

Achieving Sustainable Designs within Master Planned Communities

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ABSTRACT

Under rapid technological advancement within the urban development industry, fuelled by booming economic conditions, a fertile environment is flourishing for the uptake of sustainable development practices. However, this gives rise to the question: Then, why is there a considerable lag in the implementation of sustainable practices aimed at reducing greenhouse gas emissions and human waste? This paper expands on initial findings of localised research into the adoption of ecological sustainable development practices within the land development industry. Through this research and further investigation a number of issues are exposed; the lack of regulatory direction, training of industry players and a gradual shift in community values. This paper also investigates the wide gap between best intentions and actual built results, followed by insights into the dilemma of local government development applications constrained by regulation and associated levels of commitment to delivering a higher standard of sustainability within our built environment. To illustrate market trends toward sustainable development practices currently implemented two Greenfield Master Planned Communities being developed on the Gold Coast are discussed as examples.

INTRODUCTION

It is now widely recognised that the industrialised world is confronting significant challenges in responding to rapid climate change and resource depletion. As a result of post-industrial economic expansion, wealthy nations are presently in a period of unprecedented self-indulgence and rampant consumption. Environmental, social and economic behaviours of humans are carried out within networks of social behaviours, norms and values, which are, reinforced through our built environment and technology. In order to confront these challenges, both economic and social values are required to shift from former ways of operating. One path in the journey to combat climate change and resource depletion is the deviation of behaviour within the residential development and construction industries, where sustainable values are emerging associated with market viability.

In the past, social consciousness has assisted in regulating community values via institutions such as religious orders, setting the standards for values. In recent decades these belief systems have been redirected from traditional values that embraced broad community benefit, towards market values where individual private benefit is paramount. For example, the co-dependent business relationship between banks and excessive consumptions needs to be acquiescent with realistic expectations from the natural capital to support human co-habitation over time.

In the 1920's the rapid growth in urban expansion took full flight with the introduction of the bank guaranteed term mortgages. Business frameworks further promoted this relationship between land use and finance, where the financial tool became both the lubricant and a significant driver in the feasibility of working class home ownership. As the Australian standard of living increased and in combination with the introduction of the automobile, a massive expansion of residential development has occurred around urban centres. This relationship has become a building block of national economies of consumption - further encouraged by Australian Federal, State and Local policies. As the building construction industry in Australia accounts for over 14 per cent of Gross Domestic Product (Mead and Wales, 2004), financial institutions in conjunction with market trends dictate the variety of housing, the components within the structures and the surrounding communities.

Research Objectives

Within the building and development industry the response to environmental challenges has been slow with substantial short falls still impeding a sufficient response. Due to rapid population growth rates spawning unmitigated urban expansion in South East Queensland¹, the Collaborative Research Centre for Construction Innovation (CRC CI) in collaboration with CSIRO², conducted research to identify sustainable development practices currently implemented within the culture of industry processes and market demands. Through this investigation the short falls that impede the building and development industries were exposed. This paper expands on the findings of this research project, with reference to the development of Master Planned Communities taking place within Gold Coast City limits.

SUSTAINABLE DEVELOPMENT IN QUEENSLAND

Within Queensland there has been a surge in population migration to urban areas and increased demand in housing has dramatically intensified greenhouse gas emissions. In an effort to mitigate environmental impacts a handful of land developers have begun to incorporate sustainable development practices into their Master Planned Communities.

In recent years this has led to an increasing trend away from a conventional design approach to initiating major Greenfield project. New trends are aiming to deliver reduced environmental impacts, encourage social wellbeing and sponsor economic vitality. In correlation with this, an emerging market sector incorporating environmental ethics has galvanised a social awareness that is evolving into a new set of community values.

Early initiatives such as Local Agenda 21, assisted in prescribing actions to lead toward reductions in greenhouse gas emissions and promote greater social equity within a framework widely accepted across the globe. Within this higher mandate, sustainable development projects in South East Queensland have been on the rise. After discussing the research findings this paper will portray

¹ Although achieving sustainability in built environments is an issue nationally, the brief for this research project was confined to South East Queensland incorporating the Sunshine Coast, Gold Coast, Western Corridor and Greater Metropolitan Brisbane Area

² The CRC-CI is an Australian research, development and implementation centre, focused on the needs of the property, design, constructional and facility management sectors. It was established in 2001 and headquartered at the Queensland University of Technology as an unincorporated joint venture under the Australian Government's Cooperative Research Program

current examples of market trends within Master Planned Greenfield developments, such as Coomera Waters, and Jacobs Ridge that broach sustainability.

Achieving Sustainable Communities

In order to develop an understanding of the sustainable practices incorporating into developing larger Greenfield sites, it first became necessary to become familiarised with industry practices and attitudes. Therefore the research sought to investigate the developers' perceptions, experience and attitudes towards sustainability in urban design, specifically the design of Master Planned Communities.

In interviews with key respondents, it became apparent that there is a lack of comprehension regarding concepts of 'sustainability'. Repeatedly, interviews would evolve into a discussion of what sustainable principles could be appropriate to implement in Master Planned Communities. Many respondents indicated that incorporating sustainable principles were commonly perceived as 'too expensive' and 'having little market demand' (Mead and Wales, 2004).

Demand side economics dictate that a market is driven by the demand of its customers and their willingness to pay. The most significant bearing was placed on the concept that developable land is the relative short supply in key areas. In addition, challenges placed upon consumers include rapid increases in energy costs, accelerated depletion of water and activities that exacerbate global warming. As a reaction to this, the development industry is gradually responding to this growing market opportunity.

In contrast to unsustainable development practices, proactive developers are becoming alert to where the market is heading and are prepared to embrace this new environmental ethic. Practices are emerging such as sustainable sub-divisional design, environmentally responsive building construction, which is then promoted to clients as a feature in sales promotions. Some developers will also provide site analysis, which recommends residential environmental criteria suited to each specific site as illustrated in Jacobs Ridge Design Guidelines. Here, water tanks are also supplied as part of the 'package' in an effort to conserve resources (Stockland, June 2005).

In Queensland, development assessment is a function of a Town Planning Scheme established by the local regulatory body and legislated by the Integrated Planning Act (IPA). Although there is a legal conformity, regulatory mechanisms vary from one local jurisdiction to another where local governments have differing levels of sustainable initiatives.

Generally, Planning Schemes do not incorporate guidelines for innovative approaches to new types of sustainable development. In addition, planners are not trained to identify sustainable design issues or to address alternatives that may be based on international examples not commonly found in Australia. Key informant's spoke of receiving little leeway from regulatory bodies with 'no rule book to measure if what they are doing is good or bad' (Mead and Wales, 2004).

The cautious nature of regulatory bodies avoid some sustainable innovation, because the unfamiliarity of alternative development procedures. This means that when developers attempt to incorporate change, the current development approval structures are not supportive. One developer summed this up well with the statement; 'regulations do not keep up with motivation' (ibid). If local Planning Schemes are not responsive to developing trends of the market, they may hinder the uptake of sustainable planning applications.

Respondents also commented that local decision makers at the jurisdictional level are ill informed of sustainable development practices. This results in officials under pressure, making approvals for

decisions, which have long-term significance without regard to far reaching implications for future intergenerational equity. A relatively short term in office encourages short term gains.

It was clearly stated through out the interviews that it is imperative for professionals to collaborate, in order to achieve an integrated approach to sustainable communities. This is of particular importance in the introductory stages of a project where the specialities of various disciplines need to be applied in a team effort. Pre-lodgement meetings were identified as the most significant opportunity to identify clear objectives for a comprehensive sustainable approach to the design and implementation of new construction.

The pre-lodgement phase of a development project is highly significant in the manifestation of works. An emphasis of timely feedback into the expected outcomes was identified as an important opportunity for critical information to be shared. At this point in the pre negotiation phase, before a development application is lodged to a local government, project expectations can be discussed in depth.

This gives rise to the potential of establishing professional design review committees to facilitate innovative industry practices. To ensure a structured approach, the committee would hold a fiduciary responsibility to the wider community, whilst facilitating a balance between public good and economic viability.

MASTER PLANNED COMMUNITIES WITHIN GOLD COAST CITY LIMITS

The majority of key informants indicated varied degrees of commitment to sustainable development. Within the Gold Coast limits, rapid growth and unmitigated urban creep appears evident along the M1 corridor between Brisbane to Coolangatta. Although conventional construction practices are commonly implemented, the move to adopting alternative practices aimed at reducing human impact on the environment is growing indication of a commitment to sustainable development practices. Two recent developments, which illustrate this application, are the Master Planned Communities at Coomera Waters and Jacobs Creek.

Coomera Waters, located on the north shore of Coomera River, is a 370 hectare development surrounded by environmentally protected open-space. This setting has promoted a natural opportunity to capitalize on development design principles that encompass natural assets and promote environmental awareness. The urban design layout includes extensive walking trails and community parks, described as “dragon fly ponds” and “butterfly gardens”, with residential allotments been infused into remnant native woodlands identified as “nature pockets” (Coomera Waters, 2005b). It is anticipated that these features will develop into neighbourhood landmarks, instead of built features. Many of the residential building sites are visually depicted with a predominance of remnant bush land, touted as ‘the’ contributing factor that makes home sites exclusive. Also suggestive of this, the development has gone to the extent of providing an environmental interpretive centre, “where nature trails are leading to a wild wonderland at your doorstep” (ibid.).

Much of the urban design principles incorporated are using a water sensitive approach utilizing wide roadways, permeable swales and native landscaping along a generous circulation network. Although this development promotes exclusivity (neighbourhood entry security gates) the general theme is one of complementing indigenous landscapes as part of the marketing spin. “Coomera Waters is a community where lifestyle enjoyment comes naturally” (Austcorp, 2005a).

Jacobs Ridge, promoted as “contemporary country living” is a Stockland example of a 123 hectare land development project in the process of providing building lots for a projected population of

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3,500 (Stockland, June 2005). . This development seeks to reduce environmental degradation and has retained a high percentage of the original native bush land. The urban design layout is skilfully articulated with open swales instead of curb and channelling, nine community parks, hiking trails and bike paths. Guidelines specify that dwellings, encompassing all balconies, verandas, covered walkways and porches have the appearance of a single-family home with ancillary outbuildings. Additional design criteria include overland flow-paths for drainage, native landscaping, embankments, street-front fencing. Structural designs are approved through “Stockland Designer Lifestyle” in a similar fashion to approvals requirements from council and private certifiers.

The development offers natural gas as a primary domestic energy source and a complementary rainwater tank with each new home constructed. There is also a strong emphasis for prospective residences to follow strict Design Guidelines that stress careful placement of building footprints with envelopes that will ensure a cohesive aesthetic, while in accord with natural climatic and topographic features of individual building sites. Purchasers sign agreement to these stipulations, prior to purchasing land within the development.

In addition to Design Guidelines such as these, to reduce human impact on the environment, accurate measurement of natural capital and the rate of degradation need to be broadly standardised. All interview participants indicated that measuring progress in achieving sustainable outcomes was important. Participants questioned the uniformity of measurement approaches and the discrepancies of measurement methods. Overall, they expressed that the range of what was being measured was too narrow and no rating tool was site particular.

Current rating tools such as Building Energy Rating System (BERS) and Nationwide Housing Energy Rating Scheme (NatHERS) specifically rate energy efficiency in buildings (AGO 2000). Although this is a foundation for standardised measurements considerable work needs to be accomplished to achieve meaningful and significant measurements. Survey participants noted the need to develop a standardised measurement that would identify the environmental elements and their complex interactions. Some also indicated that a measuring tool would need to be site-specific to ensure robust environmental ratings of individual building sites.

Other participants, also mentioned that levels of complexities to be measured should involve the performance of sustainable suburbs over the life span of a development, including:

- the life cycle of the physical materials, and
- embodied energy from origin to expenditure.

These interviews gave an indication to the level of sophistication and concern that some developers had regarding environmental sustainability and the impact of Greenfield development.

Much of the key informant feedback supported the notion of incorporating an incentive program aimed at encouraging sustainable development practices and implementation. This was considered as a mechanism to encourage new approaches to subdivision methods, while promoting a broader acceptance of credibility in a ‘new’ form of doing business.

CONCLUSIONS

The supply of residential development in South East Queensland is becoming more sustainable and less demanding on natural capital. Although the momentum for the uptake of sustainability is not rapid, it is encompassing resource conservation. However, surely it is only a matter of time before momentum builds and sustainable practices become the standard. This research has emphasised the need for action to support further momentum. These include:

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- A necessity to disseminate information regarding sustainable design principles in order to boost the consumer's awareness.
- Effective tools that measure efficiency need to be site specific, across the whole of industry, and take into account factors such design according to in-depth site analysis, importance of building envelope placement and orientation, conservation of vegetation, and minimal impact construction principles.
- Professionals collaborate towards achieving sustainable outcomes.
- Any regulations that are introduced need to be across the board, to retain the competitive nature of the industry.
- There is a need for research to demonstrate that new and innovative models of sustainable development are more affordable than traditional models of development.
- There is a need for collaboration between local authorities, agencies, landowners and developers – to share a vision that is of benefit to all parties.
- The application of incentives to encourage sustainable practices, promote innovation and pilot new methods.

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