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The making of a city campus

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Introduction

Universities have been significant city and region-shapers for centuries and in the contemporary environment their scale and diverse interfaces with the community have made them powerful civic institutions. They have latterly attracted a bespoke literature attempting to make sense of their historical, economic, environmental, geographical and social importance. Within a spatial paradigm, this ranges across their roles in economic development and particularly their contributions to the knowledge economy (Deiaco *et.al*., 2012), involvement in urban renewal and land development (Perry & Wiewel, 2005), heritage conservation and adaptive reuse (Haar, 2011), engagement in city-university collaboration (Goddard, *et.al.*, 2016) and catalytic processes like 'studentification' (Hubbard, 2009).

The university campus, as the core physical estate, is a topical focus for pre-, peak- and post-modernist planning (Turner, 1984) and architectural (Muthesius, 2000) histories. Recent empirical literature on campus planning also explores best-practice guidelines and correlations between design innovation and performance targets ranging from sustainability to student experience (Dalton *et.al*., 2018). Emerging from both research streams is the continuing importance of the built environment as a crucial institutional commodity. This is increasingly underlined as universities reposition themselves in competitive global educational and urban marketplaces revolving around innovation and creativity (Van Heur, 2010).

The evolution of campus forms is increasingly expressing wider interconnections between globalization, knowledge-driven economic development and larger place-making and infrastructure provision strategies. This is captured by Charles (2011) who highlights innovative developments defined by precincts, such as QUT embedding a creative industries faculty in Kelvin Grove Urban Village. Our paper examines another illustrative example through the development of the University of Technology Sydney (UTS). Beginning life as a technological institute with roots in the nineteenth century, UTS was officially inaugurated in a bicentennial gesture on Australia Day 1988. It now has over 30,000 students and employs nearly 4,000 academic and professional staff.

The paper charts the evolution of UTS as a centre for higher education, setting that within the spatial paradigm of a 'city campus' as a 'tech transformed'. This historical framework

recognises the importance of path-dependency in critical early decision-making not only though sunken development costs but through a succession of reinforcing critical planning and design junctures (Sorensen 2015). UTS has metamorphosed from a utilitarian compound amid a desultory industrial setting via a citadel era criticised for brutalist architecture into a major presence within a dynamic mixed-use precinct. The City of Sydney's latest draft strategic plan stresses enhancement of central Sydney 'as a destination for business, investment, education, culture and tourism' (City of Sydney, 2017. p.33). UTS's primary planning context is now within the NSW State Government's Camperdown-Ultimo 'collaboration area' conceived largely around an assemblage of educational, medical, and research institutions defining a development corridor of global importance (Greater Sydney Commission, 2018).

The methodology draws on interviews with key stakeholders, archival research and fieldwork[1]. It employs a single, descriptive, longitudinal case study in urban planning and design to not only to better understand the physical maturation of an important educational precinct but to capture broader forces shaping other Australian central city campuses (Birch 2012; Yin 2018). We have cast the paper as the third in a series of contributions to *Geographical Research* that have introduced and deconstructed new development types in the Australian city through representative case studies (Freestone, 1996; Freestone & Wiesel, 2014). UTS's Broadway campus is the main focus, but the discussion acknowledges a wider institutional presence, notably its merging into the Haymarket precinct in central Sydney adjacent to Darling Harbour (Figure 1). The paper has four main sections. The first establishes the main conceptual lens of the paper which resides within the nexus between institutional and physical development. The second codifies the notion of the city campus to establish the representativeness of the UTS case. The third and longest section identified five overlapping phases in its development. The fourth and penultimate section discusses the major historical lessons and future challenges for UTS as a city campus.

[FIGURE 1 ABOUT HERE]

Conceptual framework: Towards the interdependent urban university

In bringing together spatial and historic perspectives to illuminate the changing built environment, the paper follows the lead of Heffernan et al (2018) in placing the form of the university estate at the intersection of Castells' (2010) two spatial logics: the space of places and the space of flows. The former draws us to an evolving built form and the latter to the wider context for these changes in the context of evolving enrolment, teaching and research trends, and institutional governance.

Since the late twentieth century the neo-liberal turn has valorised the knowledge economy and the potential of universities as providers of the kinds of intellectual capital sought by knowledge-intensive commerce. Benneworth et al (2010) identify two distinct spatial responses to these pressures: the 'standalone' campus where universities act independently to consolidate facilities to appeal to students and researchers, and the 'high-technology' model where universities invest in developing science parks and incubators, either on campus or at a separate location. Their investigation however reveals an emergent third model of civic engagement 'through physical development projects that are also core to university interests, helping them adapt to their changing external environment' (Benneworth et al 2010, p.1623).

In this third category universities spread across more porous physical and institutional boundaries leverage urban settings to their advantage and act as 'planning animateurs' jointly with business and government (Benneworth and Hospers, 2007). One outcome is to enhance urban governance through linked-up rather than silo-based decision-making. We propose that the UTS campus development process can be seen as one example of this emerging model.

The rise of the city campus

There is no 'one size fits all' campus. Different historical trajectories and contemporary circumstances have produced disparate cross-cultural outcomes. At the same time there is an identifiable convergence around particular urban forms (den Heijer & Curvelo Magdaniel, 2018; Hassell, 2014; Larkham, 2000). Anti-urbanism and, notably from the late twentieth century, suburbanism, have defined the institutional history of many universities. However the university campus in the central city is also a time-honoured type dating back to the beginnings of tertiary education (e.g. Bologna, Cambridge). Spatially this type has been

characterised by different 'heterogeneities' (Bender, 1988, p.290) of which the dominant contrast has been the 'semi-cloistered' campus within the 'uncloistered' city.

The archetypal contemporary form of the city campus has been called the 'city consolidated' model, meaning 'near or in the central business district, generally contained in one site, possibly with some extension of the campus or outlying buildings in adjacent areas' (Hassell, 2014, p.14). In the early twenty-first century, these campuses spatially situate their universities conspicuously as continued urbanization, revaluation of traditional urbanism and the turn to knowledge industries align to reward centrality. Universities have returned to or consolidate within central cities in search of greater visibility, regional accessibility, marketability, synergies with other institutions, and proximity to beneficial infrastructural investments (Diner, 2017).

Multi-faceted relationships between city and campus are increasingly cultivated to symbiotically shape processes of urban development around the trope of knowledge. As universities seek to establish attractive city profiles through place-making, assume developer roles, and promote contextual rather than 'enclave' campuses, old physical delineations between town and gown have weakened (Goddard & Vallance, 2013). Matched with a multiplicity of outreach and partnership initiatives, this contemporary renaissance of the 'civic university' is valued by state, private and NGO stakeholder institutions as an enterprise model promoting virtuous interdependent development (Goddard *et al.*, 2016). The notion of the 'univer-city' has taken hold, stressing strategic partnerships (Teo, 2014), but the importance of the physical experience of the university is increasingly recognised as crucial for attracting and retaining quality students and staff despite the expansion of digital education opportunities. In these terms, 'a lasting commitment to the built environment' is the 'cornerstone' of integration (Coulson *et al*., 2015, p.21).

A 'headline theme' of recent campus building has been the 'university as part of the city', captured by moves to enliven the campus 'with community and cultural activity, housing, vibrant public spaces and convenient transport connections' in order 'to attract more people to the campus, thus providing a more engaging experience' (Hassell 2014, p.3). Drawing on European and American evidence, Hebbert (2018) identifies a 'new campus urbanism' very different from once-fashionable out-of-town, all-of-apiece low-density university parks,

including Benneworth et al's (2010) 'high technology' campus model planned on modernist lines. There has been a trend towards a different design lexicon: connective rather than impenetrable boundaries, densification, mixed uses, and disruption of traditional building typologies. Campus master plans have been recalibrated in response to more sophisticated student needs and lifestyles on the one hand, and on the other to the imperative of 'sticky' campuses retaining students on site longer and in the process repay investments on infrastructure and services. Haar (2011, p.xiii) writes of the appeal of new US urban campuses: 'within higher education in general and on urban campuses in particular there is the beginning of a new relationship with the city based on the common mission to acknowledge and accommodate diverse people, ideas and technologies and to advance knowledge directed toward global interactions'. Consequently, universities have manipulated their campuses both internally and externally to better reproduce and relate to the diversity and appeal of urban life (Coulson *et al*., 2014). At the same time sequestered places have given way directly to more extensive adaptive reuse of scattered city buildings and indirectly to stimulating new property markets such as purpose built student accommodation (Savills, 2018).

In Australia, the manifestations of this movement are varied. Many universities (particularly smaller and regional ones) establish a presence in CBDs to expand their market reach (e.g. Central Queensland University). These toeholds may not be campuses in a conventional sense, but as administrative and meeting places they reposition the spatial definition and connectivity of a university. However, the growing appeal of the 'vertical campus' has seen decisive investment by universities in new corporate-style buildings in both traditional CBDs (Victoria University in Melbourne) and regional business districts (Western Sydney University in Parramatta). Some outer suburban universities have partially migrated to inner city locations profiting from more animated, attractive and accessible quarters (Deakin University, University of Newcastle) while others colonise clusters of separate CBD buildings, embracing (Notre Dame, Fremantle and Sydney) or contemplating (University of Tasmania) a 'city integrated' form (Hassell, 2014). Still others have sought to re-orientate the design parameters of suburban campuses to simulate the intensity of urban 'buzz' through attention to density, walkability, infill development, facility upgrades, and the mix and quality of student amenities (Curtin University). Table 1 offers a typology of city campuses

that conveys this differentiation but the 'mix and match' nature of complex built environment responses needs to be acknowledged.

[TABLE 1 ABOUT HERE]

The focus in this paper is on what is identified as the 'tech transformed' category, representing the longest central city presence and including Queensland University of Technology's (QUT) Gardens Point campus in Brisbane, RMIT, the University of SA on North Terrace, and of course UTS. All these institutions have unique trajectories but the legacy character of three of them (QUT, RMIT and UTS) is captured in this representation of 'concrete city universities':

> [They]…are tight and urban. They lack the collegiate spaces and relaxed idle of sporting fields and courtyards… Often established as "institutes of technology" and located to be close to where their part-time student base worked, these universities have tended to grow in a haphazard fashion, making opportunistic land and building purchases. Over time the campuses have become disjointed, with different parts separated … by busy streets and non-campus buildings, encouraging silo-like faculties and little cross-cultural interaction. Even the buildings themselves have tended to be inward-looking, with little interest in engagement with the city (Nimmo, 2016, p.52).

However, locationally well-placed to profit from new paradigms of campus place-making, all recognised the need to lift their game from the 1990s as higher education under neo-liberalism was repositioning 'as an industry, seeking financial reward' (Forsyth, 2014, p.226). The UTS narrative captures this process of refashioning a university in a central city setting.

The spatial development of UTS

UTS's main Sydney campus is situated in the southern CBD close to Central Railway Station and bordered by Broadway (George Street South), Wattle, Thomas and Harris Streets (Figure 1). This is a compact campus with just ten major buildings, although the institutional footprint now extends further into the surrounding precinct. Its pre-history was decisive in

both calibrating and constraining future possibilities and we turn to this narrative in this section of the paper.

1. Initial moves to expand facilities for technical education

The interdependence of city and campus can have both different expressions and deep roots. In the case of UTS a critical path dependency is determined by the long association of Ultimo with technical education dating back to the opening of Sydney Technical College (STC) in 1891. This consolidated the former Sydney Mechanics School of Arts Working Men's College which occupied various CBD buildings from the late 1870s (Neil, 1991). The Ultimo site was close to the major maritime-industrial-transportation precinct centred on Darling Harbour, as well as to inner city working-class students. Rebadged, the STC continues as part of the contemporary TAFE system contiguous to UTS Broadway (Freyne, 2010).

The prospects of Ultimo as a major educational hub were advanced in the 1930s (Technical Education Commission, 1935) and, by the early 1960s, STC was the prime mover for expansion, upgrading and a more impactful presence in the city (Figure 2). Correspondence between Principal WR Crisp and the NSW Department of Technical Education reveals expansion plans, the desire for a multi-storey building fronting Broadway, and a modern 'campus' (in the traditional sense of an enclosed open space) as a landscaped centrepiece. The Government Architect, EH Farmer, was involved in these discussions. Several plans were produced over the next few years. The ruling architectural ethos was modernist high-rise, a major departure from the STC's Romanesque origins but promising a comprehensive remodelling in contrast to motley accretions from the 1930s and 1940s.

[FIGURE 2 ABOUT HERE]

The first of the modernist schemes was the 'Tech Scheme' in 1962 (UTS Archives). This proposed five buildings up to eight stories high atop an expansive two-level podium (Dysart, 2012). Its architect Michael Dysart recalls it as 'quite modest really… they didn't have …. grandiosity' (Dysart, 2017). This scheme of demolitions, resumptions and redevelopment was nonetheless costed at £12.5m. A newspaper account in September 1964 stressed vertical expansion, a block-long façade to Broadway to gain city prominence, and the value of

catalytic regeneration of the surrounding area (Anon, 1964). The Minister for Education was apprised of the concerns of displaced local businesses but rejected retention of on-site commercial premises as incompatible with a public educational body. This was a normative statement of the college metamorphosing into a standalone institution. Demolitions commenced, however there was no new construction as the longer-term cost and complexity of the project became appreciated by key stakeholders.

Meanwhile the institutional landscape had also changed. In 1964, a new Institute of Technology was decided upon 'to relieve the Universities of pressure to engage in the technical preparation of the fast-increasing numbers required by industry and commerce' (Joint Report, 1965, p.xx). The Menzies Government's Martin Committee Report on the Future of Tertiary Education provided a major fillip to technical education nationally with assurance of federal funding. The NSW Institute of Technology (NSWIT) was duly inaugurated in 1965 and in 1967 a separate Institute of Business Studies was established (reintegrated three years later). STC's aspirations transitioned seamlessly into an even more visionary scheme for NSWIT.

2. Commitment to a vertiginous modernist precinct in the city centre

In 1965 an upscaled NSWIT scheme was released. The new 'general developmental plan' envisaged a core of seven separate towers rising above a podium plaza with two basement levels for car parking and service vehicles. The constricted site now demanded vertical planning with buildings up to 20 stories (Joint Report, 1965), in line with an increasingly vertiginous Sydney CBD skyline following the relaxation of long-standing building height regulations. The plan was subsequently revised, with the preferred outcome being three towers rising from a four-storey podium with a first stage 26-storey central tower (Anon, 1966). In January 1966, the Superintendent of Buildings and Engineering Services described 'a spectacle of imposing grandeur along Broadway that should set an architectural trend and give a lead for more modern development of the southern end of the city' (UTS Archives). The City of Sydney obliged with development approval in April 1966.

Two months later the first report of the Commonwealth Advisory Committee on Advanced Education (The Wark Committee) strongly endorsed the retention and modernisation of existing central city sites for technical education in Melbourne, Brisbane, Adelaide and

Sydney. The NSWIT proposal was praised as providing 'an atmosphere for the pursuit of learning … which can never be achieved in an institution which is scattered throughout a variety of converted buildings in widely separated locations and has no corporate existence' (Wark Committee, 1966, p.xx).

In 1968, another official design appeared (Figure 3). This integrated the three-tower plan into a wider conception based on expansive assumptions of up to 70,000 students with separate technological, business and future humanities/liberal arts institutes (NSW Department of Technical Education, 1968). The design addressed the route of a proposed Western Expressway heading away from the Harbour Bridge and acknowledged state government-proposed educational zoning on the eastern side of Harris Street and its continuation across an old freight railway line into Haymarket. Much of the inherited street morphology would be obliterated to avoid pedestrian-vehicular conflict, a major planning ideal at the time (Stephenson, 1965). Harris Street was to be bridged to improve connectivity and a high-level pedestrian walkway to Railway Square also formed part of the megastructure treatment. This was a master plan based on 'a planned and harmonious development of the whole of the area' (NSW Department of Technical Education, 1968, p.4). Dysart (2017) recalls this scheme as more an exercise in ultimate possibilities rather than a definitive proposal but worked closely with Ron Werner, the Director of NSWIT, as its central propositions took hold.

[FIGURE 3 ABOUT HERE]

While the urban design was a unique response to specific context and circumstance, the heroic accent on a unity of international-style tower forms, podiums, and multi-level circulation systems recalls other bold modernist conceptions of the day such as the Empire State Plaza in Albany, New York (1965-76) and local unrealised schemes for the redevelopment of Sydney's Rocks precinct by James Wallace Pty Ltd (1964) advised by Edwards Madigan and Torzillo and a later Melbourne team led by Osborn McCutcheon commissioned by the Sydney Cove Redevelopment Authority (1970). Walter Abraham's 1964 scientifically planned scheme for the University of Sydney extension into Darlington, with a floor space ratio three times that of the historic campus, was another precedent. The daring brutalist style of new campuses in Britain such as the University of East Anglia would have been noted (Dormer & Muthesius, 2006; Jahn, 2019). This was the dominant urban campus model at this time and, as with the University of Illinois at Chicago Circle (1965),

while it 'reached out to the city, it simultaneously ignored its context, replicating the isolated tendencies of cloistered campuses' (Haar, 2011, p.130).

3. Early physical development from the late 1960s

The actual campus environment at Broadway still fell short of the utopian designs. Services for students were primitive and partly delivered by STC, while much of the teaching still happened in leased CBD premises such as the old Anthony Hordern's retail emporium. Amenity was sub-par: 'unfavourable climatic and man-made conditions … high solar heat loads … glare ... and winds … impose planning limitations. Existing development in all directions is not visually attractive' (Farmer, 1971, pp.44-45). Moreover, the environmental quality of Railway Square with its 'overtaxed pedestrian crossings' was also 'at a very low level' (p.27).

A new lecture block and alterations for laboratories were completed in 1968 but the big move was the call for tenders for Building 1, the first of the three projected high-rise towers. By the late 1960s, site preparation produced Sydney's largest excavation, dubbed 'the big hole' (Figure 4). With a major Commonwealth contribution secured, construction proceeded on the now 32-storey building but it was not completed until 1977 (Figure 5). Designed by Dysart, the UTS tower was a prominent landmark but became reviled as one of Sydney's ugliest structures (Cubby, 2006). The original design was compromised for several reasons. Electrical Engineering as a foundation occupant required wall-mounted equipment which precluded windows at eye level and explains the large horizontal beams and strip windows on the external façade (Dysart, 2012). The intended light-coloured Grafton sandstone was replaced by a sombre grey-brown. And the Student Union – to be the 'hub of the entire complex' - was deleted to avoid its use as a flashpoint space for the kind of student insurgency witnessed in Paris in May 1968. Adding insult to injury, the ultimate $32m construction cost was almost double the original estimate (Salt & Ashton, 2013). Sydney's prototypical 'vertical campus' now houses little teaching because of the challenges for lift systems in moving large numbers of students at peak times. Building 2 failed to secure Commonwealth support so only the podium was constructed with an 11-storey building completed by 1980 (Salt & Ashton, 2013).

[FIGURE 4 ABOUT HERE]
[FIGURE 5 ABOUT HERE]

4. Into Haymarket in the 1980s

The next challenge came with growth projections outpacing site capacity. Both the state government and city council worked to extend educational zoning for NSWIT. A 1971 *Outline Development Plan* by the Government Architect (Farmer, 1971) assimilated a general plan sketched by Werner in 1970. This plan relegated Broadway to the status of 'minor campus' and limited the density of development beyond the three towers first envisaged in the mid-1960s. A ring of buildings framing a green plaza became the agreed urban form but student housing could not be envisaged 'within reasonable economic limits' (p.48). The greatest floorspace uplift was now to be the redevelopment of Sydney's rezoned old market quarter, Haymarket, a 10-minute walk from Broadway. This proposal was substantially elaborated in 1974 (NSWIT, 1974).

Haymarket was set to be vacated with relocation of the city markets (accomplished in 1975). Its approximately 16 ha (40 acres) site was projected as a hub for advanced education, housing new institutes for para-medical studies and the social sciences, a new library, spaces for business and law, a technical teacher training college, halls of residence, and a new museum of applied arts and sciences. In early 1969, the Askin State Government formally accepted the recommendation to reserve the land for educational purposes, however, NSWIT had to acquire the site from the Sydney Farm Produce Market Authority (UTS Archives).

The design narrative for Haymarket picks up an evolution in the preferred urban campus. The early impulse emphasised 'the need for high rise building development to be continued as a principle' (NSWIT, 1973, p. 34). This translated into a comprehensive redevelopment comprising modernist 5-7 storey buildings. The density was seen as midway between suburban universities and commercial buildings in the city. Polite pushback to this 'international style' redevelopment came from several sources. Planning consultant George Clarke promoted a more human-scaled vision of a 'cite universitaire' (City of Sydney, 1971,

p.88) in line with the Civic Reform Association's preference for a mixed-use, small-scale character.

What actually emerged in the 1980s, near the peak of the heritage conservation movement (Freestone, 1995) was Cox Richardson's 'Markets 3' campus, retaining much of the façade and low-rise scale of the old market structures with sympathetic infill maintaining the street wall. The architects described it as 'a well-mannered response to a classic heritage problem' (Richardson, 1990, p.44). The 1912 market clocktower at the intersection of Ultimo Road and Quay Street was retained as 'a visual reference point.' Soon after the new complex opened, NSWIT became The University of Technology Sydney and in 1989 amalgamated with the Kuring-gai College of Advanced Education and the Institute for Technical and Adult Teacher Education from Sydney College of Advanced Education.

5. Rethinking and commitment to expansion on the core site from 2000

With expansion space secured and upgraded facilities, the Broadway campus again became the major centre of attention and was set for transformation into a twenty-first century city campus. Its mediocre environment compared unfavourably to makeovers happening at competing institutions in Sydney and the Building 1 Tower had a definite image problem. These shortcomings were intensified by the deindustrialising and dynamic precinct in which the university now found itself. Most notably, by 2008 the 170-year-old Kent Brewery opposite UTS on Broadway had closed to make way for a major new mixed-use precinct known as Central Park.

The year 2000 can be seen as a watershed in Sydney with staging of the Olympic Games helping both to decisively inject global benchmarking into local decision-making and invigorate the Sydney design community (Johnson, 1999). With the federal government no longer bank-rolling university capital investment as a matter of course, and universities left largely to their own devices (Forsyth, 2014), UTS released its first truly substantive strategic vision, *Setting the Pace: A Vision for the next Decade*, calling for a significant self-funded upgrade of the Broadway campus, investment in technology, and new student spaces and accommodation (Ashton, 2008). The university engaged the global advertising agency Saatchi and Saatchi to help strategise its re-branding (Ashton, *pers. comm*, 2019).

The institutional ambition was to transform UTS into a world-leading university of technology occupying 'one of the most stunning inner-city campuses you will see anywhere in the world' (Milbourne, 2013), with a new Vice Chancellor Ross Milbourne (2002-14), Chancellor Vicki Sara (2004-16), and DVC (Resources) Patrick Woods (2006-) playing key roles. The early consensus was to develop a long-term financial plan and strategise the more effective use of existing facilities to 'create an environment that would encourage students to stay on campus' (Woods, 2013, p.152). Woods recalls that 'we basically viewed the campus as a blank piece of paper and said we are going to rebuild' to world-class standards. A program management office was hived off from everyday facilities management. There was recognition that the spatial configuration of the buildings and grounds would have a direct impact on UTS' relationship with the city and that 'the university [had] to open itself up to its neighbours, and visitors, through the creation of plans and buildings that [were] easily accessible, to include… places that reflect the cultural and educational precinct in which the university finds itself' (Woods, 2013, p.152). New and refurbished buildings were in the frame, with the accent on interiors, as 'tools' for wider institutional repositioning (Woods, 2017). Driven by the new philosophy to better connect research, teaching and urban life, the intent was now to achieve a contextual campus: 'we didn't want a gated university in Sydney. We didn't want to be anything other than part of the fine grain of the city' (Woods, 2017). This position transitioned UTS thinking to an engaged campus model (Benneworth *et al*., 2010) which inevitably meant more intensive and productive interactions with state and local government.

Despite its ambitious institutional goals, UTS still 'lacked any true planning vision' (Woods, 2013, p. 151) until 2007 when architects FJMT prepared the *UTS Physical Concept Plan*, assessing the floorspace potential of the Broadway campus. In 2009 Bligh Voller Nield (BVN) produced the UTS *City Campus Masterplan* 2020, subsequently approved as state significant development under the *Environmental Planning and Assessment Act* 1979 and State Environmental Planning Policy (Major Projects) 2005 (JBA, 2009). This was the truly decisive step in the university investing in its reminted aspirations as planning animateur (Figure 6). The declared budget for the (re)building program eventually grew to around $1.3b over a ten-year timeframe. The university divested itself of its isolated suburban Kuring-gai branch campus by 2015, foregoing perceived development opportunities there to concentrate

resources on the makeover of the more popular and highly accessible Broadway campus. The commitment was 'to reinvent itself as a university within the city' (Slee, 2015, p.57).

[FIGURE 6 ABOUT HERE]

The masterplan initially provided around 85,000m^2 additional gross floor area. Planning principles included quality design, provision of cultural and recreational hubs, useable open spaces, high level sustainable performance, and new entrance ways linking to 'capitalise on the site's urban character and maintain the informal transition between the campus and the remainder of the city' (JBA, 2009, pp.vi-vii). Design excellence would primarily be achieved through competitive processes, adapting the City Council's new requirements for major commercial projects (Freestone, *et al.,* 2019). The guiding institutional philosophy focused on supporting UTS' technology and collaboration-based model of teaching and industry-linked research. Six significant development and administrative modifications to the concept plan were approved between 2009 and late 2018, mainly to cater for sustained growth in enrolments. The most recent of these was 'Modification 6' for additional floorspace and rehabilitation of a legacy federation-era heritage building submitted to the state government in December 2017 (Ethos Urban, 2018).

Some early new building initiatives were seized in the 1990s, such as the Faculty of Architecture building, again by Cox Richardson, but this was a 'very opportunistic' action – 'a case of there's some land, let's build, and we have a faculty we want to put in there' (Woods, 2017). Another decisive early move was conversion of the former Fairfax newspaper building on Jones Street into new teaching spaces, for which BVN and Woods Bagot Interiors were jointly awarded the prestigious Sulman Award for Architecture in 2003. A contemporaneous citation foresaw the potential of this initial project 'to reinvent the institution, informing future urban moves which will create a new spatial order for UTS' (Anon, 2003). However, the first major new building was the Faculty of Engineering and Information Technology (FEIT) by Denton Corker Marshall, a design competition winner in 2009 opened five years later (Figure 7). Approached down Broadway from the west, this building occupied a 'dominant location … the first signifier of university territory' (McCaughan, 2015). As a gateway to both the campus and the southern CBD, it highlighted the 'pivotal role' of UTS within an emerging knowledge precinct (Waters, 2014).

[FIGURE 7 ABOUT HERE]

The major new building and infrastructure investments completed since approval of the Concept Plan in 2009 are summarised in Table 2. All involve prominent and emerging designers (Trimble, 2011). The most famous new building was initially conceived outside the concept plan, albeit duly modified. This was the Dr Chau Chak Wing Building completed in 2015, housing the Business School and designed by famous American architect Frank Gehry (Naar & Clegg, 2015). When the chance opportunity arose to commission Gehry, the original idea of a design competition was rejected. VC Milbourne said that 'we wanted to brand the university and it would have been silly not to take advantage of a Gehry building' (Slee, 2015, p.60). With its crumpled exterior distantly inspired by Gehry's Weatherhead School of Management in Cleveland, Ohio, the interior design is seen as promoting the desired interactive teaching and research advocated by the university (Green, 2013). The new business school has been cast as presenting the university as a 'place of creativity and innovation … establishing it as the vibrant centre of a vibrant city' (Woods, 2017). It certainly exemplifies the so-called 'starchitecture' turn in campus design (Coulson, *et al.*, 2014) as well as the recent trend for universities 'building as much to give themselves an identity as they are to give themselves accommodation …. it's a branding issue' (Mould, 2017).

The newest building to open is UTS Central on the site of the original Building Two: a glass-walled mixed-use student hub, faculty space, library and food court open to the public (Figure 8). Regarded both as a positive link tying together the brutalist facade of Building 1 and the neo-industrial façade of FEIT (Andersons, 2019) and a visual and practical model of increased urban integration, the project by FJMT and Lacoste Stevenson was designed to 'enhance the urban quality of the local precinct' (UTS, 2017) and improve 'the aesthetics, amenities, experiences - not only of [the] students and academics but also for people who live in the area' (Oliver, 2019).

[TABLE 2 ABOUT HERE]

[FIGURE 8 ABOUT HERE]

Discussion: UTS past, present and future

The Institute of Technology which preceded UTS was one of the 'largest and most complex projects' undertaken by the NSW Government Architect in the 1960s and 1970s (Jack, 1980, p.170). Michael Dysart was a key player in the evolving conception of the institution as a comprehensively redeveloped set of tower blocks and modern plazas. Today with the emergence of a new UTS, firstly in the Haymarket and now in Broadway, he has some misgivings: 'I think there's a certain lack of cohesion ... [a] scaffolding of ideas or grabbing … bits and pieces … it's [the] star architect phenomenon …. there's no question about that' (Dysart 2017). Yet this diversity makes it a campus for its times, eschewing the monolithic modernism of the 1960s-70s to work with a precinct shaped by a changing cast of designers in line with the wider city in which it sits.

Just as the governance, funding and priorities of tertiary education have changed significantly over the past half-century, so too have design aspirations, requirements and perceptions. Dysart's own Tower 1 building has shifted from a maligned eyesore into the iconic marker of a reimagined campus (Adelaide, *et al.,* 2013). What once marked 'the slummy end of town' is now a beacon for 'creative Sydney' (Liz Jacka in Adelaide, *et al.,* 2013, p.38). The modernist legacy remains but now mediated through iconicity. As a reinvented city campus following the interdependent urban model (Benneworth et al 2010), form follows function in a very deliberative way. As VC Attila Brungs conveyed in a speech in early 2016:

> As a University and a public institution, we approached this not just as what was required for our campus but what was required for the community and precinct around us ... using our buildings to create the urban space that will create the character to improve the utility for people and their lives. UTS deliberately has no walls around our campus, we have community groups, large and small industry on all ground levels of the new buildings. Our buildings are a catalyst for urban renewal and a fundamental supporter of our precinct (Brungs, 2016).

The stakes and complexity have increased over time, with major developments at UTS now assessed through the high-level approval pathway of 'state significance'. Shifting governance

structures for planning decision-making involving serious stakeholder consultation and greater alignments between institutional, city and state plans have become mandatory. UTS has also become a key player in the broader metamorphosis of this southern gateway to the Sydney CBD (Hawken, 2015). It has ended up being superbly situated for a twenty-first century university. It is highly accessible by public transport, within walking distance of the CBD and Darling Harbour. Aspect Studio's 'Goods Line' rail conversion (2015) is reminiscent of New York's 'Highline' in terms of the adaptive reuse of a post-industrial relic, provides a direct pedestrian connection to the north, while Broadway is a remade development corridor now dominated by the high-end Central Park commercial and residential precinct. Woods (2017) recalls that after UTS had talked to the developers of Central Park, it 'led to a great deal of confidence' in their own strategic thinking. UTS has leased commercial floorspace in a new Central Park building to accommodate its growing needs in health education and research, further blurring the divide between city and campus. Increasingly conscious of the amenity impacts of some of its traditional operations in a transformed inner-city environment, heavy-duty engineering facilities have been relocated to a new facility near Sydney Airport.

UTS Broadway has now been rebadged as a genuine 'city campus' (Woods, 2017) with the decade-long program outlined in the 2009 master plan effectively complete. Future master planning lies ahead and the challenges are formidable:

> Today, we have greater political uncertainty… greater uncertainty with respect to the international student market ... with respect to how to provide an interface to the online world … We need to be cognisant of technology in terms of our built infrastructure and technology in the sense that it facilitates a whole new world of online education and what does that mean for the higher education sector? We certainly don't need the massive buildings, for example, to provide online courses. But we do still need infrastructure to provide for a student-focused campus environment for the more social aspects of their higher education (Oliver, 2019).

Three particular challenges for UTS are highlighted by our analysis. First, a 2015 brochure summarising the existing master plan presents only a compendium of flagship building

projects. When carried to extremes, Rybczynski (2016) has likened this approach to a kind of 'petting zoo' as name architects bid to outdo each other. There is now far greater recognition of the need for a more-integrated urban design and activation strategy centred on the quality and interconnections of spaces between buildings. Relatedly, and like all other universities, UTS will need to finance major new design moves having already expended over $1b in a decade. The city campus does not come cheap.

Second, is the future of the Haymarket campus. There will be pressure to increase development density yet retain overall consistency with the character and scale of the former market quarter requiring dexterous design solutions given the likelihood of greater public scrutiny as it ventures beyond its core domain. Securing better links and wayfinding between the close but geographically distinct Broadway and Haymarket campuses are already challenging with the university seeking place-making advice from leading Danish consultant Jan Gehl, a specialist in human-centred design and advisor to the City of Sydney (McNeill, 2011; Oliver, 2019).

A third challenge is the necessity for the university to continue to broaden its view and further conceive itself as a key hub in a wider spatial 'innovation ecosystem' recognised by Sydney's metropolitan planning authority (Greater Sydney Commission, 2018) and taking in the University of Sydney and the Central-Eveleigh redevelopment corridor (Transport for NSW, 2019). With campus strategy and design thoroughly tied up with concerns about connectivity, governance, productivity and sustainability, the importance of place-making now fans out to include increasingly wider collaboration networks of metropolitan significance. This kind of 'city-university' collaboration has parallels nation-wide (e.g. City of Melbourne, 2016).

Conclusion

Ultimately, all tertiary institutions have their own unique historical narratives. As the university's early 'concern for separation' has been supplanted by a vigorous 'search for integration' (Hebbert, 2018, p.883), the city campus in its various forms has become a highly regarded commodity in the knowledge economy. These are places shaped decisively by broader forces or 'flows' of global resonance across institutional growth and place-making

and marketing strategies, state and city development initiatives, trends in higher education, and design fashion.

This campus configuration has crystallised in the early twenty-first century. In its various forms the contemporary city campus channels design trends which include revitalised master plans, adaptive reuse, building for collaboration, and 'starchitecture' along with closer functional linkages between campus and city (Coulson, *et. al.*, 2014). More particularly it expresses a distinctive institutional urbanism stressing the links between creativity, higher education and urban life; greater physical and functional connectedness to the wider community and urban fabric; porous physical perimeters; and heightened commitment to quality place-making (Hebbert, 2018). This commitment to an urbanism emphasising 'compactness, connectivity and context' has not only caught the imagination of university leaders, city planners and designers, it has also become highly valued by students globally (Hajrasouliha, 2017, p.167).

We have narrowed the frame of reference for the UTS story to the 'tech transformed' campus. Even in this light the making of UTS is just one narrative in a wider campus development phenomenon, being representative rather than typical. RMIT in Melbourne also exemplifies 'the rise and indeed renaissance of the centrally located city campus' (Saniga & Freestone, 2017). They share some fundamental traits and trends – CBD locations; transition from historic workingmen's institutes to universities; latterly strategic nodes in innovation precincts; institutionally-driven rebranding; and a design evolution from organic functionalism through high modernism to post-modernism onto a more nuanced interdependent urbanism. But there are still differences around curatorial design leadership, the degree of state versus local government intervention, investment in urban design, and locational and morphological attributes with RMIT benefitting from Melbourne's fine-grained laneway system. There is no doubt that UTS would have observed closely the pioneering transformation of RMIT from the 1990s, but this kind of observation goes back at least to their parallel modernisation projects in the early 1960s (UTS Archives; e.g. 1962 newspaper clipping from the *Daily Telegraph* on '£14m for Melb. Tech').

What UTS does do is illustrate the different types of positive benefits which investment in the city campus can deliver for the wider city as recognised by Benneworth et al (2010, p.1616).

These are first, the production of new 'knowledge-intensive' spaces; second, enhancement in the sophistication of urban governance through alliances with planning and civic authorities; and three, helping in 'repositioning the city's profile to external investors and knowledge workers' (Benneworth et al 2010, p.1616).

As the urban agency of universities widens and deepens, universities are becoming increasingly implicated in the processes, problematics and politics of urban development (Winling, 2018). The risk which Addie (2017) identifies is the march toward a neo-liberal obsession with growth. That remains a cautionary note, but wider scrutiny comes into play at this scale as the city campus leads the higher education sector in transitioning from enclave to situational status. We err on the side of Nimmo's (2016, p.56) confidence given the demonstrable outcomes to date: 'The city campus can be an effective agent in the process of urban change and can add to the cultural landscape of the city. In many ways it is a model for ideal urban development, in which greed and self-interest give way to the higher goal of mutual benefit and a different balance between private and public use.'

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Notes

1. The primary archival source drawn upon from the UTS Archives is *Broadway Building Development file 71/S211/81060*.

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Table 1 A typology of Australian city campuses

City Campus type	**Urban engagement**	**Examples**
Traditional sandstone	Enclave institutional precinct; traditionally 'in' but 'apart' from city life	Adelaide
Tech transformation	Consolidation, renewal and re-imagining of 19th century clusters for technical education	RMIT UT QUT Gardens Point UniSA City East
Dispersed	Occupation of various city buildings in scattered locations and clusters	University of Tasmania
Adaptively reused	Significant presence in repurposed precinct-defining heritage buildings	Notre Dame, Fremantle and Sydney Western Sydney-Rydalmere

		Deakin-Geelong
Master-planned urban renewal	Integrated new development of substantial precinct	UniSA City West
New vertical campus	Major investment often by joint venture in new stand-alone commercial office towers	Victoria University Western Sydney-Parramatta
External specialisation	Presence in specialist precincts facilitating engagement with external partners, e.g. law, business and arts schools	Griffith University-Southbank
Leased offices	Leased office space providing an accessible CBD presence	Suburban, interstate and regional universities requiring a capital city street address

Source: authors

Table 2 Major master plan developments at UTS 2011-2019

Facility	*Architect*	*Completed*	*Notes*
Multi-Purpose Sports Hall	PTW	2011	The first 'master plan' building. Under Alumni Green.
UTS Yura Mudang student housing	Nettleton Tribe/Lacoste + Stevenson	2011	720 bed residential tower above Peter Johnson building.
Great Hall and Balcony Room Upgrade	DRAW Architects/Kann Finch Architects	2012	Connected to Tower Building 1 which has also been refurbished mainly for administration
Faculty of Engineering and IT Building	Denton Corker Marshall	2014	Largest building in the master plan. Aluminium 'binary code screen' patterned with 1s and 0s.
Faculty of Science and Graduate School of Health Building	Durbach Block Jaggers in association with BVN Architecture	2014	Green building, green roof, feature façade of 85% recycled materials.
Library Retrieval System	Hassell Architects	2014	Under Alumni Green.
Alumni Green	ASPECT Studios Landscape Architects	2014	Green space softening a concrete-based environment and promoting social interaction. Winner of several design and landscape architecture awards.
UTS Central Stage 1	FJMT, with façade to podium by Lacoste + Stevenson and Daryl Jackson Robin Dyke	2019	The last 'master plan' tower building to replace the former Building 2 to include student hub and new library.
UTS Central Stage 2	Lacoste + Stevenson, and DJRD.	To be determined	The podium extension to UTS Building 1 is approved but yet to be commenced.

Source: Planning reports and UTS Program Management Office.

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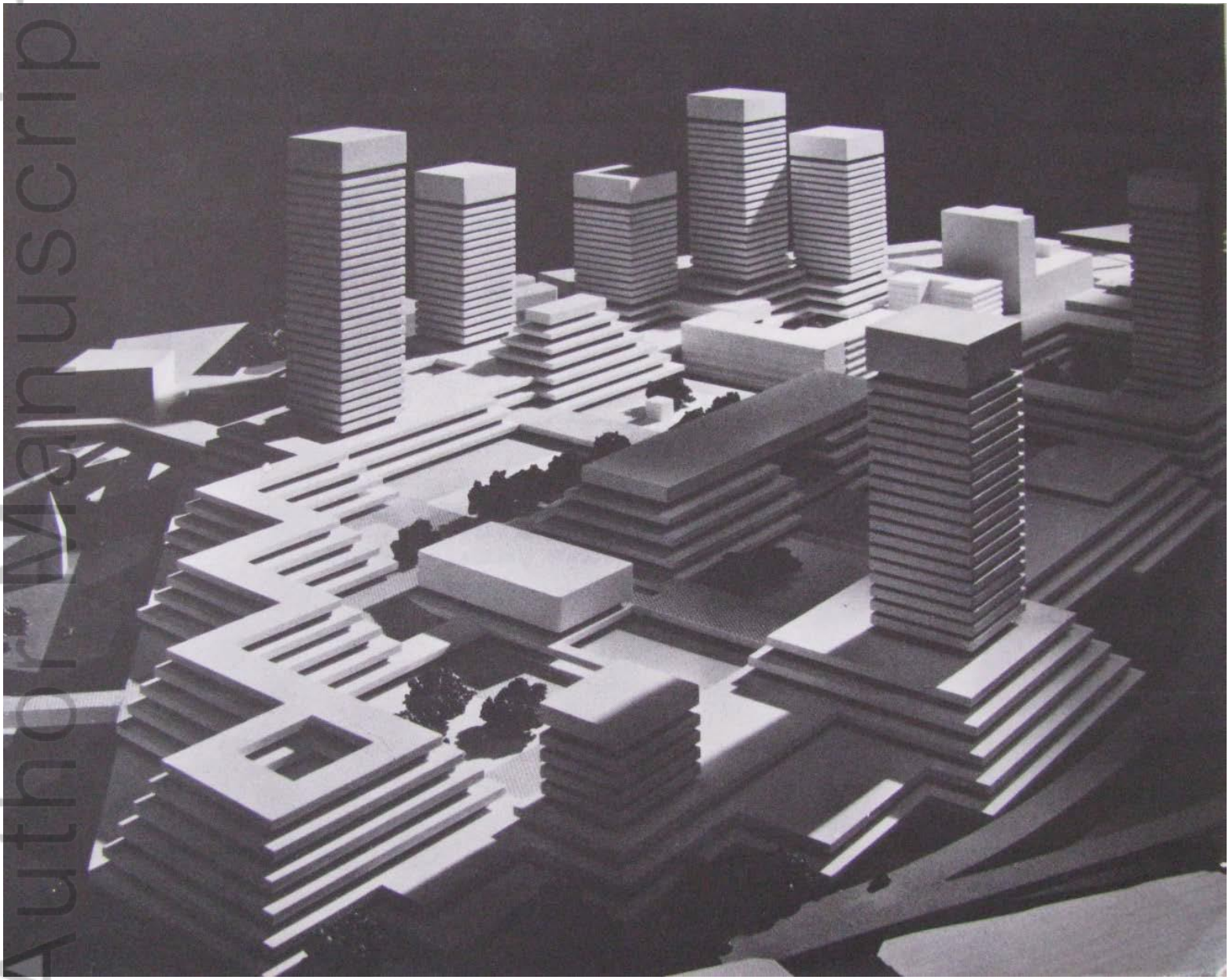
GEOR_12439_Fig 2.jpg



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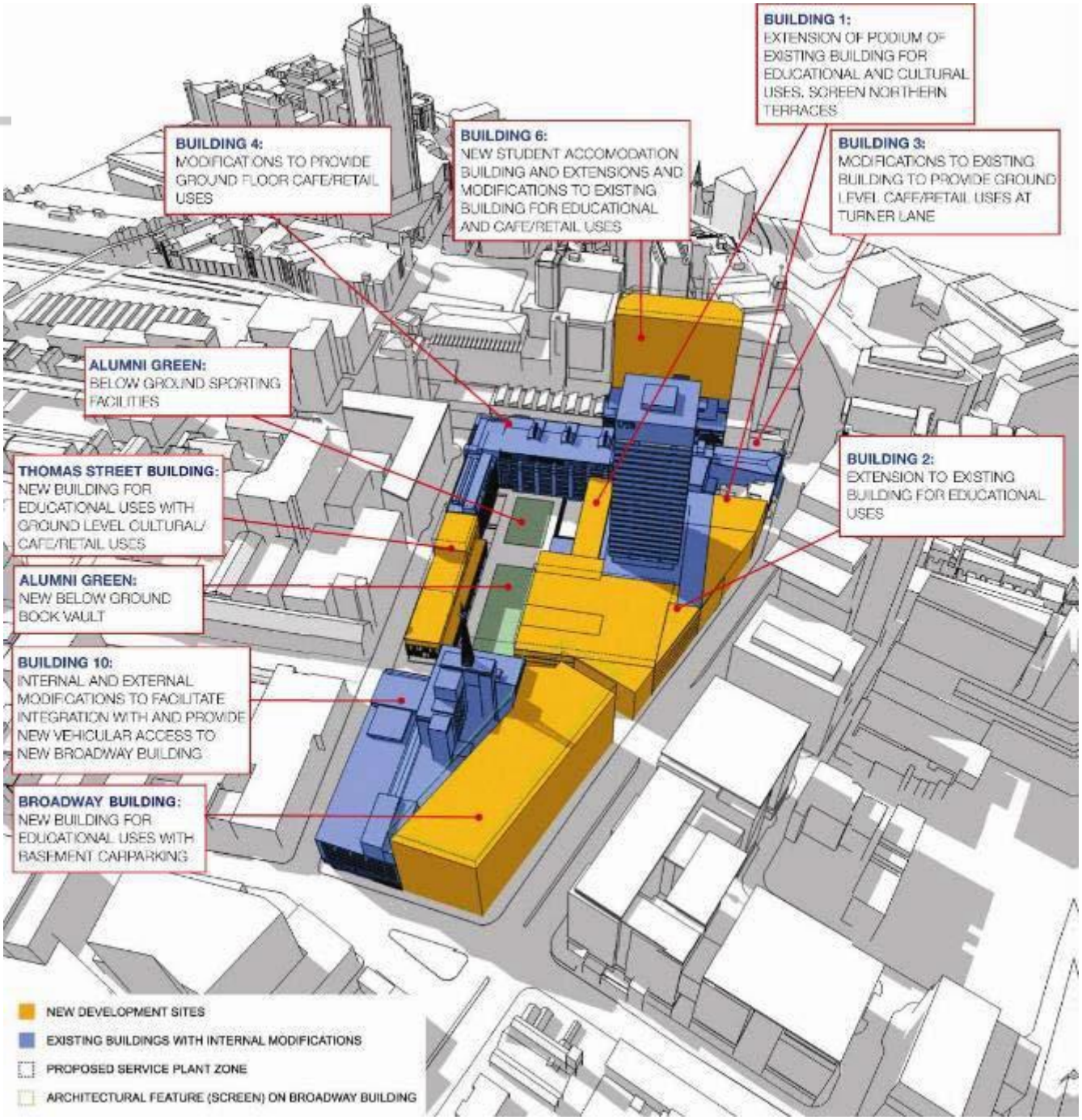

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