

Urban implications of telework: Policy gap in Sydney metropolitan planning?

Author

Alizadeh Fard, Tooran

Published

2011

Conference Title

World Planning Schools Congress 2011: Planning in an era of uncertainty and transformation

Rights statement

© 2011 ANZAPS. The attached file is reproduced here in accordance with the copyright policy of the publisher. Please refer to the conference's website for access to the definitive, published version.

Downloaded from

<http://hdl.handle.net/10072/45265>

Link to published version

<http://anzaps.net/>

Griffith Research Online

<https://research-repository.griffith.edu.au>

**Urban Implications of Telework:
Policy Gap in Sydney Metropolitan Planning?**

Dr. Tooran Alizadeh
Griffith School of Environment
Urban and Environmental Planning Discipline
Griffith University
Brisbane, Australia
E: t.alizadeh@griffith.edu.au

Paper Presented in Track 1(Governance, Politics and Conflict) at the
3rd World Planning Schools Congress, Perth (WA), 4-8 July 2011

Urban Implications of Telework: Policy Gap in Sydney Metropolitan Planning?

Abstract

The paper attempts to develop an understanding of urban implications of telecommunication with a focus on telework in the Australian context. It begins with definitional discrepancy in the telework studies and defines telework as a flexible knowledge-work option in the new economy. It then reviews some of the urban implications of telework in the literature, and analyzes Metropolitan Plan for Sydney 2036 as the major document that shapes the future of Australia's first global city. This analysis identifies policy gaps regarding the lack of telecommunication focus at Sydney metropolitan level. The paper also reveals great opportunities involved in the current strategy to work with telecommunication and to deal with the major planning issues challenging the future of Australia's largest capital city. Considering the major investment on the telecommunication infrastructure namely NBN, this paper is perfectly timed and addresses policy issues that could highly impact the future of urban planning and policies in Australia.

Keywords: Telecommunication, Metropolitan Planning, NBN, Sydney, Telework

Introduction

Since the term 'telecommuting' was first coined (Nilles, 1975), research emerging from disciplines ranging from transportation, urban planning, and information science to organizational behavior, and sociology have investigated the practice of telecommuting or alternatively telework (Ellen & Hempstead, 2002; Handy & Mokhtarian, 1996; Olson, 1989). Telework has been investigated as an alternative work arrangement through telecommunication that blurs the old boundaries between the locus of work and the place of domicile. The new form of work-home connection has appealed a growing number of teleworkers whose organizational, individual, work, technological and spatial characteristics have been explored in the literature (Alizadeh, 2009b; Bailey & Kurland, 2002; Haddon & Brynin, 2005). However, the lack of universally agreed definition of telework, consistently transformative nature of telecommunication technologies, and difficulties involved with collecting empirical data from the heterogeneous social group of teleworkers have stultified research findings. Therefore, conclusive results regarding the above five categories of teleworkers' characteristics are hard to find and further empirical research need to be conducted.

This paper focuses on the spatial characteristics of telework and reviews its urban implications with a focus on planning systems in Australia. It begins with addressing definitional discrepancies in telework literature and offers a project-specific definition in which telework is understood as a knowledge-based activity facilitated by telecommunication technologies. The paper then briefly reviews urban implications of telecommunication and more specifically telework in the literature. Borrowing from research findings in different parts of the world, it attempts to unfold planning implications of telework in the Australian context with a focus on metropolitan planning in Sydney. It concludes with a policy analysis of Metropolitan Plan for Sydney 2036 (Department of Planning, 2010) as the major document that shapes the future of Australia's first global city.

Telework Definition

Definitional problems in telework studies are prevalent (Hill, 2003; Tremblay, 2002), and the search for a consensus over a telework definition has been the source of considerable debates (Baruch, 2000; Sullivan, 2003). In the Australian context, large-scale national surveys of telework (ATAC, 2006; Lafferty & Whitehouse, 2000) showed the heterogeneous nature of Australian telework that cannot be simply categorized. To address the complexity and diversity of telework population, some studies challenge the assertion of a universally acceptable telework definition, and argue that project-specific definitions for telework are inevitable (Haddon & Brynin, 2005; Sullivan, 2003).

This paper follows the emerging trend in the literature that introduces telework as predominately a professional practice for knowledge-workers who produce and disseminate information through telecommunication (Haddon & Brynin, 2005; Hotopp, 2002; Pratt, 2002). This new trend is different from the earlier studies that classified telework as part of a larger set of flexible work arrangements such as traditional home-working, outworking or remote work (Boris & Daniels, 1989; Rowbotham, 1993; Weijers, et al., 1992). The nascent knowledge-based definition of telework is in line with the empirical research in Australia. A three-year research on the adoption of telework in Australian organizations presented teleworkers as mostly managers and professionals (Lafferty & Whitehouse, 2000; Whitehouse, et al., 2002). In this study a large scale national survey was followed by case study research interviewing managers and teleworkers. The findings indicated that in the Australian context telework is being used for specialized work, rather than the more routine data entry with which telework was originally associated (Haddon, 1998). This line of argument has been supported by a second national survey (ATAC, 2006) funded by DCITA

(Department of Communications, Information Technology and the Arts) that presented teleworkers as professionals involved with knowledge-based industries, including business, tertiary education, communications, finance and insurance sectors. More recently, Access Economics (2010) adopted a similar telework definition while examining impacts of telework under the NBN (National Broadband Network).

Urban Implications of Telework in the Literature

The co-evolution of cities and telecommunication, over the last few decades, has been increasingly emphasized in the academic debates interested in the intersection of new technologies and their urban implications. Previous research introduces telecommunication as a whole new urban infrastructure that will transform our cities as dramatically as railroads, highways and telephone did in the past. Earlier trend in this discussion reflects a classic belief that the introduction of telecommunication technologies leads to the economic decline of cities as they replace face-to-face interactions, and disperse previously centrally located activities in urban areas.(Gordon & Richardson, 1997; Negroponte, 1995). On the other hand, there is a second trend in the literature that argues telecommunication technologies develop the complexity of cities and enrich, rather than destroy, place-based communities in traditional urban localities (Graham & Marvin, 1996; Mitchell, 1999).

In the case of telework, as one of the ramifications of telecommunication, research emphasizes on blurring boundaries between work and home in which the necessity of daily commute is compromised (Alizadeh, 2009b). This is understood to offer greater flexibility in residential location choice as people no longer have to live in a certain distance from their work. Wider choice for residential location introduces nascent opportunities for decentralized urban patterns to attract information workers, introduce complex and diversified patterns of suburban employment and play productive roles in the new economy (Fagan & Dowling, 2005). To understand urban implications of telework, previous studies draw an analytical portrait of the ideal information-workers who could work from almost wherever they desire through telecommunication technologies (Glenn Searle & Pritchard, 2008). This growing social group is described to require a certain scale and intensity of telecommunication infrastructure as well as vibrant urban life.

Authors argue that diversity of all kind is the key to attract and retain information-workers in every live/work community (Carvalho, 2006; Craglia, et al., 2004; Van den Berg, et al., 2004; Yigitcanlar, et al., 2007). Under the most optimistic scenario, these live/work communities are to achieve what was best about old-style small towns and urban

neighborhoods (Mitchell, 1999). Research emphasizes that telecommunication technologies provide an opportunity for the qualities that were celebrated by Jane Jacobs (1961), and that have been sought in the neo-traditional movement by the New Urbanists (Leccese & McCormick, 2000). These debates have been recently supported by limited but growing empirical research that investigates teleworkers' life/work style in outer-city urban areas. The empirical studies mainly appreciate the significance of mixed-use in residential communities that provide the conventional support system for teleworkers who live and work in the same locality. Previous studies (Alizadeh, 2009a) have even suggested to consider telework-oriented districts as a new zoning class and describe the detail of mixed-use system needed in these areas including housing, work, education and leisure.

While academic debates about urban implications of telecommunication seem to be blooming, current policy and planning systems are behind. Different countries around the world have been making extensive investment to provide telecommunication infrastructure, but very little is done to adjust the planning systems to work with the new technology-based opportunities. This is a worldwide issue and is not limited to Australia. Research from around the world shows that the use of telework in creating sustainable communities in the new economy may have started to be recognized at the strategic level, but that urban planning and design policies for it is still to be developed (Kawai, 2008). However, considering the hefty investment that Australian Federal Government is making through the National Broadband Network (NBN) to provide telecommunication for all Australians, it is time for research to analyze major policy and planning documents in Australia and investigate their position towards telecommunication and telework. The NBN will provide fibre network coverage for 93% of Australian premises by the end of 2020, with the remaining 7% served by fixed wireless and satellite coverage (NBN Co. Ltd., 2010). It represents the largest single infrastructure project undertaken by any Australian Government, an investment up to \$43 billion over eight years (DBCDE, 2010). Moreover, DBCDE (Department of Broadband, Communications and Digital Economy) has already started to model the rate of telework adoption under the NBN, and to calculate its potential benefit including travel saving, office expenses, and transport gains (Access Economics, 2010).

Research Method: Policy Analysis

Adequate and supportive urban strategies and policies are required to ensure that the upcoming major investments in telecommunication infrastructure reach their potentials. Such supportive urban documents need to clarify the ways in which different ramifications of

telecommunication including but not limited to telework are regulated. In order to contribute to the provision of a telecommunication-aware urban framework, this paper focuses on Sydney as Australia's first metropolitan city. Metropolitan Strategy for Sydney 2031 (Department of Planning, 2005) and Metropolitan Plan for Sydney 2036 (Department of Planning, 2010), as the major documents shaping the future of the metropolitan area of Sydney will be carefully analyzed. The paper acknowledges that the 2010 plan supersedes the initial 2005 version. Yet, it considers both documents to clarify the way in which metropolitan planning in Sydney understood changes over the last five years and revised its approach to tackle the future challenges. This policy analysis firstly examines the representation of telecommunication in different parts of both documents, and then concludes with the potentials and gaps regarding telework. In line with the rest of the paper, the policy analysis considers telework both as a ramification of telecommunication and as an alternative work option.

Sydney Metropolitan Planning

In December 2005, the NSW Government released its Metropolitan Strategy for Sydney 2031 – City of Cities: A Plan for Sydney's Future (Department of Planning, 2005). This document attracted a wide range of reactions from planning academia, profession and the public. Five years later in December 2010, Metropolitan Plan for Sydney - Metropolitan Strategy Review: Sydney towards 2036 - (Department of Planning, 2010) was released to supersede the initial strategy. The NSW government describes the new plan as the result of the first five-yearly review of the Metropolitan Strategy 2031 that also incorporates the principles of the Metropolitan Transport Plan 2010: Connecting the City of Cities (NSW Government, 2010). It is introduced to integrate transport and metropolitan planning and form a single, integrated Metropolitan Plan for Sydney 2036.

Considering that the Metropolitan Plan 2036 was only released a few months ago, it is hard to find a comprehensive analysis on that. However, over the last five years the Metropolitan Strategy 2031 has been analyzed by both academics and professionals as part of a distinctive Australian paradigm of metropolitan planning (Bunker, 2007; Bunker & Searle, 2009; Glen Searle & Bunker, 2010). It has been described as the most comprehensive planning strategy that Sydney has ever had; the one that gives direction to private sector investment decisions, and defines a framework for local planning (Property Council of Australia, 2004). While the Metropolitan Strategy 2031 seemed to be at the behest of the development industry sector, critiques from academia were not convinced that the strategy

had thought through all the issues facing Sydney and planned for them (Mahjabeen & Dee, 2008; Glen Searle, 2006). The thrust of the argument was that the City of Cities strategy, while having a number of worthy features, fell short to offer a framework outlining main problems facing Sydney, and consequently failed to grips with some of them. For example, the strategy was criticized of failing to offer any serious solution to the inadequate public transport, not handling areas of socio-economic stagnation and decline, and appearing too complacent about the future of Sydney's global economy.

It is fair to say that in reaction to some of these critiques, at the end of the first five-yearly review period, the Metropolitan Strategy for Sydney 2031 was revised. The integration of metropolitan planning and transport planning incorporated in the Metropolitan Plan for Sydney 2036 is a very positive step and probably addresses some of the concerns raised by critiques in regard to the role of strategic planning to guide Sydney's inadequate public transport system. However, the main question raised by the critiques still seems to be unanswered: What are the challenges facing Sydney over the next 25 years and what is the proper strategic response for them? The Metropolitan Plan for Sydney 2036 intends to serve as a primary input into the state government decisions. If the main challenges are not addressed by this major document, it is more likely that the state government does not have any proper response for them and, those challenges may be left to local governments to deal with. Apart from the fact that local governments do not have access to the resources available to the state government, the lack of an overarching strategic view could result in discrepancy across different LGAs (Local Government Areas). This could simply turn a planning challenge into a planning crisis.

This paper considers telecommunication as one of the challenges facing the future of Australian planning systems. In addition to the global shift towards knowledge-economy putting a great emphasis on telecommunication, the upcoming major investment on a National Broadband Network (NBN) puts telecommunication in the centre of many discussions about the future of planning in Australia. This paper offers a policy analysis to understand metropolitan planning major documents stance towards telecommunication, considering that they are to guide Sydney during the timeframe that NBN, as the upcoming telecommunication infrastructure, will be in place. The analysis is undertaken in two parts. The first one focuses on the way in which both Metropolitan Strategy 2031 and Metropolitan Plan 2036 define Sydney's role in the international stage. This section mainly focuses on the global position of Sydney and how this position is protected by the plans. The second section focuses on Sydney's mission at the local scale. The paper identifies the notion of fairness as

the core mission defined by the initial 2005 plan that is supposed to be achieved through fair distribution of resources across Sydney metropolitan area. The paper investigates the role defined for telecommunication under each section, identifies policy gaps, and makes some suggestions to be considered for the second five-yearly review.

International Perspective: Global City

In Metropolitan Strategy 2031 and Metropolitan Plan 2036, Sydney is defined as a global city. Both documents are very proud and protective of this position. They describe Sydney using phrases such as ‘Australia’s only truly global city’, ‘one of the world’s great metropolises’ and ‘Australia’s unrivalled global gateway’. Both plans also consider themselves as broad frameworks to secure Sydney’s place in the global economy. In other words, the emphasis on the global position of Sydney is common between both 2005 and 2010 strategic plans. Yet, the way in which this role is protected through policy actions might be slightly different between the two major documents:

Economic Competitiveness

Both 2005 and 2010 plans emphasize that in order to secure Sydney’s global position, it is important to enhance its economic competitiveness at the global stage. In fact, this notion has found its way to the vision of the plans, and their main aims and strategies. ‘Strong global economy’ has been defined as one of key elements of the vision for Sydney’s future; ‘strengthening economic competitiveness’ has been also emphasized as one of the main aims, and finally ‘economy’ is also named as one of the strategies to deliver the planned future. More specifically, in order to maintain and enhance the competitive edge of Sydney, national and international points of interest are defined. At the national level, Sydney’s high proportion of employment in financial and business services (over 30%) is emphasized. At the international level, Sydney’s major role in the Asia-Pacific, as the home to 60 percent of headquarters established by multinational companies in the region, is pointed out. It is important that the same logic is followed in both Metropolitan Strategy 2031 and Metropolitan Plan 2036. However, the latter one being produced after the global financial crisis seems to be more cautious, and acknowledges such a crisis as a challenge that needs to be tackled carefully. Anyway, both documents name innovation as the key to maintain Sydney’s competitive edge. Unfortunately, neither of them defines what innovation is. This is the place that the first policy gap in metropolitan planning for Sydney is identified. Although this paper is not to clarify the meaning of the innovation, the author acknowledges the

extensive body of literature that relates innovation to the knowledge economy (Andersen, et al., 2000; Cooke, 2001; Kim & Mauborgne, 1999) Both 2005 and 2010 documents fail to establish Sydney's position in the knowledge economy, and consequently underestimate the role of telecommunication in the new economy. Failing to acknowledge the shift in the economy at the global stage, leads to their second failure of not defining the significance of telecommunication technologies as new infrastructure in the arising knowledge economy.

Infrastructure

The second aspect developed in both Metropolitan Strategy 2031 and Metropolitan Plan 2036 to secure Sydney's global role is infrastructure. The Metropolitan Strategy 2031 notes that the emphasis on the global position puts enormous pressure on infrastructure. This document does not offer an explicit list of infrastructure needed to develop for the global role, but the major emphasis throughout the whole document is to promote Sydney's transport network. The growing congestions and consistent complaints about Sydney's public transport, just after releasing the Metropolitan Strategy 2031, called for more systematic attention to transport - as an infrastructure in crisis. As a result, in the first five-yearly review of the plan, the Metropolitan Plan 2036 was prepared as an integration with the Metropolitan Transport Plan 2010 with metropolitan planning. As great as this sounds, Sydney still has a long way before it could claim that its metropolitan plan is fully integrated with infrastructure. This is simply because as important as transport is, infrastructure is a wider topic. Currently, it seems like the Metropolitan Plan 2036 has taken up transport on the board because it is turning to a planning nightmare. It is obviously not wise for the metropolitan planning to ignore infrastructure unless it turns to a complete failure.

It is fair to say that transport is not the only infrastructure named in the Metropolitan Strategy 2031. The document briefly acknowledges that global cities' need advanced communication infrastructure. Unfortunately, this is as far as the important issue of communication infrastructure goes in the plan. Telecommunication is easily neglected as the major focus of the whole plan – in regard to infrastructure - is on the growing crisis of transport in Sydney. This is the second major gap in the Metropolitan Strategy 2031 that is very much on the core of this paper's debate. The role of (tele)communication as a new infrastructure is also underdeveloped in the Metropolitan Plan 2036. This shortcoming is mostly surprising because the latter document was produced during the time that the debates over the National Broadband Network (NBN) were in progress. It is a huge policy gap, as the Metropolitan Plan 2036 is to guide Sydney during the rollout and post-construction periods of

the NBN program, and yet keeps silent on the very significant upcoming infrastructure. It is very important for the next five-yearly review version to address the role of NBN in enhancing Sydney's global position. This is actually a discussion that needs to start much earlier than five year time, and this paper hopes to at least emphasize the need for it.

Environmental Qualities

The third aspect developed in the Metropolitan Strategy 2031, to protect the global position of Sydney relates to the environmental qualities. Sydney's natural attributes are introduced as key attractions for economic activity and investment driving the growth of the city to its prominent national and international position. From this perspective, protecting the natural environment is considered equally important to Sydney's position at the global stage. Five years later, the Metropolitan Plan 2036 agreeing with this logic, takes the discussion over environmental issues to a different level. The revised document, defines climate change as one of major challenges for Sydney, and pushes for more sustainable development to prepare the metropolitan area for the drier and unpredictable weather events ahead. Yet, both plans seem to neglect to value any specific change in order to practice more sustainable life/work style. In doing so, telework could be noted as an alternative work arrangement that reduces daily commute and supports sustainable choice of life/work style. This is another area that needs to be developed in future reviews of the plan.

Local Perspective: Notion of Fairness

Metropolitan Strategy 2031 and Metropolitan Plan 2036 define themselves as broad framework to facilitate and manage growth and development of Sydney over the next 25 years. Both documents note that given the city's natural limitations, the next phase of growth demands more careful planning and coordination. They address the expected population growth and demographic change, and focus on a number of areas including housing, employment and infrastructure – with a focus on transport - that need to be carefully planned for accordingly. Yet, reviewing main aims and strategies addressing the local issues in both Metropolitan Strategy 2031 and Metropolitan Plan 2036 reveals a notion of fairness to be the core of metropolitan planning in Sydney. 'Fair access to housing, jobs, services and open spaces' is set as one of the key elements of the vision statement; 'ensure fairness' is named as one of the main aims; and finally 'fairness' is defined as one the elements that the strategy's success will be measured upon. So, it could be said that metropolitan planning is to guide

Sydney towards a fair growth. In order to achieve the ultimate goal of fairness in Sydney metropolitan area, a number of strategies have been adopted:

Housing and Employment

There is a great emphasis on housing and employment sectors in metropolitan planning for Sydney. The Metropolitan Strategy 2031 defines itself as a planning guide for where people will live and work in Sydney. The Metropolitan Plan 2036 also names housing affordability, new jobs, new homes, and change in housing need as the recent challenges facing future Sydney. Both 'housing' and 'employment' are mentioned as strategies in the documents. It has been emphasized by both strategies that employment capacity targets need to be planned in association with housing capacities, in order to maintain a better balance between population and employment growth in Sydney metropolitan area. Both 2005 and 2010 plans promise to deliver jobs closer to home - and homes closer to transport - through most sustainable use of infrastructure and land. In doing so, there is a great emphasis on Western Sydney and specific employment planning capacity targets are set for its sub-regions. Both documents note that half of the new job opportunities need to be produced in rapidly growing Western Sydney. To do so, two main actions are set. Firstly, major urban land release is suggested to meet residential, employment and centre size targets. Secondly, an innovation strategy is set to support emerging clusters of high value health and education activities in Western Sydney where they are needed most. The innovation strategy is based on the future employment trend prediction that indicates the growth in professional knowledge-based jobs and decline in jobs that are located in industrial areas. To increase such job opportunities, in Western Sydney, the need for better tele(communication) is briefly acknowledged. Yet, plan fails to open any room for the potential of telework as an alternative work arrangement to reduce the need to daily long commute for Western Sydney-siders. In other word, while metropolitan planning in Sydney is criticized to provide tight targets regarding its land release policy (Glen Searle, 2006), its plan for the innovative employment strategy is underdeveloped.

Centers and Corridors

The Metropolitan Strategy 2031 has a vision for the metropolitan area to work as a city of cities. It supports a metropolis made up of five key cities and 22 other strategic centers. The goal is defined to strengthen these five key centers - not just the two harbor cities of the CBD and North Sydney, but the river cities at Parramatta, Liverpool and Penrith. Building

‘stronger cities within the metropolitan area’ is named as a key element of the metropolitan vision. ‘centers and corridors’ are also included as part of main strategies for the plan. The document sets forward a number of specialized centers in the main five key cities and locates places such as hospitals, universities and major research and business centers within them. These special centers are to perform vital economic and employment roles across Sydney. The multicentre nature for Sydney supported by the strategy is planned to work through connecting the specialized centers via major corridors. However, the strategy fails to acknowledge, let alone support, the possibility of actively connecting these centers via telecommunication. There is no explicit priority for the centers and corridors to have access to telecommunication infrastructure, and telework has not been considered as alternative work arrangement within the specialized centers. This is an underdeveloped area in the Metropolitan Strategy 2031 for which telecommunication and telework could work to help tackle the issue of connecting the key cities to each other.

Unfortunately, the revisions suggested after the first five-yearly review period of the Metropolitan Strategy 2031 did not improve the position of all five key cities equally. In the Metropolitan Plan 2036 which is the revision of the initial strategy, for the first time five key cities are divided into two very different categories. While the CBD and North Sydney are addressed as Global Sydney, Parramatta, Liverpool and Penrith are labeled as Regional Cities. This basically means that the original promise of equal development of five key cities – made in the Sydney Metropolitan Strategy 2031 – is broken. This major shift could be considered as the beginning of the end of fairness for metropolitan planning in Sydney. In the new plan, a stronger global economic corridor from Macquarie Park through North Sydney to Sydney Airport and Port Botany is recommended to connect the two global cities to each other and to the airport. Yet, the original ambition of enhancing three river cities to the same level is disappeared. The 2010 plan acknowledges the advancement occurred in Parramatta over the last five years even though it does not seem to be enough to consider Parramatta as an equally important centre.

Transport and Other Infrastructure

The Metropolitan Strategy 2031 defines one of its missions to seek balance between growth and financially viable infrastructure. More specifically it names ‘transport’ as one of the main strategies. It notes that enhanced interconnectivity is vital in spreading the benefits of growth across the Sydney metropolitan area. However, critics were never convinced that the Metropolitan Strategy 2031 put enough emphasis on transport (Glen Searle, 2006). This is the

reason that in the first five-yearly review, it was decided to explicitly link metropolitan planning with transport strategic plans. It was noted earlier, that the notion of fairness- in regard to five key cities- has slightly faded in the 2010 revision. It seems like the policy makers believed that such a notion is compensated for by the stronger link with transport that could provide better access to housing, jobs, services and open space throughout the metropolitan area. As mentioned earlier, there is no emphasis on virtually connecting the key centers through telecommunication. Yet, the 2010 plan promises to build connected centers supported by an expanded and improved transport network. This paper doubts the depth of such promise but is mostly worried about other areas of infrastructure that were not recognized to be worthy of integration with metropolitan planning for Sydney. It is unfortunate that both 2005 and 2010 documents mostly define infrastructure as ‘transport and others’. I believe there is a need for the next five-yearly review to seriously consider the integration of infrastructure planning – in its broader sense – with metropolitan planning. This is a huge gap in the current version which needs to be addressed. In doing so, obviously there is a need for telecommunication infrastructure to be included in the discussion.

Conclusion

This paper refers to the major investment in telecommunication infrastructure namely National Broadband Network (NBN), and understands it as both a challenge and an opportunity facing the future of planning in Australia. NBN is a challenge as adequate strategies and policies are required to deliver its full potential. It is also an opportunity as through appropriate strategies and policies telecommunication could help tackling some of the major planning issues in Australia. In order to contribute to the provision of such telecommunication aware urban planning framework, this paper has analyzed the major policy documents guiding metropolitan planning in Sydney. Both Metropolitan Strategy 2031 and Metropolitan Plan 2036 have been analyzed in order to understand their positions regarding telecommunication and telework. The result of this investigation shows that over the last five years metropolitan planning in Sydney has come forward to integrate with transport strategic planning. However, such integration does not go any further to include other aspects of infrastructure. The paper identifies this as the major gap in metropolitan planning in Sydney that has highly affected its position towards telecommunication as the upcoming infrastructure. The paper has also identified some opportunities in which telecommunication and its ramifications such as telework could help the current strategy to

deliver its vision at both local and global levels. These opportunities need to be developed and addressed in the second five-yearly round of review in 2015.

References

- Access Economics. (2010) *Impacts of teleworking under the nbn*. Canberra: Department of Broadband, Communications and the Digital Economy.
- Alizadeh, T. (2009a) *Towards efficient regulatory environment for home-based telework in the digital age*. Paper presented at the Housing Researchers Conference, Sydney, Australia. Retrieved: May 25, 2010, from: <http://www.fbe.unsw.edu.au/cf/apnhr/papers/Attachments/Alizadeh.pdf>.
- Alizadeh, T. (2009b) 'Urban design in the digital age: A literature review of telework and wired communities'. *Journal of Urbanism*, Vol. 2, No. 3: 195-213.
- Andersen, B., Howells, J., Hull, R., Miles, I., & Roberts, J. (Eds.) (2000) *Knowledge and innovation in the new service economy*, Cheltenham: Edward Elgar.
- ATAC. (2006) *Telework for Australian employees and businesses: Maximising the economic and social benefits of flexible working practices* Report by Australian telework advisory committee (atac). Canberra, Australia: Department of Communications, Information Technology and the Arts (DCITA), Department of Employment and Workplace Relations (DEWR), Commonwealth of Australia.
- Bailey, D. E., & Kurland, N. B. (2002) 'A review of telework research: Findings, new directions, and lessons for the study of modern work'. *Journal of Organizational Behavior*, Vol. 23, No. 4: 383-400.
- Baruch, Y. (2000) 'Teleworking: Benefits and pitfalls as perceived by professionals and managers'. *New Technology, Work and Employment*, Vol. 15, No. 1: 34-49.
- Boris, E., & Daniels, C. R. (Eds.) (1989) *Homework: Historical and contemporary perspectives on paid labour at home*, Chicago: University of Illinois Press.
- Bunker, R. (2007) *A plenitude, plethora or plague of plans? State strategic plans, metropolitan strategies and infrastructure plans*. Paper presented at the the 3rd State of Australian Cities Conference, Adelaide 28-30 November.
- Bunker, R., & Searle, G. (2009) 'Theory and practice in metropolitan strategy: Situating recent Australian planning'. *Urban Policy and Research*, Vol. 27, No. 2: 101 - 116
- Carvalho, L. (2006) *Governance challenges towards a knowledge economy: The case of the metropolitan area of Porto*. Rotterdam: European Institute for Comparative Urban Research, Erasmus University.
- Cooke, P. (2001) 'Regional innovation systems, clusters, and the knowledge economy'. *Industrial and Corporate Change*, Vol. 10, No. 4: 945-974.
- Craglia, M., Leontidou, L., Nuvolati, G., & Schweikart, J. (2004) 'Towards the development of quality of life indicators in the 'digital' city'. *Environment and Planning B: Planning and Design* Vol. 31, No. 1: 51-64.
- DBCDE. (2010) *National broadband network, overview*. Canberra: Department of Broadband, Communications and the Digital Economy.
- Department of Planning. (2005) *City of cities: A plan for Sydney's future*, Sydney: Department of Planning.
- Department of Planning. (2010) *Metropolitan strategy review: Sydney towards 2036* Sydney: Department of Planning.
- Ellen, I. G., & Hempstead, K. (2002) 'Telecommuting and the demand for urban living: A preliminary look at white-collar workers'. *Urban Studies*, Vol. 39, No. 4: 749-766.

- Fagan, B., & Dowling, R. (2005) 'Neoliberalism and suburban employment: Western sydney in the 1990s'. *Geographical Research*, Vol. 43, No. 1: 71-81.
- Gordon, P., & Richardson, H. W. (1997) 'Are compact cities a desirable planning goal?'. *Journal of the American Planning Association*, Vol. 63, No. 1: 95-106.
- Graham, S., & Marvin, S. (1996) *Telecommunications and the city: Electronic spaces, urban places*. London: Routledge.
- Haddon, L. (1998) 'The experience of teleworking: A view from the home. In P. J. Jackson & J. M. Van Der Wielen (Eds.), *Teleworking: International perspectives: From telecommuting to the virtual organisation* (pp: 118-135). London: Routledge.
- Haddon, L., & Brynin, M. (2005) 'The character of telework and the characteristics of teleworkers'. *New Technology, Work and Employment* Vol. 20, No. 1: 34-46.
- Handy, S. L., & Mokhtarian, P. L. (1996) 'The future of telecommuting '. *Futures*, Vol. 28, No. 3: 227-240
- Hill, E. (2003) 'Does it matter where you work? A comparison of how three work venues influence aspects of work and personal/family life.'. *Journal of Vocational Behavior*, Vol. 63, No. 220-241.
- Hotopp, U. (2002) 'Teleworking in the uk'. *Labour Market Trends* Vol. 110, No. 6: 311-318.
- Jacobs, J. (1961) *The death and life of great american cities*. New York: Random House.
- Kawai, Y. (2008) 'Work/life community by telework: Possibilities and issues in the case of loma linda'. *Journal of Green Building*, Vol. 3, No. 2: 128-139.
- Kim, C. W., & Mauborgne, R. (1999) 'Strategy, value innovation, and the knowledge economy'. *Sloan Management Review*, Vol. 40, No. 3: 41-53.
- Lafferty, G., & Whitehouse, G. (2000) 'Telework in australia: Findings from a national survey in selected industries'. *Australian Bulletin of Labour* Vol. 26, No. 3: 236-252
- Leccese, M., & McCormick, K. (Eds.) (2000) *Charter of the new urbanism* New York: McGraw-Hill.
- Mahjabeen, Z. S., K., & Dee, J. (2008). *Rethinking community participation urban planning: The role of disadvantaged groups in sydney metropolitan strategy*'. Paper presented at the Australia New Zealand Regional Science Association International Conference.
- Mitchell, W. J. (1999) *E-topia*. Cambridge, MA: MIT Press.
- NBN Co. Ltd. (2010) *Corporate plan 2011 – 2013*. NBN Co. Ltd.
- Negroponte, N. (1995) *Being digital*. New York: Knopf.
- Nilles, J. (1975) 'Telecommunications and organizational decentralization'. *IEEE Transactions on Communications*, Vol. COM-23, No. 10: 1142-1147.
- NSW Government. (2010) *Metropolitan transport plan 2010 : Connecting the city of cities*. Sydney: NSW Transport and Infrastructure.
- Olson, M. H. (1989) 'Work at home for computer professionals: Current attitudes and future prospects'. *ACM Transactions on Office Information Systems*, Vol. 7, No. 4: 317-338.
- Pratt, J. H. (2002) 'Teleworkers, trips, and telecommunications: Technology drives telework—but does it reduce trips?'. *Transportation Research Record: Journal of the Transportation Research Board*, Vol. 1817, No. 58-66.
- Property Council of Australia. (2004) *Metro strategy: A property industry perspective*. Sydney: PCA.
- Rowbotham, S. (1993) *Home-workers worldwide*. London: Merlin Press.
- Searle, G. (2006) 'Is the city of cities metropolitan strategy the answer for sydney?'. *Urban Policy and Research*, Vol. 24, No. 4: 553-566.
- Searle, G., & Bunker, R. (2010) 'Metropolitan strategic planning: An australian paradigm?'. *Planning Theory*, Vol. 9, No. 3: 163-180.
- Searle, G., & Pritchard, B. (2008) 'Beyond planning: Sydney's knowledge sector development. In T. Yigitcanlar, K. Velibeyoglu & S. Baum (Eds.), *Knowledge-based*

- urban development: Planning and applications in the information era* (pp: 184-202). Hershey, PA: Information Science Reference.
- Sullivan, C. (2003) 'What's in a name? Definitions and conceptualisations of teleworking and homeworking'. *New Technology, Work and Employment*, Vol. 18, No. 3: 158-165.
- Tremblay, D.-G. (2002) 'Balancing work and family with telework?'. *Women in Management Review*, Vol. 17, No. 3/4: 157-170.
- Van den Berg, L., Pol, P. M.-J., Russo, P., & Van Winden, W. (2004) *Cities in the knowledge economy: A literature review and a research framework*. Rotterdam: The European Institute for Comparative Urban Research, Erasmus University Rotterdam.
- Weijers, T., Weijers, R., & Soelman, E. (1992) 'Telework remains: Made to measure. The large-scale introduction of telework in the netherlands'. *Futures*, Vol. 24, No. 10: 1048-1055.
- Whitehouse, G., Diamond, C., & Lafferty, G. (2002) 'Assessing the benefits of telework: Australian case study evidence'. *New Zealand Journal of Industrial Relations*, Vol. 27, No. 3: 257-268.
- Yigitcanlar, T., Baum, S., & Horton, S. (2007) 'Attracting and retaining knowledge workers in knowledge cities'. *Journal of Knowledge Management*, Vol. 11, No. 5: 6-17.