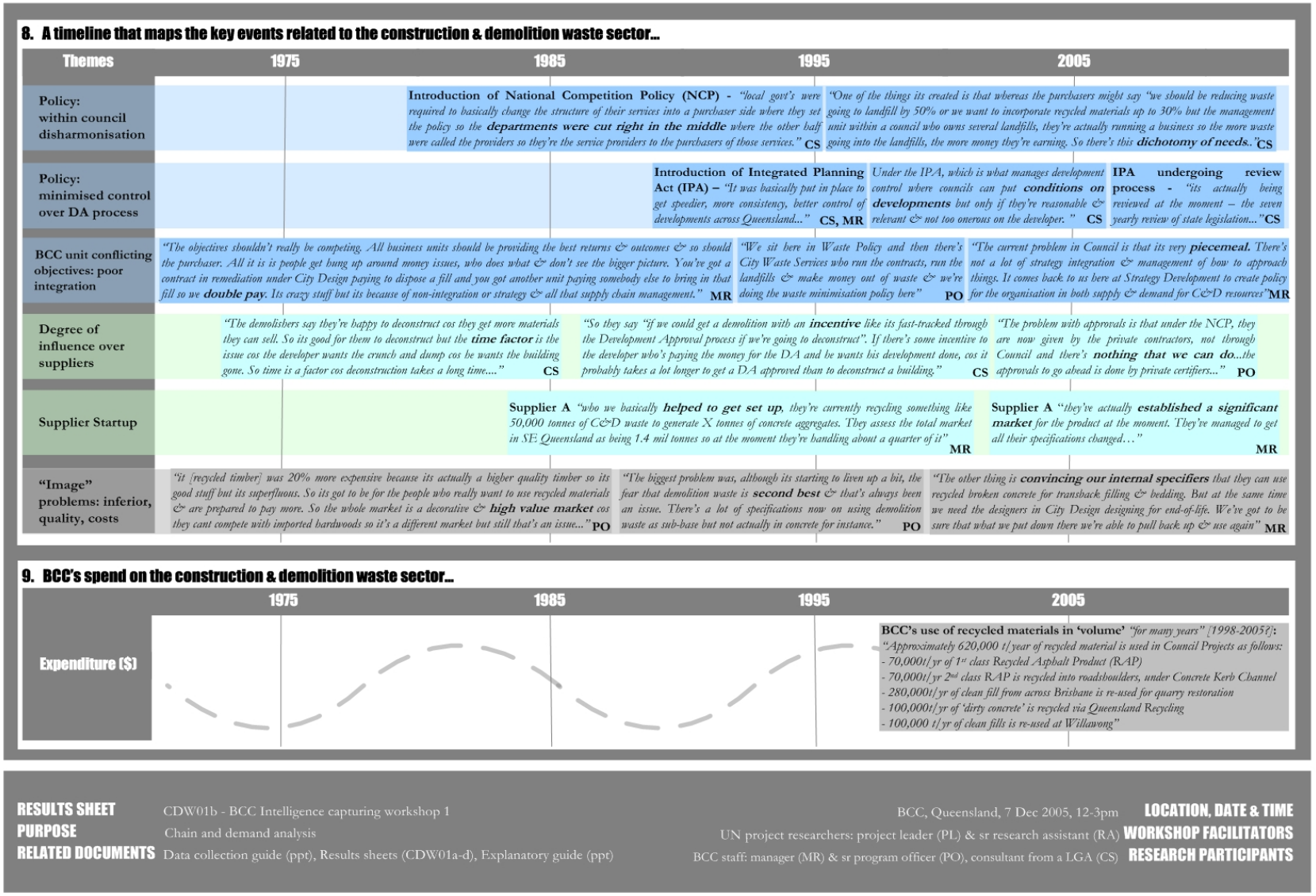

Figure 1.6 RR01b: Chain and demand analysis

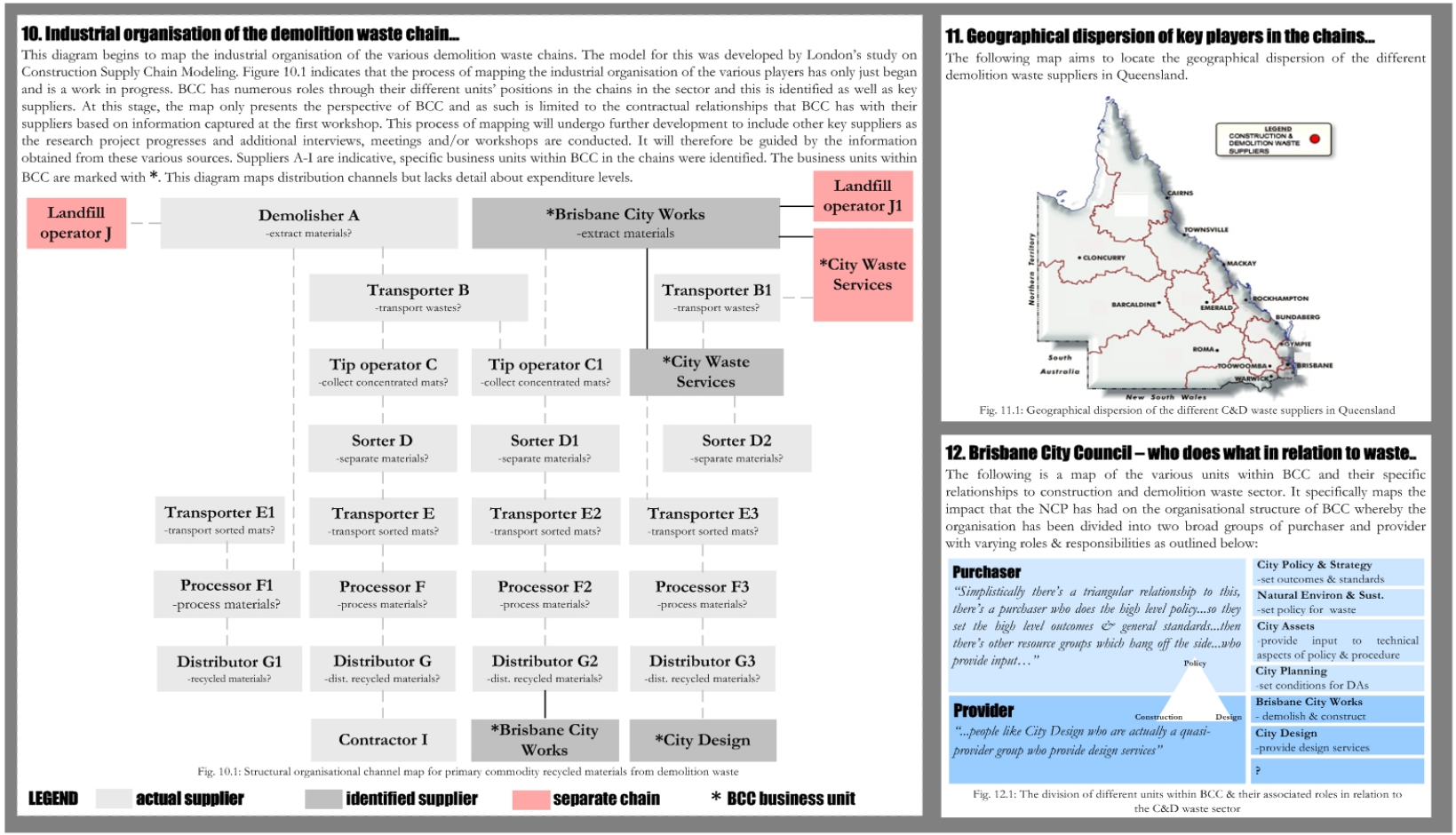

Figure 1.7 RR01c: Chain analysis

13. Opportunities and barriers to achieving increased recycled materials content on BCC projects...

Themes	Opportunities	Barriers	Potential Strategies
Setting conditions on Development Approvals as incentives so as to encourage the use of recycled materials whilst being in compliance with IPA	*"...its about standards for construction, policies for development approvals that you can really have a major influence on & that's a significant part of this, the DAs. There's currently* ***nothing that requires a developer to recycle*** *out of demolition"* **PO**	*"The Lord Mayor actually wants to force developers to recycle but the legal opinion is its* ***not relevant nor reasonable requirement on the developer****. Under the IPA, which is what manages development control where councils can put conditions on developments but only if they're reasonable and relevant and not too onerous on the developer"* **CS** *"The problem with approvals is that under the NCP, they are now given by the private contractors, not through Council and* ***there's nothing that we can do****...the approvals to go ahead is done by private certifiers"* **PO**	*"There's a smarter way to go about it – you can link that condition onto another outcome so that you can have discount structures within that and make it an* ***incentive****..."* **MGR**
Utilising recycling benefits as marketing opportunities or leverage	*"The key driver in my mind at the moment is still the economics & from the work that's been done so far, its cost effective. The fact that its* ***cost effective should leverage change****"* **MGR**	*"I think the thing that's preventing the change is you* ***cant have one or the other,*** *unless you've got that high level strategy & you've got the economic drivers, if City Design puts it in their specifications or the purchaser wants a particular colour, whilst all this is happening, the provider will just go "oh the spces wont allow it, its* ***all too hard,*** *don't want to change..."* **MGR** *"You've got to have both the reason for doing it, here's the economics, why it makes sense but then they go "yeah, OK the economics look good, so* ***how do we go about doing it?****"* **CS**	*"You know, you've got to have an* ***easy pathway*** *for them cos otherwise its just too hard, you've got to make it easy for them..."* **CS**
Developing a life cycle total asset management framework in BCC to demonstrate to private sector effective policy, process & practice & reduce non-integration	*"Simplistically if you actually create the* ***right strategy & the right alliances****, start to do proper policy, strategy & you work with the private sector, its very easy to achieve a lot of these outcomes"* **MGR**	*"The objectives shouldn't really be competing. All business units should be providing the best returns & outcomes & so should the purchaser. All it is is people get hung up around money issues, who does what &* ***don't see the bigger picture.*** *You've got a contract in remediation under City Design paying to dispose a fill and you got another unit paying somebody else to bring in that fill so we* ***double pay****. Its crazy stuff but its because of non-integration or strategy & all that supply chain management...They're thinking about waste rather than resource opportunities..."* **MGR**	*Ideally you've got to look at is as a* ***life-cycle total asset management framework*** *thing where to get the optimal outcome you need the people setting the policy, the people doing the design & the people building it all working to the best value in the asset management chain providing constructability input, reusability input, all those sorts of input into the policy, design & construction."* **MGR**

14. Strategic alignment...

Players	Objectives	Key issues related to achieving objectives
*Brisbane City Council	**Economic, social & environmental sustainability: increased recycled materials content on projects** *"The problem is its [increasing recycled materials content] very high level you see, the Lord mayor says 30% increased recycled content but 30%* ***from what****..."*	Unclear benchmark to indicate increased recycled material content
*City Waste Services	**Economic sustainability** *"...there's City Waste Services who run the contracts, run the landfills &* ***make money out of waste****"*	Lack of integration between units within BCC
*Brisbane City Works	**Economic sustainability** *"****end users on both sides of the equation****...they can do the demolition side & they can also do the construction side. Its basically a provider unit... "*	Lack of integration between units within BCC
Developers	**Maximise return: shorten construction time, minimise costs** *"So they say "if we could get a demolition with an incentive like its* ***fast-tracked*** *through the Development Approval process if we're going to deconstruct". If there's some incentive to the developer who's paying the money for the DA and he wants his development done, cos it probably takes a lot longer to get a DA approved than to deconstruct a building."*	Time pressure to reduce construction time hence costs
Demolishers	**Maximise return – increase amount of materials for collection & re-selling** *"The demolishers say they're happy to deconstruct cos they get* ***more materials they can sell****. So its good for them to deconstruct but the time factor is the issue cos the developer wants the crunch and dump cos he wants the building gone. So time is a factor cos deconstruction takes a long time...."*	Time pressure: hinders ability to deconstruct

RESULTS SHEET CDW01d - BCC Intelligence capturing workshop 1 — BCC, Queensland, 7 Dec 2005, 12-3pm — **LOCATION, DATE & TIME**

PURPOSE Strategic alignment — UN project researchers: project leader (PL) & sr research assistant (RA) — **WORKSHOP FACILITATORS**

RELATED DOCUMENTS Data collection guide (ppt), Results sheets (CDW01a-d), Explanatory guide (ppt) — BCC staff: manager (MR) & sr program officer (PO), consultant from a LGA (CS) — **RESEARCH PARTICIPANTS**

Figure 1.8 RR01d: Strategic alignment

2.2.2 RR: Industry/supplier perspective

OVERVIEW OF PARTICIPANTS

Table 2.5 Key characteristics of RR supplier organisations interviewed

	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5
Business type	Part of a larger multinational group	Privately owned	Part of a larger national group	Part of a larger national group	Privately owned
Role	Project & Development manager, member of C&DW working group	Director, Founding member of C&DW working group	Sales Representative, Member of C&DW working group	Manager, Member of C&DW working group	Managing Director, Founding member of C&DW working group
Products/ services supplied	Skip bins collection Landfill operator Transfer station operator	Demolisher	Recycler (concrete)	Landfill operator	Demolisher
Size/Annual turnover	92 mil	4-6 mil	-	4 mil	3.5 mil

DEMAND ANALYSIS: significance of various client types

Table 2.6 Key clients of RR suppliers

	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5
Government/ councils/defence	-	50% -"do a lot of defence work"	10%	5%	20%
Domestic:	-	20%	15%	-	10%
Commercial:	65%	30%	75%? (Large national contractors)	95% (40%: mid-size operations, 35%: transfer stations, 20% one-man-bands)	70%
Others	35% (Internal – other business units within organisation)				
BCC	-	Part of 50%	10%	Minimal	Part of 20%

CHAIN ANALYSIS: Key problems related to the sector

Table 2.7 Suppliers' perspective on the key problems related to the sector

Themes	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5
Legislation	Inconsistency - Varying degrees of legislation for different players		Inconsistency - Varying degrees of legislation for different players		
		"silly legislations" – legislations which are not supportive of recycling activities	Specifications not reflective of performance of recycled materials		
	Cheap rates to dispose at landfills	No legislation to encourage recycling		Cheap rates to dispose at landfills	No incentive to recycle for developers, ie time factor
Immature market		Time & cost investments to develop technology; initial costs to set-up, ie long-term vs short-term costs		Time & cost investments to develop technology	
	Cost as impediment to end-users wanting to use recycled materials	Time as impediment to end users wanting to recycle			
	Not feasible to recycle	Economies of scale – not worth recycling		Economies of scale – not feasible to recycle	Not feasible to recycle – expenses outweigh cost benefits
		Specialised nature of sector & impact on availability of skilled labour			
	Lack of demand for recycled materials – supplier's unwillingness to invest on recycling	Lack of demand for recycled materials		Lack of demand for recycled materials	
Conflicting directions/ objectives from various parties		Unclear/conflicting directions/ instructions from various government bodies		Government departments difficult to deal with	Individual interests of varying government bodies
Free tipping				Difficulties to prevent free tipping	

Ensuring payment				Difficulties associated with	
Perceptions		End-users stigma/culture in relation to paying for recycled materials Councils perception of recycling as "backyard business"	End users perception that recycled material should be cheaper		
			Lack of awareness or knowledge of recycling C&DW materials in the community		Lack of awareness by the industry, ie clients, contractors, demolishers, etc

Legislation

Themes	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5
Legislation	Inconsistency - Varying degrees of legislation for different players		Inconsistency - Varying degrees of legislation for different players		
		"silly legislations" – legislations which are not supportive of recycling activities	Specifications not reflective of performance of recycled materials		
	Cheap rates to dispose at landfills	No legislation to encourage recycling		Cheap rates to dispose at landfills	No incentive to recycle for developers, ie time factor
		Legislations that limit innovations surrounding recycling			

Inconsistency – varying degrees of legislation for different players; unfair disadvantage for longer-term organisations:

> *"…I think the **EPA wields a bigger stick against the people who play it by the rules than those that don't**. The silly part is that as a licensed *** business we have a huge array of guidelines that we must abide by. If you are a fly by nighter or a cowboy that's just come in … and you don't have a block of land that you do this on regularly, by the time someone makes a complaint against the dust or what work's gone on there they're gone, so's the product, the product then enters into the system at such a quick rate that before the EPA can get out and wield their stick people are gone, so that's one of the pitfalls but there are probably three or four organisations who on a yearly basis ***[recycle] you know significant amounts of *** [material] that would normally come to us…what we've found also is that the end user is happy to take the short cut as well and that there are engineers out there and people that sign off on these jobs who are swayed by the dollars… so because they did it at a cheaper rate rather than the manufactured product, they then ask for the discrepancy to be overlooked and it's signed off as a *** when in effect it was a ***, just to save themselves some money… engineers tend to overrate a job so realistically they've asked for *** but they could probably get away with *** so that's where the loophole is... **And it varies, we're finding the more we push buttons here to make it more regulated from a viewpoint of people that are in authority checking on these things**, **the more times we have of having a victory you know somebody putting an inferior product into the system**." (Org. 3)*

> *"...**there are so many people that operate illegally** and like we charge $9.25 a cubic metre, there's sites down the road that charge $6 a cubic metre. Yeh they just set it up, there's no environmental controls or anything… I mean there's nothing we can do about it, we've complained to council and they won't do anything. So it **just makes a mockery of things and then council actually give contracts out to those people to collect their waste**. Yeh there's about six round here now, we keep complaining and write letters to different people and there's only about two around so we have to compete with those two" (Org. 1)*

Specifications not reflective of actual performance of recycled materials, "silly legislations" – not supportive of recycling/limits innovation:

> *"It [specifications] comes from the engineers in Brisbane Council… **it's a problem in that people aren't changing with the times** … if you're an engineer you want to go through a process that is going to cause you the path of least resistance, you want something that's going to run smoothly so an engineer in your 50s and 60s you're probably gonna take the path that you know which is call for the aggregates and the fill to be of a quality from a quarry so on and so forth. The regulations are set here in Queensland are all based on quarry materials, therefore what we're saying is…**judge us on what we produce not on what you think we produce**, they're not prepared to do that. Until such time as somebody sits down and says "We've used this and here's our report" and like come out and said that it's been done, we're probably not gonna change their minds…" (Org. 3)*

> *"…**councils don't like using recycled timber** and this is how silly it is they say "If you're gonna use recycled timber you have to get it destruction tested". Now how do you destructive test a piece of timber because you can't glue it back together and then use it. Well that's see, that's silly legislation…we're looking at expanding into areas that people haven't even thought of**, we wanna go overseas and bring some of that technology back** I mean we can look up on the internet any day of the week and find new technology that we could use but OK we bring it into the country and then **it's people on the council go "oh you can't do that you'll need a special clearance to use that machine in this particular area"** instead of saying well hang on that's gonna make a big difference to the environment, let's try some, they won't do that because no one will stand on their two feet and say something…" (Org. 2)*

Absence of legislation to encourage recycling:

> ***"...I think it's actually too cheap to dispose at landfill**, in New South Wales they have a Landfill Tax, in Queensland they don't and it's just too cheap, way too cheap. **There's almost no financial incentive to recycle**…*

the thing is that people say "Oh you should do recycling" but if you're an investor I mean in a way you wouldn't really care if they're doing recycling or not as long as you gave them the return that they wanted". (Org. 1)

"...what we find is there's two different types of people in this industry, people who will recycle and resell the timber and everything and then there's people who'll just go through and crunch the building, load it out and just go, go to the next building now the biggest problem with that is ***there's no one to stop them from doing that so all they do is they just send all their material to landfill****…So that's the main problem I can see is legislation, they need to legislate something to say that people must recycle...the other thing is not only the councils we need developers to say "OK you need time to recycle so developers can't say OK I get an approval tomorrow, I want it demolished by the weekend and I start building Monday".* ***Councils need to say "No you need to recycle that process*** *and you will get a faster DA approval…the whole thing's about legislation, changing councils and, even* ***councils make money from landfills so do they wanna change****? That's the question...It's all too hard for councils, if it's too hard they don't wanna do it" (Org. 2)*

*"I try and keep up with all the latest things….and not only in Australia but what's happening overseas and the volume of waste that we get in here****, the amount of stuff we bury because of our cheap tip rates****, for example my gate figure here is $9 a cubic metre but if I go to Europe and I get a mixed load, firstly you can't no longer, you can no longer tip a mixed load it's illegal. Yeh you have to separate it but even if I could like a few years ago when I could it was like $260 a cubic metre so from $260 a cubic metre it's like there's a fair amount of things you can do with that 250 dollar difference…" (Org. 4)*

"…one of the major problems we have at the moment is that just say Mr Jones owns a building, he wants to demolish that building and develop the site…As it stands today he has to apply for a development approval and a building approval through councils...Talking to these people it seems that the councils are very difficult to deal with, they take a long time to give approvals… so Mr Jones might be sitting on an empty building for six to nine months waiting for approvals, then he's finally given the approval, his pain then is to get that building gone off the site as quick as possible. That then determines how much time the demolisher has got to sort through the building and recycle… A lot of them go I don't want any recycling, I just want you to knock it down and it's gotta be gone in two days, ***to recycle it we might need five days or even two weeks, so it's hard to convince that bloke to say let us stay here for two weeks because time is money to hi****m.* ***So we would like to see councils cooperate a bit better and streamline the approvals*** *and say righto look we know this is gonna happen, we'll approve the demolition part of this now so that you've got two or three weeks to do the demolition and then we'll finalise the development approval after that, then that would give the demolisher time to recycle, it should help Mr Jones cos the building's gone and he's almost ready to start straightaway soon as the approval comes through, there's no holdups so he wins, we win and the environment wins. So that's the biggest problem we have today". (Org. 5)*

Immature nature of market

Themes	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5
Immature market		Time & cost investments to develop technology; initial costs to set-up, ie long-term vs short-term costs		Time & cost investments to develop technology for recycling	
	Cost as impediment to end-users wanting to use recycled materials	Time as impediment to end users wanting to recycle			
	Not feasible to recycle	Economies of scale – not worth recycling		Economies of scale – not feasible to recycle	Not feasible to recycle – expenses outweigh cost benefits
		Specialised nature of sector & impact on availability of skilled labour			
	Lack of demand for recycled materials – supplier's unwillingness to invest on recycling	Lack of demand for recycled materials		Lack of demand for recycled materials	

Costs & time investments as impediments to suppliers wanting to recycle:

"The biggest drawbacks we have with the timber is paint, it's a hard product that because we've got the room here to let it mulch down over a long time the paint actually sits on top of the surface and the soil, and when we mix it actually, we can get most of the paint out of it you know, it's not the new paint it's the old paint the old lead based paint which become a problem so, ***but we're also looking at enzymes that eat that too… the paint is the problem but there is technology that can take it off****… the thing is* ***it's the initial cost to start up something****, see if the council turned around and said to a number of people "Right this is what we wanna do, we wanna produce a one stop C&D you know clean up site", you know where you have a mulcher for even general rubbish like household rubbish you can mulch all that stuff and it'll you know drop the amount of landfill material down by 30 or 40% so you know, it's*

*a cost you know, **what is the cost of landfills in the future compared to the cost now**, that's what people have to ask themselves you know we're just gonna have to go further and further out to dump material..." (Org. 2)*

*"…I'm looking more mechanical processes to help us with that cos the steel price, cos I get a national price, a very attractive steel price I can you know possibly look at having some sort of mechanical conveyor belt system to take the steel off but you know **that all costs money…I've gotta justify those dollars**…I pitch that idea all the time and they said how much is it gonna make? Well I mean in Victoria they have a waste levy of $11 a tonne for the waste received down there, as part of that you can apply to have grants to get that back. The *** in Melbourne were doing some composting in new technology and they made application for 400,000 as part of their construction of this project and what happened was they received a grant but it was immediately taxed at 50% so they had to give $200,000 back and then the requirements associated with that grant amounted to $300,000 was an extra monitoring equipment, approvals, studies, all that sort of stuff so it was going to cost them 500,000 to get 400,000 so they wrote a cheque for 400,000 and gave it back**, it just wasn't worth it. No there was no real incentive to do it…and they said never again and they don't apply for anything anymore.**" (Org. 4)*

Cost/time/etc as impediment to end-users wanting to recycle

*"…**I think recycled material is not valued, until it's cheaper or as cheap as new product it's going to be very hard**, like why, if you're building a house or building a building and you've got material that's brand new that costs a $100 and then recycled material that's costing $105. So that's the real, I think that's probably the toughest, probably bigger than regulations and bigger than illegal transfer stations and that sort of stuff is that **until the market actually makes it easier for people to recycle it's gonna be very hard**". (Org. 1)*

*"…the biggest problem we have with domestic is **more and more people not interested in recycling or considering it they just want the house gone so they can build their new house**, that's all they're interested in and there's certain factors, health and safety is reduced, you know general environment is reduced cos the more you bash and crash something the more dust you're gonna get you know then you have things like asbestos being released into the air and all sorts of things…The other thing is OK if we go into development, developers and the medium sized work**, it's time again, it's the biggest problem there, just doing it, time to recycle everything**, that's about, I mean defence and government work's all pretty quick so how would you say, you've got guidelines and you have to follow them that's pretty much what they're paying for, for you to make sure everything's done right so there's no real problems with the higher end of the market, it's always the **middle and lower end that you have problems with as far as you know health and safety and recycling time wise** and all that sort of stuff". (Org. 2)*

Economies of scale – not feasible to recycle:

*"… the thing is **with resource recovery there's a huge issue about economies of scale**, **some things are viable but only when you reach a certain volume**. And until you do and it's hard to know what that volume is until you try. So there's a couple of things that we're trialling you know on a minor scale to see what the economics are, some things we stockpile them just in case they become viable...so for example we would probably dispose of 60,000 tonnes of timber a year, enough to supply a small power station with fuel…we are sophisticated enough but for me to pull that out…**the cost benefit is not there**. See I've investigated it would cost me fourteen million to set up a small power station, the return on that is maybe two million dollars a year, if I then have to pull waste out to supply it, that waste is gonna cost me money you know so it's sort of, at this point in time it's not feasible....Yeh for example steel we get about $200 a tonne, plastic I can get $250 a tonne, we currently don't pull plastic out. Yeh what I wanna do is put a picking station in so that I can have people picking you know specified waste as they came past on a flat tray you know if we had plastic coming past in reasonable quantities we can then have someone designated to pull plastic out. I mean we've got like x amount of material you know in a waste. And within that is a certain amount of resources that have a value**. It's you know deciding how much we're gonna spend removing that material of value**" (Org. 4)*

*"**The other issues are the expense of getting material out of the building as compared to what you get for it at the other end** you know so if we were to demolish this house here we'd come in and say look it's not worth putting a highly paid labourer on to take that door off, it might cost us $15 for him to take the door off but we might only get $10 for the door you know so we go it's not worth it. So we need more people involved in the recycling side of things, they need to be encouraged and given grants or whatever to look at ways of reusing the stuff that comes out of buildings you know? *** are a good example**, they've spent a lot of time and money developing products out of crushed old concrete and bricks** and stuff like that, now I don't know whether they've been given incentives to do that or whatever but that's the sort of thing that needs to happen…" (Org. 5)*

*"Cos the thing is if we do a sorting machine, a sorting machine costs $350,000 OK, and then there's, that's capital costs and then there's you know running costs probably about $20,000 a year to run the machine so each year we'd have to, if you want 20%, our company operates on 20% return, so to break even we'd have to do 20% of $350,000 is $70,000 and plus the 20% on costs, running costs, **we'd have to make $90,000 a year on sorting something before we'd buy that machine**. Yeh, no we don't have any sorting machines we just basically get a longreach excavator with a grab and just pull things out…the **financial numbers don't work out**." (Org. 1)*

*"…but the problem is there's money to be made but the time and effort and cost of having labourers doing it, which is our biggest expense, it's very hard, it's very hit and miss you know you could make money but then lose it and it's a little bit difficult…you can recycle the tin but it's not really worth it at the end of the day because **by the time you pull it all out, put the tin there and the landfill stuff there, then you're only gonna get a small amount of money for the tin and won't really cover your costs to get around it or to separate it, they just throw it all in together and you put it in the dump, which is what a lot of people do**". (Org. 2)*

Specialised nature of work & impact on availability of skilled labour:

*"Training is terrible…Absolutely terrible…when somebody comes on site they have at least four hours of paperwork training to do where they you know we just run through all the dos and don'ts and things like that but because **every job's different every day is a training**... Every project is different…" (Org. 2)*

Lack of demand – impact on suppliers' willingness to invest on recycling:

*"I just think it's several issues in recycling is that when you recycle something you've gotta have an end buyer of the product and **we're not convinced that there's an end buyer of the product**…like we don't do it because say for concrete if we crush concrete and all that sort of stuff and we have to buy a machine then eventually we've got a product and we haven't got any expertise to sell concrete, we've got no sales staff, no nothing…I think just recycling's a hard game and there's gotta be maybe the two that the end market you know that's probably immature market at this stage that it's sort of a very much amateur stage that yeh **do people want recycled material**, that's probably the biggest thing" (Org. 1)*

*"Yeh well cos I mean a lot of the land, a lot of the material we look at, plastic is always involved in everything but it's something that you can't do anything with, you can granulate it, you can do things but **there's no end users for it at the moment**…Yeh so that's our major drawback…one problem is we do projects where we clear properties, you mulch the trees and all that sort of stuff for an end use but problem is there's, we're not using the mulch as fast as we can produce it... You can wait for you know 15 years for it to mulch down into top soil but it's just you know taking up valuable land and all that sort of stuff too…**it is creating a market…Problem is they can produce it a whole lot faster than the market**…We should put a tax on it, say an environmental tax and then people would go "Well hey". Obviously if it's a business that you know are a necessity like pine timber framing and things like that OK you can't get away with using recycled timber for that, it's just too hard and too slow…but when we're talking about people who're putting in decks they have to use a certain size timber and big heavy stuff then you know why should we be cutting down forests when there's plenty of the stuff out there and I mean **obviously if more people used it the price would actually probably come down cos people would wanna be selling it…**because I mean timber can sit here for three or four years some of it and piles up and I mean we'll show you that, that we haven't even touched because we haven't needed that yet but if we can get it out quicker, it's being used you know obviously our bottom dollar's better and everyone else's using it and it's not going to waste" (Org. 2)*

*"well **you've gotta have the product first and then you've gotta find a market for it so to develop the product you've gotta think there's a market for it cos otherwise you won't bother** and that's what we're saying you know **people need to be encouraged to look beyond** because once no one bothered about this and the next thing now all of a sudden concrete is a medium that can be recycled successfully. Ten years ago when we first started all our concrete went to landfill, it was just dumped and never seen again. Steel and that was always recycled because there was always a market there, same as metal…scrap metal's always been a product that you can get rid of pretty easily. Timber has always been a product that you can recycle because there's always been someone that wants to build a shed or whatever you know but they've found new uses for the timber today you know like ten years ago you'd sell timber and it would be reused pretty much for what it was being used for at the time, you know either second hand flooring or second hand walls or framework, now people like *** have got that timber and they've looked at it and they've value added by turning it into a nicer type of floor or a feature beam, furniture stuff like that so it's found a new market as well you know? Yeh and people have the forethoughts to say well you know what else can you do with the stuff you know it's there what can we do with it" (Org. 5)*

Conflicting objectives

Themes	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5
Conflicting objectives		Unclear/conflicting directions/ instructions from various government bodies		Government departments difficult to deal with	Individual interests of varying government bodies

Varying interests of different government bodies, ie not working together:

*"…the biggest problems we have are with bureaucratic things obviously it's councils is our biggest problem, obviously things like we're in a water restriction time and Health and Safety says that we have to use water to dampen down the loads and wash down and we're doing asbestos removal but see we can't under water restrictions so no one really knows**, the council don't really know their job you know the other government bodies the EPA you know Workplace Health & Safety, cos it affects all three of them but none of them know** when we talked about "Oh what'll we do in these restrictions"?...and you know you might as well hit your head against a brick wall when you're starting to talk to these people" (Org. 2)*

*"that's where I'll discuss **government departments, they're phenomenally terrible to deal with**, yeh that's pretty much, and also planning and things like that, where we're gonna go and what we're gonna do like with the infrastructure side of things." (Org. 4)*

*"…government legislation and stuff like that is an issue, local government and council stuff is an issue you know, all of these things have to be addressed at some stage to show where the weak points are and what has to be done to bridge those gaps to make it all happen you know**, at the moment it's this one's looking after their interests, this one's looking after theirs and this one's looking after theirs and they're not working together**…So you've got one council department here saying let's recycle and recover everything we can and make it good and then you've got this group over here in the same council saying look we've got a tunnel to build, just get them out of our way. See this is the issues that we're faced with day after day. But because that department doesn't talk to that department or because that department is run as a business and they wanna make money, they don't want this department to get in their way and stop them making money so that's where the conflict comes" (Org. 5)*

Free tipping

"Another big problem is fly tipping on our borders, we've got like a lot of the back of our site here we're just over here we have this road that goes nearly right around our site and then there's a, we also own out here, there's all tracks

*through **here and it's nearly impossible to you know create an impassable barrier to keen people looking to get in and we find through here there's all trucks have been in and dumped asbestos for free.** Yeh so free tipping, free tipping is a problem" (Org. 4)*

Ensuring Payment

Difficulties associated with getting paid (particularly with government):

*"They [Qbuild] always deny that it's their load, that wasn't us, that's not our vehicle even though they've used subcontractors account so everyone deny that's not us so they're on stop credit too. So until they can sort out something on that side because we're only a small component of every job in getting rid of the rubbish. No one thinks about it so even with your larger customers like you know large or significantly large building companies there's purchase orders for the whole job and when I come to chasing up payment they go well didn't you, weren't you given a purchase order and I said no and they said well go back and they say oh yeh forgot to give you one you know it's just you know cos we're not an integral part of the construction process we're just get rid of that rubbish…it's so regular it's basically constant all the time so that's the problem there but usually with building companies I can chase it up and there's someone will take responsibility but in the government it's with multi branches and depots it's just impossible…Payment as a whole is a problem, I would have at any one time 50% of my debtors 60 days plus so that comes with the, with demolition especially and contaminated soil remediation they're the first ones to move in a project and so they get paid when the slab goes down or some other milestone and that's often a long time before the projects start like the excavation of waste or contaminated soil or acid sulphate so there's a lag in payment to the contractor so often they don't run on massive cash reserves so **then in turn I'm left waiting until they receive a payment so that's a significant problem yeh even with the government it's nailing someone to be responsible for saying yes that is my waste** (Org. 4)*

Perceptions

Themes	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5
Perceptions		End-users stigma/culture in relation to paying for recycled materials Councils perception of recycling as "backyard business"	End users perception that recycled material should be cheaper		
			Lack of awareness or knowledge of recycling C&DW materials in the community		Lack of awareness by the industry, ie clients, contractors, demolishers, etc

End users' reluctance to pay for & lack of confidence in recycled materials:

*"…one problem we have with an end user, everyone believes that because demolishers basically get it for nothing we shouldn't be able to sell it again so like people don't wanna buy mulch, people don't wanna buy second hand timber because you know, well second hand timber is actually in some cases more expensive than new timber but obviously what I'm saying it's better quality but **people don't believe in paying for it…so there's a stigma there…** it's culture, culture or stigma, you know people just go oh you know "Why should we use that" you know"…I mean there's a number of limitations that we have in this industry obviously council, it's very hard to get council to be forward thinking on anything you know… we've been recycling for over 25 years and **the council still sees us as a you know backyard business, they don't see it as a future industry growth thing**". (Org. 2)*

*"…**the hardest part for us is to make people feel confident that using something that was considered waste beforehand is now something that has a value**. People perceive that it should be a lot less in price because it's not a natural occurring product like as in quarries but to get it to a reusable state a lot more money has to be spent to bring it up to that level. The one big thing, one big advantage that recycled material has over quarry material is that its density is a lot less so when you purchase quarry material you pay, if you're paying the same price in effect you get less of the quarry material than you do ours because of the weight density" (Org. 3)*

Lack of awareness:

*"The issues are that there's still a lot of concrete that goes to landfill because people aren't aware of what we do, people see our recycling sign out the front and think we recycle cans of coke you know because of the aluminium. Effectively **there's not a broader knowledge of what we do in the community** so that the mums and dads when they do a clean up they don't get charged exorbitant amounts…there should be a campaign to let people know that hey there are people out there that recycle concrete, bring it to em it's cheaper than dumping it". (Org. 3)*

*"so that's the barriers at the moment, it's education and not only education of the clients but education of the contractors as well you know, there's a lot of demolishers that are still in that mindset of just knock it over and get rid of it and they'll get paid for it, **we need to educate the industry as well to say you know this, we can recycle, we can do it properly and you can still make money and everybody wins you know?"** (Org. 5)*

UPSTREAM CLIENT/DOWNSTREAM SUPPLIER STRATEGIES

Role of large clients like BCC

Themes	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5
Legislation	Provide incentives to encourage recycling	Provide incentives to encourage recycling			Provide incentives to encourage recycling
	Stricter legislations on illegal operations				
					Streamlined processes – decision-making process (clear instructions)
Understanding		Client professionalism & support			
Supplier selection		Non-price criteria			
Behaviour/ attitudes		Change in behaviour by councils	Efforts to increase awareness		Change in behaviour by councils

Legislation

Provide incentives to encourage recycling:

> *"**I think they've actually got to give incentive for people to do recycling, I think actually putting a landfill levy on would be a great idea even though we operate landfills we'd actually agree with that**…the thing is it's probably less waste to go to landfill but we'd capture it elsewhere. All we'd do if there's a landfill levy of $10 a tonne we just halve that all the way through our customers. So the thing is then theoretically when it comes to a transfer station there's $10 a tonne of money thats in the system so it's, we can do recycling and the landfill levy is only paid when it's actually deposited at landfill so theoretically we could actually capture part of that $10 at a transfer station. And do more recycling."" (Org. 1)*
>
> *"you'll find that a lot of bigger clients are looking at I don't know I think they've got it in NSW as well but they look at greening points, **you get green points if you looking like you're doing the right thing by the environment** and I think more and more builders in, or larger companies will be going well we need those greening points cos we get tax cuts or whatever the hell they get, so they'll be looking at people who will make the effort to do that" (Org. 2)*
>
> *"We need the time frame yeh that's critical. Sometimes there is because if there's a lot of value in the salvage and Mr Jones says OK well if it's gonna cost me $5000 to knock it over and take it away as rubbish and it's only gonna cost me two to recycle then he's more inclined to do that but the way it is at the moment the money that it costs him having that site tied up with demolition is more expensive than what he's gonna save, so what I'm saying is if he's got an empty site and his builder can start today straight away he's making money cos the sooner his building, new building's up the sooner he's getting rent or he can sell it or whatever so while it's an empty building or a vacant block of land it's costing them time and money **so we'd like to see it streamlined so that he gets his approvals quicker and we've even suggested that they maybe give him special dispensations for other stuff if he's going to recycle**, you know what I mean so if he goes to the council and says "look I've got a building, I'm gonna give you two weeks to recycle", they go "good, instead of your fee being $800 it'll be $700" so he saves a $100 just for being a nice guy. So there's an incentive for him to do it and there's time for the demolisher to do it so we want incentives for them as well, fast tracking their permits and you know not being held up in bureaucracy sort of thing." (Org. 5)*
>
> *"**the client base - they need to be educated on the fact that it's good to recycle and it's good to be environmentally friendly but they have to get a reward for that**, they don't care you know, most people don't care and for them to care there's gotta be a reason for them to care…**Economics is the driving force** behind it you know? So that side of things and then the landfill and the cost of dump fees and all that sort of stuff all needs to be taken into consideration if you've got a company that's spending time and money recycling and doing whatever it can to reduce landfill then when they get to the weigh bridge they shouldn't be penalised at high dump fees you know they should be encouraged OK you're a company that recycles, your dump fees will be $50 a tonne, if you don't recycle, if they can see that you're bringing in big lumps of concrete and steel and timber, you're not recycling then your rate will be $70 you know, that way we can use that $20 to put someone down on our chip face to recycle...And we think too that then a levy could be put on the dump fees that goes into another fund that looks after environmental issues you know created by demolition, instead of just slapping fees on everybody it's the ones that aren't doing the right thing will pay…" (Org. 5)*

Stricter legislation on illegal operations:

"I think if council's serious on recycling first they've gotta shut down your illegal operators, I'd say that's the biggest one" (Org. 1)

Streamlined processes/clearer decision-making:

"We're not really sure, this is another one of those internal things where this department will be the owners of that property, this department will be the ones that want to develop the property and then they've gotta buy it from these people you know internally they buy it and then they develop it so there's gotta be someone in that chain that says I can make a decision to say let's get rid of the buildings you know, let's go out and do a survey and say you know what are the risks of keeping the buildings, is there any purpose in it and what's the benefits...so they need a committee to deal with that sort of stuff you know, …but they're all, they're all government based or council based you know the council own a lot of property and houses, Main Roads own a lot of property and houses, they'll sit derelict and abandoned for years before anything's done about them you know and we believe that if they're dealt with as they come up….When they know when it's at a point of no return that's when they've gotta say let's do it ***but there needs to be someone to go round and view these things and make the decision and say" yeh that goes, that stays, that goes".*** *(Org. 5)*

Understanding from client

Client professionalism & support:

*"Safety is this huge thing for anyone, no one wants anyone to get hurt on the job site and I mean that's the one thing with *** that I find is that they're* ***an extremely professional company*** *and every day the manager or the site project manager will come to the site and he'll talk to everyone on site…say "oh good work you know make sure we can do it safely and we all wanna go home at the end of the day" and nearly every day he did that and that's because they, he's not a person that sits on his rear end in the office and makes sure everything, takes the credit for it…you have someone on site who not just has a go at people for what they're doing wrong but lets them know that they're doing a good job you know it's a, you don't wanna go into work every day being told oh you know you're a terrible worker, you're a bad subcontractor and all that sort of stuff, they might be but isn't it easier for someone to say why don't you try it this way and* ***give them an incentive to learn I mean we're not, not everyone's perfect"*** *(Org, 2)*

Supplier selection

Non-price criteria:

*"*** are great they are really good. They don't always go for the cheapest price you know I've been, I realised that I* ***mean I wasn't the cheapest price on one job but my safety record got me through on the project*** *and that's another thing you know you show me a company that's not worried about the bottom dollar all the time. We always go for the cheapest price when we do something but you know it's an interesting way of thinking and that's happening more and more in our industry" (Org. 2)*

Behaviour/attitudes/perceptions

Change in behaviour by councils:

"it was interesting in the C&D forum they've got lots of councils come to it and they said oh the councils do this and the councils do that and I worked with the councils all the time I mean you go and have a look in their bins they have steel and they have good timber that could probably be recycled and they're the worst culprits of them all, they don't recycle anything, you know they throw paint tins in with the general waste which should be sent off as regulated waste, things like that, ***they're the worst offenders, cos it's all too hard, you know you can set it in place for everyone else but it's all too hard****…but then for the council to change their behaviour costs three times as much as to send legislation to make the general community change their behaviour." (Org. 2)*

"Yeh probably the general public is gonna be a harder thing to deal with. We need to start with councils, governments, you know local governments, federal governments, state governments whatever. ***The government in itself is one of the biggest land owners and owners of structures in general in the country you know? Now it's up to them to look at their backyard, start with them you know, get them to work systems where buildings can be demolished and recycled rather than just knocked over*** *and burnt or whatever. We've recently just undertaken a demolition of what was left of a school that was burnt down at ***. Now these buildings at that site have been empty for 18 months but no one since that date that these buildings will never be reused again, they're gonna be demolished and the site developed, now the demolition should have taken place – instead of waiting til now, now one of these buildings ha***s** *burnt down, it's pulled huge resources as far as firefighting and water wastage…So they've spent thousands of dollars putting firemen in there at risk putting this fire out, the asbestos content of the building has obviously led to health issues and stuff, environmental issues in that general area, the smoke and stuff like that, then they had to engage us to come in and demolish what's left of that building at a bigger expense because the asbestos has to be dealt with you know in a different manner. Now had they got us in to demolish that buildings two years ago, it would have been done cheaper, we would have recovered a lot more material out of it for reuse, blah, blah, blah" (Org. 5)*

Efforts to increase awareness:

*"They [BCC], because of their political clout, because of their position in the community where they're seen as every bit the market leader so in every area whether it be water consumption, whether it be you know the bringing down of vegetation****, if they have a will or a mindset that they try and convince everybody that "Don't send your concrete to a dump, we don't want it, send it to these people they'll recycle it", that would be a major positive to you know make sure that this business survived and make sure that it was for the betterment of everybody***

concerned. *I mean at this point in time it makes no sense to build bigger holes in the ground just dig quarries for the sake of later on filling them up with material. The theory is that every single bit of rubbish that comes into this site should have a home for reuse…". (Org. 3)*

STRATEGIC ALIGNMENT

Table 2.8 Key objectives of suppliers and the barriers and opportunities associated with those objectives

Themes	Org. 1	Org. 2	Org. 3	Org. 4	Org. 5
Objectives	Profit-driven			Profit-driven	Profit-driven
	Safety & environment	Environment			Safety & environment
	Expansion	Expansion – increase recycling activities	Expansion & diversification	Expansion & increasing services	
Barriers	High costs			High costs	
Opportunities		Use legislation to create a market			
	Changed perceptions				

Objectives

Profit-driven

*"Yeh we probably forego our growth in certain areas **but this company has an idea that profit is more important than growth**, which is correct yeh I agree with that so sometimes rather than build a facility that'll cost us a million dollars to compete with one next door, we just won't compete with that one, we'll actually deposit our waste into their facility" (Org. 1)*

"get more customers, make more money" (Org. 4)

"I suppose you know primarily obviously your purpose is to make money you know that's obvious" (Org. 5)

Safety & environment

*"I'd say probably **safety and environment**. And environment is also our objective so in some areas that, we'll know that we won't get environmental approval or we may get it and we'll have a lot of customer complaints or community complaints, we will not go there any more" (Org. 1)*

*"We've got new timber sales people around us and we work in with them, if we don't have the stuff for people we send them to these people, if they you know, they always say to their clients the other option is if that's too expensive you can go and see these people, I mean **working together we try and keep everybody in together in this area which is good"** (Org. 2)*

*"we would like to believe that at some stage our company would be recognised as being a leader in you know the techniques of doing the demolition work, a leader in the recycling side of things, a leader in the environmental issues that everyone's facing and then come out the end of it being recognised as someone who's not just thought about profit but thought about the impact that everything's having on the environment as such you know? So that's where we'd like to sort of head you know**, good demolitions practices, safe demolition practices, good recycling practices** and at the end of it all yeh coming out on top of the heap somewhere" (Org. 5)*

Expansion & diversification:

*"So also we're looking at **landfill extensions and looking at new approvals for different projects and then we also do a few experiments** and see if we can improve our business in some areas as well." (Org. 1)*

*"**what we're looking at doing in the future is expanding to what they call waste transfer facility**, we're gonna do that but I'm also looking at setting one in the centre of town so what people do is who are doing, they come to us and then we bulk fill the trucks and we send them out to landfill and things like that and the way we see it is that us being recycling technicians we can recycle their concrete, it's a great product to recycle, we can recycle their timber if we get you know approval from the council to do what we're doing, we can recycle the steel instead of it all going to landfill...And that's what we're trying to do here, we're trying to make this an envirosite transfer station that we can do everything here and even people like *** and *** are looking at bring their business to here so we've got a one stop shop." (Org. 2)*

*"We have established ourselves through Melbourne and here in Queensland as one of the leader of recycling not only concrete but construction type materials in Australia, we want to continue that but **we wanna diversify into other areas** and those areas include paper, cardboard, plastic, timber, we're looking at waste to energy projects and also soils. We're expanding at the moment, looking into Sydney and Adelaide and Western Australia, we are also looking*

at Canberra and places like that so from a point of view of our size we hope to be in all states with inside of you know the next five to seven years." (Org. 3)

*"**we are looking at transfer stations as well as – having our own**. As Brisbane grows and there's traffic and fuel prices gets, traffic gets heavier and fuel prices get higher people are less likely to travel a long distance to come here so if we can put satellite transfer stations around the place and consolidate the waste and then bring it in here you know that will become more and more attractive to our clients and we're finding that in the recent history that there's been a proliferation of small transfer stations. And even small skip companies etc are starting to bring waste back into a central location to dispose, like to either consolidate waste into bins or into semi trailers and things like that, so if we can supply some of those, that sort of infrastructure out there that may help us in increasing our waste volumes that come in" (Org. 4)*

Barriers

High costs involved with recycling:

*"I think that as long as we're smart we'll achieve it but I **think it's gonna be harder and harder soon that our costs of compliance and our land and rent costs are going up so, but the rate at which we can charge customers hasn't increased** so we're having a situation where costs are going up but revenue's pretty stagnant so our profits are getting tighter and tighter so in some areas that's why now we don't expand" (Org. 1)*

*"there's a real lack of industrial land that's suitably zoned and that land is so incredibly expensive that it makes it really to do you know cos a transfer station requires a fair amount of room and so to establish something on those sites, firstly t**hose larger sites are even not available at a price so that it makes it extremely difficult to justify having a transfer station on those sites**. A lot of, there's a situation now that the EPA doesn't require licensing for transfer stations under 20,000 tonnes per annum and that has started a lot of people just starting up an ad hoc transfer station saying we're not receiving more than 20,000 tonnes per annum however it wouldn't be hard to prove otherwise and I mean a lot of those transfer stations are coming here and I know what quantities they're taking in and it definitely qualifies them for a licence but one potential customer who we were talking to he has put his hand up and said I anticipate that I will be doing more than 20,000 tonnes and the council and EPA have jumped on him so hard that no one else will consider going for a licence. He's done best practice and he's still finding it extremely difficult to get approval. So everyone's saying well look at that **I'm not trying to do the right thing it's not viable"** (Org. 4)*

Opportunities

Changed perceptions:

"customers want their stuff to be recycled, which is – perception yeh" (Org. 1)

Council legislation towards creating a market:

*"That's what we're saying we need to get council to stand behind us in legislation you know or government should turn around and say OK you'll get a tax break if you can something that is better for the environment you know. That then creates the market…**you can put your own money into the market to create it** because I mean we're only considered a small business in the scheme of things but you know 80% of the country's run by small business you know we prop the country up so and we're the ones making the effort to go well we'll spend a couple of million dollars to get something going but you know we wanna get it back obviously the money in the long run, feasibilities, but we want somebody to be backing us" (Org. 2)*

3. ACTION OUTLINE

Based upon the findings from the two case studies, two actions have been defined as the following.

3.1 Case study 1: Action PCC

External stakeholder workshop to develop strategy for ideas around:

- Earlier design input; standardisation and impact of standards – opportunity to engage in a dialogue
- Communication of workload changes to ensure consistent workflow – timing of changes
- Clarity in communication of processes related to projects, ie design changes, decisions, points of accountability

3.2 Case study 2: Action RR

External stakeholder workshop to develop strategy for ideas around:

- Conflicting messages from various government departments
- Legislation – consistency & more supportive of recycling activities
- Economies of scale; high costs & time investment
- Image and perception of the industry

4. SUMMARY

This report has described the main activities involved throughout the “Intelligence capturing phase” of the project. It has described the aims/objectives of the phase and the data collection and analysis techniques specifically for this stage.

It has also included the results of the “Intelligence capturing phase” including findings from a supply chain policy document analysis aimed at identifying the difficulties associated with public sector supply chain policy implementation; analysis of different worldviews of various participants related to the two sector case studies and also a record of observations performed to date; all of which have been documented in the form of graphical and “punchy” results sheets. Finally, the report proposed two “action” outlines for both case studies based upon the key findings.

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Jessica obtained a Bachelor of Architecture in 2003 from the University of Newcastle and is currently a Masters candidate at the same university conducting research into architect-client relationships in the house design process. She has been involved with various nationally funded research projects in the areas of design firm internationalisation, government supply chain management, sustainable urban development decision-making policy, process and practice and innovative dissemination of research findings. Jessica is a member of the Centre for Interdisciplinary Built Environment Research (ciber). She also tutors Research in the Built Environment to undergraduate students in the disciplines of Architecture and Construction Management.

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