CRC for
Water Sensitive Cities

Fitzgibbon Chase

A case study in technological innovation, regulation and planning policy connections

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Fitzgibbon Chase: **A case study in technological innovation, regulation and planning policy connections**
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Executive summary

Fitzgibbon Chase is a master planned development 12km northeast of Brisbane's CBD. A flagship project of the Urban Land Development Authority (ULDA), the development aimed to bring land to the market quickly, provide affordable housing, and trial specific innovations for sustainable urban development outcomes.

This development project provided a case study to explore governance issues surrounding the ownership and operation of decentralised water harvesting and treatment systems, and the influence of innovative ideas on land use planning policy.

Key lessons regarding decentralised arrangements for implementing novel infrastructure included:

- *The need to think about the regulatory regime as a whole,* including all dimensions of construction, commissioning and system operation. The way in which water sources or products are defined within regulatory frameworks will have implications for the long term operation, monitoring and reporting for a scheme. This may result in the imposition of a regulatory regime with requirements and risk assumptions that are excessive or inappropriate to the scheme, and make it unviable and unattractive to potential operators.

- *There are disincentives in current financial models and licencing requirements that hinder the pursuit of broad multi-benefit solutions.* Unfavourable economies of scale make small schemes (lot/estate scale) unattractive to operators of centralised schemes. In addition, if licence conditions are already met through centralised schemes, there is no incentive to invest in schemes that deliver additional services and benefits.

These results suggest that **licence conditions for service providers need to include performance incentives for delivering more than simply safe and secure water supplies.** Likewise, **financial models are needed that can appropriately cost these additional benefits and services**, and that, when linked to suitable licence conditions, can provide the required justification for service providers to invest in these schemes. The analysis also **suggests a need to define a broader range of water sources and fit-for-purpose services within regulatory frameworks**, and develop suitable regulatory regimes. Finding the right regulatory 'fit' requires collaboration, negotiation, and good will.

Key lessons for practice-policy connections included:

- *That the current connections between practice improvements and supportive policy change are generally tenuous and unresponsive.* However, a coordinating organisation with the right mix of industry capacity, policy authority, and collaborative culture, can deliver integrated urban design, services and infrastructure.

- *Finding a better balance between stability/reliability and responsiveness/innovation will require a significant shift in how the bureaucracy operates.* Flexible policy instruments/processes are available, other than major legislative change, but they lack sufficient authority to drive widespread uptake.

These results suggest **that flexible policy instruments need to be strengthened** with more authoritative weight **and be better informed by practice** to be readily applicable. Also, a coordination/integration role with sufficient resources and authority can be a step toward making policy settings more cognisant and supportive of practice innovations.

Introduction

Fitzgibbon Chase is a master planned land development located 12km northeast of Brisbane's central business district. A flagship project of the State Government's Urban Land Development Authority (ULDA)[a], the development aimed to bring land to the market quickly, contribute affordable housing and achieve sustainable urban development outcomes[1].

This development project is of interest from a governance perspective for two reasons: due to governance issues surrounding the ownership and operation of the novel water harvesting and treatment systems that form part of the residential development and the influence of the development on land use planning policy. These two features of the case study, governing novel infrastructure and influencing policy change, will be important considerations in moving toward water sensitive cities (WSC). The first, because the governance of decentralised technologies delivering fit-for-purpose water is seen as central to WSC[2] but pose substantive challenges to current centralised water governance systems. The second feature, because the translation of new ideas, solutions and approaches developed in these types of demonstration projects often do not translate into policy[3], thence prompt adjustments to existing regulatory and legislative frameworks.

This report documents the research into this case study, to inform the CRCWSC project *Better governance for complex decision-making* (Project A3.1). This research project seeks to better understand the governance arrangements needed to support WSC, by:

- describing the mechanisms and strategies known to help overcome governance challenges;
- identifying adaptive elements of governance arrangements that enable the flexibility to find solutions to complex policy problems; and
- exploring the policy integration and innovation pathways needed to start the transition toward more water sensitive governance systems.

This report describes the Fitzgibbon Chase development and background context in the next section, then presents the findings of the research in the Results and Discussion section. The Conclusions section distils some lessons from the case study on the mechanisms, tools and strategies useful for addressing issues of decentralised system governance and bridging the demonstration project-policy influence gap. Direct quotes from interview participants are presented in italics throughout the document to highlight ideas and support claims. The research methods used to collect and analyse case study material is provided in Appendix A.

[a] The Urban Land Development Authority was replaced by Economic Development Queensland in early 2013.

Case study description

Fitzgibbon Chase is a greenfield residential development of 1300 new homes[4], within the 295 ha Fitzgibbon Priority Development Area (PDA)[b], located 12km north of the Brisbane CBD[5]. The development was planned and delivered by the Urban Land Development Authority (ULDA), in close collaboration with the land development industry.

The Fitzgibbon site posed a number of challenges, including endangered species and drainage issues (pers. comm., interviewee 2014). However, close proximity to transport networks and existing infrastructure, significant bushland areas and opportunities for public open space, and established adjacent residential areas provided an attractive opportunity for high quality residential development at the site[5].

In addition to adhering to State government planning provisions, including water sensitive urban design (WSUD) Technical Design Guidelines[6] and State Environmental Protection Policies[7], development in the Fitzgibbon PDA was also required to meet the objectives of minimising water use, maximising infiltration and managing storm water quality and quantity. These objectives were included in the Development Scheme for the area, which is a statutory planning instrument under the Urban Land Development Act 2007 [1] and the subsequent Economic Development Act 2012.

These statutory objectives for best practice stormwater management, coupled with the timing of the development during the 2008-09 height of a prolonged drought, invited opportunities for novel water services solutions, and helped to attract investment from the Australian Government[8]. These aspirations for the development also facilitated investment from a Japanese Government-backed engineering company (JFE Engineering), looking to test novel water treatment technologies in a stable regulatory environment (pers. comm., interviewee, 2014).

Overall, the Fitzgibbon Chase development displayed a number of innovative features, including:

- Stormwater and rainwater harvesting schemes utilising novel rooftop harvesting and treatment technologies and an integrated but flexible system design [9, 10]
- Testing the market for small lot housing designs with freehold title (pers. comm., interviewee, 2014)
- Providing a model for integrating water supply planning with urban design[11]
- Demonstrating a hybrid centralised/decentralised water supply system
- Australian firsts for the supply of treated stormwater to homes and a precinct-scale roof rainwater harvesting scheme. [11]

The development has received industry recognition for the residential design[12, 13], speed of the master planning and approvals process for the site[14], and the integrated storm and rainwater harvesting scheme[15].

While there are many domestic examples of innovative approaches to water servicing, housing and urban design, the Fitzgibbon Chase development has been chosen as a case study primarily because of its influence on policy. Many of the experiences in developing and seeking approval for the new approaches within the development

[b] Under the previous *Urban Land Development Act 2007*, these areas were known as Urban Development Areas (UDAs). With the repeal of the ULD Act and replacement with the *Economic Development Act 2012*, these areas were known as Priority Development Areas (PDAs).

were collated, or informed planning schemes for future ULDA developments, supporting guidelines and practice notes. This included practice notes on the inclusion of stormwater management and treatment in urban parks (Practice Note 13), integrating sustainable principles into residential subdivisions (Practice Note 4), and guidelines for park planning and environment and flooding protection[16]. These documents were referenced in State planning policies, and so could effectively be legally adopted by councils when approving developments. Thus, these policy developments have potential to be refined and incorporated into standard land use planning practices, facilitating the mainstreaming of innovative water services integrated with urban planning.

This case study therefore provided an opportunity to identify and explore the factors that transfer learning and innovation from specific practice changes and projects, into institutional structures, through the policy process.

Organisational context

As one of the first development projects of the ULDA, there were significant performance criteria to be met. Not only did the Authority need to build its relationships and reputation within the land development industry in order to deliver on its legislated objectives, it needed to 'prove its worth' to Governments (State and local). The Fitzgibbon Chase development provided a major vehicle for the new authority to demonstrate its competence.

The Fitzgibbon development was not primarily a testing ground for innovative water supply technologies. The ULDA was established by the Beattie Labour government as a key policy response to the Government's Housing Affordability Strategy (2007). The organisation had a remit to improve the availability of land for urban development and provide affordable housing options, while providing infrastructure and developing planning principles that 'give effect to ecological, sustainable and best practice urban design'[17].

The organisation was initially provided with three years of funding, with the expectation it would become self-funded (pers. comm., interviewee, 2014). The decision was taken by the ULDA Board to purchase the land at Fitzgibbon as a profit-making exercise, so that the Authority could commercially develop the land as a source of revenue (pers. comm., interviewee, 2014). These conditions provided strong internal and external drivers for the development of Fitzgibbon to be a commercial success as well as achieve the outcomes laid down in the ULDA Act.

Governance and political context

The ULDA was effectively a land development authority with wide-reaching planning and development powers which could replace local government planning schemes and approval processes, within Urban Development Areas (UDA) declared under the Act. The move to establish a separate statutory authority was premised on the need to enhance Government's role in the land supply pipeline; to stimulate more affordable housing by facilitating raw land to completed development. The new Authority was also tasked with improving the performance of the state's planning and development assessment system under the *Integrated Planning Act 1997*[18], and to facilitate development in regional areas with land development market failures[19]. Thus, the establishment of the UDLA provided the opportunity to *'do something differently…'*

'Here's a government saying we want something different done - we're going to give the legislative powers to you to do whatever you want to do as long as it makes sense in terms of the principles of the Act...'

A number of interviewees commented on the enabling properties of the legislation, which had been modelled on the *East Perth Redevelopment Act 1991*. Other studies of Government Land Development Authorities have recognised that a strong legislative basis can provide these authorities with the ability to play a leadership role, by providing them with the legal authority to effectively take on many of the risks associated with experimental approaches and technologies[20, 21].

In November 2012 the *ULDA Act 2007* was repealed and replaced with the *Economic Development Act 2012*, dissolving the ULDA in early 2013 and shifting its responsibilities to a new departmental business unit with a broader remit; Economic Development Queensland (EDQ). This move by the recently elected Newman LNP Government was claimed to be a response to the lack of consultation afforded to relevant local governments under the ULDA model[19]. However, the continued existence of the Authority, albeit with a redirected focus on economic development, implicitly recognised the achievements of the ULDA and the value the organisation's land development activities had provided to the State Government.

'It's a new government with a different agenda. We were a factor of the old government with a different agenda, but interestingly, we must have succeeded, because not only did it not get disbanded, the legislation got in fact empowered and broadened to economic development [not] just affordable housing.'

Key drivers and outcomes

The development of Fitzgibbon Chase aimed to support the State Government's Housing Affordability Policy [18] more than being driven by urban sustainability or water management concerns. However, the timing of the initiatives, at the height of the Millennium drought, made water accessibility a significant land development consideration, and new and innovative supply solutions were being sought.

As the first major development of the ULDA, there was some pressure for it to succeed. Through strategic leadership and a strong partnership approach, the project not only gained industry recognition for speedy and quality urban development, the project also contributed a number of supplementary planning policy guidelines and practice notes.

'We did some projects ourselves. We approved a lot of other projects, and we prepared and documented wherever we could, whatever we were involved in, so other people could then copy, learn, throw stones at or whatever.'

These included guidelines for urban parkland planning, environmental values and sustainable resource use, and flood and storm tide inundation protection[16]. Practice notes informed by the experiences at Fitzgibbon included how to integrate sustainable principles into residential subdivisions and integrating stormwater management treatments into urban parks and public open space[16].

However, despite engagement with the central water retailer, Queensland Urban Utilities (QUU) throughout the planning, development and commissioning of the alternative precinct-scale water harvesting and treatment schemes, QUU was reluctant to take on ownership of the schemes. In addition, while third party water providers were interested in taking on these schemes (pers. comm. workshop participant, 2015), the lack of certainty around regulation of recycled water in State legislative frameworks left the schemes without an owner/operator and thus not fully operational[c].

In summary, there were a range of factors which drove an innovative approach in a number of aspects of the Fitzgibbon development, summarised in Table 1.

[c] Postscript: During July 2015, the EDQ commenced an Expression of Interest process for a partner to operate and manage the FiSH and PotaROO schemes on a commercial basis for a three year period.

Table 1. Innovation incentives and influences on Fitzgibbon Chase

Drivers for innovation	Description
Drought	Concern for 'drought-proofing' future supplies prompted new thinking in a wide range of water management areas, from supply planning and water services institutions to precinct scale residential development and municipal planning schemes
Market failure in regional development	Lack of commercial land development in regional areas called for state government intervention
State economic growth	Government policy mandate to stimulate economic growth through regulatory barrier reduction
Affordable housing	Key urban growth management challenge for State and local governments – resulted in closer attention to the cost of land and infrastructure provision
Organisational mandate	ULDA created as a response to state-wide drivers,
Business opportunities	Innovative approaches opened new commercial ventures or niche markets for businesses
Individual altruism	Individuals with a sense or moral obligation or personal principles were driven to pursue more sustainable solutions

Fitzgibbon Chase novel water systems

The early development assessment work for the Fitzgibbon development was conducted by the engineering firm Bligh Tanner, who were also working with the Queensland Water Commission (QWC) on an investigative piece of work to design, scenario-test and cost novel stormwater management systems (pers. comm., interviewee, 2014). The Fitzgibbon development was put forward as a suitable demonstration site to test these ideas. As the ULDA had an 'appetite for innovation' (pers. com, interviewee, 2014), and the new system designs would help to meet the stormwater management objectives in the Fitzgibbon Development Scheme[1], they agreed to their inclusion. This stormwater system was named the FiSH (Fitzgibbon Stormwater Harvesting)[22].

As a potential remedy to the low potable water supplies, a precinct scale rainwater harvesting system was also designed as part of the water infrastructure for Fitzgibbon. Through linkages between Bligh Tanner and a Japanese government backed private engineering firm, an agreement was reached to trial new roofwater harvesting and treatment technologies, known as the 'PotaROO' project (Potable Roofwater)[9]. Leveraging from these partnerships, Bligh Tanner developed a successful grant proposal on behalf of the UDLA, securing $7.13 million through the Australian Government's Water for the Future initiative to contribute to the construction of both the FiSH and PotaROO[8].

Both the FiSH and PotaROO projects represented novel storm/rainwater harvest and treatment schemes, providing both fit-for-purpose and potable water supplies to Fitzgibbon residents. The FiSH project was designed to harvest stormwater from the Carseldine Drain (290ha catchment), undergo natural pre-treatment and be stored in a 5ML lagoon. A treatment plant then disinfected water prior to distribution for non-potable use through a third pipe system. The modelling suggested that this system could supply up to 89ML/year of treated stormwater to residents. Due to the flexibility with planning controls within the UDA, this scheme allowed the ULDA to relax controls that at the time required the installation of a rainwater tank at every new residential property. This freed yard space in dwellings, enabling smaller lot designs to maintaining affordability[11]. This also provided physical space for builders to innovate in other aspects of the dwelling designs (pers. comm., interviewee, 2014).

The PotaROO project sought to harvest and treat rainwater from residential roofs across the Fitzgibbon Chase development, to reduce reliance on regional water supplies by an estimated 44 ML/ year. The scheme collected rainwater from a number of catchment rainwater tanks and treated the water to a potable standard. Initially this water supply was to be fed into the FiSH non-potable pipe distribution scheme over a three-year period for validation and testing, before being connected to the mains drinking water supply network. The aim was to have both schemes provide for potable and non-potable water uses within the development, reducing residence's reliance on mains water by approximately 60%. Initial costing put water supplied through the FiSH at $3/ML, which was at less cost than installing rainwater tanks on every property (required under the planning controls at the time)[11]. The PotaROO was estimated to produce water at $4-5/ML, and with maturation of the technology and greater economies of scale in other projects these costs were expected to decrease for future developments.

In addition to the reduced demand on regional water supplies, the environmental and social benefits expected to result from the novel water schemes included[11]:

- Catchment management improvements as a result of having a stormwater harvesting system in place
- Retention and treatment of 89 ML/year of runoff removing associated pollutants from the downstream waterways
- Small reduction in minor runoff events to waterways and improved waterway ecology
- The treatment plant occupies otherwise "unusable" land on the powerline easements and operates using 100% green energy
- Providing Fitzgibbon Chase residents with an alternative water supply to draw on in times of regional water scarcity
- Help to defer major water supply augmentations and the community opposition and environmental impacts they often involve.

In addition to the water system innovation at Fitzgibbon, there were novel urban design elements such as multi-functional and increased public open space and unique apartment-style housing designs with freehold title. Standard water and energy headwork costs were also renegotiated by ULDA with suppliers, due to the potable substitution the FiSH and PotaROO schemes offered and energy efficiency measures built into the development's design guidelines (pers. comm. Interviewee, 2014).

Fitzgibbon Chase development timeline

2006 SE Qld Regional Plan set water demand reduction targets of 230L/person/day by 2020 (demand was sitting at 300L/person/day at the time). The plan also embedded water quality and hydrology management objectives for WSUD (Implementation Guideline No. 7).

2007 State Government Affordable housing strategy released, with establishment of a land development authority included as a key action.

Urban Land Development Act passed (September).

2008 Urban Land Development Authority established.

The Fitzgibbon PDA declared (July).

Requirement to include non-bulk water supply options for new dwellings introduced to the Queensland Development code (removed in 2013).

Water Supply Safety and Reliability Act passed, included a requirement to have risk-based management plans for water suppliers

2009 Sales and construction commences at Fitzgibbon under Interim Land Use Plan (April).

Fitzgibbon Development Scheme approved (July).

2010 Fitzgibbon display village opened.

Australian Government grants $7.13 million to FiSH and PotaROO schemes through the *Water for the Future* initiative.

Development wins Planning Institute of Australia (QLD) award for Excellence in Planning (Housing).

2011 Development wins Urban Development Institute of Australia (UDIA QLD) award for Excellence in Environmentally Sustainable Development.

2012 Newman LNP Government formed following State election in March.

Economic Development Act passed (November), replacing the ULDA with EDQ, a business unit within the Department of Infrastructure, Local Government and Planning.

Fitzgibbon Chase development wins Australian Water Association (QLD) award for Infrastructure Innovation, and Healthy Waterways/BP WSUD award.

2013 Development wins Urban Development Institute of Australia (UDIA QLD) award for Best Large Residential Development.

Results and discussion

The Fitzgibbon Chase development is a case study for realising WSC from two perspectives: the challenge precinct-scale water recycling systems pose for regulating water supplies and governance of infrastructure, and the translation of innovative urban development approaches into planning policy. The lessons from these two experiences in Fitzgibbon are collated below, illustrated with direct quotes from interview participants in italics.

Decentralised governance

This case study has highlighted that not only do decentralised schemes show an uneasy fit with current regulatory frameworks for water servicing, they can also sit uncomfortably within organisations who may appear to be the best placed to manage them, and with regulators when other non-traditional organisations are proposed as the owner-operators. The Fitzgibbon schemes posed regulatory issues in terms of:

- Access to stormwater from council owned drains for the FiSH
- Regulation of water quality from both schemes as, at the time, regulation existed only for drinking water and recycled wastewater
- Regulation of third party water service providers.

However, the key issue has been the handover of the water schemes to an owner-operator. Despite ongoing consultation with the central water provider (QUU), profitability, internal workforce capacity, and a shift in the executive's tolerance for risk led the organisation to become reluctant to accept ownership of the schemes.

'When it was first developed and proposed, one of the things the [Queensland Water Commission] was trying to assist in was getting the arrangements and the support of QUU to take on the scheme and agree to own it long term. That certainly had the support of a couple of key people within the organisation…'

'Anyway so their board has changed…and their CEO has changed as well now and I think that's just a change in outlook.'

'The peak question is, is it part of our core business? and executive would say no.'

As a number of interviewees reflected, the expectation that QUU would be best placed to take on the novel infrastructure at Fitzgibbon was perhaps unrealistic, given the organisation was relatively young and still building its skills and capacity in its core water retailing function. Taking on the FiSH and PotaROO schemes represented a shift toward water treatment, which the organisation did not have a mature workforce for[d], and the scheme itself was at a small scale, representing a high level of investment for QUU with only small returns. Significantly, the scheme also represented a redundant level of service for the utility, as they were already providing water supplies to the development through the existing regional water supply scheme. As such, it was difficult for QUU to justify any additional investment in the scheme, in this case maintenance costs[e], as they were already fulfilling their water servicing obligations.

[d] Waste water treatment and alternative sources (including water recycling) functions had sat across a number of water businesses immediately following the substantive reforms of the *South East Queensland Water (Restructuring) Act 2007.* These functions were consolidated in Seqwater in January 2013.

[e] It was expected, as capital costs of the infrastructure had been provided predominantly through grants, that ownership of the schemes would be transferred to QUU for a nominal fee (pers. comm. Interviewee, 2014).

'At the time, only a couple of years old, QUU were in the business of getting the business together, not moving into taking on different businesses or different types.'

'QUU are coming out of it with a different mindset…we don't want to do this because we can't point to someone or some group in the organisation that owns and operates and runs distributed systems.'

This experience points to a need for broader consultation with potential owner-operator organisations, and recognising that executive leadership change may bring changes in confidence toward innovative projects. Thinking about the history and skills set of organisations earmarked to take on novel infrastructure is also an important factor. Critically, the reluctance of the major water service provider to take on a novel piece of infrastructure highlights not only the importance of influences on internal decision making processes, but also the disincentives and tensions in existing business models and licence conditions to the adoption of alternative supply sources, despite their expected additional benefits; in the Fitzgibbon case, fit-for-purpose supply, greater security through regional and local supply connections, and a range of environmental benefits.

In addition to the handover issues, the Fitzgibbon water scheme highlighted an emerging problem for governing these novel solutions; multi-functional schemes do not fit easily into current single-function or single-source regulatory regimes for water (i.e. drinking water, recycled water, waste water etc.). Research on other cases shows that finding the regulatory 'fit' for novel solutions requires significant negotiation between regulators and proponents[22].

While these negotiations were successful for the feasibility and approval stages of the Fitzgibbon development, when it came to the longer term operation and regulation of the supply schemes, there were some problems navigating the various regulatory frameworks to find a suitable regime for ongoing operation. Specifically, the different types of water being provided through the FiSH and PotaROO—recycled stormwater and roof rainwater—are not currently defined as water sources in existing regulatory frameworks. Defining them as recycled water assumes that their source is wastewater, under current regulatory guidelines, which brings regulatory requirements and risk assumptions not necessarily suited to the systems and their operation.

'…one on the Potaroo…you could get a licence to treat and then drink black water but you couldn't get a licence to drink stormwater from a tank because there was just no regulation for it.'

'…the regulatory burden on the provider of the recycled water was so stringent that it just failed to become cost effective.'

Interviewees reflected that negotiating these regulatory arrangements early in the development could help to negate over-regulation of novel water service systems and providers.

'I think because it was so new there was a bit of a knee-jerk reaction that went from one extreme of under regulation right through to the other of extreme regulation…all of a sudden the maintenance obligation and the costs associated with operations just went up immeasurably.'

'…that requires trust…Really working with the regulator so they fully understand the system so they don't need to put excessive burden on, purely because they don't actually understand something.'

Policy innovation

The second important governance aspect to be explored in the Fitzgibbon case study was how lessons learned through the exercise of fostering innovative urban design could be captured and used to inform policy. As one of the interviewees from the ULDA recalled: *'We'd started from the outset, that to be a demonstration we actually had to document.'* Specifically, the organisation was seeking efficiencies by producing guidelines relevant to their own development areas and projects. However, they recognised the value these could provide for planning approvals in similar developments across the state.

'So the intention for that was to be our documents to guide our approval processes…but then it was open for others to pick them up and use as they could….At the same time we produced the practice notes because we realised you can have a guideline and you can do them different ways - what works and doesn't work, so what are the tricks of the trade or lessons learned…'

'The development guidelines that we create by doing and testing things ourselves then translate across to the private developments. So if you look at all the design in the development scheme for Caloundra South, Yarrabilba, their engineering standards, the planning guidelines all come out of Fitzgibbon.'

Operationally, the ULDA convened multi-council/state agency working groups to develop standards and guidelines that they could apply across the declared Urban Development Areas where the organisation had planning control. They also dedicated a staff member to compile practice notes on various aspects of urban development, and also used slower times between developments to direct staff to document lessons in guidelines and practice notes that could act as supplementary material within the planning system.

As a separate statutory authority, the ULDA had little direct control over any changes to the State's statutory planning system. Nevertheless, their guidance material was made available within the planning system, and anecdotal accounts from interviewees suggest that the development industry and local councils drew on this material in their development designs and approval processes on a regular basis. Thus while the ULDA had significant planning and approval powers, these supplementary guidelines within the planning system provided the avenue to translate new ideas and approaches in two ways. First, by providing practice-informed guidance readily applicable to developers and second, as a means for decision-makers to justify their approval decisions.

While these documents do not have full statutory standing, they do supplement State Planning Policies (SPP) and have some authoritative weight within the planning system. This also enables flexibility within the system, by enabling such documents to guide the implementation and enforcement of SPP, while not requiring legislative change if the guidance material can be improved or a new approach becomes more appropriate. However, one interviewee recounted how, without statutory standing, these documents and the 'best practice' they contain could easily be lost from practice.

'The next thing he [incoming Planning Minister] said is, I've read your guidelines over the weekend - they're fantastic - why aren't we promoting these? So that was the political mindset in 2012. There was an opportunity in 2013 for all of that work to be rebranded - can't have the ULDA on things, which they did, but then to use it in the State Planning Policy, the single planning policy to promote good leading practice in terms of urban development, and I thought they had actually been referenced in the back of the document…They're not. They'd been taken out. So four years on all of that good work - high praise by the Deputy Premier, sitting buried down in a website.'

This result demonstrates the often tentative link between innovative practice and policy development. In this case study, while significant effort was put into documenting the learning and experience of various aspects of urban development, the uptake of this knowledge relied heavily on the insistence and persistence of senior managers to push the transfer of these documents into regular use and semi-official standing (ie. short of statutory recognition). In the Fitzgibbon case study, this outcome was partly the result of the disconnection between an independent statutory authority and the central policy agency, and the politics this can entail. However, it raises

questions as to how practice innovations like those progressed by the UDLA, or indeed other private developers or planners in local governments, can be readily and reliably included in policy development or legislative adjustments. The model for this knowledge transfer at the moment appears to be driven by the policy review cycle, instigated more from political expediency rather than from new knowledge or practice breakthroughs. Moreover, the mode of transfer tends toward quick solutions to recognised problems rather than consideration of where and how practice improvements could deliver improved outcomes, and what policy and legislative changes could better support these improvements. As one interviewee reflected, the ULDA was trying to pursue an alternative, more iterative, model of knowledge transfer between policy and practice:

'[ULDA] were trying to be a go-to consultancy that could ensure that the policy settings were going to drive opportunity for innovation and then mainstreaming of a lot of those techniques, but also wanted to be directly involved in design and delivery of works as a mechanism of supporting the evidence base that was needed to get the policy settings in place.'

Specific mechanisms, tools and strategies

This section explores some of the specific governance features that enabled those involved in the Fitzgibbon development to pursue innovative approaches, and the strategies they employed to realise these opportunities. These case study insights are grouped as i) structural features within governance arrangements that incentivised innovation, ii) the skills and capabilities that were critical for utilising opportunities for innovation, and iii) the collaborative processes and partnerships that help to realise innovation.

Incentives

The administrative arrangements for the ULDA were a significant structural governance feature that both initiated and enabled an innovative approach to be taken. Specifically, the *ULDA Act* and its inception provided:

- A clear mandate for fostering innovation to achieve social, environmental and economic outcomes, resting within a single coordinating organisation
- Organisational authority to support innovation in the form of special planning powers
- A level of independence from the existing planning system and the institutional legacies it contains
- An avenue to incorporate new ideas and approaches, tested through projects and supported by relevant stakeholders, into policy frameworks (in the form of supplementary material to State Planning Policies).

However, the interpretation of this legislation and the subsequent management approach used to implement these objectives was also critical for the successful development and delivery of innovations. These success factors are explored in the subsequent sections on capacity and collaboration.

Essentially, the planning powers in the *ULDA Act* combined planning and development functions, allowing the ULDA to act as both development proponent and approver, in areas where it chose to purchase land such as Fitzgibbon Chase.

'There was a piece of legislation that went with it [ULDA], which actually gave them the ability to be, interestingly, not only the developer but the approver as well.'

This institutional feature brought planning and approval activities together in a single organisation, facilitating innovation by allowing flexibility in both planning and developing activities, in the absence of statutory approval processes if changes to either planning provisions or development objectives were required. This allowed a cross-fertilization of improvements between the two functions to occur.

'They combined planning and development together. So the two processes feed on each other.'

'That's why our [ULDA's] planning process is so important for innovation is that we're actually quite flexible about changing as we go.'

These arrangements also enabled the organisation to cut through the institutional complexity of existing planning frameworks to fast-track development, even when they were not the landowners. As a number of the interviewees reflected:

'The ULDA could come and use its act and declare what is now a priority development area and within 12 months have a full master plan and approvals basically ready to go.'

The ability to speed the development process was partly due to the ULDA's significant planning powers, but also the facilitative role the organisation sought to play. With a remit to expedite development across the State, the ULDA did not only seek to deliver innovative development, but identify blockages in the planning system and work with the relevant stakeholders to address these barriers.

'I think the main role we have is a facilitation role…I think the purpose of the ULDA and now EDQ in some respects in terms of the planning side is really to coordinate a single state approach which isn't beholden to particular silos.'

Government-owned land development agencies like the ULDA have existed since the early 1970s in Australia. Gleeson and Coiacetto [21] point out that many of their criticisms have not been supported with empirical evidence. Nevertheless, these critiques are substantial (if not substantiated) and worth noting, including: the intervention into and potential distortion of land markets, potential for corruption due to their sweeping powers and combined developer/approval functions, and tensions between their generally precinct-scale development frameworks and standards and those managed and integrated regionally by local governments. Indeed, there has been a history of politicisation of government land development authorities similar to the ULDA model, stemming from arguments from conservative governments, the development industry, and local governments. This opposition is perhaps an inherent risk when an independent organisation is deliberately established to intervene in land development markets and can remove planning power from local government. However, the ULDA seems to have successfully countered opposition through its close partnerships with the development industry in its own development projects, its collaborative approach to engaging with state and local government on planning issues, and its performance in delivering quality urban developments.

In addition, while the ability to produce a statutory Development Scheme for declared PDAs gave the ULDA significant planning and approval powers, this mechanism also enabled them to cut through persistent planning problems and issues. The planning function gave the Authority scope to circumnavigate existing institutional barriers and find new approaches to overcome these issues. The approval authority and remit to deliver quality urban developments incentivised the Authority to work with other stakeholders to deliver on this objective. These arrangements and inducements resulted in practice innovations, but the efforts of the ULDA to capture these experiences in guidance materials for the planning system could potentially initiate the institutionalisation of these practices and approval decisions.

Capacity

There were three particular aspects of capacity that emerged in the analysis as being important for the ULDA's ability to innovate; the workforce capacity of the organisation itself, its knowledge sharing and capacity building efforts, and the policy capacity it provided in the land development industry.

With regard to the skills and capabilities of the organisation itself, a number of factors emerged as important contributors to the ULDA's successful performance in urban development innovation:

- Organisational leadership and staff effort to establish a positive reputation for the new organisation with key stakeholders
- Organisational direction to achieve outcomes rather than work toward narrow performance objectives, and willingness to stretch the boundaries of their roles or professional practices to achieve these outcomes
- Well respected individuals bringing both technical/procedural expertise and experience
- Resources devoted to capturing and documenting new procedures and learning
- Perseverance and stamina

In terms of the internal workforce capacity of the organisation, management level interviewees from the UDLA noted the importance of recruiting staff with experience and expertise in the business of land use development. Such practice knowledge was needed to deliver on-ground development quickly, but also provided a 'bottom-up' perspective in the production of planning documents and standards for UDAs. This ensured the plans were readily implementable for developers, and relevant for broader application and practice.

'… they seconded and cobbled together 17 staff…the 17 people who I had inherited were predominately public service background, and they weren't the right people for the job... We needed a mindset and capabilities which wasn't from within government…We also utilised people who - grey-haired people from the industry to come and work on a - two days a week, three days a week. So we had some people with impeccable development experience.'

'It also involves getting down into the detail and I think that's where I have to say the experience of … development people working in the infrastructure side make a big difference because it's not just a top down approach.'

'So what was created over that time period was a group of people who had experience with writing planning documents which were simple, very performance-based, but had three components - a land use plan, an infrastructure strategy and implementation strategy.'

As interviewees recounted, the operational style that strategic leadership and strong management expertise created within the organisation helped them to deliver successful projects in UDAs, which were often problematic due to historic lack of progress or development challenges.

'So their style and project management et cetera actually got some things to happen quite quickly and effectively.'

'Their vision was to be leaders, but to develop projects that could be - they'd be proud of.'

The ULDA also saw a role for themselves in building capacity within the industry to take on the approaches and ideas developed by the organisation, to satisfying their legislated objective of improving the performance of the state's planning and development assessment system. As a ULDA interviewee described:

'We had a person who was employed to work on the practice notes and provide sort of - not education, but talk and go and meet people and all that sort of thing. So the tours would be someone who's interested - come down and we'll show you around and we'll do the walking tour, we'll give you some documents, answer your questions.'

'We'd always say to anybody, come and have a look at Fitzgibbon - see what's happened there - see what's worked and hasn't worked, then you pick what you think suits your community in the market there.'

The final capacity related success factor that was evident in the Fitzgibbon Chase case study was the coordination/facilitation function the ULDA provided. This role helped to bring the right skills and authority together in collaborative efforts to resolve issues and elevate these solutions to the policy sphere. As discussed above, the creation of the organisation bought practical expertise to the task of writing planning guidelines and delivering urban development projects.

'EDQ, are the project managers on behalf of the department, which is the proponent. But they pull in the expertise of the consultants or the Stocklands of the world to actually deliver that.'

Interviewees reflected on how this new organisation, with its remit to improve urban planning and development, recognised knowledge and expertise, and collaborative approach, was able to cut through some of the historical issues and tensions in the sector that inhibited the resolution of issues:

'I think it can be summed up as being said that when there's large complex infrastructure issues which involve the private sector, local government utilities and various state government agencies the complexity is too great for local government to deal with because they don't have authority over state agencies.'

'So that's where we get involved so the facilitation is mostly what we do. It's quite important. Without us there'll be no one facilitating other outcomes, it would be business as usual.'

These organisational qualities and facilitator role of the ULDA gave the sector the capacity to produce more outcomes focused directions and elements of planning policy, as one interviewee reflected:

'Rather than just being a small section of government, it's now the government planning group saying, this is what we think is good development. That will be in some ways a game changer because the department really hasn't, I don't think, provided much leadership in the actual outcomes on the ground. They certainly provide a lot of leadership in terms of processes and planning processes, but not in planning outcomes.'

Thus, the ULDA provided a critical link between practical expertise and demonstration projects to policy development. As an organisation, the ULDA had the capacity and authority to drive a more coordinated approach to land development. This not only helped overcome particular barriers (such as negotiating reduced headworks charges), but provided an arrangement through which urban design, services and infrastructure provision could be integrated and delivered. This arrangement has subsequently helped to embed outcomes focused elements into the State planning policy framework.

There were, of course, many capacity elements outside of the ULDA itself that were critical to the advancements that were made. These include leadership in various organisations and at different levels, permissions from within organisations to allow staff to collaborate on the projects or learn from them, and the personal principles and values of these key champions. These capacity needs for innovation are well documented and discussed in other research, and so were not explored in this report for reasons of brevity. However, this lack of coverage should not downplay their importance, nor the significant effort of the many individuals involved. As one of these champions reflected:

'We all strongly believe in these kinds of things, so we have a strong personal belief that these things should be done and we definitely put quite a lot of time in that we'll never ever get paid for to try and make these things happen.'

Collaboration

Collaboration in the Fitzgibbon Chase case study was critical in two ways. First, to build respect and trust for the new organisation (ULDA) within the development industry, and relevant policy and regulatory agencies. This support was critical to pool resources, expertise and authority to deliver Fitzgibbon Chase and other development projects, and address the ULDA's land availability and affordable housing objectives. Second, these development collaborations then built a network of relevant practitioners and partners for the ULDA to pursue its other legislated objective of improving the state planning system to give effect to ecological, sustainable and best practice urban design. Collaborative efforts fostered a community of practice around the new ideas and approaches that emerged from the Fitzgibbon project, to build the evidence base, industry support, and the case for change to satisfy state government that reform of either key policy positions or legislative settings was needed. Thus, some of the collaborative elements evident in this case study included:

- A coordinating organisation that provided scope and encouragement for innovative approaches from delivery partners
- A number of individuals in leadership positions, both inside and outside the coordinating organisation, who recognized opportunities for change and worked together to try and utilize them
- Partnering organisations who saw benefit in collaborating on specific developments/initiatives
- Individuals motivated by a shared sense of purpose and similar values or principles.

To prompt broader uptake of the innovative urban design, housing types and water recycling systems, the ULDA recognised a need to work with others within the urban development policy system, to ensure the practice and process lessons from their own development projects were embedded as supportive elements in planning policies.

'They [development companies] need to see confidence in the regulatory side and the approval side and the cost side.'

'It will take some time for that to get to a point in my view for it to be sufficiently connected and cohesive as a story to get the broader market. By that I mean political interest, policy interest and practice interest.'

The process for starting collaborative partnerships in this case study followed conventions often highlighted in studies of system change and the role of peer networks. Initial connections are often informal and require a 'safe' space where issues and ideas can be discussed without the influence of organisational positions or representation. It is generally understood that these types of exchanges not only build a shared understanding of the problem, but an appreciation and respect between participants for their knowledge skills and influence. This mutual understanding is attributed to the ability of these networks to collectively strategise and pursue change agendas.

'But it was a meeting of minds and it started off quite informally and it was an opportunity to have conversations… To have those safe conversations. You build up that trust. You have the conversations. Then you nut it out.'

'I think the key thing is making sure every party has an interest and has a say and is in there arguing and debating and you'd hope that the best outcome comes out of that process.'

However, these kinds of relationship building activities require a time investment that often needs endorsement from management. Given the conversation of this time into a tangible benefit for an organisation can often take an

extended period, there can be difficulties in seeing or communicating the value of collaboration. As one interviewee reflected:

'But I can tell you now that it is very very hard for me to demonstrate to a CEO that your organisation gets X amount of dollars through collaborating with us.'

While the Fitzgibbon Chase case study proved to be a collaborative success in some respects, there were still issues surrounding the politics of being an independent authority reliant on core policy agencies to institutionalise the new ideas, practices and processes for urban design and development that had been developed.

We're an independent statutory body, so while we have tried to have a very good relationship with this department…authorities [are] almost always viewed sceptically or critically by government departments… 'They can do things that we can't do…' You'll never ever have a good relationship with the department, even if you've got good relations at the senior level, which we did…We experienced that from the point of view of outright hostility - from the point of view of people saying, you shouldn't exist - from the point of view of, we see what you're doing but we really don't care…so consequently, what we did didn't get any real traction in the department.'

There are also inherent tensions within an intervention model like the ULDA, where a remit to resolve institutional blockages and significant power to bypass existing rules and standards can conflict with the longer-term considerations of other organisations, such as local governments and infrastructure owners/service providers.

'The water utilities or council, we can build anything and tell them they have to take it. We don't like to do it and the Minister doesn't like to do it and they have standards for a reason, but mostly we tend to work with them.'

'…they [ULDA] have this development and they are, oh now we want you to own the assets. But you didn't actually work with us when you were actually getting the assets designed so we don't know what the design standards are, we don't know the criteria.'

This tension illustrates two important aspects of successful collaborations: that the positions of stakeholders are explicitly understood, and there is substantial good will to find mutually beneficial outcomes. As one interviewee reflected:

So [ULDA] don't focus on the top down approach, which is what the QUU do and they're probably doing that very well…[ULDA] focus on the bottom up and so it's that tension between the two where you start to actually then work out what the best pathway is if you can't find a solution going one way or the other.

Conclusions

The Fitzgibbon Chase development offers some insight into the processes of practice innovation and policy integration, which are recognised as key pathways to transitioning governance arrangements to support Water Sensitive Cities[23].

As a central coordination body with authority for planning and development, and partnerships with the land development industry, the ULDA was able to achieve significant inroads in integrating sustainable water management into urban development from design and infrastructure provision perspectives. The organisation also achieved some success in translating these on-ground innovations into policy and planning frameworks, by helping to initiate a process of institutionalisation through its influence on the planning policy system and industry capacity building efforts.

This government-owned land development agency model has significant advantages and a long history of successful performance in many Australian states. However, the approach does come with a high potential for politicisation, due to the impositions on local government and intervention into land markets. The success of such a model depends not only on the 'hard' institutional arrangements that establish the remit, authority and boundaries of an organisation, but other 'soft' institutional features, which the Fitzgibbon case study has highlighted and includes:

- High-level facilitation to coordinate and/or support experimentation, capture lessons, and translate these into supportive policy mechanisms to progress new approaches and guard against a return to business as usual
- Planning policy supplementary material, informed by practice, which provides implementation guidance to proponents and justification for trade-off decisions to approval authorities
- Multiple champions, collaborators and supporters across relevant organisations in positions of leadership and influence
- Workforce capacity with technical knowledge, understanding of the relevant industry and its commercial aspects, and policy development expertise
- Commercial and regulatory investigation of novel systems, alongside technical feasibility, at all stages of approval/regulation; from design and construction to ownership and operation
- Early collaboration and ongoing negotiation with regulators in order to ensure gaps and silences in regulatory frameworks do not become barriers to innovations, or prompt unnecessary levels of regulation to deal with unknowns.

While the hard institutional features of the ULDA and its supporting legislation may be hard to replicate or instigate in other jurisdictions, these softer governance features evident in the Fitzgibbon Chase case study are more transferable, and could be employed to overcome or remove the institutional blockages unique to other locations.

When looking closer at the structural institutional features of the Fitzgibbon case study, some key lessons and generalised conclusions may resonate with the circumstances and issues in other jurisdictions.

Key lessons regarding decentralised arrangements for implementing novel infrastructure included:

- *The need to think about the regulatory regime as a whole,* including all dimensions of construction, commissioning and system operation. The way in which water sources or products are defined within regulatory frameworks will have implications for the long-term operation, monitoring and reporting for a scheme. This may result in the imposition of a regulatory regime with requirements and risk assumptions that are excessive or inappropriate to the scheme, and make it unviable and unattractive to potential operators.

- *There are disincentives in current financial models and licencing requirements that hinder the pursuit of broad multi-benefit solutions.* Unfavourable economies of scale make small schemes (lot/estate scale) unattractive to operators of centralised schemes. In addition, if licence conditions are already met through centralised schemes, there is no incentive to invest in schemes that deliver additional services and benefits.

These results suggest that licence conditions for service providers need to include performance incentives for delivering more than simply safe and secure water supplies. Likewise, financial models are needed that can appropriately cost these additional benefits and services, and that, when linked to suitable licence conditions, can provide the required justification for service providers to invest in these schemes. The analysis also suggests a need to define a broader range of water sources and fit-for-purpose services within regulatory frameworks, and develop suitable regulatory regimes. Finding the right regulatory 'fit' requires collaboration, negotiation, and good will.

Key lessons for practice-policy connections included that:

- *The current connections between practice improvements and supportive policy change are generally tenuous and unresponsive.* However, a coordinating organisation with the right mix of industry capacity, policy authority, and collaborative culture, can deliver integrated urban design, services and infrastructure.

- *Finding a better balance between stability/reliability and responsiveness/innovation will require a significant shift in how the bureaucracy operates.* Flexible policy instruments/processes are available, other than major legislative change, but they lack sufficient authority to drive widespread uptake.

These results suggest that flexible policy instruments need to be strengthened with more authoritative weight, and be better informed by practice to be readily applicable. Also, a coordination/integration role with sufficient resources and authority can be a step toward making policy settings more cognisant and supportive of practice innovations.

Appendix A: Case study methods

Interviews were conducted mid 2014 with practitioners either directly involved in the Fitzgibbon Chase development, or with knowledge of the project through involvement in urban water/land use and development planning policy networks (n=9).

Secondary sources included a range of policy and legislative documents, consultancy reports, industry newsletters and websites, and published scholarly research. Discussion with other researchers who had conducted related research into the Fitzgibbon Chase development was also conducted to test assumptions and clarify details (n=3). In addition, researchers participated in a research and development workshop for the Fitzgibbon Chase development, attended by key state government policy officers, Queensland Urban Utilities staff, local engineering and economic consultants, Japanese engineering consultants, and other interested researchers. This workshop provided an opportunity to discuss some of the governance issues surrounding the development in a focus group-type format.

The NVivo software package was used to code interview transcripts and to identify and explore key concepts and themes in the data.

The data analysis approach drew on a coding framework derived from an initial literature review[24] that identified incentive mechanisms, capacity requirements and collaborative efforts as critical elements behind the resolution of governance challenges in the urban water sector. The coded results were then used to explore the themes of interest in the case study (governance of decentralised schemes and practice innovation-policy connections) and comment on the envisaged pathways for transitioning governance arrangements to better support WSC (policy innovation and policy integration), which were derived in the development of a conceptual framework for governance change[23].

The final case study report was provided to key interview participants and other industry partners for crosschecking of facts and comment on analysis results. The researchers would like to acknowledge the time and effort of these study participants.

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