Introduction

The 8th International Urban Design Conference entitled ‘Empowering Change: Transformative Innovations and Projects’ was focused upon profiling and discussing inspirational changes in urban environments across Australia and internationally. For three days the conference brought together a range of designers, practitioners, academics and students from around the world to deliberate on a diversity of topics relevant to contemporary urban design and the challenges it faces leading into the future. Ten conference sub-themes (e.g. Health & Urban Design) provided the session structure for the various paper and poster submissions. Below is a listing of the double blind peer reviewed papers enclosed in this Conference Proceedings. Please note that the papers below are organised under the respective theme they were each submitted under.

**Balancing the Quick and Slow Formation of Cities**
‘Let’s make a prototype’: Exploring temporary urbanism in the form of transitional urban design schemes that can be tested prior to permanent implementation
Mr Dale Harrop, City of Perth, Perth & Dr Andreas Wesener, Lincoln University, New Zealand

**Big Data – Smart Cities – Technology**
Optimising uncertainties: A design-led investigation into the challenges of realising urban innovations in a data-driven environment
Miss Lee-Anne Khor, Monash University, Melbourne
**Higher Density Urbanism**
Achieving medium-high density in low scale development: The Queensland experience in innovative ‘fine-grained’ urbanism
Mr Malcolm Holz, Holzink, Maleny and Mr Michael Kane, Economic Development Queensland, Brisbane

**High Density Development: Community Attitude and Urban Planning Response**
Mr Matthew Ballard, Dr Sadasivam Karuppannan and Dr Alpana Sivam
School of Natural and Built Environments, University of South Australia, Adelaide

**Health & Urban Design**
A Research-based Model for the Design of Public Space in Beach Precincts
Dr Nigel Cartlidge, Transitions, People, Place and Activity, Gold Coast

Design for Ageing: The Role of the Urban Environment in our Ageing Experience
Ms Hannah Slater, Architectus and Queensland University of Technology, Brisbane

Improving the health of Australians by applying evidence from behavioural epidemiology to urban design projects
Dr. Beau B. Beza and Dr. Jenny Veitch, Deakin University, Geelong and Burwood
Mr Frank Hanson, Metropolitan Planning Authority, Melbourne

**International Cities**
Minha Casa, Minha Bicicleta (my house, my bicycle), Cycling As A Mobility Strategy for the Urban Poor In Brazil
Ms Irene Duckett, University of Melbourne, Parkville, and Ireneinc Planning and Urban Design

Use and Spatial Patterns of newly developed Public Squares in Urban Villages in Shenzhen
Professor Marc Aurel Schnabel, School of Architecture, Victoria University of Wellington, NZ; Professor Minh Nguyen-Ngoc, Victoria University of Wellington, NZ; Professor Diane Brand, National Institute of Creative Arts and Industries (NICAi), The University of Auckland, NZ, Prof Jules Moloney, School of Architecture and Built Environment, Deakin University, Melbourne

The future of the "City in the Garden"
Exploring high density and high quality urban liveable environments for Singapore
Asst. Professor Oscar Carracedo Garcia-Villalba, National University of Singapore, Singapore

**Technology that Changes how Cities Work**
Reassembling The City: Reinventing the Technologies of Demolition
Dr Peter Garth Armstrong, Faculty of Architecture Design and Planning, University of Sydney, Sydney

**Think Tank**
Post-Disaster Temporary Urbanism: An Analysis of the creation, use and benefits of transitional community-initiated open spaces in Christchurch, New Zealand
Dr Andreas Wesener, Lincoln University, Lincoln, NZ
Urban Design Practice
Designing cities with people: as an alternative to building cities for people
Associate Professor Rasmus Frisk, arki_lab, Danish Institute for Study Abroad, Denmark

Campus WU: A holistic history in Vienna
Ms Laura P. Spinadel, BUSarchitektur, Wien, Austria

Each of these papers reflects critical thought and insight into their respective topic(s) and a range of views can be found in each. The editors of these conference proceedings encourage you to read and distribute these works widely! Where you wish to make contact with a respective author we also encourage you to do so. An urban design dialogue is sought in the production of these works and we (including the authors of the papers) look forward to any debate.

Statement on Academic Peer Review

As editors of this Conference Proceedings, we wish to confirm that the academic papers contained herein and listed above have been subject to, and approved thereupon, an academic peer review process that involved a double-blind assessment or review of the research paper in its entirety before presentation by independent, academically-qualified experts.

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EMPOWERING CHANGE
TRANSFORMATIVE INNOVATIONS AND PROJECTS

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REASSEMBLING THE CITY:
Reinventing the Technologies of Demolition

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Paper Presented at the
8th International Urban Design Conference
Brisbane QLD, 16 – 18 November 2015
REASSEMBLING THE CITY: Reinventing the Technologies of Demolition

ABSTRACT:
This paper examines the genesis of contemporary Japanese demolition technologies in terms of pre-modern building techniques and cultural attitudes to property. The recent disappearance of two Tokyo landmarks has imperceptibly transformed familiar landscapes which have acted as points of orientation for half a century. Demolition is ever present in our cities As a new project is heralded, the demolition of existing buildings of the site has already begun, erasing the memories of earlier occupants and the civic memories of the broader community Economic pressure for the demolition of buildings which were once symbols of cultural and corporate grandeur has emerged as the principal determinant in the development process. Exponential change in interior environment has accelerated the processes of obsolescence.

While European concepts link building to site as a single financial entity, Tokyo is a disposable city where only the land is permanent and buildings are consumables. Japanese traditional construction systems are based on complex wood joints which provide strength and flexibility. The consequence of this system is that while buildings are assembled, they may also be dis-assembled, facilitating the process of demolition, portability, resale and re-use. A dismantled building could be removed with ease to another site with its structure, fabric, fixings and fittings. The corollary of this cultural attitude was that only the land was important, to be held intact and handed down from generation to generation. The buildings were expendable.

While these construction systems operated to facilitate flexibility and portability in the face of natural uncertainty, contemporary building systems for both construction and demolition are now reaching a similar level of sophistication. A high rise tower can be removed floor by floor, quietly and imperceptibly. The debris can be fully recycled. The transience of the towers as commercial property is predicated by land value, the economics and technologies of removal. Traditional carpentry methods are now revived in steel and concrete and familiar city centres will renew and transform to match constantly evolving demand. Once familiar urban spaces will imperceptibly transform into unrecognisable and challenging landscapes and new generations will require new navigation skills for the reassembled city.

Keywords: Japanese carpentry technology; high rise buildings; demolition; urban landscape
INTRODUCTION

Mark Twain’s aphorism on the unending development of New York\(^1\) remains a telling comment on the rapidity of change in the city in the twenty-first century. Tokyo has been burned and rebuilt from ashes twice in living memory\(^2\). Familiarity and impermanence co-exist as we make our way through our cities following spaces and landmarks which guide us from one known place to another. However, demolition is ever present in our cities. As the removal of one building follows another, erasing the memories of earlier occupants and the civic memories of the broader community, the familiar urban landscape becomes unfamiliar and distant. Contemporary economic pressure for the destruction of buildings which were once symbols of cultural and corporate grandeur has emerged as the principal determinant in the development processes of urban development. Change in expectations of interior working environments and office technologies have accelerated the processes of obsolescence. Exponential growth in the central areas has increased the bulk and height of building stock. In turn this has required greater efficiencies in the demolition process. Greater speed, re-cycling efficiency and decrease in environmental and economic impacts of demolition is the corollary of this change. Increased economies have reduced the cost component of demolition in the redevelopment process, enabling accelerating change of contemporary urban fabric and the loss of familiarity and legibility and the symbols and identity of the contemporary city. Recent Japanese technical developments in the demolition of high rise buildings have further ameliorated the negative impacts of demolition in dense urban areas so that familiar landmarks are quietly and quickly erased. This accelerating obsolescence and the replacement of visual symbols of identity continue to erode the citizen’s individual sense of identity in the urban environment\(^3\) creating a pervading anonymity in the common spaces of our cities.

TRADITIONAL DEMOLITION TECHNIQUES

The hammer and the wrecking ball have been the implements of demolition in times past, but have reduced in effectiveness as building technologies have evolved to meet the requirements and possibilities of height. Controlled implosion as in the demolition of Millbank Estate is possible only in locations where surrounding areas permit. Various methods have been employed to meet the demands of greater scale. These have generally demanded the scaffolding and enclosure of the building and the removal of the building floor by floor. Demolition begins from the top of the building and debris is removed to street level with rubble craned to the ground for disposal. Other methods include by lift, or by dropping of rubble down lift shafts or through a shaft created by the removal of a section of floor plate. These methods are not without environmental, safety, time and industrial problems as in the case of the demolition of the HCF Building in George St. Sydney\(^4\). Stricter controls on pedestrian and worker safety, dust, noise and the sustainability of the methods of debris disposal have required greater regulation and consequent cost in the removal of medium rose buildings from the post war period. As buildings with increased height reach obsolescence the cost of removal continues to rise. The generation of such

\(^1\) “It will be a great place when they finish it”

\(^2\) Since its establishment in 1590 Tokyo has been burned some nine times in total.

\(^3\) Bell and Tyrwhitt Human Identity in the Urban Environment.

\(^4\) To save time front end loaders were placed on the top floor and rubble dropped down a central shaft. Excessive load precipitated a collapse killing the drivers as they plunged to the ground floor.
buildings in Tokyo now exceed 100 meters, rising to 145 meters. The demolition of these structures has raised the requirement of decreasing the cost and environmental impact of demolition, particularly in the denser areas of central Tokyo.

JAPANESE CULTURAL ATTITUDES

The Japanese islands, by virtue of geographic accident are subject to geological disturbance which brings destruction by fire and flood to its dense urban areas. The earthquake and fire of 1923 saw the loss of the architectural tradition of the Meiji Period as the city was rebuilt under Goto Shinpei, the visionary mayor of the time. Much of city, and particularly the Low City were lost and insufficient supplies of building material and the practicalities of rebuilding led to the institution of the so-called Barrack Regulations. The lowered building standards of the reconstruction of the Low City led to the beginnings of Taisho modernity with its flattened surfaces and minimal embellishment which Bruno Taut so despised. Despite the efforts of Kon Wajiro and the Barrack Soshoku Company to dignify this new architecture, the built fabric of the city lacked the dignity of the old city, and reflected both changing architectural preferences and expediency. The vicissitudes and development processes of interwar Tokyo stand as a salutary reminder that demolition, however sophisticated does not necessarily result in urban outcomes for the public good.

In two decades this new city was again to be incinerated in the fire bombings of March 10th 1945. The ever changing fabric of the Low City was again removed to reveal the empty plain on which the city was built. It was again rebuilt largely on the lines of its Edo Period subdivision of deep sites with narrow frontages. As land values rose and building technologies developed after the war, the city rose in a unique way as a forest of buildings was built to maximum height within the limits of technology on these minimal sites. The post-war city created the unique phenomenon of high rise buildings built on the foot print of an Edo house within the limitation of a plan configuration of a lift, a stair and one room. The streetscapes of Ginza and Shinbashi and their myriad of small buildings reflect the concept of height as a product of the Japanese concept of building as commodity and land as asset. The process of site consolidation for larger building footprints and passing urban design goals was passed by in a city where instability of the very ground meant that the citizens held fast only to that which would still remain after each natural disaster. The concept of monument and identification with the European conception of building as opposed to the concept of historic space remains foreign in concept. Prior to 1868 in readiness for a major conflagration, important documents and objects were stored in a fireproofed storehouse or a portable chest which ensured survival of the family or business although the building was reduced to ashes. While European concepts link building to site as a single financial entity, Tokyo is a disposable city where only the land is permanent and buildings are consumables. The corollary of this cultural attitude was that only the land was important, to be held intact and handed down from generation to generation. The buildings were expendable.

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5 Sorenson p125-7


7 Sand p 143
TECHNICAL HERITAGE

Pre-modern technology in Edo period Japan had reached sophisticated levels in the eighteenth century. Construction methods and the manufacture of tools and joinery techniques facilitated the manufacture, construction, modification, restoration and removal of buildings as required. Japanese traditional construction systems are based on complex wood joints which provide strength and rigidity while maintaining a level of flexibility in earthquake resistance. The consequence of this system is that while buildings are assembled, they may also be dis-assembled, facilitating the process of demolition, portability, resale and re-use. A dismantled building could be removed with ease to another site with its structure, fabric, fixings and fittings. The joints interlock and use very little architectural ironmongery to meet structural and aesthetic requirements (Figure 1.)

![Eaves Support Connection Detail](image)

Figure 1 Eaves Support Connection Detail

The traditional technique of *kaitaishuri* continues in contemporary use in the restoration of wooden structures. The building is disassembled, repaired as necessary and reassembled. Prominent examples include the main hall of Toshodaiji, the Katsura Detached

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8 Morris-Suzuki 1994 p51

9 Engel, Coaldrake, Nishizawa
Palace and the Rinshunkaku of Sankeien. The latter was originally built for the Kii family in Wakayama Prefecture in 1649 and sold in 1764 to a Sakai merchant. In 1914 it was bought by Hara Sankei and moved to the Sankeien in Yokohama where it still stands. Maekawa Kunio’s 1941 house was discovered at his villa in Karuizawa and has been reassembled in an architectural museum in Tokyo. The technique has also been employed in stone by Nakagawa Takeshi in the Bayon of Angkor Thom.

While the system permits the Japanese building conservation system of taking apart a building for restoration purposes, it also permits the dismantling and removal of any structure, large or small. Wooden structures are also subject to wear and decay in normal use which leads to an attitude to buildings as consumable items, to be acquired, used and disposed of in the same way as a suit of clothes. The value of buildings could thus be considered as clothing, to be used and disposed of according to fashion and wear.

CONTEMPORARY TECHNICAL EXTENSION

Currently emerging technologies for the dismantling of high rise towers are demonstrably an extension of timber technology to other forms of construction. Conventional methods have been refined and developed to address the principal problems of sites in the congested areas of central Tokyo and its sub-centres. The major construction companies have developed separate methods, with all but Kajima Constructions beginning from the top of the building. Taisei Construction’s system, Ecological Reproduction System (Tecorep), covers the upper floors of the building with a sliding scaffold. Shimizu Constructions system, Reverse Construction (KC&D) is similar as is Obayashi-Gumi’s Cut Off system. Nishimatsu Construction’s system is interestingly named. Move Hat.

While these systems are effective, the departure point for the new technology developed by Kajima Constructions has been to invert the demolition process while reviving traditional carpentry methods in steel and concrete. Demolition begins at the base of the building. By the combined use of structural stabilisation and a system of jacks the building is sequentially removed floor by floor and lowered to allow work to commence on the next level. Demolished material is processed on site to allow a level of re-use in excess of ninety percent and removed without the need for vertical transportation. The high level of accessibility at street level resolves the complexities of traffic management and the distribution of pollutants to the surrounding air.

The complexities of stability during demolition are increased by the ever-present possibility of natural disaster. The shadow of the transient world of Edo is also the environment of earthquake, typhoon, fire and the imminent destruction of Tokyo, where impermanence as an urban state and Tokyo as a consumable city both environment and

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10 Detailed accounts of craftsmen in the last disassembly and reconstruction of the palace are recorded in Sasai 2001
11 Nihon Kenchiku Gakkai Ed. 1970 Nihon Kenchikushi Zushu Shokokusha Tokyo p113
12 Maekawa Kunio 1941 Edo-Tokyo Open Air Architectural Museum, Koganei
13早稲田大学アジア建築研究室 1999 アジアの歴史的建造物の設計方法に関する実測調査研究監修：中川武、編集・発行：早稲田大学アジア建築研究室
economic terms. So the stabilising structures required as the original structure is removed are required to withstand Richter scale quakes in excess of the now common level of 7. Integrity maintained by the use of temporary structural supports gathered at cores. While techniques vary from building to building depending on the original configuration of the plan and construction a number of famous landmarks in Tokyo have quietly disappeared. These include the twin towers of the Kajima Construction Company and the Akasaka Prince Hotel. These buildings were well known as iconic buildings of post war modernism in Japan. The permanent elements of the city continue to exist less as monuments and more as the open spaces of the natural systems of the city and the city’s cultural legacy.

The technical corollary of the new technology of demolition will soon become included into the extension of life cycle design to include demolition and removal as an initial design premise in the development of the structural and fabrication systems used in the new building. Thus cities will continue to be rebuilt in successive, shorter, economic waves.

THE LANDSCAPE CONSEQUENCES FOR THE JAPANESE CITY:

The development processes of Tokyo maintain this cultural inheritance in terms of impermanence where space rather than object becomes the familiar element of identification, and urban fabric is regarded as a consumable subject to destruction, modification removal: The Forecourt to the Imperial Palace in Tokyo is a wide landscaped public park which provides a forecourt of fitting scale to the nation’s most important building. It separate s the palace from the dense commercial buildings of Marunouchi on the east side of the original moat of Edo Castle. However, until 1868 it was covered by the dense development of the Edo mansions of the country’s senior feudal lords who were responsible for the governance of the country. The families of this feudal nobility were required to live permanently in the capital to ensure loyalty to the Tokugawa Government. Instituted by Toyotomi Hideyoshi in Osaka, the system of required residence in the capital by the families of domain lords was developed by the Tokugawa government to a finely honed means of political control. The maintenance of three separate households in a socially competitive environment placed a heavy financial load on each domain while providing alternative places of residence in the event of the loss of one or more in the case of a conflagration. In 1868 the system was ended with the disenfranchisement of the samurai class and the wholesale evacuation of the High City as samurai returned to their domains to look for alternative means of earning a living. The dense clusters of samurai residences around the entrances to the castle can be seen in maps from the Keio Period. Following the establishment of the Meiji Government the great residences were dismantled and disposed of by sale and re-use, leaving the broad spaces of the forecourt to the Imperial Palace covered then, as now, with pristine white gravel.

The dense fabric of the Low City continued to survive in its Edo period form despite the loss of it economic base. Buildings reached the maximum possible height on very small plots of land. In comparison to Japanese concepts of property and assets, European derived concepts inextricably linked building to site as a single financial entity. These attitudes to property included both the land and structure in the value ascribed, while the cost of the land is regarded as of lesser value. In terms of this value system, Edo was a disposable city where buildings were consumer goods. Building was regarded as a commodity to be used and disposed of as necessary. The techniques of construction simultaneously facilitated the process of demolition, portability, resale and re-use. This readily permitted redevelopment on the same site: In the same way, as post-war Tokyo grew higher with site aggregation, the major sub-centres were still built to site boundaries. However this confident new world of post-war modernity came to a halt with the oil shocks and currency changes of the seventies with the bubble economy of the nineties. The increasingly fragile architecture began to reveal
the transience of the towers as commercial property. The new sub-centres and their glittering new towers were the disposable fabric of the city of the citizens.

**URBAN IMPACT ABROAD**

The export of Japanese technology and the impact on urban space as a result of increased ease of demolition will impact substantially on the form and internal spatial character of our capital cities. The increasing commodification of building stock in our CBD areas will have the unintended consequence of reducing the life cycle of a building as the costs and dislocations of demolition become a decreasing component of the financial feasibility of redevelopment. Economic utility will become the determining factor in the evaluation of each new development. In this context of accelerating change; the transition time for a building of architectural quality and social value to be recognised and deemed worth of preservation is reducing, to be replaced by the use of economic utility in any evaluation of architectural quality. In the public domain a further consequence will be the requirement of a massive exchange of commercial benefit for very limited retention of buildings of distinction particularly those in public ownership. Buildings in the public domain remain most vulnerable, as in the demolition of the State Office Block and its replacement by Aurora Place.

At the urban level, accelerating reduction in building life cycle will have the consequence of a constantly changing urban landscape in central areas and the loss of identifying monuments and streetscapes. Local authorities will struggle with approval processes subject to legislative simplification and inadequate resources. The loss of traditional methods of professional consensus in townscape evaluation and administration by local authorities has already created a pressing need for a more objective and verifiable methodology for the evaluation of townscape to replace the traditional value judgements of poorly composed committees.

Australian cities are not excepted from the accelerating standards required of all types of development. Sydney remains the first choice of incoming migrants. Despite the relentless pressure on the housing market, Sydney retains its place among the world’s cities with the most desirable living environment. However it is the visually prominent commercial development which forms the urban structure and interstitial spaces which are used by workers at the economic heart of our cities.

Obsolescence occurs at multiple levels, not least in terms of the expected rental returns generated by increasing site value. The contemporary problem of climate change and rising standards of carbon output extends to the inadequacy of aging building stock in terms of increasing environmental performance standards. Greater sophistication of mechanical systems and environmental services with higher standards and lower costs is rated and becomes a factor in locational choice leading to the economic obsolescence of older building stock. The requirement of major financial houses for uninterrupted data services has required radical change to electrical systems but also to the physical space requirements for enclosure, distribution and security. This contemporary demand for exponential performance standards is accompanied by the deterioration of the exterior and interior fabric of high rise buildings, particularly in the critical areas of lobbies, lifts and wet areas, while scaffolding is a

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15 André Sorensen 2004 The Making of Urban Japan Cities and Planning from Edo to the Twenty First Century Routledge

permanent feature of once pristine buildings now requiring the expensive repair of concrete cancer and deteriorating sealants. Obsolescence of housing relates directly to occupation rates which at the upper market levels are impacted by real estate fashion, access, location and rental returns. At the lower levels of social housing occupation rates here affect outcomes. Issues of poor living conditions, standards and safety in the public domain have combined to reduce the social utility of major developments to a point where demolition has been the only available course of action.

While traditional Japanese construction systems operated to facilitate flexibility and portability in the face of uncertainty, contemporary high rise building systems for both construction and demolition are now reaching a similar level of sophistication. The Japanese construction industry has responded to the transitory character of urban commercial development by building to facilitate both construction and demolition. The development of demolition techniques which allow the process of change to proceed without impact on the daily life of the city is tried and effective. The implosion techniques used for half a century have been replaced by dismantling methods so that a high rise tower can be removed floor by floor, quietly and imperceptibly. A familiar monument disappears unnoticed and un lamented to be replaced with new anonymous towers. The social cost of the new high rise building, its spatial distribution and the external cost to the community are quietly amortised. The transience of the towers as commercial property is predicated by land value, the economics and technologies of removal. As the commercial sub-centres continue to reach increasing levels of density, the towers themselves change in accordance with the time honoured traditions of the lower city. As economic utility declines, the towers will be dismantled and removed and replaced with buildings which meet the technical and economic requirements of the next generation. Traditional carpentry methods are now revived in steel and concrete and familiar city centres will renew and transform to match constantly evolving demand. Once familiar urban spaces will imperceptibly transform into unrecognisable and challenging landscapes and new generations will require new navigation skills for the reassembled city.
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Improving the health of Australians by applying evidence from behavioural epidemiology to urban design projects

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Improving the health of Australians by applying evidence from behavioural epidemiology to urban design projects
Abstract
Rapid urban population growth in Australia requires an expansion of supporting hard and soft infrastructure. In the State of Victoria, directing this growth are a number of urban design and planning mechanisms that provide a ‘blueprint for development and investment’. Although topics revolving around physical health are present in these and other planning related documents, largely absent from this literature are ‘tools’ to assist decision makers in determining whether or not an urban setting supports physical health and provides opportunities for physical activity. Insufficient physical activity is a risk factor contributing to Australia’s growing and significant burden of chronic disease including cardiovascular disease, Type 2 diabetes and overweight/obesity. The potential of the built environment to influence population-level physical activity is well recognised. A key element in Victoria’s planning framework that can help address these health concerns is the provision and redevelopment of open space(s) in urban areas that provide opportunities for people of all ages and abilities to engage in physical activity. However, in the realisation of these settings, evidence informing the design of urban open space(s) that promote opportunities for physical activity is needed to produce evidence based decision making. Using the three geo-spatial visioning layers embedded in Victoria’s planning framework (i.e. Growth Area Framework Plans, Precinct Structure Plans and Planning Permits) as positioning instruments, this paper merges the fields of behavioural epidemiology and urban design to: i) provide a brief overview of current research relating to design of open space to optimise usage and physical activity, ii) consider what type of evidence relating to features of open space is needed to help inform decision makers, iii) consider the methods and procedures practitioners may use to incorporate evidence in to their planning, and iv) discuss the geo-spatial development level that the respective data can best assist decision making to achieve positive gains in physical health.

Keywords
Physical Activity, Behavioural Epidemiology, Urban Growth, Urban Development, Urban Design, Parks

Introduction
Population growth and planning framework
In March, 2015 Victoria recorded the highest population growth rate in Australia (Australian Bureau of Statistics, 2015) with growth surpassing New South Wales, Queensland and Western Australia, which in past years have had stronger acknowledged growth rates by the Australian Bureau of Statistics (ABS)(ABS, 2013a, 2015). Where growth has been recorded throughout the country it has primarily occurred in outer suburban areas, inner cities, infill areas and along the coast (ABS, 2013a). Growth in Melbourne, Victoria has followed these trends with the largest growth recorded in the city’s greenfield areas and in particular, its western suburbs. The ABS (2013a) also reported that the inner-city area of Melbourne and Southbank precinct had some of the largest population increases in the country, with the greatest population densities occurring in inner-city Melbourne and Carlton (10,100 and 8,400 people per Km², respectively).
These strong growth rates have resulted in the State of Victoria directing growth into greenfields growth corridors, inner urban renewal areas, national employment clusters (NEICs) and urban renewal areas to “provide a framework to guide the planning of new communities” (GCP, 2011, p. 5). Both Plan Melbourne and Plan Melbourne Refresh (2015a) note that "to accommodate growth, around 1.6 million dwellings will be required across the metropolitan region by 2051". The concept of the "20 minute neighbourhood" (illustrated in Figure 1) across each growth area is manifest in Plan Melbourne. “The ability to meet your everyday (non-work) needs locally, primarily within a 20-minute walk. This may include facilities such as schools, shops, meeting places, open space, cafés, doctors, childcare and access to public transport” (Plan Melbourne Refresh, 2015a, p. 22).

![Figure 1: Proposed example 20-minute neighbourhood (1-1.5 kilometres). Source: Plan Melbourne Refresh (2015b, p. 22)](image)

The ‘framework’ used to guide the planning of new communities becomes progressively more detailed and prescriptive as it moves from one geo-spatial level to another, that being: i) Growth Area Framework Plan (GAFP) (planning for 100,000-400,000 people); Precinct Structure Plan (PSP) (accommodating 7,000-30,000 people); and iii) Planning permit/subdivision (PP/S) (500-5,000 people). The latter level provides the ‘precise detail for
laying out streets and housing lots and for developing a site’ (PSPG, 2009a, p. 4). Figure 2 presents an illustration of this framework. In essence, documents such as these provide a ‘blueprint for development and investment that will occur over many years’ (PSPG, 2009a, p. 2).

Figure 2: Illustration of the geo-spatial planning framework levels. Source: GCP (2011, p. 8)

*Designing built environments that support healthy lifestyles*

The physical ‘visioning’ of growth within these documents and other urban planning related literature provide ‘practical tools, case studies and guidelines to encourage built environments that provide opportunities for physical activity and other health related activities […] to raise awareness of the relationship between physical activity and the built environment’ (Plan Melbourne, 2014, p. 116). Victoria’s legislative framework also ensures developers provide the recommended supply of open space for residents within urban areas and that open space is in within comfortable walking and cycling distances and/or public transportation use from residents’ homes (see Clauses 56.04-1, 56.05-02, 56.06-2, 56.06-3). For example, the Metropolitan Planning Authority (PSPG, 2009b), through its greenfield Precinct Structure Planning Guidelines mandates that at least 95% of all residences in new growth areas in Melbourne should be located within 400 metres safe walking distance of public open space, co-sharing of recreational facilities with schools is encouraged, shared walking and bicycle
networks should be included in the cross sections of local access, and connector and arterial roads and open space networks are encouraged along watercourses and other natural features.

To encourage walking and cycling and reduce dependence on motorised transport in growth areas, gridded suburban layouts with high levels of street connectivity and Town Centres located at regular spacings are additional features of all PSP areas.

The National Employment and Innovation Clusters (NEIC) (major precincts around universities, biomedical and other major employers) and Urban Renewal (generally within established suburbs and brownfields) areas are also planned settings within PSPs that are intended to encourage adoption of these features where possible. Precinct Structure Planning Guidelines have been developed for Greenfields areas and are under development for NEIC and Urban Renewal areas.

As greenfield areas are developed over time, with the rollout of facilities based on population or demand triggers, the establishment of neighbourhood built environments that support ‘healthy lifestyles’ can be a challenge. There are a range of triggers beyond pure demand including the requirements of development contribution plans, Local Government cash flow requirements and others which add to the challenge of delivery. In addition to this, the retrofitting of existing established suburban areas, particularly the car based post war suburbs may prove even more problematic. Planning alone cannot deliver healthier urban design outcomes but it can greatly assist by helping set up the framework for delivery.

Organisations like the National Heart Foundation of Australia have enlisted the support of statutory planners in councils referring to them as the ‘gatekeepers to the development of our urban environment’ (Heart Foundation, 2013, p. 2) and have encouraged planners ‘to use whatever power of discretion they may have to influence or enforce applicants and developers to apply healthy urban design principles’ (p. 3). In one sense this is very much a ‘stick,’ rather than a ‘carrot’, approach to creating urban open spaces that encourage physical activity and improve public health.

Evidence-based approach to informing public open space design

Given that much of our provision of public open space and supporting infrastructure is a result of a generally highly collaborative public-private partnership between state, local government, non-government organisations and the private development sector, it is essential that an ‘evidence based’ approach to the design and siting of facilities is undertaken where possible. This type of approach ensures that the stakeholders; the community at large and the
shareholders of private developers achieve an appropriate return on their investment in terms of community well-being, monetary returns and corporate good will.

It is also necessary for evidence to inform design and then to review the evidence based designs before implementation, following completion, and monitoring them over time. An approach such as this contributes to the establishment of a base of comparison to determine, in essence, what works and what does not work in delivering urban open space that maximises opportunities for physical activity and other health related outcomes.

An important partner to help provide evidence to inform the design of new developments and/or renewal of urban settings that promote physical activity and other health outcomes are researchers such as Behavioural Epidemiologists; which, in the context of this paper, is framed as a researcher who examines the role of urban open space(s) and the opportunities they provide for people across their lifespan to engage in physical activity and other health related behaviours. (In this research Dr. Veitch is a behavioural epidemiologist at Deakiin University and provides the health related narrative in this work.) The aim of this paper is, therefore, to apply the interdisciplinary roles of architecture, landscape architect, urban planning and behavioural epidemiology to the design of public open spaces to:

i) provide a brief overview of current research relating to the design of open space to optimise usage and physical activity;

ii) consider what type of evidence relating to features of open space is needed to help inform decision makers;

iii) consider the methods and procedures practitioners may use to incorporate evidence in to their planning and

iv) discuss the geo-spatial development level that the respective data can best assist decision making to achieve positive gains in physical health.

**Approach to the paper**

Urban design and planning material related to the provision and use of open space in urban settings was identified and collected. Identifying and collecting the urban design and planning material consisted of reviewing planning authority web sites (e.g. Metropolitan Planning Authority, DELWP-Planning Schemes Online) to glean subject matter and university library data bases. This approach resulted in an extensive amount of material and by refining the search process to include a focus on Victoria and growth a manageable
amount of 10 documents/statistical figures were identified for use in this work. Material related to physical health and open spaces/parks was provided by the team’s behavioural epidemiologist; where she drew from her numerous research projects and experience in this field to provide comments for use in this study.

From these documents and statistics commentary addressing the aims of this paper was developed. This commentary follows the aesthetic model and expert based judgement approaches described by Daniel and Vining (1983) and Taylor, Zube and Sell (1987).

**Importance of physical activity and urban open space**

Low levels of physical activity and increased time spent in sedentary behaviours are major public health concerns. Adverse effects of physical inactivity and sedentary behaviour include overweight and obesity, as well as chronic diseases such as type 2 diabetes, cardiovascular disease, and some cancers (Lee et al., 2012). Physical inactivity contributes to almost one-quarter of the burden of cardiovascular disease in Australia (24%) (Begg et al., 2008) and is the second greatest contributor, behind tobacco smoking, to the cancer burden in Australia (World Health Organisation, 2009). Television viewing time is the predominant leisure-time sedentary behaviour and has been shown to be independently associated with increased cardio-metabolic risk and all-cause mortality (Dunstan et al., 2010). These issues are problematic worldwide (World Health Organisation, 2015), but especially so in developed nations, including Australia and the United States (US) (Finucane et al., 2011; Owen et al., 2010).

Although, Australians may consider themselves an active nation, it may be more accurate to describe ourselves as a nation of ‘couch dwellers’. For example, eight in 10 Australian children do not meet national guidelines of 60 minutes of physical activity per day, and eight in 10 children exceed screen-time guidelines of two hours per day (Active Healthy Kids Australia, 2014). More than a third (36%) of Australians aged 15 and over do very little or no exercise at all. Since 2001, the proportion and number of Australians doing very little or no exercise has continued to increase (ABS, 2013b). In order to encourage Australians to move more and sit less, physical activity guidelines were updated in February 2014 for specific age groups (www.health.gov.au):

For example, the recommendations for children aged 5-12 years are:
- To accumulate at least 60 mins of moderate- to vigorous-intensity physical activity (MVPA) every day;
- Children’s physical activity should include a variety of aerobic activities, including some vigorous intensity activity;
- On at least three days children should engage in activities that strengthen muscle and bone;
- To achieve additional health benefits, children should engage in more activity – up to several hours per day; and
- Limit the use of electronic media for entertainment to no more than 2 hrs per day and break up long periods of sitting as much as possible.

The recommendations for adults 18-64 years are:
- Be active on most or preferably all days every week;
- Accumulate 150-300 mins MVPA or 75-150 mins vigorous intensity physical activity (VPA) each week;
- Do muscle strengthening activities on at least 2 days each week; and
- Minimise the amount of time spent in prolonged sitting and break up long periods of sitting as often as possible.

Population-level solutions to addressing physical inactivity, sedentary behaviour, and overweight/obesity include an increasing focus on the neighbourhood built environment, such as urban design and access to parks and recreation facilities (Mackenbach et al., 2014; Owen et al., 2014; Sallis et al., 2012). As highlighted in the National Heart Foundation of Australia’s (NHFA) Blueprint for an Active Australia released in 2014 (see Giles-Corti et al., 2014), to increase physical activity it is necessary to create built environments that support active living. Reshaping the built environments in which most Australians live, work, learn and recreate is acknowledged to significantly increase daily physical activity levels. To help achieve this, the Blueprint recommends to implement policies that create neighbourhoods that support active living. In relation to public open spaces specifically, the recommendation is to ‘develop open-space policies, standards and planning codes that ensure residents have access to a range of open spaces for both active and passive recreation within walking distance, accessible by pedestrian-friendly route’ and to ‘provide access to a hierarchy of high-quality public open spaces suitable for multiple user groups across the life course; designed to
enhance safety and provide amenities to meet the needs of different user groups’ (pp. 16 & 17).

As the introduction highlights, urban population growth and infrastructure in Australia is expanding rapidly. There is an urgent need for evidence to inform the development of public open spaces and policy and practice that supports engagement in physical activity within growth, retrofit and infrastructure planning. Scientific ‘evidence’ when applied to the design of built features ultimately gives weight to decision makers on the location and funding of new facilities, if over time, evidence can suggest short and long term benefits to a communities’ overall health and well-being. Unfortunately, evidence of this nature is one of the less tangible elements designers and decision makers make use, or have access to when deciding upon funding in an era of fiscal challenges and responsibilities. The following sections focus on a discussion of open space and parks to provide commentary on aims ii and iii of this paper.

Open Space and Parks

Public open space and parks are key features of the built environment that support people of all ages, abilities and from different socio-economic status areas to freely engage in physical activity (Cohen et al., 2007; Kaczynski and Henderson, 2007; Lachowycz and Jones, 2011; Suau et al., 2012). Parks may encourage physical activity in two ways: as a destination to which people walk or cycle (i.e. active transport) and as a setting in which physical activity can take place. Both of these ‘opportunities’ for physical activity may make substantial contributions to overall physical activity levels and therefore benefit public health.

There is evidence of inequalities in the built environment, with previous research demonstrating that parks in low socio-economic status (SES) areas have fewer amenities and features likely to promote physical activity among children than parks in higher SES areas (Crawford et al., 2008). Improving parks may also be particularly advantageous for increasing physical activity levels and social connectedness among disadvantaged populations where residents are at an increased risk of inactivity and associated poor health (Ball and Crawford, 2006; Pearce and Maddison, 2011).

A study among adults living in a low socio-economic status area of Victoria showed that each additional park visit per week was associated with 23% greater likelihood of being in
the high category for transportation physical activity (i.e. walking and cycling to go from place to place), 26% greater likelihood of engaging in high amounts of leisure-time walking, 11% greater likelihood of engaging in moderate- vigorous-intensity physical activity, and 40% greater likelihood of high total physical activity (Veitch et al., 2013).

Research shows that park availability, proximity and access are associated with higher overall levels of physical activity (Kaczynski and Henderson, 2007) and spending time in parks can be restorative and beneficial to mental health (Hansen-Ketchum and Halpenny, 2011). There is also evidence that physical activity undertaken in parks or green-spaces may have greater psychological and physiological benefits than physical activity in other settings (Mitchell et al., 2009; Pretty et al., 2005).

Despite the significant potential for parks to promote physical activity, parks are generally underutilized (Cohen et al., 2012), and efforts to increase use could potentially augment current physical activity levels. However, observational studies of park use in the USA have shown that more than half of park users engaged in sedentary behaviour (primarily sitting) during their park visit (Cohen et al., 2007; Floyd et al., 2008). Further, a recent observational study in two large metropolitan parks in Australia showed that most park visitors (62%) were engaged in sedentary pursuits such as lying, sitting or standing, with only 29% observed engaging in moderate-intensity and 9% in vigorous-intensity physical activity. Park use differed by time of day, sex, age group, and neighbourhood socio-economic status (Veitch et al., 2015). These studies showed that a large percentage of park visitors engage in low levels of physical activity. It is therefore important to better understand what features/facilities may encourage park users to engage in physical activity while they are in the park. The provision of parks without consideration of features/design may be insufficient to increase already low community-wide physical activity levels.

A number of studies have found park quality and park-specific features to be a major factor associated with achieving recommended levels of activity (Giles-Corti et al., 2005a; Kaczynski et al., 2008; Schipperijn et al., 2013; Sugiyama et al., 2010). The following studies provide an example of this evidence. An Australian study among adults found that a wider range of activities, including sedentary behaviours such as picnics and sitting, took place in more attractive parks (e.g. attractiveness score based on nine attributes including shade along paths, lawns irrigated, water features, walking paths, sporting facilities, quiet surrounding
roads, adjacent to ocean/river, birdlife present, lightning present) (Giles-Corti et al., 2005a). While this may benefit mental health, without active transportation to the park, it will have little impact on physical activity and thus risk of chronic disease. Hence, simply providing attractive parks may not be enough to increase community-wide physical activity levels. However, using the same attractiveness score Sugiyama and colleagues found that Australian adults with larger attractive open spaces within 1.6km of their home were more likely to walk 150 minutes or more in a week (Sugiyama et al., 2010). This emphasises the importance of achieving high levels of connectivity between residences and open space along with open spaces to one another within the overall hierarchy of park and open space settings.

In addition, a study among adults in Denmark found that physical activity in parks was associated with parks containing the following features: a walking and/or cycling route, a wooded area, a water feature (e.g., lake, stream), lights along (some) trails, a pleasant view to the outside of the park, a bike rack, and car parking (Schipperijn et al., 2013). In the United States, a study among adults showed that parks that were used for physical activity had a mean area of 22.34 hectares, a mean of 12.43 features, and were, on average, located 955 m from participants' homes. Parks that were not used for physical activity were smaller (mean 0.83 hectares), had fewer features (6.74) and were located further from participants' homes. Parks with a paved trail were almost 26 times as likely to be used for physical activity as were parks without a paved trail (Kaczynski et al., 2008).

It is vital to provide safe, well surveyed and pleasant walking and cycling routes to and from open spaces to encourage active non-motorised transport to access them. This principle is embedded in the PSP process but must be carefully monitored through the permit process (i.e. site specific scale) to ensure that such routes are included. A neighbourhood where relatively young children are free to travel even 400 meters to open space unaccompanied by an adult would surely be the ultimate measure of success. However, previous research has shown that a major barrier to young people visiting parks is their inability to visit parks unaccompanied by an adult. This inability to access parks can also be due to inappropriate motorised transport infrastructure (see Mees, 2010; Stone and Beza, 2014) that unintentionally prevents young people from accessing park and open space facilities. Additionally, a study among Australian youth aged (8-16 years) showed that of those who reported visiting parks, 87% travelled to the park they usually visited using active transport: 57% walked, 22% cycled, and 8% used a scooter/skateboard. Just 15% and 13% of youth
regularly walked or cycled alone to parks/playgrounds respectively, and 25% and 19% regularly walked or cycled with friends or siblings (no adults) respectively. For the 84% who reported having parks/playgrounds within walking distance from home, those who regularly walked alone to parks and regularly walked or cycled with friends to parks, were significantly more likely to visit a park at least once per week, compared to others. This study showed that active transport is frequently used by this sample of young people to travel to parks. Findings also highlight the potential importance of providing opportunities for youth aged 8–16 years to visit local parks independent of an adult. (Veitch et al., 2014).

The impact of park refurbishment on park usage and park-based physical activity
One way to obtain evidence on the impact of redesigning an urban setting is to conduct natural experiments which enable researchers to evaluate the effectiveness of ‘real-world’ interventions that have not been manipulated by the researcher. Natural experiments have been identified as a priority for investigating causal associations between the built environment and physical activity (Sallis et al., 2009). A recent review showed promising evidence to support the use of programs and physical changes to the built environment for increasing park use and park-based physical activity (see Hunter et al., 2015).

A natural experiment that investigated the impact of the refurbishment of a park in Victoria, Australia on its usage and park-based physical activity, showed that modest improvements to park features and facilities can result in significant increases in park usage (Veitch et al., 2012). For example, the refurbishment of a small neighbourhood park that included the installation of a modest playground, walking track, off-leash dog area, and landscaping resulted in a 419% increase in park visitation after the refurbishment. This percentage represents park visitors, observed in a set period, increasing from 235 prior to the refurbishment to 985 following the refurbishment (i.e. 12 months later during the study’s post installation observation period). Significant increases were also observed in the number of park visitors walking and engaging in vigorous activity over the same time period. (Veitch et al., 2012).

Another natural experiment is currently being conducted in a large metropolitan park, which is in a low socio-economic status area of Victoria, Australia. The results of this study will be important for informing future park design (Veitch et al., 2014) and investment. Unfortunately, the research in this field is limited and further natural experiments that
examine the impact of park refurbishment on park usage and park-based physical activity in parks of different sizes and in different neighbourhoods are required. Studies of this nature will help designers, decision makers, etc. to better understand whether park improvements increase overall park usage, park-based physical activity and active travel to and from the park and to identify which specific aspects of the park refurbishment attracts park visitors and encourages park users to be more active.

**Discussion/Conclusion**

Public open spaces receive significant investment for development and renewal, particularly from local authorities and developers. It is also strongly prescribed in planning and design legislation, at a range of geospatial levels (e.g. GAFP), to accommodate population growth and their health in the State of Victoria. Therefore, it is an economic and legislative imperative that these open spaces are designed to maximise usage and provide opportunities for people of all ages to engage in physical activity and connect socially with family and friends.

The evidence needed and how it can inform design is essentially generated and collected by multidisciplinary teams working together to address clearly intended outcomes prescribed by the planning legislation and visioning. Hence, ‘evidence’ in Victoria needs to support these legislative requirements at four geo-spatial levels: 1) The State’s visioning (i.e. Plan Melbourne); 2) Growth Area Framework Plan(s); 3) Precinct Structure Plan(s); and 4) Planning permit/subdivision(s). It is important to note that Plan Melbourne is a statutory visioning document; it includes elements which are to be implemented at the various levels of intervention provided by the GAFP – PP/S process. The following text uses the ‘layout’ and provision of infrastructure related to parks and open space found at these latter three planning levels to structure this discussion.

The starting point for the built environment to provide opportunities for active recreation, both structured and unstructured, is to collect and provide evidence that supports the non-motorised movement of populations at the GAFP level. Please note that at this level only major park and open space systems are depicted. Hence, an individual park and/or open space element must be regarded as a destination which people can walk and/or cycle to (see Veitch et al., 2013, 2014) and that a transport framework for non-motorised activities supporting access to these built features (see Kaczynski and Henderson, 2007) is provided for the
population. At the PSP level this framework translates into a finely interconnected network that provides ‘nodes’ or transfer opportunities for young people and adults to access other park/open space destinations. Mees (2010) (or Stone and Beza (2014) and his development of the network effect provides a conceptual structure for establishing transport related interconnectivity.

Additionally, at the PSP level Kaczynski et al. (2008) suggest the mean area of a park setting and its proximity to one’s home influences use and physical activity, combined with attractiveness or quality of park settings and the individual features of parks. At the PP/S (i.e. Permit) level this is where evidence describing the ‘attractiveness and features’ of park settings is best applied. Authors such as Giles-Corti et al., (2005a), Schipperijn et al. (2013), Sugiyama et al. (2010), and Veitch et al. (2012, 2013) provide evidence that can be used to help with decision making related to park design. Some of the more recent PSPs provide guidance on the type of open space, and the diversity/key features to be provided via an open space table. This is intended to guide assessment of planning permit applications and landscape plans.

Evidence to support decision making related to the design and development of park and open space settings, may be obtained from natural experiments. Veitch et al. (2012, 2014) provides examples from natural experiments and how they can provide evidence on the impact of park refurbishment on park usage and park-based physical activity and this evidence may be used to help inform designers’ redevelopments. Importantly, these examples illustrate the benefit of potential partnering with an affiliated consultant to achieve positive gains, through design of the built environment for increasing physical activity and reducing sedentary behaviour. However, a major challenge is knowing how to most effectively use this evidence, and other relevant local and international evidence, to inform policy and design, for example, of neighbourhood public open spaces to optimise park usage and physical activity. The research and evidence needs to be relevant and feasible for stakeholders (for use at a respective geo-spatial level). It is also essential to understand the needs of policy makers and planners responsible for public open space design and the different ways evidence is used or refuted by policy and decision makers (Giles-Corti et al., 2015). Research is needed to identify potential strategies and possible scenarios for incorporating evidence in policy, planning and design of public open spaces and to explore the feasibility and potential barriers of the identified strategies.
Lastly, design and decision makers must also recognise that new developments whether urban renewal or greenfield take time to establish and mature. Not all planned infrastructures such as open space and park facilities will be available when the first residents move in, so establishing healthy habits with temporary or interim measures may be required in urban fringe locations, NEICs, Urban Renewal Areas and in the refreshment of established areas. As Melbourne embraces the notion of the ‘20 minute city’ its interpretation and meaning in each of these growth areas will require different responses. This embracing will be especially important in the provision of public open space which promotes and enhances health outcomes for future residents. An evidence based approach to the design and siting of new features will assist planners in delivering these new facilities with greater certainty.

References


The future of the "City in the Garden"
Exploring high density and high quality urban liveable environments for Singapore

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ABSTRACT:
Singapore is renowned for its very successful urban model of a 'City in a Garden' with high-density development, efficient transport system, innovative housing policies and liveable environment. During the last 50 years this model has worked efficiently giving rise to one of the most thriving economies in the world. However, Singapore is facing new challenges towards an environmental sustainable, more social and liveable development. This paper examines the physical and spatial conditions of the existing urban model, and assesses critically the system through the quantitative data obtained. Based on the Ecological Urbanism methodology and indicators (S. Rueda), the article presents the preliminary findings and conclusions on the performance of the Singapore neighbourhoods in relation to their liveability. The ultimate purpose of this research and the proposed system is to provide a useful guide for developing sustainable and liveable neighbourhoods in our cities.

Keywords: Liveability; Urban Planning; Urban Design; Neighbourhood Planning; Urbanism; Singapore

Introduction

Both city and a country, Singapore is located at the southern tip of Malaysia, at the centre of a major sea route connecting Asia, Europe, and the Middle East, which gives the country its strategic importance. With a total land area of 782 square kilometres and almost 5.5 million inhabitants -70% Singapore residents and 30% expatriates-, this very small city-state is the third densest country in the world with an average population density of 7,814 persons per square kilometre (World Bank, 2014).

Figure 1: Population density. (World Bank, 2014)
In 1960, Singapore population was 1.9 million, and 68% of the inhabitants were living in squatter settlements. Fifty years later it is unquestionable that the urban planning model and policies implemented have been very successful, transforming a third-world country into a thriving international economic and financial centre, and one of the most developed, green and efficient cities in the world.

The current features that we found in Singapore nowadays, began to take shape in the 60's, when the country adopted two urban models that had begun to be implemented by the British planning system in the early years of the 20th century. On the one hand E. Howard's utopian model for the Garden Cities, and on the other hand its later evolution into the New Towns model, an approach to neighbourhood planning integrating residential areas with a town centre, parks, communal facilities, commercial and industrial activities.

These two models applied by the Urban Redevelopment Authority (URA) and the Housing Development Board (HDB) laid the foundation of Singapore as a "Garden City", and the new towns as a city-wide urban development strategy, although in the case of Singapore the British new town idea evolved to a high-rise, high-density model due to land scarcity (Yuen, 1999). However, despite the adaptation of the new town model, the concept remained essentially the same (Teo, 1986), and the aim of providing the maximum public housing to accommodate as many residents as possible, creating homeownership and building a community (Liu, 2013) has been maintained during all these years. Through this publicly oriented housing model and the garden city concept, the country has achieved that 82% of the residents live in public housing and that 30% of the land gets devoted to green and open spaces. But, have these models led Singapore to become a more liveable city? Is the city still a "garden"? Is the urban model efficient, people friendly and people oriented?

Using Urban Systems and Urban Ecology as a methodology to assess the liveability of neighbourhoods.

In the recent years, the city has experienced an evolution towards a more responsive model to the changing needs. In 2013, the Singapore government formulated two key documents. On the one hand, the 'Population White Paper: A Sustainable Population for a Dynamic Singapore', which projected a possible population range of 6.5 to 6.9 million by 2030 to address the country demographic challenge, and on the other the "Land Use Plan to Support

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1 The concept began in 1963, when the founding Prime Minister Lee Kuan Yew initiated a tree-planting campaign signifying the start of the vision of Singapore as a Garden City. "From Garden City to City in a Garden". Ministry of National Development. 2013
Singapore’s Future Population”, which envisions the urban spaces and infrastructures with the strategy of preserving a high quality living environment and creating one of the most liveable cities in the world (URA, 2013).

Due to this future scenario, Singaporeans, the neighbourhoods, and the city are facing new challenges ahead. This research aims to examine the physical conditions of the existing urban model in order to determine its performance, and to identify the significant characteristics and attributes that can be incorporated into the future development of neighbourhoods towards a more liveable environment. This paper shows the preliminary results and conclusions obtained from the research analysis.

The paper is organized in three parts, after the introduction to the definitions and methodology used; the second part focuses on the study of Singapore neighbourhoods, and dissects their morphological, physical and spatial organization using quantitative data, based of GIS mapping and surveys. Built on this research data, the paper concludes with the strengths that must be kept and suggestions to the critical aspects and weaknesses that Singapore neighbourhoods will have to improve in the future in order to achieve high density and high quality urban liveable environments, that meets the changing needs and aspirations of a more diverse population.

Figure 2: The CLC liveability Diagram. (Centre for Liveable Cities, 2013)
**Liveability, a set of interconnected relationships between urban systems**

In the document "10 principles for Liveable High-Density Cities", the Centre for Liveable Cities (CLC) shows a Liveability Matrix Diagram (Figure 2) comparing the 2012 liveability ranking of Mercer's Quality of Living Survey and the urban population density in 28 different countries. The diagram suggests that Singapore is the most high density and high liveable city among the studied (Khoo, 2012). This seems to contradict the common perception that liveability tends to be higher for cities that have a larger geographic space, low-rise developments, and a low-density population (CLC, 2013). In fact, Mercer’s Quality of Living Survey ranks Singapore as the first in Asia and the 26th in the world, and the Monocle’s Quality of Life Survey as the third in Asia and 13th in the world, which seems to justify CLC's argument. However, although it is not a new concept, liveability can be very difficult to define and a very slippery concept. In this sense, we should understand in each case what do these survey rankings refer to and what do they measure.

For the purpose of our research, the definition of liveability emphasizes on the morphological and physical characteristics and factors that improve well-being and the quality of everyday life in the city neighbourhoods. These factors include mobility, accessibility and good access to public transport, pedestrian or bike networks; mixed-use and walking distance neighbourhoods; density and typologies; or the provision, proximity and accessibility to facilities, open spaces, everyday business and basic services.

Figure 3: Regions and Planning Areas in Singapore. (Urban Redevelopment Authority, 2014)
In order to explore and map these factors, this research uses the concept of planning areas to refer to the city neighbourhoods. This concept, which was introduced in the 90’s by the URA, organizes Singapore into five regions and divides it into 55 smaller planning areas. The analysis developed by this research focuses on those planning areas that, according to URA and to the population statistics provided by the government, include residential uses and residents. Following these criteria a total of 40 planning areas out of the 55 meet this condition and have residential uses and residents.

Figure 4: Proposed Systems and Indicators for Liveable Urban Environments based on Urban Ecology principles (Oscar Carracedo, 2014)

The research makes use of quantitative and qualitative methods in order to get the data. Through GIS mapping and analysis quantitative data of the physical environment is obtained. In addition, taking the Urban Ecology proposed by Salvador Rueda as a methodological guideline, the research organizes the physical analysis of the build environment of the neighbourhoods into six systems: land and density; open space and urban habitability; mobility and services; green spaces and urban biodiversity; social cohesion; and urban complexity.
complexity. These systems are analysed through the study of 20 urban indicators at the city and neighbourhood scales that show our understanding of urban liveability. Following Urban Ecology, the indicators are based on average standards obtained from the analysis and measurement of different cities.

In order to show the results in a comprehensive and synthetic way, the results of these indicators are shown graphically in ten maps organized under seven themes: density, living, working, services, consumption, mobility and open spaces.

Qualitative data has been obtained through surveys. The survey includes a total of 39 questions regarding the use, perception and level of satisfaction of issues such as amenities, facilities, transport systems, public spaces or housing. At present more than 200 surveys have been conducted and this process will last for one year, with the expectation of getting more precise and diverse data.

**The DenseCity**

As shown in the CLC diagram (Figure 2), Singapore is considered one of the densest and most liveable cities in the world, but in order to make this concept meaningful we should compare it in the same terms in every case.

Figure 5: The DenseCity. Housing and Population Density in Singapore. Darker areas are those with higher housing density (Authors map, 2015)
Population or housing density always raises the question of liveability and compactness of a city since, at some point, when we have very high densities and too much compactness cities become unliveable. In this sense, density in cities is important to promote proximity and pedestrian mobility, but has to be reasonable and balanced with other uses and open spaces in order to produce liveable environments.

Analysing the urban context of Singapore, we observe that the population density related to the country area is 70 people per hectare, and when considering only the consolidated residential areas, the net population density is 495 people per hectare. These figures become more meaningful when we compare them with other cases such as the City of New York, where the net population density is 107 people per hectare of land; the city of Hong Kong where the average density is 63 people per hectare; or the city of Macao SAR in China, where it raises up to 200 people per hectare. Thus, we observe that Singapore has a high population density comparable to other dense cities in the world, however, as a result of the conducted surveys, we notice that the perception is that 73.9% of the respondents think that population density in Singapore is high or too high -58.5% and 15.4% respectively-, even so 93% feel that the city is liveable. In conclusion, we can understand that CLC's conclusion about the relationship between liveability and population density corresponds with the obtained data and people's perception.

If we refer to housing density we note that the housing density for residential areas is 124 dwelling units per hectare, not too different from the average density of 101 dwelling units per hectare in London (Maccreanor, 2012), also considered as a highly dense yet very liveable city (see Figure 2).

In addition, looking at the residential building footprint we realize that build-up areas only occupy the 29.20% of the residential areas, below the recommended by the indicator, which shows a generous amount of open spaces in-between buildings.

**The Living City**

In Singapore a total of 13.4% of the land area is dedicated to residential uses. The Living City analyses the residential areas and the living environments in Singapore. The maps show the public residential areas (Figure 6), which include public housing developments, the so-called HDB areas, and the private residential areas (Figure 7), including condominiums, landed
properties and other housing units and apartments. Although Singapore is not generally related to the idea of welfare state (Phang, 2007), and the analysis of public and private housing is not directly related to liveability, the weight of the public housing provision in Singapore is a feature of liveability and plays an important role in the population perception of quality of life.

Public Residential Areas (HDB) in Singapore

This is reflected in the fact that, according to the Housing Development Board, 83% of the Singapore residents live in public housing areas (HDB, 2014). This figure accounts for 59% of the total population of the country -including Singapore residents and expats- living in public housing areas, while 41% lives in other types of housing areas.

Comparing with Hong Kong data, in 2014 47.7% of city residents were living in public apartments -government subsidized housing- or residences -government rent-controlled housing- due to their inability to access the free market and purchase private housing.

In Vienna, a city that ranks on top of public housing provision to its residents, 60% of its population lives in subsidized apartments, including both city-owned flats and limited profit housing associations.

Figure 6: Public Residential Areas in Singapore. HDB areas (Authors map, 2015)
In all the three cases the percentage of population living in public housing is very similar, however there is a notable difference in the model followed by the different cities. While in Hong Kong and especially in Vienna the provision of public housing aims to provide affordable accommodation to low-income families, in Singapore it is more than just providing shelter for Singaporeans, its mission is about homeownership and building a community (Liu, 2013). In this sense, in Singapore HDB encourages public housing residents to purchase their apartments -nine out of ten HDB residents own their homes-, while the social housing approach in Hong Kong and Vienna seeks to secure the basic needs of the residents. Furthermore, the comparison reveals an important difference in the attitude toward public housing and the Viennese approach. While in Vienna housing subsidies are instruments of redistribution, Singapore, sees its affordability measures as a means to promote economic growth in general.

Nevertheless, the analysis of the data gives us some interesting conclusions. In Singapore 48% of the total residential areas are devoted to public housing, a 6.5% of the country land area, while in Hong Kong only 20% of the residential areas are dedicated to public housing, 1.4% of the total land area of the country. Although as we have seen before they accommodate a very similar percentage of population, Singapore almost uses two and a half times the land used in Hong Kong, which shows a much higher proportion of open spaces. In addition, the typological analysis reveals that the average residential space per person in Singapore is 35 square meters when more than 30 square meters of residential space per person is considered a good standard. In Hong Kong the standard is only 12.8 square meters per person.

Despite these good standards in the Singaporean public housing, surveys conducted demonstrate that people has a slightly different perception. Thus, we note that 75% of the population living in HDB's would like to change and move to private housing typologies, and 35.9% think that their apartment is small or too small, 26.6% and 9.3% respectively.

_Private Residential Areas in Singapore_

We found some answers to these questions when studying private housing areas. In this case we note that the average residential space per person in private residential areas is 119 square meters, more than three times the standard for public housing. Moreover, net housing density in private residential areas -66 housing units per hectare- is much lower than in public
residential units -142 housing units per hectare-, which is also aligned with the people's perception that population density in Singapore is high.

In addition, 94% of the surveyed people living in private residential areas want to continue living in this type of housing, which shows a very high level of satisfaction. In this sense, although they have quite good living conditions in terms of provision, density and dwelling size, public housing areas seem to be below the desired standards of Singaporeans, probably as a consequence of higher aspirations of the HDB residents. Meanwhile, the standards of private housing seem to be satisfactory for their residents.

**The Working City**

This analysis shows the working spaces within the residential neighbourhoods that, according to URA, allow the mixture of functions and urban uses in the residential environment. Proximity to working spaces helps to reduce the impact of mobility, since mono-functional sectors generate higher number of vehicle journeys. The balance between residential spaces and activity spaces helps to increase self-containment mobility. If working spaces are offered in close proximity to residential areas, commuting for work is reduced. Moreover, the mixture and the coexistence of urban functions and uses such as residential, offices and shops promote the permanent use of the city.
It is also demonstrated that youths, adults, and older adults living in mixed-use communities with walkable destinations do more total physical activity than their counterparts living in residential-only neighbourhoods (Dannenberg, 2011).

Figure 8: Working spaces and mixed-use areas.
The map shows all the mixed-use, business and commercial zones within walking distance (10 minutes walk) from residential areas based on the URA Masterplan. (Authors map, 2015)

To achieve mixed-use neighbourhoods and proximity between work and residential areas it is required that economic activities integrate into residential areas. The Working City map shows the working and activity areas (tertiary areas) that are within a walking distance from residential areas.

Diversity and Mixed-uses in Neighbourhoods to promote sustainable mobility

According to the Urban Ecology indicators, between 20-25% of the land area should accommodate mixed-uses and promote the balance between urban activities and residences. A sufficient range of uses and functions should ensure a balanced social structure development, as well as to contribute to satisfy a part of the local labour demand (Rueda, 2012).

The analysis of Singapore shows that the percentage of land devoted to tertiary areas (offices, commercial, business...) in relation to the total residential area is 31.96%, much higher than
the recommended by the indicator. However 13 neighbourhoods out of 40 are below the minimum standards recommended by the indicator. These figures reveal that one third of the neighbourhoods in Singapore are mainly mono-functional and do not have not enough mixture of uses and urban functions in the same residential environment which affects other aspects such as mobility. In this sense, it is interesting to note that, according to surveys, 30.6% of the population chose the location of their residence because of the proximity to work or study places.

The Flow City

Mobility is one of the most important features of our cities nowadays since millions of people move and commute to go to work or to their study places daily. The Flow City studies the spaces devoted for mobility in Singapore. Infrastructure systems, and specially the road and street systems, usually occupy a significant quantity of land of our cities. Transforming infrastructures into streets and public spaces will increase the public space quality and help to make our cities more liveable. In sustainable cities, car dependency is reduced to reverse the environmental consequences of their use by promoting alternative public transportation systems. In this sense, enhancing various forms of mobility such as pedestrian, bicycle and public transport will reduce the car-dependence and the space devoted to vehicles in streets. In sustainable models space for cars should not exceed 25%, which means that 75% should be for pedestrian use, this will create walkable neighbourhoods where walking will be encouraged amongst residents (Rueda, 2014). Pedestrian friendly streets with public transport networks, together with connected and continuous green systems will create the conditions for a close-proximity relationship between people and urban uses, promoting the self-containment and self-sufficiency of neighbourhoods and reducing the number of daily trips by private vehicles.

Street space

In Singapore 9.94% of the land area is for roads and streets and the rate of vehicles per person is one vehicle\(^2\) every eight citizens, in both cases very low standards involving alternative modes of transport. However, the street space only devotes 15% of its area for pedestrians, an average of 3 square meters per person, while one vehicle has an average of 61 square meters and 70% of the street space is for their use. This shows a vehicle-oriented

\(^2\) includes vehicles for work/study mobility purposes.
street system where space for vehicles almost doubles the average size of residential spaces per person (35m²).

In addition we note that 15% of the land is used for the open air parking areas, one of the characteristic aspects of the HDB residential areas, when the optimal would be a percentage lower than 5% of the land.

Figure 9: Open-air and multistorey parking spaces.
The map shows the area covered by parking spaces within 300 m (Authors map, 2015)

This vehicle-oriented street system gets confirmed with the data of the street spaces according to their use. In this case 65% of the street space in Singapore is devoted to "private use", which include street space for vehicles or parking areas, while only 20% of the street space in Singapore is for "public use", which includes space for pedestrians, public transport and bicycles.

Analysing walkability in Singapore, another essential aspect for liveable neighbourhoods, we observe that residential areas have an average of are 159 street crossings per kilometre square. According to UN-Habitat a standard of 100 to 200 street crossings per kilometre square allows to have a walkable environment to generate street life and for moving goods and services productively and efficiently (UN-Habitat, 2012).

This indicator contradicts the previous vision of a vehicle-oriented city with few spaces for pedestrians on streets. In this sense we can state that, although the level of intersections
responds to reasonable standards, the space devoted for public use and pedestrians in order to create a walkable and pedestrian-friendly environment is not sufficient and do not promote this kind of mobility. However, although the amount of space dedicated for vehicles is high, surveys show that 64% of the population think that their neighbourhood doesn't have too many cars, which is a good indicator of the sense of liveability. The statistic of the use of vehicles reaffirms this perception, only a 9.7% of the population uses a private vehicle to get to work or study.

Figure 10: Public Transport: MRT, LRT and bus systems.
Map shows catchment areas for buses (300m), MRT (500m) and LRT (500m) (Authors map, 2015)

Public Transport

The data obtained from the analysis of public transport reveals that 41% of the population lives within a 300 meters distance from a bus stop and 15% within a 500 meters distance from a MRT or LRT station, the same percentage as for bicycle networks. However, even the coverage seems to be optimum, only a 5% of the population has simultaneous access to the three mobility networks. In this case, according to the Urban Ecology method, the desired value would be that at least 80% of the population had simultaneous and alternative access to the three different mobility networks in order to have a more sustainable and pedestrian friendly environment, however, data shows the opposite (Rueda, 2014).
**The Joy City**

Open spaces are essential for the liveability of our cities, they are the habitat for people and constitute an indicator of the city life, showing the intensity of life, encouraging interaction and tightening relationships and welfare. Living close to parks, trails, and recreation facilities is related to greater use of facilities and more recreational physical activity (Dannenberg, 2011).

It is very important to find the balance between built areas and open spaces for resting and socialize. As we have seen, Singapore is credited with the quality of being "A City in the Garden", 30% of the land area is covered by "green open spaces". But, is the garden green? Is it accessible to all? The Joy City map shows the different types of open spaces and their use, dividing them into two main categories: public open spaces and private and restricted open spaces.

![Figure 11: Public Open Spaces.](image)

The map shows the catchment area according to each type of open space: Nature Parks-4Km; Parks-2Km; District Parks-750m; Local open spaces-200m (Authors map, 2015)

**Public Open Spaces**

We consider public open spaces those democratic spaces usable and accessible to all. According to their use and scale, four types of open spaces have been included in this analysis: Nature Parks, Parks, District Parks and Local open spaces. The map shows the...
proximity radius for each type of open space (4Km for Nature Parks, 2Km for Parks, 750m for District Parks and 200m for the local open spaces located in between residential buildings), and defines the catchment area of the different spaces.

Out of the 30% "green open spaces"\(^3\), 35% are dedicated to usable public open spaces\(^4\), 10.5% of the land area of Singapore, and 58% are dedicated to private open spaces, 17.6% of the land area of Singapore.

With a total of 2,880 hectares, the Central Catchment Nature Reserve alone comprises a 12.3% of the total are of public open spaces\(^5\). As a reference, the Central Park in New York, with 341 Hectares, comprises 6% of Manhattan's total land area.

According to this data, the rate of public open spaces per person is 14.97 square meters, slightly below the indicator value, although the World Health Organization (WHO) recommends a minimum of 10 square meters per inhabitant. As a reference, New York has 29 square meters per person, and London has 27 square meters.

It is also interesting to note that 38% of the public open spaces are local open spaces in close proximity with users. These spaces are located in-between public residential buildings or in their ground floors, the characteristic Singaporean typology of the "void-deck". The rate of these types of open space in public residential areas, the ones that should be used more frequently by residents, is 9.7 square meters per person, slightly below the WHO recommendations.

Responding to the questions posed at the beginning of this chapter, we can state that, Singapore can be considered an environmentally green garden city due to the quantity of open and green spaces. However, this green city is not accessible to all and most of those spaces are restricted to public, which means that Singapore is mostly a privatized green city with less focus on green spaces as a social contribution.

The analysis of the proximity to public spaces reveals that 94% of Singapore and 70% of the population is covered by the catchment areas. However, only 8.5% of the residential areas and 20.7% of the population has simultaneous access to at least three categories of open spaces, which is the optimum in order to have diversity in the different types of spaces accessible in close proximity.

\(^3\) Green open spaces in streets are included in this total.

\(^4\) Due to their physical characteristics, open spaces in streets are not considered usable open spaces.

\(^5\) Due to the difficulties to demarcate the public accessible area of the Central Catchment Nature Reserve the whole area has been considered as usable open public space, although a part of it is not publicly accessible
Private and Restricted Open Spaces

Private and restricted open spaces are those spaces that, although they are open, they are publicly restricted or non-accessible, creating precincts in the city that cannot be used or accessed by the majority. Private and restricted open spaces are based on the URA master plan, and they include private residential open spaces, golf courses, special use areas, utilities and agricultural spaces.

As we have seen before, 58% of the green open spaces are private or restricted, in this case 17.6% of the land area of Singapore. 27% of them are open spaces in private residential areas. In this case the rate of private open space per user in private residential areas is 16.6 square meters, 72% more than in public residential areas, probably another reason why people living in HDB’s prefers to move to private housing.

The Service City

In order to guarantee the quality of urban life, neighbourhoods should have enough facilities for their residents. Facilities are those essential services required by the population to cover their basic and daily needs. A homogeneous provision and distribution of a varied set of
facilities is essential for the functioning of the social structure of neighbourhoods and it should ensure that all people, regardless of status or income, have access to them. As public spaces and public transport, facilities should be located near housing areas to encourage social cohesion and relations.

The Service City studies the spatial distribution of facilities in order to evaluate their diversity, balanced distribution and population access. Facilities should be located within walking distances from residential areas, 300 or 600 meters depending on the type of facility. This network will help to ensure accessibility, proximity, reducing mobility and improving the liveability of neighbourhoods.

Figure 13: Public and Private Facilities and Services.
The map shows the areas within 600m from the different types of facilities (Authors map, 2015)

The Service City map shows five different types of facilities considered as primary and basic in our daily needs: Healthcare, Culture, Sports, Social Welfare and Education. The circles show the catchment area of the different facilities and the proximity radius covered in a walking distance. The overlapping of the different catchment areas shows the simultaneous coverage and proximity to areas, indicating those areas with a better ratio of mixed-use and equitable distribution.

The data obtained from this mapping shows that 10.4% of the land area of Singapore is dedicated to facilities, and that the standard per person -21 square meters- is much higher
than the required by the indicator. However, even the 98.6% of the residential area is covered by at least one facility, only 1% of the population has simultaneous proximity to four of the five different types of facilities, much lower than the 75% required by the indicator. Once again the standard performs well but the spatial distribution is unbalanced. Proximity to facilities is a basic condition in order to reduce mobility and to have an equitable access. Moreover, simultaneous proximity also reports urban compactness and mixed-uses to the city.

The Consuming City

The provision of space for shops, stores, retail and other activities is essential to create mixed-use residential environments. Mono-functional areas will generate a high number of motor vehicle journeys in order to get the basic goods. Creating living spaces with the local activities and services necessary for everyday life in proximity will reduce mobility and increase self-containment.

The Consuming City maps the local activities, those economic activities that citizens use daily and that is important to have in close proximity to home. In this category we include six categories: Hawker centres, Food centres, Supermarkets, Wet Markets, Convenience stores and Shopping Malls. The map shows a 300 meters radius walking distance catchment area for each type. The simultaneity of these activities in a walking distance indicates a residential environment with lively public spaces that provides the minimum resources and services to live, avoiding unnecessary vehicle trips. Neighbourhoods lacking this variety and diversity of activities will have less street life and higher travel costs to cover every day needs.

The ground floor level constitutes a key element towards liveable neighbourhoods. The continuity of activities located at the ground level increases the use of public space and contributes to their vibrancy and safety, and preventing them from abandonment. As a standard it is recommended to dedicate a 20% of the street ground floor space for activities every 100 meters. In Singapore the use of void-decks with activities increases the use of local open spaces.
Commercial activities

The data obtained from the mapping shows that 62% of the residential areas and 32% of the Singapore population are covered by at least one activity. However, when we analyse the proximity to everyday businesses we realise that 0% of the population is covered simultaneously by the six categories of activities, which is the optimum according to the indicators requirements.

Lights and shadows of the City in a Garden

Summarising the reading of the mapping, and referring to the indicators, we see that Singapore achieves a positive assessment in 40% of them, 8 out of 20. This shows a discreet performance of the city in terms of liveability, and shows some of the weaknesses and strengths of the Singaporean urban model.

It is important to note that in quantitative standards, such as green and built area per person, number of intersections, or percentage of facilities and green spaces Singapore achieves a good performance and scores over some other reference cities. However, in terms of social and population outcomes, such as proximity to basic services, transport networks, facilities or public spaces, the performance is very low. This is probably due to the rigid planning system based on theoretical models but no on population behaviour patterns. In this sense it is
suggested not to focus only on standard achievements but to find criteria towards a balanced spatial distribution of activities and facilities according to residents location. This spatial distribution should also be added to a higher diversity of activities, specially taking advantage of the opportunities that the ground floor levels offer. These actions will promote the use and vibrancy of open spaces and the sense of security, and will increase the simultaneous access to services.

Figure 15: Evaluation of the proposed indicators. In green those indicators met by Singapore, in red those not complied (Oscar Carracedo, 2014)

Special mention has to be done to the mobility and services system, where none of the indicators are achieved positively. In this case the results are mainly due to a model strongly based on car dependency with not many considerations towards population and residents. In order to correct this unfriendly environment for pedestrians it is suggested that the layout and cross-section distribution of streets should be revised, giving more predominance to people and walkable areas towards a people oriented and pedestrian-friendly model. This, together with a decentralized model of public transport, will increase the efficiency and the access to intermodality, which will also help to create a more sustainable city model.
It is also suggested that a more publicly oriented model regarding open spaces will contribute to higher standards of proximity to them as well as to achieve better ecological connectivity and continuity between systems. This will help to shift the concept of City in a Garden towards a City in a Garden accessible for all.

The discreet performance that we observe in the indicators is also represented in the results of the surveys conducted where 34.6% of the population feel "just right" with the living environment and only 56% of the population is satisfied or very satisfied. In any case, the suggestions proposed or any changes introduced to the systems should seek to improve and transform the existing urban milieu into a more liveable environment, increasing people's satisfaction of the environment they live.

As mentioned at the beginning of the article, liveability is a very difficult concept to define that can vary from city to city. It is important to understand that the approach proposed by this research sees the city as a set of interconnected relationships between urban systems that can be planned in order to enhance our living environments and to achieve better quality of life. In this sense, it should be understood as a process and a method rather than a fixed set of rules or standards.

To conclude, the ultimate purpose of this research is to provide a useful guide for developing sustainable and liveable neighbourhoods. Through the system proposed by this research, cities can be analysed in order to take the necessary actions to improve them and to achieve higher liveability standards that meet the needs of the people who live in our cities.

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A Research-based Model for the Design of Public Space in Beach Precincts

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Transitions, People, Place and Activity
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A Research-based Model for the Design of Public Space in Beach Precincts

Abstract: This paper has developed from a mixed methods case study of the urban design of three different beach precincts on the Gold Coast, Australia. The intent of the research was to understand how people value, use and relate to urban beach precincts so that their design, planning and development may functionally reflect the role that they play in people’s lives.

The case study identified that the dominant and special interest groups on the Gold Coast have designed public spaces that create constituencies of advantage and disadvantage. This has arisen due to the provision of public facilities that support favoured activities in the public foreshore parks and by private ownership of half of the available foreshore. This limits egalitarian access to the social, recreational and restorative benefits of the beach precinct.

In response, this paper suggests a new research-based paradigm for the urban design and planning of beach precincts. This paradigm would rely on research into how well places meet different people’s expectations and preferences for activity and use by the degree of fit with individual desires, needs, expectations and preferences for the use of particular places.

The proposed research model would also support the use of an urban design and planning model developed from the case study which prioritises public access to activity, amenity and facility to restorative environments (Cartlidge & Armitage, 2014a). This would ensure the incorporation of the values identified as relaxation, restoration and connection to nature in inviting, comfortable and secure public places as identified in the case study.

Keywords: Accessibility, Activities, amenities and facilities, Governance, Public space, Restorative environments, Urban design guidelines
Introduction

The City of the Gold Coast stretches along 57 kilometres of coastline (Gold Coast City Council, 2015) and is an example of a linear coastal city. The city is located in southeast Queensland and borders Tweed Heads in New South Wales. The major period of development of the Gold Coast from the 1950s coincided with the emergence of global financial, governance and development practices that saw the car emerge as the primary form of personal transport (Burton, 2009). For over a half of the coast there are private properties built along the foreshore and only limited amenities and facilities to support activity on the beach for visitors (Wake et al. 2008).

This paper has emerged from a mixed methods case study (Flyvbjerg, 2011) of the urban design of the Broadbeach, Burleigh Heads and Mermaid Beach precincts on the Gold Coast, Australia (Figure 1). The intent of the author’s research was to understand how people value, use and relate to urban beach precincts so that their design, planning and development may functionally reflect the role that they play in people’s lives.

Figure 1: The City of the Gold Coast showing the case study locations (Cartlidge, 2012)
The case study identified that the dominant and special interest groups on the Gold Coast have designed public spaces that create constituencies of advantage and disadvantage (Cartlidge, 2015:259). This has arisen due to the provision of public facilities that support favoured activities in the public foreshore parks and by private ownership of half of the available foreshore. This in turn limits egalitarian access to the social, recreational and restorative benefits of the beach precinct.

The contemporary concept of urban design reflects the architectural, urban design and planning practices which are based on land-use planning oriented to the laissez-faire political doctrines that have dominated post-war development in Australia (Burton, 2014). Urban design guidelines have no statutory basis in Queensland in the governance of development. They are seen as advisory and open to definition by the dominant and special interest groups who control the governance of the Gold Coast (Cartlidge & Armitage, 2014b), a city largely created by the influence of mass tourism and lifestyle products (Burchill, 2005; Griffin, 2007; Burton, 2014).

Research into the meanings and values of beach precincts appears to be surprisingly scant. This is possibly because the beach precincts are places where affectations for the values of place are strong. Layers of evolutionary, biological, emotional, subjective, personal, historical and cultural meanings are associated with the narrow, liminal, transitional spaces between the built and natural environment. Urban design researchers appear to have shrunk from attempting to explain places that are so loaded with affective meaning.

The paper will examine the implications of the role of power and privilege in the construction and governance of the public realm of Gold Coast beach precincts. The Gold Coast foreshore can be seen as the location of an ongoing conflict for the control of the essential values of relaxation, restoration and connection to nature. These are values located in the liminal spaces between the built and natural environments of beach precincts.

In response, this paper suggests a new research-based model for the design of public space. This model would rely on research into how well places meet different people’s expectations and preferences for activity and use by the degree of fit with individual desires, needs, expectations and preferences for the use of particular places.

The proposed research model would also support the use of an urban design and planning model for beach precincts developed from the case study which prioritises public access to activity, amenity and facility to restorative environments (Cartlidge & Armitage, 2014a). This would ensure the incorporation of the values associated with beach precincts into the design of those precincts. These values were identified as relaxation, restoration and connection to nature in inviting, comfortable and secure public places (Cartlidge, 2015: 452).

The Patterns and Relationships of Conflict to Particular Places in Beach Precincts

The case study illustrated that conflict over the control of the benefits of the beach precincts is largely concentrated and located in the beachfront transitional corridor along the foredune. It is in this space that beachfront residents and corporate interests have restricted public access to the beach by building homes, apartments and resorts along one half of the available beachfront on the Gold Coast (Wake et al. 2008). In the few places along the coastline where foreshore parks exist, activity groups such as the Australian Surf Life Saving Clubs and cyclists have staked territorial claims on this extremely important cultural, social, historical, recreational and restorative space (Cartlidge, 2015: 342ff).
The case study identified the governance of walkability as the most important urban design principle in the beach precinct (Cartlidge, 2015: 366); the transitional locations and edges located in the transitional corridors (Figure 2) between built, private, public and commercial, access and natural forms, as the most important spaces and places in a beach precinct (Cartlidge, 2015: 420); walking, particularly socially as couples and groups, as the most common movement activity (Cartlidge, 2015: 269ff.); and a relationship between other types of activities with clear view lines, and facilities which are sited to take advantage of views for sitting, eating, drinking and talking (Cartlidge, 2015: 421ff.).

Figure 2: Typology of Form, Use and Transition of Beach Precincts (Cartlidge, 2015: 444ff.)

The characteristics of the attributes that differentiate the different Gold Coast beach precincts along the coastline are found in the local morphology, spatial allocation and arrangement of land uses; location and design of different forms, social nodes and routes; and the nature of the access form and transitions.

The patterns and relationships of activity in those spaces and places in the beach precinct is not evenly distributed amongst the different ages and genders. Field observations of beach precinct use and activity made in the case study found that adult males are overrepresented in the beach precincts. In association with young adults, they dominate movement observations in general and cycling activity in particular (Cartlidge, 2015: 330). Older males, women and older women are underrepresented in the beach precincts. Older women also appear to rely on partners, younger family and friends to socially support visitation and activity. Young and adult women appear to be responsible for supporting visitation and other activities by children, although they
may be supported by males and older women in this role. Children are more commonly observed engaged in activities other than movement that involve extended stays in a particular place such as a playground, beach or other social facilities (Cartlidge, 2015: 328ff.).

There were patterns of activity and clusters of behaviour associated with facilities, amenities and locations that were also identified from the urban design analysis and confirmed in the field observations of the case study. These patterns are affected by physical, visual and symbolic barriers such as: walls, fences, gates, the lack of shade, shelter and seating; the absence of supportive public or commercial infrastructure, lighting, enclosed and disconnected spaces, dunal plantings, SLSC buildings and parking that divide public space; busy roads and traffic controlled crossings, one way road systems and shared pathway policy and design. The activity of promenading is also closely related to social, recreational and restorative activity and is the dominant activity found in beach precincts with foreshore parks (Cartlidge, 2015: 331ff.).

The localised, political conflict for the control of the beachfront transitional corridor is in many ways a microcosm of the global struggle over the use and distribution of important benefits and resources found in the wider society (Graham & Aurigi, 1997). It is evident that many of the same conflicts exist in the design and planning of beach precincts, as in other public realms, between the application of wealth, privilege and influence of dominant and special interest groups in society and the less powerful members of that society (Cervero et al. 2013).

The conflict for the use and control of the benefits of the natural and liminal environments of the beach precinct are located as could be expected where the place values are at their maximum benefit for relaxation, restoration and connection to nature in inviting, comfortable and secure places. It is precisely where the benefits are greatest that the social and political tension for control are most informative of the values of a place (Stephenson, 2005; B. Flyvbjerg, 2012).

These conflicts for the control of important public spaces are pervasive and not limited to the Gold Coast beach precincts (Stevens & Dovey, 2004). The case study indicates that control of the transitional spaces in a beach precinct is matter of local dispute in all the beach precincts analysed by the content of the informal literature (Cartlidge 2015:435). The only difference in the nature of the conflict in the different jurisdictions examined is where the boundaries have been drawn between land, beach and ocean and the rights of the public to access that beach in the liminal coastal environments (Cartlidge, 2011).

The case study tended to confirm the evidence that the built environment professions are not meeting the needs of all members and groups of society (Mees & Groenhart, 2012). The research indicated that designing for the beach precincts using design guidelines developed for different places in different contexts, such as general urban or city centres, was an inappropriate application of those guidelines (Cartlidge, 2015: 139). The research also identified characteristics of the urban design and planning of beach precincts that would be appropriate, responsible and responsive (Cartlidge, 2015: 450ff.).

The production of architectural, urban design and planning practices, based on generalised urban design guidelines (Carmona, Marshall, & Stevens, 2006), can produce urban development that is unresponsive and irresponsible to the local urban morphology and the values associated with particular places like waterfronts (Chang & Huang, 2008). One of the reasons given for this is the dominance of established architectural, urban design and planning practices based on land-use planning (Hall, 2008).
According to Gil et al. (2012), typology-driven research into the urban form of places by applying typologies of place to urban design analyses has not been widely adopted as a research practice, despite its importance in understanding responsive and responsible urban environments (Samuels, 2008). This paper also proposes a typological urban design approach to the design and planning of public space in beach precincts. This approach would be founded on the inherent values of a different types of restorative place (Kaplan, 1995) where egalitarian access to activity, amenity and facility is supported by the production of an explicitly political mission to support the urban design and planners to maintain, enhance as well as protect those values from the dominant and special interest groups who would subvert them for their own gain (Flyvbjerg, 2003).

A Research-based Model for the Urban Design of Public Space in Beach Precincts

The research findings of the case study led to the formation of an urban design research model which could guide inquiry into how places are used and how they meet the expectations of different types of individuals and groups with similar needs and expectations (Cartlidge, 2015: 459ff.). A research model that could meet these objectives would assist urban designers, planners, architects and developers to design built environments that are responsive to the functional needs of those different individuals and groups. It could also provide a research framework to investigate the factors that contribute to the design, governance and planning of places according to the values and meanings that people hold for them.

The physical features of a place, particularly the desirable physical and spatial form of the public realm for social usage, has long been a particular concern of the theories and practices of some influential urban design writers (Jacobs, 1961; Tibbalds, 1992; Gehl, 2010). This has largely been because, as Carr et al. (1992: 92) observed, ‘places that do not meet people’s needs or serve any important functions for people will be underused and unsuccessful.’

As Relph (2006) observes, the activities, uses, activities and cultural meanings that people associate with the physical attributes and characteristics of place, are interrelated and irreducible. In a survey of the economic and social values of Gold Coast beaches Raybould & Lazarow (2009:12) identified the importance of activities that indicate a preference to be outdoors, socialise with family and friends, walk on the beach, relax and unwind as the most important reasons to visit. This coincided with the preferences for passive and social activities identified in the case study for enjoying views, fresh air, relaxation, watching others, and being in a natural environment, meeting friends and family. It would also appear that most people view beach precincts as low intensity places to get away from the stresses of modern living and enjoy the opportunity to socialise, relax and take in the views afforded along the beachfront transitional corridor in the foreshore parks (Cartlidge, 2015:312ff.).

The case study findings suggested that a research-based, value-rational model of urban design and planning for particular types of places is an approach that could reorient the planning and governance of beach precincts for the benefit of all. In turn, it could avoid the prioritisation of dominant and special interest group preferences that do not coincide with the public good or the particular values of place (Cartlidge & Armitage, 2014a). This analysis of the competing preferences and needs of different groups to the benefits of a place would rely on research into how well the design solution fitted with the individual and group desires, needs, expectations and preferences of use of particular places.
If the urban design and planning of special places like beach precincts, waterfronts, parks and other natural environments, within and on the edge of towns and cities, is to be in any way aligned with the expectations and preferences of all the potential users, then a clear and overtly political process would appear to be essential. This process should include the constituencies of disadvantage who are usually passive or entirely missing members of the existing community consultation practices. Instead, the processes are focused on the needs and preferences of the organised and active dominant and project groups (Flyvbjerg & Richardson, 2002).

The passive and disadvantaged need the planning profession to employ practices and processes that include focused research to establish the values of places so that they may be represented in the political field of conflict for the production of public spaces that employs responsible (Haas & Olsson, 2014) and responsive (Bentley et al. 1985) urban design practices.

The research-based model for the design of public space of beach precincts, is composed of three main components, as explained below:

1. a model for the degree of fit of expectation and preference to experience,
2. a conceptual model of motivated behaviour,
3. the influence of internal and external factors that affect the individual’s experience of the use of particular places.

A Model of the Degree of Fit of Expectation and Preference to Experience

In constructing the theory of ‘good city form,’ Lynch uses ‘fit’ as one of his criteria in a set of performance dimensions which relate the human values of different types of place in cities to their spatial characteristics, along with ‘access, control, sense vitality, efficiency and justice’ (Lynch 1981). This concept of fit has been adapted in the proposed research-based model as a way of relating the different values and factors of particular places to the preferred uses and activities of different individuals and groups.

The first component of the research-based model for the design of public space is a model of the degree of fit of preference, expectation and experience of place developed by the author to provide a qualified assessment of different places.

The expectations and preferences of the user are proposed to have four conditions of fit: ‘no fit’, ‘dysfunctional fit’, a ‘degree of fit’ and ‘full fit’. If the user of the beach precinct expects to engage in an activity and has a preference for how that will occur, their perception of a place before and after the visit will depend on the degree of fit of those expectations and preferences to their experiences (Figure 3).

The first condition is of ‘no fit’. The visitor finds no match for their expectations and preferences at a place. For instance, a visitor may expect to have a pleasant walk along the beach followed by a reasonably priced coffee in a pleasant café. They may also prefer to drive their car and park at a convenient place to start and finish their walk. If these expectations and preferences are not met in the precinct, visitors are not likely to return there.

The degree of fit is a contextual individual assessment of the attributes of a particular place. For instance, in the example given, it may suit a resident of a precinct that the lack of fit for visitors discourages them from visiting. The lack of parking and the absence of a café increases the degree of fit for the resident, as they don’t need to park and can use their home for refreshment,
with the added advantage that they have an uncrowded beach. Therefore the same attributes and characteristics of place can have differing degrees of fit for different individuals and groups.

The second condition of fit is a dysfunctional fit. The user of the precinct may have an unpleasant walk along a poor footpath with no view of the sea and visit a cafe that is ten minutes walking distance inland, only accessible by crossing a busy road. It may also have restricted-period parking they consider expensive and inconvenient. In this case, they may choose not to visit, or to tolerate the degree of inconvenience or perhaps modify their expectations.

![Diagram of No Fit, Dysfunctional Fit, A Degree of Fit, Full Fit]

Figure 3: Model for the Degree of Fit of Expectation and Preference to Experience (Cartlidge, 2015:459)

The third condition of fit of a place is when the urban design attributes of the precinct have a ‘degree of fit’ for their expectations and preferences, but where the perception of place is, to a degree, compromised. The degree of fit is expected to vary for different users, but the degree of fit will apply to all users with the same expectations. Users who experience this condition may return, adapt their expectations and preferences or seek a closer fit at an alternative precinct which better meets their psychological and physiological needs.

The last and most preferred condition of fit is when the user experiences a ‘full fit’ of their expectations and preferences. This last condition rewards the user with the satisfaction of their expectations and preferences, creating the experience that their preferred characteristics of a place for use and activity have been met in the precinct. They are then more likely to enjoy visiting or living in this place.

The next component of the proposed research model arises from the need to incorporate an inquiry into the external (seen) and internal (unseen) factors (Arefi, 2005) that modify the
individual’s desires, needs, expectations and preferences when they are using a public place, and how social, environmental and design factors modify their behaviours. In the course of the research, motivation was identified as a psychological process central to directing behaviours towards obtaining satisfaction of expectation and preferences in the use of place.

A Conceptual Model of Motivated Behaviour

The second component of the research-based model for the design of public space is a research model developed by Hofmann et al. (2012). It helps to explain the social rules of living with others, in particular, different groups sharing the use of public spaces (Figure 4). The conceptual construct of motivated behaviour includes an examination of the role of the personality trait of self-control in restraining or redirecting desires, especially where social rules and formal regulations constrain and conflict the satisfaction of preferences in a public place.

The lower pathway of the model assumes that desire strength instigates behaviour. The upper pathway represents the inhibiting effect of self-control, triggered by the experience of conflict between a desire and other goals. The external arrows indicate how each step may be moderated by personality and situational factors. For instance, people identified as perfectionists found it harder to control conflict with their goals, values and motivations, with reported high levels of conflict and frequent resistance to desires (Baumeister & Heatherington, 1996).

Figure 4: The four-step conceptual model of motivated behaviour (Hofmann et al. 2012)

People with a behavioural trait such as narcissistic self-entitlement were more likely to enact desires and feel less conflicted in their behaviour enactment (Hofmann et al. 2012). If this model is applied to an analysis of conflicted access to desired environments, places or facilities in a place, it can be seen that relying on social rules and formal regulation to modify or moderate
behaviours is unlikely to succeed if the desire strength is very high and self-control is not absolute.

Hofmann et al.’s (2012) model also explains why young males will cross the highway even if barriers are erected in the central reservation; why property owners will cut down trees growing in the public land of the dunes that diminish their views; or why cyclists will speed through social spaces in a foreshore parks to enjoy the sensation of speed (Grzebieta, McIntosh, & Chong, 2011). It also explains the sense of entitlement to private enjoyment of public goods, such as views and public spaces, exhibited during the course of the case study research.

The research by Hofmann et al. (2012) also indicates that a possible solution to conflict over spaces and places in the beach precinct lies in an incorporation of people’s needs, desires, and behaviours into the governance process. In order to prioritise the spatial design and arrangement of the natural and built environments of a public space, a clear understanding of people’s psychological and physiological needs is required. The provision of public and private infrastructure that is supportive of those needs is therefore likely to assist in reducing conflict and improving the sustainable governance and design of a place.

It is thought that incorporating personality traits, situational and social environments in the research model for the purposive use of places would be very useful to urban designers and planners. This would enable the influence of personality to be considered when considering design solutions for the provision of facilities and amenities to support activities, particularly its effect on the decision making of individuals and groups (Kivetz & Zheng, 2006).

The Influence of Internal and External Factors that Affect the Individual’s Experience

The final component of the research-based model for the design of public space is a summary of the most prominent internal and external factors identified in the case study affecting use and activity of the beachfront transitional corridor. As Hoffmann et al.’s four-step conceptual model of motivated behaviour indicates, if the conflict between desire to use a place is overcome by the influence of the internal and external factors, then the preferred behaviours, such as purposive use, will not occur (Hofmann et al. 2012). This is a significant effect, as those people who are not using or visiting the beach precincts can also be assumed to have a degree of conflict with the factors that adversely affect any desire they may have to use or visit that beach precinct.

The research-based model for the design of public space (Figure 5) makes the assumption that the desire for the purposive use of places is affected by the degree of internal conflict with the physical characteristics of place and the needs, desires, expectations and preferences that people have for them. Particular lines of enquiry are needed to examine how the relationships and patterns of internal factors and external factors and membership of constituencies of privilege and disadvantage constrain and conflict the satisfaction of preferences in different types of places.

The suggested research-based model for the design of public space combines the degree of fit of preference, expectation and experience of a place with individuals and groups, the conceptual model of the social rules of the use of place (Hofmann et al. 2012) and a summary of the internal and external factors which influence how well places meet different people’s expectations and preferences for activity and use. The model analyses the degree of fit of individual desires, needs, expectations and preferences for the use of particular places by observed behaviours and reported preference (Cartlidge, 2015: 459ff.).
The social, design and environmental factors also influence the satisfaction of needs, desires, expectations and preferences in a public space for intended use and activity. These factors are observable by survey and analysis of the multifaceted patterns of meaning associated with particular localities and places such as beach precincts (Margolin & Margolin, 2002).

The degree of fit can be used to compose research frameworks which enquire into the effect of observed and self-reported preferences of different types of places for different types of activity, amongst different groups of users (Jabareen, 2006). Enquiry into the way the experience of use does or does not match identified expectations and preferences could also lead to the informed incorporation of feedback loops in participatory research for the purposes of urban renewal or improvement (Ho et al. 2012).

**Figure 5: Research-based Model for the Design of Public Space (Cartlidge, 2015)**

**Applying the Research-based Model for the Design of Public Space**

The research model is capable of being adapted to examine different aspects of the relationship between people, place, and patterns of use and activity. The model could be operationalised to guide inductive and deductive lines of inquiry through a deliberative process that identifies the particular and unique values of a place and relates those values to their meanings and perceptions (Gunder, 2010). The analysis of the local context and values of places and the mechanisms of the politics of domination would then become transparent and open to challenge and change (Clegg, Flyvbjerg, & Haugaard, 2014).

The research model is particularly suited to the creation of a research framework to guide case studies and complementary statistical inquiries that would provide detailed understanding of the
context and processes of the relationship between people, place and activity and how conflict between different groups of users could be managed or avoided (Flyvbjerg, 2011). This may involve a study of particular types of places with identified conflict between different groups. This study would comprise of an examination of the effect on the conflict of different sets of factors from the model, and, an inquiry into the opinions, beliefs and meanings that individuals and groups hold for those locations, with the intent to describe their degree of fit (Flyvbjerg, 2012).

Research conducted using this model is intended to inform and support decision making for an egalitarian, responsible (Haas and Olsson 2014) and responsive (Bentley et al. 1985) approach to urban design that reduces the barriers to accessibility of the beach precincts for the constituency of disadvantage identified in the case study (Cartlidge, 2015: xx). This means that the public realm of beach precincts would be responsive to the functional needs of this constituency (Fainstein, 2000).

The design solutions that may arise from the application of the model are expected to vary in response to the different attributes, characteristics and values of the different types of beach precincts. These solutions could involve reorganisation of the allocation of public space to support uses and activities identified as supportive of the values of place during the research (Cartlidge & Armitage, 2014b). They could also involve the application of urban design guidelines to the planning of future and existing beach precincts (Cartlidge & Armitage, 2014a).

Research Propositions Suited to the Application of the Model

The case study suggested propositions, issues and topics where further research could add to the understanding of the relationships between different groups and their use and activity in particular places that would be worthy of future research (Cartlidge, 2015: 465ff.):

- Research is needed to further identify and understand how particular places in beach precincts can meet common, shared and unique needs and preferences of people who are members of the constituency of disadvantage, in particular older women. The use of the proposed research model would allow an in-depth inquiry into the purposive use of place by older women that examined issues of mobility and ageing. This research should compare the preferences of place for specific behaviours by older women with other groups of beach precinct users, to identify their critical motivations for beach visitation and potential tension points with other users.
- Research is also needed into the nature and causes of the conflict between different types of physical activity such as walking, jogging, cycling, surfing, jet-ski riding, kite-surfing, body-boarding, boating and sailing and fishing and how the spatial and facility needs of these activities can be met in beach precincts.
- There is a need for further inquiry into the motivations and opinions of decision makers for urban design and planning practices. This is because activities that are appropriate to women’s interests and the provision of facilities that specifically support the needs of older women do not appear to be well understood by the design and planning profession.
- Studies that identified personality traits and the psychological mechanisms of environmental behaviour in the use of beach precincts would appear to be a useful research field. This would include an inquiry into how people’s individual preferences are formed by their personality traits, gender and age; in particular, how the urban design of beach precincts can address the specific needs of an ageing population.
The nature of social visitation and the relationships and associations of group composition to enable and support beach precinct use and activity was indicated as an area of future research, in particular, meeting the social needs of child carer groups for their preferences and expectations of visitation.

Inquiries could be conducted into how well the internal factors of different types of individuals and groups expectations and preferences for use and activity are met by combinations of the external factors or by particular factors such as cultural permissions, urban design values, and meanings of place.

The proposed research model could also be used to examine how the environmental opportunity and experience of behaviour affects the degree of satisfaction with that place for those behaviours. The role of external factors in creating conflict with behavioural satisfaction could also be explored and tied in with different types and groups of peoples’ preferences, behaviours and degree of satisfaction with particular places.

It is considered important to ensure the participation of the constituency of disadvantage in decision making processes. However, this constituency is also the most likely to be also members of the passive or resistant groups and the least likely to be represented in contemporary public participation processes of planning (Elias & Alkadry, 2011). It is also incumbent on the design and planning professions to understand that their professional and academic discourses are not necessarily those of the public when they construct designs, plans, policies and programs (Gunder, 2005). This was also indicated in the analysis of the Delphi group process of the case study (Cartlidge & Armitage, 2014b).

It is suggested that the role of urban designers and planners should be to represent the constituency of disadvantage that is informed and enabled by a process of targeted research (Gunder, 2003). It is through knowing the needs and preferences of the passive groups in the constituency of disadvantage that government representatives and officials, in cooperation with built environment and urban professionals can operationalise the highest and best use of the public realm (Lunney & Matthews, 2002; Crase, Dollery, & Wallis, 2005). The proposed research-based model could assist by informing the approach taken by urban designers and planners.

This is because it is not thought that current approaches of urban design and planning are capable of meeting the desires, needs and preferences of the constituencies of disadvantage, as they are not focused upon them (Stojanovic & Barker, 2008). Urban design is usually focused on neighbourhood design, building codes, street patterns and arrangement of urban activities commonly found in the urban form of towns and cities (Centre for Applied Transect Studies, 2010; Llewellyn Davies, 2007). Without the adoption of a new, research-based approach to the urban design and planning of beach precincts, it is likely that the contemporary urban design and planning regimes will continue to have unintended and negative consequences.
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Books/Edited Books/Book Chapters:


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minha casa, minha bicicleta

(my house, my bicycle)

Cycling As A Mobility Strategy For The Urban Poor In Brazil

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Abstract: Brazil’s social housing program Minha Casa Minha Vida (my house, my life), was initiated by the Brazilian Government in 2009 in response to rapid urbanisation and consequent housing crisis. Whilst the programme has provided large scale housing estates, these are often located on the periphery of urban centres; relocating vulnerable populations to remote urban areas lacking in services, social connectivity, or transport.

Whilst many cities in Brazil are now adopting integrated public transport strategies which include passenger trains, bus rapid transit, and cycling, the generic application of those models cater to areas of high population concentration, and fail to deliver adequate mobility options for the most vulnerable communities which are located on the periphery of these cities.

This paper explores the ways in which cycling culture has been adopted in Latin America, specifically Brazil, and explores strategic considerations in adopting cycling as a mobility strategy for the urban poor.

Keywords: cycling; mobility strategy; social housing; poverty; Brazil

Introduction

Brazil has undergone rapid urbanisation in recent years and with it a two speed economy that has resulted in extreme wealth as well as extreme poverty within the population. The need for shelter, driven by the rapidly increasing population of urban underclass has led to growth of unplanned or informal settlements, known in Brazil as favelas. In 2009, in response to the growing crisis of affordable housing (estimated as a deficit of 7 – 10 million houses), the Brazilian Federal Government established the social housing program Minha Casa Minha Vida. The program responded with large scale housing projects; however in many cities where land prices are high it did so at the cost of accessibility, by locating these housing estates on cheaper land on the urban periphery.

Physical isolation has become one of the critical consequences of this social housing program, as existing public transport policies in Brazil fail to provide adequate mobility and access to infrastructure, employment and civic life. There are a number of factors impacting the ability for public transport to respond to the need for these social functions. Firstly, in the face of rapid urbanisation, the government has under invested in public transport, and many services are provided by private contracts. The integration of these services depends on the ability of each local authority to co-ordinate and control the network. Secondly, public transport is regarded as a traffic engineering issue, an environmental issue where
sustainability is the goal (Baumann, 2013). Success of a transport service is measured by the
gross number of people using the network, rather than the needs of the community it serves,
and hence the service is usually concentrated in areas of highest population density. Public
transport rarely features as a social issue, and as a result any social benefit gained is by
default, not by design.

**Brazil - socio economic context**
Brazil has undergone rapid population growth and urbanisation, with population growth of
1.17% per annum between 2000 and 2010. Despite falling fertility rates, with family size
reducing from 3.4 to 3.1, families in the low income sector are still averaging 4.2 per
household. Extreme poverty is decreasing, but figures indicate that it is still significant, with
16.2 million people, or 8% of the population living in extreme poverty\(^1\) in 2010 (UN
HABITAT, 2013).

The impact of this poverty has been exacerbated by the rapid and intense urbanisation
process, with the rate of urbanisation increasing from 35% in 1950 to 85% in 2015 (World
Bank, 2015). As a result, approximately 3.2m families living in informal settlements across
the Brazil and at least 10 million experience deficiencies in infrastructure (Embarq Brasil,
2014). Many informal settlements (favelas) lack water, sewerage infrastructure, and
connectivity both internally and with the surrounding urban structure.

The government’s response has been represented in the establishment of the
affordable housing programme, “`Minha Casa Minha Vida” (my house, my life) (MCMV).
MCMV provided financial incentives to private construction companies who would design
and construct mass produced housing, stimulating the economy through the construction
sector, and reducing the housing deficit. Targets were created for three tracks of housing
based on income levels and population need (Figure 1).

<table>
<thead>
<tr>
<th>Track</th>
<th>Income threshold (per household per month)</th>
<th>Target construction goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Track 1</td>
<td>0 – 1,600</td>
<td>2 million</td>
</tr>
<tr>
<td>Track 2</td>
<td>3,100</td>
<td>1 million</td>
</tr>
<tr>
<td>Track 3</td>
<td>5,000</td>
<td>400,000</td>
</tr>
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\(^1\) Extreme Poverty is regarded as a monthly per capita income of <$38 US per month.
The planning and land acquisition of these housing estates is left in the hands of the construction companies. In the state of São Paulo, 87.5 thousand homes have been commissioned, the highest concentration of any state in Brazil. However as with other cities in Brazil, São Paulo faces serious difficulty in meeting the investment required to service the demand for the lower income bracket (track 1), because of the high price of land in metropolitan areas reduce the already low profit margins on track 1 housing (UN HABITAT, 2013).

Figure 1: Delivery of MCMV dwellings in each income bracket (track) up to July 2014 (Shimbo, 2015)

As a result much of the track one housing is located on cheaper land on the periphery of urban centres, relocating the lowest income households to outer areas where urban mobility is already poor, generating marginalised and vulnerable communities.

This sentiment is echoed by analysis of the programme delivery: “A pressing concern has been raised on the socio-spatial and environmental implications of housing developments which the Programme is promoting and financing, particularly related to the location of projects and the challenges of urban integration. Improvements could be made to better connect new housing projects within the existing urban fabric to improve urban inclusiveness and prevent urban spatial fragmentation and sprawl.” (UN HABITAT, 2013)

**Vista Bela**

One such housing estate, Vista Bela, is located on the urban periphery of Londrina, in the state of Parana in Brazil. Large scale housing estates have been located on the periphery of the urban area resulting in pockets of high density, interspersed with large areas of undeveloped land. Whilst the largest high density housing projects are located in the north of the city, the
university, higher socio economic housing, recreation and major retail development are located to the south. The sprawling nature of the city necessitates high levels of car ownership with 442 automobiles per 1,000 inhabitants, compared to a national average of 254. Connecting roads are congested, exacerbating travelling time both for private car and for public transport (Polidoro, 2011).

Figure 2: Vista Bela Housing Estate in Londrina

Established by the federal government in 2009 under the MCMV Program, one such project, the Vista Bela estate consists of over 2000 housing units, housing a population of 12,000 people. Research undertaken by the University of São Paolo provides some insight into the estate’s demography. Of those surveyed, 23% were forcibly relocated from unregulated households in water catchments, river bank areas and favelas (Vincentim, 2014). In Londrina 3,510 unregulated households are located within valley bottom areas, 2,914 of which have been forceably rehoused under the MCMV programme (Durán-Ortiz, 2014). Households headed by women (single parent) are a priority population for rehousing, and represent 60% of households. Illiteracy and incomplete secondary education is prevalent, with no occupants surveyed having attained tertiary education (Vincentim, 2014). Correspondingly, 43% of the population is unemployed, with those in employment working as recyclers, labourers, and waitresses or in construction trades. Women reported difficulty in attaining employment due to a lack of childcare facilities. Consequently, 43% of those surveyed had zero income, and 27% had income of less than $1,000 BRL ($415 AUS). 50% received no family allowance. Private car ownership is low, and school transport is provided by a private school bus service.

For the poor, urban mobility is a critical determinant of their ability to access schools, employment, markets, food supplies, culture and recreation. In short, mobility underscores the quality of life which is available to them. For the urban poor who have been relocated to the periphery of urban areas, often from very centrally located unplanned settlements, mobility
and access to their workplace, lifestyle and family networks, lack of mobility perpetuates a downward spiral of poverty.

**Cycling as part of a public transport strategy**

In Brazilian cities public transport infrastructure is poorly developed, and fails to serve low income areas effectively. Rapid urbanisation has led to large population growth, high car dependency, congestion and in many cases poorly developed road infrastructure.

In Latin America, public transport is privatised, and service to areas of social need is not subsidised, leaving non-profitable or viable sectors unserved. Favelas and unplanned settlements are often located on hilltops, with steep topography and narrow streets make access difficult by bus or by car, leaving non-motorised transport as the only option.

Figure 3 & Figure 4: Rocinha Favela in Rio de Janeiro

Whilst many developed countries, in Europe, United States and more recently in Australia have seen resurgence in cycling as a form of transport, South American cities face unique hurdles due to their rapid urbanisation; and unique cultural and socio-economic barriers. For the purpose of this paper, three key areas of development are identified which impact on adoption of cycling culture: a) infrastructure; encompassing cycle paths, connectivity with broader transport networks, bike racks, storage areas, and other
infrastructure works; b) vehicles; which includes access to bikes, affordability, bike share programs, charities and government programs to improve financial access to bikes; and c) culture; which includes status and perceptions and political leadership.

Notwithstanding the constraints to cycling, a number of Latin American cities have adopted unique initiatives to overcome some of these obstacles. In Mar del Plata, Argentina, where the number of cars on the city’s roads has increased from 192,000 in 2007 to 300,000 in 2012, the city’s transportation and transit master plan requires that 150 km of bicycle lanes be installed (Ruchasnsky, 2013). In Bogotá, by law every new street constructed must include a bicycle lane.

Many of the region’s largest metropolises have seen significant increase in bike lane infrastructure, with São Paulo having virtually no bicycle lanes in 2009 to planning nearly 100 km of lanes by the end of 2013 (Romig, 2009). In Brazil, the Bicycle Program Brazil (PBB) Bill requires 15 percent of the money collected from traffic fines to be invested in cycling infrastructure in municipalities with populations over 20,000 (Sonuparlak, 2011).

Corporate partnerships or sponsorships with bicycle-sharing programs use the bicycles and paths as advertising opportunities. In São Paulo, Itaú Bank funds Bike Sampa, while one of the country’s largest insurance companies backs Usebike.

Figure 5: Modal split for world's megacities - journey to work (Luoma, Sivak, & Zielinski, 2010)
As a result, the modal share of bike use in many Latin American cities is relatively high. Figure 5 indicates that in Rio de Janeiro and São Paolo, cycling represents a significant portion of the modal share. Between the two cities however, the nature of cycling varies significantly. In São Paulo cycling as a form of commuting is generally restricted to the lower income earners. Among the higher income earners, cycling is a weekend pursuit for recreation and fitness (Baumann, 2013). In Rio de Janeiro on the other hand, where cycling has become a part of a cultural change, cycling is a more broadly embraced mode of choice for commuting.

Many cities received funding for their mobility programs from the World Bank on a platform of alleviating poverty, however the recognition or acknowledgement of the importance of cycling infrastructure to aid the mobility and economic development of the urban poor is not explicitly stated as an objective, and as a result those most in need of infrastructure do not reap the benefits of the programmes.

**Culture**

In some cities, cycling has evolved from a transport strategy to a culture. Whilst it is difficult to define bike culture, it is evident at many different levels of the city’s values and functions. Importantly, strong leadership is essential. The message needs to be consistent and frequent, and underpin all policies and actions.

In Bogota, the cycling culture began with Mayor Enrique Peñalosa as its advocate, and included the installation of 174 miles of protected bike lanes, which helped bring bicycling’s mode share from 0.5 to 5 percent. Bogota’s policy gave inverse priority to vehicle speed. That is, highest investment priority was given to pedestrians, then bicycles, and then busses followed lastly by cars. The aim of the program was to create an egalitarian city.

The former mayor’s brother, Gil Peñalosa, also a cycling advocate, outlines what he sees as the elements in creating a cycling culture. The first is to create a sense of urgency. That urgency is impending, he says, through the rapid changes in our society, expressed through obesity epidemics, reduced city budgets, rapid urbanisation and population growth, climate change, and aging populations. Element two is implementing infrastructure which creates equality of movement for all ages, including lowering speed limits for cars, creating good footpaths, street trees, parks, and a complete network of protected bike lanes. Cities must include flourishes such as street art, mixed uses, and spaces dedicated to people, not cars. His third element is to elevate and support visionaries and leaders. The fourth element is about being bold, and undertaking bold actions. The fifth element is community participation.
and engagement in the process “Citizens can no longer be spectators, they must participate,” says Peñalosa, and the greatest barrier for engagement is complacency (Ciohen, 2015).

Bogota and Rio exemplify the success of cycling culture in Latin American cities, and have successfully integrated cycling as a mode of transport into many aspects of urban planning. They both host 250 km of bike lanes each, with officials in Rio estimating that cyclists make over 1 million trips per day on these paths. Bogota hosts the oldest ciclocreovia, where streets are closed to vehicles on Sundays and holidays, and boasts participation rates of one in seven of the population (Baumann, 2013).

In Rio de Janeiro, bike planning commenced in 1992 with the establishment of a Bike Planning Committee. In the period up to 2004, around 140 km of cycle lanes were constructed, which along with traffic calming measures, provided connections for almost all subway stations with the beach. Bike share programs were first introduced in 2009, with the highest shares of bicycle use located in the western part of Rio de Janeiro, where income generally tends to be lower than in the rest of the city, and where many of the MCMV estates are located. In Bangu, for example, the share of bicycles is about 4% of all trips, with individual motorized mobility accounting for only 10%. In Campo Grande and Realengo, bicycles account for 5% and 6%. Finally, in Santa Cruz 8% of all trips are made by bicycle, and almost equals car traffic, which is used for 9% of all trips. 2009 surveys suggested approximately 4 million bicycles within the city limits of Rio de Janeiro (Aichinger, 2015). These figures are supported by the observations of the current Mayor, cited further in this paper (Sustainable Cities Collective, 2015).
The most effective public transport models owe their success to both providing integrated public transport networks, as well as constraining the ease with which private vehicles can be used (Mees, 2010). Preferential lanes, taxes and restrictions on car use help to achieve this. In many cities the existing congestion is a sufficient disincentive. This is demonstrated in Rio as well as Curitiba, through recreational events such as the annual intermodal challenge, where cars, bikes, buses and taxis race each other for the fastest commute times (Institute for Transportation and Development Policy, 2012).

Figure 7: Cycling in Rio de Janeiro has become engrained in the culture
In contrast, in Londrina, a city located in the state of Paraná in the north of Brazil, there is no visible evidence of a bike culture. Residents cite various reasons for not riding, including the weather, steep hills, dangerous traffic and the widely held stigma that cycling for the purpose of commuting is only for the poor.

Figure 8: Lack of safe cycling infrastructure on roads in Londrina

There is a clear social divide represented in the forms of cycling. Cycling as a form of commuting was mostly observed being undertaken by manual workers and children, often in relatively unsafe traffic conditions, as illustrated in Figure 8; whilst cycling as a form of exercise or recreation is favoured in higher socio economic areas, such as around Lake Igapo (Figure 9). The basis for the variation is that the quality of infrastructure for the purpose of commuting is so poor that only those that have no other choice of transit will risk cycling on the roads.
Infrastructure
The key elements required to designing bicycle infrastructure include (Embarq Brasil, 2014):  

- **Security**: Ensuring safe passage and safe cycling safe for residents and visitors;  
- **Scale**: Using human scale to the development of streets, spaces and neighbourhoods;  
- **Process**: Exploring and engaging with the needs and desires of the community in order to guide the actions, involving residents from planning to implementation and administration of the proposed initiatives.  
- **Integration**: Providing bicycles as an alternative to connect all neighbourhoods, destinations and townspeople. The most visible investment in infrastructure in cities is the construction of painted or segregated bike paths. Their appearance on roads gives a clear indication of a cycling integration policy. Whilst the appearance of cycle lanes is heartening, the location of the paths is critical to the way that they are used, and the populations which they serve.

São Paulo is a highly car-oriented city, with 300km of daily congestion. In recent years however the city has invested in a cycling policy, with approximately 200 km of cycling infrastructure constructed by 2012. Surveys showed the use of bicycles for daily commuting trips doubled between 1997 – 2007, however further analysis of these figures show that whilst the **total number** of trips increased 90% over this period, the number of **daily trips** increased only 20%, indicating that the increase represented weekend riders rather than daily commuters (Lemos). Weekend observations at Lake Ibirapuera Park, the largest and most popular park in São Paulo, indicated that there was a strong interest in cycling for recreation; however most
bikes arrived at the facilities strapped to a car roof rack. Whilst the investment in cycling infrastructure is conspicuous in the city, it lacks network configuration (with other cycle paths, or with public transport connections), with most cycle paths provided in wealthy neighbourhoods.

Figure 10: Recreational Bike Paths, Ibirapuera Park, São Paulo

Over greater distances cycling can provide a personalised and targeted means of commuting when integrated with other transport use, such as buses and trains, referred to as multi-nodal trips. To be effective as a form of commute, facilities need to be provided where bikes can be taken onto trains, bike racks are provided on buses, or safe storage and garaging facilities provided at the transit points from one transport mode to the next. In São Paulo some facilities for parking bikes are provided at certain train and metro stations (Copenhagen Design Company, 2011), with a bike station in Maua providing guarded parking, water, showers, bike repair and even legal advice (GTZ Transport Policy Advisory Services, 2011). However this infrastructure is not frequent, nor is it equally distributed across the city.

The city’s public transport system struggles to keep up with population growth, with the design and number of routes insufficient to service the population. The situation is exacerbated for the poor who lack private means of transport, and often live in the peripheral areas and work in more centralised neighbourhoods where they find improved job opportunities and wages (The World Bank Group, 2015). The lack of effective transport network and cycling infrastructure exacerbates the inequality and vulnerability of marginalised and low income communities.
The conclusion in assessing these sustainable transport models, and in particular cycling strategies, is that whilst they have the opportunity to service the urban poor, without a targeted approach the generic transportation models do not achieve a successful transport mode for lower income earners.

In order to reach marginalised communities, programs need to be geographically and culturally targeted to achieve this outcome. Urban renewal programs in Rio have found that the pattern of narrow winding alleyways made traditional mobility a challenge, and impossible to replicate the formal town’s road system. However that same urban pattern created challenges and opportunities to encourage mobility by non-motorised means. Even if the conditions in terms of slope and built environment are unfavourable 57% of movement in the communities are made by bicycle and on foot (Embarq Brasil, 2014). A guide produced by Embarq Brasil in 2014 provides a number of infrastructure works which assist in bicycle mobility in these specific geographic areas in Rio (Figure 12).
In March 2015 Complexo da Maré, a notoriously dangerous favela in Rio, became the first favela community to have a bike track proposed, linking the Complexo da Maré to the Bus Rapid Transit (BRT) stations and Fundão, a commercial centre and location of the Federal University of Rio de Janeiro (Brunet, 2015). During the inauguration event, Mayor Eduardo Paes stated that the bike track is, in reality, symbolic since a good portion of the local population uses bikes daily (Sustainable Cities Collective, 2015).

In Londrina, a report submitted in support of a funding application to the Inter-American Development Bank describes the city has having a 11.5 kilometre network of bicycle paths, which the Londrina Municipal Government is seeking to expand to promote the viability of non-motorised transport extending the bicycle path network by an additional 10 kilometres at a cost of R$1 million. However 40% would be spent on constructing bicycle
paths in recreation areas, and 60% for adapting roads for commuting. According to the latest survey of mobility in Londrina, 36% of people use public transportation, 34% use private vehicles, 24% travel on foot, and 6% use a bicycle as their means of transportation. Other data cited in the study identified a high level of receptiveness towards using bicycles, in which 56% of people who drive private vehicles, 40% of those who ride buses, and 59% of pedestrians interviewed would choose this transportation alternative if there was a more extensive system of bicycle lanes. Currently, bicycles are mainly used on roads with heavy vehicle traffic, exposing cyclists to safety risks (Durán-Ortiz, 2014).

The proposal, which was granted funding, included the extension of the existing cycle path along Saul Elkind Avenue, which is the main arterial route to Vista Bela. There are a number of lost opportunities with this proposal. Despite the relative proximity to Vista Bela, no connection is provided, and access to the site from Saul Elkind Avenue is by a very rough dirt track. Extending the path on the plan to directly connect with Vista Bela would have sent a very clear message to the residents of Vista Bela that their mobility by bike is considered important.

Figure 13  Existing and proposed bike path network (shown red), with Vista Bela shown circled in insert. (Prefeitura de Londrina, 2012)
Secondly, the circulation routes still run east west, when the city lies south of the site, making any trip to the city in a north south direction very circuitous, and unnecessarily long by bike. Secure bike parking would need to be incorporated at the nearest bike interchange to make multimodal journeys viable.

**Vehicles**

The third critical element in the mobility plan is access to a bike. This can take the form of bike banks or bike libraries, where bikes are donated and available for short or long term loan; donation of bikes or bike parts through various not for profit organisations; government sponsored programs for bike subsidies, and bike share programs.

In São Paulo, the city’s bike share program, Sampa, provides a network of stations throughout the city centre, however these are located in areas of tourist interest and key retail areas. Poorer suburbs in the centre of the city have no stations located within them, despite the potential for integrated networks given proximity to metro and bus systems. Rio on the other hand has a far more comprehensive network, with stations located in tourist areas as well as poorer neighbourhoods. Notwithstanding the efficiency of Rio’s public transport network, elements of it continue to alienate the poor. In North America, research indicates that bike-share membership is underrepresented among people with incomes of less than $50,000; but overrepresented among residents with higher incomes (Citylab, 2015). This is likely the case in Latin America also, due to two key issues. One is that in order to gain access to the bikes, a user is required to pre-register online, necessitating internet access, and payment with a credit card or bank account. The IMF recently revealed that 2 billion people in the world do not have bank accounts (Times, 2015). Neither can it be assumed that the urban poor have access to the internet to preregister for a hire bike. The same systems exist in Rio and São Paulo.

The second issue, as identified in São Paulo, is that bike stations are located in central retail and tourist areas. They are not positioned to service poor or remote areas, and indeed appear to avoid such areas. For cycling to be an effective mobility strategy, the households in the lowest income brackets need to be provided with access to bikes.

In Argentina, the city of Buenos Aires has collaborated with Banco Ciudad (City Bank) to make bicycle ownership accessible through its Mejor en Bici (“Better by Bike”) program, providing interest free loans for bicycle purchases. Residents can purchase the bicycles in registered shops throughout the city, making payments for up to six years at 20 pesos (roughly $3.90 AUD) per month or up to 30 percent of their net salary. In the first 15
days of the program the bank granted 738 loans and was processing 4,000 more; with loans averaging about $534 per bicycle. The initiative has attracted people who were not previously interested in bicycle ownership and allowed people to buy bicycles for their entire families. Banco Ciudad President Federico Sturzenegger calls it “a program with a profoundly democratic vision.” (Baumann, 2013).

In Lima in the 1990s, the World Bank provided to the municipal government a grant for low interest credit for bicycle purchases to low-income workers in order to increase employment access, provided that they could demonstrate that they would use bikes for income generating activities. The project also provided for bike paths to be constructed from a poor community in the northern part of Lima to the industrial areas and the central business district (CBD). Routes were chosen on potential demand, and to date 48 km of paths have been built (World Bank, 1999).

Brazil’s President Dilma Rousseff established the Caminho da Escola “Way to School,” program (Caminho da escola, 2010). Municipalities with populations of up to 20,000 must register and complete the Articulated Action Plan. The municipalities can then allocate these to schools who distribute to eligible students. "The council can give bicycles to students and make periodic checks of conservation status or predict the donation, after two or three years of use, related to attendance at school and the notes in the ratings" (Palace Plateau, 2015). In 2011 students from approximately 300 municipalities were provided with 100,000 bicycles. In both programs however, the full potential of delivery was limited by the bureaucratic process which they entailed.

Conclusion

The elements exist, both around the world and within Brazil, for an integrated program to deliver bikes to families within Minha Casa Minha Vida (MCMV) programs, to compensate for their physical displacement and provide a vehicle for economic and social opportunities. The importance of such a policy, as with any policy, is that it needs to be explicitly stated as a goal for delivery to be successful and beneficial. The cities visited throughout this research had all adopted cycling policies to varying degrees of success, however without a targeted approach to service the urban poor, such generic models fall short of the providing mobility solutions to the areas of urban poverty, and in particular the relocated residents housed in MCMV estates.

Cycling has an established place in transport policy, and as evidenced in this paper, is being adopted in many Latin American cities as a legitimate mode of transport. Whilst
cycling is only just emerging in São Paulo, in Rio de Janeiro it is fully embraced within the culture. However, the success in Rio did not occur by accident. Being a relatively compact city, Rio was able to provide equal accessibility to cycling infrastructure to the city’s favelas as it was to tourists and higher income areas, resulting in evidence of usage by all groups in the community. While this optimistic picture of equality of access is presented for the city centre, the same cannot be said for the housing projects constructed under the MCMV in Rio, where, as with other cities, large numbers of poor have been relocated to outlying areas to the west of the city, poorly serviced by transport and other infrastructure (Healy, 2014).

Rio does serve to demonstrate that neither topography, climate, social class or income are barriers to the acceptance of cycling. The success of Rio was due to a clearly stated goal of equal access and integration, and a comprehensive implementation strategy, which covered the three main areas of cycling, being culture, access to bikes, and infrastructure. Using the same approach, adoption of a policy of cycling targeted at areas housing the urban poor, and particularly those displaced and at the highest levels of vulnerability on the urban fringe could also be successful.
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Building Cities With People

Democratic Urban Design

Co-Creating Cities: the process of citizen involvement in urban design practice through innovative tools and new technologies

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Democratic Urban Design

Abstract: Arki_lab is an interdisciplinary urban design firm based in Copenhagen, Denmark. The office consists of people coming from various backgrounds, such as architecture, landscape architecture, urban planning, communication, sociology and more. What brings these people together, beside their passion for better cities, is their frustration with the gap between designers and the users. Here, in arki_lab, we believe that cities should be constantly shaped and transformed by people. When designing urban spaces, the focus should be put on engaging people in all the design stages. The attention of the architects and urban planners has to be shifted towards the processes of urban formation instead of being stationed on the final product. Furthermore, the outcome of this process should be adaptable and responsive to the changing needs of the users. This is what we call Democratic Urban Design. Our focus at arki_lab is to promote the Democratic Urban Design through developing citizen involvement tools. Educating, activating and empowering local people and communities are the central goal in all of our projects, and those goals are only achievable through processes of co-creation.

In the following paper, we elaborate on the concept of Democratic Design. Also, we try to redefine the role of architects and urban planners in a way that falls in line with the above intentions. Furthermore, some of the tools that we are using to engage the users to a higher degree in the production of space will be introduced.

Keywords: Democratic design; Community building; Education; Physical change; Citizen involvement tools

Introduction

Ever since the height of the 1960s’ functionalist approach to architecture and urban planning, praising architectural geniuses’ such as Le Corbusier for their role as conductors of logical, aesthetic masterpieces, numerous different reactions have seen the light of day (Eiler Rasmussen, 1957). The emerging trends have tried to put the focus on the inhabitants of the city and have tried to adapt evermore-inclusive approaches to urban design. This has happened in accordance with the democratic inspired processes of the 70s in almost all parts
of society. In the field of architecture and urban planning critical urban theory, as one of the most prominent reactions to such rigid conception of cities, argues that “another, more democratic, socially just and sustainable form of urbanization is possible” (Brenner, 2009). Critical urban theory, while is very well discussed in theory, fails to live up to its full potential when applied in practice. (Brenner, 2009). In contrast to almost all other aesthetic and artistic industries, the architectural branch still clings to an elitist, closed off process of creating cities – the most fundamental sphere of our lives.

Whereas sustainable urban development agendas put a big emphasis on environmental and economic sustainability, they largely overlook the third equally important dimension of sustainable development: The social dimension. (Woodcraft et al., 2012) It is however true that citizen participation as one of the ways to reach higher levels of social cohesion has gained increasing importance during the last decades (McKenzie, 2004). In an attempt to put people at the center of the discourse, participatory planning focuses on involving the everyday people in urban processes. Nevertheless, the conventional participatory planning practices, limit the influence of the people to the very first stages of design, and exclude them from further stages. It is often seen as an irrelevant checkbox, to cross off before continuing with the actual work. Consequently, our cities remain to be the product of architects and urban planners, instead of being the outcome of an engaging process involving the users. It is this kind of thinking that arki_lab challenges in its attempt to make socially sustainable Democratic Urban Design focusing on building cities with people.

Our first concern at arki_lab is the communication gap between designers and users, which need our immediate attention. The role that architects and other designers take, should not be defined by isolated professionalism, but should instead look outwards the society. We want to redefine the role of the architect not as the genius of aesthetic forms and proportions, but as the mediator between the professional world of expert-groups of architects, engineers, stakeholders, municipalities, investors, etc. and the actual everyday users. The architect is not a conductor of rigid classic music, but a devisor of a spontaneous, creative jam session where everybody has an equal democratic voice.

Our second concern is best exemplified by the traditional utopian renderings of dreamscape used to present architectural projects. Instead of the final building, space, or other physical products being the key measurement of success, the emphasis should be on the process as the key assessment method for the work. However, this may sound like a very
radical take: Is the end product not what will be standing in the world in the future? We believe it is, but it is only a good process that leads to a good end product. Thus we envision a shift from the masterplan towards the masterproces.

In the following, we will expand the theoretical background for our approach and how our work-practice has been shaped into the 3 focus-areas. The first is the need for spatial education; creating a common language and shared understanding between experts and laypersons. The second is the need for community building, which secures that the interventions will be socially embedded in the local people as part of their everyday life. The third is the actual physical change, which should mirror the process and the people’s involvement. Using examples from our different projects we will show how these focus-areas are intertwined in all parts of our daily practice. In the end we will present some of our concrete tools with which we facilitate our work reflecting these three dimensions of Democratic Urban Design.

**What do we talk about when we talk about “Democratic Urban Design”**

Henri Lefebvre’s notion of the right to the city is a widespread concept today. The right to the city, as David Harvey (2008) argues following in Lefebvre’s footsteps, is not only the ‘individual liberty to access urban resources’; it is also ‘a right to change ourselves by changing the city.’ The freedom to remake one’s city after one’s ‘heart’s desire’ (Park, 1967) is thus a common right of exercising ‘collective power to reshape processes of urbanization’ (Harvey, 2008). To put it in simpler words, the right to the city is a call to collectively search for an alternative city in which urban dwellers actively create and recreate their everyday spaces in resonance with their needs and aspirations. We build ourselves in relation to our material surroundings and vice versa. Or as Robert Park coins it: “In making the city man has remade himself” (Park in Harvey, 2008).

This stand is in sharp contrast to how building processes are organized today. In the system, which surrounds the creation of new places, exists an alienation. The places are ordered, planned, determined and constructed by a huge apparatus of developers, clients, architects, engineers, etc., and those are people who in all likelihood don’t have a relation to the place being created nor are future users of the place. The everyday people only play a minor role in this rigid machine-like system. The thought of seeing a group of teachers building their own school seems absurd. To build have become an expert function in our society (Giddens, 1990). The consequence of this mismatch between the right (and need) to
co-create your city and the large degree of professionalism alienating the everyday citizen from urban planning and building processes results in an extremely low degree of social sustainability.

The Social Life report defines social sustainability as “a process for creating sustainable, successful places that promote wellbeing, by understanding what people need from the places they live and work. Social sustainability combines design of the physical realm with design of the social world – infrastructure to support social and cultural life, social amenities, systems for citizen engagement and space for people and places to evolve.” (Woodcraft et al., 2012) In order to achieve social sustainability, users’ needs should be fully understood by the designers and the optimal way to gain such understanding is involving the users as much as possible in all design stages.

The other important factor when talking about Democratic Urban Design, which is also tightly linked to the right to the city as well as social equity, is best illustrated in Agger & Hoffman (2008) writing on the democratic process:

“A criterion for a democratic process is – in a representative understanding of democracy – that those, who wish to make their influence count, should have the possibility to do so. In this light user-involvement should in principle be open and reach out to everyone. In practice however it is seen, that there are certain groups which it can be hard to reach, for example young, ethnic minorities, children families, elderly and socially marginalized groups, but also resourceful actors, who choose not to participate. It is therefore important how the groups viewpoints are captured and handled” (Agger & Hoffman, 2008)

The Democratic Urban Design process, is not only a design process that is fully oriented towards people’s need by way of involving them in all design stages as much as possible, it is a design process that put a maximum effort into reaching out to those vulnerable social groups whose voice is difficult to hear.

The need for a new way of working

In line with the above discussed concerns and in order to achieve a quotidian dynamic adaptation of urban spaces, Lefebvre attributes two central rights to the inhabitants: The right to appropriate urban spaces and the right to actively participate in their production. The right to appropriate urban spaces involves the right to occupy, access, represent, characterize and create spaces based on everyday needs of the inhabitants, while the right to participate
ensures that inhabitants are central to all the processes of decision-making concerning the production of urban spaces. What we usually fail to notice is that the right to participate has further implications than sending out formal questioners or information pamphlets to the users about the changes that are going to occur to an urban space. Stephen Bass et al. (1995) identify six levels of participation:

- Participants listening only
- Participants listening and giving information
- Participants being consulted
- Participation in analysis and agenda setting
- Participation in reaching consensus on the main strategy levels
- Participants involved in decision-making on the policy, strategy or its components

While in the first three levels participation is seen as a checkbox that should be crossed off before continuing with the actual work, the last three levels put a stronger emphasis on the actual users being involved throughout the entire process. It is however argued that the last level is a function of national decision-making processes that ensure the participation outcomes are being implemented. (Bass et al., 1995) Hence, the highest degree of participation during the design process is reached in fifth level, where all the users have to reach consensus before any decision is made.

If we accept Lefebvre’s suggestion of the right to the city and if we admit that the users should actively participate in all stages of space production, one crucial question arises: what would be then the role of an architecture office, a rather homogeneous group of people in the space production? The realm of the everyday is the streets, the parks, the rooms, buildings and spaces of the city ranging from the public, via the semi-public and semi-private to the private. Much of this space is a seemingly chaotic mix of more or less everything imaginable. The city contains endless individual ideas of 'the good life, and 'the good city'. That is why the street is conflicting in many ways, chaotic, dirty and constantly changing (Sennet, 1992). On the other hand there is the office of the classical architecture firm: clean and functional. There is a miscommunication between these two realms: One of them is so overwhelmingly complex; the other is almost too easy to read. If all spaces should be produced through citizen involvement, shouldn’t we simply eliminate the architects and planners from the process and leave the job entirely in the users’ hands? Not at all. Exactly because of the professionalization of the processes, with the rapid growth of the cities and increasing
number of actors who play a role in forming our cities, architects and planners are needed
more than ever before. That is the main reason why we, at arki_lab, had to rethink our role
and reconceive our working methods. Instead of being the master-planners who make definite
decisions for people, we see ourselves as mediators, negotiating between the different
stakeholders of the everyday. This is especially important, as “between equal rights force
decides' (Marx, 1867). Hence, our mission is to level the scales, so that the ordinary citizen
stands a chance against the overwhelming system of construction and urban development.

The citizens as active co-creators

As stated before, architects and planners’ goal must be the people of the everyday. With this is meant the everyday users of spaces who are not professionally involved in the building-system and thus not have officially acknowledged position to affect change. Citizens are thus not defined by their official national or municipality status, but by their right to the city as dwellers and users of a certain domain. The involvement of the everyday citizens is not only ethical principle but also a major creative resource: “The right to the city involves building capabilities, creating active publics capable of engaging in the production of knowledge and transformative engagement with the world and public matters.” (Farias, 2011) Besides transmitting peoples’ voice to the other involving actors, we activate the built-in knowledge and productive potential of the everyday people. This is where we separate our methods from the conventional participatory planning methods. Where they view themselves as subjects and the citizens as objects of study, we envision the citizen as an active subject who is co-creating with us.

What we have learned from experience is that people are not always consciously aware of their own perceptions of their city, their actual needs or what they want in their urban spaces (Seamon, 1980, Merleau-Ponty, 1945). To access the phenomenological life-world of the citizens we need carefully constructed tools. Therefore we can’t simply ask, but “rather, we shall have to tease the information from the subject, using whatever means psychology can offer to inspect the contents of the mind” (Milgram, 1976). This information is of course discussed with the subjects opening their own perception in reciprocal learning situations. If the citizens discover an ice-skating ring would brighten their city’s winter
slumber, we as urban planners discover this to. Therefore, at arki_lab, a central part of our
everyday work is developing tools that on one hand help people to learn more about their
living environment and the ways that they can improve it; and on the other hand, help us to
understand what people need in their cities.

Our Design Trio

Arki_lab started out with a genuine curiosity for how we could develop tools for our concept
of democratic design, hence the name: We are an ‘architectural laboratory’. We wanted to
activate people, and to let their knowledge, their individual ideas of 'a good design' for a
specific site shine through. After years of experience and experimenting with citizen
involvement, we have realized that there are three areas towards which we have to direct our
focus in order to make socially sustainable democratic urban design: education, community
building and physical change. Our ideal design process, or the master process, as opposed to
master plan, is the one that brings these three focus-areas together. These three areas always
overlap in our projects and it is challenging to completely separate them. In spite of that, the
three following sections use three of arki_lab projects to exemplify the three mentioned areas.

Figure 1: arki_lab's design trio

Education:
The German Sociologist Axel Honneth criticize the stratification of contemporary society
arguing that the views of the lower, less educated classes are ignored in the public debate,
because they fail to refer to broadly recognized coherent moral systems (Honneth 2003, 2001). This however doesn’t mean they don’t have access to a kind of intuitive ad hoc morale concerning most things in society – including city space and architecture (Honneth, 2003). This corresponds to our experience working with all kinds of people; they do care about their physical surroundings, but they either aren’t given the chance or lack the resources to articulate their views in ways that will carry weight and have an impact. Because of this our work involves a translation of this intuitive ethic or ad hoc opinions on physical space into a common language which can be discussed in the public debate and thus integrated into the building-system (Honneth, 2003). This involves giving the people the tools to express their opinions. Thus we reach the first major element of our approach: Education.

Education of people is also a prerequisite of participation as professor in social work Golam M. Mathbor states: “[E]ducating people about the development initiatives and outlining a plan of action is critical in generating a process of participation” (Mathbor, 2008). The people need to be kept in the loop to participate and contribute to any given project. When we engage with the citizens we thus seek to create communities of practice - a collective of people who share a passion about a place and try to understand it better - where we join forces with the citizens to develop places together and learn from each other in participatory processes

(Wenger, 2000). Our position thus aligns itself with new views in actor-network-theory realigning the relation between the experts and layperson. As Ignacio Farias argues insights needs to be made ‘known’ and “‘known’ means here that they are shared, socially accessible, discussable, open. This involves a symmetrization of knowledge positions between experts and laypersons [and] the redefinition of their identities, valuation criteria and languages” (Farias, 2011). In this was we seek to return knowledge to the people by the creation of a common language.

Our starting point was the schools of Copenhagen. How could we engage people in architecture, when the architectural language is so far from the everyday language? We needed a language that was accessible to all, even kids. Our school projects focus is to use architectural methods to create learning projects across the disciplines in school, and over a longer-term project introduce various concepts, tasks and activities. In this way our different projects range from teaching choice subjects to government founded research projects, where

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1 These communities are not only made with citizens but are also a central way our office works, with wide open doors we’re we continuously invite architectural students, pupils, interns, locals and experts inside to partake in our work. The work culture at arki_lab is constructed around this kind of thinking
the students had to participate in Park(ing) Day, create their own perfect classroom, redefine their school yard, identify areas they wanted to change in their local area, solve professional architectural design tasks, create exhibitions and build temporary installations.

The project’s grip on education differs from the traditional didactic classroom-based teaching according to the structure and tools that we use. We want to make sure, that the students get an understanding of the relevance and importance of the learning process rather than focusing on the results, and rather than let the project being based on fictitious issues, it is the students’ own local environment that are brought into consideration. By using the city, which provides the framework of the students’ everyday life, we break down the typically sharp distinction between schools and self, which may be a barrier to student’s engagement in learning.

Our own experience has also shown us that involving young people in the urban design process has the potential to teach them new skills and competences, or it shows them how knowledge gained in the more traditional school setting can be applied to ‘real life’ situations. While each of these school projects stimulates project-based learning, it also encourages the young designers to look outside the school and begin to consider aspects of their local urban setting and community, leading to a greater understanding of the relationship between space, place and the people that inhabit it.

Figure 2: Workshop with students in front of arki_lab
Community Building:

We put a lot of emphasis on the empowerment of the people involved in order to identify needs and reach solutions that will be of direct benefit to the community. In this way the communities of practice that we seek to create are not only educational but also community
building for example by empowering the citizen’s relation to the place and their feeling of identity. Democratic design is an investment in a community, creating community value (Wenger, 2000). The reasons stated above all contribute to creating a social value that is incredibly important for a successful and vibrant city but very difficult to generate - especially from ‘top-down’ initiatives. Educating people and giving them new skills but also giving them a motivation to reflect on their neighborhood, generating knowledge from local communities on what they need and want, are all part and product of a process that empowers those involved and has a unique potential to boost the community values.

To exemplify some of the main aspects of community building we can turn to our intergenerational research project for the Ministry of Housing, Urban and Rural Affairs. The project addresses the increasing problem of age-segregation in the Danish society, where we from birth are divided into nurseries, kindergartens, schools, universities, workplaces and retirement homes (Hagestad and Uhlenberg, 2005). Therefore, community cohesion in our urban and residential areas is the main task of the overall project, with a special emphasis on the integration of elderly citizen groups.

arki_lab’s aim in the project was to foster interaction across generations in urban space in order to increase community cohesion and decrease side effects of age-segregation such as loneliness. We think that the best scientific results are shown in real change, so we’ve devised the project positioning itself between action and design-based research intervening in the local community (Majgaard, 2011). In one of the case areas of Sydhavn in Copenhagen facilitated the establishment of an intergenerational urban garden. In close relation with the area renewal of the municipality in the neighborhood, we brought the different interested actors; a public school, the local senior organization, the local university branch and local activists together around the table and mixed them with the needed professional expertise of urban garden planners and municipality workers to fertilize the development of a common plan and application. Again being the mediator between the average citizen and the system creating a common community of practice with the shared goal of creating the garden.

Our work was characterized by lengthily involvement with the different groups, countless cups of coffee, mediating cultural differences, bridging gaps of reciprocal understanding, small degrees of conflict solving and a continuous exposure of the different groups to each other, activating and empowering the local community to take matters into their own hands.
In this way our engagement process in itself was designed to have an age-integrating aspect leading to a lot of laughs when kids and seniors interacted at our workshops.

By focusing on community building as part of our research we made sure our interventions had anchoring, the plans where embedded in the social structure and the project would continue without our continual engagement.

Figure 5: workshop with different age groups for the intergenerational project

Physical Change:

Of course physical impact is one of our focus-points in arki_lab, because as architects and urban planners physical change is our job, but it never comes in the first stages of a project. We always start be designing the complex involvement processes which will then lead to physical change. The physical space is never designed without a thorough socio-cultural study of the area, and no permanent structure is ever erected without making sure it bears the imprint of the citizens involved. In this way education and community building is always a prerequisite of physical change. Arki_lab’s Marseille project ‘Plan d'Aou’, a neighborhood revitalization plan, is one of the best examples of a project that was launched with the goal of having a large-scale physical impact. The proposal suggests a rethinking of the traditional historic French Village, known worldwide for its community building abilities as well as its celebration of the natural setting.

In the Plan d’Aou project it was crucial for arki_lab to involve and activate the knowledge of local inhabitants and stakeholders. As Plan d’Aou is a neighborhood with an infamous
reputation, reaching the point where taxi drivers won’t even take you there, it was especially necessary for us to place as much of our work out in the area. Being on site was a key element in breaking this bad reputation. The workshops with the local stakeholders and inhabitants have so far created an understanding of the social and physical context of which Plan d’Aou is a part. This knowledge has been processed and analyzed to build a cornerstone for the rest of the process.

The proposed holistic process of participation and involvement aims to give citizens a sense of ownership and ‘place’ in Plan d’Aou. Its community focus establishes a firm social foundation for the future development, which insures both interests in the site and social sustainability as well as addressing social issues by empowering the people involved. After the social life and structure is secured and heavily rooted in the design process, the infrastructure of this life must be carefully organized. This is where the prototypes, temporary models and the outcome of the workshops are translated into buildings. As well as the design of the public spaces and the social aspects, the physical infrastructure is also done in a participatory way, where arki_lab qualifies the knowledge created, and ‘translates’ it into a comprehensive plan with a toolbox that architects must refer to and use when detailing the future buildings and spaces. It’s important to emphasize this critical point, where most traditional participation processes missteps. The design needs not only to reflect the citizens’ ideas, but also needs to be based on them and qualified by our professional skills and know-how. This is the important point where the architect and urban planners role shift from being a mediator to also involve being an interpreter making a ‘translation’ of inputs from the citizens into fully fledged professional designs. It is further important that the citizens of Plan D’Aou are continuously involved to maintain the feedback-loops and also in embedding the physical changes in the existing social structure of the neighborhood. In this way there is no traditional ‘end-product’ in our work in Plan D’aou, but a continuation of the process already started, with ongoing implementation of both social and physical change.

Finally, through the dimension of learning and community building in our projects, we reach the solution for the physical product, it being a public space, a building, or redesigning of an existing physical form. In a nutshell, using such processes we not only create and empower communities and individuals, but we also reach the true ‘good design’, sustainable to the ever so complex needs and wishes of the everyday.
Figure 6: First stage planning workshop with citizens, Marseille

Figure 7: arki_nopoly workshop with citizens, Marseille
Tools To Get There

To make the most out of our design trio, we need a set of methods to facilitate our design process and to help us co-create the city with the citizens. As we matured as an office and learned more about the different ways of involving the citizens in all planning stages, we developed this set of tools to tackle the issues at hand. As we move on with our projects and gain more experience, we improve our tools accordingly. Our toolbox is a universal one, where the tools, when adapted and adjusted, could be used in different context. Below are some of our tools that we have used in many of our projects.

Arki_nopoly: The board-game arki_nopoly was developed as a tool to facilitate both purely educational projects but also for citizen involvement in projects with a physical outcome. The game therefore is centered on a specific site, of which the participants have a daily knowledge. The aim of the game is to activate this 'silent' knowledge of the participants; broaden it by means of discussion, analysis and debate; developing new ideas based on this knowledge and analysis; and finally to assess and gather this knowledge for further use. It is basically the steps in a design process translated into a board-game format.

Figure 8: Kids playing arki_nopoly
The game’s structure is much similar to ‘monopoly’, and therefore easily accessible. It has a huge versatility, as the different slots around the edges can be changed to involve questions or steps crucial to the exact project. A group often consists of people from many different ages, occupations and interest. Therefore it is designed to be a collaborative process within the groups, where all members have to participate and help each other in order to ‘win’ against the other groups. The element of winning or loosing is only a secondary feature of the game, which in our experience especially helps in activating and focusing the children and youth who might be participating.

The main outcomes of playing the game are insights into the everyday practice of the participants, their concrete problems, and ideas for solutions.

Figure 9: An exhibition of the arki_nopoly results

CoCityApp: CoCityApp is a smartphone application which allows everyone to engage in the transformation of the city. The steps are very simple. You take a picture of your interest area, make a collage that illustrates your vision for the area, and upload it on the web. The outcome would be a collection of collages that is accessible to all citizens and municipalities.

The CoCityApp is an important tool for all facets of the community. It is a source of community empowerment. Simple, fast and easy to use, the CoCityApp encourages citizen involvement on the go by allowing people to share visions and dreams concerning their urban environment. On the other hand, the CoCityApp enables decision makers to get a real-time image of their city through the eyes of its citizens. This data is invaluable for the
development of any municipal-driven project or planning strategy, and much more meaningful than the typical, outdated approach to community engagement such as a questionnaire or online survey. The CoCityApp can be used either by individuals or groups as a useful tool for co-creating your city.

Figure 10: Using CoCityApp

Figure 11: Using CoCityApp
**Arki_probes**

The arki_probes is a development of the idea of cultural-probes (Gaver, 1999). They address the problem that you can’t follow people around in their everyday life to document their behavior and use of spaces - instead we send a probe with them. arki_probes can take many forms, some simply being a postcard with a question or a map to draw on, others being small kits of multiple probes ranging from maps, urban diaries and disposable cameras to full scale digital platforms. The probe-kits can be themed in different ways to engage specific user-groups, for example as an urban scavenger hunt aimed at families with kids. The point of the probes is that they are easy to deploy [hand out to people] and have an inbuilt return mechanism [by mail, by delivery to a certain place, by uploading].

One of our very successful probes are the memory-diary aimed at very old people, where they gain the possibility to tell about they life, experiences of living in their neighborhood and their wishes. These gave a unique insight into the everyday life of a user group, who are very hard to engage by normal approaches.

*Figure 12: arki_probes used in the intergenerational project*
Conclusion

In this paper we have framed the two main changes in contemporary architecture that arki_lab tries to promote. The first being the change of the conception of architect as a closed off elitist professional working as an artistic genius designing cities for people, to the architect as a mediator between the ideas of the ordinary people and a complex urban development system designing cities with people. The second change is the shift in focus from a master-plan ending in a concrete easily rendered utopian end-product. Instead we choose to focus on a master-process, where the involvement and engagement of the future user groups is the most central goal. These are the main prerequisites to move towards a social sustainable democratic urban design ensuring the citizen’s right to the city.

Embracing these democratic values in our work demands some drastic changes in the way we go about ‘doing architecture’. We focus on 3 elements in devising our engagement processes: 1) Education of the ordinary citizen building a common language of architecture in the process, 2) building community and relations between the citizens and the cities they inhabit through engagement and participation, 3) making physical changes in close cooperation with the end-users and based on their needs and ideas.

In the different projects that arki_lab has been part of during the last couple of years, we have experimented with developing this approach. This has led to the use of different arki_tools, a set of easily adaptable tools for user engagement and participatory design processes. It is our hope that these tools, as consequences of our collaborative approach to urban design and architecture can be an inspiration for all to how we can change our perception of architecture to something living we do together. We hope this can be a first step towards a global movement of building cities with people.
Bibliography


‘Let’s make a prototype’: Exploring temporary urbanism in the form of transitional urban design schemes that can be tested prior to permanent implementation

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‘Let’s make a prototype’: Exploring temporary urbanism in the form of transitional urban design schemes that can be tested prior to permanent implementation

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Abstract: Temporary uses of urban spaces are generally not foreseen in urban planning and design have been often connected to urban disturbances and disorder. However, temporary uses might also help reveal, elicit or test alternative urban design ideas, for example by adding or enhancing aesthetic or functional characteristics for a limited period of time. From that perspective, temporary urbanism could be conceptualised as an envisioned type of urban design rather than a substitute for permanent development.

Urban design schemes have been critiqued in regard to design goals that have not been met after implementation. This is indeed a risk, even for well-designed projects, in particular with big budget schemes. The paper discusses processes that may help minimise risks by testing urban design schemes prior to permanent implementation. Following on from Christchurch's transitional city programme facilitated by local government and community organisations, the paper explores ideas regarding utilising transitional urbanism to test urban design schemes.
Drawing on empirical research during Christchurch's post-earthquake recovery process, international case studies and a critique of ‘traditional’ urban design processes, the paper discusses the benefits of temporary urbanism and argues that temporary schemes could help detect potential issues that may arise post implementation at an early stage. The discussion advances the use of ‘low-budget’ urban design schemes in order to test ideas before permanent solutions are implemented, thus creating a successional urban design process. This process has the potential to assist urban designers and property developers in sourcing solutions to urban design problems through low budget means in austere economic conditions.

**Introduction**

With an estimated population increase to 9.6 billion by the year 2050 (United Nations, 2004), and a shift of 60% of the population living in urban areas by 2030 (United Nations, 2005), the design of public open space within the city has never been more important than now. Creating successful public open space is a challenge in its own right, especially with the economic and environmental climate of the 21st century.

During the course of a city’s development through time, temporary uses of urban space are generally not foreseen in urban planning and design, this has often been connected to disturbances of the urban fabric. However, temporary uses of urban space might help reveal or test ideas, for example by adding or enhancing urban spaces in a temporary nature might reveal hidden characteristics or aesthetics. From this perspective temporary urbanism could be conceptualised as a key part of urban design and planning to test ideas rather than a substitute for permanent development.

This paper sets out to critique the traditional urban design process to expose its constraints when implementing well designed large budget schemes. This paper will discuss processes that will help minimise the risks involved with such schemes for developers, architects, landscape architects, urban designers, and planners by testing urban design schemes before permanent implementation, thus turning the urban fabric into a laboratory to test ideas.

The city of Christchurch is currently in a phase of transition as it recovers from the 2010 and 2011 earthquakes. This paper outlines the NGO organisations that have been set up to provide temporary urbanism projects as a form of recovery for the communities within Christchurch and the Christchurch City Council’s Transitional Programme that provides funding to people wanting to create temporary urbanism projects.
Although a relatively new idea there are international case studies where this process has been adopted almost by accident as temporary urbanism schemes become so popular that they are permanently adopted by cities. This paper will explore such case studies to take lessons learnt forward into proposing a new urban design process that includes temporary urbanism.

This paper will also further discussion around including temporary urbanism as a part of the urban design process to test urban design ideas and proposing the idea of a successional urban design process.

**Christchurch Transitional Program**

On September 22nd 2011 a 6.3 Magnitude earthquake struck the city of Christchurch causing major devastation to the city, resulting in 185 deaths and 6500 casualties (McSaveney, 2014). 80% of the Christchurch central city building stock demolished, along with 10,000 suburban homes demolished (Bennett, et al., 2013) As a result the city began to experience a doughnut effect as businesses relocated out of the city to the suburban office parks, the remaining businesses in the central city became isolated from each other and the rest of the city. Due to the political environment of the city and insurance issues, development stalled this created a wealth of empty space in the city that had become desolate, some of which is still seen today. A number of Non-Governmental organisations started to activate these spaces through temporary urbanism. Groups such as Greening the Rubble, Life in Vacant Spaces, and Gap Filler implemented temporary urbanism schemes alongside the Christchurch City Council’s Transitional Program which provided funding to applicants who wanted to temporarily activate sites within the city. As well provide council owned temporary schemes (Christchurch City Council, 2015). Examples of such temporary schemes that are successful include; High Street Transitional Project (Christchurch City Council, CCC), Pallet Pavilion (Gap Filler), ReSTART Mall (Re:START & the heart trust). These schemes attempted to take back the city and provide life to vacant spaces within the central city.

The temporary nature of these schemes are designed around temporary use but also recycled lightweight materials that are used in innovative ways this provided them with a certain character which has become synonymous with the city.
Critique of Traditional Urban Design Processes

The urban design process has been extensively researched and studied over the past century, ultimately the process is in a state of ongoing flux as new methodologies are devised and new issues and constraints force the urban design process to adapt. This could be argued about the current urban design process which has evolved to include sustainability principles as a part of the process due to the ongoing discussion around climate change and cities (Ewing, et al., 2007).

Traditionally the urban design process was developed out of necessities, this is seen in the medieval layout of cities as fortresses to protect against invaders (Morris, 2013). The European renaissance followed, where cities were planned based on baroque influences. Important discussions at the time were based around traffic flows, sanitation and aesthetics (Friedman, 1988) the process at the time also revolved around the necessities of the cities and how urban planning can help solve some of the issues that arise from cities that are growing. The European enlightenment period (1700-1800) followed, marked by various disasters that became catalysts for redesigning major cities as a show of power to other nations. This was a significant time for urban planning. Spanish engineer Ildefons Cerdà coined the term ‘urbanization’ in his plan for Barcelona, where he aimed to improve the health of Barcelona’s inhabitants, enhance social integration and improve the sunlight exposure of urban open spaces (Busquets, 2005). This brief timeline shows the historical movement from top down planning methods towards a more human scale method of planning that has more recently been discussed in detail by post-modern urban theorists such as Jacobs (1961), Lynch, (1960) and Whyte (1980). More recently, the 19th century gave birth to modern planning ideas as a direct consequence of the industrial age and its effect on the urban poor (Howard, 1902). What emerged was Ebenezer Howard’s garden city movement which theorised that the working environment should be separated from where people lived, providing them with a healthy living space from where they could commute into the city to work. This method of planning became popular throughout England and the United States of America (Fishman, 1982). The 1920’s brought about the Modernism Movement within urban planning, pioneered by modernist architect Le Corbusier who produced the ‘contemporary city’ concept that proposed a city for three million people who would be housed within large skyscrapers placed in the centre of large parks. The idea was to house people in high-density buildings, allowing for more public open space surrounding these buildings. Le Corbusier promoted the car as a means of transport and segregated it from pedestrian paths (Fishman,
Modernism was criticised towards the end of the 1960’s for its grand scale of planning and architecture that disconnected the city from its inhabitants (Goodchild, 1990). The modernist movement of this period did not involve public participation as a part of the urban design process which created disconnected cities that were not designed for the people that lived in them.

These ideas and theories help shape the framework to challenge the traditional processes within the urban design discipline.

The post-modernism ideas theorised by academics such as Jacobs (1961) believed that planning should focus on the human scale and criticised the top down planning ideas of the modernist period (Jacobs, 1961). Jacobs work in “The life and death of great American cities” is seen as a normative precedent for urban design and planning that many academics use as a basis for urban design and planning today. Jacobs (1961) critiques the urban renewal policies of the 1960’s and discusses how they destroyed communities and created isolated urban ecological habitats. Jacobs (1961) discusses what makes a vibrant street, theorising that eyes on the street create safer streets and diversity in activity attracts people to socialise on the street, creating vibrant urban spaces. Jacobs (1961) also discusses the need for mixed uses, small blocks and heritage buildings – a distinct change from the grand scale of urban design theorised in the modernist movement. Jacobs (1961) challenges the traditional urban planning process by protesting to include public participation within urban planning processes. Lynch (1960) discusses similar ideas but focuses on legibility and way-finding within the city. These ideas echo theories discussed by Jacobs (1961), reiterating planning at a human scale (Lynch, 1960). (Alexander, 1964) proposed the idea that urban design and planning was too focused around the idea that cities consist of separate functions, and argued that this type of planning is unhealthy for the way cities are planned; that in fact cities are full of overlapping functions. Alexander (1964) used the language of patterns to explain these differences, explaining that a planned city has a tree pattern, whereas a natural city has a semi-lattice pattern. This point echoes the critiques of Jacobs and Lynch of 20th century planning methods and introduced human complexity and public participation into planning that at its core is a key part when designing urban space.

These ideas were developed over 50 years ago, yet cities and their public urban open spaces are still criticised as it seems there is a gap in the implementation of these post-modern ideas. One architect/urban planner who has managed to implement some of these ideas is Gehl
(2010), who expanded on the theories of post-modern academics. Much like Whyte (1980), Gehl focused on redesigning cities on a more human scale and has implemented strategies for Copenhagen, Melbourne and New York. The strategy for Melbourne has turned the city centre from being deserted to vibrant, named the most liveable city in the world by The Economist magazine (Economic Intelligence Unit, 2011). The evolution of planning from the top down to a human scale has helped turn cities and suburbs from unattractive, deserted places to vibrant and liveable places.

Temporary Urbanism

Temporary urbanism or ‘Tactical Urbanism’ as it is sometimes could be considered a relatively new idea in the 21st century. However, (Lydon, et al., 2012) stated that the idea behind temporary urbanism first arrived in 16th Century France with what are called Les Bouquinistes or the booksellers. These were informal travelling booksellers who created pop up stores on the banks of the River Seine to sell books, due to private business owners complaints these informal pop up stores were shutdown. However, due to their popularity the city had to eventually allow their presence to become permanent. Today the Les Bouquinistes is a UNESCO world heritage site (Lydon, et al., 2012). This was a beginning for temporary urbanism, the idea evolved through a timeline of influential events that helped shape temporary urbanism that we see today, this is outlined by (Lydon, et al., 2012). One early event in 1970 was Bonnie Sherk’s portable parks project which were art installations aimed at bringing unexpected nature to urban locations in San Francisco (Lydon & Garcia, 2015). The timeline outlined by (Lydon, et al., 2012) shows a gap in key influential events between 1970 and the early 2000s when the Park(ing) Day developed in San Francisco, and the Pavement to Plazas program started in New York which involved the Times Square Case Study. Today temporary urbanism can be linked to disturbances in the urban fabric for example the Christchurch Earthquakes and the subsequent transitional projects and programs that evolved in the aftermath. Temporary urbanism utilised in a post disaster scenario has been explored by (Wesener, 2015) who detailed that initial temporary development post disaster focused on temporary housing. Wesener (2015) showed that the context of circumstances influences the processes of temporary urbanism, and described the temporary urbanism of post disaster recovery as drivers for urban recovery and regeneration, which has received official endorsement and public funding (Wesener, 2015). This sets the city of Christchurch up as an ideal urban laboratory to test ideas through temporary urbanism as the endorsement and buy
in by both the public and local government allow greater freedom to implement temporary urbanism ideas.

**Urban Design Process**

The urban design process is difficult to define as cities and indeed countries have different processes and political environments which can have an effect on the way urban design and planning is undertaken. However, a comparison of urban design protocols from New Zealand and Australia allowed analysis of local urban design processes. The documents reviewed were the *An Urban Design Protocol for Australian Cities* (Australia) and New Zealand *Urban Design Toolkit* (New Zealand).

An Urban Design Protocol for Australian Cities outlines an indicative process for creating high quality urban design projects. This process consists of:

**Context**

A strategic planning framework that analyses what economic, environmental and social outcomes need to be achieved and prioritises actions to achieve these outcomes.

**Engagement**

Relevant stakeholders, including community members should provide feedback during the urban design process. The protocol states that stakeholders can help develop the vision and review design options (Australian Government, 2011).

**Excellence through**

- A design process that embraces visionary leadership and should embrace a design champion as a part of the project team.
- A multidisciplinary approach to ensure competency within the design team.
- Integrated processes that includes consulting stakeholders, a vision, detailed brief, thorough analysis
- Realistic and varied options
- Document preferred option
- Select procurement method
- Evaluate outcomes
**Custodianship**

Ensure systems are in place for the ongoing maintenance and management of the place over a long-term time period.

The *New Zealand Ministry for the Environment: Live Work Play, Liveable Urban Environments: Process, Strategy, Action* outlines an urban design process to create high quality urban design. The document outlines a five stage process which includes:

*Do the Groundwork*

Background information that outlines project objectives, defining the urban environment to which the project is taking place, learning information about the community to successful create a consultation exercise and how can the project fit with larger projects within the same context.

*Learn what the community wants*

Outlining a consultation process that is tailored to the specific community to which the project sits within. This will help learn what the community value within public space as a whole, and what they want changed. An action plan as a part of this stage is crucial to outline how objectives and community needs and wants will be achieved.

*Design a strategy*

The design strategy stage includes providing a clear strategic direction, a mix of management methods, public participation and clear documentation. The strategy needs to reflect what the community want but also be realistic in respect to time and resources.

*Measure success*

The measure of success outlined in this document is the design project creating a place that is good to live, work and play in. This part of the process is defined as what, when and how monitoring is takes place to measure success this allows the project to change to further meet the needs of the community (Ministry for the Environment, 2002).

Comparing both these documents, both outline the need for engagement not only at early stages of the design process but as an ongoing discussion to achieve outcomes that stakeholders and the public desire. However, both do not discuss the idea about testing design options prior to permanent implementation. This provides an opportunity to open the
discussion around testing design ideas before permanent implementation through the use of temporary urbanism.

**Benefits of temporary urbanism**

Temporary urbanism is a growing body of research and the reaction is mostly positive.

The benefits can be grouped into three categories.

- Economic
- Social Benefits
- Adaptability and experimentation

**Economic**

Temporary urbanism is noted as being a relatively cheap measure to developers, land owners and councils, most costs are attributed to maintenance and labour (Senatsverwaltung für Stadtentwicklung Berlin, 2007). SQW Consulting performed a report on the temporary use of urban space in the UK and noted economic benefits to both property owners/leaseholders as well as the community. The report outlined that the temporary use decreased the cost of security as active occupation discouraged vandalism. A case study in Cambridge, England was identified and revealed that temporary urbanism saved a land owner £18,000 in empty property business rates over the course of 6 months. The economic benefits to the community were noted as being low cost and a low commitment to space as there wasn’t a need to commit to a long term lease and allowed community groups to get established and create quick wins. (SQW Consulting, 2010).

**Social benefits of temporary urbanism**

The social benefits of temporary urbanism have recently been studied by Wesener (2015). The research analysed community initiated open spaces in post-earthquake Christchurch. Wesener (2015) found that temporary urbanism in a post disaster recovery setting had positive effects on community resilience as community resilience is influenced by positive attitudes and actions of individual community members. Wesener (2015) was able to identify that temporary urbanism, fosters community empowerment, create and strengthen social capital and create opportunities for positive emotions and experiences. The fostering of
community empowerment is noted as the “highest identified level of public participation” (Blake, 2013).

*Adaptability, experimentation*

Lydon, et al. (2012) outlines that temporary urbanism projects intentionally create a laboratory for experimentation and allow for an incremental approach to city building. Lyndon, et al. (2012) also noted that there is merit in a municipality or developer spending $30,000 on a temporary plaza before spending $3,000,000 on permanent change.

Wesener (2015), reinforces the ideas put forward by (Lydon, et al., 2012) as the research stated that temporary projects provide opportunities for creative experiments. This is evident in Christchurch as the earthquake decimated the urban core providing a blank slate for which experiments to take place in.

This brief overview outlines the benefits that temporary urbanism has on both community and property owners/leaseholders. It builds a case towards including the use of temporary measures within the urban design process.

**International Case Studies**

Temporary Urbanism is an international phenomenon that has exploded over the past decade, there are many case studies where temporary urbanism projects have become so popular that people have demanded they become permanent. This creates interesting case studies that can provide lessons learnt when developing a process of testing ideas before permanent implementation.

*Times Square, New York, USA – New York Department of Transport*

The New York Department of Transport (DOT) undertook a pilot project called Green Light for Midtown in 2009 which seeked to address issues and provide opportunities to Broadway. Broadway cuts the diagonal grid of Midtown New York creating complex intersections and interesting geometry for public spaces to work with. The goal of the project was to improve mobility, safety and provide additional benefits to the project area.

The project rerouted traffic away from Times Square, thus turning the square into a pedestrian plaza. However, an issue was quickly identified days away from the opening of the plaza that the Times Square Alliance had not organised or provided seating for the area. The director made a pragmatic decision to hastily order cheap beach chairs, this provided a
temporary solution for the area, which was well received by the public. Ultimately a decision had already been made to find a more permanent solution to the seating problem (Grynbaum, 2009). However, the quaint nature of the cheap beach chairs defines the character of temporary urbanism.

Figure 1. Times Square Temporary Intervention (New York City Department of Transport, 2010)

A report was undertaken by DOT to evaluate the success of the pilot project and analysis of the changes made to the area resulted in empirical data supporting that the project had succeed in meeting its objectives, and a decision was made to make the changes permanent.

The DOT found that as a result of the pilot project, 84% more people were engaging in stationary activities in Times Square and on Broadway, both on the weekdays and the weekend. It was also assumed that if pedestrians were spending more time in the space they were potentially spending more money, thus potentially improving the local economy of the place (New York City Department of Transport, 2010). Responses to a survey conducted by the Times Square Alliance reinforced the findings by DOT and respondents have said they were heading into Times Square after work to shop and spend time in the area and also that 26% of people in employed in the area are heading out of their offices for lunch more frequently (Times Square Alliance, 2009). It was concluded that given the significant
positive response to the pilot project that DOT recommended that the changes made by the project be made permanent and built upon to increase the vibrancy of Midtown. DOT also made the recommendation that the temporary materials in the project be upgraded to further enhance Times Square and Broadway (New York City Department of Transport, 2010).

Architectural firm Snøhetta were commissioned to design the permanent pedestrian plaza for Times Square and Broadway. Their design rationale “creates uncluttered pedestrian zones and a cohesive surface from building front to building front that reinforces the Bowtie's role as an outdoor stage. Snohetta explained that “This clear and simple ground surface made of pre-cast concrete pavers creates a strong anchor for the space, allowing the excitement of Times Square's commercial components to shine more brightly above” (Snohetta, 2010).

Figure 2. Times Square Concept (Snohetta, 2010).

This is a clear example of how temporary urbanism and piloting designs can be used within the urban design process before permanent solutions are sort.

*Museum Street, Perth – City of Perth*

The Museum Street project in Perth was devised in conjunction with the Central Institute of Technology as a part of the City’s Central Institute of Technology Precinct Plan that sets an urban design framework for future projects in the area.
In March 2014 Museum Street became a temporary plaza with pop up food stalls, tables, umbrellas, and chairs. The area included free Wi-Fi and was occupied by buskers playing music, during the evening the area was activated with pop up bars and food stalls. The traffic on the street was reduced to a one way flow south, north.

Figure 3. Museum Street Activation Plan (City of Perth, 2015).

The temporary plaza ran for three weeks and during the activation of the space the City of Perth monitored the impact of the project using traffic modelling, observation studies, feedback from stakeholders and surveys via social media. The results of the monitoring showed that the change to a one way traffic had little impact on the traffic. Data on pedestrian traffic was collected before during and after the activation, this allowed analysis of how successful the interventions were.

The data showed that during the three weeks that the activation occurred the daily average of pedestrians who visited the area increased compared with before and after the three weeks of
activation (figure 4). The survey responses showed that majority of people thought the temporary interventions greatly improved Museum Street (figure 5). When asked what intervention they wanted to become permanent, the most popular answer was extra seating. However, all of the answers were popular and had very tight margin.

Figure 4. Museum Street Data (City of Perth, 2015).

Figure 5. Museum Street Feedback (City of Perth, 2015).

Following analysis of the results the decision was made to implement the project as permanent and concepts were designed, and are currently under construction.
This project is another example of how pilot projects can be utilised as a part of the urban design process.

3rd Avenue, Portland – City of Portland & Better Block PDX

In August 2014 Better Block PDX decided to trial an idea to remove parking, realign vehicle lanes and create a pedestrian plaza out of an unused car turnaround space outside a restaurant on Portland’s 3rd Avenue. The idea behind the trial was the outcry from local business owners to the City of Portland, which decided to integrate the business owner’s suggestions into one of their long term planning efforts (Maus, 2014). Better Block PDX decided to act straight away and the project was initiated. Better Block PDX assembled 150 wooden planters to create a segregated cycle lane with a budget of $10,000 they also used astroturf and road cones to mark out the cycleway and pedestrian crossings. The pedestrian plaza consisted of hay bales and picnic tables as a form of seating and ping pong tables to provide activity.
The project lasted three days and the response from the public and local businesses were overwhelming, this kick-started the 3rd Avenue Stakeholder Advisory Group to devise a plan to make the project permanent. The group provided a plan to the City of Portland, which was evaluated by the City’s traffic engineers and the plan was approved with some variations such as preservation of on street parking thus not allowing a physical separation of the cycle lane, as of today the project is underway but not yet complete (Maus, 2014).

Although the original pilot project removed all on street parking and provided a physically separated cycle lane, the project showed that testing the idea in a temporary way showcased the potentially positive impact that the project can have, to not only local government but also the public. This increased public buy in of the project and allowed the 3rd Avenue Stakeholder Advisory Group to lobby the City of Portland to consider making the project permanent.
Temporary urbanism as a way of testing ideas

Utilising temporary urbanism as a way of testing ideas in Christchurch stemmed from research conducted in Christchurch as part of the post disaster recovery process (Bennett, et al., 2013), (Harrop, 2014), Wesener (2015).

Harrop (2014) research used public life study methodology that revealed the issues with the urban fabric of the suburb. The research proposed an urban design scheme for an inner city suburb of Christchurch the scheme consisted of streetscape upgrades. The main driver was a segregated cycleway upgrade that allowed cyclists to travel safely segregated from vehicle traffic. The scheme proposed a low budget option and a high budget option. The low budget option utilised temporary planter boxes on the carriageway that provided a barrier between cycle traffic and vehicle traffic. The high budget option had a fully built segregated cycleway with a different surface material and in ground planting. Following analysis of each option it was discussed that both options achieved the same objectives. However both had different aesthetic values, this provided an interesting idea that both options could work together. The low budget option could be rolled out following public consultation about the project, allowing the design to be tested and the issues and constraints identified. Further public feedback could be sort allowing the design to be altered before a permanent solution is implemented. This meant that if the original design did not work for any reason the low budget scheme could be taken away at a low cost rather than having implemented a high budget scheme that doesn’t work and would cost a lot to remove.

This process creates what was named a successional urban design process (Harrop, 2014) as the permeant urban design scheme supersedes the temporary urban design scheme. The benefit of this is that money can be saved if interventions do not work as intended, as they can be made up of temporary elements that can be moved and relocated elsewhere at a relatively low cost. However, if the temporary scheme is determined a success, then permanent elements can be implemented. This idea has also been reinforced by (Lydon, et al., 2012) who outlined a similar idea to utilise temporary urbanism as a means to facilitate better permanent outcomes. This reinforces the case studies outlined in this paper as ways of utilising temporary urbanism as a way of facilitating better permanent outcomes.

This idea has also been proposed in Nemeth & Langhorst (2014) the paper argued that temporary use of vacant land offered a rich and diverse territory which can accommodate the testing of a wide variety of uses processes and their effects, thus offering more understanding
of the operations and effects of particular urban interventions. Nemeth & Langhorst, (2014) also reinforces the idea that any failure or evidence of negative side effects of urban intervention approaches can be quickly corrected. Finally the paper concluded that utilising this idea the urban planning and design process becomes a continual process that transforms the urban fabric through constant editing (Nemeth & Langhorst, 2014). This reinforces the idea of a successional urban design process.

The combination of empirical research and case studies of temporary urbanism suggest that including this in the everyday urban planning and design process will potentially have positive impacts on urban design projects. So why has this not been implemented yet?

There are potential risks involved with this idea of successional urban design and it is not a straight forward answer to the issues surrounding urban planning and design.

The temporary nature of temporary urbanism projects is what makes them special. Temporary urbanism has a unique style born out of the low cost, recycled materials that are used. The projects are usually aimed at achieving “quick wins” within urban space. Turning them into permanent projects could make them lose the temporary character that made them special and unique to people and the community in the first place. It can be argued that the community and the public may no longer have the attachment to them they once did if they become permanent. As Wesener (2015) stated that community initiated temporary open spaces build community empowerment and resilience, the risk that this could be lost if projects become permanent. This could be said for Christchurch as there is a signal that that transitional phase is over and that more permanent projects need to be implemented (Harvie, 2015). Is there a risk that the public could grow tired of temporary urbanism projects? This is possible if cities become saturated with temporary urbanism projects due to every project including a temporary phase that use transitional elements, the public may grow tired of seeing temporary projects. As an urban designer who studied and worked throughout the earthquakes and the ongoing recovery phase, I for one was starting to tire of temporary urbanism projects. However this could be attributed to the timing of the recovery process and the lack of progress on permanent projects within the city. However, the lessons learnt during this transitional phase should not be lost, and the public participation involved with the temporary urbanism projects should be included in further permanent projects. Christchurch is the laboratory to test temporary urbanism ideas but also test public reaction to these projects.
The urban design process should not be looked at as a means to an end when each project is completed, the process should be more likened to that of ecological succession where projects are always evolving and improved upon, this is echoed by (Lydon, et al., 2012). Inclusion of utilising temporary urbanism as a way to test ideas as a part of the project creates this succession as projects can start small with temporary measures, feedback gathered, further testing if required and a permanent solution. This permanent solution can then be re-evaluated further down the track to identify any further issues as the cities and spaces move further into the future.

**Conclusion**

This paper aimed to discuss processes that will help minimise the risks involved with such schemes for developers, architects, landscape architects, urban designers, and planners by testing urban design schemes before permanent implementation.

The paper outlines the transitional program in post disaster Christchurch as a form of recovery which has inspired this paper. Traditional urban design processes were distilled through a brief look at the history of urban design and how it has evolved into the discipline we see today. National urban design protocols from Australia and New Zealand have been analysed to compare the urban design processes. Both protocols were relatively similar and utilised the same principles within an urban design process. However, both did not include within their respective processes a pilot project stage or testing stage where designs could be tested to reveal issues and constraints. This paper suggests that a testing stage be included in new urban design processes to reduce the risk to land owners, developers, landscape architects, urban designers, architects, planners and users. The paper suggests utilising the temporary urbanism movement as a way of testing permanent ideas and summarises the benefits of temporary urbanism, it discusses international case studies in New York and Sao Paulo where successful temporary measures were utilised to pilot projects before permanent implementation. The discussion further advances the idea that testing ideas before permanent implementation would be beneficial to cities but also revealed risks that temporary urbanism could lose its unique character if cities become saturated with temporary urbanism projects, projects could also be stuck in the testing stage and never fully realised which could result in a lack of permanent projects. This is certainly true in post disaster recovery Christchurch where there are calls to move on from temporary projects to more permanent projects (Harvie, 2015).
The implications of this paper on the future of temporary urbanism are positive as it raises the already rising profile of temporary urbanism. Christchurch is an interesting case study for temporary urbanism as a form of recovery and further research could help reveal the benefits of moving from temporary to permanent. The city of Christchurch has the opportunity to be used as an urban laboratory to test new, innovative urban design ideas through temporary urbanism which can be thoroughly studied to become a case study worldwide for this new urban design process.
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Achieving medium-high density in low scale development: The Queensland experience in innovative ‘fine-grained’ urbanism

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Achieving medium-high density in low scale development: The Queensland experience in innovative ‘fine-grained’ urbanism

ABSTRACT: Worldwide population growth and economic agglomeration is driving increasing urban density within larger metropolitan conurbations. Population growth and housing diversity and affordability issues in Queensland have seen an increasing demand for more diverse and higher density development. Under Queensland’s flexible planning regulatory provisions, a level of ’medium’ to ‘high density’ is being achieved by a focus on fine-grained urban design, low scale development, lot diversity, and delivery of single dwelling products. This for Queensland (and Australia) has been an unprecedented innovation in urban and dwelling design. Dwellings are being delivered on lots with zero regulatory minimum sizes providing for a range of new products including ‘apartments on the ground’. This paper reviews recent and nascent demonstrations of EDQ’s fine-grained urbanism principles, identifiable with historical ‘vernacular suburbanism’. The paper introduces and defines a concept of a ‘natural density’ linking human scale built form with walkability. The paper challenges the notion that (sub)urban development, outside major city centres, needs to be of a higher scale to achieve density and diversity aspirations. ‘Natural density’ provides a means of achieving the increasing demand for more diverse and higher density development.

Keywords: dwelling density, urban density, fine-grained urbanism, natural density, vernacular suburbanism, apartment on the ground

Introduction

Fuelled by issues of economic change, population growth, housing diversity and affordability, there is an increasing demand for larger metropolitan conurbations to achieve higher urban density through higher rise development. Worldwide historical patterns of natural, human, and low scale higher density development, however, suggest that (sub)urban development, particularly outside major city centres, does not need to be of a higher scale to achieve density and diversity aspirations. A new interpretation of ‘natural density’ provides a means for large lower density metropolitan conurbations to achieve increased demand for more diverse and higher density development in a way more acceptable to community expectations.

Australia is not immune from the global pressures of population growth and economic agglomeration; the dominance of Australia’s major cities has increased in recent years and this has led to a range of challenges for local and state governments and communities as population growth drives demand for increased urban density. As of June 2014, just over 15.6 million people, close to two-thirds of Australia's population, resided in major capital cities (ABS 2015).

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1 This paper is based on the authors’ separate doctoral research into the spatial analysis of density and the knowledge economy. The content of this paper has been derived from this doctoral research, geo-spatial analysis of existing inner city and (sub)urban areas, new building and development innovation, and analysis of existing and emergent Queensland planning regulations.
McLean (2004) has noted that due to Australia’s large spatial size (and the need to maximise economic agglomeration) there has been a historic tendency, evident since the nineteenth century, for Australia’s scattered population to concentrate in a few large urban areas (see also Robinson 1961, Butlin 1964, 1984, Major Cities Unit 2010, Daley 2012, BITRE 2014). Hugo (2002) noted that the Australian pattern of population distribution was not just concentration in urban centres but a concentration in, and growing dominance of, the largest metropolitan areas (see also Daley 2012 and BITRE 2014).

Bertaud (2004) has argued that larger cities worldwide have grown despite the discouragement of engineers, planners and municipal officials in the 1960s and 1970s who believed larger cities of several million people would be unmanageable and unliveable. The reason Bertaud (2004) argued large cities have grown and kept growing is because of the higher productivity benefit of large cities compared to smaller cities in terms of larger effective labour markets, which are generally accepted as being more efficient than the smaller labour markets (Baumgardner 1988, Prud’homme and Lee 1999, Glaeser and Ellison 1999, Bettencourt, Lobo, Helbing, Kuhnert and West 2007).

Recent studies on agglomeration have identified links between urban density and human capital (Rosenthal and Strange 2008, Knudsen et al 2008, Glaeser and Ressger 2010, Abel, Dey and Gabe 2012). Glaeser and Ressger (2010) found that there was a correlation between per worker productivity and city size where there were higher levels of human capital which they surmised as evidence of knowledge agglomeration. Abel et al (2012) determined new estimates of the magnitude of agglomeration economics in USA metropolitan areas using a model of urban productivity that explicitly incorporated the complementarity between cities and skill. It was found that the productivity of a metropolitan area is primarily determined by population density, the human capital stock, and other factors that vary by region.

Australia’s density challenge

Australia’s urban population largely lives in suburbs within the major capital city metropolitan areas (ABS 2015). However, the 50-year legacy of the homogenous, low-density, one-size-fits-all approach to suburbia (with limited amenity or economic agglomeration and significant commuting times to access employment or education) is coming under increasing and

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2 Possibly this was due to the lack of understanding by planners and other officials of the benefits of agglomeration (and an over focusing on dis-agglomeration externalities such as congestion).

To tackle this population growth and market driven demand for increased city size, and, paradoxically, housing affordability through both sprawl and increased density, all Australian state government and mainland territory jurisdictions – except Tasmania and the Northern Territory – have capital city metropolitan strategic spatial plans, which set out state planning policy, defined land uses, and guided local government planning and development (Productivity Commission 2011). A key purpose of these strategic metropolitan plans was for managing major change in the urban structure of metropolitan cities (Gleeson et al 2004, Forster 2006, Dodson 2008, Bunker 2009, Jain 2009). The nature of Australia’s metropolitan regional planning schemes has, since the turn of the 21st century, been focused on a broad concept of sustainability with a particular focus on constraining metropolitan expansion with long-term or very long-term aspirational ‘compact city’ plans seeking to address ‘urban sprawl’ and manage high population growth.

Arguably increased sprawl is being driven by increasing housing unaffordability due to increasing demand for CBD centric or accessible real estate which has had significant price increases (Forster 2006, Dodson 2008, O’Connor and Rapson 2003, Kulish, Richards and Gillitzer 2011). Most of Australia’s capital city regional planning schemes are seeking in-fill population and housing targets (Newton et al 2012). The challenge of meeting ‘infill’ targets, especially in the middle ring suburbs and under current industry, government and community processes, Newton et al (2102) have argued ‘may be insurmountable unless there is a major transformation in the process by which, and the scale at which, the existing built environment can be regenerated.’ As urban population growth continues, and as policies for urban consolidation struggle to deliver on desired dwelling densities there is likely to be continued pressure to build wherever there is developable land. This will be regardless of whether this land is within, on the edge, or beyond Australia’s major metropolitan areas.

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1 Worldwide modern cities can be considered or understood by including their surrounding metropolitan area with both the number and populations of large metropolitan regions worldwide having increased dramatically during the last century (Heywood 2006). However these metropolitan regions, according to Heywood (2006) have not only failed to manage their own problems of growth, congestion, pollution and conflict, but also exert increasing dominance over the economic and political lives of the surrounding regions and nations.

2 Urban sprawl has been said to be an ill-defined term including terms such as ‘low density’, ‘dispersed’, ‘decentralised’, ‘suburban’, ‘polycentric’, ‘scattered’, ‘leapfrog development’, ‘commercial strips’ and ‘single-use development’ (Ewing 1997, Curtis 2006).

3 The increasing cost of CBD accessible or centric real estate indicates Australian cities have strong mono-centric characteristics (see Kulish, Richards and Gillitzer 2011). This is likely being driven by the increased importance of the CBD centred knowledge intense service economy.
What type and level of density?

The (easy) solution to the demand from Australia’s increasing metropolitan population for housing with good accessibility to employment is to increase urban density. But, the more difficult questions are to what level and type of density, and where?

Differing levels and types of density, and its location, all impact on human commuting, amenity and health in different ways (Newman and Kenworthy 2006, Newton et al 2012, Udell, Daley, Johnson and Tolley 2014; Giles-Corti, Hooper, Foster, Koohsari, Francis 2014). Udell (et al 2014) have found that the higher density, the higher the requirement for additional public amenity to make density work and to gain community acceptance.

Newman and Kenworthy (2006) suggested there is a fundamental threshold of urban intensity of around 35 people and jobs per hectare where automobile dependence is significantly reduced (Newman and Kenworthy 2006:35). Giles-Corti et al (2014) in looking at urbanism from a cardiovascular health perspective have, from limited evidence available, recommended a net density threshold of 20 dwellings per hectare (dw/ha) (or gross density of 18dw/ha) as the minimum required to encourage walking. However dwelling densities of between 35-43dw/ha net and 32-40dw/ha gross (based on housing occupancies of 2.6 persons/dwelling) is required to encourage public transport use, with higher public transport use leading to increased walking: although it is noted that dwelling density should ‘not be considered in isolation of the other critical built environment attributes required to increase walking, cycling and public transport use’ (Giles-Corti et al 2014:48).

Jobs are often the issue in the suburbs; 35dw/ha are required assuming at least one resident of each house works in the local area. Newman and Kenworthy’s (2006) 35 people per hectare is readily achievable but the same jobs density is highly unlikely with agglomeration drivers in key industries reinforcing the need for local centres and employment areas where jobs will be most available.

Newton et al (2012) found that the number of people living in the middle suburbs of Melbourne – likely to be representative of the middle suburbs of most Australian capital cities – is significantly less than in the inner and outer suburbs, with a net population density

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6 Holz (2015) postulated the potential for an entire suburb of houses designed to facilitate a variety of home-based business - including commercial, retail and industrial - at jobs densities in excess of 35 per hectare. Holz’s (2015) research featured a design of a ‘homeworkhouse’ capable of ‘subdivision’ into three separate tenancies and providing for up to 6 jobs on a single 225sqm lot. However, it is counter-intuitive to believe there might be at least one person per household working at home in any situation, let alone in the suburbs.
in the 20 to 30 persons per hectare range. Despite this, they had the lowest levels of population growth in 2001-06 with the outer greenfield suburbs being the main demographic absorbers. Latest population data indicates the urban population is continuing to increase at the metropolitan centre and the periphery (ABS 2015).

Giles-Corti et al (2012) have proposed that good levels of density depend on a range of factors. While there appears to be more potential harm linked to high-rise housing this may depend upon who lives there, quality of design and build, and where it is located. Giles-Corti (2012:87) note that high-rise inner-city housing, occupied by employed adults with no children, may well work very well and that:

...high-rise housing in high socioeconomic areas with good neighbourhood amenity, built-in security, shared facilities (e.g. recreational space), opportunities for selective interactions, and structures addressing building and social governance, may also work well for people who can afford to live there.7

The preference for density with waterside amenity is also noticeable in Australian cities. This is particularly the case in Queensland with the most densely populated local areas in Greater Brisbane being inner-city riverside suburbs (ABS 2015). In the rest of Queensland, eight of the ten most densely populated areas are on the Gold Coast. Giles-Corti et al (2012) have argued that the optimal and preferred outcome for a diversity of possible residents, including families and older adults, is for higher density to be achieved through lower rise development. With medium-density housing of no higher than three to five storeys, families are better suited to living on the lower floors (Figure 1).

Figure 1: Different architectural forms that achieve the same density (i.e. 75dw/ha)

Source: Giles-Corti et al 2012 page 87 modified from Greater London Authority

7 Giles-Corti et al (2012) also note that the evidence suggests it is optimal for higher density housing to be located away from roads with heavy traffic, but also within easy access of public transport, shops, services and a hierarchy of public open space.
Density in Queensland

Queensland has an unusual relationship with density. In most quarters density has become the dirtiest word of all. However it will not be going away. The largest population increases projected for Queensland between 2011 and 2036 are expected to occur in the major urban and suburban South East Queensland (SEQ) local government areas of the Gold Coast, Ipswich, Brisbane and Logan (Queensland Treasury and Trade 2013). As with the rest of Australia there has been sustained growth in the population of SEQ, particularly in Greater Brisbane and Queensland's coastal regions, increasing faster relative to regional Queensland (ABS 2015).

Developers have retreated and local governments have resorted to targeting activity centres and transit oriented development in the greyfields (Newton et al 2012) and special ‘master planned community’ or ‘development control plan’ areas in greenfield areas to achieve the housing supply, and to a lesser degree, the density and diversity required to make suburban areas more liveable and sustainable. Newton et al (2012) however have questioned the lack of established development models for encouraging precinct-scale redevelopment or regeneration.

This paper is therefore emerging at a time when the paradigm and product are aligning, at least in terms of new greenfield or regenerating greyfield suburbs being considered ‘places’, built at densities which support centres and facilities in what promise to be new and genuine communities. In some locations the most innovative developers and builders are being given the opportunity to be more creative; unbridled by regulations which previously unduly limited dwelling size, lot size, building setbacks, lot cover, on-site car parking and so on, these suburban innovators are achieving densities of between 30 and 60dw/ha in one or two storey detached and terrace-style ‘apartments on the ground’. Rather than being up in the air where construction costs can quickly escalate, these low-set buildings are proving a tour de force in the sustainability and commerciality of places such as the Economic Development Queensland (EDQ) development of Fitzgibbon Chase, on the north side of Brisbane, in the

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8 Greyfields in the Australian context have been defined by Newton (2010) as the ageing but occupied tracts of inner and middle ring suburbia that are physically, technologically and environmentally failing and which represent under-capitalized real estate assets. Predominantly they are between the more recently developed greenfield suburbs and the more vibrant CBD/inner city housing market (Newton et al 2012).

9 Economic Development Queensland is a Queensland Government planning and development business unit within the Department of Infrastructure, Local Government, and Planning, which is established under the Economic Development Queensland Act 2012.
middle metropolitan suburban ring. Fitzgibbon Chase is a development within a declared Priority Development Area (PDA). Under the Economic Development Queensland Act 2012 special State zoned ‘Priority Development Areas’ (PDAs) are able to be declared with planning and, in some cases, development powers being exercised by EDQ.

Vernacular suburbanism – a natural density

A Queensland vernacular

In many ways this is a story of back to the future, as simple analysis of some of the most revered suburbs in Queensland reveals that Queenslanders were historically developing at these densities when similarly less (or little to no) restrictive regulations were in force. Spring Hill and Petrie Terrace in Brisbane are excellent examples of what may be called ‘vernacular suburbanism’, suburbs developed at ‘natural densities’ of around 40dw/ha prior to the introduction of the Undue Subdivision of Land Prevention Act 1885, an Act which limited all new lots created in Queensland to a minimum width of 10 metres (m) and area of 400 square metres (sqm). There are few remnants of inner city suburban terrace housing built in Queensland prior to 1885. Figure 2 shows terraces with verandas built to the front property boundary in Rogers Street, Spring Hill. Of course this was at a time before cars, although it is not hard to imagine these terraces being serviced by a rear lane for vehicle access and, as was the case in English cities, a convenient place for kids to play.

Figure 2: Rare terrace houses, Rogers Street, Spring Hill, Brisbane
Figure 3, a tiny house in Union Street, Spring Hill is possibly the smallest in Brisbane. It also shows that when left to our own devices, and most likely without bank finance, we tended to build with the few materials we had available (e.g. ‘timber and tin’), in the techniques and aesthetics handed down by our ancestors (e.g. ‘a shed’), and on a lot which suited our immediate needs.

Figure 3: Tiny house, Union Street, Spring Hill

Figure 4 shows the block surrounded by Rogers, Water, and Union Streets, and St Pauls Terrace in Spring Hill, Brisbane. The net density in this example is around 40dw/ha with variations in lot dimensions similar to those in the more progressive suburban developments in Queensland today. For example, the block is approximately 57 metres wide: 25 and 32 metre deep lots are standard in Queensland (EDQ 2015).
Contemporary vernacular suburbanism

The building and urban designs in a contemporary medium-high density situation are a return to the lot sizes and densities at which we were naturally progressing during early post-colonial occupation of Australia. This assists in defining ‘natural density’. ‘Natural density’ can be defined as the density that prevails where humans settle with a dominant reliance on walking as the means of local horizontal transport and stairs as the means of vertical transport.

This focus on a density derived from walkability underpins the EDQ\textsuperscript{10} guidelines (e.g. EDQ 2015) relating to urban design, parks, and streets.\textsuperscript{11} Essentially, natural density requires the application of a range of urban design principles that encourage walkability and liveability through engagement with community and nature. It also requires an integration of urban design, dwelling design and planning for community amenity. Increased density can also result in reduced private open space which needs to be compensated for through increased and better quality public open space.

\textsuperscript{10} EDQ was formerly, up until late 2012, the Urban Land Development Authority.

\textsuperscript{11} See in particular ‘Guideline No 1 Residential 30’; ‘Guideline No 5 Neighbourhood planning and design’; ‘Guideline No 6 Street and movement network’; ‘Practice Note: Footpath provision in residential sub-divisions’; and ‘Practice Note: Tree retention in residential subdivisions’ (EDQ 2015).
Lot diversity and flexibility are the keys to enabling the modern form of ‘natural density’. In relation to low rise buildings, front building setbacks are measured to the wall, enabling at least a 2.4m deep front veranda to be built on the front property boundary and whether on-site car parking spaces are available directly from the street, on a ‘front-loaded’ lot, or via a ‘rear-loaded’ lane way. Traditionally it has been easier and more economical to build a low set rather than high set building of the same area. In this regard, one-storey detached building designs are a feature of the most affordable types of compact housing featured in recent research undertaken by Defence Housing Australia (DHA 2015). Projects by EDQ are featured in this research.

In EDQ projects ‘medium density’ outcomes of at least 20 and typically 30dw/ha net are being achieved with a mix of (just) dwelling houses on lots of no prescribed minimum size and frontages down to 4.5m. Such narrower lots can result in a fine-grained development outcome which achieves desired densities of dwelling houses subject to domestic rather than commercial construction. Terrace or row houses can deliver up to 60dw/ha net (including local streets and parks). Arguably one of the most remarkable achievements has been at Fitzgibbon Chase where, through the PDA mechanism, there have been a number of progressive planning provisions introduced. This has included, in particular, planning provisions that require no minimum lot size.

**Fitzgibbon Chase case study**

The EDQ development at Fitzgibbon started as a project where “housing innovations” delivering the (previous) ULDA Act’s housing affordability objective would be trialled to test their market and community acceptance and commercial viability in a suburban setting.

When Fitzgibbon Chase commenced in 2009 typically the only new dwellings available in the surrounding area for a new home purchaser were two-storey, four-bedroom homes on 500sqm of land or townhouse style multi-unit developments usually within gated complexes. Not only was there no diversity of product available in the local community but the cost of land meant that there was no ability to deliver affordable housing on “traditional” lot sizes. Since sales commenced at Fitzgibbon Chase in April 2009, the ULDA worked with builder partners to provide the diversity that had been lacking in the local community, starting with the first "Fonzie" flat by AusHomes marketed in mid-2009 for $199,000.
The Fitzgibbon Chase development is almost complete. The latest releases feature a diversity of building designs suited for lot sizes ranging from 45sqm to 250sqm producing house and land package prices from $310,000 (http://www.fitzgibbonchase.com.au 28 September 2015). Fitzgibbon Chase is a leading exemplar of achieving net residential densities between 27 – 55dw/ha net. Figure 5 is a Nearmap view of the built form outcome: around 27dw/ha net right and 55dw/ha net left.

Figure 5: Fitzgibbon Chase, Brisbane

A critical feature of the built form at Fitzgibbon Chase is that these densities have been achieved with one and two-storey dwellings/houses on freehold titles, not subject to a body corporate. The commercial and community success of even the smallest of houses on the smallest of lots under these circumstances is testimony to the market and community need to return to developing at the density and diversity we were developing over 140 years ago. It is worthy to note that the blocks developed at around 55dw/ha net, as shown in Figure 5, could have been developed at 5 storeys. This accounts for the relatively wide street reserves and perpendicular on-street car parking arrangements in the development to the left.
Rear lanes free up the streets for on-street visitor car parking at rates of almost one on-street space per dwelling. A 16.0m wide street reserve has therefore proven adequate for densities between 25 and 60dw/ha net, the rear lane required at around 30dw/ha net.

Figure 6 rationalises the progression to delivery of medium-high density dwelling houses on lots of no prescribed minimum size at Fitzgibbon Chase, Brisbane.

Figure 6: Evolution of the EDQ ‘Urban’

**EDQ first generation ‘Loft’ apartment** (‘Fonzie flat’) – *laneway* accessed and typically delivered on a building format lot subject to a community title arrangement – this is a Class 2 building in accordance with the Building Code of Australia. In Queensland infrastructure services such as power and water are traditionally serviced from a street, not a lane. Embedding a separate lot in a lane, means that infrastructure service lines need to be located in the rear lane, complicating the process and adding some cost to delivery.

**EDQ second generation ‘Loft’ house – laneway** accessed and delivered on a freehold ‘Torrens’ title – no body corporate – a Class 1 building in accordance with the Building Code of Australia. A street-accessed house is the simplest method of delivering houses on their own lot, regardless of the lot size – this is normal industry practice in Queensland. Rear lanes are being increasingly used to achieve higher densities. However introducing runs of narrow lots into a streetscape increases the number of driveways potentially *interrupting* pedestrian and cycle movement in the street.

**EDQ third generation ‘Urban’ house – street** accessed and delivered on a freehold ‘Torrens’ title – no body corporate – a Class 1 building in accordance with the Building Code of Australia. A street-accessed lot is suitable for a front loaded lot of 54sqm in area. It is to be noted that the Urban Terrace sits within a street including a diversity of lot widths and sizes.

Figure 7 shows the latest in the evolution of design innovation at Fitzgibbon Chase, the “Urban Terrace” suitable for a front loaded lot of 54sqm in area. It is to be noted that the Urban Terrace sits within a street including a diversity of lot widths and sizes.
Moreton Bay Regional Council planning scheme – emerging innovations

EDQ planning mechanisms and design provisions¹² – as demonstrated at Fitzgibbon Chase – are also now being mainstreamed in other PDAs with EDQ or private sector development projects, and within an increasing number of local government planning schemes across Queensland, including the draft Moreton Bay Regional Council planning scheme (MBRC 2015). The new MBRC scheme (MBRC 2015) includes 13 place types. Place types define the long term vision for development throughout the region. A traditional zoning approach underpins the place types. The General residential zone includes three precincts: Suburban neighbourhood; Next generation neighbourhood; and Urban neighbourhood. Dwelling density aspirations are couched in ‘site’ and ‘net’ terms; net being the area of land including local streets and parks, site being the area net of local streets and parks, typically within a ‘block’ (the area surrounded by streets and parks).

The Next generation neighbourhood precinct supports site densities between 15 and 75dw/ha. A maximum site density of 15dw/ha is supported in the Suburban neighbourhood

precinct; whilst in the Urban neighbourhood precinct a minimum site density of 45dw/ha is required.

The Suburban neighbourhood precinct is indicated primarily over existing low density development areas where redevelopment to higher density is not envisaged. The higher density aspirations across the Next generation and Urban neighbourhood precincts are, in contrast, supported by a range of progressive site planning and building design provisions. Innovations include no minimum lot size, reduced building setbacks, generous site coverage and built-to-boundary wall regulations, and maximum on-site car parking requirements. Dwelling houses are permitted in both these medium to high density precincts.

Given these advances, it is possible that medium-high density development – even close to coastal and river side areas – in the Moreton Bay region could follow similar lines as Fitzgibbon Chase, and achieve close to even the highest density aspirations of the MBRC scheme with the use of Dwelling houses on their own freehold lot, not subject to a body corporate.

Assuming 35% of a developable area is given to local streets and parks, the net density aspirations in the Next generation and Urban neighbourhood precincts per the MBRC scheme are as follows:

- Next generation neighbourhood – from minimum 13 to a maximum 65dw/ha net
- Urban neighbourhood precincts – a minimum of around 40dw/ha net

EDQ guidelines for the dimensions of a typical block (area surrounded by streets or parks) are 57 x 130m = 7,410sqm (EDQ 2015). If a typical block is assumed to be a ‘site’ representing 65% of the developed area, then ‘net’ density relates to an area of around 1.14 hectares (i.e. 100% divided by 65%, times 0.741 ha = 1.14ha). If a typical block included 22 dwellings (‘site’ density of nearly 30dw/ha) then the ‘net’ density is accordingly ~20dw/ha (1.14 divided into 22). Figure 8 shows a range of dwelling house densities that could be achieved using these assumptions.

Figure 8: Net density analysis

<table>
<thead>
<tr>
<th>% local streets + parks (per ha ratio per 0.741ha block)</th>
<th>Number of lots required in 0.741ha block (rounded to nearest even number)</th>
<th>Average width of lots in 0.741ha block (1.14m divided by half number of lots in block)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>60dw/ha net</td>
<td>45dw/ha net</td>
</tr>
<tr>
<td>35% (1.14)</td>
<td>48</td>
<td>52</td>
</tr>
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</table>
Figure 8 shows that there is a threshold of between 45 and 60dw/ha net where the average lot width may result in a product which is unworkable and/or unmarketable. As shown in Figure 5, 55dw/ha net has been achieved at Fitzgibbon Chase; is this the likely limit of ‘natural density’? The relatively low minimum densities of 40dw/ha net proposed in the Urban neighbourhood precinct in the MBRC scheme could however be easily reached, in line with Figure 8 with terrace houses on lots with an average width of around 6.0m.

Whether developers and builders in the Moreton Bay region will rise to the opportunities presented by the new MBRC scheme, and develop medium-high density with just Dwelling houses remains to be seen. Perhaps, as the case with Fitzgibbon Chase, high quality demonstration projects will be required in order to fully test the regional market and community response.

Conclusion

This paper has challenged the notion that (sub)urban development outside major city centres needs to be of a higher scale to achieve density and diversity aspirations. Worldwide population growth and economic agglomeration are driving increasing urban density within larger metropolitan conurbations. As lower density cities are challenged by the need to increase urban density in new development or redevelopment areas there will be increasing pressure for increased density. Population growth and housing diversity and affordability issues in Queensland have seen an increasing demand for more diverse and higher density development, in particular in new greenfield and existing greyfield suburbs.

As demonstrated by EDQ at Fitzgibbon Chase and by historical examples elsewhere in the world similar levels of density can be achieved through different forms of density. However, as Giles-Corti et al (2012) noted, different forms of density have varying suitability for different demographics. They argued that the optimised and preferred outcome for a diversity of potential residents, including families and older adults, was for higher density to be achieved through lower rise development. This suggests better matching is required between the types of community and the types of density being developed. The concerns with density of existing more diverse communities are likely to be better13 addressed with low rise medium-higher density, rather than the more confronting high rise approach. To address this contention further research is required on the lived experience of new communities developed at a ‘natural density’.

13 Noting there are other common community concerns with increased density such as lack of transport infrastructure.
Fitzgibbon Chase, a new development almost completed in the middle ring of the Brisbane metropolitan area, exhibits a diversity of low-rise terrace housing achieving ‘natural’ densities at which Queensland cities and towns were developing prior to the introduction of the *Undue Subdivision of Land Prevention Act 1885*. Fitzgibbon Chase has been the exemplar for a range of other new developments in PDAs as well as for a number of new local government planning schemes. Analysis of the provisions of the draft new Moreton Bay Regional Council planning scheme shows that the highest density aspirations of the scheme could be achieved by similarly creative collections of low-rise, one-two storey dwelling houses on their own freehold titled lot, not subject of a body corporate.

The re-emergence and resultant commercial and community success of the small house on its own small lot in new places such as Fitzgibbon Chase, suggests that increasing density and diversity in the greyfields could also be readily achieved, without forcing builders or developers to higher density 3+storey development in areas typically requiring lot amalgamation in order to get an appropriate development site.

Beyond locations with high accessibility to the major centres such as CBDs and/or with high levels of amenity (such as closeness to river and ocean amenity), increasing urban density and diversity within larger metropolitan conurbations may best be achieved relying on a walkable ‘natural density’. ‘Natural density’ principles provide a means of achieving the increased demand for more diverse and higher density development in a way more acceptable to community expectations. The historical lived experience of ‘natural density’ suggests that humans have successfully formed communities with low rise higher density.

The Queensland experience in innovative fine-grained vernacular suburbanism with Fitzgibbon Chase strongly suggests that achieving medium-high density in low scale development in low density cities, common in Australia, is not only plausible, but possibly preferred.
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Optimising uncertainties:
a design-led investigation into the challenges of realising
urban innovations in a data-driven environment

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Optimising uncertainties: a design-led investigation into the challenges of realising urban innovations in a data-driven environment

**ABSTRACT:** Big data has potential to revolutionise the way we manage, use and measure the urban realm. Integrating extensive and diverse datasets will provide new knowledge about the way urban environments are formed and inhabited. But will this increased knowledge translate to increased implementation of new and innovative designs that can transform the existing physical fabric into smarter, more resilient cities?

Barriers to urban innovation have been the focus of many recent research initiatives, largely instigated by the slow adoption of sustainable development practices. Economic viability and conflicting priorities of complex stakeholder groups are common obstacles. This paper focuses on the spatial design innovations, distinct to technological, organisational or operational innovations (although interrelated). Design-specific obstacles include the late introduction of design in the overall development process, a lack of metrics and methods that can ‘quantify’ design benefits over an appropriate lifecycle and a dissonance between extant urban datasets and speculative modes of enquiry.

A design-led investigation into the regeneration of public housing assets in ageing middle suburbs is presented to illustrate some of the challenges associated with delivering real and effective changes in these contexts. The research proposes three intensities of precinct-scaled redevelopment and examines their ‘net’ impact in cost, quality and density terms at neighbourhood-scale. The assessment employs the projective and iterative modes of design and optimisation modeling to examine both short- and long-term development effects and to engage with the differing priorities of sustainable development. The project explores how such a framework could be used to distil multi-objective stakeholder requirements and respond to shifting development priorities as the built fabric evolves, operating conditions change or more accurate data becomes available. Finally, the paper reflects on the role of speculative design thinking for strategic urban decision-making and the challenge of incorporating design-knowledge in urban data platforms.

**Keywords:** speculative design research, design value, precinct regeneration, greyfields, middle suburbs, spatial innovation, optimisation, uncertain data

**Introduction**

Melbourne’s ‘greyfields’\(^1\) are beginning to witness the collective impact of incremental change as more single dwellings turnover to dual occupancy units (Figure 1). On an individual level, one could argue that dual occupancies are simply a continuation of the original garden suburb model, just on smaller lots – that the basic building blocks of a detached house on a privately owned lot with a yard has persisted (Figure 2). While in theory this may be true, the spatial reality is somewhat different. As lots have become smaller,

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\(^1\) Greyfields are ageing but occupied residential allotments that are physically and technologically obsolescent, environmentally poor performing and economically underutilized, primarily located in the middle suburbs. (Newton 2010).
houses have become larger and the household now garages 2-3 cars, rather than the original single carport. The logical conclusion of these incremental built form changes (Figure 3) is a significant loss of landscape amenity and the unwitting erasure of the ‘green leafy suburban character’. The dominance of vehicles over pedestrian/cyclists exacerbates car-dependency, congestion and health issues we now associate with low-density settlement patterns.

To date, small-scale infill projects have been dismissed as ‘opportunistic’ market activity rather than strategic, policy-driven growth (Netwon & Glackin 2014; SGS 2014). On a lot-by-lot basis, dual occupancies are too small and ad hoc to attract interest from commercial property developers. As such, greyfields have not received the same level of industry attention as other forms of urban intensification. The unfettered development of small infill projects now accounts for around ¼ of Melbourne’s housing supply (Newton & Glackin 2014; Szafraniec & Holloway 2012) but it has not benefited from commensurate levels of examination or strategic direction. The refresh of Plan Melbourne (Victorian State Government 2015) is beginning to turn its attention to new strategic policies for this context. Higher levels of cooperation between public and private agencies present new opportunities for implementing innovative and positive urban changes that can respond to the imperatives of sustainable, liveable and productive cities. While government leadership is welcomed the question remains, what else can our garden suburbs become? In the face of unprecedented population increases, is it time to radically re-think the contemporary role and spatial structure of the suburbs? And if so, how will new and innovative designs be implemented in a context that, so far, has resisted fundamental changes in its basic settlement pattern?

Research Aims and Method

This paper explores the potential roles that architecture and urban design could play in the synthesis and application of ‘big data’ for implementing spatial innovations in established residential suburbs. The first section provides a brief summary of relevant data-related challenges for enhancing infill outcomes in greyfield areas. Despite urban policy emphasis on infill housing supply, small-scale residential development in established suburbs is an under-investigated segment of the housing market and there is a lack of meaningful data to support innovative transformations in this context. The authors discuss the use of extant and projected datasets for strategic decision-making and the difficulty of measuring the ‘value’ of innovative design outcomes across appropriate timeframes and urban scales.
Figure 1: Current condition of established residential suburbs (Source: Nearmaps)

Figure 2: Original condition of residential suburbs (Source: City of Whitehorse)

Figure 3: ‘Logical conclusion’ of dual occupancy infill (Source: Nearmaps)
The second section reflects on a design research project that examines innovative, precinct-scaled redevelopment of dispersed public housing assets in Melbourne’s middle suburbs (Murray et al 2015). Design research employs projective and integrative modes of inquiry “in which architects use the creation of projects … as the central constituent in a process” (Fraser 2013). Through a speculative and spatial engagement with ‘real world’ issues and sites, design research can uncover unique insights about the urban challenges we face. This paper discusses the value of the design knowledge generated by Murray et al (2015) and the difficulty of translating its place specific, qualitative nature into a quantitative evidence-base typically required by urban policy formation.

Lastly, the authors test and present a preliminary framework for capturing speculative design knowledge and assessing the value of spatial innovations over time. Optimisation modeling was employed as a method for inter-relating and examining the ‘net’ impacts of the proposed designs. In regard to the urban environment, optimisation has been used to assess the best allocation of scarce resources, the most effective combination of land uses and the most efficient phasing of building maintenance (Ligmann-Zielinska et al. 2008; Haque & Asami 2010; Sotelo-Pichardo et al. 2014; Martinaitis & Uzsilaityte 2010). To the authors’ knowledge, optimisation has not yet been applied to design and development evaluations per se. The decision to experiment with optimisation for this purpose was threefold. Firstly, multi-objective optimisation is a recognised approach to making complex trade-offs between sustainable criteria (Zavadskas & Turskis 2011; Bramley 2008). Secondly, it isn’t always possible to identify explicit design criteria representing the collective preferences of complex stakeholder-groups from the outset of a project (Macmillan 2003). Optimisation allows decision-makers to examine the influence of different parameters, explore alternative outcomes and learn more about the problem at hand as they search for solutions—in effect revealing user preferences as part of the evaluation process (Xiao et al. 2007). Finally, development decisions would ideally be based on detailed feasibility studies but this level of information is often unavailable as innovative concepts are developed. Optimisation models can be designed to iteratively adjust the number and weighting of discrete criteria and the dynamic of the ‘forces’ applied over time. Initial models might incorporate uncertain data or phasing with subsequent versions becoming more sophisticated as preliminary decisions are confirmed (Zavadskas & Turskis 2011; Xiao et al. 2007; Ligmann-Zielinska et al 2008).
Through these three sections, the paper explores the value of design knowledge and how it might be captured to better engage with the formation of new strategic policies in support of implementing innovations. The place-specific, visual and experimental nature of design is both an advantage and a challenge in contemporary evidence-based contexts. The authors discuss three potential roles of design to: 1. generate new and transformative spatial knowledge; 2. synthesise and distill large volumes of urban data; and 3. provide a locus for making disparate forms of urban data more meaningful.

**Data-driven challenges for implementing innovations in small-scale infill housing**

*Knowledge gaps*

A great deal of housing supply data is being generated by government, industry and academic sectors. Nevertheless, relatively little is known about the current pattern of small-scale residential infill, the factors driving the type and quality of outcomes or its collective impact on established suburbs (Szafraniec & Holloway 2012; Rowley & Phibbs 2012). This is, in part, due to the undifferentiated measures of infill housing and inconsistent definitions of ‘established’ suburbs. For instance, the Victorian Government (2015) contends that 70% of new housing in Melbourne is already supplied by infill but do not distinguish between inner city high-rise apartments, major redevelopment sites and small piecemeal projects in residential neighbourhoods. When development types are considered, other analysis suggests that the share of infill development has consistently decreased over time (.id 2014). In this study, large land parcels in established suburbs were counted as greenfield supply if turned-over in a “traditional greenfield format” and yielding less than 20 dwellings per hectare. Newton & Glackin (2014) similarly include all “broad hectare” sites in greenfield counts and provide a further breakdown of housing yields delivered by brownfield intensification and greyfield residential development.

<table>
<thead>
<tr>
<th>Residential yield of infill residential development</th>
<th>Total</th>
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<tbody>
<tr>
<td>1:1</td>
<td></td>
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<tr>
<td>1:2–4</td>
<td></td>
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<tr>
<td>1:5–9</td>
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<td>1:10–19</td>
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<td>1:20–49</td>
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<td>1:50–99</td>
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<tr>
<td>1:100 +</td>
<td></td>
</tr>
<tr>
<td>Brownfield</td>
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<td>Greyfield</td>
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<td>Totals (%)</td>
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<td>N</td>
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Table 1: Residential infill yields, Melbourne, 2004–2010 (Source: Netwon & Glackin (2014))
When scale, type and location are considered, Newton & Glackin (2014) show that less than 50% of new housing is supplied by infill, more than half is delivered by piecemeal projects yielding 1-4 dwellings (25% of overall supply), many of which occur outside nominated development areas. Almost 30% of infill supply is generated by large-scale projects of 50+ dwellings, illustrating the relative lack of mid-scale projects between 5-20+ dwellings (Table 1).

Spatial analysis of extant housing data provides an important evidence-base for tracking infill supply against policy targets, however very little research comprehensively links this type of quantitative analysis with the qualitative effects of development or its collective impact on the physical and social fabric of our cities. Qualitative analysis is needed to monitor how development outcomes perform against the imperatives of creating diverse, liveable and sustainable cities (Lowe et al 2014). For instance, Wilkins (2015) provides insights into neighbourhood impacts on life satisfaction, noting that “neighbours helping out or doing things together have large positive effects”. The spatial configuration or physical nature of those neighbourhoods encouraging/discouraging neighbourly interaction is not presented. More research would be required to understand how such information could be reapplied to the urban environment.

The gap between the aspiration for high quality and sustainable urban environments and its physical implementation is increasingly recognised. Giles-Corti (2015) notes “the policy challenge is to transcend the rhetoric of the benefits of ‘walkability’ and to use evidence to influence decisions”. However, the sheer volume of evidence being generated is in itself a challenge for decision-makers. Other research has examined the relationship of urban settlement patterns on housing affordability, social disadvantage and mobility, community participation, access to job-markets and transport connectivity, inactivity-related health issues, economic vulnerability and car dependency (Cheshire et al. 2014; Hulse et al. 2011; Dodson & Sipe 2008; Trubka et al. 2010). While each area of research has demonstrative value, the adoption of their ‘quantified’ outcomes in urban policy can be difficult. Indicators are often sensitive to scale or specific locations, or numerically ‘isolated’ by discipline-specific syntaxes that are less responsive to other aspects of the complex and dynamic systems cities represent. The capacity for such indicators to form the basis of integrated urban policy will rely on the ability to translate and inter-relate various urban measures across research areas, data-types, scales and places (Lowe et al 2014).
New methods for synthesising disparate sources of ‘big data’ and distilling practicable benchmarks are needed to support both the reformation and implementation of urban policies that better contend with the complexities of achieving sustainable, liveable and productive cities. This is particularly relevant for the transformation of established suburbs where the imperatives of, say, liveability may differ for existing and new residents, or what is considered sustainable differs for metropolitan and local conditions. This paper explores how architecture and urban design could be used as the locus for translating and cohering divergent urban inputs. The experimental and integrative nature of design speculation offers a potential vehicle for testing the overlaps and influences of various criteria, while its place-specific operations provide a common scale and condition under which big data could form meaningful correlations. However, spatial design is typically introduced towards the end of a strategic process, after high-level decisions are made and project briefs have been established (Figure 4). Largely seen as an instrument of implementation, spatial design knowledge is often omitted from strategic decision-making. One reason for this is the lack of adequate design metrics that can be incorporated within conventional evaluations (Funderburg & MacDonald 2010; Macmillan 2003). Conversely, most of the literature reviewed in this paper does not consider the physical qualities presented at site and building scales in their respective assessments of the built environment. As such, there is little capacity to capture and adopt innovative design opportunities in decisions about the future growth and development of the city (Figure 5). When understood in this way, it could be said that current data projections underpinning strategic policy are in fact biased towards business as usual outcomes.

**Lack of design metrics – capturing the value of design knowledge**

What constitutes design evidence is a contested issue, centering on the skepticism that the qualities of good design are in fact ‘measurable’ (Pert 2014; Dutoit et al 2010; CABE 2006). An exemplary design outcome will creatively synthesise a complex range of subjective and objective considerations into an integrated whole that becomes something more than just the sum of its parts. This makes it very difficult to adequately capture the value of that design through discrete criteria typically needed to generate an evidence-base (Macmillan 2003). This challenge is then amplified for innovative design propositions, for which there is little precedent, existing measures or prior industry knowledge (Dutoit et al 2010).
Figure 4: Preliminary mapping of data flows at strategic and implementation scales

Figure 5: Identification of gaps in knowledge capture
This paper specifically addresses spatial design innovations, as opposed to technological or operational innovations. Rating tools, such as Green Star and LEEDS (Green Building Council), are not discussed as they primarily relate to the latter two innovation areas. Other tools, such as the Design Quality Indicator (DQI), have attempted to codify the value of design based on the broad principles of functionality, build quality and impact relative to a project’s “resource envelope” (finance, time, natural and human resources; Macmillan 2003). DQI was initially developed to facilitate stakeholders’ commitment to agreed design criteria but ultimately became a tool for thinking about design, rather than an absolute measure of it (Gann et al 2003). Peak bodies have noted their reservations about codifying design evaluations observing, “the best examples often break or transcend the rules” (CABE 2006).

Evidence-based design (EBD) is an emerging practice area that has, to date, largely focused on the design of medical facilities. EBD promotes research-led design processes, drawing on best-practice examples, contextual analysis, ‘scientific’ experiments and relevant literature as evidence for design decisions (Hamilton 2004). Many would argue that designers already draw on this evidence-base, employing tacit knowledge gained through scholarly experience and professional rigour (Murray 2013). The questions raised by EBD relate to the capture of design knowledge and the validity of drawing on tacit knowledge as evidence, with Hamilton (2004) distinguishing between an individual’s expertise (data) and a transparent body of knowledge (evidence). While EBD may prove beneficial for the medical sector, which has the need and capacity to invest in spatial experiments under ‘laboratory’ conditions for instance, the feasibility of establishing an equivalent evidence-base for other design sectors needs more consideration. This is particularly relevant in the time- and cost-constrained environment of greyfield redevelopment. The tools and interfaces being developed to collect and analyse big data offer opportunities for the design disciplines to generate evidence that better engages with strategic policy formation. However, determining the types of design knowledge required would benefit from healthy debate. For instance, there is a concern that data-driven practices that don’t adequately recognise existing design expertise could introduce unnecessary and restrictive requirements.

*We need to move beyond technology-driven ideas of the city and incorporate more urban theory and practice into the design of solutions for the complex systems that are cities. ... For example, in New York City, the statistical finding that shopkeepers keeping their doors open reduced the incidence of crime could also have been predicted by urban theory (NYC’s own Jane Jacobs wrote about the need for ‘eyes on the street’ many years ago).* (RIBA & Arup, nd)
Design research – Precinct scaled redevelopment of established residential suburbs

This paper reflects on a design-led project (Murray et al 2015) that developed and tested three place-specific precinct proposals on dispersed public housing assets in two different suburbs in Melbourne. Through the resolution of the speculative scenarios, new knowledge was uncovered about the current barriers to greyfield regeneration. Findings from the design research processes relevant to this paper are summarised below, see Murray et al (2015) for detailed methodology and project discussion.

Capacity for precinct redevelopment of public housing assets in Melbourne

Analysis of the type, condition and distribution of 23,500 properties on the Department of Health and Human Services (DHHS) asset register was undertaken identify the capacity for precinct-scaled redevelopment in middle suburban locations (Figure 6). The assessment of suitable sites encompassed both quantitative data (e.g. age of stock, SEIFA) and the recurrence of qualitative design criteria (e.g. nature of spatial clustering). The survey found that seventy-five per cent of housing stock was built in the 45 years following 1950; more than half of the DHHS portfolio is located in the middle regions of the city (12,263 properties); and 60 per cent of middle suburban properties are single houses on a lot. The quantum of low density ageing stock in relatively high amenity areas represents an underutilised government asset that could be strategically ‘re-purposed’ to achieve more effective housing and urban outcomes.

Past housing policies for stock acquisition, construction and disposal have produced fragmented clusters of ‘residual’ sites in the middle suburbs that mimic current market infill patterns. Thus the findings from the speculative design inquiries could also be relevant to private industry. The site-clusters vary across locations, however the most prevalent distribution was characterised by pockets of 2-5 lot assemblies forming groups of up to 20 sites (Figure 7). 6672 properties dated 1990 or older were considered suitable for immediate precinct-scaled redevelopment and this number will likely increase as more stock approaches its end-of-life. The survey also revealed recurring urban situations where broader public benefits could be leveraged. For example, property clusters are commonly found near failing strip-shops, ‘blind’ park edges and underutilised community facilities.
Figure 6: Distribution of DHHS Properties in metropolitan Melbourne

Source of figures 6-8: Monash Architecture Studio

Figure 7: Example of site-clusters that exist within the ‘residual’ public housing portfolio
To explore the place-specific opportunities and constraints presented in different suburban areas, three design scenarios were developed and tested by Murray et al (2015) in a low and high value suburb: 1. Connected network of typical suburban streets, where site constraints and sensitivities to infill redevelopment are greatest; 2. Interface with an underutilised public park where high-impact design opportunities were identified; and 3. Strategies for seeding the future renewal of (currently failing) local shops. The precincts operate across 12-lot clusters, which is a replicable scale within the DHHS portfolio. This precinct size has the necessary ‘critical mass’ to leverage broader neighbourhood benefits, but is small enough to be understood as an autonomous project with a clear function and ‘contained’ extent. This is important for successful community engagement and cooperative partnerships. Each speculative design resulted in differing dwelling and public realm solutions. For the purposes of this paper, a summary of spatial design findings common to all proposals are provided:

- **Flexible siting increases diversity, yield and connectivity** - Operating across a field of dispersed sites allows for non-uniform, flexible siting of higher density buildings, mixed uses and efficient parking arrangements. For example, larger-scale apartment buildings could be located at park edges where ample landscape amenity can support higher density living arrangements and minimize adverse impacts on neighbours (Figure 8). Low-rise dwellings could then be delivered in more sensitive precinct areas enabling a variety of households and tenure types to be accommodated across a neighbourhood while still achieving considerable yield increases overall. On-site parking can consume up to 25% of typical infill sites, placing huge restrictions on the built form outcomes (Bertram et al. 2011). When multiplied across a neighbourhood on a lot-by-lot basis, the physical impact is pronounced. Collectivised parking for housing clusters presents significant development efficiencies. New pedestrian links to a network of small parking nodes also improves neighbourhood connectivity.

- **Public realm upgrades are needed to maintain liveability for increased populations** - Much like the housing in greyfield suburbs, many community facilities are outmoded. The precinct design approach enables existing public assets to be integrated with new housing provisions. Upgrading community buildings for an expanded set of uses and physically
Figure 8: Park edge precinct design

This proposal enhances the interface between the existing neighbourhood and the large public reserve. Generous landscaped ‘street’ connections are provided between the rows of new housing, increasing access to existing pedestrian and bicycle networks in the public reserve. These are important structural enhancements that could contribute to reduced car-dependency, as the reserve connects to other public transport services and near-by education and employment areas. Localised clusters of vehicle parking are proposed to adapt to other uses over time. Potential district-wide servicing, which could be installed linearly along the park edge. For example, a bio-swale system could capture storm/waste water from the precinct and re-used to maintain the recreational ovals in the park. Infrastructure could also incorporate other properties in the surrounding neighbourhood.

No. allotments: 12

Site area: 9100m$^2$ (lots)
2385 m$^2$ (public realm)
11485m$^2$ (total)

No. dwellings: 1.5BR x 20 4BR x 10
2BR x 40 5BR x 3
3BR x 6 TOTALLS

No. car parks: 95 (1.07 per dwelling)

Public realm upgrades included: Childcare centre
Parking deck and recreation
Park + aged care interface
Streetscape + open spaces

Public realm upgrades by others: Upgrades to parkland
District-wide servicing

Source: Monash Architecture Studio

Figure 9: Park-edge precinct – interface to open space reserve

Student proposition for higher-density, low-rise housing at park edge. Building forms about the rear boundary of allotments, enabling greater densities to be achieved, as well as providing opportunities to activate the currently blind edge of the reserve. This porosity and activity would improve security and passive surveillance in these areas (a key concern voiced by workshop participants). The new park frontages have the potential to accommodate a range of small community facilities or commercial programs related to recreational park uses and the existing sports club (e.g. bike or equipment hire).

Images: Lara Pannuzzo

Source: Lara Pannuzzo
relinking them back to a changed urban context enables them to ‘work harder’ for more people, in turn supporting liveability levels for higher population densities. Existing assets can be augmented with place-specific infrastructure tailored to local needs and aspirations. For example, a health facility for assisted living units could also service local sports clubs (Figure 9).

• **Laying the groundwork for incremental transformations** - The dispersed precinct model is inherently flexible. It leaves gaps open for future opportunities—not expending future capital—allowing for adjustments and adaptations over time. It provides the groundwork required for ongoing regeneration of the physical and social fabric, supporting long-term, and genuinely sustainable urban transition. Good quality design encourages other flow-on benefits, such as attracting local business or institutional investment through active streetscapes and improved access/connectivity. Neighbourhood upgrades that are desirable but aren’t immediately necessary, could be staged and incorporated as cooperative finance opportunities are presented (Figure 10).

Figure 10: Public realm upgrades – immediate enhancements & seeding future works

- **Field of influence** - When ‘clusters’ of lots are collectively redeveloped as an integrated precinct, their site dispersal becomes an advantage, not a limitation. Compared with one large consolidated site, dispersed precincts encompass a greater surface area, or field of influence, for regeneration initiatives. This expanded field is contingent on precinct sites having an apposite level of ‘nearness’ to one another. Conversely, if the dispersion of sites is too great, the ‘field of influence’ offered by coordinated redevelopment becomes diluted, symptomatic of piecemeal development delivered lot-by-lot (Figure 11).
The speculative design process cohered the expertise of the local residents, housing providers, local government and the design research team to uncover innovative strategies for increasing dwelling yields and diversity while simultaneously enhancing the overall quality and sustainability of existing neighbourhoods. By integrating the design of small-scale infill housing with community asset renewal and targeted public realm improvements, the dispersed precinct approach offers a vehicle for transitioning the piecemeal redevelopment activity in residential suburban areas towards more effective urban outcomes. While local stakeholders can appreciate the value embedded in the place-specific design proposals, the precinct model is yet to be ‘proven’ against broader urban priorities that can be supported by strategic policy (e.g. long-term public benefits, public asset management, implications for strategic and statutory planning), or attract take-up by a risk averse development industry (project viability). Without other forms of evidence to support the ‘value-proposition’, implementation of the proposed spatial design innovations is likely to be impeded.

**Optimising Uncertainties: an experiment in capturing design value**

This section of the paper presents a preliminary framework for weighing up how the precinct design model performs against the various priorities presented at local, metropolitan and market levels compared to business as usual (BAU) and current best practice housing quality (QUAL) (Figure 12). The framework is not intended to ‘solve’ for the most feasible option. Rather it is presented as an initial experiment to inter-relating speculative design knowledge.
with other forms of quantitative urban data through optimisation modeling techniques. Through their integration, the study poses new ways of thinking about development impacts and explores the possibility of extracting new ‘evidence’ to support strategic decisions about innovative, but as yet unproven, spatial design outcomes. For brevity, this paper focuses on the capacity of combining design and optimisation frameworks as an initial ‘proof of concept’ and less on the validity of the data used or preliminary outcomes achieved. Data-sources and assumptions have been documented in detail elsewhere (Murray et al 2015b).

The model engages with the related issues of public realm upgrades, property values, market leadership and uplift of private sector infill activity by speculating on the transition from BAU lot-by-lot development to a higher instance of coordinated precinct outcomes over a 20-year period (Figure 13). It draws on the design research knowledge generate by Murray et al (2015) and extrapolates the potential impacts in the low and high value 1km$^2$ study areas, as though the business as usual dual occupancies (BAU), best practice housing quality (QAUL) and innovative precinct designs (PRE) were replicated on surrounding residential properties. The assessments are design-driven in the sense that they speculate on future scenarios and, through the creation and resolution of those scenarios, provide insights about the conditions and inputs employed in their making (Murray 2013).

The model has been guided by three key challenges:

1. There is very little existing analysis specific to Melbourne’s middle suburban infill housing market (Szafraniec & Holloway 2012; Howley & Phibbs 2012);

2. A lack of adequate design metrics impedes meaningful estimation of market effects attributable to specific dwelling and neighbourhood qualities (Funderburg & MacDonald 2010). In addition, the research examines a new and ‘untested’ infill model for which there is little precedent. The preliminary model has initially adopted property price increases as a proxy indicator for design benefits.

3. Stakeholders often cannot, or will not, provide transparent accounts of the overall costs and benefits of sustainable development which inhibits effective risk/profit sharing arrangements (Groenendijk 2006) and in turn impedes the implementation of innovative design. This model is designed to incorporate increasing levels of data certainty in subsequent iterations of development. It initially compares the net impacts (financial and physical) of different infill approaches based on the speculative design knowledge
Figure 12: Experiment: comparative examination of design value

Figure 13: 2 x study areas

<table>
<thead>
<tr>
<th>Study Area A</th>
<th>Study Area B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median house price; $430K</td>
<td>Median house price; $1M +</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>DHHS all</th>
<th>All lots in 1km²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of lots</td>
<td>153</td>
<td>665</td>
</tr>
<tr>
<td>% lots in 1km</td>
<td>23%</td>
<td>100%</td>
</tr>
<tr>
<td>Total lot area (m²)</td>
<td>108,076</td>
<td>412,980</td>
</tr>
<tr>
<td>% are of 1km²</td>
<td>28%</td>
<td>100%</td>
</tr>
<tr>
<td>Av. lot size (m²)</td>
<td>706</td>
<td>621</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>DHHS all</th>
<th>All lots in 1km²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of lots</td>
<td>71</td>
<td>717</td>
</tr>
<tr>
<td>% lots in 1km</td>
<td>10%</td>
<td>100%</td>
</tr>
<tr>
<td>Total lot area (m²)</td>
<td>92,477</td>
<td>511,876</td>
</tr>
<tr>
<td>% are of 1km²</td>
<td>18%</td>
<td>100%</td>
</tr>
<tr>
<td>Av. lot size (m²)</td>
<td>657</td>
<td>557</td>
</tr>
</tbody>
</table>

Figures include residential land only and exclude land already strata titled/subdivided
generated by the project. The comparative examination of can identify the conditions, limits and levers required to achieve different spatial outcomes at various intervals in the development life-cycle (Figure 14) and consider the relative “opportunity cost” if innovations were not implemented. As pertinent criteria are identified through preliminary assessments, and more certain data becomes available, the model’s parameters can be adjusted to generate different forms of evidence, reflecting the iterative development of strategic decisions.

Figure 14: An incremental approach to sustainable urban transformation

The optimisation model initially seeks to maximise the dwelling sales that are possible under the constraints of three different ‘strategic directions’ and calculates the implications in terms of cost, profit, time required for transitioning, the share of development approaches delivered (i.e. business as usual (BAU), current best practice housing quality (QUAL) and innovation precinct designs (PRE)) and the dwelling yield and diversity supplied. The ‘strategic directions’ used to nominate key determinants in the future-directed model include:

1. Do nothing—assumes no strategic planning or industry change, the rate of BAU completions increases over time due to its relative ‘ease’. Very modest property price rises and increases in demand occur over the 20-year timeframe due to the lack of housing quality and neighbourhood improvements delivered.

2. Housing quality benchmark—urban policies facilitate small lot consolidations and housing quality improvements. Limits are imposed to represent the time and degree of difficulty involved for the market to transition from BAU to Best Practice outcomes. Price rises and development uplifts reflect the culture shift towards higher quality infill outcomes.
3. Strategic transitioning—assumes a paradigm shift by governments, industry and landowners to implement innovative precinct designs. Model constraints reflect the degree of difficulty for assembling sites, coordinating stakeholders and resolving the innovative designs. After the first precincts are completed, the rate of price rises and development uplifts are more intensive.

Table 2 defines the constraints and variables used in the model to ‘affect’ the market conditions created by the above strategic directions. The bulk of these constraints are linear, while some are nonlinear. Table 3 lists the magnitude of limits imposed over time. All costs and prices are given in constant dollars.

Linear optimisation models are of the form:

Find n-vector \( x = (x_1, \ldots, x_n)^T \) to maximise an objective function
\[
ctx = c_1x_1 + \ldots + c_nx_n
\]
subject to the constraints:
\[
a_{11}x_1 + a_{12}x_2 + \cdots + a_{1n}x_n \leq b_1
\]
\[
a_{21}x_1 + a_{22}x_2 + \cdots + a_{2n}x_n \leq b_2
\]
\[
\cdots
\]
\[
a_{m1}x_1 + a_{m2}x_2 + \cdots + a_{mn}x_n \leq b_m
\]
and:
\[
x_1 \geq 0, \quad x_2 \geq 0, \ldots, \quad x_n \geq 0
\]

The mathematical definition given above can be simply translated into a set of statements describing the current model:

Maximise the sum of profits over 20 years derived from unit and apartment sales
subject to constraints in the:
- number of lots available for development in any period
- the ‘snowball’ effect of increased stakeholder awareness of development benefits
- share of developments that are allocated to BAU, QUAL and PRE categories
- yield of precinct development by type [BAU, QUAL and PRE] and location [A or B]
- areas [m2] of development by type [BAU, QUAL and PRE] and location [A or B]
- costs [cost per m2] of development, as well as
- prices within completed developments
and:
- number of lots available \( \geq 0 \)
- snowball factor \( \geq 0 \)
- share of developments \( \geq 0 \)
- yield of precinct development \( \geq 0 \)
- areas [m2] of development by type \( \geq 0 \)
- costs [cost per m2] of development \( \geq 0 \), as well as
- prices within completed developments \( \geq 0 \).

---

2 ‘Snowball effect’ is defined as the acceleration of land made available by local residents, developers, DHS and/or others as they recognise the benefits of development involvement.
Table 2: Definition of constraints and variables used in the optimisation model

<table>
<thead>
<tr>
<th>Category</th>
<th>Constraints</th>
<th>Variables set for each scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>NUMBER of lots available for development in any period:</strong></td>
<td>The maximum DHS lot numbers available within the square kilometre. The maximum TOTAL lot numbers available within the square kilometre. The SHARE of these lots to be used in a given period.</td>
<td>Number of lots per location (Area A or B). Refer Figure 3. Number of lots per development type BAU, QUAL, or PRE. Refer Murray et al 2015b. Maximum inter-period percentage growth in lots used. Conservative estimate is initially set at 12.5% p.a. representing a maximum of approx. 30 lots per year.</td>
</tr>
<tr>
<td>2. <strong>SNOWBALL effect on lots available for use in any period:</strong></td>
<td>The maximum and minimum annual percentage increase in lots available for use within a given scenario and period.</td>
<td>Percentage increase in rate of land released by property owners (local residents, developers, DHS and others) as they recognise the benefits of involvement in developments completed under each strategic direction ('Do nothing', 'Housing quality benchmark' and 'Strategic urban transitioning'). See Table 2 for year 1 and year 20 factors.</td>
</tr>
<tr>
<td>3. <strong>SHARE of developments which are allocated to BAU, QUAL and PRE categories:</strong></td>
<td>The maximum percentage category share available within a given scenario and period, given that: BAU% + QUAL% + PRE% = 100% The minimum percentage category share available within a given scenario and period.</td>
<td>Maximum and minimum inter-period percentage of development types (BAU, QUAL and PRE) completed under each strategic direction ('Do nothing', 'Housing quality benchmark' and 'Strategic urban transitioning'). See Table 2 for year 1 and year 20 factors.</td>
</tr>
<tr>
<td>4. <strong>YIELD of precinct development by type (BAU, QUAL and PRE) and location (A or B):</strong></td>
<td>Determined by design scenarios.</td>
<td>Number of unit and apartment types constructed per design scenario (Park edge, Green streets and Local shops). Refer Murray et al 2015b for development data.</td>
</tr>
<tr>
<td>5. <strong>AREAS (m2) of development by type (BAU, QUAL and PRE) and location (A or B):</strong></td>
<td>Determined by design scenarios.</td>
<td>Site areas for development. Additional public use areas required. Dwelling areas by type (units, apartments). Hard-surfaced areas required. Soft-surfaced areas required. Refer Murray et al 2015b for development data.</td>
</tr>
<tr>
<td>6. <strong>COSTS (per m2) of development:</strong></td>
<td>Determined by development costing.</td>
<td>Unit cost per m2 for site purchase, infrastructure, commercial, hard-surfaced and soft-surfaced areas. Unit cost per m2 for construction by type (unit or apartment). Development overheads (% by type (BAU, QUAL and PRE). Refer cost data.</td>
</tr>
<tr>
<td>7. <strong>PRICES within completed developments by period:</strong></td>
<td>Maximum and minimum annual percentage price rise limits for units, leading to: maximum and minimum price levels for units maximum and minimum annual percentage price rise limits for apartments, leading to: maximum and minimum price levels for apartments.</td>
<td>Percentage increase in sale prices relative to the physical quality and level of amenity provided by development type (BAU, QUAL and PRE) completed under each strategic direction ('Do nothing', 'Housing quality benchmark' and 'Strategic urban transitioning'). See Table 2 for year 1 and year 20 factors.</td>
</tr>
</tbody>
</table>

Table 3: Magnitude of constraints applied to different scenarios

<table>
<thead>
<tr>
<th>Development share max</th>
<th>'Do nothing'</th>
<th>Housing quality benchmark</th>
<th>Strategic urban transitioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAU 100% 100%</td>
<td>100% 80%</td>
<td>100% 30%</td>
<td></td>
</tr>
<tr>
<td>QUAL 0% 15%</td>
<td>0% 40%</td>
<td>0% 50%</td>
<td></td>
</tr>
<tr>
<td>PRE 0% 0%</td>
<td>0% 15%</td>
<td>0% 50%</td>
<td></td>
</tr>
<tr>
<td>Development share min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAU 100% 80%</td>
<td>0% 40%</td>
<td>0% 10%</td>
<td></td>
</tr>
<tr>
<td>QUAL 0% 0%</td>
<td>0% 0%</td>
<td>0% 0%</td>
<td></td>
</tr>
<tr>
<td>PRE 0% 0%</td>
<td>0% 0%</td>
<td>0% 0%</td>
<td></td>
</tr>
<tr>
<td>Snowball effect Max</td>
<td>0% 2.5%</td>
<td>0% 15%</td>
<td></td>
</tr>
<tr>
<td>Min 0% 0.6%</td>
<td>0% 3.8%</td>
<td>0% 7.5%</td>
<td></td>
</tr>
<tr>
<td>Price rise per annum</td>
<td>Max 0% 1%</td>
<td>0% 4%</td>
<td>2.5% 5%</td>
</tr>
<tr>
<td>Min 0% 0%</td>
<td>0% 3%</td>
<td>1% 3%</td>
<td></td>
</tr>
</tbody>
</table>

BAU = business as usual dual occupancies; QUAL = best practice initial housing; PRE = innovative precinct designs

Source: Dench Analytics
To some extent, it was expected that higher density and higher quality precinct designs would not be feasible under current market conditions. The aim of the optimisation model is to explore the degree to which this might occur compared to lower-risk development models and identify potential strategies for increasing the implementation of innovations. Eighteen different iterations of the model were generated (Figure 15) producing different levels of profit, dwelling yield and types. This enabled a basic comparison of the parameters interacting in the model, supported by the visual and qualitative design outcomes. Development shifts at yearly intervals can be interrogated to isolate relevant information to support strategic decisions, such as the potential levers for ‘step-changes’ in design quality (e.g. achievement of housing diversity) or payback periods of design innovations. As well, the cumulative impacts at the end of the 20-year timeframe indicate the long-term implications of early decisions made under each ‘strategic directions’.

Figure 15: Discrete examination of 18 development outcomes

The preliminary study indicates:

- **BAU infill—an unfeasible approach for sustainable urban transformation**: BAU was not profitable in either location and its economic feasibility decreased as time went on. BAU
cannot be considered viable for strategic urban transitioning due to the low dwelling yields achieved, combined with suboptimal housing design and lack of broader contributions for the neighbourhood. The consumption and land impedes future regeneration initiatives, presenting a significant opportunity-cost for established suburbs.

- **Best practice infill outcomes are the most feasible in the short-term:** Current best practice was the most viable model in the early phases of the development life cycle, due to the judicious design of higher density dwellings using efficient construction methods. It provides a benchmark for the immediate infill market, however dwelling diversity is limited in the long term and development ‘breaks even’ over 20 years. External investment would be required to provide supporting services, amenity and infrastructure for the resultant population increases.

- **Integrated precincts performed best over time:** The ‘strategic urban transitioning’ scenario is the only model that achieves a cumulative profit over the life-cycle of redevelopment. The initial development investments result in a deficit until for mid-cycle, after which time the ongoing urban improvements tip the physical and economic conditions into a more favourable state for viable regeneration. When read in parallel with the precinct design outcomes, better quality and greater diversity of dwellings are delivered, with a modest, but effective density increases across the 1km².

The combined outcomes for all 18 scenarios average out the differing property values and number of available allotments in each of the study areas. As well, the average outcomes absorb the differences in dwelling yields and development costs associated with the context-specific design outcomes. As such, they provide a preliminary indication of how an integrated and strategic approach to precinct redevelopment might perform across different locations. Understanding the share of development types generated by incremental transformations provides insights for current housing need and the spatial distribution of future housing supply (Figure 16 + Figure 17).
The aggregate assessments reinforce the opportunity costs of BAU redevelopment. Simply put, we can’t afford to ‘do nothing’. Even with strategic policy intervention, BAU development will still consume 65% of infill sites (Figure 16). Future iterations of the model will examine to what degree the constraints need to be varied to generate a different future outlook. Dwelling yield and profit increased with higher occurrence of precinct designs (Figure 18 + Figure 19), indicating that strategic renewal of public housing assets could be used to ‘kick-start’ sustainable and viable urban transformations by the private market. The initial experiments suggest a pay-back period of around 10 years. Alternatively, development partners with a long-term interest in the quality and performance of established suburbs could be sought. The not-for-profit housing sector is an obvious contender. Other possibilities include health (e.g. housing with care service delivery) and education sectors (student housing), whose operating models are moving from a ‘contained campus’ to ‘spatial network’ as technology and facilities respond to increasing number of clientele. Future iterations of the precinct designs and optimisation model will investigate proposals for integrating health and education design priorities.
Making data meaningful through speculative design: strategic value

To conclude, the authors briefly reflect on the potential of ‘big data’ to support the implementation of spatial design innovations. The design disciplines are relatively new to this arena and it is not yet clear how big data will impact on their urban practices (RIBA and Arup, nd). Nevertheless, they have extensive experience with the city and tacit knowledge about how it behaves and changes. Projective design and speculative thinking offers a vehicle for synthesizing, prioritizing and drawing out meaning from valuable, but extraneous, urban data sets. Conversely, when unprecedented population and environmental pressures are catalyzing the need for innovative urban transformations – for which data certainty is rare – design could be used as a vehicle to examine and distil data projections to underpin robust
strategic policies that can better contend with urban challenges we face. This will rely on the ability to translate existing evidence across multiple spatial scales that include indicators at collective site and building scales.

In a greyfield context, where scant urban evidence has been developed, speculative design can be used to uncover new knowledge. The current formation of development policies is underpinned by the need for market-led solutions (Pinnegar 2007; Tomlison 2013). As such, the dialogue around innovation and urban transformation tends to be dominated by short-term financial concerns relevant to private industry. Addressing these concerns is necessary to improve immediate infill outcomes (Rowley & Phibbs 2012) however there is also a need to recalibrate development measures so that long-term design advantages are appropriately weighted in current decisions for urban change. In collaboration with analytical experts, design offers the potential to re-frame the ‘evidence-based’ from a cost-dominated model to a value-oriented model. Through a renewed spatial understanding of urban impacts, innovations may be more readily valued in, rather than risked out.

References


Rowley, S & Phibbs, P 2012, *Delivering diverse and affordable housing on infill development sites*, Australian Housing and Urban Research Institute, Melbourne.


Use and Spatial Patterns of newly developed Public Squares in Urban Villages in Shenzhen

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Abstract

This paper investigates the use and spatial patterns of newly developed public squares in urban villages in the City of Shenzhen, China. Given the lack of information about how this type of public space has been used by the Chinese, this paper provides insights that enable the development of more user-friendly public space in China. The research is based on the fieldwork carried out in 2014 to examine public squares in four urban villages in Shenzhen. Direct observation and activity mapping have been used as major methodology for this research. The focus of this paper will be placed not only the formal aspects such as the design aspiration, scale and provision of public amenity, but also on the usage that includes types of users, their daily activity as well as their location preference.

The findings of this research address the failure of current design to meet the needs of the majority of users. Chinese public space users seem to have vastly different behaviour patterns compared with their Western counterparts, therefore many design guidelines emerged in the West can be misleading in China. As important, this paper identifies key issues related the design of public squares in urban villages and provides some hints to mitigate such issues. The paper concludes with design guidelines that reflect not only the cultural complexity of public spaces in China, but also how different scales can be mediated to generate a space that allows for various activities to occur naturally.

Keywords: public squares, Shenzhen, Use Patterns, spatial transformation, Chinese cities
Introduction

Although Public Square is the quintessential type of public space in Western culture, it is still something very new in China. Those very first public squares were firstly built in the second half of the last century. Interestingly, over the last three decades, this type of public space has become the most popular one in many Chinese cities. The rapidly increasing number of public squares happens partly because it has been using as a central element of the redevelopment of many urban villages. Unlike Western cities, Chinese cities are often composed of hundreds of villages which have been transformed rapidly from rural to urban entities within a few decades. In Shenzhen alone, the number of such urban villages is nearly 250 (Zheng et al., 2009) and national wide, there are thousands of urban villages. Only a small percentage of these villages have been redeveloped recently, whereas the majority of them are already in the list of local government to rebuild in the near future.

This research paper takes the assumption that many of the remaining urban villages might follow a popular model originated in Shenzhen in which a Public Square is conceptualised as a central element of the whole new village. This model seems to gain more popularity as the model of conversing urban villages into high-raised housing tower communities has received much negative feedback from different perspectives. Considering the relevance and importance of the design of public squares in Chinese urban villages, we are interested in knowing how they have been used and whether the current design practice has addressed the daily needs of the actual users. This set of knowledge will certainly contribute to the making of more user friendly public squares in many urban villages in the years to come.

The lack of information about the use of the space

Given the fact that public space in general, and public squares in particular, have been introduced into China in a period when the country has undergone tremendous social, economic and political change, little attention has been paid to the use and the design of public space.

The majority of studies in China have approached the topic of public space from political and legal-economic perspective.¹ Many studies dating back to the 1990s

¹ According to Neil (2010), there are three distinct perspectives in research of public space: political, legal-economic and social-spatial perspectives.
focused on the transformation of the development of the “public sphere” in China and the consequences on the use of public spaces as a disputed territory between the state and the society (Huang, 1993, Gu, 1999, Rowe, 1990, Wakeman, 1993, Rankin, 1993, Orum et al., 2009). In a similar vein, it is argued that newly developed public squares in China have been designed as a scene for the state to display its political power and achievement (Gaubatz, 2008, Padua, 2006, Hassenpflug, 2004, Pu, 2011), with much less attention being given to the people’s daily needs. In addition, many studies report on the commercialisation and privatisation of public space in China that occurs due to an absence of institutional regulation which further compromises the rights of public space users (Chen, 2010, Pu, 2003, Pu, 2001, Broudehoux, 2004, Juan, 2010). These studies might provide information about some aspect of the use of public space; however, the quantitative information, which especially explains spatial behaviour in open spaces by the Chinese, is less evident.

Within a socio-spatial perspective, the majority of studies to date focus on the formal expression of design, embedded within a discussion of the development of Chinese modern identity versus the preference of Western models (Yang and Volkman, 2010, Hassenpflug, 2010, Yu and Padua, 2007, Bracken, 2009, Pu, 2011, Pu, 2001). These studies focused on the image and the identity of the space rather than how they have been used. For example, Pu Miao, a prominent public space researcher in China, often argued that the introduction of public squares into Chinese cities is not appropriate. According to him, the scale and design of Public Square is not matching with the fine grain of the urban fabric of Chinese cities. Therefore, he argued that it is better to develop many small connected courtyards instead of one or two large squares (Pu Miao 2011). In a similar vein, Yang and Volkmann suggest adopting the concept of the Chinese scholar garden, characterised by circuitous pathways and the provision of many small sub-spaces. However, it is worthwhile to note that these historical precedents were conceived as private spaces that were designed for the use of individuals. In contrast, public space in China now are widely used by large activity groups which need much more spacious settings than those offered by the Chinese traditional gardens.

In short, although the number of the studies of Chinese public space in general and public squares in particular has increased over the last two decades, the majority of them is failed to provide architects and urban designers knowledge about the use of the space including the demographics of users, their activities and their spatial preferences. In the rise of a more bottom-up approach to urban design, many authors would suggest
that the use of the space to be the main source of creativity (Carmona 2014; Gehl 2013; Marcus and Francis 1997; Whyte 1988) rather than any ideological preferences by architects and developers.

This research paper is extracted from a PhD at Victoria University of Wellington which aims to close this knowledge gap, providing concrete information about the daily use of public squares in urban villages in Shenzhen: what these daily use patterns are and whether current design practice has addressed the needs of the users. This paper is not interested in the historical development of the space as well as users’ perception.

**Methodology**

This research paper is based on the quantitative analysis of direct observation and activity mapping of the central public square in Xiasha Village, a big urban village in the central areas of Shenzhen City.

The square was observed one weekday during January 2014 in six time periods from 7 am to 7 pm. The observation allowed us to map the use of the space by people according to the variables of gender, age groups, group-sizes and type of activities. The classification, see table 1, of the types of users is specialised for the Chinese context. School children and teenagers are nearly absent in public squares in a weekday, whereas there are plenty of the elderly and small children.

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Gender</th>
<th>Male</th>
<th>Female</th>
<th>Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Old (50+)</td>
<td>Young (17-50)</td>
<td>Children</td>
<td></td>
</tr>
<tr>
<td>Group Size</td>
<td>Big group (3+)</td>
<td>Couple</td>
<td>Individuals</td>
<td></td>
</tr>
</tbody>
</table>

Regarding the classification of activities, the Chinese context differs from Western counterpart given the popularity of group activity such as exercising, babysitting, singing and oftentimes sewing by women. In addition, sitting and standing will be also two main activities occurring during the day. In short, this set of data can provide information to answer the questions such as who the users are, what activities they do, when and where these activities are likely to occur.

In addition to activity mapping, the physical surveying of the site will provide concrete information about the provision of seats, the size of the space and other amenities that
might affect the use of the space. Along with the activity maps and observation notices, photos have been taken also for the investigation at later stages.

Figure 2: Example of an activity map

Introduction of case study: Xiasha Village and its central Square

Xiasha Village is located on the southwest of Futian District, a central District in the city of Shenzhen. The village is connected with three main transportation lines: Binhe Road, Shennan Road and the Guangzhou-Shenzhen Highway. Xiasha village is the home of nearly 60 thousand former villagers. Given its superior location and convenient transportation, Xiasha Village has attracted a large amount of working migrants which has brought an enormous amount source of income for former villagers as well as the local government of the village.
Similar to many other urban villages in Shenzhen, former villagers have lost their rice fields when the city expanded. Many of the former villagers have no skills or adequate education for the job market of a global city such as Shenzhen. Therefore, for many former villagers, the main income is generated from the right to rebuild their house to become low-budget renting apartment for migrant workers from the countryside. As the land ownership in urban villages is collective, many villages organise themselves as joint-stock enterprises which will be in charge for the redevelopment of public structure of the village. The location and structure of the village can be seen in figure 3 below.

**The urban structure of the redeveloped urban village**

Xiasha village has been transformed rapidly over the last three decades. Between 1995 and 2000s (Ma 2006), the old organic street network of the village and decaying houses were replaced by a new rationally planned structure. A central square was added at that time as well.
The newly developed urban structure of Xiasha village represents a typical pattern which can be seen in many other villages in this kind. A network of local streets divides the village into a dozen of blocks. In turn, each block will be divided into relatively equal-sized building plots. Each household of former villagers will have the right to build their house on one of the building plot whose size is roughly 100 square meter. Since renting becomes the main source of income for most of villagers, the underpinning logic behind the masterplan of the village is maximising the building areas. In order to achieve this, the public space such as local streets and alleys were kept to the minimum. Most of alleys within the village are less than two meter which cannot meet the requirement of basic sunlight and or ventilation (Ma and Wu, 2004), especially when most of the buildings have more than five floors.
The focus on maximisation of renting areas as well as the equalisation of the land area for each household has generated a messy landscape of low-budget housing towers and unusable space between the buildings on the one hand. On the other, the local streets are often overcrowded of trading and small business activities that in turns also exacerbates the quality of street as public space in the village.

In this circumstances, the central public square should serve as the main open public area for leisure activity purposes for a large number of local inhabitants. The question is however whether the design of the space has fulfilled this expectation by addressing the daily needs of people.

**The Central Square of Xiasha Village**

The public square of Xiasha village is one of the largest squares in urban villages with a metric size of over three hectares. Xiasha village square contains some typical public facilities that can be seen also in other public squares of this kind such as an ancestral hall, an open stage, two religious temples, and a Village Gate. Being the only large public open space in the village, the square’s design includes also two fenced sport fields and an underground public car park (see the map below). In addition, the ground of the square is mostly paved and carved with Chinese motifs, which give the space a strong sense of local culture.
According to Chinese researchers, the design of the space is comprehensive and includes many unique characteristics that can hardly be seen in other ‘villages’ (Ma 2006). From my personal experience, the square has some interesting sub-spaces such as the scenic garden (figure 7 right), the space at the Gate and around a small temple (number six in the map figure 6).

However, despite the picturesque characteristics of the space, it is uncertain about how the space has been used and whether its design has addressed users’ everyday needs. The following sections will attempt to answer these questions.
The Demographics of Public Space Users in Urban Villages

The demographics of the users is a crucial source of information for designers (Lynch and Hack, 1984). Designers should know who they design for. A public space is open for the general public, but given its location and the preference of users, a public space might attract one particular group of users over the others. For example, public squares in American city downtown are likely used by office workers than other groups. This demographic investigation should identify the majority of users of public squares in urban village and perhaps also providing information about the absence of particular groups. From informal observation, it is suggested to divide the demographics of users into three sub-categories: age groups, gender and group sizes.

Age Groups

The result of our observation in a weekday exposes a striking fact in Xiasha village is that nearly 60 percent of public space users are the elderly. This number is proportionately extremely high as according to the population census 2014 (Index-Mundi, 2014), the percentage of people older than 55 in China is about 20 percent of the whole population. Especially in Shenzhen, a young city where only 1.22 percent of the population are over 65, this figure suggests that public square is much needed by the elderly.

Figure 8: Age groups of public space users

By contrast, the amount of working people with age of roughly between 18 and 55 is proportionately low, contributing less than 15% of the whole. The number of working people is less than half of the number of small children observed in the space.
Gender of Public Space Users

The ratio between male and female users of public space often reflects the local culture and society. A famous historical painting of a Chinese city (see figure 9) shows that mainly men were present in traditional paintings of urban public spaces. Indeed, prior to the Communist Revolution in 1949, the presence of women in public was highly restricted due to the patriarchal nature of the Confucian ideology which had institutionalised a strict separation of the spheres, associating women with the inner sphere and men with the outer sphere (Bray, 1997, Leung, 2003, Cheng, 2000).

Figure 9: Famous Painting from the Qing Dynasty: only men found in public space (Wu, 1997)

The Communist ideology however has equalised the role of women in the Chinese modern society, and it might entail certain positive impacts on the presence of women in public space (Jin, 2011). In the post-Maoist era, although the influence of the Confucian ideology is still present, a different image of public spaces was found in China.

In fact, our data suggests that the number of women found in Xiasha village square is slightly higher than that of men. The mean percentage of women is about 38 percent, whereas that of men is 33 percent (see figure 10) which is only slightly more than the number of children.
Group Sizes

The size of the group might affect the preference of location in open public space. People in groups often select to situate at where they can have a face-to-face conversation. At the other end, individual users often select location with ability to see others but not to be highly exposed. The information of the size of the groups, therefore, also provide useful insight for designer in the development of user friendly public space.

Another significant finding is that the majority of public space users were found in groups of more than three people. On average, nearly two-thirds (65 percent) of total users belong to one of the big groups. The concrete number of people in big groups varies to a large degree. While the typical size of big groups is about five to seven people, larger groups can be up to forty or more people. In contrast, the percentage of users, as individuals, is relatively low with a mean value of 13 percent.
In the case of Xiasha village, the central public square is used more collectively rather than a place for individuals to rest and to escape from the crowded metropolis.

**Levels of Usage and Temporal Patterns**

A general critique of the use of public squares in Western cities is that they are heavily used by lunch time, but are often empty during the day. In other words, the temporal patterns of those public squares are aligned with those of office workers. These patterns might not be seen in Xiasha as the majority of users are the elderly and small children.

Located in a densely populated urban village, the public square in Xiasha village attracts a high number of users on a weekday. The mean number of users observed from 7am to 7pm is nearly 140 people. However, the actual number varies during the day. Number of users increases rapidly from 7 am to reach the peak of the day by 10 am with the maximum number of nearly 190 people.

Figure 12: Temporal Use Pattern of Xiasha Village
Interestingly, this number drops to nearly half during lunchtime, before it increases again to the second peak of the day occurred at 4 or 5 pm. It would appear that the temporal use patterns of the central square in Xiasha village is dominated by the elderly who use the space as a part of their daily routine.

However, the number of users does not necessarily reflect the efficiency of use or the atmosphere of the space. Given the vastness of the square, it appears often empty as shown in figure 13. This feeling of emptiness is also given by the design of the square which lacks a clear centre and therefore people are scattered to the edges where they could find places to sit.

Figure 13: The emptiness of the space given its scale (photo taken 2014)
Types of Activities

Beside the demographics of users, this investigation also looks at what Chinese people do in public squares on daily basis. With office workers as the majority of users, public squares in Northern American and European cities are dominantly occupied by those activities of this specific group. They come to have lunch, sit or read a paper. Most popular activity is said to be watching other people (Whyte, 1980, Gehl, 1987). By contrast, the main user groups in China might be the elderly and small children in big groups. The collective behaviour and the cultural difference might lead to the vastly different types of activities in open public spaces.

Indeed, it appears that some activities that occur frequently in the West, rarely appear in China such as eating lunch or reading. However, a wide range of other activities which is rarely seen in other context is highly popular here such as singing in groups, playing chess/card, exercising and babysitting.

Regarding the body posture, 53 percent of users are recorded when sitting, whereas the percentage of standing and exercising people are 33% and 14% respectively. The high figure of sitting people is understandable given the majority of users are the elderly and people with small children. They are those who need a place to sit when staying for duration.
In Xiasha village square, and perhaps also other places, ‘exercising’ and ‘babysitting’ activity often generate big crowds. These group activities are not only include a large number of member, but also attract a good amount of audience who simply want to observe. ‘Babysitting’ alone contributed to nearly 60 percent of all activities, and together with ‘exercising’ they make nearly third fourth of the total level of usage.

The data suggests that the majority of activities in public squares in China is active instead of being passive as their Western counterparts. People who simply come to a square to sit and watch other people passing by exist too, but they contribute to only a small amount of public space users in China.
If the two sections above provide information about the demographics of the users and their activities, the following section looks at physical aspects of the space, and their relation to the use.

**Physical Aspects of Xiasha Village Square**

As introduced earlier, Xiasha village square obtains plenty decoration elements such as religious statues, a grand gate, a large scenic garden that remind viewers of a long tradition of Chinese garden design. Those elements certainly contribute largely to the image of the space. Nevertheless, this section concerns more about other physical aspects including the accessibility, the provision of seats as well as the issue of the scale of the space.

**Accessibility**

Western public squares often have clear geometric shapes, many of which have a rectangle form that is the size of one or two urban blocks (Siksna, 1990). In many historical cases, the shape of public squares was in fact generated through routes of movement (French, 1958, Siksna, 1990). Therefore, they are easy to access from their intermediate surroundings both visually and physically. Accessibility become the most crucial fact for the success of public squares in the West (Carmona, 2014, Gehl, 2010).

![Figure 16: Existence of fence and a zig-zag boundary](image-url)
However, the central square of Xiasha village showcases that public squares in China might have irregular shapes with zig-zag boundary lines that seldom provide continuous walking routes around these spaces (see figure 16 left). The irregular shape of this central square might be caused as the redevelopment of the village was building centred and this public space was simply a leftover piece of land.

In addition, the square is fenced with a limited number of entrances to the space. This implies that even for people living close to the square, they might need to follow a detour to enter to space.

Another characteristic that might decreases the accessibility of the space is the concentration of public facilities including several temples, a Chinese mini garden, two sport fields, and an open stage. This partly decreases the overall visual accessibility of the square from within. Users might find it hard to navigate as many entrances or gates of the squares are often hidden by these facilities. Furthermore, these facilities often hinder the formation of direct routes crossing the square.

In terms of accessibility, the central public square of Xiasha village appears to be a ‘gated’ park with a paved ground. This investigation suspects instead of articulating local movement, the central square in this context functions as a hole by limiting the opportunities to use the square as shortcuts.

**Provision of Seats**

Beside the accessibility, the square offers a high level of cleanliness as well as a public restroom. The only major concern regarding public amenity is the extreme poor provision of sitting places in general and group-sitting places in particular.

Regarding the provision of seats, the Project for Public Space (PPS) has suggested that a good public square in a busy city centre should have more than one seat for any 6 m² paved area (Miles et al., 1978). This ratio one seat per 6m2 might be used as a benchmark in Western cities, however might not be adequate for the Chinese context given the much higher population density there.

The actual ratio of Xiasha village square is about one seat per 64 m2 paved area which is more than ten times less than the proposed ratio by the PPS. As a result of this poor provision of seats, many people were found sitting and leaning uncomfortably on the ground or the fences of the two sport fields (see figure 17).
Many users, especially people with small children, bring their own movable chairs to the square as they often stay for duration. In a peak period (by 10 am and 4pm), the percentage of users recorded when sitting informally on the ground or using their own chairs is nearly half of the total sitting people (43 %).

As important, while the percentage of users in big groups in this case study is nearly two half of the total number, however, the percentage of group-seats is only 10 percent which is much less than what needed. The majority of sitting places are linear arranged which is perhaps suitable for individuals and couples, but they are less preferred by big groups as they do not encourage group conversation.

**Discussion**

The findings in this research paper provide the very first set of information about how public squares in urban villages in Chinese cities have been designed and used on the one hand. Some of these findings are significant and thus invite further discussion, namely the dominance of the elderly and people with small children and the collective use patterns.

Firstly, through the case of Xiasha Village Square, it would appear that public squares in urban villages in China attract significantly different types of users than its Western counterparts. Our survey of a weekday suggests that about 60 percent of users are the elderly and also nearly 60 percent of all activities are composed by babysitting or playing with small children. The absence of office workers, the most dominant type of public square users in Western context. Our observation of other public squares in other urban areas also confirm the fact that public squares in China somehow are failed to attract young users.
Although the square is heavily used by the elderly and people with small children, this
does not necessarily means the design of the space has addressed well the needs of these
people. By contrast, there is an extreme lack of basic amenity such as places to sit and
saved playgrounds. It would appear that these two specific groups of users have to use
the space because they do not have other option. Given the fact that only 2% of the
elderly in Chinese cities have access to indoor recreation institutions (Yiqian, 2014),
public spaces seem to be an undeniable alternative. Similarly, in urban villages, children
of migrant workers have restricted or no access to public educational system including
kindergarten and primary school, therefore, for many of them, the central public square
of the village function as a substitute for these institutions. In this sense, the
development of open public squares in urban villages might solve some current social
problems within the Chinese context. Nevertheless, there might be a danger that public
spaces can become places for those unprivileged citizens socialising, and this might also
the reason for the absence of other groups of people. However, this statement needs
further in-depth investigation.

Another interesting fact about the use of public squares in China is the dominance of
collective use and group activities. This might lead to a vastly different way of using
and thus designing open spaces. Many studies in the West suggest to provide sufficient
linear sitting places which is favoured by individuals and couples as they are the
majority of public square users there. This line of recommendation might not work in
China given the majority of Chinese public space users are found in big groups. Our
investigation of the Xiasha village square observed an extremely lack of sitting places
arranged in group.

Furthermore, people in group behave spatially differently than individuals. The theory
of ‘prospect and refugee’ by Appleton suggest that people tend to avoid highly exposed
location and prefer ‘secluded’ areas in open spaces (Appleton, 1975). This theory might
explain the preference of the edges of public space in the West (Alexander et al., 1977,
Whyte, 1988) as they provide a certain degree of visual protection but at the same time
allow users to have a good view of the surrounding.

This observation might be correct for those passive users who enjoin watching other
people when sitting. However, if the majority of public square users involve in playing
with children or exercising, the above line of logic might be no more relevant. Our
observation found the contrast to Appleton’s theory. Namely, group users, especially
those who are engaged in active activities, prefer highly visually exposed areas. People with a group wants to keep a strong visual connection to other members, therefore they together tend to prioritise spacious and thus exposed location. In addition, when in a big group, the fear of the ‘public gaze’ which is the reason that make people away from the exposed areas might be declined largely. The observation of Xiasha village square might not be sufficient for any general statement, but it is suggested that further investigation into this aspect will useful not only theoretically but also practically.

**Concluding Remarks**

Given the lack of information about the use and design of public squares in urban villages in China, this research paper is set out to fill the gap through the case study of Xiasha village in Shenzhen. Unlike elsewhere, public squares in China are used dominantly by the elderly and people with small children. The majority of users were engaged in group activity that prefers spacious and highly exposed locations within the square. This collective behaviour is vastly contrasting a widely accepted assumption emerged in the West that public space users tend to prefer secluded locations over the highly exposed areas. In this sense, this paper suggests that the context of China is a fruitful ground to examine further the collective behaviour of public space users.

Although the design of the square contains plenty decoration elements, it seems to overlook the basic daily needs of daily users. While the majority of users are the elderly and people with small children who are highly demand on sitting places, the current provision of seats only serve a small percentage of these people. Despite the high level of usage, it is worth to note that the majority of users are those elderly who have limited access to indoor recreational centres and migrant workers’ children whose access to public educational system is restricted. In this sense, while Xiasha public square is well used, it might be a sign of social segregation rather than a place for people from different background coming and sharing. The observation in this paper might not be sufficient to fully support this statement, however the absence of other user groups including teenagers and office workers might be crucial evidence for our suspicion.
References


High Density Development: 
Community Attitude and Urban Planning Response

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High Density Development: Community Attitude and Urban Planning Response

ABSTRACT: Environmental and economic pressures in Australian cities have forced urban planning practitioners to investigate and increase residential density that have been generally low density in nature. The 30-Year Plan for Greater Adelaide is the latest strategy plan that proposes greater densities in the current urban form. Empirical evidence suggests that many Adelaideans are adverse to having higher density developments near them, let alone living in it.

This paper investigates the perceptions and preferences of the community towards higher net residential density (more than 70 dwelling units per hectare) developments in Adelaide metropolitan area. The paper also investigates senior planners responses to these perceptions and preferences and what may be the way forward.

Keywords: Housing, Density, High density development

Introduction

Environmental and economic pressures in Australian cities have caused planners and public officials to develop appropriate planning responses to these pressures. These have mostly been in the form of restricting urban sprawl and provisions for increased densities within the existing built up area. This form of development has been opposed by members of the community in Sydney as being unsightly, unsafe, and not suitable for families and will affect the urban character (Bunker et al. 2002).

Adelaide is not different from Sydney and much of the empirical evidence suggests that many Adelaideans are adverse to having high density developments near them, let alone living in it. This issue is of particular interest to the planning fraternity in Adelaide due to the recently released 30-Year-Plan for Greater Adelaide, which proposes urban consolidation and high-net density (more than 70 dwelling units per hectare) developments in certain parts of the city.

Adelaide has had a long tradition from its earliest days of urban planning - by Colonel William Lights and other leaders of planning including Sir Charles Reade - of strong suburbia. This enabled the new social theories of the day to be tested in the new convict free settlement of South Australia. These theories included the nonexistence of distinction between working and upper classes and traditional social separations. This emphasis generally maintained the preference for low-density suburbia constant through the continuing decades.

The planning strategy, the 30-Year-Plan for Greater Adelaide, proposes urban consolidation and high-density developments in certain locations. The main reasons being it is often the
mainstream response by the planning professionals to population growth, sustainability, efficient use of infrastructure, climate change, evoking “build up not out”. There are, however, concern about high-density developments, although planned, may be thwarted by the rejection by the community with overwhelming preferences for lower density developments. 

What is the urban planning response to the preference and performance of the community towards high-density urban developments in Adelaide? The research will examine the issue community perceptions of density through how planners feel about high density urban developments and what strategies could be implemented to ensure that the proposed densities are respected and accepted in the policy arena. The research also assesses planners’ opinion on how urban planning should respond to these community sentiments. The research uses a triangulation method by using theory, surveys and interviews.

Both qualitative and quantitative data was collected through surveys because this method is considered credible as the outcomes are supported by multiple sources as findings are corroborating (Yin 2003). Examples of these types of questions included:

1. Would you be supportive of increased densities in your neighbourhood? with a yes/no option; and,

2. What is your understanding of the word ‘density’? Allowing for individual original responses.

The advantages of the mixture of questions and responses allowed the qualitative data to provide extra detail in supporting of the quantitative data. This also reduced any bias that may have been formed by the researcher’s questions.

Surveys were conducted in four case study suburbs namely Glenelg, Magill, Modbury and Adelaide CBD to understand the perception and preferences of community towards higher density developments in Adelaide. A total of 275 questionnaires were distributed and 87 responses were received amounting to 32% response rate.

A number of high profile planning professionals from both public and private sector were invited to participate in this research. However they declined due to time constraints. An interview was undertaken with an officer from the Department of Planning, Transport and Infrastructure (DPTI), who was the principal planner who oversaw the preparation of the 30-
Year Plan for Greater Adelaide. The data collected was in the form of qualitative data. Examples of the types of interview questions included:

1. How does the department feel the progress of the targets of the 30-Year Plan?
2. What are the three most important themes in the plan?
3. How do you believe urban planning should operate?

Results and findings

This section will provide the community sentiments captured through the qualitative survey and stakeholder’s opinion through interview.

Survey

There is very few research or public opinion surveys undertaken on proposals for increasing residential densities in recent times, particularly since the release of the 30-Year Plan of Greater Adelaide. In this research two types of surveys were undertaken: a paper edition survey and an online version of the survey. Both surveys were designed to avoid planning terminologies and jargons that may not be understood outside the urban planning profession, thus accessible to the wider community.

The online edition of the survey was distributed through an online social media output, posting with ‘friends of friends’ able to have their say by following a hyperlink to the online survey. A total of 43 individuals completed the survey, the predominate age group that took part in the survey consist of younger age groups. The paper version of the survey forms were distributed in person at four locations across Adelaide: Glenelg, Magill, Central Business District (CBD) and Modbury (refer table 1 and figure 1).

Table 1: Survey details

<table>
<thead>
<tr>
<th>Suburb</th>
<th>Number of questionnaires distributed</th>
<th>Questionnaires received</th>
<th>Response rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glenelg</td>
<td>50</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>Magill</td>
<td>50</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Modbury</td>
<td>100</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>CBD</td>
<td>75</td>
<td>20</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>275</td>
<td>87</td>
<td>32</td>
</tr>
</tbody>
</table>
These locations were selected due to the targets and policies put forward in the 30-Year Plan for Greater Adelaide, which propose changes in the structure of these suburbs. All four locations are categorised into two groups; low density (Glenelg, Magill and Modbury) and medium density (Adelaide CBD) that can help see the similarities and differences in responses from these suburbs with different densities.

Glenelg, Magill and Modbury are classified as low density mainly consists of traditional detached housing. In recent times, the coastal suburb of Glenelg has witnessed high density redevelopments along the foreshore. The CBD area is classified as high density.

Results and findings
Majority of respondents’ opinion on density from all four suburbs were mainly on building height: higher the building the greater the density. In the next question participants were asked to place their suburbs in density levels on the scale provided at the start of the survey.
Most of the respondents from Glenelg described their suburb as low density similar to the government definition. Respondents from Magill defined it as low density suburb whereas Modbury had a different opinion on density for their suburbs.

Adelaide CBD

Figure 2: opinion on density for their suburbs

Most of the respondents from Glenelg described their suburb as low density similar to the government definition. Respondents from Magill defined it as low density suburb whereas
the government regards it as very low density. For Modbury the responses were very mixed between very low densities to medium densities and did not align with the government definition. A majority of the respondents from the CBD rated it as ‘medium density’ similar to the government definition. Online survey result reflected that a majority (51%) of respondents placed their suburbs at medium density. This was a surprising result considering that just 9.3% respondents live in medium density suburbs. The result suggests the definitions provided by the State Planning Department are not clear to the respondents.

In order to understand how people perceive density, participants were shown images of four housing developments and asked to rate densities (refer appendix A).

![Figure 3: Respondent’s density determination based on images](image)

Respondents from the three low density case study suburbs perceived image 1 as low and medium density. In *Understanding Residential Densities* booklet (DPTI 2006) the same is areas were identified as very low density. About 69% of CBD participants rated image as low density. Some of the respondents from low density case study suburbs stated that the dwellings were too ‘close together’ in image 1 and rated it as ‘less than medium density’. Respondents from all three low density suburbs rated the Image 2 as ‘very low’ and ‘low
density’. Their rational for very low and low density was that there are lots of open spaces around the dwelling units. About 26% of CBD respondents rated the image as ‘medium density’ and the main reason was there was not enough open space around and in between the buildings. This shows they are not identifying density based on the intensity of development but their rating is based on the visual appearance of the place. Most of the respondents from all suburbs rated Image 3 as ‘medium density’ and the reason was that there was no space between the dwellings units. Their responses were same as what was identified by the DPTI (2006). Respondents from all case studies rated Image 4 mostly as ‘medium density’ whereas the DPTI identified it as ‘high density’. The results reflect that opinion of low, medium and high density was related to the building height (number of stories) and open spaces around and between the dwelling units.

Upon review of the results there appear to be general aversion to higher density forms of development, than what currently exist in the area. This was expected from the collected results. Perception of density appears to be formed by the amount of open space (both public and private), built form of the buildings with anything over two stories being the threshold between medium density and high density. There is a disparity in the conclusions of the online survey and the paper survey between what the public sees as their suburb density and the official designation of density by the DPTI (2006).

In an answer to another question on whether they would be supportive of increased densities in their neighbourhood was rejection by most of the respondents in low density suburbs whereas CBD results were mixed. Over two-thirds of online respondents indicated that they were not supportive of any increase in density in their neighbourhood.

![Figure 4: Would be supportive of increased density in your neighbourhood](image-url)
Respondents were asked ‘are you in favour of the proposals in the 30-Year Plan for Greater Adelaide?’ A majority of respondents from Magill and Modbury rejected whereas respondents from Glenelg and CBD and online respondents had mixed answers. Many of the participants, who agreed with some of the proposals of the 30-Year plan, suggested that they did not agree with high density transit oriented development but might be open to more medium density developments.

The following section illustrates urban planning practitioners’ responses to these results, especially in relation to preferences of the community and the role of urban planning.

**Interview**

The surveys provided an understanding of the perceptions and preferences of the community towards higher density (more than 67 du/ha) development in Adelaide. Some of the key results of the survey were that the word ‘density’ evokes different meanings to different people. The empirical evidence suggests that majority of the respondents were in favour of low-density development and were adverse to development that is higher in height. It was found that open space and height more than 2-storeys were the main factors in deliberating whether a particular area is regarded high or low in density. The comments on surveys also suggest a level of frustration with planning practices of late where a large number of respondents suggested that they disagreed with a majority of density guidelines put forward in the 30-Year Plan for Greater Adelaide.

Thirty stakeholders in both the public and private sector responsible for urban development as well as academics and researchers in Adelaide were invited to take part in an interview. Number of stakeholders those who may have had a significant role in the drafting of the current planning strategy declined to participate in the interview citing time constraints, nonetheless, two individuals were interviewed:

1. A senior project officer from Renewal SA. Renewal SA is the state government agency charged with carrying out urban renewal of older suburbs that may have suffered from disadvantage. The trademark designs of these urban renewal projects has been subdividing large South Australian Housing Trust allotments into two or more blocks, thus increasing residential density.
2. A senior planner at the Department of Planning, Transport and Infrastructure (DPTI). This individual was heavily involved in the preparation of the 30-Year Plan for Greater Adelaide. The official now has responsibilities to oversee the implementation of the plan.

Both individuals did not wish to be identified in this research. In accordance with ethical considerations all identifiable information contained the research was removed. Both participants were asked the same four questions in order to ensure the ability to analyse results, and compare and contrast the responses. Answers for all the four issues are presented in the following sections.

1. The 30-Year Plan

Both individuals were asked how they thought the 30-Year Plan was progressing to date and what they observed as the most important three main themes in the plan. The senior project officer from Renewal SA stated that he did not see or have data on how the overall plan targets were progressing but did believe that due to the economic downtown targets were ‘progressing more slowly than the targets set’. The officer stated that structure planning and precinct planning were progressing slowly but were underway in Renewal SA for Transit Oriented Development (TOD) for amongst others Bowden Village, Keswick/Wayville and Port Adelaide. He stated that affordable housing was one of the most important targets in the plan.

The senior planner in the department appears to agree with the view of the officer from Renewal SA that progress on the targets is moving slower than anticipated. However, the officer stated that ‘good ground is being made in relation to infill developments and reinvigorating the CBD’. The officer highlighted the Adelaide Oval redevelopment and precinct as one of the main achievements. The three themes that were seen by the officer as important include integrating land use and transport, housing supply and affordability, and the sustainability of development.

From the responses to the interview it appears that the 30-Year Plan is progressing more slowly than originally anticipated but progress is still being made. Both interview participants saw housing affordability as a key theme in the 30-Year Plan. The point of contention was whether the plan actively tries to reduce land prices or it is encouraging development on smaller land parcels thereby keeping prices lower.
2. Response to survey results

Both individuals were asked to respond to the survey findings that show a preference for low-density development. Both interviewees were asked what strategies or methods could be put in place to change negative community views towards vertical development.

The senior project officer at Renewal SA was sceptical about the research stating that researchers should be careful in using broad terms such as vertical or horizontal development. The officer suggested that ‘emphasis should be placed on the internal areas provided in higher density developments’. The officer also believed ‘education was of key importance to inform the community on the positives of higher density development’. He also stated that higher density is often perceived to mean “tower blocks” – development that is not of human scale and therefore not pleasant to live in. The officer said that the community needed to see images of actual medium and higher density housing where community expectations in terms of an attractive public realm and liveable homes were being met. The officer highlighted new housing developments such as Lightsview and St. Clair as examples. It appears, however, that some members in the community have already rejected this type of development, with one participant in the survey forming the view that the dwellings in the Lightsview development as “dogboxes”.

The senior planner from DPTI outlined that the 30-Year Plan was not exclusively on a higher built form. The officer stated that he found it interesting in the way the conversation was framed especially in the media, with the emotive but often misleading term of “high-rise” applied to anything above three storeys. The DPTI planner stated that he was disheartened when the conversation about height and/or density was often hijacked by ‘emotional terms such as slums, congestion, and etcetera; rather than on the benefits that height and/or density it provides’. The officer also stated that the amenity provided in the Melbourne CBD and inner suburbs were directly correlated to the amount of people live in the CBD and around the CBD, which could only be achieved through a combination of low-rise higher density and higher built form.

Whilst the officer agreed that the education of the community was important he also believed that providing examples of good higher density development that was well designed have
access to amenities and provided a good diversity of uses could go a long way in changing the wider communities’ negative perceptions of such development.

It appears from both interviews that the perception in communities’ mind on the subject of high-density development needs to be changed. It is important to note that the senior project officer from Renewal SA stated that recent developments purporting by Renewal SA to meet community expectations in terms of attractive public realm and liveable homes might not be swaying opinion in the community on such developments as planners might believe.

3. Perception of density
The senior project officer from Renewal SA was asked whether they could estimate the built form in the image 3 in Appendix A, used to which were inform the community opinions surveys. The DPTI (2006) regards this picture as ‘Medium Density’ and this was identified by the DPTI planner. The officer stated that even single storey row housing can achieve 150-200m2 per dwelling which will give a net density around 50/60 dwellings per hectare.

It was highlighted by the renewal SA officer that determining density is particularly difficult, due to multicultural society /technical factors and a lack of consistency from jurisdiction to jurisdiction in South Australia. The planner at the DPTI who was involved in the development and publication of the Understanding Residential Densities booklet prepared by DPTI in 2006 stated that types of development do not correlate to a particular density range. He cited an example that many older bluestone cottages as old housing stock even though they provide a higher density than some new townhouse developments. Perceptions of built form and density vary widely and often it, they argue, comes down to design, perceived density, spaciousness, and bulk of built form.

These perceived themes in the assessment of density are height, spaciousness and open space (both public and private), were highlighted by those who respond to the survey.

4. The role of urban planners
This question asked the interviewees what was the role of urban planners? It was put to both interviewees whether it was an urban planner’s role to lead the community toward a particular urban form and living, or, should the community dictate how they wish to live and
urban planners with their professional expertise assist in making this happen in the best possible way.

The interviewees from Renewal SA said that urban planning should be the result of dialogue between planners, design professionals, building the construction industry, environmental experts, economists and financiers and community. They stressed the importance of the need of planning to be an integrated and holistic approach where the technical knowledge and understanding of climate, culture and geography are viewed in context of the communities’ aspiration for their homes and neighbourhoods and cities.

The interviewees from DPTI believed that urban planners should provide people with the best information and options and that the community then have the right to choose. Often the planner states, when provided with information about costs, benefits and the trade-offs, people are willing to accept/choose to live in higher density developments.

The DPTI planner again stressed the need for the emphasis to be on ‘how people wish to live, rather than focus on the form of development. The form of development may then be dictated by how the community wishes to live.’

The analysis of the responses on the role of the urban planner is somewhat complex with one interviewee taking a collaborative consultative approach of professionals in the field taking note of the aspirations of the community. The other interviewee discussed about a planner led system providing advice/options to the State and Local Government and the community about how to move forward.

Result reflects that whilst a planner may provide advice, it should be considered that the bias of the individual planner might affect the advice offered. The senior planner from the Department of Planning, Transport and Infrastructure appeared to give only negative views of low-density development in the interview without providing some of its positives.

**Discussion**

Findings from the study demonstrated that community’s perception about density is strongly influenced by the built form of the development, for example, image, rather than by intensity
of development/scale, even though there is no direct relationship between the image of the built form and density. Literature has established that there are no agreed upon standards of density in use throughout the world (Burton 2000; Forsyth 2003; DPTI 2006). The findings support these arguments, for example in case of Glenelg and Modbury there are three different perceptions of density for their suburbs.

Emphasis in the strategy plan relates to developing Adelaide for the future so that it ‘becomes resilient to the impacts of climate change’ (DPLG 2010, p. 59). Environmental protection and healthy, safe and connected communities are also prominent priorities in the strategy plan. Climate change and the community’s response to it were the key election issues in the 2007 federal election and 2010 state election (Bruns et al. 2008; Megarrity 2010, Priest 2012). It appears that governments have developed policies in response to this community sentiment but the community is rejecting the results.

Part of this research asked participants whether they were aware of the plan entitled the 30-Year Plan for Greater Adelaide to determine whether there was a well-grounded knowledge of it in the wider community. However, results indicate a lack of knowledge of the strategy plan in the wider community. This appears to support the literature relating to community consultation and participation in Planning in England (Carpenter & Brownhill 2008).

Planning staff in local authorities not confident about engaging with the community; and, a general apathy from the community that public consultation is only to meet standards or regulatory requirements (Carpenter & Brownhill 2008). It is true in the case of South Australia.

Definition of the density was explained to participants before conducting survey. According to results of the surveys, it is considered that density is a difficult term to define by many in the community. The respondent from Renewal SA highlighted that determining density is particularly difficult, due to multi-cultural community/technical factors and a lack of consistency from jurisdiction to jurisdiction in South Australia.

The results from the survey as part of this research found that open space (both public and private) as well as the built form were the two main factors in an individual’s determination of density. Sivam et. al (2012) found these factors in their research ‘stakeholder’s perception
of residential density: a case study of Adelaide’ where open space and a traditional built form were seen as positives in the living environment especially for families with children. This is an issue which is repeated in a number of studies (e.g., Howley 2009; Howley and Redmond 2009; Buys 2011). It is found in the literature and survey responses that a community opinion would need to be included in how higher density developments are designed, keeping in mind the value the community puts on open space and the built form. Due to the communities’ general negative attitude towards such development, it appears that further education, marketing or refining of such developments needs to be undertaken before higher density development is perceived as being equal to, or better than, present low density.

There is a slight majority of respondents who agree with the sentiment that higher densities can create a “buzz” and make an area “thrive”, according to results from the surveys. However, they prefer that this type of activity be separated from where they live. For example, many in the suburb of Magill agreed with the general sentiment but preferred if the buzz and thrive occur in places like Norwood (3 km to the west). This may be a factor of “NIMBY (Not In My back Yard)” syndrome or a deeper issue over mixed uses which are heavily involved in TODs. This sentiment has not been widely researched locally or in a wider sphere. Although a study in New York found that while areas had been zoned as mixed-use, demand indicated that many individuals opted for separation between land uses (such as commercial and residential) (Wolf-Powers 2005). This aspect needs further investigation especially in the context of Transit Orientated Developments proposed across the Adelaide Metropolitan Area.

An additional finding in this research saw the low support in the community for the proposals in the 30-Year Plan for Greater Adelaide for local areas. These policy proposals, widely supported by young respondents include:

- High density transit-orientated development along the transit corridors;
- Higher densities and smaller land sizes surrounding the TOD and transport corridor;
- Cycling and walking friendly with car use discouraged.

This sentiment cross age groups with younger people also expressing little support for the proposals and seek homes that are lower in density, with a general aversion to higher density
development. It is unclear whether these attitudes could change with education, or it again relates to the level of consultation with the community or lack thereof.

As mentioned in the preceding section, the emphasis when interviewing both senior planners is that education and providing examples of good high density living will change community perceptions. Evidence of this occurring elsewhere is unclear. Research from the UK show that education and marketing of new higher density development did have an effect on the demand for high density living (Evans & Unsworth 2012). However, in the same research there was a majority that expressed the intention, in the near future, of moving out and into lower density houses. Similar to results are found in Buys (2011) and Howley (2009). From this evidence, it is unclear whether education in itself will solve the issue of community perceptions or whether a broader holistic approach by planners and other policy makers is needed to change community perceptions.

This research highlights that there is dissimilarity between what is being planned by policy makers and the perceptions and preferences of the community towards higher density development. Further research on the perceptions and preferences of the community towards of high-density development in different areas of the Adelaide Metropolitan Area could provide better details of the perceptions to the community, politicians and planning practitioners alike. A study may provide areas of compromise and better informing of both the community and planning professionals.

**Conclusions**

The finding of this paper is that the community who participated in survey perceived density through a number of individual but linked factors. These include height of development, visual bulk, the amount of open space and greenery around development. The community may more easily accept the designing of more dense development, which takes in these factors, than traditional forms of higher density development.

In addition, as the empirical evidence suggests, the preference is strong for lower-density forms of development and are adverse to higher density forms of development. Most of participants in the surveys were against any increase in densities near where they live. Other
results indicate that the community are wary of having development that is high in height and would prefer to see open space reduced in order to accommodate more low-rise development.

This view did not appear to change with age. Younger age groups were also not generally supportive of high-density development. Younger generation who live in it merely see it as a “stop-gap” measure as they save to live in more traditional low density developments. This is due to the perceived benefits for families but also an underlying rejection of the push to higher densities. An interesting trend was the strong rejection of the proposals in the 30-Year Plan for Greater Adelaide, with most supporting only a few or none.

Finally the findings of the research illustrate that residential density is one of the most challenging dimensions of contemporary urban planning. Density should be an integral tool in planning policy to guide future development and provide direction about how areas will look and feel in future. There is also the need to educate the community about density so as the need for context specific definition for various types of density and its relation to layout and design parameters.
References


Appendix A: the photographs used to capture the perception of people and stakeholders about density

Image 1: This is regarded as very low density streetscape under the Planning Department’s Understanding Residential Densities booklet (DPLG 2006).

Image 2: This is regarded as very low density streetscape under the Planning Department’s Understanding Residential Densities booklet (DPLG 2006).
Image 3: This is regarded as medium density streetscape under the Planning Department’s Understanding Residential Densities booklet (DPLG 2006).

Image 4: This is regarded as High density streetscape under the Planning Department’s Understanding Residential Densities booklet (DPLG 2006).
Design for Ageing:
The Role of the Urban Environment in our Ageing Experience

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Design for Ageing:
The Role of the Urban Environment in our Ageing Experience
ABSTRACT: The ageing population is attributable to; people living longer, the significant decrease in fertility and the maturing baby boomer generation. By 2040 Australia will require four times the amount of aged care accommodation and by 2050, the aged population will exceed the population of children. It is important that the residential offer meets the demands of the fast growing population 'majority' through the provision of high quality living and care environments that are well connected to the urban environment and associated infrastructure.

Increasing inner city land value is resulting in the replacement of facilities with new apartments. Consequently, residential aged care facilities (RACFs) are becoming isolated through their relocation to outer suburbs where land is cheaper. This presents obstacles for the ageing population, disconnecting residents from established communities, families and access to vital services. This, in combination with the replication of outdated models that amalgamate ageing citizens in large suburban often ‘gated’ facilities, breeds negative stigma and rejection from the community due to the inappropriate scale, institutional demeanor and awkward relationships these buildings have with their surrounds. Further, aged care providers are currently disadvantaged in the marketplace with a staggering 40% of facilities running at a loss. Lack of financial incentives inhibits the upgrade of existing facilities and deters investment in new construction. This series of conditions sets up a problematic urban model which requires rethinking.

This paper evaluates the relationship between RACFs and urban design through the identification of existing barriers that underpin the current model which segregates, isolates and immobilises the aged population from their community and neighborhood. The paper further questions how the current urban framework might be reshaped to provide more appropriately integrated aged care communities, that offer a diversity of desirable living opportunities into the future.

Keywords: Aged Care, Urban design, Design Solutions, Barriers

Introduction
The World Economic Forum (2012) identifies population ageing as one of the top five challenges ahead of us globally. Australia has an ageing population due to a number of compounding factors. Internal migration is seeing young people leaving the country to work, and more frequently, older people migrating for the desirable quality of life (ACSA, 2005). The ageing population can also be attributed to; increased longevity, falls in fertility and the maturing of the baby boomer population (ACSA, 2005). Australia will require four times the amount of aged care accommodation to cater for the ageing population (Brisbane City Council, 2008). This condition poses significant challenges into the future, both from an architectural and city making perspective. Unfortunately, the current aged care offer is narrow in providing adequate quality of living for this population majority, setting up poor urban
relationships. This paper summarises existing literature and professional opinion regarding the barriers to providing more diverse and equitable outcomes, with particular consideration towards the role of the urban environment. The paper considers a range of possible design solutions that might enhance the quality of life and provide more integrated care communities for all.

Current built model
There has been little change in the urban and architectural aged care model over the last 50 years. The current residential offer is limited to two ends of the spectrum; residential aged care facilities (RACFs); that offer low to high care services for residents, and home care; which involves remaining at home and retrofitting the environment to allow provision of care (Bowers, J. 2015). Consolidation of growth in urban centres, and increasing land value, has created a scarcity of land on the urban fringes (Baldwin, Osborne and Smith, 2012). As a result, RACFs being located in the suburbs has become the norm. Unfortunately, the suburbs are not an ideal location for this demographic. Rapid suburbanisation, dispersed development patterns, a lack of footpaths, separation of land uses and automobile dependency all challenge the independence of seniors (Australian Local Government Association, 2006).

For the past 50 years, seniors’ housing developments have been approached as specialised suburban forms, usually organised around recreation or allied medical programmes (Scott, B. 2012). Residential aged care has historically emerged from the hospital care models, which are generally single storey, homogenous units that require large sites often producing architecture criticised as being ‘institutional’ (World Economic Forum, 2012). This typology is perceived to be a product of the aged care reform strategy delivered in the early 1980’s. Facilities are generally age segregated, regulating the number of non-senior residents within the facility at any time and monitoring the duration of stays for non-senior residents (Scott, B. 2012). There are limited facilities that provide long-term or overnight stays for family members or visitors.

Facilities aspire to provide a ‘home-like’ environment for residents, however the reality and economies of service provision drive the need for increasingly larger facilities (ACDQ, 2014). This approach offers economic advantage and is seen to maximise coordination but hinders residents’ independence and social wellbeing and is criticised as insular, lacking important engagement with surrounding communities and neighborhoods.
Residents argue that the limited offer precludes participation in the community and impedes their right to select their place of residence and whom they live with on an equal basis (ACDQ, 2014). The current offer is unsatisfactory in delivering appropriate living environments for the ageing population and the industry has created simple models for very complex conditions (Scott, B. 2012).

**Future situation**

*Predictions*

It is important to project forward to understand the predicted future condition for aged care in Australia. Research indicates that by 2050, for the first time ever, the number of older persons will exceed the number of young people (Bridge and Elais, 2013), with the traditional population pyramid morphing into a rectangle (Scott, B. 2012). In Australia, the number of people aged over 65 is expected to grow from 2.5 million to 7.1 million by 2050 (Australian Local Government Association, 2006). Significantly, the ageing of the baby boomer population will drive a dependency ratio shift, whereby fewer working people will be available to support those who do not work.

The growth of the ageing population will inevitably result in greater diversity. It is anticipated that the dimensions of diversity will be vast, and encompass; health status, care needs, wealth, income and assets, culture, ability and disability, preference, location, gender and family structure (ACSA, 2005). There will be a requirement for the existing system of care to overcome current limitations and develop new approaches of care to meet the larger and more diverse pattern of demand. Additionally, it is anticipated an increase in the population of disabled persons will drive the need for RACFs to become high care (ACSA, 2005). Despite the increased demand for high care ageing facilities, it is anticipated development over the next 20 years will decline due to rising costs associated with construction, difficulties in securing suitable parcels of land and funding constraints (WA Planning Commission, 2015).

Inadvertently, the diverse ageing population will have significant implications on how we plan and build our urban environments, compounding current undesirable urban and architectural attributes associated with the existing model. We can expect a requirement for bigger facilities that will occupy larger sites (Scott, 2012). Increased cost of living will push elderly populations further out into satellite towns exacerbating problems of isolation and
social exclusion (Smedley, T, 2012). These statistics indicate the rapid increase in the urban population, combined with the ageing of the population, will have major implications for future development of the aged care sector (Scott, 2012).

Aspirations

There is narrow research that questions and consolidates the needs and desires of the ageing population. Research that does exist reveals that 90% of people aged over 65 desire to remain in their existing home and community with only 5.3% of the population having a desire to move into RACFs (Andershon, Wijnties and David. 2012). This is the result of the populations’ strong investment in the communities in which they currently live and negative connotations associated with the currently limited aged care options. At a neighborhood level, seniors value access to education, safe walking paths, technology, housing with close proximity to services and facilities, outdoor environments and green space, autonomy supported by public transport and casual employment (ACDQ, 2014). These findings indicate independence and choice are shared values amongst the diverse aging population. Further, their values align with those of younger generations; this prompts inquiry into why the current residential offer is so vastly different across age groups.

We are currently at a significant juncture, characterised by the ageing of the baby boomer population. This population holds different values concerning aged care and retirement living, challenging the traditional model (Stanely, J. 2015). The emergent cross section will increasingly be urban dwellers who have a desire to remain living in the city where they maintain access to a range of services including libraries, theaters, restaurants, bookshops and cafes. This group is characteristically more well off, mobile, active and independent than previous generations of retirees (Urban Taskforce Australia. 2013). It is expected they will exhibit less tolerance for the current model and will drive significant change for our cities, challenging property developers, urban designers, planners and architects to develop new typologies to support their shifting needs (ASCA, 2005). Current homogenous suburban models, characterised by enclaves of single-storey, homogenous units, are the antithesis of the idea of connectivity to a broader community, valued by the emerging generation of retirees (Lacey, 2015).

The desires and expectations of the ageing population align with the aspirations set out in the World Health Organisation’s Guide for age friendly cities, which sets a benchmark
for active ageing. There is a shared hope for inclusive, multigenerational communities in our towns and neighborhoods where the contribution of elders is respected, valued and celebrated (Baldwin, Osborne and Smith, 2012). The report argues social participation and inclusion are connected to good health and wellbeing (World Health Organisation, 2007). Indeed, people have a right to choose their place of residence on an equal basis and for the community to facilitate full inclusion, participation and contribution in family, work and community life (Western Australia Planning Commission, 2015). This vision is admirable, however, the current offer in combination with the future statistics suggest this aspiration is far from attainable.

**Methodology**

Literature proves there is a disconnect between the current residential aged care offer and the desires of the ageing population. This paper is intended to provide an overview of the existing barriers that contribute to the problematic residential aged care offer. The examination to follow demonstrates the topic is broad and complex, thereby the format of the paper limits the depth and scope of discussion, with the content remaining at a high level. This discussion is framed through considering the role of the urban environment and questions how current practices might shift to arrive at more appropriately integrated communities that offer more diverse living opportunities.

In the pursuit of understanding the existing disconnect, interviews were carried out with five key professionals and structured around a series of questions targeted to prompt discussion regarding:

- Barriers in providing a more diverse aged care offer
- The importance of the built and urban environment for the ageing population
- Appropriate creative and innovative design solutions for the future

These themes covered a broad number of issues surrounding the future of residential aged care and urbanism. Discussions raised a number of concerns regarding the direction of urban development in Australia and shared speculation on possible design solutions. Individuals were selected for their practice, experience and research expertise within the aged care and the built environment and included:
Role of the built environment

The first area of enquiry aimed to ascertain the role of the urban environment in the provision of more appropriate aged care models. Interview findings unanimously aligned with research discussing the poor condition of existing facilities; ‘these places are very often ghettos for the most vulnerable portions of the population. Even if they are in an urban environment they are not integrated into the wider community’ (C See 2015, pers. comm., 13 September).

Robinson (2015) further identified repercussions associated with the ongoing replication of what has become the norm, specifically on cost, pain and wellbeing for residents in facilities; ‘Why are we spending billions of dollars on infrastructure that doesn’t work, when in 20 years it will all be bulldozed... people are not going to want to live in them. They are highly inefficient and don’t promote quality of life or wellbeing’ (A Robinson 2015, pers. comm., 16 September).
Scott (2012) argues good urban design accommodates for all age groups and has the capacity to raise the quality of life for all residents. In Australian practice however, planners have historically been preoccupied with particular age groups, specifically favoring child and family focused community development and planning (Scott, B. 2012). This neglect of the older population contributes to the ongoing reproduction of the existing problematic model. It was a shared view that design has the capacity to play a big role in shifting the existing typology with participants arguing ‘We really need to think more about the significance of the built environment. People intuitively, have an appreciation for the types of environments that they would like to live out their lives in’ (J Franz 2015, pers. comm., 11 September).

Indeed, research concludes, location is the single biggest determinant of the health and wellbeing of seniors as they age (ACDQ, 2014). Poor urban environments can double the risk of functional loss for older people, increasing the likelihood that they will not be able to remain in their community, therefore degrading their quality of life and wellbeing (Andershon, Wijnties and David. 2012). Smith (2015) supported this stance arguing; ‘it isn’t the type of house that you live in that has the biggest impact on the quality of your aging, it is the location’ (P Smith 2015, pers. comm., 21 September). Historically, there has been a preoccupation with the design of the house over the urban environment. Interviewees challenged this approach, arguing; ‘if we know that location is one of the most important things about the quality of your ageing experience, then why are we not having a conversation about the structure of the neighborhood and the structure of the city… ultimately that will impact so much more on the quality of your ageing and the quality of your health’ (P Smith 2015, pers. comm., 21 September).

On an architectural level Robinson (2015) agreed there is a current lack of leadership in the field, which ultimately compounds poor outcomes; ‘I would say a big problem in not achieving a good outcome is the architect… Architects have a lot to answer for, they have allowed bad solutions to prosper and become the norm. They are delivering solutions they are familiar with and taught to a totally unfamiliar environment, for people who have vastly different needs’ (A Robinson 2015, pers. comm., 16 September). This view was shared by Faye (2015) who argued a lack of specialised industry knowledge contributes to the problem; ‘One of the key barriers is architects. Architects sell themselves as experts on everything and often they aren’t… very few have adequate aged care knowledge; they rely a lot on what the client says, and the client is limited by his or her knowledge’ (R Faye 2015, pers. comm., 17...
September). Evidently, there are existing issues on both an urban and architectural scale that need to be addressed ‘I think now the need is changing really rapidly and the built environment model isn’t keeping up’ (C See 2015, pers. comm., 13 September). It is understood that ageing population undoubtedly poses a number of challenges for urban designers and planners. There is an opportunity for good urban design to drive real change and play a major role in ensuring quality of life for seniors (World Health Organization. 2007).

**Barriers**

Interviews identified there are a number of barriers that contribute to and compound the current model, including:

- National policy
- Funding Models
- Role of the individual
- Cultural mindset and social exclusion
- Research and evidence base
- Land Value

**National Policy**

The exponential increase in ageing persons has immense implications on policymakers both presently and into the future (Lacey, 2015). Smith (2015) described the existing National Policy as restrictive posing a significant barrier; ‘there is currently no national approach or commitment to best practice in achieving aged care communities across the three levels of government’ (P Smith 2015, pers. comm., 21 September). Arguably, the most limiting are existing zoning provisions responsible for contributing to the congregation of aged care services on very large sites. RACFs in a lot of planning schemes and under the Queensland Planning Provisions are designated as a particular use. This use allows rooms, accommodation units and associated program such as allied health to be co-located on sites. However, the planning scheme requires such uses to be ancillary to the primary aged care function. If the additional uses come to service the surrounding community, the facility shifts to become classified as mixed use, changing the level of assessment from code and self-assessable to impact assessable. Ancillary uses that are seen to service the surrounding community are deemed negative and compromise other established centers in regions. Interviewees identified the downfall of existing planning structures in their discouragement of mixed use, arguing; ‘if we are hoping to achieve communities that integrate and contribute in
a positive way to their neighborhood... there needs to be flexibility in the planning system that encourages mixed use, allowing the opportunity for other programs, such as retail or childcare. That’s incredibly important because our current retirement and aged care models are failing’ (P Smith 2015, pers. comm., 21 September).

Funding Models
Interviewees argue there is an ingrained impediment in the way aged care projects are funded from the federal government that is contributing to the poor existing urban and built model. Smith (2015) discussed existing narrow funding models which do not encourage a diversity of outcomes; ‘there are no care models in-between; there’s federally funded community care and federally funded aged care, but there’s no funding model that easily allows ageing in place to happen outside of a suburban setting’ (P Smith 2015, pers. comm., 21 September).

Issues with the funding model are perceived to influence the economic viability of facilities, which are currently financially unsuccessful; ‘there’s up to a 20% vacancy in Australian RACFs because people aren’t going to them. Despite the increasing aged population only 12% go into retirement facilities. Therefore, operators need to find other forms of revenue’ (P Smith 2015, pers. comm., 21 September). Research supports these findings and reveals aged care has been compromised and bled of resources over a considerable period due to the failure of government subsidies to keep pace with the costs of providing quality aged and community care services (ACDQ, 2014).

The poor funding model contributes to the lack of facility upgrade and general degradation of existing aged care sites (Urban Taskforce Australia. 2013). Redevelopment is further hampered by increasing construction costs, in combination with the lack of return that facilities generate. Independent surveys of residential aged care indicate 40% of the sector is losing money and unable to invest in building new facilities. Modern facilities are costly to build and operate an average return per bed of 1.1% (Brisbane City Council. 2008). These findings indicate the need to resolve fundamental issues regarding existing funding models in order to move towards a more acceptable urban solution.

Role of the individual
Beyond the role of the government, architects and planners, interviewees identified the responsibility of the individual in contributing to the conversation and driving change. It is a shared view that the current aged population has a tendency to avoid conversations regarding
ageing and inadvertently don’t make a plan for their future living options. Smith (2015) argued this position does little to instigate and drive a change in the current model; ‘One of the challenges in changing the model is engaging the community in a really valuable conversation about death and ageing. At the moment, the implication is these people are putting themselves into housing options or localities that don’t suit their ageing needs’ (P Smith 2015, pers. comm., 21 September). Franz (2015) shared this view and identified the importance of individuals confronting and accepting the responsibility and the unique opportunity to contribute to the conversation and catalyse change; ‘It is not just designers’ or the government’s responsibility to think about the future, it’s people themselves. It is imperative they question; How can I become more aware about what are the possibilities that might confront me? What am I going to do about it? And, What am I going to implement now that will help me respond to issues into the future?’ (J Franz 2015, pers. comm., 11 September).

Interviewees expressed optimism towards the emerging baby boomer population who are expected to drive change in the market and exhibit proactivity in planning for their future; ‘the baby boomers are inherently more thoughtful about urbanism, less frightened about urbanism, and less frightened of centers. Therefore, they are more likely, even in regional areas, to move into urban centers because they understand it’s a better way to live for them’ (P Smith 2015, pers. comm., 21 September).

Cultural mindset and social exclusion
Most Australians are aware of the ageing population, however it is too frequently paired with negative ageist assumptions (Lacey, 2015). Interviewees identified the most significant barrier in contributing to the recurring poor urban model is an existing social construct which stereotypes the ageing population. Historically, our attitudes towards older adults have shifted. The beginning of the twentieth century valued a continuity of wisdom and saw the majority of the aged population continuing to have an active presence in their communities through encouraged social participation on chairs, boards and community organisations. However, the second half of the twentieth century noted a shift in this mentality with older adults, as they became retirees. They were seen to be relieved of their previous burdens and deserving of years of quiet pleasure (Scott, B. 2012).
Robinson (2015) described the current Australian condition as problematic; ‘Ageism is absolutely endemic in western culture... we hold very negative sentiments towards older people, particularly frail older people’ (A Robinson 2015, pers. comm., 16 September). The culture is very focused around the individual; the practice to look after oneself outweighs a broader social responsibility. Franz (2015) identified that the bipolarised condition reflects the way Australian society is structured around discrete family units; ‘We don’t have extended families, therefore if people can no longer care for themselves or don’t have others to care from them the only option is to go into a care environment’ (J Franz 2015, pers. comm., 11 September). There is the perception that ageing persons are not as productive, a view which is often perpetuated by the media. Franz (2015) identifies this condition as damaging to both the individual and society; ‘there is a stereotypical notion that when you hit a certain age you have reached your ‘used by’ date’ (J Franz 2015, pers. comm., 11 September).

This conservative position has significant impacts on the surrounding community, commonly resulting in the rejection of proposed developments. Interviewees argued that RACFs don’t reflect a socially inclusive approach; ‘they are homogenising certain cohorts which ultimately leads to further marginalisation’ (J Franz 2015, pers. comm., 11 September). This rejection is further driven by the inappropriate scale, institutional nature and poor urban relationships, existing models generate. Faye (2015) discussed common community sentiments, identifying ‘surrounding neighbors don’t want to live near a development with older people... Why are you going to want something institutionalized next door to you? It will decrease property value’ (R Faye 2015, pers. comm., 17 September). This social ideal is damaging and perpetuates the existing model.

This negative stigma is absent in areas of Europe where, by comparison, extended family networks encourage aged persons to remain living with families and connected to their community; ‘If you look at places in Europe often elderly people remain living with their families. They have a purpose and contribute to their community. There isn’t the preconception that when you reach a certain age that you don’t want to work or that you don’t have a purpose’ (C See 2015, pers. comm., 13 September). The encouragement of ageing persons to remain productive members of society is critical in maintaining dignity and independence. Research proves happiness, wellbeing, longevity and quality of life are byproducts of independence (Baldwin, Osborne and Smith, 2012). See (2015) supports this
view, arguing; ‘if you remove the opportunity for someone to be independent and remove them from their already established families and networks, their longevity and quality of life decreases, and depression increases... people will live longer if they are happier’ (C See 2015, pers. comm., 13 September). This significant differentiation in thinking and the adoption of a more integrated social structure has driven immense urban and architectural change, positioning Scandinavia and other areas of Europe as exemplars in aged care design. Franz (2015) also commends the community care approach where members of a community feel they have a responsibility to contribute to the wellbeing of their neighbors; ‘while you personally may not have an extended family, you live next door to neighbors who view you as part of their family... there is the presence of a community and a shared responsibility to each member in that community’ (J Franz 2015, pers. comm., 11 September).

Research and Evidence Base
Interviewees identified that another major contributing factor to the existing model has historically been a lack of research into the area, driven by underfunding. Robinson (2015) argued that aged care isn’t viewed as a priority, with research funding privileging biomedical and clinical research ahead of health services and care research; ‘We haven’t funded or supported research into questioning; What are good living options for old people? It is imperative that we begin to investigate the model of care and understand how space and location are fundamental in ensuring quality of life’ (AR).

Lack of research into health services and care is a key contributor in perpetuating the outdated current aged care model; ‘There really hasn’t been enough funding for research into these issues. If you look at the National Health and Medical Research Council 5% of the $700 million they give out each year goes towards health services research’ (A Robinson 2015, pers. comm., 16 September). The lack of funding drives the lack of strong evidence base, that proves the existing model is inadequate, stifling thought beyond the norm, Franz (2015) argues; ‘I don’t think we actually have the evidence at the moment to compel a different way of thinking about it’ and Robinson (2015) further states; ‘there’s no evidence because there is no funding for that sort of work. I really think we have a hegemonic approach.’

Interviewees advocate the need for research leadership to support organisations. Interviewees identified sector accreditation is driving an agenda of compliance rather
encouraging innovation. This inhibits urban and architectural opportunities for change. Faye (2015) expresses the need for a more rigorous evidence base which could contribute to a framework to guide planners. He argued this would prompt questions such as; ‘what are the benefits of integration?’ and; ‘why are we still building RACFs in isolated environments?’ to be more substantially addressed. This lack of knowledge and education within the industry is seen to be fundamental in stalling change and stifling innovative solutions; ‘we virtually have no idea about residential aged care and that seems to suit a lot of people, giving excuse to ignore the situation, what you don’t know doesn’t hurt you’ (A Robinson 2015, pers. comm., 16 September).

Land value
Interviewees identified increasing land value as a significant ongoing issue that compounds urban issues; ‘any architect or client will identify increasing land value as a big issue. Cost tends to make smaller facilities uneconomic which leads to their amalgamation. This further institutionalises these facilities and ultimately makes them increasingly less like a home’ (P Smith 2015, pers. comm., 21 September). Research suggests that a recent influx of foreign investment from China and South-East Asia is partially responsible for driving land values in the city up (World Economic Forum, 2012). Resultantly, RACFs have been replaced with apartments designed with the young and able in mind and housing for older people is pushed to outer suburbs where land is cheaper but further away from vital services and facilities (Brisbane City Council. 2008).

Design Solutions
Interviewees unanimously agreed that in order to cater for the needs of the ageing population into the future, there is a necessity for change to occur. Franz (2015) identified a need to provide more diverse options to address variable needs and care requirements; ‘it is an incredibly complex issue. It is critical we try and work out how to respond to the issue in a way that addresses individual situations’ (J Franz 2015, pers. comm., 11 September). Interviewees agreed that urban design has the capacity to play a significant role in shaping the future and identified five urban measures that might be considered to facilitate catering for the predicted diversity:

- Adoption of hybrid models
- Community Care and ‘Ageing in Neighborhood’
• Decentralization of facilities
• Inner City urban models
• Advocacy

Hybrid models
Interviewees encouraged mixed use as a means of solving a number of the issues associated with the current problematic urban model. Smith (2015) argued the size of the facilities wouldn’t be so much of an issue if more uses were integrated; ‘I don’t mind the buildings getting bigger. However they need to be in the right location and offer a range of different services’ (P Smith 2015, pers. comm., 21 September). Participants made further suggestions regarding uses that might be appropriate, advocating multigenerational communities and suggesting the co-location of childcare, university and schools to encourage diversity. This hybrid model is desirable, as it would begin to solve urban issues of isolation, segregation, and insularity by encouraging a mix of programs and uses on the sites. Smith (2015) elaborated and identified the opportunity for mixed use to facilitate the desire for more diversity and integration; ‘Hybrid models are going to be most successful. I think you can get too stuck on the building size; it’s the single use that is the problem. The difference between cities and suburbs is that cities are inherently more diverse, with lots of different things in them, that’s why people like them’ (P Smith 2015, pers. comm., 21 September).

Another method of mixed use is an urban model which encourages the co-location of university students with aged care residents through offering subsidized living; ‘Norway is setting the bar, which is being driven by their advanced social systems… Aged care providers are offering free accommodation for university students, in turn the students engage with the residents in the facility. To me, that is a really innovative response… it challenges stereotypes and offers something in terms of community’ (R Faye 2015, pers. comm., 17 September). This urban model inherently strengthens access and proximity to necessary services and encourages positive community and neighborhood development. Ultimately, the movement towards more effective economic models would make inner city sites more attainable and break the cycle of facilities being pushed further and further out, providing a new means to generate revenue.

Community care and ‘Ageing in Neighborhood’
In looking to solve a number of existing National Policy barriers, Smith (2015) advocated a shift in the planning scheme towards encouraging ‘ageing in neighborhood’ arguing ‘whilst the term ageing in place is useful for us, we need to develop a model that is about the neighborhood and the promotion of ageing in neighborhood’ (P Smith 2015, pers. comm., 21 September). Ageing in neighborhood implies that you have a neighborhood that offers a diverse range of housing supported by a care model that is community based rather than commonwealth based. This community care model divulges the care of seniors back to the community, encouraging them to play a key role in providing non-clinical social engagement; ‘We need a new model where we all have to contribute 13 hours of community care. Rather than the government funding, it comes back to a volunteer base and a shared responsibility of the community – and thinking about what that might mean then for the structure of aged care and the structure of community. If we know that community based care is better clinically, the trends are all pointing in that direction’ (P Smith 2015, pers. comm., 21 September).

Community care approaches have been successfully adopted and practiced in existing ‘apartment for life models’, specifically in Rotterdam, Holland (ACIL Tasman, 2009). Apartments for life are engineered with flexibility to accommodate the changing demand of residents; ‘apartments are designed for the individual to arrive independent, but it will shift over time to accommodate for less able needs’ (C See 2015, pers. comm., 13 September). The models allow greater scope for proximity to family and friends and cultivate a ‘mutual help’ culture, whereby one third of residents are in good health (ACIL Tasman, 2009). This cohort function as a strong support network and volunteers assisting with the management of complexes. This shared care responsibility would conceivably assist in alleviating existing funding issues and would resolve social issues that perpetuate the urban model.

**Decentralisation of Facilities**

Associated with both the desire to adopt hybrid models and the ageing in neighborhood model is the recommended shift towards a decentralized system. Robinson (2015) supported the notion of moving towards a decentralized system, stating; ‘fundamentally it is questioning how you tear down the walls of these organizations so you can facilitate the engagement of the wider society with these people. And just being aware of the human condition; All of us like going outside, all of us like going into the garden, all of us like sitting in the sun, all of us like seeing the outside. None of us like air conditioning, none of us like fluorescent lights.'
The environment is critical in how we feel’ (A Robinson 2015, pers. comm., 16 September). Decentralised systems advocate breaking down the built form into smaller groupings to establish a more appropriate neighborhood scale. Alongside this, interviewees identify the need to reevaluate architectural elements of scale, grain, massing and mixed use. Franz (2015) suggested the adoption of an ecological approach to planning our systems; ‘if we are looking at aged care being decentralized then you have to look at a whole lot of other services being decentralized...I always think of it as an ecology. If you take an ecological approach to it you realize that one little ripple locally has a ripple everywhere else. You can’t look at aged care in isolation to the other systems that make up society. We have to start to see how that alignment can happen more effectively’ (J Franz 2015, pers. comm., 11 September).

Ultimately, decentralised models would be advantageous in driving the inevitable shift away from current homogenous groupings to more integrated and heterogeneous community profiles.

Inner city urban models
Research indicates we grow more reliant on close proximities in both physical and social relationships as we advance in age. See (2015) identified that the demographic shift and significant increase in the aged population will inevitably drive the market to cater for inner city living and supported more dense, medium rise residential as one possible appropriate model; ‘That’s where I see the model shifting, towards vertical aged care in locations that people like us would want to be in... The idea of purchasing a high end apartment that could then accommodate care’ (C See 2015, pers. comm., 13 September). In overcoming challenges of increasing land cost, reference was made to a precedent in Copenhagen; ‘The provider purchased a small city block that is in an area of small-medium rise buildings. They devoted the ground floor to aged care, so the people that lived there had access to courtyards but the building was built right to the street edge. The three-four stories over had apartments that were sold or leased’ (R Faye 2015, pers. comm., 17 September). This example is innovative in developing a successful economic model, which strategically locates the aged population on the ground and on expensive inner city land.

An associated advantage with establishing inner city models is the opportunity to share resources between multiple facilities and streamline facility operations. This would assist in resolving existing lifecycle cost overruns and begin to resolve staffing issues with
Interviewees identifying; ‘you can’t service a suburban community as effectively as you can a more urbanised community’ (P Smith 2015, pers. comm., 21 September). Alternatively, one of the recognized limitations of vertical inner city facilities was ensuring access to quality green amenity by way of gardens and outdoor recreational areas.

Advocacy
Participants acknowledged the ageing baby boomer population will inevitably drive a shift in the market. However federal policy changing to reflect and facilitate the shift was met with skepticism. Participants identified the significant role that urban design professionals and planners play in shifting the current approach through embracing leadership ‘convincing clients and local government and identifying where their regulations might pose a barrier’ (R Faye 2015, pers. comm., 17 September). Further claiming; ‘it is important we use our skills to influence a change in attitude about the types of buildings and neighborhoods we should be designing’ (P Smith 2015, pers. comm., 21 September).

Interviewees reflected on the narrow existing offer and identified two opportunities where designers could drive change. Firstly, in their role as advocates for the built environment, specifically with regard to establishing a national housing policy; ‘If we advocate for a national housing policy that actually looked at housing and then the money that’s in the system, then conformed to the housing policy, we would have a better approach. I am optimistic, it is a massive group. The biggest federal expenditure of anything is ageing in health. It would be something like 30% - 40% of the national budget’ (P Smith 2015, pers. comm., 21 September). Faye (2015) identifies a second opportunity being through the formation of an advisory panel to facilitate an ongoing dialogue between planners and designers; ‘If there was a group that represented the aged care sector and an attempt to get together with the various stakeholders (local council, planners, local and state government) to discuss the future... How to get good outcomes in the city? and How to achieve affordable housing for aged persons?’ (R Faye 2015, pers. comm., 17 September). Robinson (2015) supported such advocacy roles, however also identified the need for increased knowledge, education and understanding to be happening in parallel.

Conclusion
Literature indicates we have failed to come to terms with the challenges the ageing population presents. This has led to the current inadequate aged care offer, characterised by outdated suburban models, which require drastic rethinking. Statistics indicate that if significant change doesn’t occur, we can expect existing issues to compound and deteriorate into the future. Undoubtedly, the urban and built environment plays a significant role in determining the quality of one’s ageing experience. However, there is an obvious disconnect between the current condition, the expected condition and the ageing population who value choice and diversity. People are complex and have different needs at different times in their lives and in different situations. Good urban places are places for all people and respect the varied needs and aspirations of the community, regardless of infirmity, ability or age. There is undoubtedly a need to adopt a progressive approach and reframe the ageing experience around the city and neighborhood, as opposed to suburbs. Moving forward, it is important we embrace this challenge as an urban design opportunity to transform our communities in a really useful way. It is important we question how the current urban framework might be reshaped to provide more appropriately integrated aged care communities that offer a diversity of desirable living opportunities into the future.

Limitations

It is recognised this paper has a number of limitations. The format of the paper inhibits the depth and scope of discussion for the broad topic, therefore the paper is positioned to present a high level survey of issues. It is recommended that beyond this paper each issue requires further, more focused research. The format of the paper further limits discussion and analysis of the recommended design solutions, which have been identified at a high level, however require a more detailed analysis. The study further remains limited through the number and selective nature of the participants. It would be valuable to extend future research to invite the thoughts and opinions of users of RACFs.
Reference List


Campus WU
A holistic history in Vienna

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Campus WU
A holistic history in Vienna

ABSTRACT: With its roster of some 23,000 students and 1,500 employees, the Vienna University of Economics and Business, hereinafter referred to as WU (an abbreviation of its name in the German language, Wirtschaft Universität), was in 2007 practically bursting at the seams, as the facilities which had been occupied between 1982 and 2013 were originally designed for only 9,000 users. Lack of capacity and the impossibility of expanding the building located in Vienna’s 9th district, provided the opportunity to move the university to a new and innovative Campus designed by the firm BUSarchitektur; grounds that were able to respond spatially, physically and technologically not only to the University’s immediate necessities, but also to the need take responsibility for the social, urban and environmental obligations and roles that academic districts are nowadays committed to.

As a result, the new Campus WU was envisioned as a walk along a park with sequences of plazas acting as “stations” articulating independent buildings designed by internationally renowned architectural companies such as Zaha Hadid and Sir Peter Cook, among others, creating an open campus reflecting its surroundings right in the heart of one of the most representative leisure and ecological structures of the city: Prater Park.

“The transition from modern, individual, knowledge based education, to the shared education and knowledge of the information age, means we have had to incorporate virtual networks into our lives. Surprisingly for many people, real face-to-face networks have also been reinforced. Contact and collaboration have become crucial in the virtual era. It is what Richard Sennett describes as zero-sum or win-win exchange, the balance between individuality and cooperation.” Muxí (2013)¹, Sennett (2012)².

This paper weaves together all of these different aspects in a holistic manner and reflects the perspective, intentions and background of the project run by the Austrian architecture and design company BUSarchitektur, founded by Dr. Mag. Arch. Arq. Laura P. Spinadel, winner of the Masterplan for the new Campus WU in Vienna in 2008, an urban investment project costing around 500 million Euros.

In this way, the document aims to contribute to the understanding of the 2 main concepts behind the spirit of the new Campus WU: Holism and CoOpetition, as well as to explain the 7 main roles that the company played throughout the entire process, from the initial Masterplan competition up until the inauguration in 2013.

Therefore, the following paper should be understood as a journey through some of the several features, strategies and outcomes, which played key roles in the conception and implementation of a proven urban strategy in what Dipl. Ing. Thomas Madreiter, Director of the Vienna’s Department of Urban Planning has described as “one of the most important examples for urban planning in Vienna in the last decades”.

Keywords: Holistic Architecture, Interactive Urbanism, Integral Design, Urban Communication Strategies, Realistic Utopias

FIRST PART: PRELIMINARY STATEMENTS

1.1 - Introduction:

Believe in Urban “Miracles”!

The expectations for the new Campus for Vienna’s University of Economics and Business went beyond merely putting together an ensemble of new constructions concentrated in one plot. Reinventing the educational landscape was the first step towards, from the architectural standpoint, encouraging a new multicultural and cosmopolitan substructure. As the director of the Masterplan, I had the job of deciding the rules of the game in what constituted a fascinating symbiosis between the highest level of designed architecture and the highest ecological standards. Therefore, internationally renowned architecture and award of a Green Building certificate were the “sine qua non” conditions for the development of the integral Masterplan, for an area in which it was hoped that a change in paradigms would be created both for students as well as educators and even neighbors in the surrounding areas. I am referring to a place where real human communication could take place in harmony with the environment, leaving its mark on everyday life, and where the goal was for learning and research at the campus to be much more than just an obligatory exercise. It is for these reasons that we created multiple discovery paths and meeting squares within the University Park for the purpose of fostering everyday academic life.

Image 01: The New Campus WU at the fringe in between Prater Park and the Vienna Fair. Source: Render by BOA büro für offensive aleatorik.

Working together as a team with Vasko & Partners Engineers, who were co-responsible for the Executive Project, we had to resolve the issue of how to preserve radically different kinds
of architecture as well as integrating educational concepts despite having a moderate budget.

Intensive teamwork undertaken with various groups from the Vienna University of Economics and Business (WU) as well as with the National Real Estate Company (whose German initials are BIG.), allowed us as project designers to achieve a harmonization of the various innovative architectonic proposals submitted by internationally renowned superstars whilst incorporating the wishes of the WU academic community.

Creating an awareness of the fact that the almost 30,000 guests could improve a neighborhood of 100,000 inhabitants was the objective of the intense joint work undertaken with the city of Vienna and the project team, as well as with all of the municipalities involved. As an urbanist, I am convinced that the complementary integration of several small steps taken in public administration as well as within the University created synergies which threw a spotlight on Prater Park as well as the Leopoldstadt district which allowed for the rise of new neighborhood cohesion and participatory activities.

Source: BUSarchitektur.

The Before and After Scenarios

Excerpt from Isabella Marboe: “At its opening, the old University of Economics and Business (WU) in the Sensengasse was, for Viennese standards, completely state-of-the-art. However, the building, conceived for 9,000 students, had already reached its capacity limit back then. Today, the number of students has grown to around 23,000, and the functional university building, modularly planned in a grid over the Franz-Josef Railway Station freight area in the late Modernist style of the 1970s by Kurt Hlawniczka & Partner (1976–82), in full belief in the omnipotence of technical progress, now needs major redevelopment and is very difficult to re-use. Large block depths, long access corridors, many small rooms, lecture halls with no natural light and all types of cold gaps characterize this architecture. It went out of fashion just like the six 8 x 8-meter-large, fantastic-realistic “University Fayences,” made of more
than 3,500 ceramic tiles by MaitreLeherb. They symbolize the six continents and thus two essential values of the WU: a cosmopolitan claim to open-mindedness that also incorporates an interest in art. People with a broad horizon, who see the bigger picture, were to be educated here. This claim has remained and is more necessary than ever in times of globalization. In 2007, BIG (Austrian Federal Real Estate Company) and the WU founded the project company Wirtschaftsuniversität Wien Neu GmbH, which tendered an open, European-wide general planning competition for a new construction of a university with around 100,000 m² of floor

Image 03: Location of the previous university building and the new Campus WU in Vienna. Source: BOA büro für offensive aleatorik.
Wirtschaftsuniversität Wien Neu GmbH, which tendered an open, European-wide general planning competition for a new construction of a university with around 100,000 m² of floor
space. Located in Vienna’s booming Second District, the plot is about 90,000 m² large, around 600 meters long, and between 150 and 240 meters wide.” (2013)³.

Image 04: Master Plan diagram of accessibility, pedestrian structure and volumes distribution.
Source: BUSarchitektur.

**From Non-Place and Greyfield to a New Cultural and Academic Centre**

Probably one of the most significant impacts of the project is the urban regeneration and integration into the life of the city of the empty urban fragment where the new Campus is now located at the border of the Prater Park and behind the Vienna Fair. Asphalted and fenced, the greyfield was used sporadically by the Vienna Fair as an extension area for machinery exhibitions, a storage area using a temporary pavilion or as an ad hoc parking lot, but most of the time it went unused, making it into a non-place, a dead space containing no public urban life and was the site of prostitution, traffic and alcoholism. In order to properly respond to this problem, a goal was set to make the university complex a landmark radiating beyond the city limits, with no fences or borders, open to pedestrians 24-7, 365 days a year, merging with Prater Park as kind of a natural extension of it, where its architecture could become a subject of collective fascination. It was for this reason that the Open Campus Typology was chosen from the outset as the best option for spatial organization, as it allowed the creation of interior-exterior synergies, with an osmotic interactive boundary, in contrast to the traditional Austrian concept of a “Hof” or “Courtyard” where there is a clearly defined border dictated by the façade of the buildings facing towards the street, with the interior left empty with no roof.

Source: various open sources.

Paraphrasing Patrick Geddes' concept of “Think global, act local”, the new Campus WU is a solid, proven example of how local and international architectural companies can work and coordinate together, moving beyond cultural, traditional and egomaniacal professional habits. As the participation of internationally renowned companies was established in the set of rules document in the Master Plan, developed by BUSarchitektur for the architectonic competition phase, the challenge arose of how to create a consistent and harmonious spatial unity which was able to be recognized as a whole, bringing to the fore the role of the public space as an interface for communication and exchange. According to Zaida Muxí: “The basis of the Campus is the importance given to the non built-up space, similar to an Egon Schiele painting in which a figure is defined by the void it acquires, thereby becoming the focus of the artistic composition. The main focus of Campus WU has been the apparently empty space, which defines the rules for the arrangement of the buildings and, in turn, the interactions between everything happening inside them.”(2013).

Image 06: Distinct local & international architectural styles are woven together at the Campus park.
Source: BUSarchitektur.

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The potential for CoOpetition (a balance between competition and cooperation) and other kinds of, in the words of Illa Berman and Mona El Kahif, *Multi-scalar Negotiations*, is the common denominator present in all of the different levels, design phases and implementation processes used for the new Campus: “The full realization of the Master Plan and its six architectural projects—designed by Estudio Carme Pinós [Barcelona], CRAB studio [London], Zaha Hadid Architects [Hamburg], NO.MAD Arquitectos [Madrid], Atelier Hitoshi Abe [Sendai] and BUSarchitektur [Vienna]—occurred over a five-year period through an intricately managed piece of choreography that can be summarized in relation to eight critical frameworks, processes and/or methodologies—understood as “lines of action” or “handlungsstränge”—that organized and directed the project.” (2013).

The Master plan’s greatest achievement, and complexity, can be seen in its attempt to make the most of the architecture and the Campus itself in order to maintain the university’s reputation as a synonym for innovation while simultaneously re-branding it architectonically and spatially, so that it be recognized internationally not only for its longstanding tradition, history and outstanding academic performance but as a contemporary state-of-the-art venue. “The WU is the largest school in Europe focused entirely on Business, economics and law, and is one of the best. It was founded in 1898 to prepare fledgling businessmen to grow in the then Austro–Hungarian Empire, and since (then) has produced an Austrian president, chancellors, finance ministers, industrialists and CEOs. In other words, it was a good place to generate an innovative business model for a new university structure.” Skene (2014).

1.2 – Paper Objectives and Structure:

The purpose of the following paper is to broaden understanding of the various key dimensions and components of the Campus WU project which BUSarchitektur was involved in after winning the competition to design the Master Plan, as well as the different spatial and technical themes and different roles played by them throughout the entire process between 2008 and 2013 and the conceptual framework in which the whole project is rooted.

The specific objectives of this paper are:

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6Dr. Illa Berman is currently director of the University of Waterloo School of Architecture and former director of Architecture at the California College of Arts.
7Mona El Khafif is associate Professor at the Waterloo School of Architecture.
- To discuss the conceptual framework of the project which centres around the concepts of Randomness, Holism and Coopetition.
- To outline the 10 different but complementary thematic modules underpinning the urban project for the New Campus WU.
- To summarize the 7 different roles played by the different teams coordinated by Dr. Mag. Arch. Arq. Laura P. Spinadel during the entire project process.
- To discuss the ability for innovative and academic clusters to trigger regeneration in derelict environments, by promoting and enabling "spontaneous" contact, communication and networking.
- To highlight the environmental responsibilities the urban projects had in terms of energy consumption, emissions, materials and interaction with ecological structures.

In order to discuss these topics the paper has been divided into 3 main parts:

- Part one is an introductory section describing the Campus WU project formally and genealogically in order to give the reader general background information about the location, actors involved and scale of the urban intervention. It also includes 3 main questions related to the research, and the structure of the paper.
- Part two contains the main discussion of the paper with regard to the first 3 objectives.
- Part three includes the document’s final statements organized in terms of results, and conclusions, bringing together the discussion of the last 2 objectives with a critical review of the project’s impacts and its performance since its opening 2 years ago.

1.3 – Methodology:

In order to draw its conclusions the research analyses primary and secondary sources, including some of the original documents developed exclusively for the Master Plan, Landscape and Architectonic design phases carried out by the project’s General Planer, the companies BUSarchitektur and BOA büro für offensive aleatorik (Office for advanced Randomness) and their specialist technical partners.

It also includes citations from various third-party sources including internationally recognized magazines, Austrian newspapers and interviews with the aim of providing a critical and robust counterbalance to the results.

1.4 – Questions:
As will be explained later on, the Teams under the coordination of the architect Laura P. Spinadel participated in a variety of ways throughout the development of the project, assuming 7 different active roles, each one with specific duties and responsibilities. Of these 7, 3 were related to the more classical professional practices that architectural companies are used to dealing with:

- Design of the Master Plan documents.
- Landscape design of the entire whole public space of the Campus.
- Architectonic design of the Teaching Center Building.

Attached to these 3 big challenges are 3 main questions, which were present throughout the duration of the project:

- Is architecture shaping society?
- Can landscape describe the environment?
- Should the architect submit to the market?

The next part of the paper aims to provide the reader with the elements and conceptual background needed to answer these questions, not only as a purely subjective problem to be addressed in our profession, but so as to contextualize the relevance of these criteria as applied to the actual project situation itself.

Image 07: Library & Learning Center by Zaha Hadid architects.
Source: BOA büro für offensive aleatorik.

SECOND PART: DISCUSSION
2.1 – Conceptual Statements:

Operational randomness in interactive urbanism

Creating architecture today is a gnomic game. The rules of the game are paradoxical, players are continually changing their minds and all operational processes end up being self-referential\(^\text{10}\). The basic democratic rights pertaining to built-up environments are: the right to natural light, the right to visual perception and the right to water. As a result, the job of an architect nowadays is to strike a new balance between ecology and urban planning. Our aim as thinkers and operators should be to return to playing an active role in optimizing environmental quality by acknowledging the complexity of this process and searching for sustainable alternatives.

We understand operational Randomness as an intuitive approach which aims to reduce the creative individual’s influence on the product as much as possible, in other words, and in the broadest sense, the creation of unintentional and uncontrolled works. Randomness here also refers to the complexity of factors acting indifferent non-sequential moments in macro urban interventions, of which the University is an example, due to the number of impacts that can be made on natural and manmade environments, by the pool of actors involved at different times during the whole process and the interactions between all or some of them.

As explained by Berman and El Khafif: “The Master Plan for the Vienna University (WU) Campus by BUSarchitektur is by nature as complex as it is evolutionary. It embodies a multivalent negotiation of scales, conceptual principles, architectural territories and operative methodologies. Its success as a highly accomplished work of architecture and urbanism is attributable not only to the intricacies of this multifaceted negotiation, the comprehensiveness of its approach, and the high standards to which the architecture aspires, but also to the inventiveness with which the Master Plan, as a predefined product of urban and architectural history, was conceptually retooled in order to challenge its traditional deficiencies and ensure its alignment with the conceptual strategies embedded in BUS’s design approach to the project.”(2013)\textsuperscript{11}.

![Masterplan diagrams of decentralized systems. Source: BOA büro für offensive aleatorik.](image09.png)

**Campus WU A holistic history**

BUSarchitektur has been working on issues affecting our contemporary society since it was founded in 1986. BOA (Office for Advanced Randomness), has been developing cultural interactions since its establishment in 2003. Through their proposals both companies develop realistic utopias that help us to value and redefine our inherited legacy in a conscientious and committed way. The new Campus WU project was launched in 2005 within the academic setting of the Vienna University of Economics and Business. The project culminated in 2013 with the handing over of the finished university complex within its budgetary target of EUR 500 million. It is the largest University of Economics in the European Union with a population of 25,000 students, teachers and administrative staff and is moving into a neighbourhood with approximately 100,000 inhabitants.

The democratic organization of users, state power structures, inspections by leading agencies’, monitoring of costs and budgets, branding imposed on architecture, multiple regulations, contract award mechanisms, the historical burden of a prestigious site, social tensions associated with an established centre for prostitution, the dissatisfaction of the student population, etc. – are some of the factors which caused stakeholder’s interests to be in a permanent state of unstable equilibrium. The constant search for a holistic equilibrium from the Master plan authors extended throughout the entire project process and into its execution, due to the unstable balance of power between users, residents, developers, politicians, experts and implementers of the design.

Image 10: Masterplan diagrams, spatial sequences and scale apprehension. Source: BOA büro für offensive aleatorik.

In order to better understand the particular dimensions related to the concept of Holism in the work of architect Laura P. Spinadel, Doctor and Professor Josep Maria Montaner wrote about: “…the concepts at the heart of Laura P. Spinadel’s different works. Examples include “layers” to enable different requirements and programs to be superimposed; “energy flows” as the fundamental subject-matter of architecture; “knots and networks” as the central nervous system of each architecture and landscape; the value of “personal experience” as a function of sensory stimulation; the emphasis on empowering “interactions and exchanges between people” through architecture; thoroughly and carefully designed “architectural micro-worlds”; and the courage to approach chaotic geometries and fractals forms.

To add, include and take into account all these requirements, from a humanistic and ecological point of view, has led Laura P. Spinadel to draw on the concept of holism. Holism has its roots in Goethe’s naturalistic thought, in Rudolf Steiner and theosophy, and was initially theorized by the African leader and thinker Jan Christiaan Smuts in his book Holism and Evolution (1926). The Argentinean architectural critic, Marina Waisman, also discussed
the concept in her book La Arquitectura Descentrada ("Decentralized Architecture", 1995), arguing for the need to replace analytical attitudes with a holistic vision.

Since starting out with a humanistic, theosophical and sensualist vision, Laura P. Spinadel has moved towards a holistic and ecological position, that seeks to put maximum emphasis on the health of open and closed spaces, as well as on the requirements and principles of bio-construction. Holistic thinking implies profoundly replacing rational and analytical thought with more inclusive thinking, in which all factors are taken into account, even those that seem trivial or invisible, such as perception, health or freedom. This is why it is so important that positioning should be relative to the path of the sun and that circulating air should be thought of as an ecosystem.” (2013)\(^\text{12}\).

**Coopetition at Campus WU: Multi-scalar Spatial Negotiations**

The complexity of the Campus WU project led by BUSarchitektur arises from the need to incorporate concepts from other fields into architecture in order to be able to take on and respond properly to the challenges of a project of such dimensions, while at the same time mitigating risks and anticipated conflicts or negative impacts. As discussed previously, the architect Spinadel understood that the complexity arising from the need to take on multiple roles for the duration of the process needed more than good architecture as a response. For this reason the concepts of Holism and Randomness where introduced in order to have more tools and a basis on which to make decisions correctly. The same is true of the tools related to Coopetition, which is the merger of cooperation and competition.

Although this concept has been discussed by a large number of researchers and has been re-worked several times in diverse contexts, it was in the literature of Barry J. Nabuff (Yale School of Management) and Adam N. Brandenburger (Harvard Business School) where she found inspiration for at least two crucial elements which were significant in the conceptualization phase of the project: Game theory as applied to games whose rules are constantly changing and though multidimensional negotiation tools used in multi-scalar and multi-actor projects, of which Campus WU is an example. “Game Theory is particularly effective when there are many interdependent factors and no decision can be made in isolation from a host of other decisions. Business today is conducted in a world of bewildering complexity. Factors you might not even think to ask about can determine your success or

failure. Even if you identify all the relevant factors, anything that changes one is likely to affect the others. Amid all this complexity, game theory breaks down the game into its key components. It helps you see what’s going on and what to do about it.” Brandenburger & Nabuff (1996)\textsuperscript{13}.

A good practical example of these multiple complexities is the visualization and decision assistance digital tool named “the Configurator” created by the companies BUS and BOA during the architectonic competition phase, and used by the judges in the award and selection process to compare not only the architectonic proposal for each building competing against each other building, but also their spatial cooperation, in order to determine if a coherent and consistent unity would be formed if they became part of the Campus.

Image 11: Diverse Campus scenarios visualized by the Configurator. Practical examples of how the Randomness, Holism and Coopetition concepts were applied in the Master Plan phase.

Source: BOA büro für offensive aleatorik.

2.2 – Thematic Modules:

The aforementioned conceptual tools were intended to assist the decision making process and manage the divergent themes and contingencies as well as the different actors involved in the University Campus project.

In 2013, BUSarchitektur published the book “Campus WU, a Holistic History” (available in English, German and Spanish) as an extended detailed view into all of these complementary themes. Different in nature, each independent part is fractal in essence and therefore references the other parts and networks with them. Explaining them is beyond the scope and limitations of this paper, therefore only the title of the 10 themes are given as follows, as well as informative posters with a synthesis of the key elements addressed in each chapter:

1. Light and Safety.
2. Energy and Life Cycle.
3. Spaces for Appropriation.
4. Integral Masterplan.
5. Configurators.
7. Contextual Synergies.
8. Open Spaces.
9. Gameboard of Realisation
Image 13: Light & Safety: Potentialities for Freedom in the Educational Field
Source: BOA büro für offensive aleatorik.
Image 14: Energy & Life Cycle: Self-sustainability within the Existing Ecosystem

Source: BOA büro für offensive aleatorik.
Image 15: Spaces for Appropriation: At All times of the Year
Source: BOA büro für offensive aleatorik.
Image 16: Integral Masterplan: Open Space as Interlinking Protagonist

Source: BOA büro für offensive aleatorik.
Image 17: Configurators: Novel Tools for Negotiating & Evaluating Spatial Qualities
Source: BOA büro für offensive aleatorik.
Image 18: Walk along Park: Sampling Educational Life to Emphasize Collaborative Knowledge
Source: BOA büro für offensive aleatorik.
Image 19: Contextual Synergies: Regional Significance and Community Building

Source: BOA büro für offensive aleatorik.
Image 20: Open Spaces: Green Oasis – Pavilions in the University Garden
Source: BOA büro für offensive aleatorik.
Image 21: Gameboard of Realization: Multiplicity of Stakeholders Activating the Space
Source: BOA büro für offensive aleatorik.
Image 22: Ecological Urbanism: Intensities & Densities: Encouraging Interaction in Public Spaces

Source: BOA büro für offensive aleatorik.
2.3 – 7 Roles on Campus WU:

As mentioned previously, Architect Laura P. Spinadel worked alongside specialists from both the companies BUS and BOA and external consultants, integrating several different themes during the design and implementation process of Campus WU, taking on 7 distinct professional responsibilities as follows:

1. General Planner.
2. Elaboration of Comprehensive Masterplan.
3. Landscape designer of the entire open space at the Campus.
4. Architect of the Teaching Center building.
6. Documentation of the whole construction process.
7. Communication and interaction.

**General Planner**

“BUSarchitektur operated as the general planner for the project, responsible for the design of the entire site’s public open space, one building plot (the D1 TC - Departments 1/ Teaching Center building) and the implementation of all campus-wide systems, ensuring the centralized orchestration and productive oversight of all components of the project and avoiding the fragmentation often attributed to large scale multi-building development.” Berman & El Khafif (2013) 14.

**Elaboration of Comprehensive Master Plan**

The Master Plan outlines the principles and major structural divisions, such as the designation of construction sites, building locations and open spaces. It is the basis of the architectural project and provides recommendations for the design of individual buildings. An integral Master Plan is the goal of the entire process. Designs, cooperative planning methods and visionary models serve not only for the purpose of complying with building and development regulations but to launch a complete and coherent planning and execution process guided by the Campus WU Master Plan – a plan that aims to fulfil the criteria for emotional identification while also taking into account the complex logic of its creation. By way of a moderation process with the parties involved, the team of master planners combined building aspects with social, economic and contextual goals and requirements. It is the master planners’ task to halt negative trends and to initiate positive impulses and visions, to improve

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the quality of life and work, to create long-term planning assurances, to foster cooperation and social networks, and to allow room for manoeuvre.

Landscape Designer of Entire Open Space on Campus.

The campus is a sequence of spaces which intertwine with each other. Each route forks in such a manner that destinations can be reached via many different paths. Various stations for stopovers and activities are defined along the routes of the ‘Walk Along Park’. Each area aims to encourage interaction and a search for new paths towards learning.

Image 23: Masterplan Urban Settings, set of rules and recommendations for each built up area.
Source: BOA büro für offensive aleatorik.

Image 24: Landscape diagrams, the open space develops urbanity.
Source: BOA büro für offensive aleatorik
At the same time, the new Campus is surrounded by trees and shrubs which function as a natural green boundary. This boundary represents a filter to the adjacent Prater, as well as for local vehicular traffic. The Campus is accessible through six entrances and five pedestrian passages 24 hours a day.

The goal of the landscape is for it to be an area to rest and relax in, which at the same time preserves the Campus’ collective unity and interlinks the university buildings with the adjacent spaces. Being accessible to the general public, the Campus is a key part of Vienna’s city planning. Designed together with Landscape experts from the company Landschafts Architektur from Vienna, the Landscape design of the entire plot, some 60,000 sqm, articulates various themes such as the external Boundary, the Plazas, the main pedestrian axis, the design of the fixtures and their arrangement in “Families” and the “chromatic differentiation” of subsequent spaces, of which one specialist said: “If the Campus peripheries are defined by the strong impression created by the homogeneous Ginkgo grove, then the interior vegetation is guided in color and texture by the structure and divisions within the open spaces, such as the networks and families. Bands of perennials bloom according to the different seasons. Ornamental grass clusters, such as Miscanthus or Panicum assume the role of ‘vegetation guides’ throughout the network of open spaces. Towards the end of the year, when the summer bloom is over and winter is on its way, they come into their own and serve to form an ever stronger structure.” Schmidt & Batik (2013)  

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Image 26: 2 different experiences of the public space. Top: Lounge plaza in front of the Executive Academy. Bottom: Forum Plaza with the Teaching Center to the right.
Source: BOA büro für offensive aleatorik.
Image 27: 2 different experiences of the public space. Top: Expo plaza. Bottom: Open spaces have been planned as extension of the ground floors of the Buildings, this case at the Executive Academy.

Source: BOA büro für offensive aleatorik.
Architecture of the Teaching Center building

More than a mere building, the Teaching Center is a learning platform that promotes spontaneous communication while at the same time allows for classes and activities to be held within. This quest for spontaneous exchange has different levels and scales sharing one common denominator: the path is the goal.

The structure of Plot 01 (Teaching Centre), with a capacity of up to 4,585 users, is strongly characterized by a concept of open space “pierced by paths”. This design concept was applied both indoors and outdoors. The idea behind this approach is that individuals can discover and interpret the building along different leisurely walks.

“To be precise, the Teaching Center, with the Department of International Business and the Food Court, are a conglomerate of several autonomous structures that intersect and overlap in certain areas. The interstices become fluctuations and communication zones of differing intensity. They enable exchange, establish visual references, and are dramatically staged at times.” Marboe (2013)17.

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Image 29: 2 Different views of the Teaching Center Complex. Top: Emergency exits and evacuation routes. Bottom: In foreground the Teaching Center Evacuation Staircases.

Source: BOA büro für offensive aleatorik.
Image 30: Urban interaction: Campus space flowing into the Teaching Center’s Aula.

Source: BOA büro für offensive aleatorik.
Image 31: Top: In Foreground the Department D1. Center: Open auto-study area. Bottom: Entry.
Source: BOA büro für offensive aleatorik.
Planning of the Garage.

“...The Campus is a pedestrian area; access to the garage for cars and suppliers is located to the east. Street access is via Trabrennstraße and can be used by cars and small vans as well as larger lorries and any refuse collection vehicles that need to use the loading zone or main waste disposal area. The slope of the ramps at the entrance area is not greater than 12% (Viennese Law for Garages, sect. 10 (6) and OIB guidelines 4 / 2.7.3). The garage is a zigzag shape underground building in the midst of the different construction sites. Four staircases with natural light function as connecting links to the open spaces.” Rosinak (2013)\(^\text{18}\).

![Image 32: The Garage is illuminate and ventilate naturally through light wells. Source: BOA büro für offensive aleatorik.](image)

**Documentation of the whole construction process.**

Playing a key role in the development, expert photographers and film makers had access to the entire construction process of the Campus. This resulted in several films, interviews and documentaries being made which publicised progress of the project to the community and other actors.

![Image 33: Photographic and video documentation of the entire process. Source: BOA büro für offensive aleatorik.](image)

Communication and interaction.

“During the design and construction phase BUSarchitektur, and its partner company BOA (büro für offensive aleatorik), developed critical interactive communication strategies that allowed future users and citizens to engage with the design process. These included the ArchitekturzentrumWien [Az W] exhibition (May 2009) that presented the genealogy of the Master Plan design; the on-site Info Point and exhibition operating from 2010-2013 that offered guided tours, workshops and webcam documentation of the project’s development as well as local branding through construction signage; the installation count-down located on the existing WU campus to provide an ongoing platform to communicate locally with the student and faculty population; and the development of a comprehensive website on the project in addition to a broad range of external related activities and events such as, lectures and videos.” Berman & El Khafif (2013)19.

Image 34: Photographic and video documentation of the entire process.
Source: BOA büro für offensive aleatorik.

THIRD PART: FINAL STATEMENTS

3.1 – Results:

Standing today in front of Campus WU, 2 years after the new facilities at Prater Park first began to be used academically, it is possible to evaluate the successes and accomplishments of the original objectives from the perspective of the various main actors involved, namely the University of Economics, the City of Vienna and BUSarchitektur itself with its vision of a Holistic, participative and environmentally active urban strategy.

Recognized repeatedly as a Best Practice example in architecture, urban planning, environmental protection and city branding by Austrian and international institutions, Campus WU has managed to rearticulate a splintered, decayed urban sector and revive it, transforming it into a pole for innovation, culture and leisure due to the power of its architecture and landscape design which leads us to state that the concepts underpinning the urban and architectonic strategies have been successfully applied.

Beyond simply answering the 3 key yes-no questions proposed in the first part of the paper, the following results will discuss the “how” each question lead us to evidences and references regarding the project’s achievements and connect them to the conceptual framework.

Public and Institutional Project Acceptance and Satisfaction: Urban Scale Results.

With regard to the first question: Is architecture shaping society?, different institutions such as the City of Vienna, the Municipal Department of Urban, Development and Planning (MA 18) and the BIG (Austrian Federal Real Estate Company) as well as the public in general, (according to the results of several surveys) rated the project positively and it has even been described as “one of the most important examples for urban planning in Vienna in the last decades”\(^\text{20}\).

The project succeeded in satisfying the branding expectations of the City and the University in creating a new visual landmark for Vienna and an innovative University of Economics. Proof of this can be seen in the surveys carried out asking anonymous citizens for their opinion of the architecture itself and 86% described it as a success or a great success.\(^\text{21}\)

The ultimate recognition of the relevance and importance of the new Campus WU in Austria comes from the award of the Bauherren (Client) Prize. This prize is recognition of the team

\(^{20}\)Dipl.Ing. Thomas Madreiter, Director of the Vienna’s Department of Urban Planning.

\(^{21}\)See original survey results here: [http://www.big.at/news-presse/highlights/2013/ergebnis-umfrage-campus-wu][seen 2015-11-5]
work which took place between the owner and those responsible for the architecture in order to achieve the highest possible architectonic results\textsuperscript{22}.

Image 35: Cover of the Urban Development Plan for Vienna Step 2025.
Source: City of Vienna, MA 18.

**Energy Certificates and Environmental Health Results.**

\textsuperscript{22}More information about the Bauherrenpreis 2014: https://www.google.at/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0CCEQFjABahUKEwiTo5j9ppjJAhU1XROKHaXoD64&url=http%3A%2F%2Fwww.zv-architekten.at%2Fdownload.php%3Fitem%3D6306&usg=AFQjCNYewFRKxNsWUQxKljhxX3tpmMdyYUw[seen 2015-11-7].
Can landscape qualify the environment? The role of the Landscape in the project was crucial not only because of its capacity to describe the space but also because of its environmental role. Different breeds of birds, bees and other species have found a home on the Campus, and the fact that rain water is not discharged into the sewer system but directly filters into the ground helps to maintain natural conditions, and is just one of the many positive impacts the project has had on the environment and its surroundings.

Another example is energy consumption reduction through temperature, which is managed in a very intelligent way through the use of innovative systems which exchange heat with the ground. For this reason, in the present year, 2015, all buildings on the Campus received a Blue Certificate (an evolution from the green certificate) from the ÖGNI (Austrian Sustainable Building Council) in Silver category, but the Teaching Center, developed by the BUSarchitektur team, headed by Dr. Mag. Arch. Arq. Laura P. Spinadel was the only one to receive a Gold Certificate, the highest distinction.\(^{23}\)

\[\text{Image 36: University Rector Christoph Badelt (Center) receives the Blue Certificate.}

\(^{23}\)For more information on this topic, see the website: http://www.wu.ac.at/press/info/presseaussendung/news/detail/News/blue-building-zertifikate-fuer-campus-wu/ [seen 2015-10-15].
More recently, a CICA prize was awarded at the International Architecture Biennial in Buenos Aires 2015 to the architect Spinadel in the Urbanism category for Campus WU, which also reflects: “… the sustained energy and effort required to oversee the process of this highly collaborative project over a long period of time.”

Results from the Architecture: Teaching Centre Recognition.

Should the architect submit to the market? The results achieved with the architecture are visible on many levels. Besides the Environmental recognitions mentioned previously, the Teaching Centre, Mensa and Department D1 Building have received one of the most important architectural recognitions in Austria in 2014 due to their achievements in the field of architecture: The Erns A. Plischke Preis award (also for the Master Plan and the Landscape planning).

Finally the nomination received from the Mies Van der Rohe Prize 2014, probably the most prestigious prize a building can be nominated for in Europe, is on its own a remarkable achievement which confirms the highest spatial and architectonic values of the building not only in the Austrian context but Europe wide.

3.2 – Conclusions:

After carefully analyzing the results obtained in relation to the 3 main responsibilities of BUSarchitektur, the first conclusion is that the objectives, expectations and dreams of the whole operation established at the beginning, have been accomplished:

- “An open and permeable relationship with the existing city.
- A campus with numerous and independent, yet interrelated buildings.
- A campus designed as a choral composition, with multiple architects acting simultaneously.
- Dynamically changing visual relationships that encourage movement and interaction.
- A range of possible movements, paths and places characterized by choices for every relocation and alternative locations for each activity.
- The concept of free, unspecified, multiple and overlapping activities.
- A perfectible campus, receptive to continuous improvement.

If you read this list carefully, you will see that each premise is consistent with the next: a concatenation of ideas that reaffirm the search for a new educational utopia.” Diez (2013)²⁶

Understanding Campus WU as a Holistic history enabled all of the project designers, experts and specialists who left their footprint on the project, to be convinced that through complementary and integral teamwork the spaces in the New University of Economics and Business could reach their maximum potential for the benefit of both the individual and the entire WU community in terms of quality of life and development. The relocation of thousands of students and teachers will in time surprise us with its outcomes and results which promise to be much more attractive than anything that has so far been seen in its virtual form …this is because Campus WU has been envisaged as a multi-optional space allowing the self-realization of the individual. In that respect: Cheers!!!

3.3 – Bibliography:

Post-Disaster Temporary Urbanism: An Analysis of the Creation, Use and Benefits of Transitional Community-Initiated Open Spaces in Christchurch, New Zealand

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Post-Disaster Temporary Urbanism: An Analysis of the Creation, Use and Benefits of Transitional Community-Initiated Open Spaces in Christchurch, New Zealand

ABSTRACT: The paper examines post-earthquake transitional community-initiated open spaces (CIOS) in Christchurch’s central city. Drawing on empirical research in Christchurch and existing literature on temporary urbanism in Christchurch and elsewhere, the paper encourages a holistic perspective on Christchurch’s small-scale bottom-up approaches to urban design. It analyses potential benefits of post-disaster temporary projects from the perspectives of producers/users, regulators and landowners, examines key challenges and discusses future scenarios revolving around the question if CIOS are ‘only’ short-term phenomena that will cease to exist as soon as ‘regular’ urban development picks up or if they may instigate long-term change, empower communities and become testing grounds for alternative urban design concepts.

Keywords: temporary uses, vacant spaces, post-disaster, transitional community-initiated open spaces, CIOS

Introduction

The use of vacant urban spaces for temporary activities is not a new phenomenon. Temporary spaces may include a diverse range of land uses. Squatter settlements have been, arguably, considered as temporary projects (Oswalt et al., 2013: 9) as much as cyclical events such as travelling fairs or circuses (van Schaik, 2015) that have occupied urban spaces for centuries. Pre-industrial cities displayed, arguably, more temporary than permanent structures (Bishop, 2015: 136). However, for about a decade and a half, new and diverse forms of temporary uses have popped up in cities around the globe and inspired urbanism trends including ‘Do-It-Yourself (DIY) urbanism’, ‘tactical urbanism’, ‘guerrilla urbanism’, ‘participatory urbanism’ or ‘everyday urbanism’ (Fabian & Samson, 2015: 1). The pioneering study “Urban Catalysts” (2003) and other Berlin-based publications (Senatsverwaltung für Stadtentwicklung Berlin, 2007; Oswalt et al., 2013), elevated Germany’s capital into a mecca for creative temporary uses and inaugurated a new field of professional interest and academic research (Bishop & Williams, 2012: 4; Fabian & Samson, 2015: 1).

Many temporary projects that have been documented, discussed and analysed so far share a common characteristic: They have been established in contexts of urban disorder (Andres, 2013: 759). Substantial socio-economic changes such as de-industrialisation, shrinking populations and low economic growth, often in combination with an abundance of vacant urban spaces and weak planning regimes have instigated temporary uses (Groth & Corijn, 2005; Colomb, 2012). The role of temporary urbanism as a, on the one hand, socially...
engaging practice (Tardiveau & Mallo, 2014) promoting inclusive, participative and non-for-profit projects based on values other than those purely economic (Groth & Corijn, 2005: 521; Andres, 2013: 763) and, on the other hand, its inherent potential to generate gentrified, socially exclusive, and profit-oriented corporate schemes (Oswalt et al., 2013: 349-355; Bishop, 2015: 38; Fabian & Samson, 2015: 16) has created a controversial ambiguity in regard to its socio-political (Spataro, 2015), economic and strategic goals (Bishop, 2015) for urban development. For whom is temporary urbanism – as a ‘special’ form of urban design – beneficial and why?

In Christchurch, New Zealand temporary uses of vacant sites evolved after another urban disorder – the 2010 and 2011 earthquakes which caused 185 casualties and major damage to the urban built environment and infrastructure. Christchurch’s approaches to post-earthquake urban planning and design – in particular in the city’s Central Business District (CBD) – were directed by the Canterbury Earthquake Recovery Act (CERA). Initiated by New Zealand’s central government, CERA took comprehensive control over Christchurch’s physical urban recovery process (Swaffield, 2013: 23). Parallel to this top-down agenda, various community organisations have been developing temporary projects, often supported by the local city council (CCC, 2014). The quantity and scope of projects that popped up after the earthquakes (Bennett et al., 2012; Carlton & Vallance, 2013) indicate that Christchurch’s transitional community-initiated open spaces (CIOS) have attracted a range of different people and organisations that have pursued alternative bottom-up approaches to post-disaster urbanism.

The paper is framed by existing literature on temporary urbanism in Christchurch and elsewhere and draws on empirical research in Christchurch based on personal observations and key informant responses including five semi-structured qualitative interviews and one questionnaire-based reply. The data was collected in 2014 and 2015 from actors who have had leading roles in CIOS-facilitating community and public organisations including ‘Greening the Rubble’, ‘Gap Filler’ and ‘Life in Vacant Spaces’ (CO1_2014, CO2_2014, CO1_2015, CO2_2015, PO1_2014) and a landowner (LO1_2015). Interviews were transcribed and analysed in regard to roles, benefits, challenges and future scenarios of temporary urbanism in Christchurch. The paper is divided into three sections beginning with a discussion on the roles and challenges of temporary urbanism seen from different perspectives, loosely related to Madanipour’s (2006) analysis of the roles and challenges of urban design. The second section examines characteristics of transitional projects in post-disaster Christchurch in comparison to international case studies. Drawing on the discussion
in section one and two, section three examines benefits and challenges of temporary urbanism from the perspectives of producers/users, regulators and landowners. The paper concludes with a discussion of the results and possible future development.

**Roles and Challenges of Temporary Urbanism**

Madanipour (2006) discussed the roles and challenges of urban design from the perspectives of producers, users and regulators of urban spaces noticing that these “can be at odds with each other, creating tensions and incompatibilities” (191). Temporary urbanism may evoke similar conflicts between different urban actors and their values, visions and goals. Madanipour’s distinction between producers and users and their distinctive goals is not always apparent in the context of temporary projects where producers and users of urban spaces are often the same. Haydn and Temel (2006) identified seven distinctive roles in the context of temporary projects: “interim users, ‘official’ users, owners, users/visitors, administration, politics, media” (14). The paper focusses on three key roles – producers/users, regulators (including politics and administration) and landowners. In addition, a fourth group – ‘users/visitors’ who utilise temporary spaces without being involved in their planning/design, construction or management – is briefly addressed in section three.

Producers/users of temporary spaces are heterogeneous and pursue diverse goals. Oswalt et al. (2013) distinguish between three different kinds of temporary producers/users: First, entrepreneurs who use temporary projects to realise their own ideas (53) that could be further developed into viable economic, social or cultural schemes. In this case, temporary spaces might become incubators that support individuals’ professional and social development. Second, ‘hobby-experimentalists’ who are socially established but look for new experiences. They use temporary spaces “as a parallel universe and experimental space alongside everyday working life” (60). Third, social ‘drop-outs’ who look for alternative lifestyles and use temporary spaces as an opportunity to escape mainstream social routines. Generally, temporary users have limited financial resources, however larger social and cultural capitals and a high level of commitment in terms of time and energy (53). Their works “can become powerful change agents in the city” (Bishop, 2015: 137).

Regulators’ typical urban design goals – “making the city more competitive, helping shape the future of the city, managing change and helping develop better governance arrangements” (Madanipour, 2006: 180) – remain in place with regard to temporary uses which may be instrumentalised for policy purposes (Colomb, 2012: 138). Local authorities and policy makers, confronted with high vacancy rates and dysfunctional urban economies,
have initially been opposed to temporary uses as they do not fit conventional planning frameworks that are meant to attract private investment (Oswalt et al., 2013: 7) and need time to adapt (Németh & Langhorst, 2014: 146). However, since the turn of the millennium, temporary uses have become recognised as possible economic drivers. In times of slow growth they “may offer a rich and diverse territory within which to accommodate testing of a wide range of uses and processes and their effects” (Németh & Langhorst, 2014: 149). In Germany, policy makers discovered the value of temporary urbanism for dynamic urban development (Senatsverwaltung für Stadtentwicklung Berlin, 2007; BMVBS & BBR, 2008) and incorporated ‘interim uses’ (Zwischennutzungen) into their planning frameworks (Blumner, 2006). Formerly marginalised spaces, now recognised as successful places of contemporary urban culture (Studio Urban Catalyst, 2003: 4), have become part of urban marketing strategies that drive official planning discourses. In England, ‘meanwhile leases’ have been introduced to provide a legal framework for temporary uses (Kamvasinou, 2015: 2).

In the context of temporary urbanism, landowners form a separate distinctive group of actors in addition to Madanipour’s (2006) model. They have a vital, however not necessarily active role in the production of temporary urban spaces. Landowners may be interested in tolerating or encouraging temporary uses in order to benefit from intangible values including “a new and positive image for the location, the creation of a specific identity, public awareness of the site, and the prevention of squatting vandalism and decay” (Oswalt et al., 2013: 58). In regard to short-term projects “there is very little downside to allowing temporary use on a vacant site, as long as such use can be quickly replaced by more profitable uses” (Németh & Langhorst, 2014: 148).

As long as temporary uses are mutually beneficial for producers/users, regulators and landowners, conflicts are unlikely to occur. This, however, might change when temporary grassroots projects start to attract capital-strong actors and concurrent urban upgrading or redevelopment schemes. Regulators’ attempts to brand temporary spaces as economic assets that may attract desirable user groups such as the creative industries, may contradict their supposedly ‘uncontrolled’, ‘uncommodified’, ‘dynamic’, bottom-up character (Groth and Corijn 2005, 521): “Temporary uses are thus characterized by inherent tensions between their temporary nature and the potential search for perennity, between their grassroots, unplanned character, and their inevitable encounter with top-down planning and urban development processes, between their search for alternative cultural forms of ‘insurgent urbanism’ and their inherent tendency to pave the way for profit-oriented urban redevelopment processes”
This process may include that “original initiators of the transformation—provided they have not become owners themselves—are excluded from the value creation chain” (Oswalt et al., 2013: 221). If temporary urbanism became simply a tool for market-driven urban regeneration, the primary beneficiaries would be regulators, landowners, possibly a ‘second generation’ of producers and a more consumption-oriented group of users/visitors.

Temporary uses have been defined by attitude that “seek[s] to derive unique qualities from the idea of temporality” (Haydn & Temel, 2006: 17) rather than duration. It has been argued that the distinction between temporary and permanent uses is based on producers’/users’ intentions to use vacant spaces temporarily (Bishop & Williams, 2012: 5) and not on the longevity of projects: “[…] we define temporary use as that which is explicitly and intentionally time-limited in nature” (Németh & Langhorst, 2014: 144). However, temporary uses could also “be a way of demonstrating a concept’s success” (Arlt, 2006: 39), thus become precursors for more permanent land uses: “[…] the experimentation and reversibility that temporary uses afford enable a much more incremental and flexible approach. The fast testing of models and approaches allows one to reverse course before it becomes a widespread practice […]” (Németh & Langhorst, 2014: 147). Producers/users have frequently claimed permanent land uses, e.g. when interim uses had become socially, economically or culturally successful and more established, thus contesting the temporary status of their projects (Blumner, 2006: 13; Németh & Langhorst, 2014: 147), possibly in opposition to regulators’ and landowners’ redevelopment goals. In this situation, conflicts are likely to occur. Regulators might be able to mediate between conflicting interests and negotiate compromises (Oswalt et al., 2013: 61).

Case studies illustrate that these conflicts are characterised by unequal power relationships with a tendency to disempower the initial producers/users (Groth & Corijn, 2005; Andres, 2013; Oswalt et al., 2013: 277-279). However, in some cases initial producers/users have been able to use local knowledge and linking social capital for strategic action (Andres, 2013: 768-770). This helped sustain their position during extensive urban transformation processes (Wesener, 2015: 407-408). In that case, temporary urbanism has been a positive driver for long-term cultural and economic urban regeneration that empowered producers/users during the process. However, this kind of process requires significant individual and collective efforts and resources.
Transitional Community-Initiated Open Spaces in Christchurch, New Zealand

Between September 2010 – when Christchurch was first struck by a 7.1 magnitude earthquake that marked the beginning of a series of devastating aftershocks which hit the Canterbury region throughout 2011 – and the beginning of 2012, around 15,000 people had left the city (Wilson, 2013: 209). The 2013 census indicates a net loss of around 7,000 people; many people moved into less affected districts outside the city within commuting distance (Bayer, 2013). Christchurch’s CBD, one of the most affected areas, has seen large-scale demolitions of damaged or economically unviable buildings. By February 2015, 1,240 buildings had been demolished and less than 300 new constructions commenced (Gates, 2015). It is likely that a considerable number of vacant sites will remain undeveloped.

The paper uses the umbrella term ‘transitional\(^1\) community-initiated open spaces’ (CIOS). It describes open spaces\(^2\) that have been used for temporary projects which have been developed, implemented and managed on post-earthquake vacant sites in Christchurch since 2010 including community gardens, urban agriculture, art installations, event venues, eateries and cafés, leisure activity spaces and pocket parks. Communities involved in creating CIOS may be best understood as ‘communities of interest’ that respond “creatively to the extensive damage caused by the earthquakes“ (Greening the Rubble, 2015a). They may “include faith-based groups, civil society organisations (CSOs), non-governmental organisations (NGOs) and other groups operating outside the formal governmental or commercial sectors” (Carlton & Vallance, 2013: 2). Popular community organisations such as ‘Greening the Rubble’ (GtR) (2015a) and ‘Gap Filler’ (2014a) have developed a range of CIOS with different conceptual foci since the September 2010 earthquake, sometimes collaboratively (Montgomery, 2012; Wesener, 2015).

By responding to a particular urban disorder – a natural disaster – temporary urbanism in Christchurch evolved within an urban context that is fundamentally different from places where temporary uses have been instigated by socio-economic and/or political disturbances (Wesener, 2015: 412). Post-earthquake Christchurch has been in the somehow peculiar situation of dealing with two different planning regimes. CIOS have been created, on the one hand, within the context of a “top-down government-led program of economic recovery and rationalisation” (Swaffield, 2013: 23) and, on the other hand, a partially disempowered but

\(^1\) The term ‘transitional’ has been used extensively within the Christchurch post-earthquake context, possibly with slightly different connotations than in other circumstances. A diverse range of temporary projects and events across post-earthquake Christchurch have been labelled ‘transitional’ (Bennett et al., 2012). For a more detailed discussion see Wesener (2015: 411).

\(^2\) The paper uses the term ‘open space’ in an all-encompassing sense including all un-built land in urban areas (cf. http://www.le-notre.org/urban-spaces/urban-spaces.php?encyclopedia_id=255)
supportive City Council who have encouraged participative approaches to urban planning and design (Swaffield, 2013: 14; Wesener, 2015: 410). Christchurch City Council provides funding for transitional bottom-up projects (CCC, 2014) and supports the umbrella organisation ‘Live in Vacant Spaces’ (LIVS, 2014) which acts as an agent between private landowners and temporary users (cp. Oswalt et al., 2013: 57). Christchurch’s temporary spaces have not been produced in a ‘planning vacuum’ (cp. Andres, 2013) but within a context of diametrically opposed approaches to urban planning and design and concurrent tensions between central and local government agencies.

Another difference that distinguishes Christchurch from other case studies is the relative absence of conflicts between producers/users, regulators and landowners. Only a few voices have publically criticised CIOS so far, mainly based on aesthetic values (Harvie, 2014), and there seems to be an overall positive attitude towards temporary projects even by those who are not actively involved (Wesener, 2015: 415). Community organisations in Christchurch have not pursued radical alternative political, social, economic or cultural agendas that are openly opposed to ‘official’ ones (Wesener, 2015: 412) and therefore avoided tensions with regulators and landowners (cp. Groth & Corijn, 2005). Contrary to many European examples (Blumner, 2006: 13), producers/users have not contested the temporary (transitional) status of their projects but embraced it:

“[…] they [temporary spaces] are meant to be temporary, they’re not built in a way where they’re meant to exist a long time […] it’s not that the space itself would exist permanently, it’s not about the space so much, it’s about what it creates in people so it’s that the people using them or interacting with them, if they are local people because well even if they’re not, that they develop a different sort of relationship with the city and that they might come to expect something more or something different from their city or from their public spaces and maybe even from private development in the future, […] so I don’t really know like there’s a particular project that I think should stay.” (Interview COI_2014).

Community organisations such as Gap Filler highlight the risk-free approach that guarantees a cost-free and legally approved process for property owners based on individually negotiated ‘License to Occupy’ agreements that regulate the duration of temporary uses on vacant sites:

“We use a non-commercial License to Occupy agreement to protect property owners from risk, and Gap Filler projects are covered by our own public liability insurance. Project costs are covered entirely by Gap Filler and our supporters, so the cost to you is nothing. […] Property owners have nothing to lose. All Gap Filler seeks is short-term, temporary license to activate sites while they sit fallow waiting for resource consent, insurance money, building plans, and so on. No time frame is too short. A deadline for Gap Filler to vacate the site completely will be specified in the license agreement” (Gap Filler, 2014c).

Time frames for individual projects vary; some projects are short-term, almost ephemeral (a few days or weeks), and small-scale such as the installation ‘Poetica’ (Gap Filler, 2012)
which provided opportunities to explore individual creative passions (Syben, 2012: 30). Others are short-term but large such as the Festival of Transitional Architecture (FESTA) that explored alternative forms of urban regeneration through “events, performances and projects [which] happen across empty sites and in vacant buildings […] through transitional and experimental architecture, art and performance […]” (FESTA, 2014; Figure 1). Some are medium-size and move from site to site such as Greening the Rubble’s “relocatable park” (Wesener, 2015: 413-414; Figure 2). Others are large-scale and – although meant to be of short to medium term duration (6 months to one year) – lasted longer than anticipated such as Gap Filler’s celebrated Pallet Pavilion (Wesener, 2015: 413; Figure 3). Some were meant to stay not longer than a year but have remained in place such as the Fitzgerald Avenue temporary community garden (Taylor, 2012; Figure 4).

Figure 1: FESTA (2014). Photo: Author
Regulators have supported temporary uses in post-earthquake Christchurch right from the start (Wesener, 2015: 412) and not only, like in European case studies (Groth & Corijn, 2005; Colomb, 2012), after their role as economic drivers had been acknowledged. They have considered CIOS as “opportunities for people to do a temporary project, which may test a new
idea or add public benefits until the space is needed back” (CCC, 2014) and “until the owner finds a permanent tenant or is ready to proceed with redevelopment” (LIVS, 2014).

Benefits and Challenges of Post-Disaster Community-Initiated Open Spaces in Christchurch

The apparent absence of conflict between producers/users, regulators and landowners must be discussed within the specific context – a natural disaster – that produced CIOS in Christchurch. This context differs fundamentally from other situations of urban disorder such as socio-economic or political crises. Post-disaster urban recovery3 creates a situation where mutual benefits of temporary projects are high and correlated potentials for conflicts are low. As long as temporary uses are mutually beneficial for all actors (producers/users, regulators and landowners alike), conflicts are unlikely to occur.

Producers/users of CIOS in Christchurch have benefitted from temporary projects – individually and collectively – in at least four ways: First, CIOS have created opportunities for positive emotions and experiences; second, they have provided a physical platform for experimentation and innovation; third, they have helped create and strengthen social capital, and finally, they have fostered community empowerment (Wesener, 2015: 414-417). Responses from key facilitators of Fitzgerald Avenue Community Garden (CO2_2014, CO1_2015, CO2_2015, LO1_2015), a GtR project (Taylor, 2012), revealed that their involvement has been beneficial in regard to their coping (‘re-charging’ individual and collective energy sources), adaptive and participative capacities (contributing collectively to urban recovery), the development of new skills, and the creation of social capital and alternative food supply options. The project helped create new networks and contacts that would otherwise not have been established (Interview CO2_2015). Initiators and volunteers who lost their jobs after the earthquakes reported that their involvement in temporary projects helped them find paid work. Some jobs were created in direct relationship to or as a consequence of temporary projects. In regard to the use of transitional spaces and the way users/visitors interact with different CIOS, transitional CIOS in Christchurch follow utilisation and interaction patterns that are comparable to ‘regular’ public open space uses in other cities (Wesener & Risse, 2015 - forthcoming). Users/visitors interacted with CIOS in relation to distinctive spatial qualities, attractors and provided activities relative to their

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3 For a more comprehensive discussion on the meaning and definition of post-disaster recovery see Wesener (2015: 409)
“desire for relaxation, social contact, entertainment, leisure, and simply having a good time” (Carmona, 2015: 375).

For regulators – specifically Christchurch City Council – the support of temporary bottom-up initiatives has provided opportunities to continue public presence in Christchurch’s city centre despite CERA’s imposed domination. The City Council has provided continuous funding for community groups that produced temporary projects located within the boundaries of Christchurch’s CBD. This ‘stake a claim’ approach could, arguably, be interpreted as “an implicit critique of traditional regulatory systems” (Németh & Langhorst, 2014: 148) with regard to CERA’s top-down approach. Temporary projects in Christchurch gained international media attention (Anderson, 2014; Bergman, 2014; New York Times, 2014) with possible benefits for the city’s tourism industry. Christchurch’s post-earthquake temporary spaces have been featured as hip destinations in travel guides such as ‘Lonely Planet’ and newspapers such as ‘The Guardian’ (Badham, 2014). A regulator’s primary goal – contributing towards good governance (Madanipour, 2006: 184) – has been addressed in form of the Council’s open support of bottom-up initiatives. Christchurch’s mayor, Lianne Dalziel (Labour), expressed her hopes “to usher in a new era of governance that focuses on empowering community organisations to do things for themselves” (Anderson, 2014).

Landowners in Christchurch who give permission to community organisations or LIVS to use their land for temporary projects operate virtually without risks. Landowners (public and private) are legally well protected through licence to occupy agreements that regulate all aspects of proposed temporary uses (interview PO1_2014) including maintenance and insurance issues:

“Well we saved them responsibilities, we even took on public liability insurance for the site which obviously for us was quite a few thousand dollars fees but we insured all of our sites.” (interview CO2_2014)

Landowners get their land back within 30 days’ notice in the same (or better) condition they had left it to the organisation. Benefits for landowners who decide to accommodate temporary projects are various: Their land gets regularly maintained and in some cases improved. Landowners could eventually raise their social status by supporting local community projects (interviews PO1_2014; CO2_2014). People become aware of sites: temporary activities could activate the area and increase land values, become incubators for economically-driven land uses. And last but not least, landowners might increase their linking social capital by building up working relationships with local authorities which might, in return, be beneficial for future redevelopment activities. In an interview, the landowner of a temporary community garden in
central Christchurch revealed that he might decide to combine existing temporary uses with economically-driven redevelopment goals, hence continue to involve the local community while, at the same time, integrating more commercial land uses (interview LO1_2015).

So far, mutual benefits, the apparent absence of dissentious political, social, economic or cultural agendas and a general endorsement of the transitional status have prevented conflicts between producers/users, regulators and landowners – conflicts that have been so prevalent in non-disaster contexts (Wesener, 2015). However, CIOS in Christchurch have been facing a number of challenges. Interviews with two community organisation key informants (CO1_2014; CO2_2015) reveal that producers have struggled with maintenance and management tasks related to existing temporary spaces. The deconstruction of Gap Filler’s well-known Pallet Pavilion (Gap Filler, 2014b) occurred due to operational difficulties and high maintenance costs. Greening the Rubble’s Fitzgerald Avenue temporary community garden (Taylor, 2012) was very busy during the implementation period but started to look deserted after the producer ad decreased its involvement in day-to-day activities. The Places of Tranquillity (Greening the Rubble, 2015b), planned, designed and implemented with the help of various organisations, has not been able to attract many users (Wesener & Risse, 2015 - forthcoming). Governance aspects might seem negligible if projects are short-term and quickly replaced by other uses. However, if CIOS remain longer in place (than originally anticipated), the apparent lack of activity and/or maintenance could be potentially detrimental; “[…] abandoned projects can be an insidious form of urban blight, leaving behind cynicism in the communities where false hopes have been raised” (Bishop, 2015: 138). In that case, the nature of ‘bottom-up governance’ needs to be discussed: “A longer-term vision appears to be important in ensuring local support and funding; the creation of a legacy seems to be a major motivating factor in engaging communities with all aspects of temporary projects, from hands-on site activities to management and lobbying” (Kamvasinou, 2015: 19).

For regulators, “the widespread temporary use of vacant land may present real costs […]” (Németh & Langhorst, 2014: 148). Securing funding remains a challenge for facilitating organisations, in particular when the originating context – the natural disaster – moves temporally further away:

“Because the time between the disaster and the present time is increasing and the funding that was available for post disaster relief is decreasing […] that may happen here too when funding is much harder to find and so how do you keep going or how do you diversify what you’re doing?” (interview CO1_2014)
Community organisations have considered not only diversifying their funding base, for example through international consulting activities (interview CO1_2014) and broader engagement with urban development processes. The 2014 ‘International Congress of Adaptive Urbanism’ in Christchurch (Vallance et al., 2015) invited an international audience in an attempt to discuss, conceptualise and promote the role of temporary projects within urban planning and design discourses. Community organisations, confronted with questions about their medium- and long-term roles (Wesener, 2015: 12), have reflected upon how to position themselves beyond disaster recovery:

“Will there be any trace that this ever happened and that’s definitely a valid question and it’s something that I do think about [...] if you’re aiming to change people and how they feel about the city and their connection to it then how on earth do you measure that? [...] and we are thinking about what we do that can have some permanence, we do talk about it. For us the permanence is not an end, it’s not the point, it’s actually the process by which you get to the permanence [...] if we’re thinking about built development for example, that’s permanent and being involved with something like that then for us the process has to be different and it has to be an experiment as well, a completely different process.” (interview CO1_2014)

Challenges with regard to maintenance, management, diversification, long-term strategies and ‘relative permanence’ reveal “the difficulty of divorcing social activity from the physical setting in which it inevitably takes place” (Dempsey et al., 2011: 294). A more permanent physical presence might not be the primary goal; however, it might support desired processes of change. Temporary uses such as urban agriculture projects might become legitimized creative incubators and testing grounds for alternative urban design concepts. However “legitimization – whether welcomed or not – is challenged if temporary uses are suspended in favour of more profitable endeavors […]” (Németh & Langhorst, 2014: 148).

Discussion and Conclusions

The perception of temporary urbanism as a ‘tactic’ rather than ‘strategic’ approach has resulted in new urban design trends (Lydon, 2011, 2012). Temporary spaces provide “‘alternative’ definitions of urbanity” (Kamvasinou, 2015: 3) and, it has been argued, are not necessarily utilitarian, however, should “sit within a clearly thought-out rationale and, where appropriate, be linked to clear purposeful strategies” (Bishop, 2015: 136). The apparent contradiction between tactics, on the one hand, and strategies on the other seems less paradox when examining temporary urbanism through the lenses of different urban actors. Although tactical by nature, producers/users, regulators and landowners approach temporary projects from different strategic perspectives. From a producer’s/user’s perspective, temporary uses include neighbourhood residents in the production of spaces they inhabit and empower their
role as active participants in urban development processes. Regulators and landowners might use (and abuse) these efforts for commercially-orientated redevelopment and interrupts community-orientated developments. However, regulators and developers might be able to identify and test alternative urban design approaches – together with local communities – “to operate more in terms of a continuous editing process of urban transformation” that surpasses “the far-reaching ideas and ideologies du jour, as evidenced in many models for urban renewal” (Németh & Langhorst, 2014: 149).

The paper argues that post-disaster temporary urbanism in Christchurch has provided various benefits for producers/users, regulators and landowners. However, there are also major challenges, for example regarding maintenance and day-to-day management, in particular if spaces stay longer than initially expected. In the current post-disaster context where commercially-orientated rebuild processes gain momentum, different future scenarios are imaginable. CIOS have had a beneficial role for immediate post-disaster urban recovery (Wesener, 2015). However, as time passes temporary spaces may attract less people, become under-funded, under-maintained, under-used and simply disappear at some point. Some key actors including producers/users move on and benefit from their experiences with CIOS. Besides, there are few long-term benefits that remain. In another scenario, temporary projects keep a vital role in Christchurch’s dynamic post-disaster urban development. Ever evolving groups and actors make use of the many vacant spaces that remain available after the insurance-money-fuelled economic boom eventually busted. Continuously changing projects provide colourful spectacles and suggest alternative pathways for urban lifestyles. They fill the city with innovation and experimental energy. Based on their experience of creating and running successful temporary projects, community organisations are able to develop longer-term strategies, diversify and enlarge their scope, knowledge base and skills and become empowered urban actors who provide alternative urban design concepts desirable for a range of different users. Time will tell; interviews suggest, however, that community organisations are aware of the challenges ahead and will continue their important role for Christchurch’s post-disaster urban development.

References


