

QUT Digital Repository:
<http://eprints.qut.edu.au/>



Yigitcanlar, Tan (2005) *The Making of knowledge cities : lessons learned from Melbourne*. In: International Symposium on Knowledge Cities 2005, 28-30 November 2005, Saudi Arabia, Medina.

© Copyright 2005 Arab Urban Development Institute

The Making of Knowledge Cities: Lessons Learned from Melbourne

Dr Tan Yigitcanlar

School of Environmental Planning, Griffith University, Brisbane Australia

t.yigitcanlar@griffith.edu.au

Abstract

Knowledge cities are seen as fundamental to the economic growth and development of the 21st century cities. The purpose of this paper is to explore the knowledge city concept in depth. This paper discusses the principles of a knowledge city, and portrays its distinguishing characteristics and processes. The paper relates and analyses Melbourne's experience as a knowledge city and scrutinises Melbourne's initiatives on science, technology and innovation and policies for economic and social development. It also illustrates how the city administration played a key role in developing Melbourne as a globally recognised, entrepreneurial and competitive knowledge city. Then this paper identifies key success factors and provides some insights to policy makers of the MENA region cities in designing knowledge cities.

1. Introduction

The last decade has witnessed a rapid evolution of the 'knowledge city' (KC) concept from early articulations of the 'technopolis' and 'ideapolis' into the

‘digital and intelligent city’. This concept involves developing a path towards more viable, vibrant, and sustainable development. KCs have embarked on a strategic mission to firmly encourage the nurturing of innovation, science and creativity, within the context of an expanding knowledge-based economy and society. In this regard a KC can be seen as an integrated city, which physically and institutionally combines the functions of a science park with civic and residential functions. It offers one of the desirable paradigms for the sustainable cities of the future.

There has been a considerable interest among the city administrations in regional development policies, which emphasise science and technological innovations (Oh 1995, 2002). KC is one of these innovations that promotes regional development through the development and advancement of technologies. Even though references to KCs can be traced back to about three decades (Ryser 1994; Knight 1995) and some ancestral cities have by origin a strong association with knowledge and wisdom, it was only recently that cities round the world started giving increasing attention to knowledge-based development (Carrillo 2004; Carrion et al. 2004; Ovalle et al. 2004).

The concept of KCs has caught the attention of international organisations, city administrations, research communities and practitioners during the last years. Major international organizations such as World Bank (1998), European Commission (2000), United Nations Organization (2001) and

OECD (2001) have adopted knowledge management frameworks in their strategic directions regarding to global development. This strategy clearly indicates that a link is created between knowledge management and urban development (Carrillo 2002; Komninos 2002; Ergazakis et al. 2004; Metaxiotis and Psarras 2004). The significant increase of the knowledge-based development strategies for the pursuit of metropolitan competitiveness of regions is evident in the OECD reports (OECD 2005). Globalisation, knowledge economy and knowledge society encourage city administrations to adopt these strategies for moving towards the KCs (For example Victorian Government 2002a; Barcelona City Government 2003; Dublin Chamber of Commerce 2004).

Advances in information and communication technologies (ICTs) are inevitably making societies and cities increasingly knowledge-based. The nature of city development changes accordingly as activities in the knowledge sector are becoming more important and they require conditions and environments which are different from commodity-based manufacturing activities (Knight 1995). To date many researchers have explored the characteristics of a variety of KCs (i.e. Barcelona, Sao Paulo, Stockholm, Delft, Melbourne) and developed knowledge-based development frameworks (For example Larsen and Rogers 1988; Smilor et al. 1988a; Kraaijestein 2002; Chatzkel 2004; Garcia 2004).

The aim of this research is to scrutinise the KC concept and discuss Melbourne's experience in the making of a KC. The methodology of this research includes two components. The first one is a comprehensive overview of the literature on KCs and its related issues. The second one is exploring Melbourne's approach and strategies in moving towards the KCs. This is realised by scanning published and unpublished government documents, other publications and interviews with government officials.

The rest of this paper is structured as follows. Section 2 covers a comprehensive overview of the literature on KCs. The section discusses the characteristics of KCs, and the implementation of knowledge-based development and the operational forms of KCs. Section 3 discusses key success factors in the process of developing KCs. Section 4 analyses Melbourne's experiences in knowledge-based development and scrutinise Melbourne's initiatives on science, technology and innovation and policies for economic and social development. It also illustrates how state and local administrations played key roles in developing Melbourne as a globally recognised, entrepreneurial and competitive KC. Section 5 provides some useful insights to policy makers in designing, developing or moving towards KCs.

2. The knowledge city concept

KCs play fundamental roles in knowledge creation, economic growth and development. Edvinsson (2003) sees KC as a city that was purposefully designed to encourage the nurturing of knowledge. The notion of KC is interchangeable to a certain degree with similar evolving concepts such as 'knowledge-based clusters' (Arbonies and Moso 2002), 'ideopolis' (Garcia 2004) or 'technopolis' (Smilor et al. 1988a; Smilor et al. 1988b; Dvir and Pasher 2004). KC is also seen as an umbrella metaphor for geographical entities, which focus on knowledge creation and covers other knowledge zones such as 'knowledge corridors', 'knowledge harbours', 'knowledge villages' and 'knowledge regions' (Dvir 2003).

Ergazakis et al. (2004) refer a KC as a city that aims at a knowledge-based development, by encouraging the continuous creation, sharing, evaluation, renewal and update of knowledge. This can be achieved through the continuous interaction between its citizens and also between them and other cities' citizens. The citizens' knowledge-sharing culture as well as the city's appropriate design, ICT networks and infrastructures support these interactions (Figure 1).

In its 'Strategic Plan of the Cultural Sector' Barcelona City Government (2003) lists the characteristics of a KC as a city that: (a) has instruments to make knowledge accessible to citizens; (b) has network of public libraries;

(c) provides access to new technologies for citizens; (d) has all cultural facilities and services with a central educational strategy; (e) has a high newspaper and book reading level; (f) has a network of schools connected with artistic instruction throughout its territory; (g) is respectful of the diversity of cultural practices of its citizens; (h) places the streets at the service of culture; (i) simplifies, through the provision of spaces and resources, the cultural activity of the community collectiveness and associations; (j) has civic centres that are open to diversity and that foster face-to-face relations; and (k) makes available to citizens from other territories all the tools required for them to express themselves.

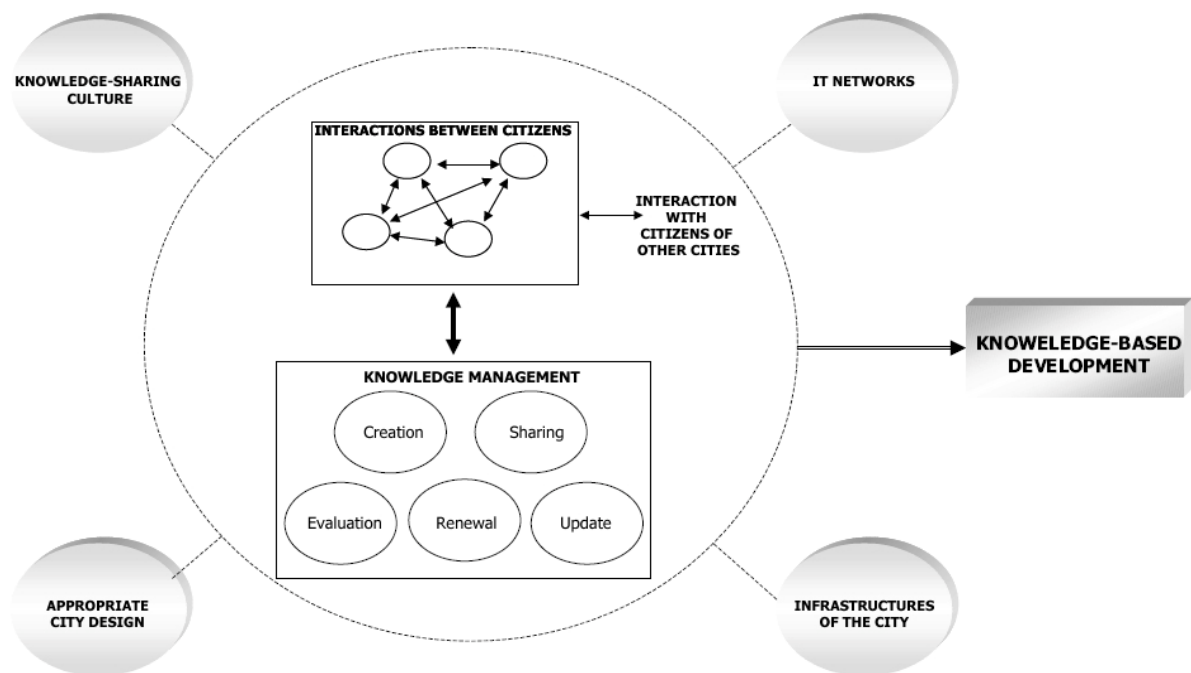


Figure 1: The KC concept (Ergazakis et al. 2004: 8)

The advantages of the knowledge-based development for the societies are emphasised by urban researchers and scholars from other disciplines (Arbonies and Moso 2002; Malone and Yohe 2002; Mansell 2002; Scheel

2002). The main benefit of KCs is that they function in such a way that is in favour of their knowledge-based development. Table 1 lists major economic, social and environmental benefits of KCs.

Economic and organisational benefits

Creation of more rewarding and well-paid employment;
 Faster growth in community's income and wealth;
 A more sustainable economy, by technological innovations and off-shore investment;
 Revitalization of traditional industries;
 A boost to the city's pride and confidence for the reinvestment of local capital into the local economy;
 Promotion of measured risk taking that helps build an entrepreneurial culture;
 Creation and innovation are central elements of its development; and
 Constant connection between universities, enterprise and creators.

Social and cultural benefits

Greater opportunities to share the wealth through investment in the public domain and better funding of social safety nets;
 Creation of knowledge communities that will provide 'just-in-time' knowledge when it is needed;
 Better education services and network of school connected;
 Creation of a tolerant environment towards minorities and immigrants;
 Leader in cultural production and the culture industry
 Instruments that make knowledge accessible to citizen; and
 Access to the new communication technologies for all citizens.

Physical and environmental benefits

Leader in the incorporation of premise of the digital area;
 An urban design and architecture that incorporate the new technologies;
 Uses and exploits its monumental, architectural and natural heritage as an attractiveness factor;
 Improved capacity to enhance and repair natural and built environment; and
 Greater community commitment to environmental decision making.

Table 1: Benefits of KCs (derived from Ergazakis et al. (2004) and Ovalle et al. (2004))

KCs are incubators of knowledge and culture and forming a rich blend of theory and practice within their boundaries, and are being driven by knowledge workers through a strong knowledge production (Work Foundation 2002). As societies become increasingly knowledge-based, the nature of city development changes because activities in the knowledge sector are becoming more important and they require conditions and environments which are very different from those required by commodity-based manufacturing activities in the production sector (Knight 1995).

In global cities, urban and regional planning has displayed a recent interest in designing policies to attract international investment and encourage economic growth in KCs. These policies also focused on creating social amenities and communities to attract knowledge workers (Martin 2001; Chen and Choi 2004). The key factors in attracting knowledge workers to KCs are mainly social relationships and quality of life of these cities (Mathur 1999; Leamer and Storper 2001; Robinson 2002; Santagata 2002).

Efforts in attracting business and knowledge workers have become the key factors to determine KCs' economic as well as social competitiveness (Rogerson 1999). As a result the quality of life in KCs is among the important issues in recruiting new employees (Patel 2001). In their research Galbraith and De Noble (1988) found that ambiance and availability of labour and property are among the key factors in deciding where to locate business investments (Chen and Choi 2004).

Cheng et al. (2004) argue that the recent research in economic geography and urban planning confirms a link between human capital and economic growth of cities. They mention Eaton and Eckstein (1997), Black and Henderson (1998) and Glaeser (2000), which suggest that access to scarce human capital is a key driver for firms for clustering in a particular location, and productivity gains can occur through knowledge spillovers when people are co-located.

3. Key success factors for knowledge-based development

It is estimated that by 2030, 60 percent of the world's population will be living in cities (Wagner 2001). As KCs creating skilled employment opportunities and economic growth, much of the urban development would occur around them. The major role of a KC is to provide its citizens with enabling conditions which foster knowledge creation, knowledge exchange and innovation. KCs also play a significant role in future business and in transferring new ideas into production. According to Chen and Choi (2004: 79):

Creation of knowledge-based cities lies in three interrelated processes that create and transfer tacit knowledge, [which are] local knowledge creation, transfer of knowledge from external sources, and transfer of that knowledge into productive activities.

Many factors are involved in the success of a KC, therefore, creation of a KC involves neither a simple nor a quick process. Carrillo (2003: 4-5) suggests the following factors to be considered in KC initiatives:

- a leadership committed with the sustainable wellbeing of its community;
- a critical mass of change agents having a sufficient understanding of the qualitative differences of KC;
- a conceptual and technical capacity to articulate and develop the social system of capitals;
- a rigorous and transparent state of knowledge-based social capital;

- a series of strategic initiatives to reach an optimal capital balance, and feeding on the best global practices; and
- an international network of relationships with leading entities in knowledge-based innovation.

SGS Economics and Planning (2002) identifies key success factors for the creation of KCs as targeting skills, research excellence, networks of commercial influence, collaborative and competitive business culture, infrastructure for connectivity, market access and awareness, and open, tolerant and merit based culture with an inclusive society.

Ergazakis et al. (2004) build on above mentioned factors and regroup the key success factors related to KC concept under six categories. These categories include political, strategic, financial, technological, societal and environmental factors (Figure 2). Among these categories the ‘political will’ is the most important factor as it is the initiator of any further action. The ‘strategic vision’ should incorporate and take into account the entirety of in-depth knowledge concerning the city status, and it results to a set of specific objectives and series of measures and actions. A strong ‘financial program’ is needed for the implementation of the strategic plans and to ensure appropriate funding for the initiatives and support programs. ‘Technological modernisation’ is necessary to supply a high-level ICT infrastructure for the city. Easy access to these technologies should be also provided for citizens.

‘Societal goals’ should take prime consideration as increasing the quality of life would attract more skilled workers and accelerate knowledge creation with in the city. Lastly, the ‘business environment’ and the market needs are significant factors and should be analysed thoroughly (Ergazakis et al. 2004).

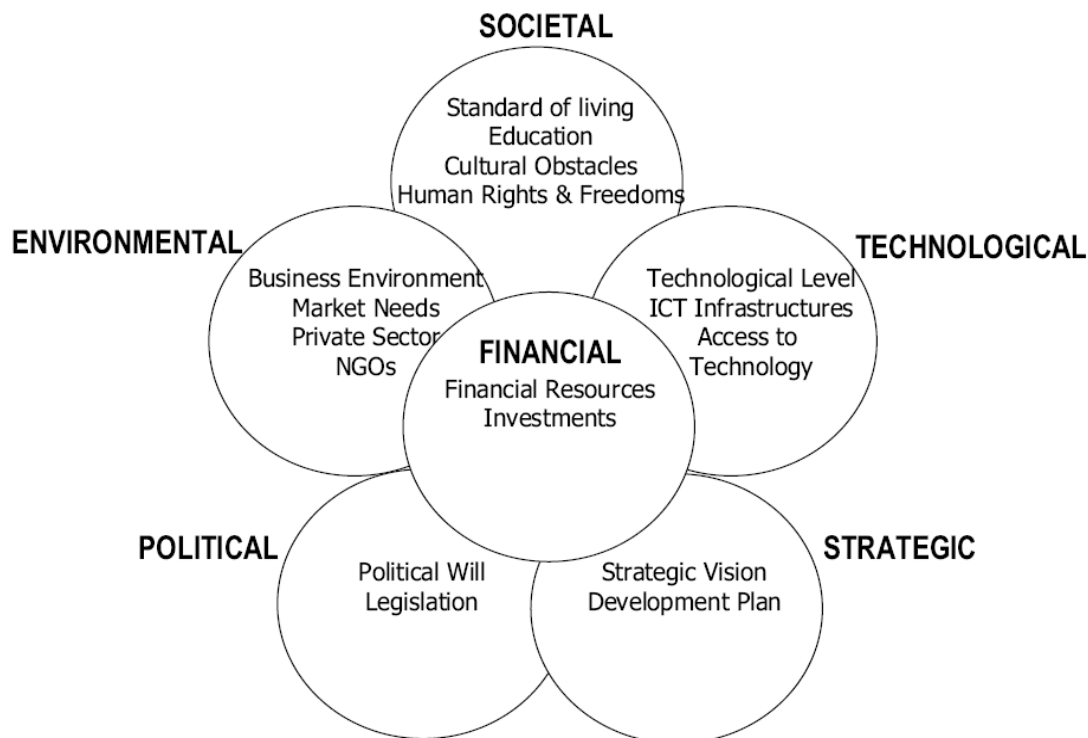


Figure 2: Success factors related to the KC concept (Ergazakis et al. 2004: 8)

Formation of the knowledge clusters is another important factor that would help moving towards the direction of transforming the city into a KC. Scheel (2002) proposes a knowledge clusters framework which is capable of gathering and empowering firms from industrial sector to develop necessary clusters for a KC. This framework empowers firms to: reach competitive leverages; link and align knowledge clusters to their empowerment external drivers (i.e. academia, banking, complementary industries and government); benchmark the cluster performance against the best practices and learn from

the gaps; and lead and integrate the well performing clusters into world class value systems (Figure 3).

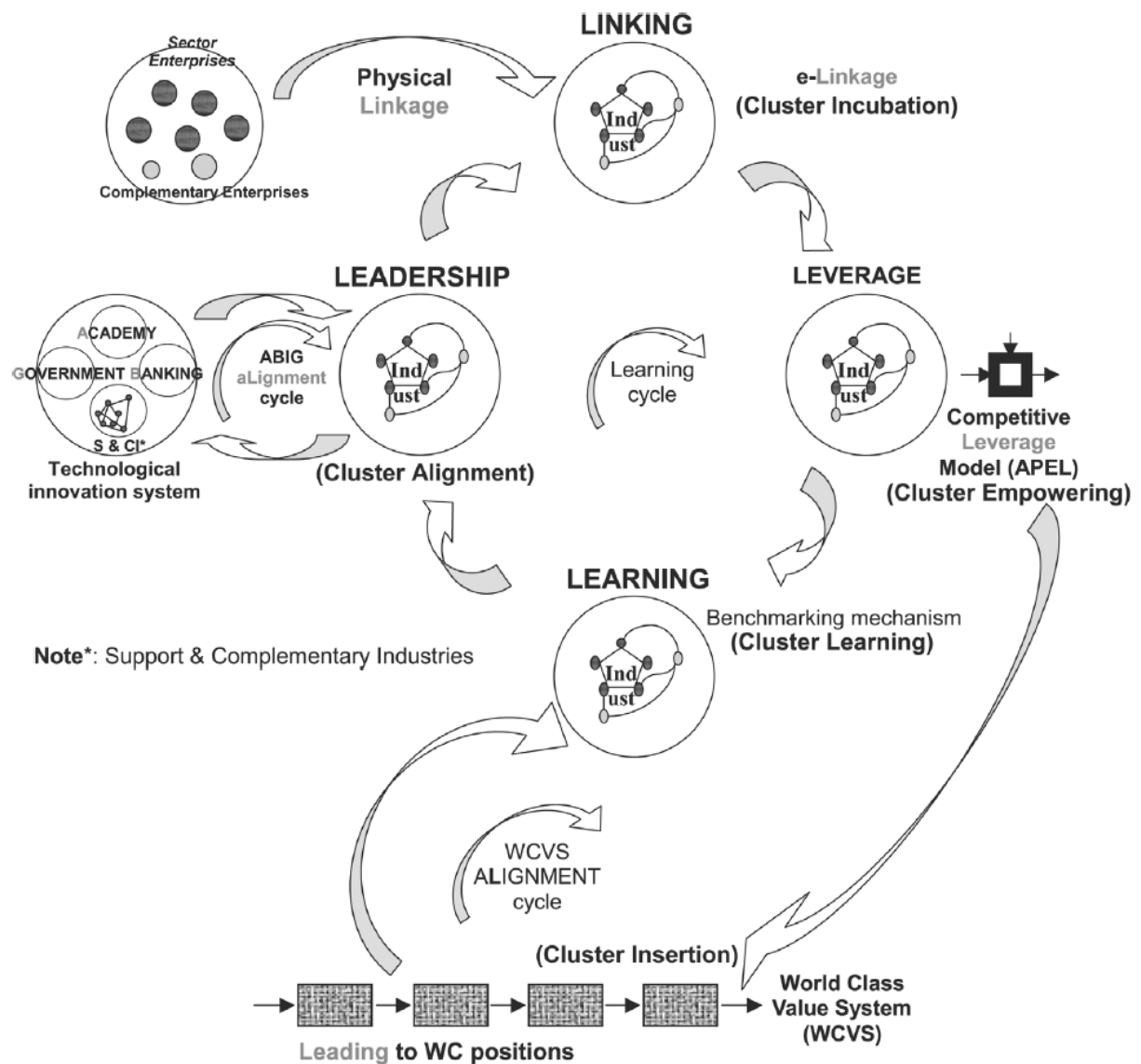


Figure 3: Knowledge clusters of a KC (Scheel 2002: 358)

The weaknesses of KCs have not been discussed extensively in the literature as it is being relatively a new concept. However, the digital divide, social exclusion and gentrification are among the important issues that need reconsideration for the success of a KC.

4. The Melbourne experience

Australia is one of the world's fastest growing economies. In 2004, Australia was the 13th largest economy in the world (Department of State and Regional Development 2005). Part of this success has to do with government and private initiatives that positioned Australia at the cutting edge of technology (Caldwell 2000). These initiatives are being co-ordinated by the Australian Government Information Management Office to lift the awareness of the benefits of the knowledge economy.

The number of Australian firms is increasing tremendously every year, as well as the revenue in Australian information industries (Frederick and McIlroy 1999). On the employment side growth of information jobs are rising remarkably. Additionally in terms of per capita use of the internet and e-government services Australia is one of the world's leading countries (Yigitcanlar 2003). However nowhere in Australia these development figures are more visible than in the State of Victoria and particularly in Melbourne. Melbourne is the capital and largest city of the State of Victoria. After Sydney Melbourne is the second largest city in Australia with a population of 3.6 million in its metropolitan area and 62.000 in the central city area.

In 1996 the Victorian Government adopted an information technology and multimedia strategy 'Victoria 21' to position state to attract inward investment and create jobs in the sector (Frederick and McIlroy 1999). With

the focus on international development 'Victoria 21' vision was revised in 1999 and the concept 'Global Victoria' was the result. But after the election the Labour Party replaced this concept with the 'Connecting Victoria' strategy (Multimedia Victoria 2002). With this strategy the new government is continuing the existing approach, but focusing primary at the following points: (a) building a learning society; (b) growing the industries of the future; (c) boosting e-commerce; (d) connecting communities; (e) improving infrastructure and access; and (f) promoting a new politics (Multimedia Victoria 2002).

In March 2002 the Victorian Government launched the e-government vision 'Putting People at the Centre'. It is a vision of broad reform and improvement government operations for the benefit of Victorian citizens and is based on the following four pillars: (a) substantially improving support and services to citizens; (b) providing better community engagement and more effective democracy; (c) using innovation in finding new opportunities; and (d) creating a framework for ongoing reform within government (Victorian Government 2002).

Victorian e-government site 'Victoria Online' portal represents the central government entry point for Victorians. 'The Channel' concept, 'Maxi' and 'Do It Online' applications, and various other portals and programs represent further major implantation attempts in building knowledge economy and

society. VicOne network is the infrastructural framework that is appointed by the Victorian Government. The 'Electronic Transaction Act 2000' and the 'Information Privacy Act 2000' are the major pillars of the Victorian data protection and electronic signature legislation. To abide the whole concept of e-government the Victorian Government also provides a number of support and maintenance programs (Blumhardt 2004).

Victorian e-government policy also focussed on bridging the digital divide by building ICT skills in the community, providing access, and on outreach such as helping the development of community and business websites through (Griffiths 2002: 3):

- Skills.net – more than 50,000 Victorians receiving internet training and access,
- VEEM – funding 39 councils to develop e-commerce projects among local businesses,
- Access@schools – 146 schools in rural areas to provide after hours community Internet access,
- Regional Connectivity Project – six centres in western Victoria providing internet training and access with an emphasis on e-commerce,
- My Connected Community – funding for community groups to develop their own websites, and
- Libraries Online – provides internet access at more than 900 work stations in public libraries across the state.

During the 20th century Australian cities were shaped mainly by manufacturing activities. According to Brain (1999) in the new millennium Australia's urban processes are now being shaped by the rise of 21st century occupations, which include business analysts, computing professionals, legal professionals, finance managers, media producers, ICT managers, and policy and planning managers. As a result of the spatial urban change in the city these jobs are concentrated in Melbourne's core (Dodson and Berry 2004). Melbourne City administration is well aware of these urban processes and municipal strategies are already developed and applied for the knowledge-based development of the Melbourne city.

One of the strategy tools for the knowledge-based development in Melbourne is the city plan. 2010 Melbourne City Plan aim to shape the future of the city as a prosperous, innovative, culturally vital, attractive, people focused, and sustainable city (Shaw 2003). The objectives of 2010 Melbourne City Plan reveal some hints about how city's future is planned as a KC. These objectives are (Melbourne City Council 2003: 34):

- Develop the city as a gateway for biotechnology in Australia and the Asia-Pacific region,
- Redress the skill shortage in the ICT sector and build the city's reputation as the ICT capital of Australia,
- Attract key strategic knowledge industry businesses to move to the city and support and facilitate innovative start-up businesses,
- Promote growth in the city's tertiary education services,

- Develop and promote the city as a place that understands, respects and operates successfully with other business cultures,
- Develop and promote the city's diverse and highly skilled workforce regionally, nationally and globally to attract global projects, and
- Enhance and promote the city's liveability and lifestyle options, including its affordable, high quality housing and educational centres and its rich and diverse culture, as some of the particular benefits of conducting business in the city.

Another strategy tool, the metropolitan strategy plan for Melbourne 'Melbourne 2030' builds on the similar visions for the city by focusing on nine key directions, which are a more compact city, better management of metropolitan growth, networks with the regional cities, a more prosperous city, a great place to be, a fairer city, a greener city, better transport links, and better planning decisions and careful management (Victorian Government 2002a). Melbourne 2030 provides for a strong and innovative economy, based on the view that all sectors of the economy are critical to economic prosperity. Economic clusters play a critical role in the success of knowledge-based development of the Melbourne city (Department of Sustainability and Environment 2003). Figure 4 illustrates distribution of these clusters inline with Melbourne's 2030 strategies.

According to Melbourne 2030, land use and transport infrastructure planning and delivery will be integrated in key transport corridors to ensure high-

quality access to ports and airports and efficient movement of freight and people (Department of Sustainability and Environment 2005). Figure 5 shows the strategies to enhance efficient freight movement with in the city.



Figure 4: Economic clusters of Melbourne (Victorian Government 2002a: 87)

Melbourne 2030 reads that “[o]pportunities will be protected for internationally competitive industry clusters seeking large landholdings, and for major logistics industries that need ready access to road and rail networks, airports and seaports” (p:37). This plan also expands logistics and communications infrastructure, including broadband telecommunications

services, to underpin development of the innovation economy which is vital to Melbourne’s success (Victorian Government 2002a).



Figure 5: Freight movement in Melbourne (Victorian Government 2002a: 84)

In Central Melbourne, the Central Activities District and Docklands are planned to remain a key location for high-order commercial development and the retail, and entertainment core of the metropolitan area (Figure 6). Continued housing development in Central Melbourne will take advantage of this area’s unmatched accessibility to jobs, facilities, recreational and cultural opportunities, adding to the after-hours vibrancy of the inner areas (Victorian Government 2002a). However, Birrel et al. (2005) argue that the planning

rhetoric and the economic reality of the plan are wide apart, and they state that:

It is true that high level business services are concentrated in the central city but with modern communications these no longer need to be in close proximity to the diverse industrial and commercial enterprise which use these services (p:6).

The traces of Melbourne's success in knowledge-based development are not only evident in these plans. The policies of designing Melbourne as a KC date back to early 1990. Social Justice Coalition's (1991) report on Melbourne's Docklands reveals that Melbourne had a vision of technology precincts and the development of these precincts were seen to provide an effective solution to economic problems. This report examines some of the lessons from overseas experience and discusses the applicability of these models for Melbourne.

Similarly Victorian Government Department of Planning and Development (1994) saw the prosperity increasingly depending on the ability of Melbourne to compete in the world economy. Melbourne metropolitan strategy acknowledged that the performance of Victoria is depending to a large extent on Melbourne's global economic competitiveness and also its ability to operate efficiently as an urban system focused on knowledge creation.

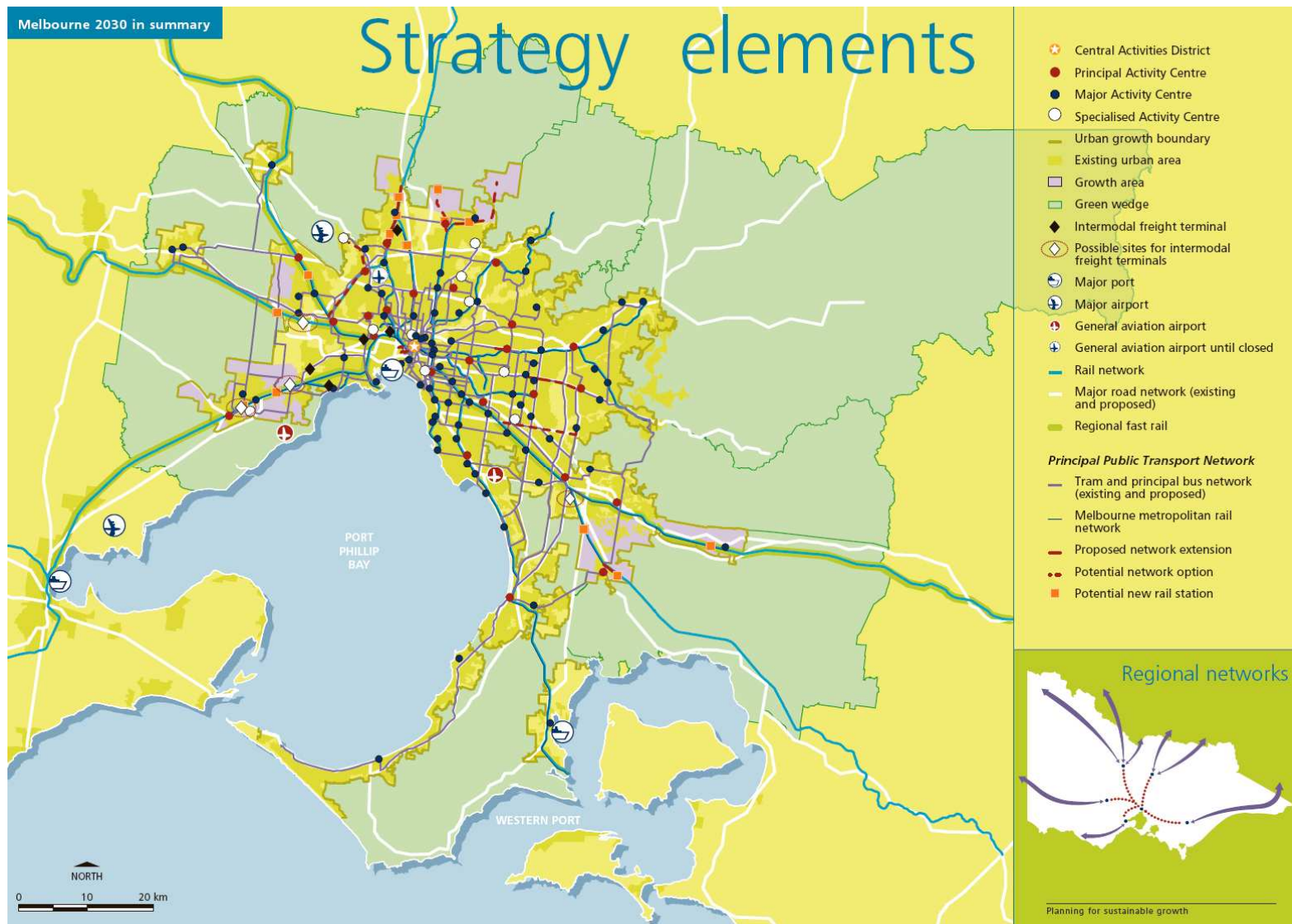


Figure 6: Strategy elements of Melbourne 2030 (Victorian Government 2002a: 6-7)

The state and city administrations' support for the communities in shaping their future is among the key aspects of Melbourne success. The Department of Victorian Communities is committed to working with and across all levels of government, community and business to provide the support and resources communities need to shape their own future. Some of the significant achievements for the 2003-2004 period include (Department of Victorian Communities 2004: 25):

- Local government partnership,
- Community strengthening projects,
- Jobs for young people program,
- Youth employment scheme,
- Community jobs program,
- Victorian indigenous community leadership strategy,
- Women's safety strategy,
- Public library assistance,
- Local government democratic reform act, and
- Community centres.

There are eight universities operating in Melbourne. They deliver highly relevant and accessible higher education courses and also conduct collaborative research with multinational companies such as Toyota, NEC, Ford, Glaxo Smith Klein, GE Money, IBM, Hawker de Havilland (Figure 7).

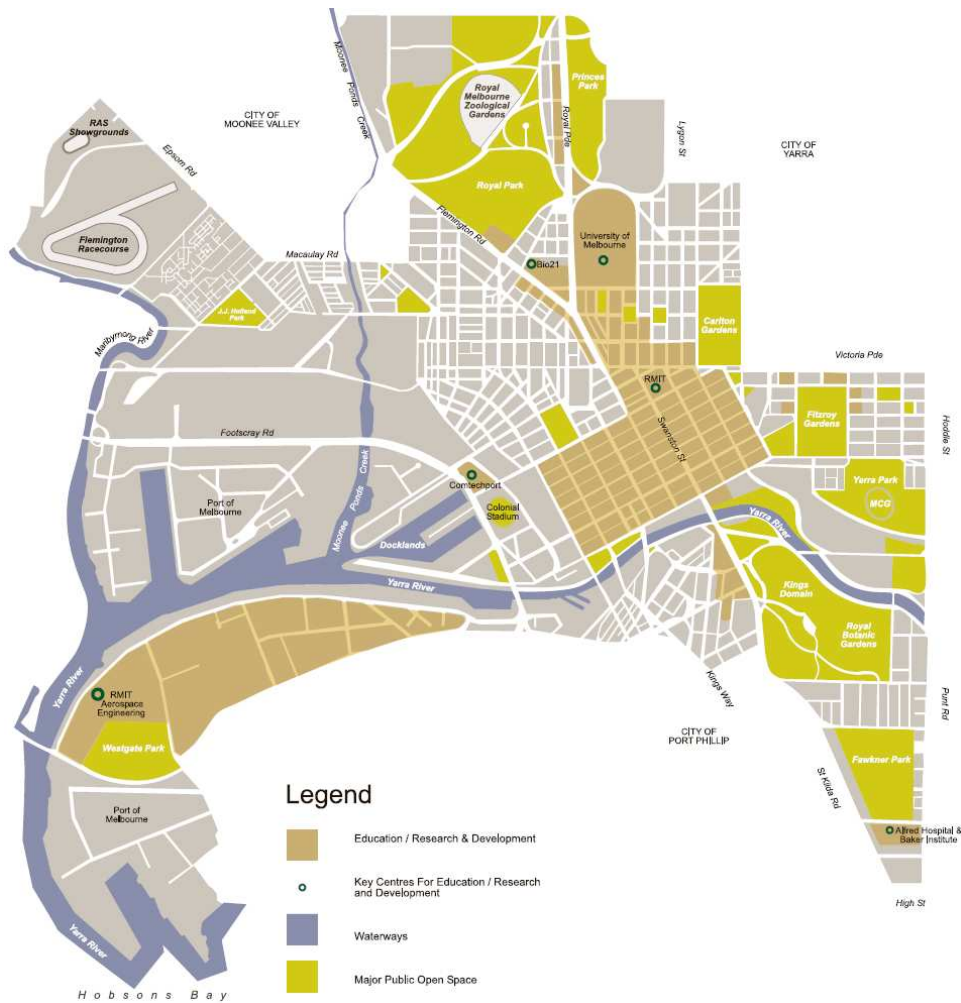


Figure 7: Melbourne’s research clusters (Melbourne City Council 2003: 35)

To boost sustainable business and trade in Melbourne Australian Federal Government, Victoria Government and Melbourne City Council have a number of business development and support funds and programs available for small and medium size and international companies (Melbourne City Council 2004). Melbourne has one of the largest concentrations of advanced industrial and scientific research in the Asia-Pacific region (Victoria Government 2004). The depth of research available is evolving into clusters of cutting-edge expertise not only in academia, but in sectors as diverse as nanotechnology, biotechnology, automotive, aeronautics, financial services

and design. Location and employment levels of some of these clusters are given in Figure 8.

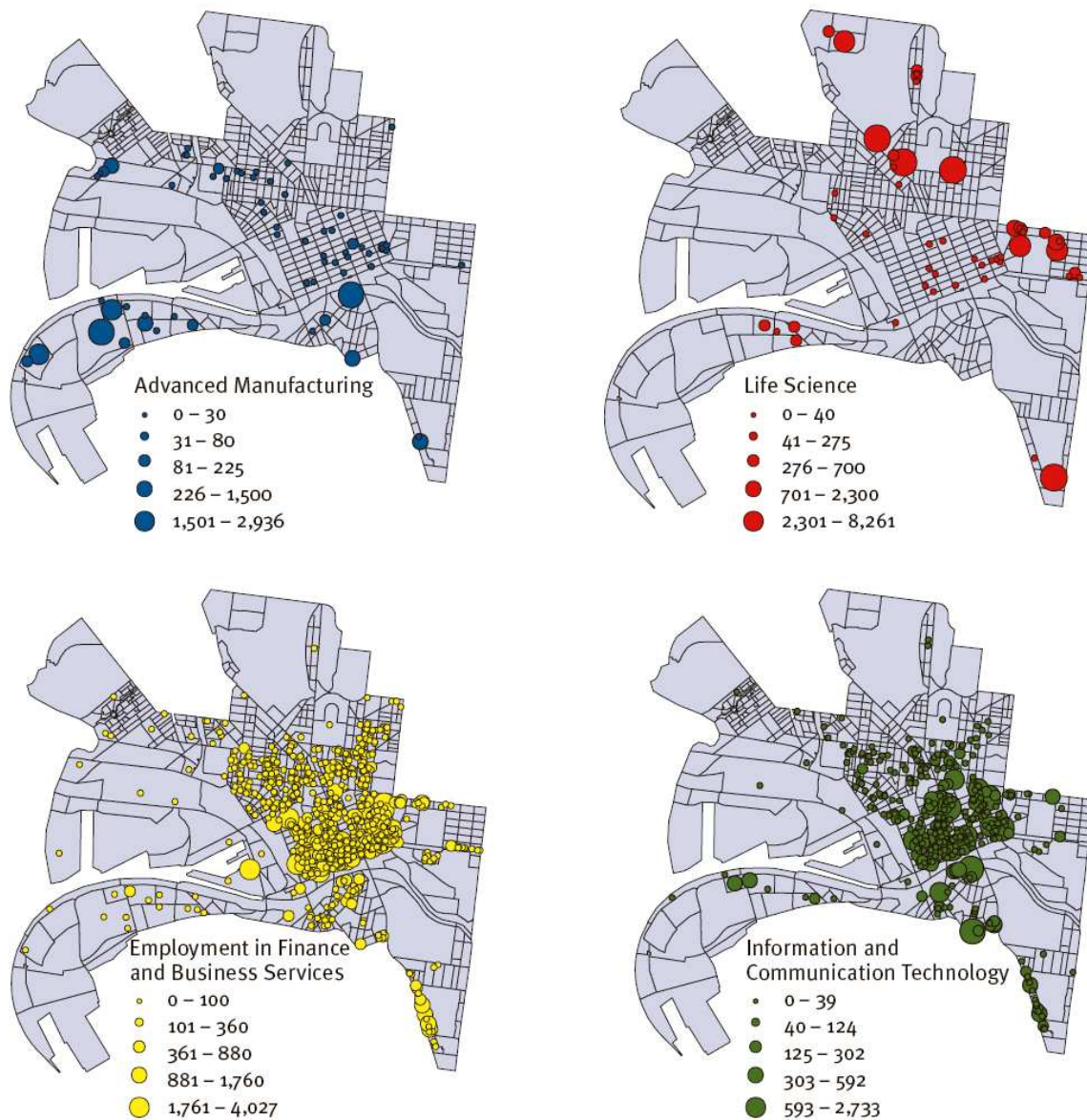


Figure 8: Melbourne’s knowledge clusters (City of Melbourne 2004: 7)

Melbourne’s success is not only limited to bringing all business, education, research and development clusters together, other clusters (i.e. tourism, sports, art and culture) have also great contributions to its transition into a KC. In 2004 everyday on average a total of 83.000 people visited Melbourne city. In a year this equates to over 30 million visitors to the city (City of

Melbourne 2005). Cultural and international sportive activities are among the major factors of Melbourne's tourism attraction. For instance, Melbourne Commonwealth Games and Australia Open Tennis Tournament are among the big international sportive events that Melbourne will host in 2006. While having a large and vibrant sports life, Melbourne is perhaps best known as a culture city. Melbourne is the home of a large number of art and cultural activities. For example, the Australian Ballet, the Melbourne Symphony Orchestra, the National Gallery of Victoria, and the Opera Australia.

5. Conclusions

KCs are becoming fundamental to the economic growth and development of the 21st century cities. The Melbourne experience has shown that research, education and development institutions, three tier government and communities are altogether help in the creation of the KC. The following processes that established in Melbourne would provide some useful insights to policy makers of the MENA region cities in designing, developing or moving towards the KC direction.

The research universities, particularly Royal Melbourne Institute of Technology, Monash University and University of Melbourne, play a pivotal role in the development of the KC by both educating and training the required workforce and professions for economic development through technology, and achieving scientific significance. They create, develop and

maintain new technologies for emerging industries, and also contribute to an improved quality of life and culture within the city. In addition, they attract large technology companies through industry collaboration schemes.

Australian federal government plays an indirect but a supportive role through financially sponsoring research and development for universities, and through onsite research and development programs. At the state level, Victorian government has a significant impact on the development of the KC through supporting education related development activities. At the local level Melbourne City Council has a noteworthy impact on company formation and relocation, quality of life, competitive rate structures and infrastructure. Continuity in federal, state and local government policies and their support for Melbourne's knowledge clusters will have an important impact on maintaining the momentum in the economic, social and cultural growth of Melbourne.

Large international technology companies are vital as they play a catalytic role in the expansion of the KC by maintaining relationships with major research universities, and becoming a source of talent for the development of new companies. These companies also contribute to job creation and indirectly support an affordable quality of life in Melbourne. Medium and small technology companies are extremely important in commercialising technologies, diversifying and broadening the economic base in Melbourne.

They also contribute to job creation, provide opportunities for venture capital investment and spin companies out of the university and other research institutes.

Policy-makers provide vision, communication and trust for developing consensus for economic development and technology diversification, especially through their ability to network with other individuals and institutions locally, nationally and globally. Besides, consensus among and between segments is essential for the growth and expansion and especially for affordable quality of life of the KC.

The making of a KC is a long and complicated process, but for sure it is the path to follow for the most sustainable urban development. Melbourne and other KC best practices can be guidance for cities that are willing to pursue knowledge-based development. However, it should not be forgotten that each city is unique and characterised by different cultural, economic and political conditions. Therefore, KC strategies need to be customised to the unique urban circumstances, competencies, opportunities and challenges.

References

- Arbonies, A. and M. Moso (2002). "Basque Country: The Knowledge Cluster." Journal of Knowledge Management 6(4): 347-355.
- Barcelona City Government (2003). Culture, The Motor of the Knowledge City: Strategic Plan of the Cultural Sector of Barcelona. Barcelona, Steering Council of the Strategic Plan of the Cultural sector of Barcelona.

- Birrel, B., K. O'Connor, V. Rapson and E. Healy (2005). Melbourne 2030: the need for a fundamental review. Melbourne 2030: Planning Rhetoric Versus Urban Reality. Melbourne, Monash University ePress.
- Black, D. and V. Henderson (1998). "A theory of urban growth." Journal of Political Economy **107**(2): 252-284.
- Blumhardt, E. (2004). E-Government in Victoria, Australia. Koblenz, University of Koblenz-Landau, Institute for IS Research.
- Brain, P. (1999). The factors and outcomes driving metropolitan development over the next quarter century. Melbourne, City of Melbourne and National Institute of Economic and Industry Research.
- Caldwell, A. (2000). Australian economy promoted as cutting edge. Australian Broadcast Company: The world today. Sydney.
- Carrillo, F. (2002). "Capital systems: implications for a global knowledge agenda." Journal of Knowledge Management **6**(4): 379-399.
- Carrillo, F. (2003). A note on knowledge-based development. Monterrey, Mexico, Centre for Knowledge Systems, Tecnologico de Monterrey.
- Carrillo, F. (2004). "Capital Cities: A Taxonomy of Capital Accounts for Knowledge Cities." Journal of Knowledge Management **8**(5): 28-46.
- Carrion, G., J. Gonzalez and A. Leal (2004). "Identifying key knowledge area in the professional services industry: a case study." Journal of Knowledge Management **8**(6): 131-150.
- Chatzkel, J. (2004). "Greater Phoenix as a Knowledge Capital." Journal of Knowledge Management **8**(5): 61-72.
- Chen, S. and C. Choi (2004). "Creating a Knowledge-Based City: The Example of Hsinchu Science Park." Journal of Knowledge Management **8**(5): 73-82.
- Cheng, P., C. Choi, S. Chen, T. Eldomiaty and C. Millar (2004). "Knowledge Repositories in Knowledge Cities: Institutions, Conventions and Knowledge Subnetworks." Journal of Knowledge Management **8**(5): 96-106.
- City of Melbourne (2004). Clue 2004: Census of Land Use and Employment. Sustainable City Research Branch. Melbourne.
- City of Melbourne (2005). City User Estimates and Forecasts Model (1998-2015). Sustainable City Research 2005. Melbourne.
- Department of Planning and Development (1994). Melbourne Metropolitan Strategy: An Outline of the Issues. State Government of Victoria. Melbourne.
- Department of State and Regional Development (2005). Business New South Wales. Sydney, New South Wales Department of State and Regional Development: Retrieved from www.business.nsw.gov.au on 6 September 2005.
- Department of Sustainability and Environment (2003). Urban Development Program: Report 2003.
- Department of Sustainability and Environment (2005). Challenge Melbourne: Issues in Metropolitan Planning for the 21st Century. The State of Victoria. Melbourne.
- Department of Victorian Communities (2004). Annual Report 2003-2004. Victoria. Melbourne.
- Dodson, J. and M. Berry (2004). "The Economic 'Revolution' in Melbourne's West." Urban Policy and Research **22**(2): 137-155.
- Dublin Chamber of Commerce (2004). Imagine Dublin 2020: Our vision for the future of the city. Dublin, Dublin Chamber of Commerce.
- Dvir, R. (2003). Innovation Engines for Knowledge Cities: Historic and Contemporary Snap Shots. Ecology.
- Dvir, R. and E. Pasher (2004). "Innovative Engines for Knowledge Cities: An Innovation Ecology Perspective." Journal of Knowledge Management **8**(5): 16-27.

- Eaton, J. and Z. Eckstein (1997). "Cities and growth: theory and evidence from France and Japan." Regional Science and Urban Economics **27**(4): 443-474.
- Edvinsson, L. (2003). Introduction to issues in Knowledge Management. Oxfordshire, Henley Knowledge Management Forum.
- Ergazakis, K., K. Metaxiotis and J. Psarras (2004). "Towards Knowledge Cities: Conceptual Analysis and Success Stories." Journal of Knowledge Management **8**(5): 5-15.
- European Commission (2000). Innovation Policy in a Knowledge-Based Economy. Brussels, Office for Official Publications of the European Communities.
- Frederick, H. and D. McIlroy (1999). "New Zealand and its Competitors in the Knowledge Economy." Telematics and Informatics **16**: 177-217.
- Galbraith, C. and A. De Noble (1988). "Location decisions by high technology firms: a comparison of firm size, industry type and institutional form." Entrepreneurship Theory and Practice **13**(Winter): 31-48.
- Garcia, B. (2004). "Developing Futures: A Knowledge-Based Capital for Manchester." Journal of Knowledge Management **8**(5): 47-60.
- Glaeser, E. (2000). The new economics of urban and regional growth. The Oxford Handbook of Economic Geography. Clark, Gertler and Feldman. Oxford, Oxford University Press: 83-98.
- Griffiths, M. (2002). Australian e-Democracy?: Its Potential for Citizens and Governments. Innovative e-Government for Victoria, Hotel Sofitel, Melbourne.
- Knight, R. (1995). "Knowledge-Based Development: Policy and Planning Implications for Cities." Urban Studies **32**(2): 225-260.
- Komninos, N. (2002). Intelligent Cities: Innovation, Knowledge Systems and Digital Spaces. London, Sponpress.
- Kraaijestein, M. (2002). Delft: From Industrial City to Knowledge City: Local Economic Policy in Delft, The Netherlands. Urban History Conference Edinburgh, Edinburgh.
- Larsen, K. and M. Rogers (1988). Silicon Valley: The rise and falling off of entrepreneurial fever, creating the Technopolis. Massachusetts, Ballinger.
- Leamer, E. and M. Storper (2001). "The economy geography of the Internet age." Journal of International Business Studies **32**(4): 641-665.
- Malone, T. and G. Yohe (2002). "Knowledge Partnerships for a Sustainable, Equitable and Stable Society." 2002 **6**(4): 368-378.
- Mansell, R. (2002). "Constructing the Knowledge Basin for Knowledge-Driven Development." Journal of Knowledge Management **6**(4): 317-329.
- Martin, R. (2001). "Geography and public policy: the case of the missing agenda." Progress in Human Geography **25**(3): 189-210.
- Mathur, V. (1999). "Human capital-based strategy for regional economic development." Economic Development Quarterly **13**(3): 203-216.
- Melbourne City Council (2003). Melbourne City Plan 2010 - Strategic Directions for the City. Melbourne, Melbourne City Council.
- Melbourne City Council (2004). Business Melbourne Statement 2004/2005. Sustainable Business and Trade Development Branch.
- Metaxiotis, K. and J. Psarras (2004). "E-government: new concept, big challenge, success stories." Electronic Government **1**(2): 141-151.
- Multimedia Victoria (2002). Connecting Victoria – A Progress Report 1999-2002, retrieved from www.mmv.vic.gov.au on 24 August 2005.
- OECD (2001). The new economy: beyond the hype, Final Report on the OECD Growth Project. Paris, Organisation for Economic Co-operation and Development.
- OECD (2005). Urban Development Policies, Organisation for Economic Co-operation and Development: Retrieved from www.oecd.org on 6 September 2005.

- Oh, D. (1995). "High-Technology and Regional Development Policy: An Evaluation of Korea's Technopolis Programme." Habitat International **19**(3): 253-267.
- Oh, D. (2002). "Technology-based regional development policy: case study of Taedok Science Town, Taejon Metropolitan City, Korea." Habitat International **26**(2): 213-228.
- Ovalle, M., J. Marquez and S. Salomon (2004). "A Compilation on Knowledge Cities and Knowledge Based Development." Journal of Knowledge Management **8**(5): 107-127.
- Patel, D. (2001). "Location, location, location." HR Magazine **46**(11): 168.
- Robinson, J. (2002). "Global and world cities." International Journal of Urban and Regional Research **26**(4): 531-554.
- Rogerson, R. (1999). "Quality of life and city competitiveness." Urban Studies **36**(5/6): 969-985.
- Ryser, J. (1994). *The Future of European Capitals: Knowledge Based Development. Germany, Goethe.*
- Santagata, W. (2002). "Cultural districts, property rights and sustainable economic growth." International Journal of Urban and Regional Research **26**(1): 9-23.
- Scheel, C. (2002). "Knowledge Clusters of Technological Innovation Systems." Journal of Knowledge Management **6**(4): 356-367.
- SGS Economics and Planning (2002). *Regional business development literature review. Melbourne, Department of Transport and Regional Services.*
- Shaw, K. (2003). "Discretion vs. Regulation and the Sorry Case of Melbourne City Plan 2010." Urban Policy and Research **21**(4): 441-447.
- Smilor, R., D. Gibson and G. Kozmetsky (1988a). "Creating the Technopolis: High-Technology Development in Austin, Texas." Journal of Business Venturing **4**: 49-67.
- Smilor, R., G. Kozmetsky and D. Gibson (1988b). "Technology and Economic Development in the Modern Technopolis." Technology in Society **10**: 433-445.
- Social Justice Coalition (1991). *Picking Winners: Melbourne's Urban Development Game. A Case Study in Planning: Melbourne's Docklands.* Melbourne.
- United Nations Organisation (2001). *Making new technologies work for human development The Human Development Report.* New York, United Nations Organisation.
- Victoria Government (2004). *Victoria: A highly educated population that produces research at the cutting edge of innovation*, retrieved from <http://invest.vic.gov.au/News/Case+Studies/Research.htm> on 31 August 2005.
- Victorian Government (2002). *Putting People at the Centre*, retrieved from www.egov.vic.gov.au/pdfs/people_at_the_centre.pdf on 24 August 2005.
- Victorian Government (2002a). *Melbourne 2030: Planning for Sustainable Growth.* Melbourne, Victorian Government Department of Infrastructure.
- Wagner, C. (2001). "Megacities of the future." The Futurist **35**(6): 8-9.
- Work Foundation (2002). *Manchester: Ideopolis? Developing a Knowledge Capital.* London, The Work Foundation.
- World Bank (1998). *World development report - knowledge for development.* New York, World Bank.
- Yigitcanlar, T. (2003). Bridging the Gap between Citizens and Local Authorities via E-government. Symposium on E-government: Opportunities and Challenges, Muscat, Sultanate of Oman, Arab Urban Development Institute.