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URBAN SPRAWL IN AUSTRALIA: AN ANALYSIS OF SYDNEY URBAN PLANS AND RELATED DEBATE

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Introduction

I first approached the topic of town planning when attending the academic course of “Urban Design” of professors Umberto Bloise and Stefano Recalcati during the my bachelor degree in architecture followed by the course of “Town Planning Design Workshop” with professor Stefano Boeri. In my master degree I have been selected to participate in the International mobility program of Politecnico and moved to Sydney to attend one year of architecture at the University of Technology, where my overwhelming passion in urban design turned on attending the course of “Architectural Histories and Theories: Urbanism and the City” with professor Tarsha Finney.

In the lectures of professor Finney the recent urban development of the city of Sydney was the theme of an individual analysis in which many aspects as the relation between city and industry, technology progress and population growth have been taken in account to explain the urban circumstances of the city, gathering the goals of actual plans for Sydney future expansions.

It was landing at the Kingsford Smith airport of Sydney, watching out of the plane window while approaching the runway, that I felt extremely charming the western settlement pattern under me, broadly scattered in the space, sometimes

following arterial highways and in other case completely dispersal and without a clear planning intention. This episode became determinant in the decision of exploring further the topic of urban expansion focusing on the sprawl affecting the city of Sydney.

The books “Sprawl: A Compact History” by Robert Bruegmann and “When America became suburban” by Robert Beauregard were fundamental in order to enter the topic of urban sprawl probing its drivers and impacts first in a broader international background and then in America. I have been successively familiar with critics’ approach supporting urban sprawl or compact city in the book “Urban Ecology, Innovations in Housing Policy and the Future of Cities: Towards Sustainability in Neighbourhood Communities” by Jan Scheurer, where I learnt also notions regarding urban ecology and practical examples of sustainability in town design.

I have been lucky enough to obtain the collaboration of Amber Williams, Executive Director of the Department of Planning and Environment of the Australian State of the New South Wales, who provided me information regarding the activity of Government in urban planning including the current plans of the city, as the “A Plan for Growing Sydney”, and also the collaboration of the Department of Infrastructure and Regional Development of Australian Government which provided me the 2014 publication “The evolution of Australian towns” and the 2013 publication “Population growth, jobs growth and commuting flows; A comparison of Australia’s four largest cities” and that let me appreciate the urban changes in the last century of the country and a focus of the changes in the major cities, including Sydney.

Historical Atlas of Sydney database was crucial to obtain digital versions of maps and associated documents and regulations of the city of Sydney, from the first City Survey Plan in 1833 to the most recent plans of the 21st century while academic professors interviews posted online have been indispensable to bring to light the debate regarding the topic of urban sprawl in Australia, of who is supporting the urban scattered growth and who prefers talking about compact city and sustainable approaches.

Although most of the bibliography was in English, I came across some articles in French and German, and I consulted also books in Italian.

The second part of the 20th century has been affected by a fast growing development of urban process, especially in those countries where the modern economic progress has led to a broad spatial expansion of the cities. In some nations, as United States of America and other Western countries as Australia, city expansion has created a new suburban area outside the historical inner city embracing low-density, car-independent and limited-function communities, which has been called "*urban sprawl"*.

The topic of this thesis is the knowledge of this modern area, strictly related to the social, economical and political influences on human life, developed in five chapters where different aspects will be taken in account.

The first chapter will analyse first the process of urbanization of the primary worldwide cities of the beginning of the 20th century and secondly examine in depth the peculiarities of recent sprawl in those countries where its understanding became emblematic, as the United States where urban sprawl has been broadly criticized and other countries belonging to the European Union. An attempt of defining sprawl will also be offered, mentioning the main characteristics of the parts of the city that usually are attributed with sprawl.

Progressively, in the second chapter, the investigation is considering the development of Australian town in the last century under the major branches of human activity as economy performances, technology and transportation, industry and its associations with the city, social behaviour, geography influence and history changes, local good, service and amenity.

The thesis is later taking in account the four biggest cities for population of Australia, intensely affected by suburban development in the last century, which are Sydney, Melbourne, Perth and Brisbane. Once briefly summarized the urban history of the Oceanian country, the study moves to the Town and Country Planning Acts exploring the strategies put in practise in the past by National and Local Government and successively those related the future challenges in meticulously planning against uncontrolled urban sprawl.

Sprawl prerogatives of being a low-density region, inducing population to use the car causing huge pollution emission and invading the rural land, has led to the raise of strong disagreements by critics. Intense worldwide debates full the literature trying to understand the processes that brought to sprawl and others trying to propose solutions. The third chapter first presents the effects of urban sprawl on

people and on the city, drivers and impacts, and secondly takes in account the two most popular positions pro and against urban sprawl, illustrating the highlights of their expressions and focused points.

The interest of urban sustainability is warmly significant because of Habitat III, the United Nations Conference on Housing and Sustainable Urban development, that is taking place in Quito, Ecuador, in October focusing on the implementation of a "New Urban Agenda", in line with the bi-decennial cycle (1976, 1996 and 2016) by the United Nations General Assembly. The main topics of the Conference are to secure renewed political commitment for sustainable urban development, assess accomplishments to date, address poverty and identify and address new and emerging challenges.

Moreover, it will also be discussed in this chapter the topic of sustainability related to urban development since cities, according to an assessment conducted by Nation Union's Department of Economic and Social Affairs, even if occupying only the 2% of planet surface are responsible of the 80% of CO_2 emissions. In fact more than half of the world population, almost 3,4 billions people, lives in urban space, and it is estimated that they can reach 6,3 billion by 2050[1]. Cities and urban agglomerations represent the future and their growth is also related to the extreme exploitation of resources and environment causing degradation and congestion. For this reason, the improvement of sustainable living is highly the main goal of national and local administration and the understanding of actual urban transformation is an indispensable requirement in order to introduce political actions to manage urban sprawl.

A contemporary academic debate and planning practise is discussed in the last part of the third chapter, embracing four main schools: the group of Sprawl Apologist, promoting sustainability in the suburban development mainly in United States and Australia; the movement of Smart growth, attempting to achieve a new vision of urban growth in the New World; the proponents of the Compact City, picturing substitution of densification and functional enrichment in existing urban areas for peripheral growth; the group of Dispersal pragmatists, focusing on the transformation of urban-regional periphery to sustainability and the supporters of the

[1] United Nations Department of Economic and Social Affairs, DESA (2014) "*World's population increasingly urban with more than half living in urban areas*", United Nations, New York

Transit-Oriented Development, claiming the importance of the access to public transport and high-density development around it.

After having examined the urban development of sprawling cities, been through a deep analysis of Australian urban settlement and major cities evolutions and faced the international debate around urban sprawl, the thesis takes in account the particular study case of the city of Sydney.

The knowledge of the previous chapters is indispensable to face the topic of the urban planning of Sydney, as a city playing the crucial node of a recent and fast-growing nation, that has been invested by an enormous population growth and job position request and, at the same time, wants to keep the reputation of a high-qualified, environmentally friendly, tourism catcher modern city.

In conclusion, the farthest intention of this document is neither to find a solution to the problem of sprawl nor outline causes and effects of sprawl on humans which are an end in themselves, but to understand the process and prerogatives of urban sprawl, its worldwide differentiations, how it has developed, how it has been contemplated by critics and how it influenced populations.

The thesis will identify the Transit-Oriented Development as the specific type of urban consolidation process taken in account for the city of Sydney, above the broader international debate regarding urban planning between urban sprawl and compact city. The political intentions are to create a networked and multi-centred city, based on high-density residential area around rail, subway and main bus stations.

The thesis will also support the creation of a duality of centres for the city, consisting of the Sydney CBD, tourism, financial and cultural node, and the new Parramatta CBD, medical and new technology node. Connecting them, the Global Economic Corridor will host the highly-specialised centres based on the theory of Transit-Oriented Development, and consequently will accommodate much of the predicted 70% of new houses belonging to the urban consolidation process.

The previously called “Outer Suburbs” in the West Sydney are nowadays the priority area of investment of the current plan, leaving the reputation of being “unprofitable” and turning out as the crucial land for the future investment of the city.

This thesis has also identified a social elements threatened by urban consolidation and related planning process, called “sense of place”, recognising the

emotional relationships that are established through existing cultural elements and how they affect residents' sense of belonging. The urban consolidation, as a rapid stimulator for change, is perceived as a threat to residents' sense of place, due to the abrupt change to the built that is altering the socio-cultural aspects of the suburbs at a fast rate.

The dynamic mutation of urban settlement around the world with different influences, does not give a clear prevision about how the reality of the city is going to shape speed, prerogatives and in the future. However, as the previous chapters explained about the role of economy and society in influencing the urban settlement, the city and its parts are subjugated to continuous transformations, somewhere towards the intensification of the phenomenon of urban sprawl, somewhere towards the opposite phenomenon of Compact city, somewhere dominated by both urban sprawl and recentralisation in a cyclic process[2].

[2] Champion T. (2001), "urbanisation, suburbanizationm counterurbanisation and reurbanisation", in Paddison R. & Lever W. F. (Eds.), "Handbook of urban studies", London, pages 143-161

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Figure chart

PART 1

Introduction to suburban sprawl

1.1 Defining urban sprawl

Characteristics associated with sprawl have been observable in most prosperous cities throughout history, becoming evident in Europe as in United States, as it is the preferred settlement pattern everywhere in the world where there is a certain measure of affluence and people have some choice in how they live.

At the very first step of immersing in the broad topic of sprawl and its history, the first difficulty facing the examiner is defining it. In fact, it has been asserted that there is not a specific definition of the phenomenon and nary a clear single-word translation into other languages, while is indicating an attitude more than any actual conditions.

Moreover the noun *"sprawl"* has often been related to a negative association and at first blush suggests something unpleasant: the evident asymmetry, the sinking "p" at the beginning and the leaping "l" in the end, the yawing diphthong in the middle even confer an awkward meaning.

Professor at the University of Illinois at Chicago, specialist on architecture and researcher on the architectural firm Holabird & Root, Robert Bruegmann defines sprawl in a very basic and objective way possible:

> *"Low-density, scattered, urban development without systematic large-scale or regional public land-use planning"*[3]

The decrease in density in affluent cities is perhaps the single most important fact in urban development of our era. In fact, there are just a few urban areas in the world today that exhibit densities like those that characterised most large cities from Mesopotamian where almost 60.000 people per square kilometres was a standard urban density. It is rare to find densities of even 10.000 people per square meters in affluent cities today, and most urban dwellers live in densities much lower still[4].

Trying to describe this vast change in urban density through centuries is extremely complicated. In any city at any given time some parts will be increasing in density as the density in others declines and every chance in one part of the urban region will have effects through every other part.

European Environment Agency (EEA) in the report concerning urban sprawl in Europe mentions sprawl as an area located mainly into the surrounding agricultural areas, leading the edge of urban growth for which planning control of land subdivision is needed. EEA claims that sprawl indicates the inefficiencies in development, which is patchy and scattered, and highlights the consequences of uncontrolled and discontinued growth, giving the example of the most clear European sprawl in the area of northeast France, Belgium, Luxemburg and Northwest Germany, overlaid with population density[5].

Sprawl has been associated also with "uncoordinated growth", mentioning a community without concerning for its consequences on people and on environment,

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[3] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago

[4] Department of Economic and Social Affairs (2014), "*Population, rate of increase, birth and date rates, surface area and density for the world, major areas and regions*", Demographic Yearbook, United Nations Statistic Division

[5] Joint Research Centre (2006) "*Urban sprawl in Europe. The ignored challenge",* European Commission, EEA Report, Copenhagen

becoming extremely unsustainable[6]. Introducing sprawl with disgust was founder of the arts and crafts movement William Morris denouncing wretched suburbs in the fairest and most ancient cities[7]. It has been also associated with "bad aesthetics" and "bad economics"[8].

Sprawl for the last 150 years has been related to a multitude of features as low-density, single-use development, scattered development, leapfrog development, car-dependent community area, at the point where seems more logic defining sprawl with indicators rather than definitions and characteristics.

In the next segment, the attempt is to recall the history of worldwide urban planning with the focus on sprawling area.

[6] Batty M., Besussi E., Chin N. (2003), *"Traffic, urban growth and suburban sprawl",* Centre of Advanced Spatial Analysis, University College London, London

[7] Morris W., Morris M. (2012) *"The collected works of William Morris. With introductions by his daughter May Morris. Sign of change. Lectures on Socialism",* Cambridge University Press, Cambridge

[8] Whyte W. (1958) *"The exploding metropolis",* University of California Press, Los Angeles

1.2 History of sprawl

1.2.1 Early sprawl: *from the ancient era to the World War I*

One of the most important facts about cities from the beginning of recorded history until recent years is the clear distinction between urban and rural way of living.

The walls, present in most of the early cities, establishes the border in which a visitor would see a dense mass of buildings, congested streets and a rich and highly dynamic urban life offering many choices while a few miles outside the walls, the same visitor, may see nothing but rural villages witnessing the slower pace of daily activities and the environment less quick to change.

However, in almost every era in a urban history, there was a transitional zone between the two, a region that accommodated activities and individuals that are still connected with the social and economic life of the city but that couldn't be

lodged within the walls along with industries that were too space consuming or too noxious to be tolerated within the city itself.

This area supported other activities of a very different sort as the houses of affluent or powerful families who had the means to build and maintain working farms or villas or second houses where they could escape the congestion, noise, contagion and social unrest that have characterized the centre of most large cities. Those houses were permanent or settlements, sometimes seasonal or occasional. Sometimes they were compact, composed of small villas surrounded by gardens in a pattern we would today call suburban or dispersed with imposing houses set on a large acreage with a rural appearance that we would call today exurban.

Although this pattern characterized earliest cities know to us as Babylon and Ur, the best evidence we have is Rome. At the beginning of the Christian era, this city had an estimated population of 1 million people within the city walls that used to contain an area of 16 square kilometres, giving a density of more than 60.000 people per square kilometres. It is hard even to imagine the consequences of crowding of this order in cities with its primitive water supply, waste removal and transportation services[9].

Additionally, must be mentioned that social and economic inequalities were much greater at that time than today and this influenced the urban distributions of buildings: a small group of wealthy Romans lived in spacious palaces taking most of the space within the walls leaving relatively little spot for neighbourhoods that housed the vast majority of families, with little direct sunlight and ventilation, wastes leaving the apartments walls and flowing into the streets. As a direct consequence, periodic epidemics wiped out large part of urban population[10].

As mentioned before, just outside the walls of Rome is located the *suburbium*, meaning what was literally below or outside the walls. Due to costs reason, people preferred to live in this part of the city, in poorly built dwellings worse than those within the walls because of the lack to municipal services and pollution generated by industries. At the same time, some of the wealthiest Romans could afford to maintain, in addition of their city residences, elegant villas near the

[9] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago

[10] Morley N. (1996) *"Metropolis and hinterland: The city of Rome and the Italian Economy, 200 BC–AD 200"*, Cambridge University Press, Cambridge

seas or on the hills. Those dwellings served not only as weekend houses but for very privileged aristocracy also were the residence for long part of the year.

It appears that the forces that work toward increased concentration and those fuelling a drive toward decentralization are, like so many other aspects of urban life, related to economic cycles. Although little is known about these cycles, it appears that throughout history, at least until recently, as most cities went throughout their most intense phase of early economic growth, the process od concentration tended to dominate over that of decentralization as residents from outlying areas were drawn into the city centre. Then, as the economy matured, the balance shifted as the number of residents who were able to move outward to the suburbs and exurbs exceeded the number coming from the agricultural hinterland to the centre[11].

We can use London as a good example of this process and largest and economically most dynamic city in the Western world in the early modern period. In the 17th and 18th centuries due to changes in agricultural production and expanding urban job marked based on new modes of industrial production there was a vast influx of new residents off the land while due to commercial activities at constantly higher densities in the centre a move of people out to the periphery. Because of the expanding economy and increase of profits, Londoners were able to build house beyond the walls[12].

The most important direction for affluent suburban growth was the west, to the area that is now London's Central West End, where aristocratic families developed their land as private leading a calm and quiet life compared to the centre. At the same time, there was a movement also to the east side, but of a vastly different kind with large-scale warehouse and industrial activities. Two different Londons were consequently observed: the airy west and the congested and the unpleasant east.

Moreover the exodus of families from central London to suburbia and exurbia was counterbalanced by the continued arrival of poor newcomers from the countryside. Despite the trend of London was both centralization and decentralization, already from the 17th century the second process was the most relevant and as a result the centre lost population while the periphery started to get packed.

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[11] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago
[12] Hall P. (1998) *"Cities in civilisation"*, Pantheon Books, New York

The peculiarity of London, that made it completely different from other continental city as Paris for example, is that being an island and relatively peaceful allowed to dispense with the defensive walls that constrained outward development[13]. As a result, London has been one of the less dense large cities in the world.

In the late 19th century, all northern European cities, had shown a tightly pattern of streets in the historic core surrounded by broad boulevards where the outer walls have been removed, usually earlier in the century, then widely spaced villa districts to one side of the city and industrial suburbs to the other; beyond, small commuter suburbs and then exurban villages with their surrounding estates.

In United States the process was even more rapid as immigrants accumulated enough money to allow them to get better housing in less dense neighbourhoods. In New York, for example, they moved over the East River to Brooklyn or to northern Manhattan using inexpensive public transportation to reach the city centre where manufacturing firms were enlarger their facilities and retail establishments dispersed. The density in the centre plummeted rapidly.

When the walls came down, in American cities and European ones, urban developments were distributed as follows[14]:

- The first suburban involved outward expansion all along urban periphery, creating a pattern of growth like annual rings on a tree. Those suburban district, usually located on the other side of a town and occupying much less space per capita were modest blocks for the working class and factories for industrial production;
- The second kind of suburban appeared along railroad lines radiating outward from the city, creating small commuter suburban settlements that appeared on maps like pearls on a necklace.
- The exurban, at the very edge, occupied by large estates of aristocracy with urban services and good railroad connections back to the city centre.

The most important variable was not if those cities were in America or Europe, but rather when they reached economic maturity. Manchester and Liverpool

[13] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago
[14] Ibid.

in the United Kingdom behaved as Chicago and Baltimore in the United States, as examples of the more heavily industrialized cities in the 19th century, extending rapidly their borders in every direction as quarters of upper and middle bourgeoisie.

1.2.2 Midwars sprawl: *from World War I to World War II*

The outward dispersion of people and businesses during the boom period of 1920s became more consistent, but with the rush to the urban periphery not longer confined primarily to the wealthy and powerful people the process could have been considered a mass movement[15].

In United Kingdom cities, thousands of families of modest income were able to move out from congested central neighbour hoods to build single-family detached houses or "semidetached" on the periphery[16]. The result was an explosion of growth in urban land area.

In London for examples, between 1921 and 1931 the population increased about 10% while the developed area increased by 200% and as a consequence the density clearly fell. New industrial complexes and house were created along the major highways out of the city in the countryside Half of the journeys to work became suburb-to-suburb rather than suburb-to-centre. This trend has been observed also in other European cities as Hamburg and Stockholm. In every case the outward movement of affluent and middle-class families left major concentrations of poor people in the oldest and densest parts of the inner city and the inner suburbs.

Beyond the suburban, the exurban continued to flourish since, while it continued to be the preferred place for wealthy city dwellers building villas and weekend houses, a growing numbers of middle-class and working-class families that could afford cheaper but farer away house from the city was registered

In cities like Vienna and Paris in order to counteract this trend, public authorities had undertaken massive efforts to redevelop and upgrade parts of the inner city. The new luxury apartments blocks facing tree-lined boulevards built during the reign of Napoleon II in Paris and the massive apartment buildings along the

[15] Whitehand J. W. R., Carr C. M. H. (2001) *"Twentieth.Century suburbs: a morphological approach"*, Routledge, London
[16] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago

"Ringstrasse" in Vienna fuelled a major trend toward of gentrification or the replacement of the existing population by one enjoying a higher economic and social position in society[17].

In North America this mass movement was even more visible: the option of living in a single-family detached house in the suburb became possible in United States for a large portion of American urban population when unprecedented levels of affluence, excellent public transportation and rising automobile ownership were observed. The expansion and intensification of retail and office uses in the old downtowns let to a decrease in the number of people living in the city of New York City, Boston and Philadelphia[18].

But it is in the West coast of United States that the biggest suburban growth happened, as in Los Angeles where in the end of the 1920s the majority of the families lived in a single-family home owning an automobile. Many industrial concerns in older cities moved from loft buildings immediately adjacent to old downtown into new one- or two-storey buildings in industrial parks farther out the city and retail activities and commercial districts appeared within or just outside central cities because of retail decentralization[19].

As in Los Angeles, Detroit experienced a similar trend with the creation in 1920s of the New Centre, a mixed commercial and residential district adjacent to Midtown and located 5 kilometres north of the city's downtown with business destination, convenient to be reached from both downtown and remote areas. In this district, General Motors founded its headquarters 1923 offering the first economic automobile in the United States. Detroit not only became the world's automobile capital but also was so attractive for many immigrants that triplicated its population from 465.000 in 1910 to 1.560.000 in 1930[20].

In America no growth and movement could have been possible without the notable expansion of infrastructure, development and modernisation of transport service and completion of urban amenities as paving streets, sidewalks, streetlights

[17] Smith N. (1966) *"The New urban frontier: Gentrification and the revanchist City"*, Routledge, London
[18] Ware C., (1935) *"Greenwich village"*, Houghton-Mifflin Co., New York
[19] Fogelson R., (1967) *"The fragmented metropolis, Los Angeles 1850-1930"*, University of California Press, Berkeley
[20] Woodford A., (2001) *"This is Detroit 1701-2001"*, Wayne State University Press, Detroit

and sewers. This decade also saw a remarkable expansion of highway system in many cities included the national superhighway network[21].

In North America during the period of the two wars forces, while decentralization triumphed definitely over the forces of centralization, important developments in urban thoughts started to turning into analysis and mapping of the modern cities by groups of sociologists, as Robert Park and Ernest Burgess from the University of Chicago (***Figure 1.1***).

Figure 1.1 – Burgess-Park's concentric "ecological" zone model

According to the two American professors, residents, as they become more affluent, would tend to move constantly outward in the urban era, replaced by newer and less affluent residents. They progressively illustrated their process that was called "ecological", by a famous diagram of a series of concentric circles, described as follows[22]:

- The core of the diagram, the inner circle, the central business district, called the "*loop*";
- The second circle, "*zone of transition*", which housed many of the city's poorest residents in communities like Chinatown, Little Sicily and Ghetto;
- The third circle, "*zone of independent workingmen's homes*", for those escaped the deterioration closer to the centre.

[21] U.S. Public Roads Administration (1939) *"Toll roads and free Roads"*, Government Printing Office, Washington DC

[22] Burgess E. W. (1925) *"The growth of the city: An introduction to a research project"* University of Chicago Press, Chicago

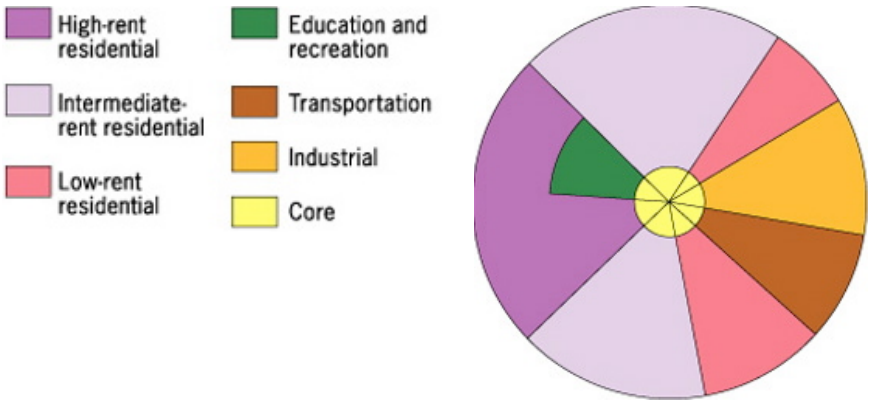
- The fourth circle, "*residential zone*", for single-families;
- The fifth circle, "*commuters zone*" of suburbs and satellite cities located from 30 minutes to one hour from the CBD.

The Park-Burgess model quickly became a standard way for many Americans planners and urban experts, to conceive the city, as describes in a very simply form, the dynamics of urban growth[23].

This model was soon criticized due to the too much generalization in capturing the complexity of the reality of American cities. In fact, while Park-Burgess was developing the "ecological" model, large cities no longer had a single centre. For instance, new business districts, as Englewood in Chicago and Hollywood in Los Angeles, had already appeared. Moreover, wide variations of income and social class are not taken in account: in Chicago, areas around the "loop" contained both the Gold Coast with wealthy residents and slums like Little Italy.

For those reasons, land economist Homer Hoyt in the late 1930s provided modifications to the Park-Burgess model creating a similar one, called "sectorial model" (***Figure 1.2***). The concept of the dynamic ecological succession with residents leaving the core remains, but he chose to segment the urban area into different wedges.

Figure 1.2 - Hoyt's "sectorial" model



Those sectors represent the "arteries" of the outward expansion, as railroads, highways, sea ports and tram lines showing that higher levels of access meant higher land values and, as consequences, residential areas became low-income housing close to the industrial and manufacturing sectors while middle- and high-income

[23] Burgess Ernest W. (1925) *"The growth of the city: An introduction to a research project"* University of Chicago Press, Chicago

households were located furthest away from these functions24. In conclusion, Park-Burgess model with the variation by Hoyt remained the standard view of urban development in the United States.

1.2.3 Postwar sprawl: *from World II to 1970s*

After World War II, differences between American and European sprawl have been observed and the two most important reasons are described as follows:

- One main reason was the immediate necessity of rebuild European cities after bombing and this gave to public planners the opportunity to exercise a great deal of the new authority: planning elite could reshape the city and hinterlands that they had been advocating.
- The second more important reason is the increase and decrease of population and the degree of affluence. In fact while some European realities experienced a decline in their population, as Hamburg, Vienna, Glasgow, Birmingham, in United Stated the population in the two decades after the World War II increased from 150 to 200 million. Los Angeles, leads this trend, jumping from 4 to 8 million, while Miami, Phoenix and San Jose leaded the growth of urbanized area that became three, four and five times respectively. Family units were able to secure for themselves more living space and consequently a sharp reduction in densities at the core of the cities and a growth in suburban areas has been observed.

Critics revealed that the postwar suburbanization and sprawl although were different in scale compared to the earlier ones, were not different in kind: in fact the first has been just an extrapolation of the process visible in London since the 17th century or in America cities in the early 19th [25].

William Levitt, an American real-estate developer, with his highly publicized techniques became in this period the most successful builder pushing further the process of reducing costs through large-scale mass-production and standardization. He developed large groups of houses, called "Levittown", sold for

[24] Hoyt H. (1939) *"The Structure and Growth of Residential Neighbourhoods in American Cities"*, Federal Housing Administration, Washington, 1939

[25] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago

not more than 10.000 dollars, and for this reason he was assigned the nickname "the king of suburbia" as he make build a house every 16 minutes[26].

Regarding postwar suburban landscape, a remarkably chance occurred. The average size of the lot at the turn of the 19th century in a typical residential neighbourhood in a large northern United States city as Chicago was 25x100 feet (almost 230 square meters). By the 1920s the size of a middle class house was 50x100 feet (almost 460 square meters), doubling in 20 years and by the 1950s a typical suburb lot reached 100x100 feet (almost 920 square meters) making 4 times bigger in 50 years. This means that at the beginning of the 19th century sixteen single family housing units could fit in acre, while in the mid of the same century just four could fit[27].

According to many historians, the postwar years saw the wholesales abandonment of public transportation, especially urban rail systems in favour of the automobile: the sift from mass to individual and from public to private transportation happened because it allowed ordinary middle-class citizens to achieve privacy and more free mobility[28].

In united States while the populations was exploding outward, the older central cities struggled as never before. Large industrial cities of the Northeast lost big numbers of industrial jobs ad manufacturing companies, confronting the problems of old facilities, high unions salaries and competition from abroad, which closed the door and moved the operation to the suburbs. For instance, Newark, Detroit and San Louis and other reached crisis stage with the jobs and residents that disappeared; buildings were demolished or destroyed by fire.

By the 1970s it was observed by critics that most American central cities might implode due to the inner city decline and the suburb rise, while other claimed that the city centres were just being reordered. Most of the housing destroyed after World War II was old and unsanitary and they have been abandoned in order to move to much better housing further out, while the housing that haven't been demolished

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26 Schneiderman M. (2008) *"William Levitt: the king of suburbia",* The Real Day, Issue Article, New York Estate News

27 Ibid.

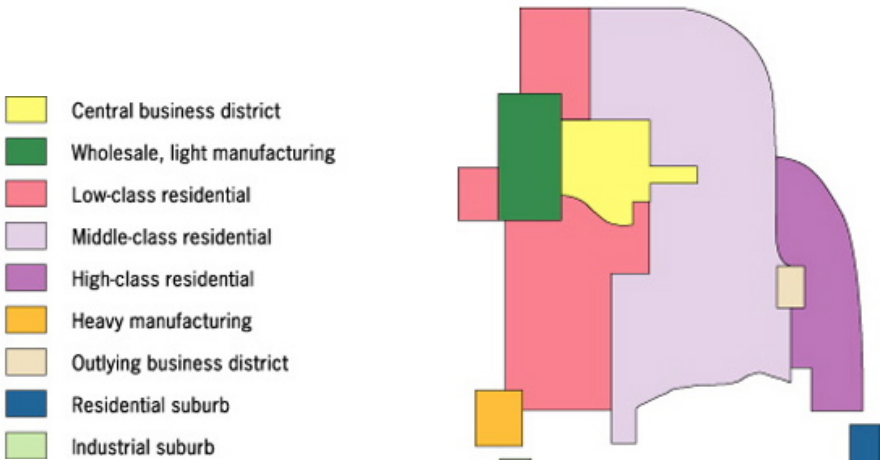
28 Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago

have been occupied by the waves of new immigrants who were grateful for what native populations no longer wanted. Consequently, house prices dropped[29].

In other cases, the process of gentrification sped up significantly. Entire districts as Boston's Back Bay and South End, Philadelphia's Society Hill and Rittenhouse Square, Washington's Georgetown and Old Town Alexandria, Chicago's Old Town and Lincoln Park and San Francisco's North Beach and Western Addition were transformed with the arrival of new demographic groups as young artists, gay people and bohemians in the vanguard, followed by single professional people and childless couples. This was the period that launched the slogan "back to the city" describing a process of central city revitalization. This trend, characterized by an increased property value made by the middle-classes, upper and lower, who bought properties in the working class neighbourhoods to obtain elegant and expensive residences[30].

Trying to represent the dispersal and regrouping of the activities occurring in postwar period, geographers Chauncey D. Harris and Edward L. Ullman created the "*multinucleated*" model[31] (***figure 1.3***).

Figure 1.3 – Harris-Ullman's "multinucleated" model



This representation has been considered soon inadequate because it assumes that each city, with all its peripheral development, was a discrete entity. In fact this

[29] Jones C., Hoppe L. (1969) *"The urban crisis in America",* Washington National Press, Washington DC, 1969

[30] Ruth G. (1964) *"London: aspects of change",* MacGibbon $Kee, London

[31] Harris C. D., Ullman E. L. (1945) *"The nature of cities",* in *"The annals of the American Academy of Political and Social Science",* Sage Publications Inc., Vol 242., pages 7-17

model did not take in account the tight clustering of cities that formed a single urban region in places like the industrial belt between Cleveland in Ohio and Pittsburgh Pennsylvania, the Pottery belt in England, the coal-mining region of the Ruhr Valley in Germany. All those were clearly part of a single urban systems but without a single dominant centre. Another example is the complex new York, Newark and New Brunswick, were Newark can be both the satellite of the New York as a city in its own and the same time districts as Oranges or Montclair can be the suburbs of Newark and New York since they are very close to the first city and farer away from the second one, but still have gravitational pull[32].

This particular urban pattern was well described in the postwar decade by the geographer Jean Gottmann coining the term "*megalopolis*" to describe the vast multicentred northeastern coast of the United States, from Boston to Washington, creating the most ancient American urbanisation corresponding to the original colonies. This area in formed by metropolitan areas with alternating woodlands, counting 40 million people and 700 kilometres wide[33].

1.2.4 Worldwide modern sprawl: *from 1970s*

From 1970 although some common characteristics can be assessed in worldwide urban settlement, due to other prerogatives related to population behaviour, political decisions and national fashion, urban areas will be analysed separately. Therefore in this chapter are going to be distinctly examined West and East Coast of United States, United Kingdom with the London case, France with the Paris case, Italy, other European countries, touching upon Australian cities which are going to be deeply described in the follow chapter.

The Central Business District, although seems it has not changed over the past fifty years, has been transformed in the way it works, specially in Europe: if those city centres once dominated the economic life of urban region, today they just contain a small share of the population or jobs in the metropolitan area.

The situation that emerged was the gentrification of the core and the sprawl at the edge, as the flipsides of the same coin: while manufacturing, ware housing and

[32] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago

[33] Gottmann J. (1957) *"Megalopolis. The urbanized Northeastern seaboard of the United States",* The twentieth Century Fund, New York

back-office functions left the core centres and moved to the urban periphery after World War II, the underutilized buildings were razed or converted as parking, providing new activities and functions[34].

The historic core of most American cities has not disappeared, remaining a government and finance centre and culture and tourism focus. For instance, San Francisco, London and Paris after experienced gentrification, became a sort of "*boutique*" downtown, catching international business and tourism and settling luxury retail and providing accommodations for privileged residential population.

Sometimes, historic districts have also multiplied and owners have restored and cleaned facades, postwar light fixtures and benched have been substituted.

The centres were living a kind of revival. The number of individuals interested in buying a house in the farthest subdivision declined dramatically and the central cities and older established suburbs began to regain interest. At the same time the process of leaving of manufacturing and warehousing functions had a consequence the reduction in street congestion and pollution and the cities became more attractive.

Along with the CBD also the remainder of the old central cities, what can be called "*Inner City*" or "*Central City*", have being transformed by the new forces with a huge loss of habitants and gentrification, both in Europe and North America.

During the last four decades, the creation of new suburban communities at the edge provoked a chain reaction of people in the metropolitan area who moved and adjust. In the process, come suburbs gained people, other lost, and in some on them the housing prices rise and in other fell, depending on the location, kind of housing stock and economy. The difference between city and suburb has become unclear as the second became more diverse and heterogeneous than ever[35].

Social conditions have also influenced the process of moving, as the fact that single-family houses have become much larger than they were in the postwar decade and as the average size of a new house has more than doubled from less than 100 square metres from the 1950 to more than 200 square metres by 2000[36].

There is a greatly expanded number of suburban row houses, garden apartments, retirement apartments and other kinds of multifamily construction along

[34] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago
[35] Ibid.
[36] Colley S. (2010), "*Housing trends, 1950-2000",* Stephen Colley Architecture, Texas

with shopping centres, business parks, office parks and large suburban "*edge cities*"[37], all connected with freeways. The term "edge-city" was popularized in 1991 by American journalist and professor Joel Garreau, who also established the rules for a place to be considered an "edge-city" as having 5 million square feet (465 square meters) of leasable office space, having 600.000 square feet (56.000 square meters) of leasable retail space, having more jobs than bedrooms.

Must be mentioned that although there has been a process of decentralization from the central cities to the adjacent suburbs, at the same time there always has been a inverse process of in-migration, in particular young people. Suburbs have experienced centrifugal and centripetal forces, and on of the best instance that helps to see this is in the development of parks and centres, as in the shopping or business centre and the industrial or office park[38]. In fact, people has always desired to enjoy the benefits of the functions and opportunities given by the centre and at the same time the tranquillity of the parks.

Along with the creation of the suburban parks due to growing decentralization, meant to be used as business venue, the birth of the new suburban centres occurred. Shopping centres became to incorporate new activities once dispersed in the metropolitan area, as doctors, dentists, office buildings, theatres, hotels and restaurants.

The similitude between United States and European cities regarding the time required to reach work has continued along the decades ahead. In fact, according to a recent study by IBM published on ZDNet.com assessing some the most international cities about their "global commuter time" have claimed that not only the traffic had got worse in the past three years before the article was published, but that European cities as Madrid, London and Paris in matter of commuting time, time stuck in traffic, stress level, increase-decrease of traffic along the years, have similar behaviour of US cities as Los Angeles and New York, while cities belonging to the BIRC countries (Brazil, Russia, India, China) have been assessed as worse in the world in matter of the previous parameters, as Beijing, Moscow, New Delhi and Sao Paolo[39].

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[37] Garreau J. (1992) *"Edge city: Life on the New Frontier",* Anchor Books, New York

[38] Button K.h, Reggiani A. (2011) "*Transportation and economic development challenges",* NECTAR Series on transportation and Communications Networks Research, Northampton, MA, USA

[39] Foynes D. (2013) "Top 10 cities with the worst commute", *Lifestyle,* Live&Invest News

Moreover, beyond the suburbs in European and United States areas, there is a band as a ring of prosperous communities, called "Commuter town"[40]. Grown as primary houses on lots larger than those in suburbia or weekend or summer locations, under the pressure of the strong decentralization they started to be considered large areas neither suburban nor rural connected back to the central cities even when they extend dozen or even hundreds of miles out from them[41]. It is considered to be the most dynamic part of many urban areas, having strong economic and social influences by the central city. Due to the increase in wealth, automobile use and communication technologies these areas have become areas more popular for middle-class families, increasing in land area more than in population as lots size.

American and European cities are known in literature for being such different kinds of urban space, but analysing the centre of Phoenix with Paris, for instance, seems like comparing a 5 year old boy with a 25 years old man[42]. It is true, in fact, that the first is extremely younger and with less changes in urban space, but the way of changing over time of both cities is quite the same. Moreover American cities, even if younger in age compared to the Europeans, have experienced a quicker decentralisation showing suburbanization 50 years before the latter.

What is clear is that suburbanisation and decentralisation are not exclusive of United States but belong to all those worldwide cities becoming more affluent in population, showing at the edges the same characteristics of urban distribution, superhighways, supermarkets and subdivisions. Landing in Minneapolis or Madrid, Buenos Aires or Bangkok, Sydney or Stockholm, the view is showing the same vast territory of suburban development, low factories, warehouse and shopping centres and wherever the has been both rising affluence and some kind of land market, the trajectory of settlement patterns has been similar.

1.2.4.1 United States of America

In United States, the process of gentrification, industrial conversion and historic preservation has been even more substantial than in Europe. In San Francisco, for instance, the gentrified area has expanded to virtually every part of the

[40] Spectorsky A. C. (1955), *"The exurbanites",* Lippincott, Philadelphia,
[41] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago
[42] Ibid.

city[43]. Influx of immigrants, initially poor but willing and able to build bustling communities with higher densities than the most of the rest of the populations, moved into many European and American cities, as the Vietnamese neighbourhoods of suburban Los Angeles to the African-Caribbean enclaves of New York City[44].

Along with the process of moving to the edge by working-class families, affluent people have been less wiling to move farther outward, particularly since many prestigious jobs in business, law, medicine and cultural and non-profit worlds have either remained or have been newly created in the traditional centres and close-in suburbs, and the automobile commuters from the edge to the centre have become longer and more unpleasant. While neighbourhoods improves and property values climb, the initial gentrifiers, often gay people, artists and other bohemian types are pushed out by rising rents and their place are taken by single or childless professionals at the top of the income scale who can afford to send their children to private school[45].

With the sprawl accelerating and the suburbs expanding at very low densities, farms and forests were transforming into housing subdivisions. In Chicago, for instance, between 1970 and 1990 the metropolitan area grew in population by only 4% while in land grew by 46%, provoking the reaction of sprawl opponents claiming the destruction by new subdivision under construction in cornfield flattering farms and forests, replacing country roads with highways[46].

In Chicago the early attempt to estimate and counteract sprawl has been more emblematic, as it was supposed that land use should be compared to the growth of population. In fact, the increase of land has been due to new houses and this suggests that there would have been an increase of number of households, but pagnationwide the number of people per household sank from 3,14 in 1970 to 2,63 in 1990, suggesting that the rapid expansion in the need for housing occurred even

[43] Power M.; Guido D. (2002), *"Downtown Rebound: Downtown Residential development Swells",* in *"Builder*", Gale Group, Farmington Hills, Michigan

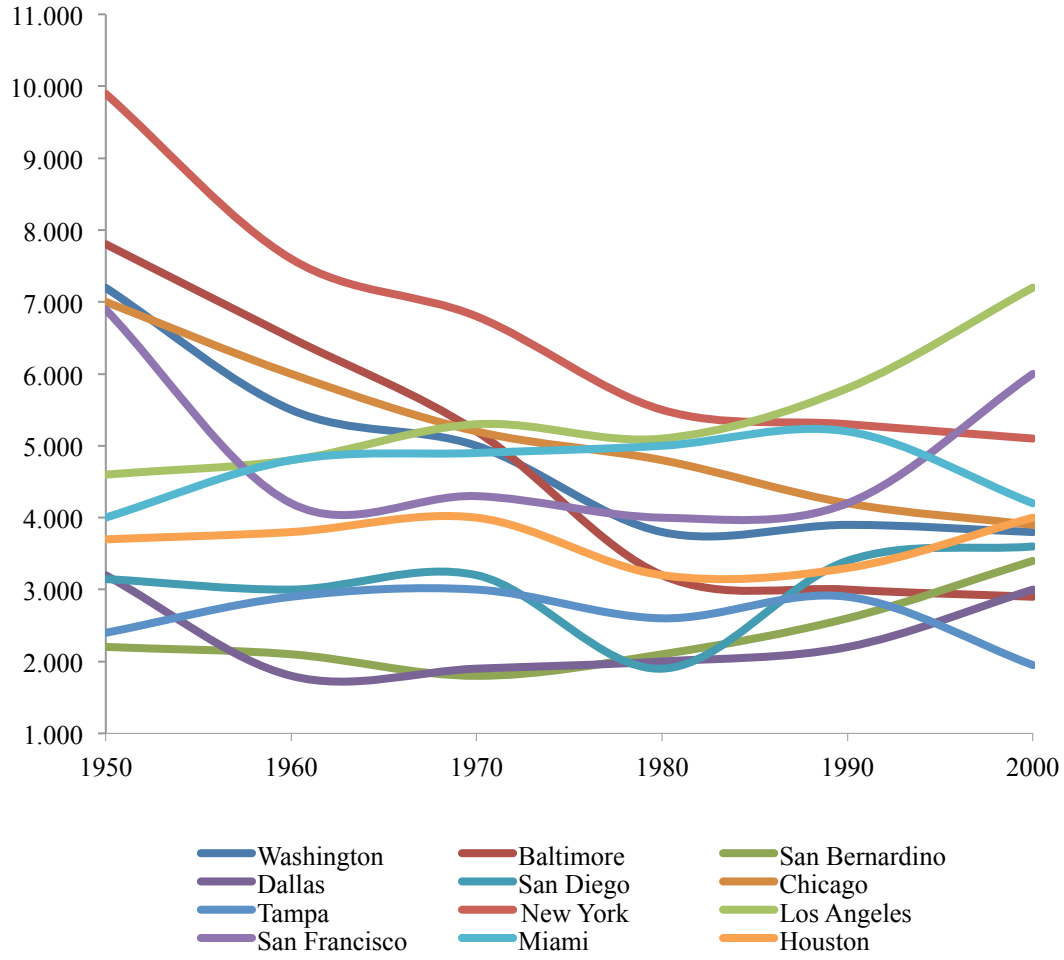
[44] Balassone M. (2005) "The heart of Little Saigon beats strong*", Orange Country*, Los Angeles Times

[45] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago

[46] Kai B. F. (1999) *"Once there were Greeenfields: How urban Sprawl is undermining America's Environment, Economy and Social Fabric",* National Resources Defence Fund, New York

without a growth in population. So, in Chicago area, where the population grew only about 4% in this period, the number of households increased 20%[47].

Figure 1.4 – Densities of selected American urbanized areas 1950-2000 (in pp/mi^2)



A consistent collection of information on densities in American metropolitan areas can be found in the "Urbanized area" published by the U.S. Census Bureau from 1955 to 1990 (***Figure 1.4***)[48], mentioning centre cities and areas around them with densities of at least 400 people per square kilometres and that are functionally related back to the central cities. This data show how populations of heavily industrialized urbanized North American cities has decreased in density after World War II as Baltimore (-58%), Milwaukee (-71%), Kansas City (-64%), New York (-45%), Washington (-51%), while some South-West and South-East American cities have, in contrast, increased their densities, as Los Angeles (+26%), San Jose (+47%),

[47] Wolch J., Pastor Jr. M. (2004) *"Up against sprawl: the Public Policy and the Making of Southern California",* University of Minnesota Press, Minneapolis
[48] Cox W. (2012) "New US urban Area data Released", *NewGeography*

San Diego (+5%) and San Bernardino (+14%) regarding the West Coast side and Miami (+38%) and Tampa (+16%) regarding the East Coast side (McClendon, 2000).

What is clear from the charts is although some urbanized areas as Chicago have decreased in the late 20th century, they decentralized more slowly than they had in the immediate postwar decades.

Figure 1.5 – Densities of Major United States Urban Areas in 2010 (in pp/mi^2)

1	Los Angeles	6.999 *pp/mi^2*	16	Phoenix	3.165
2	San Francisco	6.266	17	Baltimore	3.073
3	San Jose	5.820	18	Seattle	3.028
4	New York	5.319	19	Houston	2.978
5	Las Vegas	4.525	20	San Antonio	2.945
6	Miami	4.442	21	Dallas	2.879
7	San Diego	4.037	22	Virginia Beach	2.793
8	Salt Lake city	3.675	23	Detroit	2.793
9	Sacramento	3.660	24	Philadelphia	2.746
10	New Orleans	3.579	25	Columbus	2.680
11	Denver	3.554	26	Austin	2.605
12	Riverside	3.546	27	Minneapolis	2.594
13	Portland	3.528	28	Tampa	2.552
14	Chicago	3.524	29	Orlando	2.527
15	Washington	3.470	30	Milwaukee	2.523

From an assessment lead by the U.S. Census Bureau among the major urban areas in the United Stated in 2010 (***Figure 1.5***)[49], Los Angeles was located at the first place with almost 7.000 people per square mile (2700 people per square kilometres). It is true that the urban core of Los Angeles is much less dense than New York City, but the suburbs, where the most people live, are twice as dense.

Los Angeles is the quintessential example of American sprawl[50]. From the air, virtually the entire city basin appears as a dense carpet of buildings, with most houses packed together on lots that are considerably smaller than their counterparts in eastern city. The city of West Hollywood, for instance, is one of the densest in Los Angeles area, with a population of 7.350 people per square kilometres.

[49] Cox W. (2012) "New US urban Area data Released", *NewGeography*
[50] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago

In addiction, many area to the east of downtown that house large numbers of Mexican immigrants have very high densities even though they mostly consist largely of single-family houses, happening because many people are crowded into each house[51]. This process of growing faster in urbanized area than in population started around 1950 has slowed down fifty years later in the end of 1990s. In those years, densities are raising in at least half of the larges urbanized areas due to the birth in the last years of the 20th century of campaigns against suburban sprawl. A curious feature of the fight against sprawl is the fact that these campaigns have been most conspicuous in the largest and fastest-growing cities, which are, virtually without exception, much denser than smaller cities and small towns[52].

Suburban centres raised everywhere in the United States, from the west to the east Coast, in huge cities as Los Angeles, Chicago and Washington DC, and they have sometimes been called "*edge cities*", describing new centres raising in the suburbs including regional shopping centres with office buildings[53]. Introducing the concept of "edge city" is important to claim first that they are not actually "cities", but business centres with functions that once belong to the old downtown[54] and they are not even located in the "edge" because, although they were born on the limit of the old city, now they are rebuilt as regional business centres and just a few of them are really on the edge today.

In fact the sudden growth of these centres might have been only a brief transitional phase in a much longer process of decentralization. For instance, the two famous districts of Chicago in the 1920s, Hollywood and Englewood, they turned into suburban shopping centres in the 1950s and 1960s. It is believed that in the fastest growing cities, businesses today are more likely located in linear strips along the freeways and arterial roads than concentrated centres[55]. Edge cities best feature, and the reason they have been successful, is that they took essential character of the old downtown and intensified it. Sometimes happened that the same investors who owned and operated in the downtown departments stores were the same funders of

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[51] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago

[52] Kelley D., Yi D. and Becerra H. (2001), "Crowding no way of life in California*", Local me,* Los Angeles Times

[53] Garreau J. (1992) *Edge city: Life on the New Frontier",* Anchor Books, New York

[54] Lewis T., (2013) *"Divided Highways, building the interstate highways, transforming American life",* Cornell University Press, London

[55] Lang R. E., (2003) *"Edgeless cities: exploring the elusive metropolis"*, Washington DC Institution Press, Pennsylvania

the suburban shopping centres: as instance, Marshall Field, owners of two of the largest State Street department store Field's and Carson Pirie Scott, replicated the special arrangements of the Chicago Loops in the new "Old Orchard Shopping Centre" in Skokie, 30 kilometres north of Chicago[56].

By the end of 1990 exurbia, the most peripheral zone of the city, accounted for more than 30% in land of the United States and was home of 60 million of Americans with an increasing behaviour, making experts think that there may soon be more exurbanites than suburbanites or inhabitants of central cities[57].

On the east side of United States is considered examples of exurb the vast strip from Atlanta in Georgia to Raleigh-Durham, North Carolina passing through Greenville, Spartanburg, in South Carolina, and Charlotte, Greensboro and Winston-Salem, North Carolina, that are not necessary big cities but smaller centres compared to the US cities, creating a cluster[58]. At the beginning of the 2000s counted a population of approximately 15 million people. The large, polycentric urbanized region of Raleigh-Charlotte, under a fast population and economic growth since the late 19th century, nowadays has become nationally a textiles, biotech and high technology centre and it is considered the fourth largest manufacturing region in the country. It is indeed called "*Piedmont Crescent*"[59].

Around the city of New York, another huge regions including western Connecticut, southern New Jersey and eastern Pennsylvania can be usefully described as exurban. The New York Metropolitan case has also inspired John Fraser Hart, American author and geography professor at the North-western University, who concentrated his attention of the urban-rural fringe within 80 kilometres from the City, that he called "*perimetropolitan bow wave*" that pushes outward as the vanguard of urban expansion. In particular, has been assessed that the bow wave is created where the last intensive urban land uses area steadily displacing the most intensive agricultural uses[60].

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[56] Kamin B. (2001) *"Why architecture matters. Lessons from Chicago",* The University of Chicago Press, Chicago

[57] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago

[58] Hayes C. R., (1976) *"The dispersed city: case of Piedmont North Carolina",* University of Chicago Press, Chicago

[59] Hargan J., (2011) *"Explorer's guide North Carolina",* The Countryman Press, Woodstock

[60] Hart J. F., (1991) *"The Perimetropolitan bow wave",* Geographical Review, Vol. 81, N°1, pages 35-51

This idea of the city spreading out into the countryside as an advancing wave on a beach, is expressed by American professor Bryant C. R. with:

> *"...There is more than just the advance of the built-up edge. Like a wave braking on a rocky shore, irregular patches of urban and urban-associated land uses develop well beyond the built-up edge with ribbons of development, at least in the early stages of development... It is this ribbon and scattered development that can best be labelled 'urban sprawl' and which generates most land-use conflicts."*[61]

Cleveland's suburban fringe, along with the New York Metropolitan one, shows clearly the line between suburbia and exurbia: on the side of suburban division lots are not bigger than 40x100 metres (1 acre) while on the other side there are farmlands occupied by farmers and urban residents making business on farms[62].

More recently, French geographer Jean Gottmann, popular for his studies on urban geography of America and European countries, introduced the term "*megalopolis*" to address the heavy urbanized region of United States running from Boston to Washington counting almost 50 million people, which has been called "Northeast megalopolis". The word has been taken from the city-state Megalopolis in the Peloponnesus, Greece, founded two thousands years before the first colonies in Massachusetts Bay and Manhattan Island, which means "very big town" in Greek. Gottmann describes this area in the following terms:

> *"...We must abandon the idea of the city as a tightly settled and organized unit in which people, activities and riches are crowded into a very small area clearly separated from its nonurban surroundings. Every city in this region spreads out far and wide around its original nucleus; it grows amidst an irregularly colloidal mixture of rural and suburban landscapes: it melts on broad fronts with other mixtures, of somewhat similar though different texture, belonging to the suburban neighbourhoods of the cities"*[63]

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[61] Bryant C.R., Russwurm L.H. McLellan A.G. (1982) *"The city's countryside"*, Longman, London

[62] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago

[63] Gottmann J. (1957) *"Megalopolis. The urbanized Northeastern seaboard of the United States",* The Twentieth Century Fund, New York

Twenty years later, another interesting interpretation was given by cultural geographer Peirce Lewis comparing the network of American cities under the economic growth of the second part of the 20th century as a "*galactic metropolis*"; He claimed that this comparison has made possible with the strengthening of economic structure, transportation system and communication technologies.

> *"... City centres were linked closely with their surrounding orbit of suburban communities; small towns were ever more tightly bound up with the gravitational forces of nearby big cities; and even the most seemingly isolated rural areas were still part of the galaxy of political discourse, television entertainment, and news coverage that ignores the boundaries between big city and small, between city and suburb, between town and country"*[64].

What is clear is that America has witnessed a rapid disappearance of urban frontier between the city and the country, with the development spreading across the landscape. The concept of "Galactic metropolis" comes from the perception at night of pools of light and voids connected by arterials giving a sense of urban constellation.

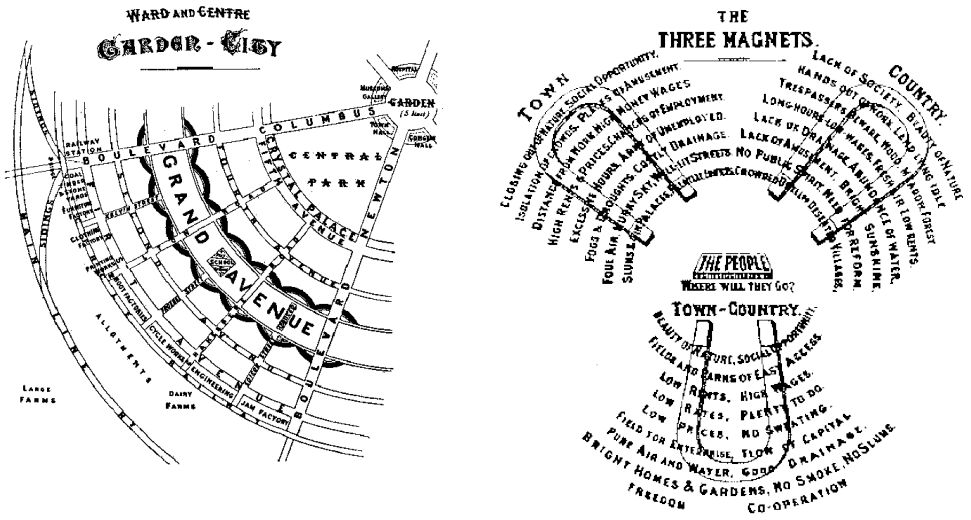
1.2.4.2 United Kingdom: *the London case*

Early attempts to face the urban planning have been made in the end of the 19th century by a town planner proposing an utopian city in which people live harmoniously together with nature. Ebenezer Howard in fact introduced a new theory regarding urbanization, offering the benefits of the town as job opportunities and high wages and of the country as low rents and better quality life, giving birth to a model that was considered as the perfect blend of city and nature. This theory was called

[64] Pierce L., (1983) *"The Galactic Metropolis"* in Ruherford P. and Macinko G.*"Beyond the urban fringe: Land Use Issues of Nonmetropolitan America",* University of Minnesota Press, Minneapolis, pages 23-49

"*Garden City*"[65], conceiving the balance between individual and community needs, represented with the "three magnets diagram" which addressed the question 'Where will the people go?', the choices being 'Town', 'Country' or 'Town-Country'.

Figure 1.6 – Howard "Garden City" theory



United Kingdom in 1935 faced the problem of urban expanding with the introduction of the "green belts" policy to retain areas of largely undeveloped and agricultural land surrounding urban areas. In 1947 the policy was introduced in the "Town and Country Planning" for local authorities and then supported by Minister of Housing Duncan Sandys in 1955. Even if the main aim was to prevent urban sprawl, as the green belt does not extend indefinitely outside a city, it pushes the growth of areas much further away from the city, increasing the urban sprawl. The consequence is the creation of leapfrogging urban centres[66].

The promotion of the "great car-owning democracy" of privatised car space by Margaret Thatcher to promote individualism has led to the fast development of motorway systems in UK. As a consequence urban expansion was favoured and consequently the congestion increased and the built environment was damaged[67].

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[65] Clark B. (2014) "*Ebenezer Hpward and the marriage of town and country",* Organization and Environment, University of Oregon

[66] Abbott L. F. (2013) *"Political barriers to housebuilding in Britain: a critical case study of Protectionism and its Industiaò-Commercial effects",* Industrial Systems Reasearch, Manchester

[67] Smith J. (2012) *"Road map: other ways of thinking about auto-mobility",* In: Tysxczuk R., Smith J., Clark N.and Butcher M. (Eds.) *"Atlas geography, architecture and change in an indipendent world",* Black Dog publishing, London

1.2.4.3 France: *the Paris case*

Paris experienced a process of decentralization that was very similar to the United States one. In 1950s was losing population in the centre while suburbs were gaining it; in the early 1970s the inner suburbs started to decline in population passing from 2,79 million in 1962 to 2,15 million while outer suburbs and exurbs were gaining from 1,66 million to 2,62 million by 1990[68].

At the same time in the city the process of gentrification was very relevant in the transformation of the city with entire neighbourhoods that used to house working-class families being filled with the affluent citizens. This gentrifications tends to produce lower densities, which helps to explain the sharp decline in the population of Paris in the 20th century: the populations of the central "*arrondissements*", that reached 75.000 people per square kilometres had dropped below 30.000 people per square kilometres[69].

As a consequence the Government promoted the *"grand ensemble",* family housing neighbourhoods with high towers inspired by modern architecture built from the 1950s to the mid 1970s. They have been built very fast to meet the pressing demand for housing and consequently presented issues since the beginning as degrade, inefficacy of sound and heat insulation. In 1973 due to social segregation and maintenance issues the construction of the *"grand ensemble"* has been stopped[70].

By the 1999 the region Ile-de-France counted 10 million people, with just a quarter of them in the city of Paris. In fact despite efforts by the government to distribute growths into specific axes of development and into "new town" with balanced jobs opportunities, housing offer and public transportation, the low-density suburbs and exurbs in the Ile-de-France look like the European copy of the American process, with an obsolete distinction between urban and rural[71] and a diffuse mode of life founded on car mobility and the single-family house, called, indeed, with the

[68] Louchart P., Ronsac J., (1991) *"Atlas des Franciliens: Rencense population de 1990",* IAURIF, INSEE, Paris

[69] AtlasPublisher (2015) "Paris Population density"*, Arcgis,* MB-Reasearch

[70] Defaux F., Fourcaut A., Skoulesky R.(2003) *"Faire l'historie des grands ensembles". Centre d'historie sociale-Universitè, ENS Edition, Paris I*

[71] Fourcaut A., (2003) *"L'historie urbaine de la France contemporaine. Etat des lieux",* Historie Urbaine, Paris

French noun "*pavilion*" [72]. Heterogeneity of the suburbs has been a feature of the French urban reality, with elegant suburbs like Neuilly and poorer as La Corneuve and Bobigny.

European exurban proceeded in the same way of United States one, as in Paris in the 18th century for instance, with areas of exurban weekend or summerhouses, became denser, then became suburbs with the introduction of municipal services, moving exurban development further out.

The main prerogative of the Paris case in recent years, that was called "*rurbanisation*" or "*periurbanisation*" is that the increase of affluence of Parisians in the inner city has been accompanied by the fear on unrest in the wake of the riots of the late 1960s followed by the disturbance in Parisian suburbs in the more recent years[73].

Concerning also commuting time, Paris is on the same line of United States: in fact in the mid-1990s in Paris, for instance, the average commute to work by car used to be 27 minutes which was comparable to the biggest United States cities, while the average commute by public transport in Paris was 53 minutes. For this reason the French Government was one of the earliest to face the problem of the switch from public transport to the automobile discouraging the individual through higher taxes on automobile and fuel[74].

1.2.4.4 Italy

Urban transformations in Italian territory have been encouraged by the necessity of reconstruction and industrialization after the World War II even if people and industrial activities scattering is occurring in the end of 1960s with a clear acceleration in 1990s.

From 1960s to the 1970s, bigger Italians cities, along with the other European cities, increased by population while minor towns decreased provoking a mass movement to the biggest centres from the peripheries. This process completely inverted the route after 1970s, when a strong decentralisation in Italian cities

[72] Raymond H. (1971) *"L'habitat pavillionnaire",* Centre de Recherche d'Urbanisme, Paris
[73] Bauer G., Roux J. M. (1976) *"La rurbanisation ou la ville eparpillee",* Editions du seuil, Paris
[74] Gerondeau C. (1997) *"Transport in Europe",* Artech House, Paris

occurred. Even if Italian population was increasing, cities were losing habitants and metropolitan areas were gaining[75].

Moreover it has been assessed that in the first phase, cities that are the centre of a wide metropolitan area have shown a stop or even a decrease in population that is balanced by the increase in population in metropolitan belt. This phase concludes between 1980s and 1990s, as from 1970s metropolitan areas are decreasing in population. What is clear is that Italy was living a process of redistribution of population in the metropolitan area[76].

In the end of the 20th century, the decrease of population in central city is followed by a fast growth of population in the suburbs areas, maintaining frequent flows and strong mobility from suburbs to the inner city, as it is shown by the city of Milan and the north urban distribution.

Giandomenico Amendola, Italian professor of urban Sociology in Florence, claims that Italian urban landscape looks far and different from American one, and even from English one, which shows the closest similitudes to American landscape[77]. By the way, he thinks that in Italy there is a clear mutation of the city and the relation between people and cities, clear from the increase in the construction of shopping malls as the witness of a suburbanization trend.

Urban sprawl in Italy shows a different behaviour than the traditional American sprawl as it has been assessed in United States that the process of urban sprawl is an integration of close urban agglomerations that are increasing in size, and consequently, entering in contact and "melting" or the creation of a new urban agglomeration in the empty space between two other urban agglomerations. Italian sprawl is taking distance from American process because prefers to develop around an historic centre that already exists[78].

While in United States new urbanizations were born, in Italy there was a transformation or amplification of already existing ones. Moreover, this amplification

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[75] Martinotti G. (1993), "*Metropoli. La nuova mortfologia sociale della città"*, in "*Saggi",* Il Mulino, Bologna, Vol. 399

[76] Ercole E. (1999) "*la crescita metropolitan"* in Martinotti G.*, "La dimensione metropolitana: sviluppo e governo della nuova città",* Il Mulino, Bologna, pages 191-230.

[77] Amendola G. (1997), *La città postmoderna"*, Laterza, Roma

[78] Mela A., Davico L. (2003), *"Cause e caratteri della diffusione urbana in Italia",* in Detragiache A. *"Dalla città diffusa alla città diramata"*, Franco Angeli, Milano, pages 62-74

focused on small villages outside urban areas, transforming them into towns with urban characteristics.

One of the first person concerned in the topic of urbanity is the Italian sociologist and politician Achille Ardigò, who defined metropolitan area as "an extension of urban settlements outside the borders of the *city-metropolis*; a spatial entity where relations between city and countryside are not anymore concerned as two different social and cultural realities, but they create a *continuum*, dominated by the urban dissemination" [79]. He conceives this process of the late 1960s, which is completely new in modern era for intensity and diffusion, as an extension of urban settlements due to the construction of new private houses and commercial and industrial businesses.

Ardigò highlighted the crucial importance of the role of the urban planning as the key to identify the better dimension of this urban sprawl.

Another interesting interpretations is given by Italian urban planner and professor Francesco Indovina and his theory based not on the historical process of formation of the city but on the hierarchical schemes representing urban settlements of the city itself[80]. Indovina sketches the following interpretation (***Figure 1.7***):

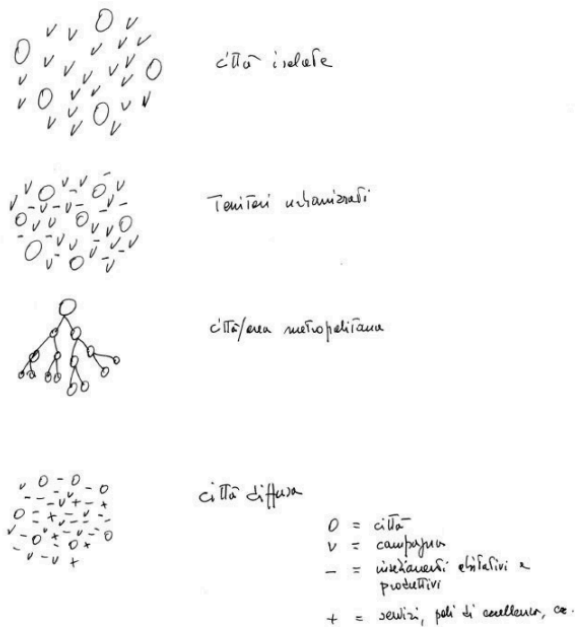
- *Isolated city*, "città isolata", in a not-urbanized countryside, where relations are limited and specialized in the city itself and reduced relations with other city who are mostly far away; they are autonomous and dependent of countryside;
- *Urbanized territory*, "territorio urbanizzato", direct evolution of the isolated city due to the automobile use, social organization evolution, production transformation and infrastructure development, with the first appearance of spatial hierarchies;
- *Metropolitan city*, "città metropolitana", which is another evolution of the isolated city, is characterized by a strong hierarchy where the central city has the principal functions and all the other secondary cities are related to it and connected through viability infrastructures that are monocentric and radial and permits mostly movement along the centre-periphery direction.

[79] Ardigò A. (1967), *"La diffusione urbana",* Edizioni A.V.E., Roma

[80] Indovina F., (2009), "*La debolezza della città, Dalla città diffusa all'arcipelago metropolitano"*, Franco Angeli, Milano

- *Urban sprawl*, "città diffusa", which is the evolution of the metropolitan city due to a process of densification and intensification, characterized by low-density several residential solutions, broad infrastructure web, public spaces. Hierarchy in functions is less strong and commercial activities are distributed and efficiently connected by infrastructure.

Figure 1.7 – Indovina theory on process of formation of the city



The difference between urbanized territory and urban sprawl is that they belong to two different levels of organization of the space, but he thinks that the first is a mandatory step for the second, presenting different phenomena in matter of economical and social impact; Urban sprawl is also very different than metropolitan city for territorial hierarchy: while the second is presenting a principal centre connected vertically with secondary medium-small centres, the first connections are horizontal and multidirectional[81].

Moreover not inevitably an urbanized territory flows into the urban sprawl but it is just a possibility of low-density urbanization; In fact according to Indovina, urban sprawl, differently from urbanized territory, offers service to people and

[81] Indovina F. (2009), "*La debolezza della città, Dalla città diffusa all'arcipelago metropolitano"*, Franco Angeli, Milano

production that can be classified as "urban service", even if it is banal. Urban territory while flowing into urban sprawl looses some services and population"[82].

1.2.4.5 Other Countries

In Germany, facing the problem of growing decentralization, government agencies have channelled growth into tight and self-contained islands in order to preserve open space and make the public transportation easier to work. Those compacts node have been before pre-existing villages and they are surrounded by highways, vast industrial and warehouse facilities and establishments.

German planner and architect Thomas Sieverts examined the new form of urbanity that have developed around the world, identifying the process of decentralization as "*Zwischenstadt*", meaning "in-between", "intermediate". The precise definition, that has not only taken in account the physical position but also the economical element, can be expressed by "type of built-up area that is between the old historical city centres and the open countryside, between the place as a living space and the non-place of movement, between small local economic cycles and the dependency of the world market" [83].

In Spain, 1970s prosperity has generated decentralization more rapid than in the North Europe, with high-density web of highways, residential subdivision, office and industrial parks at the periphery. Barcelona for instance, with the fall of the population in the historic core and the raise in the wide western area behind the hills along the B30 highway, looks indeed an American city more than an European one[84].

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[82] Indovina F. (2009), "*La debolezza della città, Dalla città diffusa all'arcipelago metropolitano"*, Franco Angeli, Milano

[83] Siviert T. (2003) *"Cities without cities: an interpretation of the Zwischenstadt",* Spon Press, London

[84] Monclús J., (1998), *"La ciudad dispersa. Barcelona: Centro de Cultura Contemporania de Barcelona",* Universidad de Barcelona, Barcelona

PART 2

Australian urban planning and sprawl debate

2.1 History of Australian urban planning

First urban planning in Australia, with the original colonial towns established on green field sites where there was no developed hinterland has been introduced since the British colonial settlement in the end of the 1700s. Those centres were of political, military, administrative and commercial power and the locus of the energising force for development and soon become, thanks to the population growth, cities dominating the whole colony[85].

Sydney, for instance, has been considered by Australian historical critic Paul Ashton "an accidental city (…) with a planning history characterised by opportunistic development and disjointed or abortive attempts at holistic planning"[86]. It shortly became the centre of all the power in the New South Wales colony.

As an English colony, Sydney has withstood to legislations in the 1830s in order to regulate some feature of the built environment as the Police Act of 1833, to

[85] Troy P. (2004), *"The structure and from of the Australian City: prospectus for improved urban planning",* Griffith University, Issue Paper 1

[86] Ashton P. (1993), *"The accidental city: planning Sydney 1788",* Hale and Iremonger, Sydney

regulate the police in the town and port of Sydney and remove and prevent nuisances and obstructions therein, the Street Alignment Act in 1834, to prevent encroachments onto public ways and regulate alignments of streets, and the Building Act in 1837 based on the London Building Act of 1774.

Sydney and Brisbane's site developed a topography departing from central plans with road construction, and rail successively, along the ridges and spines near the broken waterways, while in Melbourne and Adelaide the original grid street system was extended by funders and was overlapped with the radial rail lines and highways reducing the advantages conferred by the grid in both cities[87].

Innumerable political controversies occurred from 1850 and 1870 in Sydney while becoming the leading city of Australia, as the event that has seen the City Council being sacked for inefficiencies and replaced by colonial government commissioners; however City Surveyor and other Corporation were frustrated by inadequate legislative tools and an uninterested colonial administration[88].

Rapid colonial expansion in the 19th century, matched by economic growth, resulted in Australia becoming one of the most highly urbanised nations in the world and most of the population used to live away from the centre, as Sydney where in 1861 the 40% of city residents were living in suburbs[89].

By the close 1870s, a decade of significant and complex economic growth and of increasing social problems, nobody could credibly doubt the urgent necessity for legislation due to health, water supply, sewerage, and pollution recent issues. [90]

In 1881 was published the Width of Streets and Lanes Act, as a response to concern about the uncontrolled formation of streets in Sydney, which influenced the morphology of the inner and middle-ring suburbs until the 1920s, by requiring streets of 20 meters wide and lanes 6 meters wide[91].

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87 Troy P. (2004), *"The structure and from of the Australian City: prospectus for improved urban planning",* Griffith University, Issue Paper 1

88 Ashton P. (1993), *"The accidental city: planning Sydney 1788",* Hale and Iremonger, Sydney

89 Gleeson, B.J. and Steele, W (2010), *"A climate for growth: Planning South-East Queensland",* UQ Press, Brisbane

90 Government Printer (1879) *"Report from the Select Committee on the City of Sydney Improvement Bill"*, in *"Journal of the Legislative Council"*, Sydney, volume XXIV, part 11, page 179

91 Kemp C., Fairfax J. (2008) *"The Sydney Morning Herald 1842-1954"*, National Library of Australia, Canberra

In the 1890s, representatives of capital, labour and a new style of Liberalism engaged vigorously in debate over questions of improving and rebuilding the city[92].

At the beginning of 1900, new ideas from Europe and the United States were increasingly applied to urban questions as decision makers and experts tried to embrace the advantages accruing from the science of life as exemplified in other cities. A great contribution has been made by John Sulman, British expatriate and Australian town planning figure, who predicted in 1890 an declared that in Australia the typical model of sub-division was "a case of individualism (…) and with no better result than that in the course of years, and after many rebuildings, some kind of order and classification will have been evolved out of the chaos of the commencement. Whereas is should not be forgotten a modern town is an organism with distinct functions for its different members requiring separate treatment..."[93].

These observations represent an early reference to land use zoning just published officially in the 1940s and influencing the British social theory on the planning ideologies espoused by local luminaries and showing the grip of social Darwinism on nascent planning thought[94]. This approach was also influenced by euthenics, an environmentally deterministic pseudo-science which sought to improve living conditions to effect improvements in human beings adopted as a tool for social engineering and urban reform. It represents a platform for the advancement of early planning good or social goals[95].

In Sydney, due to a bubonic plague and the consequent contagion fear, deficiencies in the regulation of the city's development merged, inciting immediate reforms request. The City Council focused its attention on restructuring the city's port infrastructure and abutting the city's commercial wharfage in Darling Harbour[96].

As cities grew and settlement overextended beyond walking distance, various forms of public transport were developed. Melbourne and Sydney were both provided with horse-drawn tram services, and successively with mechanical power, while railways services were extended along radial routes to existing suburbs.

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92 Ashton P. (1993), *"The accidental city: planning Sydney 1788",* Hale and Iremonger, Sydney

93 Sulman J. (1890), *"The Laying Out of Towns",* Australasian Association for the Advancement of Science, Report of the Second Meeting, Melbourne

94 Freestone R. (2007), *"Designing Australia's Cities: Commerce, Culture and the City Beautiful 1900–30",* University of New South Wales Press, Sydney

95 Richards E.H. (1910), *"Euthenics",* Whitcomb and Barrows, Boston

96 Ashton P. (1993), *"The accidental city: planning Sydney 1788",* Hale and Iremonger, Sydney

Robert Freestone, president of Planning History Society and urban planner and researcher, claimed that efficiency and progress of the early 1900 led to new artistic and aesthetic interventions like boulevards, public squares and civic centres under the rising movement inspired by the two words "improvement" and "beautification" which considers parks, for instance, not only the lungs of the city and the manifestation of civic pride and worth but also morally and mentally uplifting[97].

According to administrators, the new construction and planning movement could not avoid respecting the national efficiency, industrial competency and social harmony, in order to produce the highest welfare and civilisation of people, protecting from other nations attacks[98].

Essential infrastructures as ports and railways, power and water supply was the focus of the State of New South Wales at the beginning of the 20th century, as the 1909 Royal Commission for the Improvement of the City of Sydney and its Suburbs.

In 1912 was built the first workers' suburb, Daceyville, created as a model by the authority of New South Wales housing Board, designed by the politician John Daniel Fitzgerald and architect John Sulman; it has been considered shortly the first "*city beautification*" scheme on modern lines in Australia by national breaking news[99].

In 1913 was founded the Town Planning Association of New South Wales, an urban planning and advisory body which lobbied extensively for planning reforms and the garden suburb ideal, strongly supported by city's leading architects, surveyors and engineers.

In 1919 the Local Government revision was considered the biggest success of John Daniel Fitzgerald, who in meanwhile became Minister for both Local Government and Public Health focusing his attention on a new system of governance for greater Sydney including metropolitan planning controls. With new

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[97] Freestone R. (2007), *"Designing Australia's Cities: Commerce, Culture and the City Beautiful 1900–30",* University of New South Wales Press, Sydney

[98] Irvine R. F. (1915), *"Town Planning and National Efficiency, National Efficiency: A Series of Lectures",* Victorian Railways Printing Branch, Melbourne

[99] Innes G. (1912) "State model suburb plan of Daceyville", in *"Sydney Morning Herald",* page 21

modifications, discretionary powers for council have been extended in matter of subdivision and development[100].

The control by sitting interests of this incremental growth of all Australian cities led to a high degree of centralisation that is reflected in their structure. In the early stages of growth this centralisation made it economically feasible to provide a range of urban services. However, in some point in its growth each city reached a size at which the centralisation produced a high degree of inefficiency in operation, affecting all transport systems[101].

In 1920 a civic-professional movement, called the Sydney Regional Plan Convention, tried to convince the Government to prepare a metropolitan plan of the city, without any success[102].

Between World War I and World War II, although small portion of retail trade is conducted in the centre, the transport systems continue to focus on the city centre, affecting people without business in the core of the city to travel through it, creating congestions. Until the Word War II no modern town planning in any major cities has been developed.

In 1939 the necessity of postwar reconstruction influenced planning activities, and the idea of creating the Great Sydney was coming to the mind of government city planners. According to Troy Patrick, pre-eminent urban policy thinker for many decades, two major local government reforms can be traced:

- The rationalisation of local government. In 1944 Premier William McKell announced the intention of introducing legislation concerning the extension of the boundaries of the city of Sydney and the Union of Areas in the Country of Cumberland, one of the 141 counties established in the New South Wales for surveying and land title registration. In 1945 a Royal Commission on Local Government Boundaries was appointed and three years later an Act was passed: in 1948 eight small municipalities as Alexandria, Darlington, Erskineville, Glebe, Newtown, Paddington, Redfern and Waterloo were incorporated

[100] Freestone R., (2007), *"Designing Australia's Cities: Commerce, Culture and the City Beautiful 1900–30",* University of New South Wales Press, Sydney
[101] Troy P. (2004), *"The structure and from of the Australian City: prospectus for improved urban planning",* Griffith University, Issue Paper 1
[102] Freestone R. (2007), *"Designing Australia's Cities: Commerce, Culture and the City Beautiful 1900–30",* University of New South Wales Press, Sydney

in Sydney. Further changes to the boundaries of the City of Sydney would occur in 1968, 1982, 1989 and 2004.

- Released in 1948, but not legally gazetted until 1951, the "County of Cumberland Planning Scheme" was once described as "the most definitive expression of a public policy on the form and content of an Australian metropolitan area ever attempted"[103]. It introduced land use zoning, suburban employment zone, open space acquisitions and green belt, thought to prevent sprawl but eventually eliminated to accommodate unpredicted population increase from international migration and baby boom.

Simultaneously, the process of separation of industrial activity from residential areas commenced when activities such as tanneries and wool-scouring operations were separated from other urban activities. The concern over the injurious effects on the health or amenity of residents from effluents and smoke and other noxious and poisonous gas emissions, gradually led to a separation of industrial activities from residential areas[104]. Industrial activities lived also changes due to technological development, as the adoption of electric motors that transformed the organisation and manufacturing process. In parallel, commercial activities were also progressively excluded from residential areas[105].

Town planning of the 1950s tried to capture some of the advantages of centralisation while minimising the disadvantages by fostering the growth of suburban centres, taking advantage of public transport nodes. Shopping malls developed in locations with easy access by motor vehicle and generous parking, leaving the traditional centres.

Australia was living a decentralisation of commercial and industrial activities within the metropolitan area, while a building boom arose and the first Sydney's first skyscraper was erected.

From 1964 to the 10 years ahead the responsibility for planning matters in New South Wales passed to the State Planning Authority, that identified a variety of

[103] Harrison P. (1972), *"Planning the Metropolis",* The Politics of Urban Growth ANU Press, Canberra
[104] Troy P. (2004), *"The structure and from of the Australian City: prospectus for improved urban planning",* Griffith University, Issue Paper 1
[105] Ibid.

options for controlling populations growth settling up to 60.000 people at Menai, 1,5 million people in growth corridors and 500.000 in the Gosford-Wyon area[106].

In the end of 1960s the inner city of the city of Sydney has been invested by a renew made possible by the foundation of the Sydney Cove redevelopment Authority that bypassed the Local Government Act as the new prototypical urban development corporation. It redeveloped high-rise offices, hotels and apartments, especially along The Rocks.

In the 1970s, under the Whitlam Government, the Commonwealth was instrumental in convincing the states to set up land commission whose tasks were to change the process of land development and ensure land and housing was available at fair prices. It was the Whitlam Government which was the first to recognise a Commonwealth role in urban issues, which helped fund the new growth centres, like Macarthur, and provided basic urban services to many outer areas which were never served by sewer[107].

Moreover, the State Planning Authority was replaced by the Planning and Environmental Commission, in the meanwhile of a revolution in the New South Wales planning system given by street protests, resident action groups, feminism revolution and green bans[108].

During the 1980s the City of Sydney experienced a building boom and reversal in the long-term decline of the inner city residential population due to the revaluation of residential property after commercial activities desertion, while the Metropolitan Sydney faced a growing scarcity of land, rising land prices and infrastructure deficiency in the far suburbs, suggesting the government to undertake a fast urban consolidation as a remedy. The government decision of increasing housing and population densities faced opposition from local council in the Metropolitan Area wishing to keep traditional low-density development[109].

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[106] State Planning Authority (1968), *"Sydney Region Outline Plan 1970–2000",* Sydney

[107] Johnstone Q. (1977*) "Government Control of Urban Land Development in Australia: A Model for Comparison"*, Yale Law School Legal Scholarhsip Repository, Paper 1900.

[108] Ashton P. (1993), *"The accidental city: planning Sydney 1788",* Hale and Iremonger, Sydney

[109] Peel M. (1995), "*The Urban Debate: From Los Angeles to the Urban Village*", in Troy P. "*Australian Cities: Issues, Strategies and Policies for Urban Australia in the 1990s*", Cambridge University Press, Melbourne, pages 45–7

The topic of allotment size in Australia has been taken in account since the early plans of the urban towns at the beginning of 1800s by Arthur Philip, the first Governor of New South Wales, in order to meet the self-sufficiency need.

Regarding the New South Wales, in Sydney the early attempt was to meet the needs of the merchant class by building sizeable houses adjacent to their warehouses and consequently the Woolloomooloo Hill suburb was created, with the land grants ranged from 8 to 10 acres and the grants were required to build substantial villas[110]. In Newcastle, the actual second most populated city in New South Whales located 160 kilometres north of Sydney, the allotment size was one quarter acre and streets 100 feet wide plus 10 feet of footpaths[111].

Concerning the State of Victoria, in the capital of Melbourne, the grid was laid out under the Colonial Secretary's instruction with allotment size of half acre, while in Adelaide the initial plan was 1 acre allotment, although later towns laid out in rural areas in the South Australian colony specified half-acre allotments.

Regarding the State of Queensland, for Brisbane the plan was based on allotments of one-quarter acre with street 92,4 feet wide and generous public squares, that later became one fifth acre allotment and 66 feet wide street on decision of Governor Gipps, causing congestion problems that are affecting the city also now.

In all the Country of Australia, suburban villas were popular in the middle class because of the available land outside the town and the high rents in the town centre, as incentives for people to build their own home outside the town[112]. Moreover, the Building Act encouraged suburban development by those who considers that suburban housing was healthier, made possible by the introduction of building ventilation regulations based on theories of disease transmission after disastrous epidemics. The regulations had a major and persistent influence on the design and construction of housing. That is, regulations covering structural safety, fire and health aspects of housing all helped to enshrine suburban separate houses in their own gardens as the dominant form of housing[113].

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[110] Broadbent, J. (1987), *"The push east: Woolloomooloo Hill, the first suburb. City of suburbs",* New South Wales University Press, Sydney

[111] Jeans D. N., (1965), *"Town planning in New South Wales 1829–1842" in "Australian Planner"*, Vol. 3, pages191-196

[112] Broadbent, J. (1987), *"The push east: Woolloomooloo Hill, the first suburb. City of suburbs",* New South Wales University Press, Sydney

[113] Ashton P. (1993), *"The accidental city: planning Sydney 1788",* Hale and Iremonger, Sydney

In the article "The past and future of the Australian suburb" Graeme Davison, Australian professor of social science in Melbourne, claimed that fast growing idea of the "green and secluded neighbourhood" was becoming popular in the late 1970s, giving the chance to family to enjoy "fresh air, pleasant view and shady garden"[114]. The egalitarian nature of Australian society and its high standard of living, together with the high level of home ownership, the belief that all residents could enjoy high standards of amenity and that there was space aplenty, reinforced the notion of the normalcy of the form of development that Australian cities exhibited[115].

In 1995 a new metropolitan plan called "Cities for the 21st century" appeared, taking in account the urban area from Newcastle to Wollongong, presenting four goals of equity, efficiency, environmental quality and liveability. In this occasion was first introduced the concept of "Greater Metropolitan Region", focusing on a new integrated transport strategy[116].

In 1998, after just 3 years, a new plan called "Shaping Our Cities" was introduced, focusing on the topic of the compactness of the metropolis in matter of integration of land use and transport, and promoting suburban activity centre, but with a more explicit concern with urban design at a regional scale[117].

According to Paul Ashton, the 1990s was the decade of the neo-liberal political consensus that led to an increase of infrastructure investment. What Australia experienced was a move from large-scale state expenditure and control in the social welfare tradition to privatisation and deregulation, with the state more active as a facilitator of change. After community protests and fiscal crisis in the 1970s that stuck the building programs, in 1990s notably railways as the Airport Line, expressways and the Sydney Harbour Tunnel were going to be developed thanks to public-private partnerships. The new infrastructures assembled into a metropolitan ring road called the Sydney Orbital in 2007.

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[114] Davison G. (1994), *"The past and future of the Australian suburb",* in Johnson L. C. "*Suburban Dreaming: An Interdisciplinary Approach to Australian Cities",* Deakin University, Geelong, pp 99-113

[115] Ashton P. (1993), *"The accidental city: planning Sydney 1788",* Hale and Iremonger, Sydney

[116] Rodriguez M., Crabtree M., O'Neill P. (2008), *"Historical revision of the spatial data and methods for land-use mapping in a dynamic urban area of NSW: the Sydney Basin case*", Research Gate, Sydney

[117] Freestone R. (2000), *"Planning Sydney: Historical Trajectories and Contemporary Debates",* in Connel J.*"Sydney: The Emergence of a Global City",* Oxford University Press, Melbourne, pages 119–143

In the decade of 1990s, Sydney was the set of hundred projects, mostly largely driven by private capital and with central authorities guiding significant development, making the city a globally competitive city[118]. The major projects have been the redevelopment of Pyrmont and Ultimo into high density and mixed-use zone, development of Fox Studios complex at Moore Park[119], and the development of Homebush Bay for the 2000 Olympic Games.

Just one year before the beginning of the 1990s, in 1989, an intense program of development of the Sydney CBD was institutionalised through the government with the Central Sydney Planning Committee. "Living City" strategy just followed in 1994, under the new Mayor Frank Sartor, with a vision of "vibrant 24-hou pedestrian-friendly city with a permanent residential population, leisure and arts opportunities with a quality public dominion; moreover the "design excellence" in new buildings was promoted representing a long evolution from "design agnosticism" to "design commitment" in Sydney's CBD[120].

[118] Searle G. (1996), *"Sydney as a Global City",* NSW Department of Urban Affairs and Planning, Sydney

[119] Freestone R., Randolph B. and Butler-Bowdon C. (2006), *"Talking Sydney: Population, community and culture in contemporary Sydney"*, University of New South Wales Press, Sydney

[120] Punter J. (2005), *"Urban Design in Central Sydney 1945–2002: Laissez faire and Discretionary Traditions in the Accidental City*", Progress in Planning, Sydney

2.2 Development of Australian towns

2.2.1 Introduction of the he process of change

In this chapter, the Australia's town settlement will be examined along with the factors and processes that created this change.

The time frame chosen for this assessment goes from 1911 and 2006, the first and the last Census counts of localities made in Australia by the Australian Bureau of Statistics (ABS) and exposed in the Research Report presented in May 2014 by the Department of Infrastructure and Regional Development.

Over the 20th century fast changes occurred in Australia patterns, lead by the increasing centralisation of population activity, decline in rural towns and growth in coastal locations.

Geography, history, service and goods provision, amenity, investment have been just some of the forces that are influenced by economic processes, changes in marked size, increase of wealth and technology progress.

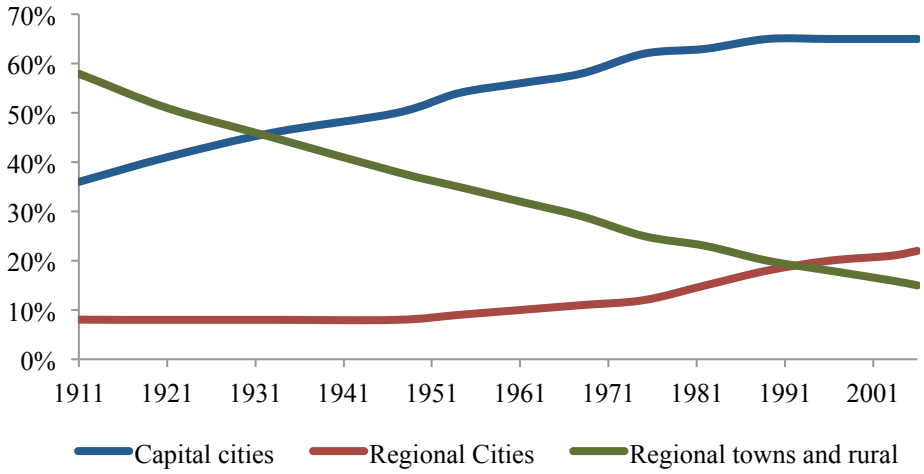
Regional competitiveness emerged with the improvement of mobility that increased the "rivalry" of close towns retailers and creating a "town versus town" competition and industry activities have favoured large regional centres, changing the relationship between towns and regions.

Towns remain important economic and social units, operating in the late 20th century as a part of larger regional markets, and are interconnected, as people and business conduct their activities at a distance and across traditional regions.

Pressures on settlement patterns are likely to continue in the form of centralising of activity, technological advancement, households seeking amenity and firms facing greater competition. This will provide both challenges and opportunities for towns and government into the future[121].

By 1911, what appears from the 2014 census, most of today's towns were already established, with small agricultural towns reflecting limited personal transport options, as horses, fewer mining-based "boom" towns and a small number of larger centres. 60% of populations was living in the Regional Australia and 45% of Australians living in towns of greater that 200 people and 15% in small localities and rural areas (***Figure 2.1***) [122].

Figure 2.1 – Australian population change in towns from 1911 to 2006



In this chapter key factors affecting the impact on settlement pattern will be presented, as the increase of wealth and of life expectancy influencing the capacity to

[121] Bureau of Infrastructure, Transport and Regional Economics, BITRE (2014) *"The evolutions of Australian towns"*, Commonwealth of Australia
[122] Ibed.

embrace technology and better lifestyle and consequently requesting better amenities, or the technological and productivity advancements and improvement of transport and communications influencing personal mobility and distance between work and residence and consequently bringing to the centralisation of activities. Population's growth and the introduction of more women in the workface affected the need of building and differentiation of occupational focus, bringing also to the centralisation of activities.

The long process of change can be considered through different batches that are briefly exposed:

- Geographic requirements in industry and transport influenced early settlement patterns. Primary industry was established in geographically appropriate areas, such agriculture in areas with the appropriate soil and rainfall, and mining areas with mineral resources. Geography also influenced the determination of transport hubs as the river ports.
- Industrial activities changed the settlement pattern, affecting adjacent small rural town equilibrium, contributing the relation between industry and town. Towns, especially if are bigger than smaller, attract industry investments.
- Access of services influenced costumers' choice, as they prefer to purchase into "one big shopping trip", causing competiveness between regional markets and small towns markets.
- Improvements in personal transport and increases in wealth have given more people the ability to choose locations based on amenity rather than employment

In order di predict the national trends regarding the changing settlement patterns, not only Australia but whichever Country you want to assess, the previous forces with local implications cannot be ignored, but examined.

2.2.2 Development of Australian towns: from 1911 to 2006

In this assessment of the time frame between 1911 and 2006 the intention has been investigating how the settlement pattern have changed and the scenarios

that came evident, trying to draw the factors and reasons this happened and forces that had their influences and expressing some future development.

2.2.2.1 Theories of spatial development

Among all the theories that have been affirmed regarding urban development, no of them explain totally the organization of human activity.

Considering all the disciplines as economics, demography, geography, sociology and history, can be created a model as foundation of urban analysis.

Topography and land quality are crucial to determine the potential sites of town, as natural harbours and rivers have been strategic for the choice of town in the past, as they let the movement of goods, service and transportations; industries also have requirements such the access for agricultural activities, ore-mining the deposit space and tourism the good climate. Similarly, a good water supply is essential for any settlement and some successful towns resulted from the development of irrigation.

Here following the main key theories on urban settlements, based on topics of industry, location, economy, costumer behaviour and retail:

- Economic Base Theory.

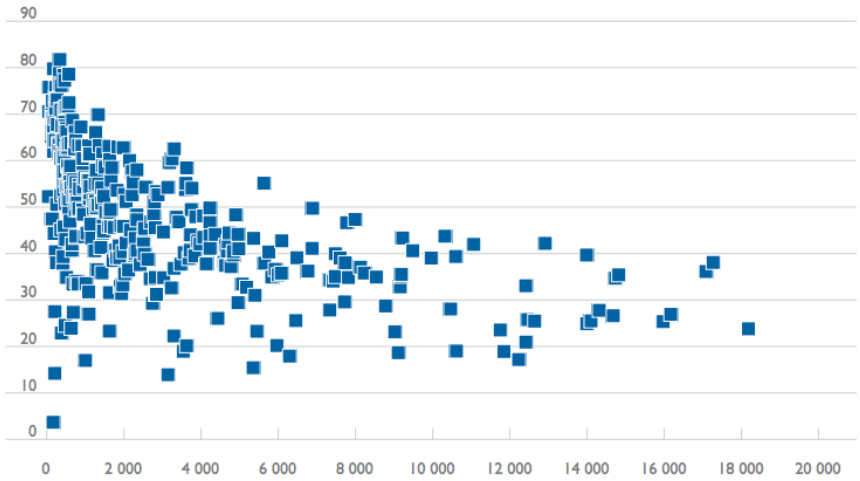
It gives a model understanding the effect investment spending and industry employment can have on a local economy, with a structure focusing on the regional export activity as the primary source of economic growth[123]. This theory suggests that funds flowing in from outside the region from selling basic industry products can directly expand the overall economic base locally, creating new employment and results in new local consumption. In Australia, agriculture, manufacturing and mining have been the traditional basic industries of local economies because of their focus on external demand, and their markets is international. Australian industries invest directly in the local economy and are common used as the foundation to promote local economic growth.

[123] Bureau of Infrastructure, Transport and Regional Economics, BITRE (2014) *"The evolutions of Australian towns",* Commonwealth of Australia

In economy there is a differentiation between "basic industries" and "non-basic industries": the first provides services to people and business outside the community, bringing money into their respective communities from the outside, while the second provides services for people and business located within the community not generating money from outside sources. All Australian regions have a mix of basic and non-basic industry types and some industries have even both of them. For instance, retailing to locals is non-basic but retailing to tourists is basic, and tourism is a great resource in Australia.

It has been assessed that in Australia only regions with very small working populations have high percentage of base industry employment, and at the same time, non-basic industries tended to serve larger populations and no small populations (***Figure 2.2***)[124].

Figure 2.2 – Percentage of employed in basic industries above people employed



The size of the basic component of the local economy determinates the size of the labour force which then becomes the initial foundation for the town's populations, while non-basic industries are vital components of the overall economic functioning of towns and were the primary rationale for the establishment of many town, providing the start of employment and production.

- Agglomeration economies.

It catches benefits including economies of scale and wider economic benefits that contribute to raising productivity by reason of location. The economy of

[124] BITRE analysis of ABS (2006) *"Census of population and Housing place of work data"*, Canberra

scale describes a situation in which the cost of producing an additional product decreases as volume increase, decreasing the average cost per unit. This goal is given by technological innovation, administration and financial savings and risk bearing capacity. Car manufacturing, for instance, achieves greater efficiency through scale because investment takes place in one location rather than across a number of areas.

Wider economic benefits claims that industries tend to concentrate geographically in order to reduce transport costs. In 1920 one of the most influential economists if the 20th century, Alfred Marshall, claimed that there are three different types of transport costs, cost of moving goods, cost of moving people and knowledge of transfer[125] and the way to reduce those costs are:

- Locate similar firms in order to develop highly specialised services nearby in response to the greater local demand (access to input improvement);
- Cluster firm with similar operations in order to have a larger number of appropriately trained workers available to the individual firm (access to skilled workers).

These interpretation allow industry to experience production economies of scale that enable all members of the cluster to reduce the costs

- New Economy Geography.

Paul Robin Krugman, American economist and Nobel Memorial prize in Economic sciences winner, developed the theory of New Economy Geography published in Journal of Political Economy in 1991. He claimed that agglomeration is the "outcome of the interaction of increasing returns, trade costs and factor price differences"[126] and economic regions with most production are more profitable attract more production. Moreover, he emphasises the importance of costumers and transport costs as drivers of increasing returns to scale and the power of positive feedback to drive larger and larger clusters.

Krugman stated that agriculture and manufacturing are indispensable sectors that are making activity elastic: agriculture disperses activity and manufacturing

[125] Henderson J. V. (2003), *"Marshall's Scale Economies"*, in *"Journal of Urban Economics",* Vol 53: pages 1–28.
[126] Krugman P. (1991), *"Increasing Returns and Economic Geography",* in *"Journal of Political Economy",* University of Chicago Press, vol. 99, n°3, pages 483-499

concentrates activity. Two different forces are raising, the dispersing and centrifugal force (agriculture) and the concentrated and centripetal force (manufacturing) and the spatial patterns of populations result from the balancing of these two forces.

- Path dependence.

It describes the phenomenon of decisions being led by existing development, for example in the creation and take-up of technology, or the choice by a firm about where to locate it. It is associated with new technology.

This model has been adopted by Ron Martin who states that combination of historical contingency and the emergence of self-reinforcing effects steers a technology, industry, or regional economy along one specific path. Moreover the theory states that the choice of location is influenced and constrained by the cumulative effects of previous decisions on a location's development[127].

- Migration theory.

It describes the ability of people to migrate between towns and regions that directly influences the development of towns. Migrations can be separated into two different groups, disequilibrium and equilibrium models. The first has in the centre the role of the labour markets as the driver of migration, through income maximisation; migration is a function of special differences in economic opportunities, encouraging individuals o search new labour markets for higher salaries, lower unemployment risks and greater employment security; the second regards migration as driven by much more than just economic opportunity; it envisages a diminished role for the labour market and assumes that spatial differences in incomes ad prices reflect wholly or in large part a compensating gap associated with corresponding spatial variation in amenity[128].

Contributors to the decision of an individual to migrate can be demographic as age, education and status or economic as employment and salary or amenity as medical services and proximity to family and friends.

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[127] Martin R., Sunley P. (2006), *"Path dependence and regional economic evolution*", in *"Journal of Economic Geography",* Oxford University Press, Vol 6.

[128] Hunt G. L. (1993) *"Equilibrium and disequilibrium in migration modelling",* in *"Regional Studies", Vol*. 27, Issue 4, pag. 341.349

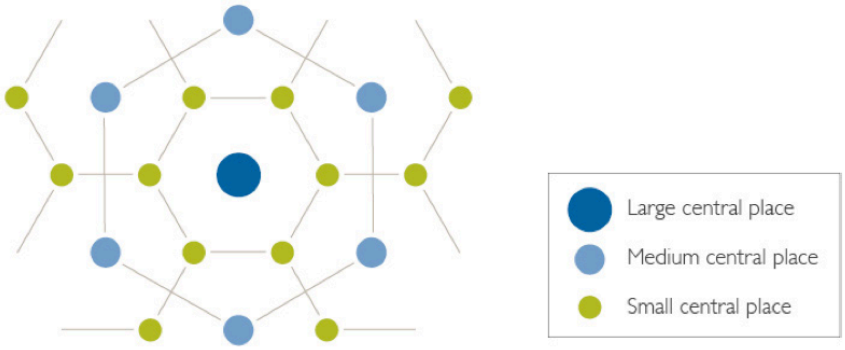
- Central place theory.

It describes the number, size and location of human settlements in an urban system, developed by German geographer Walter Christaller in 1933. In this theory all areas are meant to have homogenous and limitless surface, evenly distributed population, triangular lattice pattern distribution of settlements, same income level for consumers, who visit the nearest central places providing the function they demand. At the very base of this theory regarding goods, two considerations can be expressed[129]:

- The higher the order of the goods and services, the larger the range of the goods and services, the longer the distance people are willing to travel to acquire them;
- At the base of the hierarchy pyramid are shopping centres or newsagents which sell low order goods (grocery) and these centres are small; on the other side, at the top of the pyramid are centres selling high order (car industry) goods and these are large.

The theory highlights that the distribution of town and cities can exert a strong influence on the type and range of activity within a location.

Figure 2.3 – Christaller Central place theory



No theory above provides a complete explanation of all the spatial patterns of activity in Australia but they catch some elements and factors that help to understand the development of urban settlements.

[129] Christaller W. (1933) *"Die zentralen Orte in Süddeutschland"*, Gustav Fischer, Jena

2.2.2.2 Town populations in national trends

In order to portray the situation of American towns in the last two centuries, one approach is to take account of the economic and demographic data drawn from the Australian Bureau of Statistics (ABS), previously introduced. Studying the 1911 Bureau, the first ever done, it is possible to comprehend the result of more than a century of growth of Australian towns before, while from the compared data of 1911 Bureau and 2006 Bureau it is possible to express some consideration of the national trend and predict future progressions.

Before Australia was colonized in 1788 there were not any remaining written records of human events and this is the reason the period from the first human habitation of the Australia continent until colonization is called "Prehistory of Australia"; people lived in Australia before European contact is unknown, but estimates range from 300,000 to more than 1 million. However, this continent has a human history estimated at between 50,000 to 150,000 years old and aboriginal people are representatives of the longest surviving cultures in the world[130].

"Aboriginal Australia was a pattern of localities covering the entire continent. Groups hunted and gathered over areas defined by custom. Particular pieces of land were owned by particular groups. The land was not just a source of sustenance, but a materialisation of the journeys of the creative Ancestors. It was the basis of spiritual life and, in its own way, a religious text. Systems of land tenure were intimately bound up with spiritual attachment and notions of custodianship"[131].

The first colony was established in Sydney in 1788 but the colonisation towards west was not possible due to mountain present. When the route over mountains was created, the coastal settlements have been possible, with Hobart in (1804), Brisbane (1824), Perth (1829), Adelaide (1836) and Melbourne (1837)[132].

A fast occupation spread from each new base, with new grazing, mining discoveries and farming lands and secondly with basic industries that permitted further growth and development, made possible by exceptional factors as geography,

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[130] Lourandos H. (1997) *"Continent of Hunter-Gatherers: new Perspectives in Australian prehistory",* Cambridge University Press, Cambridge

[131] Aboriginal and Torres Strait Islander Commission, ATSIC (1998) *"As a matter of fact, answering the myths and misconceptions about Indigenous Australians"*, Office of Public Affairs, Canberra

[132] King R. J. (1998) *"Terra Australis, New Holland and New South Wales: the Treaty of Tordesillas and Australia",* The Globe, n° 47, pages. 35-55

climate and natural resources. Professor oh Australian history Sir Ernest Scott, claimed that need, or desire, for grazing land was the driving force behind many of the expeditions from the earliest days of the Sydney colony and expansion due to desire of more grazing land pushed pastoral settlement beyond the "nineteen counties" official limit settlement of New South Wales[133].

The towns provided much needed goods and services to workers, travellers and the stations themselves while an increasing demand for land was fuelled by the increased population about by the gold rushes and the improved transport possibilities for agricultural products as the rail system developed.

Gold was found in small quantities but government discouraged further prospecting to avoid disorder[134]. In fact, after 1851 Bathurst discovery after a systematic search, the influx of people from the entire world was massive and uncontrolled. In addiction to gold, copper, silver, lead and zinc have been found.

Railway system was introduced in around 1850s and has intensely changed the transport pattern in Australia, from a small beginning in mid-1850 to an extended network that covers all the Country. Although the first railway debut was made in the cities of Sydney and Newcastle, the development of railway focused towards inland and not along the coast, as maritime transport between them was already intense and railway connection was not so essential.

The Government of New South Wales established a fast speed in development towards northwest and southwest covering a big part of the Country in less than 100 years after the beginning and reason of this fast program was the colonial rivalry with the other Country as Victoria and the competitive economic factors between towns (***Figure 2.4***)[135].

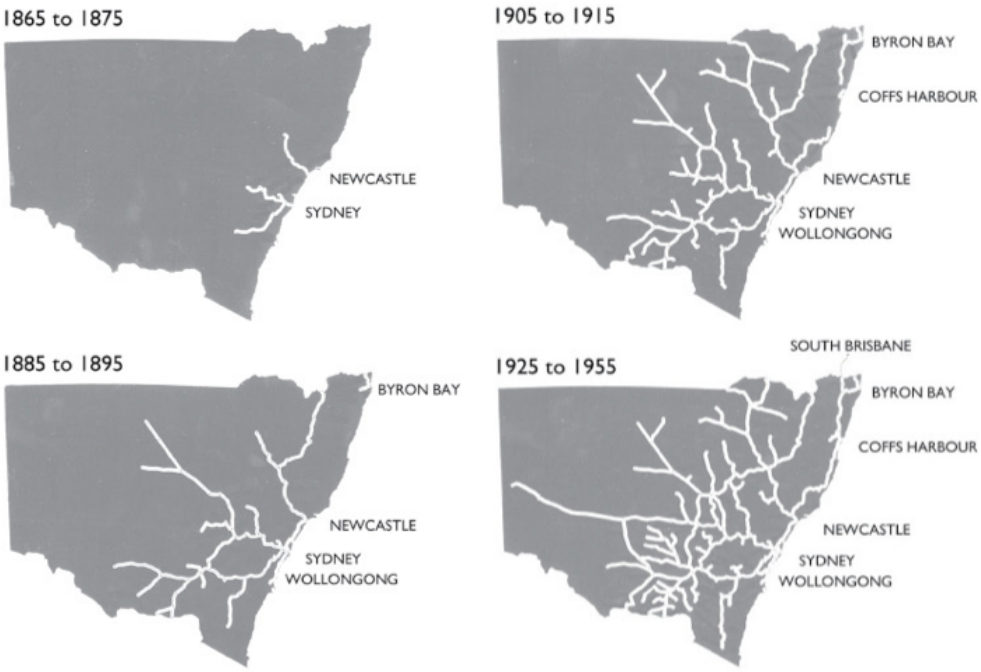
Compared to the horse or bullock-drawn wagons for heavy freight or walking for people transport, railways were immeasurably superior since it could generally be placed where the need was, while being relatively fast and reliable.

Railways had a profound effect on the economies of regional towns and regions. The coming of rail provided opportunities for the export of ores and rural

[133] Scott E. (1929) *"Australian Discovery",* University of Melbourne press, Melbourne
[134] Ibid.
[135] Bureau of Infrastructure, Transport and Regional Economics, BITRE (2014) *"The evolutions of Australian towns",* Commonwealth of Australia

products, commerce and travel, which allowed industry to bloom in new areas and create new wealth and, last but least, allowed the development of new industries[136].

Figure 2.4 – Railway development in New South Wales from 1865 to 1955



In addition the railways were significant pieces of infrastructure requiring considerable investment that provided employment opportunities, not only in construction and engineering programs but also for coal and water providers for the steam engines.

As a consequence of an established transport system is that it set in place a strong element of path dependence in terms of economic activity and competitive advantage of capital cities (***Figure 2.5***). The relation between town distributions and railway development is strong, along with the formation of highways, creating a broader network of infrastructure[137].

The lack of personal mobility and mass communication in 19th century forced industrial management and staff were obligated to live close to their work, often on rural proprieties or in towns next to mines, ports and railway station.

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[136] Bureau of Infrastructure, Transport and Regional Economics, BITRE (2014) *"The evolutions of Australian towns",* Commonwealth of Australia

[137] Ibid

Figure 2.5 – Town and railway distributions in Victoria and NSW

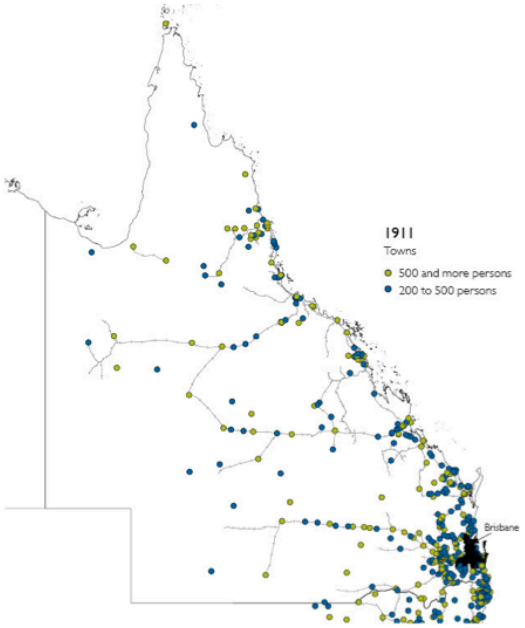
In 1911, Australian population was 4,5 million people (one fifth of the 24 millions of 2015) with New South Wales leading with 1,6 millions, following Victoria 1,3 millions and Queensland 0,6 millions. Particular attention must be given to the Western Australia that has risen in 30 years, from 30.000 people in 1881 to 280.000 in 1911 (nine times more) in response to the discovery of gold in the state in the 1890s, highlighting the strong influence has industry in population growth[138].

Thanks to BITRE analysis of ABS/CBCS 1911 Census and Geoscience Australian Gazetteer, below it is presented an examination of towns in 1911 in the different Countries mentioning the principal features (pictures are not in scale)[139].

[138] BITRE analysis of ABS (2006) *"Census of population and Housing place of work data"*, Canberra
[139] BITRE analysis of ABS/CBCS (1911), *"Census and Geoscience Australia Gazetteer",* Canberra

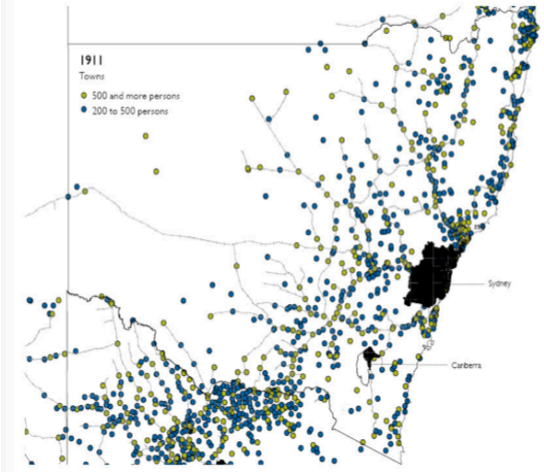
Queensland, with Brisbane capital.

- Clustering of towns on the coast particularly in the shout-eastern corner around Brisbane and clustering of small mining towns towards Cairns (NW);
- Strong association of settlement and railway along the coast.



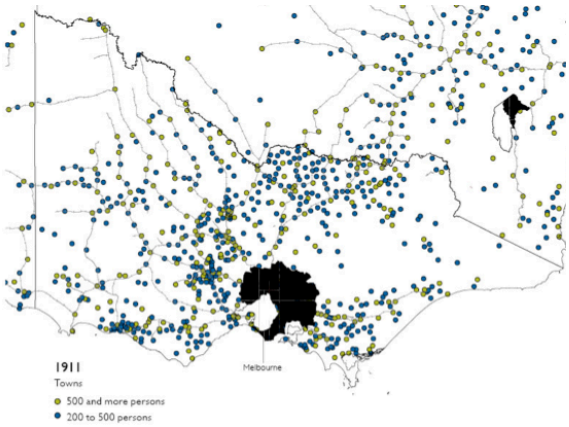
New South Wales, with Sydney capital.

- Intense settlement on the NE coast due to subtropical agriculture;
- Strong association between towns, rail transport and rivers;
- Large number of agricultural towns in the wheat-belts (NE-SW) and pastor or mining towns in the Western District,



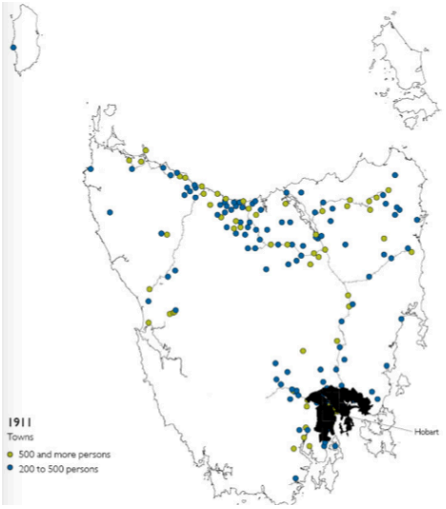
Victoria, with Melbourne capital

- Intense settlement on the south coast around Melbourne;
- Strong association between towns and rail system;
- Close settlements of the central north on the Murray River being associated with agriculture



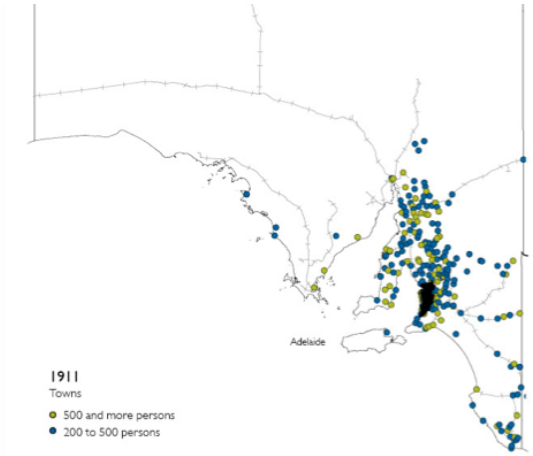
Tasmania, with Hobart capital

- Clusters of town around the capital and top north of the island;
- Growth od several mining towns in western region;
- Strong association between towns and railways.



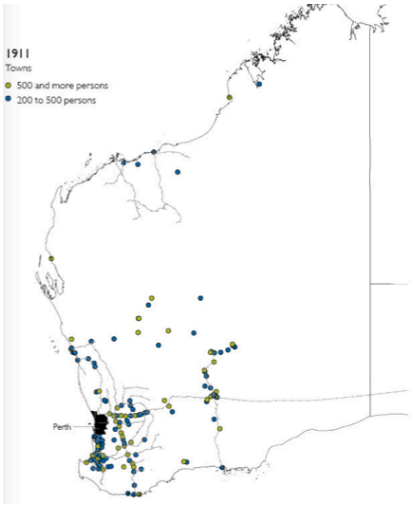
South Australia, with Adelaide capital

- Settlement around Adelaide and York Peninsula;
- No development toward west regions;
- Cluster of towns close to the state border based on logging.



Western Australia, with Perth capital

- Strong collection of town south of the capital;
- Strong association of town and railways in the agricultural regions;
- Cluster of towns around the goldfield of Kalgoorlie.



Australian town settlements were born from process of colonisation and consequently the creation of States due to administration, technological and social changes. Agriculture and gold rushes led to an explosion of the Australian population, further boosted by the coming of railways that revolutionised transport in the cities across the regions, while nodes of activity and industry have been developed around station and river ports. Substantial change in Australia's settlement patterns occurred over the 19th century.

The following discussion about towns population in national trends are taking in account the time frame from 1911 to 2006 passing through the mid-census made in 1961, with data drawn from the first, the middle and the last Australian Bureau of Statistics (ABS) Censuses. Two direct considerations can be expressed in order to give an idea of the growth of national population[140]:

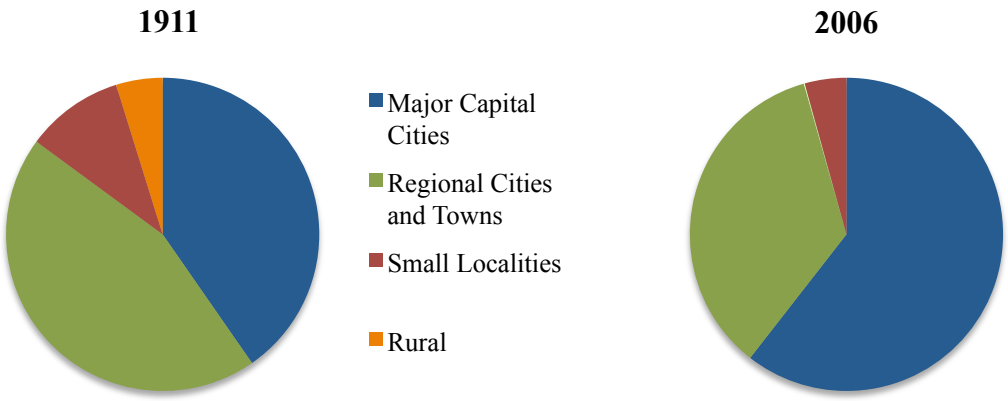
- Considering the two sub-frames 1911-1961 and 1961-2006, the annual growth rates tended to be higher in the 1911-1961 compared to the 1961 to 2006 period, with exception of Queensland and Western Australia;
- The largest growth in both frames was in the New South Wales, with an increase of around 5 million people in 1911-2006.

Regarding regional and urban populations, the population in 1911 was predominantly located outside the major capitals, in contrast to Australia today. From the following table (***Figure 2.6***) comes to light the strong difference between 1911 and 2006 distribution of population in the Country of Australia:

- Percentage of population in Major Capital Cities compared to the whole Nation increased from 40,3% (1.796.474 people) in 1911 to 60,6% 12.025.829 people) in 2006. (With Major Cities it is meant the 1911 capitals group of Sydney, Melbourne, Brisbane, Adelaide, Perth, while in 2006 cities of Gold Coast, Sunshine Coast and Central Coast are added to the group)[141];
- Percentage of population in Regional Australia compared to the whole Nation decreased from 59,7% (2.658.531 people) in 1911 to 39,4% (7.829.459 people) in 2006. (Regional Australia includes all of the town and small cities and areas that lie beyond the Major Capital Cities)

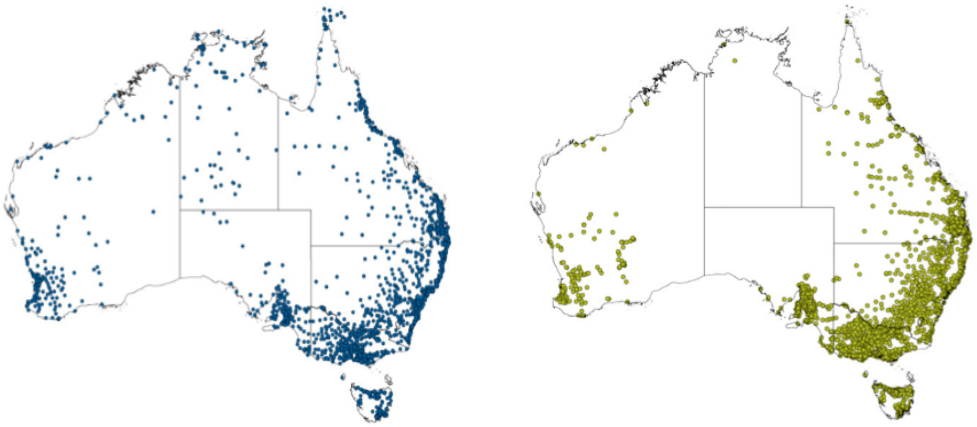
[140] BITRE analysis of ABS (2006) *"Census of population and Housing place of work data"*, Canberra
[141] Ibid.

Figure 2.6 –Population distribution in Australia in 1911 and 2006



Moreover, from 1911 to 2006 data, has been assessed a shifting towards the continent's north and west and an overall reduction in the number of towns, especially in Victoria and NSW, from 2.460 towns in 1911 to 1.708 towns in 2006 (***Figure 2.7***).

Figure 2.7 – Australian towns of more than 200 people in 1911 and 2006



One of the reason is the absorption of small towns into larger cities with the expansion of Australia's capital cities, as Pakenham and Cranbourne which once stood apart but they are today considered suburbs of Melbourne.

Australian demographer and academic Graeme John Hugo in his report "State of Ageing in South Australia" where the period between 1966 and 1996 is analysed, claims that the number of towns with populations between 1000 and 100.000 persons increased from 450 to 728, making the salient point that "it may come as a surprise to

some that almost one-quarter of Australians live in country towns and regional centres"[142].

1950 was the year of the surpass of population living in Major Capital Cities on the population of Regional Australia, while 1935 was the year of the surpass of population share of Major Capital Cities on population share of Regional towns and rural (***Figure 2.8; Figure 2.9***). In the early years of 20th century population share of Major Capital Cities is around 64%, Regional towns and rural one is 36%[143].

Figure 2.8 – Population distribution between towns and rural in Australia (in thousands)

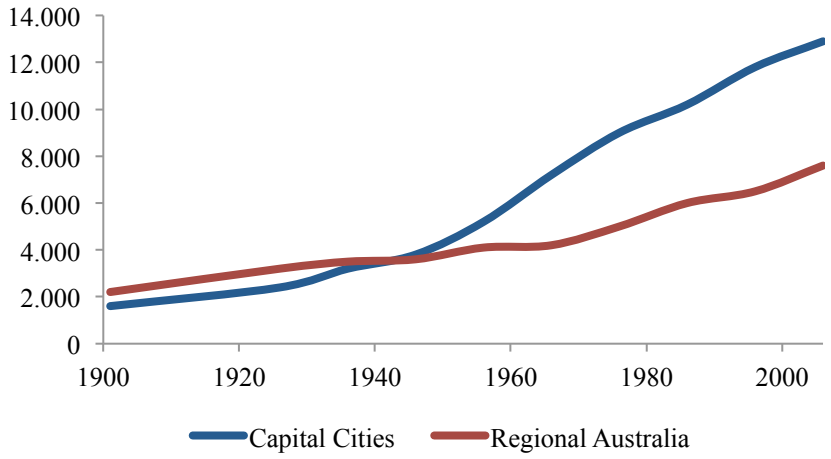
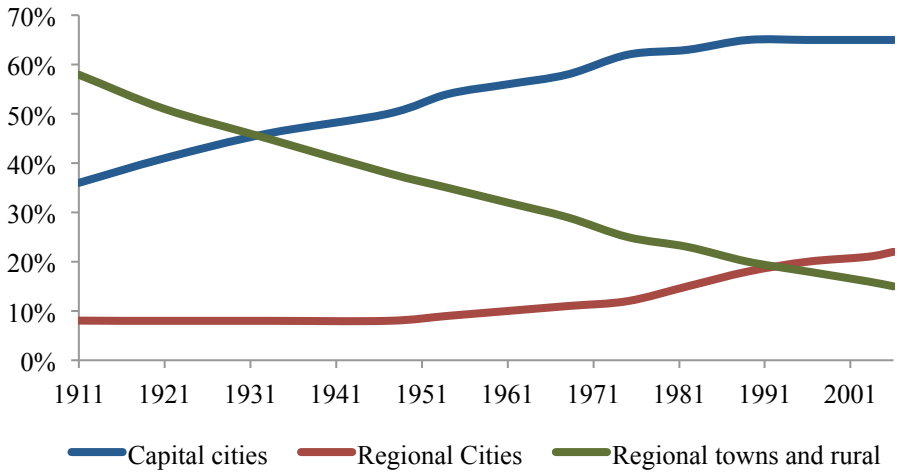


Figure 2.9 – Capital cities, Regional cities and regional relations



[142] Hugo G. and Harris K. (2011) *"Population distribution effects of migration in Australia",* Report for Department of Immigration and Citizenship, Canberra

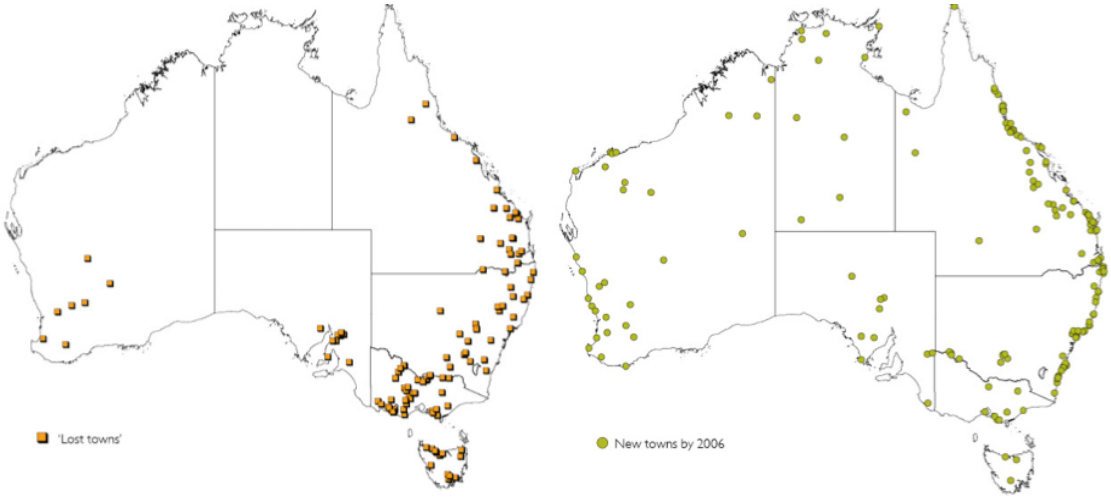
[143] Bureau of Infrastructure, Transport and Regional Economics, BITRE (2014) *"The evolutions of Australian towns",* Commonwealth of Australia

Interesting is the difference of coastal and inland cities in populations: if they were almost the same in the beginning of 20th century, 100 years later the first is double than the latter. This is given by the strong population growth in South East Queensland, reflected by the inclusion of the Gold Coast, Sunshine Coast and Toowoomba in the top biggest Australian cities in 2006[144].

On the other side, towns with annual decline in population between 1911 and 2006 were often of mining locations, particularly remote mining towns which had difficulty making the transition from being a one-industry town to a major service centre. As instance, the town of broken Hill, was founded and grew around the mining of rich deposits of lead, zinc and silver. While mining continues today, some deposits have been depleted, so resources are not being extracted at the same rate and better technology has reduced the need for mine workers. It is a town that has been exposed to the volatile fortunes of mining, yet more recently has survived because of its size and distance advantages for service provision in the area.

In some cases, the decrease or increase of population has been even so drastic, that according to Census some towns are classified as "lost towns" or "new towns"(***Figure 2.10***)[145].

Figure 2.10 – Lost and new towns in Australia in 2006



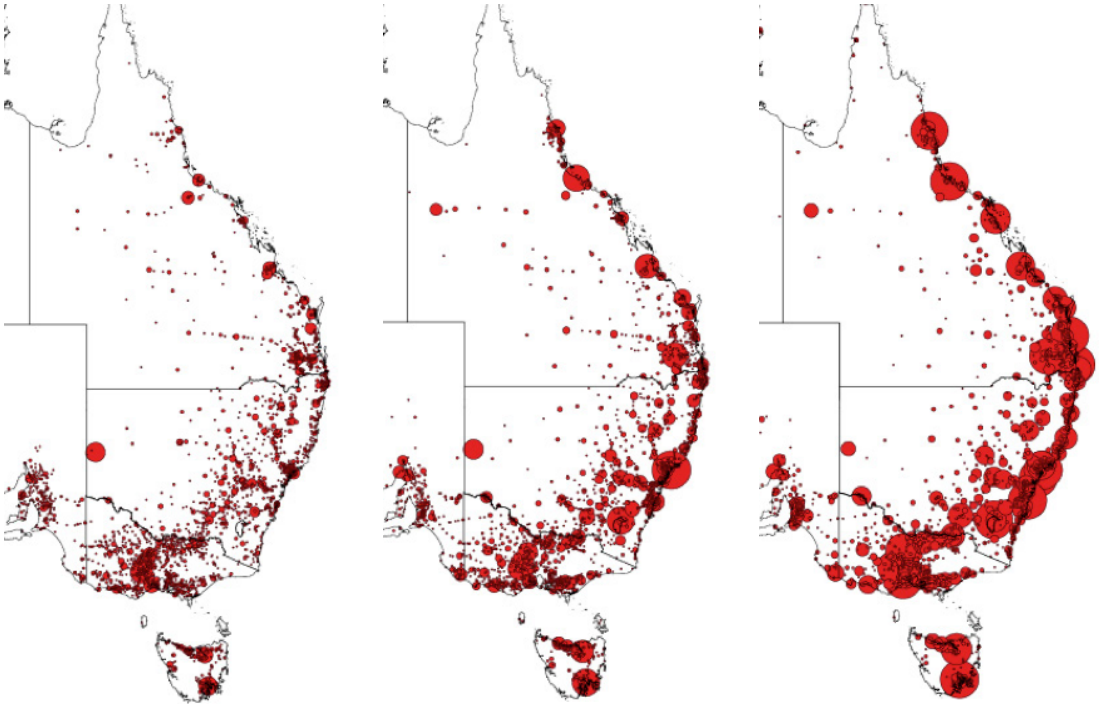
[144] BITRE analysis of ABS (2013) *"Population growth, job growth and commuting flows in South East Queensland",* Report 134, Canberra

[145] Bureau of Infrastructure, Transport and Regional Economics, BITRE (2014) *"The evolutions of Australian towns",* Commonwealth of Australia

"Lost towns" are located more along the east inland of Perth, western inland area of Sydney and west State of Victoria, while the "new town" is intensively located along the whole East Coast, from Cairns to Melbourne, and randomly located in the inland Country of Australia.

Must be said that the apparent appearance of many inland and northern towns owes more to changes in the way Indigenous Australians were counted in the Census than real growth in population.

Figure 2.11 – Towns by population size in Australia over three Censuses: 1911, 1961 and 2006



Stronger population growth in coastal regional cities compared with the inland regional cities led to the dominance of population centres on the very east side of the Country (***Figure 2.11***)[146].

Crucial words regarding the versatility of urban settlements have been said by Robert Freestone, president of Planning History Society and urban planner and researcher, "Many surveyed towns failed to ignite or their fortunes waxed and waned over time. The physical plan was rarely an issue: siting, accessibility, comparative

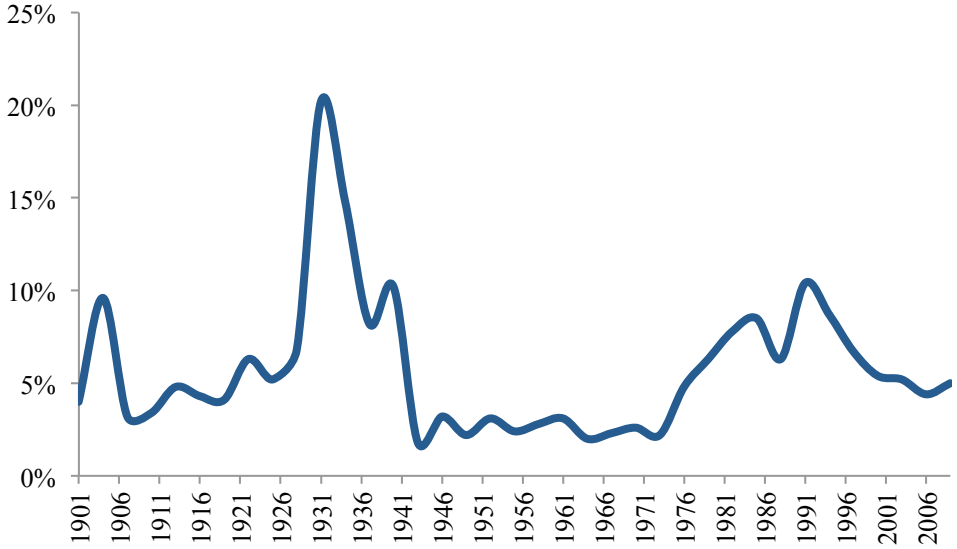
[146] Bureau of Infrastructure, Transport and Regional Economics, BITRE (2014) *"The evolutions of Australian towns",* Commonwealth of Australia

advantage, and adaptability to new circumstances, such as technological change, were more critical factors"[147].

2.2.2.3 Economy performance

Among many boom and bust cycles over the short modern history of Australia, there have been three main events that have strongly influenced the population and the GDP (Gross Domestic Product) growth rates: mining booms, World War I and II and the Great Depression of 1930s. Low and negative GDP growth is associated with the World War I and the Great Depression, while the rising of the GDP with the World War II (***Figure 2.12***)[148].

Figure 2.12 – Australian labour force and unemployment rate from 1901 to 2011.



Until the beginning of World War II Australia met an increase of unemployment rate until 20% due to the Great Depression, but during the war it decreased almost disappearing. The period between 1945 to 1974 has been described as "the long boom" due to the high growth in both population and GDP and almost

[147] Freestone R. (2010) *"Urban nation, Australia's planning heritage"*, Csiro publishing and The Australian heritage Council, Sydney

[148] Bureau of Infrastructure, Transport and Regional Economics, BITRE (2014) *"The evolutions of Australian towns",* Commonwealth of Australia

zeros unemployment and rapid expanding workforce, given by the reconstruction need and the wheat and wool price booms by the early 1950s[149].

In 1974 the situation changed drastically, with the unemployment again rising and prices rising that have been outstripped by wages that rose by 28%. This was given by slow output growth compared to the immediate post-war period, continuing inflation and slow productivity gains.

Reaction of the Government has been to reform ranged from financial and trade liberalisation as floating the exchange rate and reducing tariffs, restructuring the labour market to link wages to productivity and enhanced flexibility and reforming the taxation system. Consequently, the result was a sustained period of strong economic growth with the dropping GDP rate.

The period from 2000 to 2006 saw overall growth but with an increasing shift towards the resource sector based on demand from emerging Asian economies. It also saw the development of the "two speed" or "patchwork" economy as growth levels have varied sharply between regions[150].

Phil Garton, Domestic Economy Division of Australian Government Relator, claimed that in those years in fact the stimulus from the resources boom means that mining States will tend to grow faster than the non-mining States while the mining industry is expanding and faster expansion of mining-related regions will attract labour and capital away from the rest of the economy. In a fully-employed economy, this may imply slower growth in non-mining sectors and regions. In the presence of capacity constraints, the stimulus to demand from rises in the terms of trade adds to inflationary pressures, requiring some offsetting mechanism to moderate demand growth. Under the macroeconomic policy framework in operation in Australia this largely occurs through higher interest rates and a higher exchange rate. This phenomenon of differences in state economic performance as a result of the resources boom has been characterised as a "two-speed economy"[151].

According to the Australian Bureau of Statistics and the Department of Treasury stated that due to the increase in the standard living of Australians the

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[149] Gregory R. G. (2011) *"Then and now: reflections on two Australian mining booms",* in *"Working Paper Series Centre Strategic Economic Studies",* Victoria University, Melbourne

[150] Bureau of Infrastructure, Transport and Regional Economics, BITRE (2014) *"The evolutions of Australian towns",* Commonwealth of Australia

[151] Garton P. (2008) *"The Resource boom and the two-speed economy",* Australian Government, The Treasury

wealth has been increased as well. The growth in nominal wealth has been very rapid, averaging 10,6% per annum between 1960 and 2005[152].

Wealth contributes to increase consumption opportunities, income flows and economic security, to capitalise new and existing businesses and raise economic activities, to make individuals change their lifestyle as bigger and better housing and motor transport, increasing the personal transport.

2.2.2.4 Technology, transportation and infrastructure

- Technology and communication.

In the second half of the 20th century occurred a radical speeding up of scientific advances and their economic applications in the form of new technologies and consumer product that has been called "*knowledge revolution*"[153].

Before 1950s the connection between technology and settlement was not relevant but already from 1890 farming could be carried out on smaller lots due to technological changes, which increased the productivity of the land[154].

In the 1930s more technological changes in transport made fewer, larger farms viable and so towns with economic based on far service declined. The resultant productivity increases led to a decrease on the number of workers required.

New knowledge on technologies, as farm machinery, chemicals increasing yields, better farming systems and genetic modification, was considered "a key source of productivity growth in agriculture"[155] adding "increased production in Australian agriculture has been almost entirely a result of productivity improvements".

In farm reality has been assessed by Industry Commission in 1991 that technology led to an increase of productivity per cow making the operations fewer and larger. Consequently the pattern of dairy farm decline and the rise in average herd size occurred across all states. Number of dairy farms in Australia fell from

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[152] BITRE analysis of ABS (2012) *"Estimated Resident population*", Canberra

[153] Soubbotina,T (2004) *"Beyond economic growth: an introduction to sustainable development",* The World Bank, Washington D.C.

[154] Keneley, M (2005) *"The dying town syndrome: a survey of urban development in the Western District of Victoria, 1890–1930",* in Brodie Marc and Davison Graeme (Eds.) *"Struggle country: the rural ideal in twentieth century Australia, Davison*", Monash University Press, Melbourne, chapter 10

[155] Nossal K. and Gooday P. (2009), *"Raising productivity growth in Australian agriculture",* Technical Repor, ABARE, Canberra

43.000 in 1971 to 15.000 in 1990 and their locations as well has been affected, moving from the close area of major population centres for the perishable nature of milk to further away from major centres for refrigeration transport. Another example of technology impact on industry is that while agriculture production was increasing, its makeup changed from an emphasis of beef and wool towards cotton, whine grapes and other horticulture associated with irrigation, and consequently it has an impact on which towns grew or declined[156].

At the same time in the manufacturing field another revolution was occurring. New mechanism, computer use and production improved led to a more productive industry and reduction in labour needs with innovations in materials that changed industry. This has been called "quiet revolution" in manufacturing by the Productivity Commission, characterized by advantages in lighter, stronger and cheaper materials.

Communications technology has evolved radically in the last 100 years. At the beginning of the 20th century, communication was comparatively basic, expensive and time consuming, but today it is ubiquitous, affordable and fast. The timing of access to these communications technologies differed spatially, with major centres tending to benefit first and the most remote area much later or sometimes not at all.

By the beginning of the 20th century started a distribution of post offices in all Australia that led to a post office closure as they became bigger in space and services, decreasing from 8.001 in 1962 to 4.401 in 1990 and to 3.887 in 2000.These closures reflect a focus on efficiencies but also the wider effect of declining towns and technological shift towards other communications, such as the telephone[157].

The telegram, a major form of long-distance communication in the early 20th century, led to the establishment of some towns as the Overland telegraph between Port Augusta and Darwin in 1872, connecting Australia to an overseas network. It required repeater stations along the route, giving birth to a string of iconic Australian towns as Alice Springs, tenant Creek and Daly Waters (Australian Post).

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[156] Productivity Commission (1999*) "Impact of competition policy reforms on rural and regional Australia,Report"*, AusInfo, no.8

[157] Lee R. (2003) *"Linking a nation: Australia's transport and communications 1788–1970"*, Australian Heritage Commission, Perth

The telephone made the number of use of telegrams fall from 35 million a year to 18 million[158].

The telephone development occurred in the late 1800s in cities and towns and over the first two decades of the 20th century all the States were connected. In 1910 there were 58 telephone exchanges in regional Queensland, creating employment before being replaced by automation, while in Sydney the last one was closed in the 1920s even if smaller country towns still had a manual exchanges in the 1960s and closed in early 1990s. Communications technology has enabled greater connection between people, decreasing distance much as transport has done. The change has meant that people are able to communicate across long distances for business and personal reasons. Like transport, this contributed to the spatial distribution of firms and the longer distances that can now exist between home and workplace[159].

- Transportation

Technological advances in transport have had such a profound impact on movement of goods and people that it will be examined separately from other forms of technological progress.

In previous section "Town populations in national trends" it has already been mentioned the influences that the development of towns had on the development of railways, and viceversa, from 1850s.

The primary function was to connect a hinterland's agricultural and mineral production with seaports and the capital. Farmers benefited from lower transport costs with rail enabling produce to be moved to market more quickly and cheaply. Towns became transport nodes as agricultural products were brought to railway sidings for transport to market and rail itself became an important industry.

The Productivity Commission, Australian Government's principal review and advisory body on environmental issues, in 1999 claimed the biggest beneficiaries of railway are likely to be in country Australia where rail transport is used significantly, especially for the transport of commodities. For example, 70% of grain

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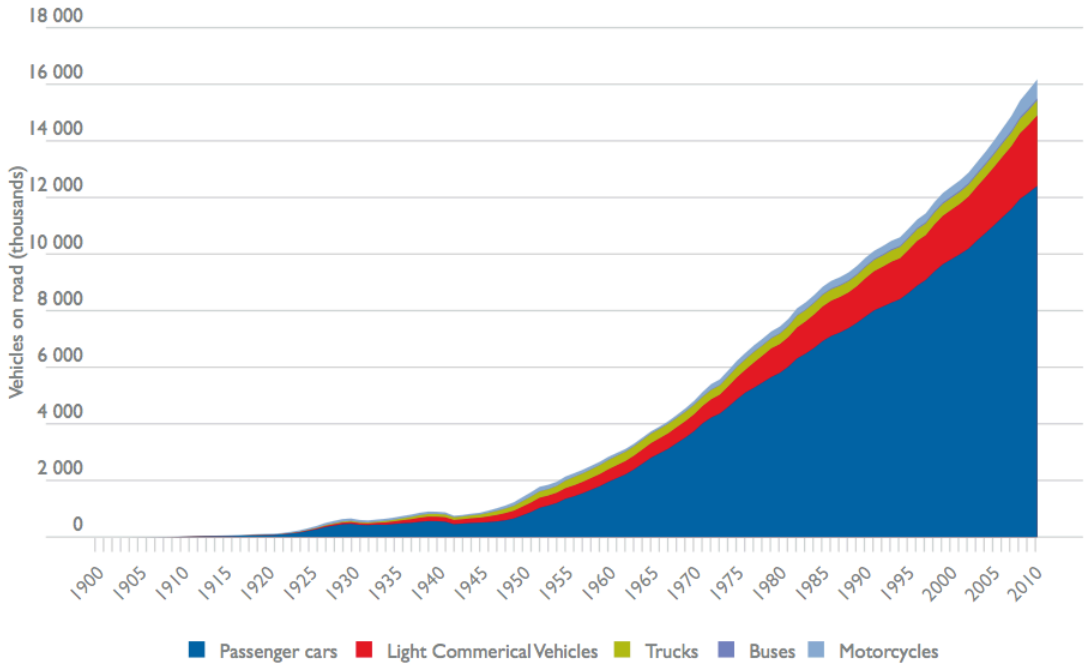
158 Lee R. (2003) *"Linking a nation: Australia's transport and communications 1788–1970"*, Australian Heritage Commission, Perth

159 BITRE analysis of ABS (2014) *"The evolutions of Australian towns",* Commonwealth of Australia, Canberra

production and 80% of coal production is transported by rail. Over the period 1989-90 to 1996-97, annual average labour productivity growth in Australian rail freight was 13 per cent, while wagon productivity increased at a rate of 9% and locomotive productivity at 7% per year over the same period, suggesting the introduction of an immediate "Progress in Railway Reform" for further gains[160].

In fact, despite the shift towards road, rail is still fundamental for some industries and in some circumstances as the wheat that is still mostly transported by rail, with rail carrying an estimated three quarters of the total volume. In overall transportation system, for transporting interstate freight, road has dominated for decades, progressively gaining a larger share of the freight task[161].

Figure 2.13 – Australian on-road vehicle stock from 1900 to 2010



Over the century, a more extensive road network was developed, with better roads enabling faster, safer travel, facilitated by technological improvements as in surfacing. The development of the national highway network was part of this improvement, connecting the nation's capital cities and outing in place important links that channel traffic along these corridors. Along those routes, a multitude of

[160] Productivity Commission (1999*) "Impact of competition policy reforms on rural and regional Australia,Report"*, AusInfo, no.8

[161] BITRE analysis of ABS (2014) *"The evolutions of Australian towns",* Commonwealth of Australia, Canberra

new towns were born, as the Hume Highway connecting Melbourne and Sydney that gave born to hundreds of towns in between[162].

Australia went from 11.000 passengers cars in 1911 to 11 millions in 2006, but until 1950s owning a car has been an elite affair and has been not convenient due to the poor quality of roads contributing to the dominance of the rail. Growth in the number of cars has been almost equal to zero fro 20 years from 1925 to 1945 (***Figure 2.13***)[163] due to World War II but after 1945 start increasing very faster due to the "long economic boom" with people enable to purchase cars for personal transport.

Contribution of motor vehicle has been enormous, changing the spatial connection between towns and activities within them, but in particular it changed:

- Flexibility of moving, taking in account a direct short rout from the place of origin to the place of destination;
- Flexibility of time, without being constrained by means of transports and their timetable;
- Flexibility in deciding who and what bringing in the car with the driver, without any limits of transport restriction and fully comfortable;
- Increasing distance of the travel following personal interest (***Figure 2.14***) allowing people to expand horizons to larger markets and social networks, to wider range of products; this led to a competition between large suburban shopping centres and retailers in country locations[164];
- Flexibility of accessing the place of work and recreational activities, influencing the movement of people within a location. Towns, in fact, were originally compact with walking the most common form of movement with limited access to places and people living in the same location.

Transport in general clearly influenced the city's urban development. Rail lines running outside in the countryside led to the discovery and establishment of

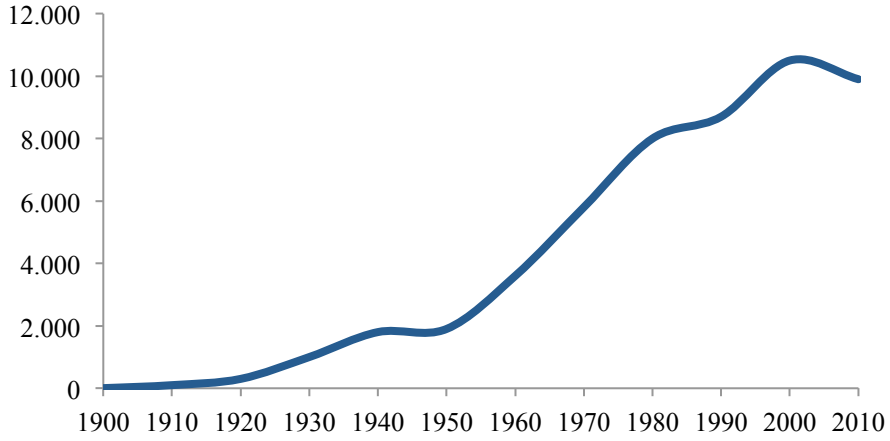
[162] BITRE analysis of ABS (2014) *"The evolutions of Australian towns",* Commonwealth of Australia, Canberra

[163] BITRE analysis of ABS (2012) *"Estimated Resident population*", Canberra

[164] Smailes P. J. (2000) *"The diverging geographies of social and business interaction patterns: a case study of rural South Australia",* in Wiley-Blackwell (Eds.) *"Australian Geographical Studies"*, Vol.38, n°2, pp.158–81

new suburbs, especially in the 1880 "land boom"165. City shapes were transforming, creating a network of "fingers" from the centre in both cities of Melbourne, to south and east, and Sydney to north, west and south, with railway system leading this urban shape mutation.

Figure 2.14 – Australian trend in vehicle kilometres travelled per person from 1900 to 2010



- Infrastructure

Infrastructure is a base for economic growth and social progress. It is an investment in the physical systems and structures in a location, and more broadly it can also incorporate more intangible aspects such as social capital[166].

The main characteristic of infrastructure is the immovability, providing service only locally and "the combination of immobility with long life duration means that infrastructure investments will shape the economic geography, or regional policy, of a country for decades"[167].

Infrastructure in Australia had a strong influence on settlement pattern, being a base on which towns grow. As instance, Latrobe Valley in Victoria, made up of several medium size cities and smaller villages, location of electricity generation stations, originally was developed with former miners encouraged into agriculture, grazing and dairying, giving born of a prominent industry and the develop of the

[165] Mees P (1994) *"Continuity and change in "Marvellous Melbourne",* in *"Urban Futures"*, Vol.3, No.4, pp.1–11.
[166] BITRE analysis of ABS (2014) *"The evolutions of Australian towns",* Commonwealth of Australia, Canberra
[167] Prud'homme R. (2004), *"Infrastructure and development"*, document prepared for the Annual Bank Conference on Development Economics, Washington, May 3–5, 2004.

towns. Successively, the region's rich resource of brown coal became the driver in turning the region's basic industry from agriculture to electric power generation. People were attracted to the region because of employment opportunities in this new industry and consequently towns expanded, as Moe that moved from a population of less than 800 people in 1911 to over 15.000 in 1961[168]

Vincent Amanor-Boadu, director of business in Kansas University, assessing infrastructure influence in community welfare, claimed "Modern communities need some basic infrastructures to sustain quality of life. These include good roads, bridges, water and sewage, electricity, telephone and information technology services, schools, emergency services and recreation facilities. In making location decisions, many people are influenced by the availability and state of these infrastructures. Thus, there is a strong correlation between the existence of quality infrastructure and the economic and social vibrancy of a community[169].

The term "infrastructure hangover" is used when infrastructure cant work as in its original function mode and it is abandoned or repurposed with new functions as tourist towns or commuter towns. As instances, Daylesford in Victoria was rediscovered as a SPA town in the 1960s after a period of decline and Mount Beauty in Victoria, born as accommodation for workers on a hydro-electricity scheme, turned into tourism location for its natural beauty[170].

2.2.2.5 Social changes

Among all the changes occurred in Australia in the 20th century, social profile of Australians is one of the most remarkable.

The development of towns occupying inland territories, brought colonizers to face with Indigenous people, who have been affected by prevailing social attitudes

[168] McRae L. (2013) "*Coal mine planning's dark history", Latrobe Valley Express*

[169] Amanor-Boadu V., B. M. (2008) *"Return on investments for Community infrastructure projects? A foundation for rural development strategy",* document prepared for the Southern Agricultural Economics Association, Dallas, USA

[170] BITRE analysis of ABS (2014) *"The evolutions of Australian towns",* Commonwealth of Australia, Canberra

and government policy over time. Consequently, the Law Reform Commission in 1986 has been published with the following main steps and policies[171]:

- "Protection policies" that characterised the first part of the century were controlling the movement of Aborigines and their employment;
- "Assimilation policies" dominated the middle of the century with the emphasis on Aborigines adopting Australian culture and beliefs, with same privileges and rights.
- "Integration policies" emerged afterwards, acknowledging Aboriginal culture improving health, education and employment;
- 1967 referendum to remove two references in the Constitution that discriminated Indigenous people;

Migrants, first from England and Ireland and later from Asia, occupied the 70% of the workforce in large projects in Australia, as the Snowy Mountains Hydro-Electric Scheme, promoting economy advantages. In 2011, 26% of the Australian population was born overseas and 20% had at least one parent born overseas. Immigrants are more likely to live in Capital Cities with the 82% of them compared with the 66% of the whole Australian population[172].

Importance of immigration is not only in total number of population but also in distribution of settlements; in fact, it has been assessed that immigrants do not settle in the same pattern as the existing population[173].

Moreover it is believed that technology and industry have a strong relationship with education, since the development of the firsts created the growth of labour face and consequently this brought to advantages in possibilities[174].

Education and employment have been two factors pulling young people leaving regional locations and migrating to the cities, showing a long-standing trend. Women employment, that was bigger in 1999 than 1911, led to a process of independence of the family itself, with more freedom in deciding where to live in order to keep two careers, the mother and the father ones, that at least one is likely to

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[171] Ellicott R. J. (1986) *"Recognition of Aboriginal Customary Laws",* Australian Government, Canberra

[172] BITRE analysis of ABS (2012) *"Estimated Resident population*", Canberra

[173] Hugo G. and Harris K. (2011) *"Population distribution effects of migration in Australia",* Report for Department of Immigration and Citizenship

[174] Evans M.D.R. and Kelley J. (2002), *"Australian Economy and Society 2001: Education, Work, Welfare*", The Federation Press, Sydney.

be based in a city. In this process, family units have been able to generate wealth more quickly than before[175].

Tourism in Australia has grown very fast and became a major industry. International tourism number to Australia has doubled from 3 millions in 1993 to 6 millions in 2011[176]. Cairns, for instance, is defined as "the city driven by tourism", and thanks to it huge industry and transport development has grown fast in recent year.

2.2.2.6 Geography and History

- Geography

As fully described in the section **2.2.1 (Introduction to the process of change)**, the basic shape of the settlement pattern of Australia has persisted over time and most towns in 2006 already existed in 1911, with new town in minority.

British geography professor and founder member of the Institute of British Geographers, Arthur E. Smailes, claimed:

> *"Though an age may have some new towns, the community cannot on any large scale afford to sacrifice the old towns and start afresh elsewhere in conformity with current geographic values or social standards (...) the past weights heavily on the present"*[177]

Once towns are created they tend to persist, changing in population sizes rather than the creation of new towns or the desertion of others.

Geography had an important role in the early settlement patterns while mineral finds and amenity were important for towns established in the 20th century;

[175] BITRE analysis of ABS (2014) *"The evolutions of Australian towns",* Commonwealth of Australia, Canberra
[176] BITRE analysis of ABS (2016) *"Australian National Accountrs: Tourism Satellite Account"*, Commonwealth of Australia, Canberra
[177] Smailes PJ (2000), *"The diverging geographies of social and business interaction patterns: a case study of rural South Australia",* Australian Geographical Studies, Vol.38, No.2, pp.158–181.

land were import for farming and pastoral activities, coastal areas for port and transport system in general, inland large cities for mining[178].

The ability to understand geography, with the ability to use the land or change it, driven by innovations and technological advancements, has affected in the 20th century the development of all the national cities in Australia, along with specific discoveries as mineral and gas.

- History

Going back in size town topic, it is believed that the size it is the outcome of decades or even centuries of accumulated investments in infrastructures, that actually have the chance to reinforce effect such the c of transport networks centred on major cities and smaller cities around a larger one increasing the larger city's potential market size[179].

History shapes and limits change in the settlement pattern. One way to think about history's role is that it creates a limiting, evolving context by which future decisions are made. This is a continuous process, because each new decision slightly alters this context[180].

The theory that describes a process where early decisions, advantages or chance occurrences become increasingly locked in, until the resultant outcome or path is difficult to escape is called "path dependence" and it is fully described with the following prerogatives: the more action is taken and choice is made and greater is its benefit called "increasing returns" characteristic, making a choice or taking an action puts in place a set of forces or complement institutions that encourage that choice to be sustained called "self-reinforcement" characteristic, an action or choice creates positive externalities when that same choice is made by other people called "positive feedback" and a choice becomes better than other if a sufficient number of other people has mad the same choice called "lock-in"[181].

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[178] BITRE analysis of ABS (2014) *"The evolutions of Australian towns",* Commonwealth of Australia, Canberra

[179] Polèse M. (2013), *"On the growth dynamics of cities and regions – seven lessons. a Canadian perspective with thoughts on regional Australia"*, Australasian Journal of Regional Studies, Vol.19

[180] BITRE analysis of ABS (2014) *"The evolutions of Australian towns",* Commonwealth of Australia, Canberra

[181] Page S. E. (2006), *"Path dependence"*, in *"Quarterly Journal of Political Science",* Vol.1, pp.87–115.

This theory may be applied on the topic of standardisation of the railway gauge, as all different colonies in Australia have different distances of the railway lines and no of them was comfortable in changing it, so connection were not able at first.

2.2.2.7 Relation town and industry

Given that from previous section industry was very dependent from the local supporting town and the relationship between them it is described in the Base Economy Theory, it has been highlighted that basic industries were the primary source of town growth and non basic-industries serving local populations quickly following. Major components of this model are:

- Households, the population of the town, supplying labour and consumers of goods and services;
- Basic industries, produces goods sold outside the town; usually they are primary, manufacturing and tourism;
- Non-basic industries, supplies goods and service to be sold to local households or industries; usually retail sectors and businesses providing input services to basic industries;
- Location outside the town, to illustrate that towns do not operate in isolation with labour, customers and suppliers from outside able to operate within the town and viceversa.

The relationship between towns and the various industry sectors is defined through the workings and outcomes of a series of markets as the export, the good and service, capital and labour.

A town's basic industry provided a multiplier effect for economic growth by injecting external funds to promote a town's economic expansion, with only minimal leakage to major cities for specialist inputs or haulage of produce: it provided the basis for the growth of many of Australia's towns[182].

The situation in 1911 regarding the mutual support of agriculture, for instance, and the town in relation to a major city is described as follows:

[182] BITRE analysis of ABS (2014) *"The evolutions of Australian towns",* Commonwealth of Australia, Canberra

- Agriculture is benefited through labour, support services, investment and a built environment that facilitated production;
- Towns grows on the back of industry through jobs, supports industries and build infrastructure, attracts further people to raise local economic activity;
- Weak connection to a major city for both industry and town, that provides only legal expertise and transport hubs.

Due to productivity gains, declining transport costs, improvements in communications, technological advancement, shifting economic conditions, international competition and periodic shocks such as droughts, led to a change in relationship of industry and town over the 20th century.

The situation in 2006 has clearly changed and described as follows:

- Agriculture and industry in general are not dependent on local support as it was one century before;
- Towns are not supporting industry anymore, neither building infrastructure and making investments;
- Strong connections with the major city, where industry and towns are looking for support in services and investment and infrastructure building support.

Small rural towns needed industry much more than industry needed small rural towns and the stimulus previously generated by industry for small towns declined, due to the shift to regional centres for support, access to factors of production and as distribution points and centres of manufacture[183].

2.2.2.8 Provision of goods and services

In the previous section it has been discussed the overall decline in the number of towns and their shift to the east coastal region and the rise of major regional service centres dominating economic activity amongst smaller towns and villages in the surrounding hinterland.

[183] BITRE analysis of ABS (2014) *"The evolutions of Australian towns",* Commonwealth of Australia, Canberra

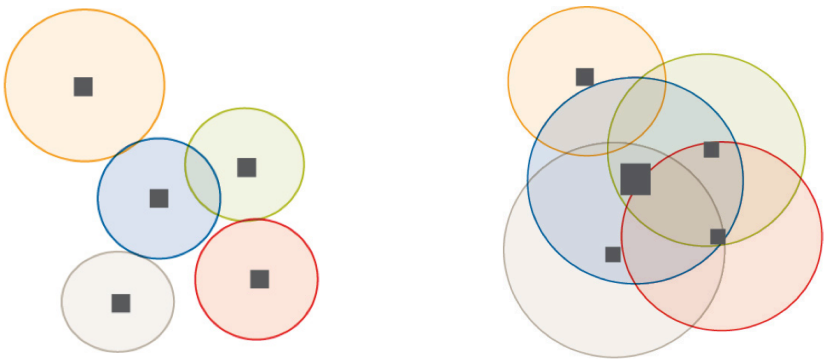
In 1911, the urban structure was multitude of scattered small towns with an occasional large centre and there was a difficulty in personal transport for potential costumers in a landscape where the dominant basic industry (agriculture) dictated a dispersed workforce and population. Transport for individuals was horses and rail for longer journeys. Moreover the limited transport ensured that it was difficult for retailers and service providers to expand beyond the local market and the turnover was limited:

Overtime, several changes enabled consumers to explore other options:

- Personal transport has moved from walking or horses to motor vehicles and road were upgraded giving the chance to access more distant stores;
- Technological progress and electricity spread made new goods became available for households and businesses, cutting the need to frequent trips for supplies;
- Innovations in communication, informing costumers about new fashion, trends, techniques and goods across longer distances;
- Improved transport allowed local rural economies to focus more on supplying goods for sale outside the region instead of for local or at home consumption, providing income and facilitated the distribution of new products.

A long- standing barrier was removed and goods not available locally were now accessible: the geographical impact was to shift from a collection of isolated and scattered towns to an economic landscape where consumers sometimes had a number of centres within their effective transport range (***Figure 2.15***).

Figure 2.15 – Towns market sizes in 1911 and in 2006



The fundamental impact was the increase in a firm's market size and at the same time, as consumer transport options increased through the twentieth century, competition increased but not because there were more retailers overall, but because consumers had access to retailers in more than one town. The situation slowly changed from one of monopoly constrained by potential entrants to one of increasing, but still imperfect, competition[184].

Due to the intense rivalry between small and bigger cities, the fair of the small village firms is to have enough demand to cover the cost of providing the service. In order to survive, the strategy is to increase the mark-up, increasing the price of the items, causing a reduced turnover, higher margins and the circles starts again with higher prices and on, in a vicious circle. The competitive larger towns instead, have lower prices, causing an increase turnover, lower margins, decreasing the price of the items and feeding the circle. The small town circle is a negative feedback, the large towns is a positive one.

It has been assessed that the consumer's decision of where to shop is made by realizing that larger towns capture more customers, generate variety and lower prices, while small towns reduce variety and increase prices in response to smaller market and so lower prices and variety are available in larger towns. Not to be forget is that the effect of being located at a key junction or junctions of major roads is to effectively increase the potential number of regional customers that can be accessed at a reasonable cost; and this is another reason why small towns can become larger ones[185].

Moreover, the emergence of a new or expanded industry in a town has the capacity to increase the number of potential customers and therefore change significantly the operating environment for retailers in that town. For this reason a small town can quickly adopts the characteristics of a larger one.

Interesting point regarding industries and their relation with the town is the fact that competing businesses now had a common interest n attracting customers to their town; the initial decision of a consumer is not to choose between them but to choose the location in which to shop. This led to a range of arrangements and

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[184] BITRE analysis of ABS (2012) *"Estimated Resident population*", Canberra

[185] Johnson N, Kackar A., Kramer M (2015) *"How small towns and cities can use local assets to rebuild their economies: lessons from successful places",* United States Environmental Protection Agency, Washington

strategies from businesses and towns often through their local government, that were cooperative in nature rather than competitive, and some of them are summed up as follows[186]:

- Advertisement and promotion as a place to live and a place to shop;
- Promotion tourism and implement regional development strategies based on their-own;
- Seek new regional businesses and industries in town to increase the attractiveness of the town;
- Support local sponsor and organizations;
- Support infrastructure attracting costumers.

If the concept of cooperative behaviour between similar firms is usually regarded with some concern, the cooperation between firms in the same town lead to a positive outcome for customers.

2.2.2.9 Amenity

In the previous sectors it has been visibly described the contribution of history, geography, industry and provision of goods and services in changing Australian settlements structure, focusing on the special role of agriculture, mining and manufacturing activities in transformation of small town into larger one. However, this influence has decreased due to the ability of people to make decisions on how and where they want to live, considering a range of options in their choice of location due to the more accessible transport.

It was discovered with the 2009 ABS that beyond employment, people identify important locational considerations such physical feature attractiveness as landscape and climate, services available and freedom in accessing to them as health and education, proximity to family and friends. All this branches contribute to a location's amenity.

Amenity is directly connected with human personality and interest, as it is up to the person himself to be attracted by an amenity type, as a student is interested in a town with specific universities or a retired person looks for health services.

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[186] Johnson N, Kackar A., Kramer M (2015) *"How small towns and cities can use local assets to rebuild their economies: lessons from successful places",* United States Environmental Protection Agency, Washington

As a result, households are important decision makers on the establishment and expansion of Australia's towns, especially on the coast where the ideal of "better living" is considerably celebrated. Environment, climate, high health and education standards, housing and flexible work arrangements have been factors that contribute to Australian settlements. At the same time a huge amount of cities lost attractiveness due to hot or cold climate, congestion, lack of services.

Amenity development was also given by the fast growing tourism. The best example is Hamilton Island, in Queensland, where previously industry was based on sheep grazing and cropping that soon got attractiveness by people for holiday. A major tourist resort was opened in 1984 and it stimulated local activities. Now the Island counts a huge amount of resorts and services with also a primary school opened recently, witnessing how tourism influence the destiny of a location and how a location grows fast when investing in amenity[187].

Inclination to transfer to a better place is related to the age, as young people have a higher propensity to migrate to obtain education and enter the labour market. Afterwards the propensity to move falls as people start a family and work, while raises in the end of their life when needing health care (***Figure 2.16***)[188].

Must be said that Australian people have high propensity to migrate and have the "highest level of internal mobility in the world"[189].

Attractiveness of a place, along with improvement of transport indeed, led to the birth of commuting over long distances giving the chance to people to live in higher amenity location and travelling very long distances to ac high income jobs or other activities in general. People are attracted to employment in major centres over those in the immediate vicinity or the surrounding region and people move to these locations while retaining access to jobs and services[190].

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[187] Gunderson R. J., Pin T. N. (2000 *"Analyzing the Effects of Amenities, Quality of Life, Attributes and Tourism on regional Economic Performance using Regression Quantiles",* in *"The Journal of regional Analysis & Policy",* USA, Vol 35

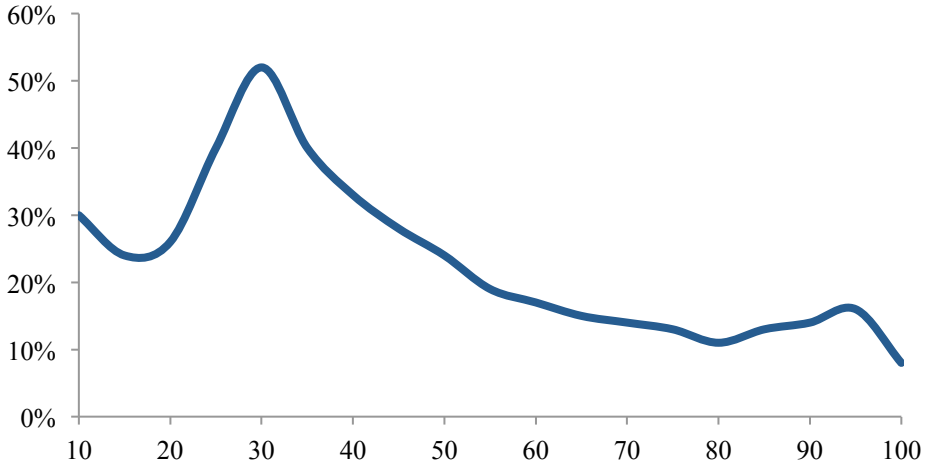
[188] BITRE analysis of ABS (2006) *"Census of population and Housing place of work data"*, Canberra

[189] Skelton R. (2013) *"Global Migration: Dempographic Aspects and Its Relevance for Development",* United Nations Department of Economic and Social Affairs, New York

[190] BITRE analysis of ABS (2012) *"Estimated Resident population*", Canberra

This trend has been assessed for instance in Victoria, in periurban areas in the Melbourne Working Zone, where population and dwelling growth was stimulated by these very high natural and build amenity[191].

Figure 2.16 – Internal migration propensity share based on age from 2001 to 2006



The expansion of these types of towns would not be possible without cheap and convenient transport which was previously unobtainable. Similarly, improvements in communications have reduced the need for face-to-face contact, as many people are able to access information more easily, as Internet and telecommuting. This potentially could further increase the separation between the location of work and residence, and give people more freedom to choose residential location based on amenity[192].Concluding, as people preferred to live in desirable locations, they weakened their connections with industry, particularly agriculture and mining and transitioned to an economy based on tourism, lifestyle and service provision. This has also prompted towns to introduce strategies to enhance their amenity as an avenue to promote economic growth.

2.2.3 Interactions and repercussions of the process of change

As described in the previous section influencing urban settlement in the Oceanian country have been geography, history, industry, provision of goods and

[191] Budge T. (2005) *"Sponge cities and small towns: a new economic partnership",* document presented to the 2nd Future of Australia's Country Towns Conference, 11–13 July 2005, Bendigo
[192] Prud'homme R. (2004), *"Infrastructure and development"*, document prepared for the Annual Bank Conference on Development Economics, Washington

service, amenity, investment, economy, transport and infrastructure, while the economic explanation of the change was the expansion of labour related to the creation of goods, implementation of services, investments in markets and industry.

It is interesting now to analyse how early-described factors are acting together and their process of interaction and implication on towns.

Once towns met almost all the needs of the residents, while now they lost some of their functions due to the improvements in personal and collective transport that let them to move in a wider area. As a result, towns are not longer supporting households and businesses, being part in a broader regional market and always in competition with other towns in provision of good and services.

Many towns still remain important as the social centre for communities and services, as hotels, clubs and cafes, while households shop or work in the nearby larger centre.

In the 20th century it has been assisted to the separation of residence and employment. Once an employer used to live close to the work place and later cheap and reliable transportation let him to reach longer destination, included the place he worked.

Moreover, people have the chance to decide where to live, not anymore constrained by walking to the place they work and high cost of transportation, favouring place where find their preferred amenities and where they can increase their level of satisfaction and consequently raise their level of life, education, consumption and mobility. Local households, firms and governments make the majority of decisions, which contribute to the evolution of towns. They generally don't consider the effect on settlement patterns. The changes they create are incidental rather than the focus of their decisions.

The interaction of all these factors and progressions in Australia in the 20th century led to the occurring process of centralisation, with regional towns growing and loosing small ones. The individual processes contributing to the centralisation process have been described before in the previous sections, and are quickly mentioned as follows:

- Change the way goods and services are accessed with households favoured to travel more to access to cheaper and wider range of good and service;

- Centralisation of industry with regional rather than local production of goods and services given by the transport advancement;
- Investment decisions in larger cities, while small ones have difficulty attracting investment;
- Network reinforcing regional centre dominance, connecting key nodes in a system.

At the same time, some factors are running against centralisation as the hangover of infrastructure, community attachment, amenity preferences, industry requirements.

2.3 Comparison of the four largest Australian cities

In the previous sections the analysis has focused on the changes affecting Australia examining the national trends through factors as economy, history and geography, goods and services, amenity, transportation and infrastructure, political decisions.

In the following section the study will concentrate the attention on the four largest cities in Australia by population, Sydney, Melbourne, Brisbane and Perth, presenting the overview of their change between 2001 and 2011, identifying some common trends and differences across them, and investigating the strategic planning goals. The decision of taking in account this specific decade is given by the easiness in finding statistics, reports and data published by the national and local Government, more specifically by the Bureau of Infrastructure, Transport and Regional Economies (BITRE) Report 2010, 2011, 2012 and 2013.

The goal of this report is to explore how commuting behaviour has responded to the change s in population and jobs and investigate the extent to which these recent spatial changes match up to the long-term strategic goals for each city.

Figure 2.17 – Location of the four largest cities in Australia

The four examined cities in this section are the four largest cities by population in Australia (***Figure 2.17***). According to the Regional Population Growth Report made by the Bureau of Statistics ending the 30th June 2014 and published the 1st of February 2016, the population and the percentage on national population of the Greater Capital City Statistical Area (the most often quoted figure for city's population in Australia) are in order[193]:

- Sydney, Capital of the State of New South Wales, 4.848.628 people (20,61%);
- Melbourne, Capital of the state of Victoria, 4.440.328 people (18,90%);
- Brisbane, Capital of the State of Queensland, 2.274.560 (9,68%);
- Perth, Capital of the State of Western Australia, 2.020.786 (8,60%).

The overall population of these four Capital Cities is the 58% of the whole population in Australia, witnessing a phenomenon of centralisation into the most urbanized area that has been very intense in the last century.

Between 2001 and 2011, the population of the major cities has grown at an average of 1,6% per annum compared to the national average of 1,4%, while the number of jobs located in the major cities has grown at an average of 1,9% per annum compared to the national average of 1,7%[194].

[193] BITRE analysis of ABS (2014) *"Regional Population growth, Australia",* Canberra
[194] BITRE analysis of ABS (2013) *"Population growth, job growth and commuting flows in South East Queensland",* Report 134, Canberra

Between 2001 and 2011, the largest population increase has occurred in Melbourne that added 636.3000 residents, followed by Sydney with 477.600, Perth 351.500 and Gold Coast 149.900[195].

The cities of Gold Coast (6th city by population), Cairns (14th) and Sunshine 2014(Coast (9th) present the highest average annual population growth rate with 2,8%, witnessing the phenomenon of moving to the East Coast that has described in the previous section. Gold Coast, Brisbane, Perth and Sunshine Coast have also the highest average annual job growth rate with 3%.

Due to the redevelopment with higher density housing, the CBDs of all four cities experienced very rapid population growth from 2001 and 2011 of more than 3% annum, the middle suburbs averaged up to 1,8% growth while outer suburbs of Melbourne, Perth and Brisbane averaged up to 2,9% while Outer Sydney only 0,9%[196]. Nevertheless, the outer suburbs accommodated much of the population growth in all four cities, contributing 46% of Sydney's growth, compared to 53% for Brisbane, 62% for Melbourne and 68% for Perth.

Regarding transportation, across all the major cities, the private vehicle mode share declined by 1,5% between 2001 and 2011, the public transport mode share increased by 1,5%, the active transport mode share increased by 0,5% and working from home declined by 0,4%. The four largest cities share a common trend of increased public transport and active transport use and reduced private vehicle use[197].

The state government population projections suggest that Sydney and Melbourne will both experience a population increase of around 1,7 million people between 2006 and 2031, Brisbane 1 million and Perth 0,9 million. They also expect that the Outer sectors of the cities will contribute the largest share of population growth, from 65% Melbourne and 76% Perth. At the sub regional scale, the largest increases in population rate are projected to occur in the South West and North West of Sydney, the Outer South and Outer West of Melbourne and the Outer West of Brisbane projecting to add between 320.000 and 425.000 new residents[198].

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[195] BITRE analysis of ABS (2014) *"Regional Population growth, Australia",* Canberra
[196] Ibid.
[197] Ibid.
[198] Australian Infrastructure Audit Background Paper (2015) "Population Estimates and Projections", Australian Government, Canberra

Each capital city has developed a metropolitan strategic plan with strategic objectives that relate to the spatial distribution of population and employment within the metropolitan area or to commuting patterns and transport use. The most recent strategic plans that are going to be analysed in this chapter are:

- "Metropolitan Plan for Sydney 2036"[199], released in 2010;
- "Melbourne 2030"[200] released in 2002 and "Melbourne @ 5 million"[201] released in 2008;
- "South East Queensland regional Plan 2009-2031"[202] released in 2009;
- "Perth and Peel, directions 2031 and beyond"[203] released in 2010.

All the recent metropolitan plans for the four cities specify some common long-term goals, relating to limiting urban sprawl, increasing densities around centres, locating employment in centres, achieving employment growth in particular suburban locations, achieving greater use of public transport and active transport, concentrating development around public transport and reducing commuting time and distances.

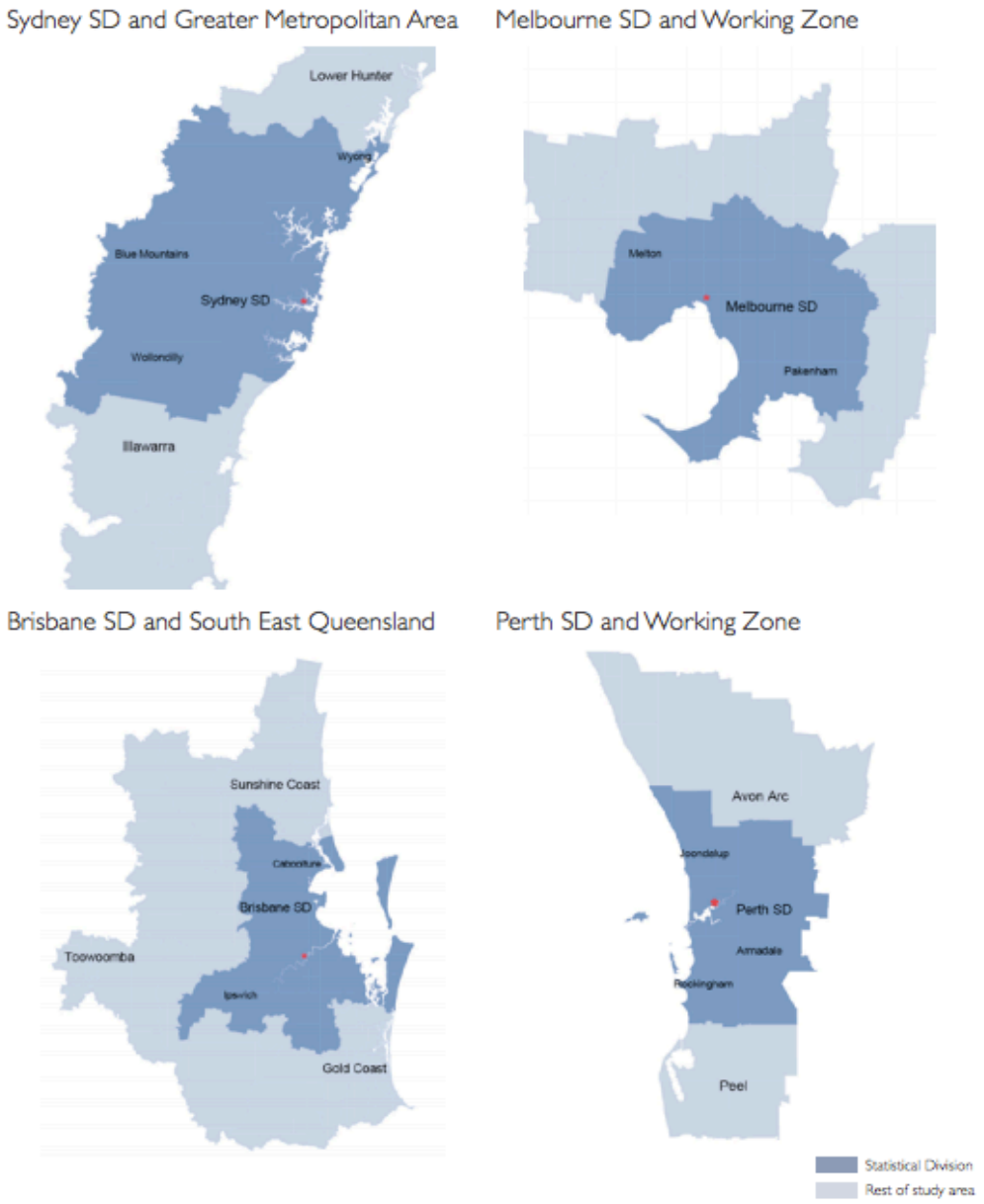
The aim of this chapter is not to identify is these strategic plans are going to be suitable for the need of the single city, rather tries to identify the common points and evidences in the trends of population, employment, transport use and commuting.

2.3.1 Study area presentation

The Statistical Division (SD) boundaries, defined in the Australian Bureau of Statistics (ABS), are the areas where the study bases the comparison among the Australia's four largest cities (***Figure 2.18***).

Figure 2.18 – Relationship between statistical division boundary and study area

[199] Department of Planning (2010), "*Metropolitan Plan for Sydney 2036",* New South Wales Government
[200] Department of Infrastructure (2002) *"Melbourne 2030",* Victoria Government
[201] Department of Infrastructure (2008) *"Melbourne @ 5 millions",* Victoria Government
[202] Department of Infrastructure and Planning (2009) "*South East Queensland Regional Plan 2009-2023*", Queensland Government
[203] Department of Planning, Planning Commission (2010) *"Directions 2031 and beyond"*, Western Australia Government



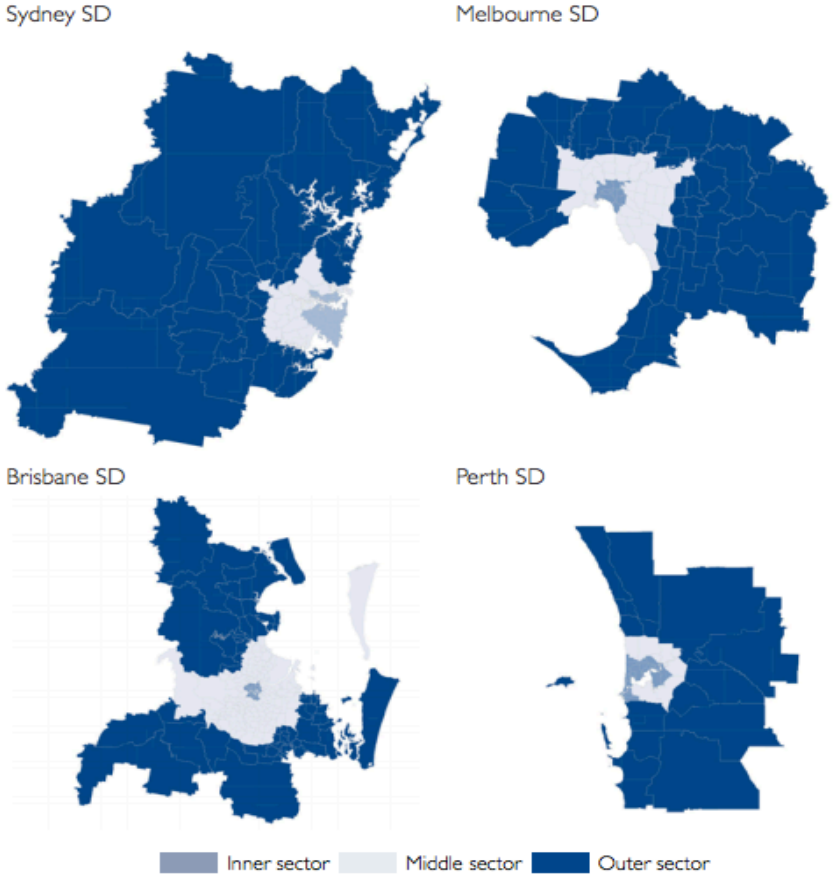
Analysis the trends of the four largest cities in Australia, becomes extremely important to include also the commuting catchment of each of them due to the strong interdependencies between inner suburbs and the nearby regional cities and periurban areas. For this reason the study area is not restricted to the Statistical Division but expands outside their boundaries to the following location:

- Beyond Sydney SD, considerable information can be described for the Sydney Greater Metropolitan Area including Illawarra in the North and Lower Hunter in the South of the SD;
- Beyond Melbourne SD, the Melbourne Working zone is considered due to the areas with strong commuting connection as Bacchus Marsh in the North and Mitchell South in the South;

- Beyond Brisbane SD, are included the other large cities of Gold Coast in the South and Sunshine Coast in the North, corresponding to the Southeast Queensland (SEQ) Regional Plan;
- Beyond Perth SD, the study examines also Peel in the North.

To better understand the distribution of residents and jobs each city has been divided into Inner, Middle and Outer sectors, based on the state government classification (***Figure 2.19***); the sectoral classification reflects the history of residential development in the city map, as it has been described in the previous sections of development of the Australian cities.

Figure 2.19 – Inner, Middle and Outer Sectors for individual city



2.3.2 Strategic planning of the four largest Australian cities

In order to control the development of the fast growing cities present in Australia, local governments and institution have published strategic plans since the beginning of the 19th century, as assisted in the second section of this chapter.

The common goals of the metropolitan plans developed recently by the four cities are the limitation of urban sprawl, the increase of residential densities around centre, the location of employment in centres, the achievement of the employment growth in particular in suburban locations, the full participation in the use of public transport and active transport, concentrate development around public transport and reduce time and distances.

The intention of the following analysis of the metropolitan strategic plans of the Australian cities is identifying if the actual changes are occurring with respect to the strategic planning goals in matter of population spatial pattern, employment growth, commuter flows and transport use and identifying if these movements are in the desired directions.

- City of Sydney.

Metropolitan Plan for Sydney 2036[204] published in Sydney tried to arrange the growth and development of Sydney metropolitan area over 25 years ahead, as the extension and update of the *City of Cities*[205] of 5 years before, both promoting liveability, economic competitiveness, fairness and protection of the environment. Sydney, as the key of a system of regional cities and major centres connected with rail network, bus corridors and orbital motorway web, need to maintain a global competitiveness.

Concerning the limit of urban sprawl, it focused the attention on containing the urban footprint by locating at least 70% of new homes in existing suburbs and by focusing land release in the designated Growth Centres. Moreover the aim in matter of residential densities around the centres is locating 80% of all new homes within the walking catchments of the centres.

Employment is managed to be focused in strategic centres, promoting economic progress of regional cities, as the key node of Parramatta on the West, and at the same time the aim is accommodating half of the new jobs in Western Sydney.

Concerning transportation, the increase of public mode share is at the first place, with the promotion of active transport opportunities. The Plan tries to

[204] Department of Planning (2010), "*Metropolitan Plan for Sydney 2036",* New South Wales Government
[205] Department of Planning (2005), "*City of the Cities",* New South Wales Government

concentrate the residential and job growth around public transportation nodes, with indeed making efforts to ensure more jobs closer to home.

- City of Melbourne.

Melbourne 203[206] followed by *Melbourne @ 5 million*[207] metropolitan published in Melbourne has the aims of achieving a more compact city, better management of metropolitan growth and network with regional cities and a better and greener place to live.

47% of new dwellings will be accommodated in the designated Growth Areas, achieving more efficient use of greenfield land with a target of 15 dwellings per hectare. Moreover, the increase of density through more intense housing development in and around activity centre is another good pint regarding residential section. The overall city population is forced to be shifted from the South-East to the North-West. In economy matter, the plan tries to concentrate the new economic development at activity centres and restrict out of centre development while the employment growth is expected to be located outside Central Melbourne.

By 2020 the increase of public transport's share of motorised trips is going to be 20% of the overall, while cycling and walking are going to be encouraged. All new residential and economic new patterns will focus in areas well served by public transport system. Commuting to and from work is going to be reduced with the distribution of jobs and activities close to the railway network.

- City of Brisbane.

South East Queensland Regional Plan 2009-2023 [208] focuses on sustainability, affordability, prosperity and liveability respecting the climate change; moreover promotes activities against inappropriate urban development along all 11 local governments creating the SEQ metropolitan area.

The development of urban settlement will remain within urban footprint as the plan regarding urban sprawl, accommodating 50% of new SEQ dwellings through infill and redevelopment of existing urban areas.

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[206] Department of Infrastructure (2002) *"Melbourne 2030",* Victoria Government
[207] Department of Infrastructure (2008) *"Melbourne @ 5 million",* Victoria Government
[208] Department of Infrastructure and Planning (2009) "*South East Queensland Regional Plan 2009-2023*", Queensland Government

Regional activity centres will embrace higher density residential development, consolidating rural population growth within existing towns and villages. The aim is to accommodate an increased share of SEQ's population in the Western and South Western Corridors.

Regarding transportation the main effort is to promote public transport use with new infrastructures and improved services and information, while promoting walking and accommodate residential and job growth in areas with access to high-frequency public transport. Through urban consolidation the goal is to reduce travel times and distances, while reducing the length of trips by localising access to goods, services and jobs.

The SEQ Regional Plan aims also to locate government and office-based business employment outside the Brisbane CBD, in specified regional activity centres

- City of Perth.

Directions 2031 and beyond[209] is the framework developed in Perth establishing a vision for future growth of the area between Perth and Peel, concerning detailed planning and delivery of housing, infrastructures and services necessary to accommodate a range of growth scenarios, replacing the *Network City*[210] strategic plan regarding the focus on a network of activity cities connected by corridors.

Limiting the urban sprawl, Perth is projected to achieve a more compact city pattern by accommodating 47% of new dwellings though infill development and promoting higher densities in greenfield development. The links between centres with medium-rise higher density housing is the main goal regarding residential density around cities.

Concerning economic growth the plans wants to increase employment self-sufficiency of outer sub-regions, helped by the encouragement to shift to public transport use. The use of walking and cycling is stimulated to and from work, or even nullify with the promotion of working at home.

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[209] Department of Planning, Planning Commission (2010) *"Directions 2031 and beyond"*, Western Australia Government

[210] Department of Planning, Planning Commission (2004) *"Network city"*, Western Australia Government

The current spatial distribution of population and jobs within the cities reflects the accumulated pattern of development over many decades and continues to be shaped and influenced by demographic trends, cultural preferences, economic forces and government interventions. To operationalize strategic planning into development control instruments and infrastructure design and construction can involve 10 to 15 year processes. The changes observed since 2001 with respect to population, jobs and commuting will partly reflect the policies of earlier decades[211].

Must be said that the Council of Australian Governments (COAG) reform Council in 2012 published its review concerning the efficiency of the four capital cities strategic planning systems and none of them was found to be fully consistent with the agreed criteria. In fact COAG claimed that[212]:

- Sydney system "lacks the hard-edged accountability, performance and implementation measures to drive the policies; to drive toward densification and making Sydney a "city of the cities" requires a delicate balancing act between affordability and growth, on the one hand, and productivity and sustainability goals on the other"; reform of integration is not consistent along with accountabilities, timelines and performance measures;
- Strategic policies and underpinning analysis for nominated activity centres are unclear; integration, frameworks and innovation, consultation and engagements are partially consistent;
- Queensland planning lack of accountability and performance measurements systems, even if has strong mechanism to support government coordination and implementation;
- Perth has limited performance monitoring of outcomes and implementation along with consultation, even if has consistent planning for future growth and nationally significant infrastructures.

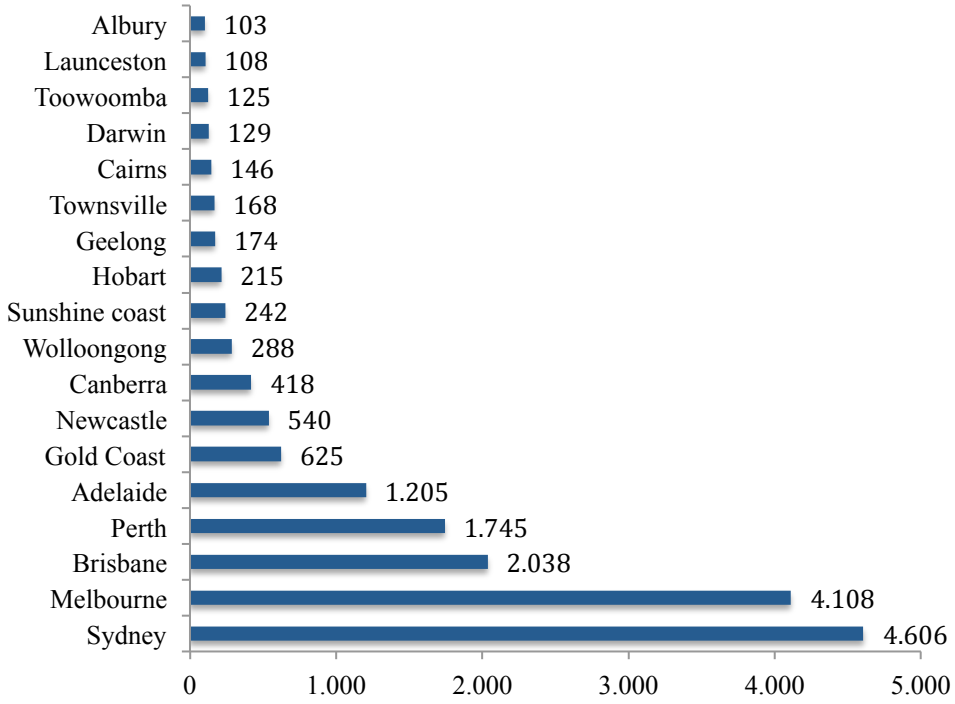
2.3.3 Comparison of key aggregate measures of growth

[211] BITRE analysis of ABS (2013) *"Estimated Resident population"*, Canberra

[212] COAG Reform Council (2012), *"Review of capital city strategic planning systems"* Infrastructure and Transport Department, Canberra

After broadly described the national trends of growth in Australia in the previous part of this chapter, in order to narrow down the list of cities sharing measures in population growth, jobs growth and commuter use of transport modes across Australia, an analysis of the 18 major cities, having a population larger than 100.000, is proceeded. The reminder is indeed the 4 largest cities, Sydney, Melbourne, Perth and Brisbane.

Figure 2.20 – Estimated resident population of major cities in 2011 (in thousands)



Examining the population of the Australian cities with a population more than 100.000 people in 2011 and the growth of estimated resident population of the same major cities between 2001 and 2011 (***Figure 2.20***)[213], published by BITRE analysis of ABS 2012, at first glance it is clear than there is a disproportion between the four major cities and the rest and that the fastest growth in resident population is affecting the North-East coast of the Country, with Gold Coast, Sunshine Coast, Townsville and Cairns in the top positions.

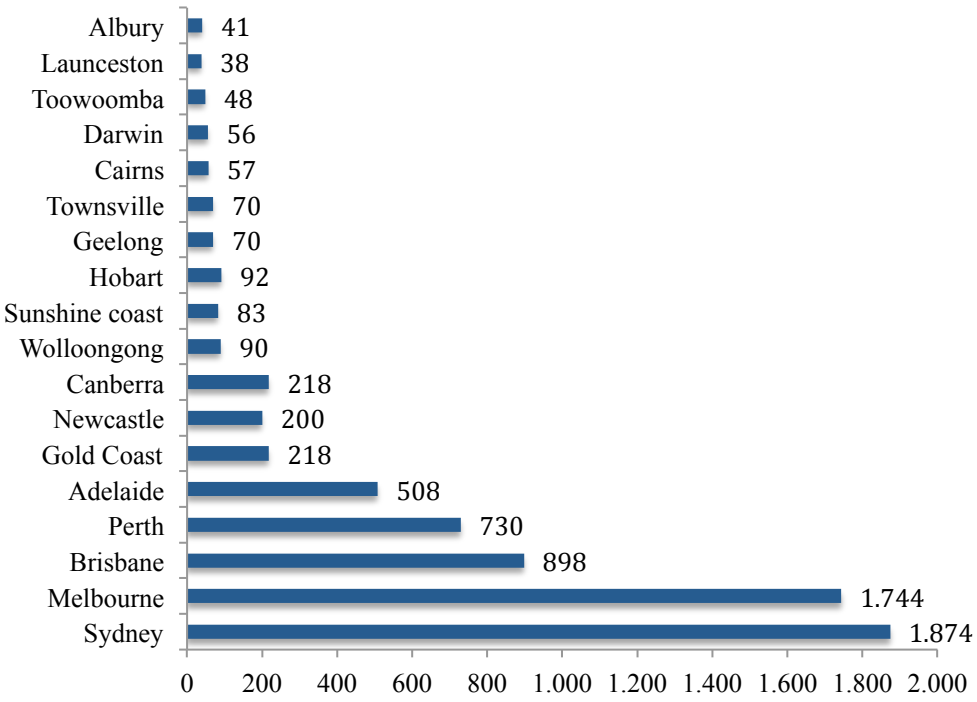
The employed growth has behaved in a similar way to the population growth with Sydney and Melbourne leading the chart of the 18 largest cities (***Figure***

[213] BITRE analysis of ABS (2012) *"Estimated Resident population"*, Canberra

2.21)[214]. Overall for the major cities the employment has grown at an average annual rate of 1,9% compared to the national average of 1,7% and 1,2% for the rest of Australia outside the major cities.

Gold Coast, Brisbane, Sunshine Coast have the highest average annual growth rates between 2,8% and 3,0% witnessing the increase of interest in working along the Northeast of the Country; Sydney has shown a slow growth around 1% and Launceston stagnated with 0% of growth.

Figure 2.21 – Employed people with place of work in major cities in 2011 (in thousands)



Considering commuter use of transport, the modes of transport have been divided into five main categories as private vehicle, public transport, active sport so walking and cycling, other and worked at home.

Also in this occasion, in the 18 cities chart in matter of transport mode share concerning the journey to work, cities have clear different behaviours (***Figure 2.22***)[215]: if private vehicle, including cars, trucks and motorbikes, are dominating the

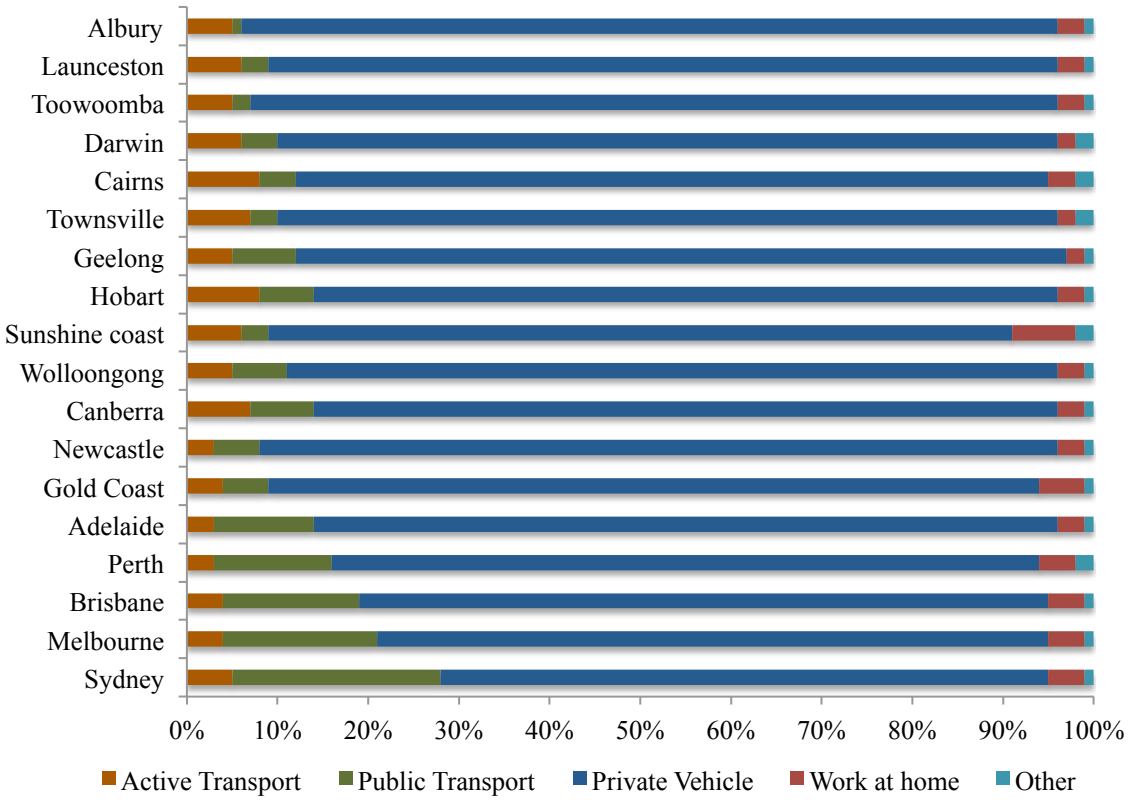
[214] BITRE analysis of ABS (2011) *"Census of population and Housing customised place of work data for 2001 and 2011"*, Canberra

[215] BITRE analysis of ABS (2011) *"Census of population and Housing customised place of work data for 2001 and 2011"*, Canberra

chart in each major city ranging from 67% of Sydney to 89% of Toowoomba, in the four largest Capital Cities the public transport had the second highest mode share after private vehicles.

John Stone and Paul Mees, Senior Lecturers in Transport Planning at the University of Melbourne, in their studies in monitoring and analysing the trends in transport behaviour is essential in order to understand impacts of current policies and to guide planning in future infrastructure, claimed that smaller and less densely populated a city, the smaller the public transport mode share tends to be[216]. In fact Albury, Launceston, Toowoomba, Sunshine Coast and Townsville have the lowest public transport mode shares (less than 3%) confirming Stone and Mees' theory.

Figure 2.22 – Transport mode share of empl. residents for journey to work in 2011



Active transport is very popular in Hobart, Darwin, Canberra, and Cairns (up to 9%) while working at home is the less popular generally with the exception of Sunshine Coast and Gold Coast.

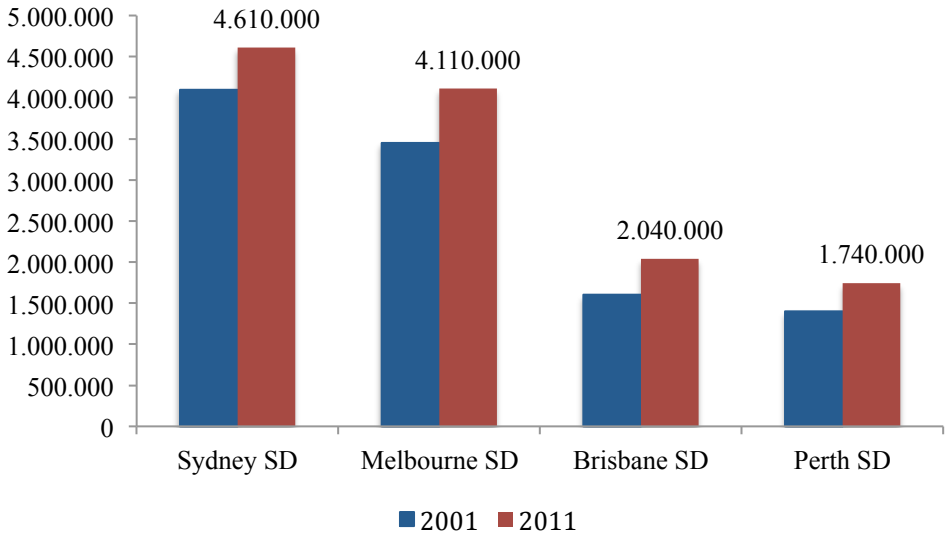
[216] Stone J. and Mees P. (2011) *"Spatial distribution of the journey to work by sustainable modes in Australian cities",* Australasian Transport Research Forum, Adelaide

This chapter has summarized some key trends relating to population growth and shifts in commuter use of transport modes for Australia's 18 major cities between 2001 and 2011.This information provides the relevant context for the remainder of this report, which focuses solely on Australia's four largest cities: Sydney, Melbourne, Brisbane and Perth.

2.3.3.1 Residential pattern

As previously examined, Melbourne gained 636.300 residents between 2001 and 2011, which compares to a gain of 477.600 for Sydney, 408.900 for Brisbane and 351.500 for Perth. The average annual rate of population growth was 2,3% for Perth and Brisbane, 1,7% for Melbourne and 1,1% for Sydney (***Figure 2.23***)[217].

Figure 2.23 – Estimated resident population of four capital city statistical divisions (SD) in 2001 and 2011

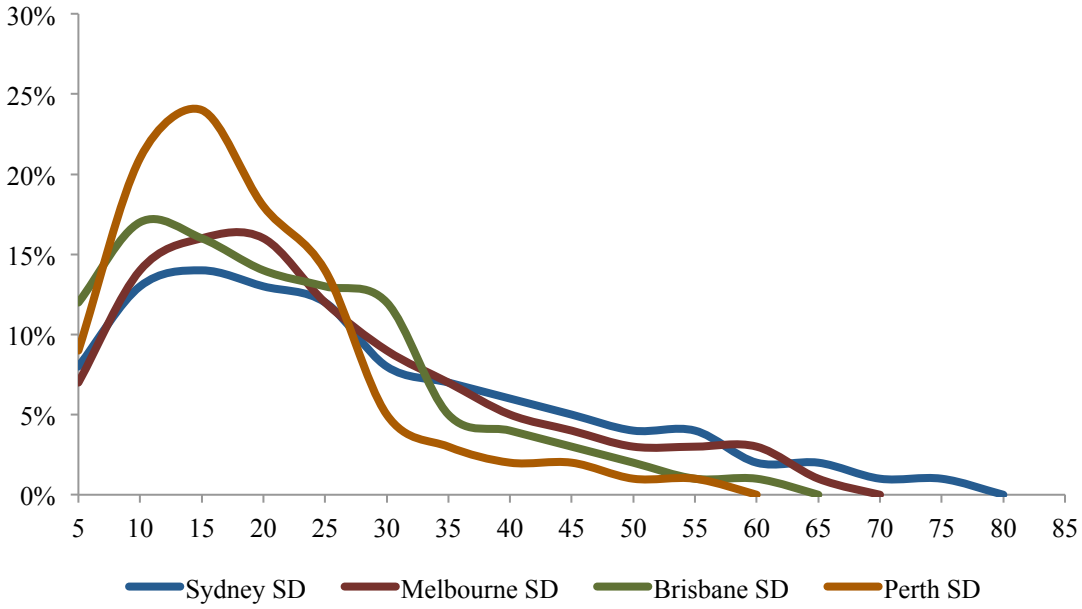


Reflecting the geographic constrains and the accumulated pattern of development over many decades, the spatial distribution in the four cities is sometimes different and sometimes has common prerogatives. Distributing the population living at various distances from the Central Business District (***Figure 2.24***)[218], it is possible to make some considerations:

[217] BITRE analysis of ABS (2012) *"Estimated Resident population"*, Canberra
[218] BITRE analysis of ABS (2011) *"Census of population and Housing customised place of work data for 2001 and 2011"*, Canberra

- Brisbane has a greater share of population living within 5 kilometres from the CBD compared to the other capital cities;
- Perth has the 70% of residents living within 20 kilometres from the CBD, compared to the 60% of Brisbane and 50% of Sydney and Melbourne; moreover the highest percentage of them is between 5 and 15 kilometres;
- Sydney shows a share of population that is almost constant from 10 to 25 kilometres, around 13%, while is the one with the highest percentage more than 50 kilometres, showing a large dimension of the city itself.

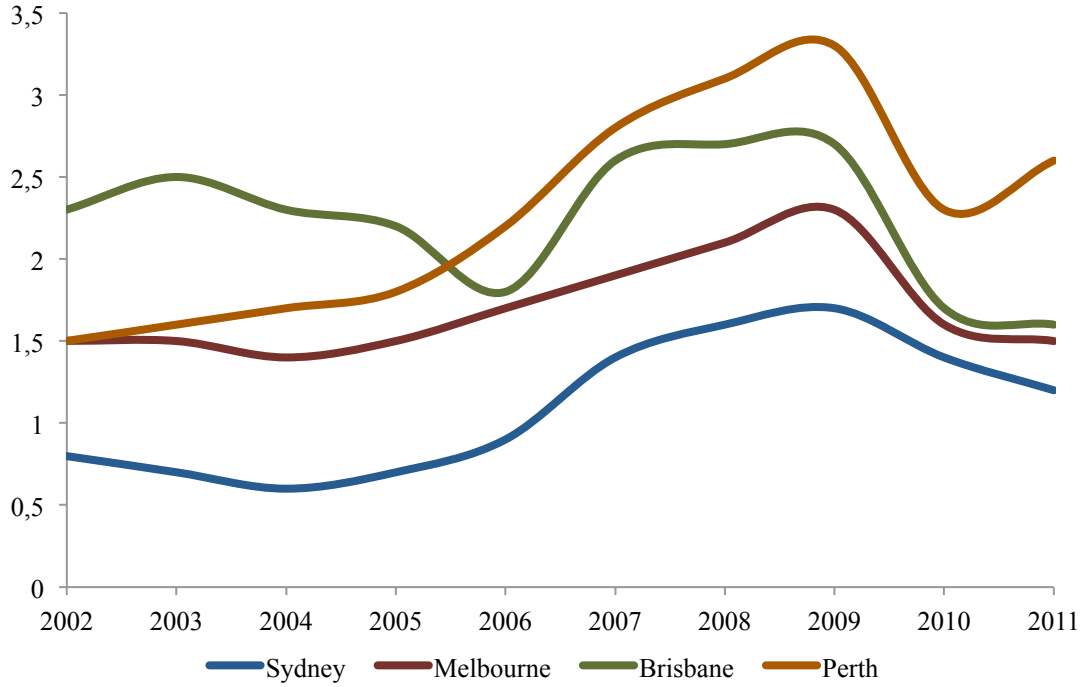
Figure 2.24 – Proportion of population living at various distances from the CBD in 2011.



Annual population growth has varied between 2001 and 2011, with a rapid increase in mid 2009. Brisbane is leading the group with the highest annual growth, while Sydney has always been on the bottom of the chart reaching also the slowest rate in 2004 being one fourth of Brisbane one (***Figure 2.25***)[219]. Melbourne gained the most new residents with population increase of 636.320 people.

Figure 2.25 – Annual growth rate of estimated resident population for four capital city statistical divisions from 2001 to 2011.

[219] BITRE analysis of ABS (2012) *"Estimated Resident population"*, Canberra



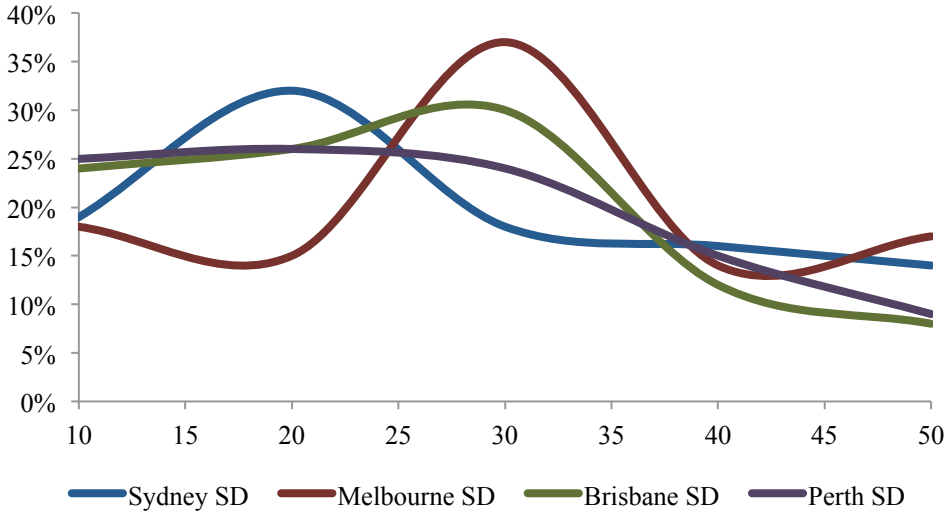
It is interesting to concentrate the attention on how population has grown in the different sectors of the statistical division of each city. In fact, due to the local government decisions in redevelopment with higher density housing, the CBDs of all cities experienced a very rapid growth.

The Outer sector accommodated much of the population growth in all the four cities, contributing 46% of Sydney's growth, 53% of Brisbane, 62% of Melbourne and 68% of Perth and while some of this Outer suburban population growth reflected infill within established suburbs, as in particularly in Sydney, most was attributable to greenfield developments on the urban fringe.

Observing the proportion of population growth occurring at various distances from the CBD from 2001 and 2011 (***Figure 2.26***)[220] emerges that the cities of Brisbane and Perth have the highest share of population growth occurring within 10 kilometres; Sydney has the highest growth between 10 and 20 kilometres reflecting significant development within its middle suburbs; Melbourne has the highest growth between 20 and 30 kilometres, in those areas that are designated by the government to be the Growth Areas. Both Sydney and Melbourne have a significant greater proportion of their growth located more than 40 kilometres from the CBD.

[220] BITRE analysis of ABS (2012) *"Estimated Resident population"*, Canberra

Figure 2.26 – Proportion of population growth occurring at various distances (in km) from the CBD (in percentage)



Must be said that beyond the SD borders, so beyond the Outer Sector, there has been a considerable population growth as well: for instance, Gold Coast and Sunshine Coast are located farer away from the Brisbane CBD and they witnessed huge increase in population growth or the less popular Melton East, Whittlesea North and Wyndham North around Melbourne where the population in those 10 years have become four times, three times and twice respectively[221].

Along with changing in densities, from 2001 and 2011 has been registred a change in dwelling that indeed affected the change in density itself. The proportion of the different types of venues to live are summarized as follows[222]:

- Living separate houses, the trend in Sydney, Melbourne and Brisbane decreased up to -6%, while in Perth it remained constant to 78% of the total dwellings.
- The trend in living in flat or apartment in block of four storeys or more increased by 4% in Sydney and Melbourne, increased by 1-2% in Brisbane and remained constant in Perth;
- The trend in living in flat or apartment in block of three storeys or less decreased by1-2% in Sydney, Melbourne and Brisbane while increased by 1-2% in Perth;

[221] BITRE analysis of ABS (2012) "*Estimated Resident population*," Canberra
[222] BITRE analysis of ABS (2011) *"Census of population and Housing"* Time Series Profile, Canberra

- Semi-detached row or terrace house living has seen an increase by 3% in Sydney and Melbourne, 4-5% in Brisbane and a decrease by 2% in Perth.

Sydney, Melbourne and Brisbane have always had a similar behaviour in changing the dwelling types, with the increase of four storeys apartment and flat and semi-detached and terrace houses and with the decrease of separate houses. Perth has been constant in separate houses and four storeys apartments while decreased the semi-detached and terrace houses.

Strategic plannings have been in the Capital Cities have been developed by local governments in order to face the recent changes summarised previously, in matter of limitation of urban sprawl, increasing of residential densities around centres, consolidation of rural population growth in existing settlements and shifting the focus of population growth within the city[223].

- Limiting urban sprawl.

The strategic metropolitan plans of the four largest cities have to common goal of controlling the urban sprawl though increasing the densities in existing and new suburbs and restricting locations in which urban development occur, even if with different targets: regarding the city of Sydney the target is to locate not less than 70%[224] of new homes in existing suburbs while in Melbourne is 47%[225]. All four cities also aim to increase residential densities by focusing higher density residential development around activity centres.

There are differences also in the mechanism put in place to support achievement of this policy goal: for instance in Melbourne was established that an urban growth Boundary is essential to set clear limits to metropolitan Melbourne's outward development while in Brisbane the idea is to establish a boundary for urban development, containing urban growth and promoting a higher density urban form[226].

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[223] BITRE analysis of ABS (2011) "*Population growth, jobs growth and commuting flows, a comparison of Australia's four largest cities",* Department of Infrastructure and Regional Development, Canberra

[224] Department of Planning (2010), "*Metropolitan Plan for Sydney 2036",* New South Wales Government

[225] Victoria Government, Department of Planning and Community Development (2008), *"Directions 2031",* Melbourne

[226] Queensland Government, Department of infrastructure and planning, Southern region Division (2009), *"SEQ urban Footprint",* Brisbane

Observing the real changes occurred from 2001 and 2011 in Sydney, given the goal of at least 70% of new homes within the urban footprint, the 81% of Sydney's dwelling completions occurred within the existing urban area, reaching the goal, while 19% were relating to greenfield developments[227].

Melbourne goal was 47%, but only 39% of dwelling approvals occurred in the designated Growth Area municipalities with the remaining 61% occurring in established municipalities near the urban fringe.

Brisbane largely reached the goal of 52% of new dwellings through infill and redevelopment of existing urban areas with the 76% occurring within the urban area boundary, even if some of this infill relates to new houses built on recently subdivided land near the urban fringe rather than to redevelopment of established suburbs[228].

Perth has not reached the goal so far, with the intention of having 47% of new dwellings inside the boundary but with the actual 36% of lots in the urbanised area and 64& in greenfield areas[229]. Sydney, Brisbane and Melbourne are currently surpassing the targeted long-term rate of infill development, while Perth is way too below the target.

Increasing the residential densities through infill development in existing is not the only way city adopted; in fact it has been decided to decrease the median/average size of newly created lots in each city over the last decade.

- Increase residential densities around centres.

All four cities aim to increase residential densities in and around activity centres with differences in density level of new housing development and the centre types to which the objective applies.

Sydney, for instance, has the target to locate at least 80% of all new homes within the walking catchments of existing and planned centres[230] while Melbourne targeted 41% of new dwellings being located in strategic redevelopment sites

[227] BITRE analysis of ABS (2011) *"Census of population and Housing Time Series Profile",* Canberra

[228] BITRE analysis of ABS (2013) "*Estimated Resident population",* Canberra

[229] Western Australian Planning Commission (2012) *"Urban growth monitor 2012, Perth Metropolitan, Peel and greater Bunbury regions",* Perth

[230] Department of Planning (2010), "*Metropolitan Plan for Sydney 2036",* New South Wales Government

particularly principal and major activity centres[231] and Perth and Brisbane have established quantitative guidelines for minimum residential density levels in different types of activity centres.

In summary, the census-based evidence shows that residential densities increased for centres between 2001 and 2011 in all four cities, with centres experiencing more rapid residential growth than the capital city SDs as a whole. This reflects a shift towards higher density forms of housing, with many new high-rise flats, units and apartments being built in activity centres (primarily within the CBD-based activity centres). Compared to the other cities, Melbourne experienced limited, even if still positive, progress in increasing residential densities in centres.

2.3.3.2 Employment and industry

This section wants to focus on the location of jobs and job growth within the four capital city Statistical Divisions.

Must be mentioned that in 2011 Sydney SD has the higher number of employed people (1.874.119) followed by Melbourne SD (1.756.405), Brisbane SD (925.388) and Perth SD (751.805). Females as share of employment have the 48-49% of the overall and people working from home share goes from 3,8% of Perth SD to 4,3% of Brisbane[232].

The main industry contributors to employment are broadly similar across the cities with the same top four employing industries as retail, property and business services, manufacturing and health and community services for all the four capital city, even if retail was the top one for Perth, Melbourne and Brisbane and property and business services was tone top one for Sydney.

Small differences in the contributions, however, can be observed:

- In Perth, mining and construction industries made a more significant contribution to employment than the other cities;
- In Melbourne, manufacturing is a more important source of employment than the others;

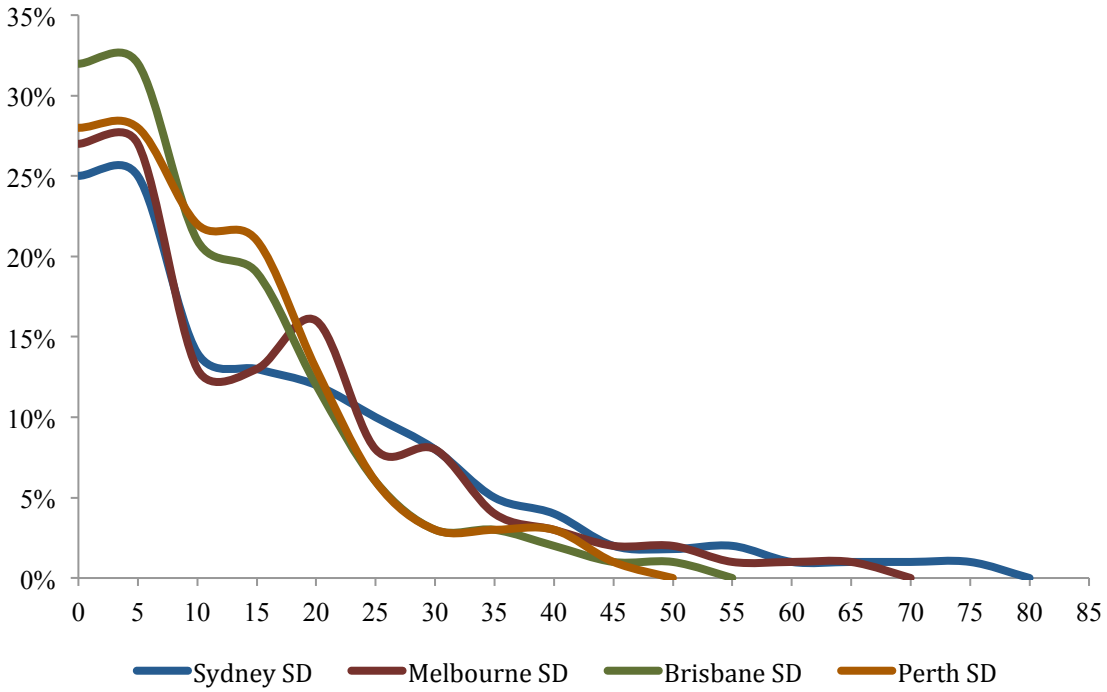
[231] Department of Infrastructure (2002) *"Melbourne 2030",* Victoria Government

[232] BITRE analysis of ABS (2012) *"Census of population and Housing place of work data 2011"*, Canberra

- Finance and insurance and Property and business industries has an employment contribution higher in Melbourne and indeed Sydney, more than Brisbane and Perth;
- Brisbane has a relatively high share of employment in the Government administration and defence industry.

It is interesting how the distribution of jobs covers sometimes identical and sometimes different distances from the CBD for the four capital cities (***Figure 2.27***)[233] for instance between 26% and 34% of jobs for each city is located within 5 kilometres from the CBD and from 40% to 51% is located within 10 kilometres of the CBD. Moreover, while Brisbane has the highest proportion of its employment located in the CBD and Sydney the lowest, Sydney has the highest located over 40 kilometres and Perth has the highest between 5 and 15 kilometres.

Figure 2.27 – Proportion of jobs at various distances from Central Business District in 2006 (in percentage).



Generally, industries can be distinguished in terms of location preferences in the following three groups[234]:

[233] BITRE analysis of ABS (2006) *"Census of population and Housing place of work data"*, Canberra
[234] Western Australian Planning Commission (2009) *"Directions 2031- drafts spatial framework for Perth and Peel",* Perth

- High order services, as finance, governments, business services, prefer central locations. The Property and business services industry tends to be very concentrated around the CBD, and is the main Inner sector employer for all four cities with an employment share that ranges from 19,7% in Perth to 23,2% in Melbourne;
- Second order services, as retail, education and personal services are more dispersed and tend to follow the distribution of the population; Retail trade was the top employing industry in the Middle Sector of all four cities;
- Industries, as manufacturing and transport, are located in places that meet their specific infrastructure and land use requirements. Manufacturing was the top employing industry in Melbourne.

The CBD-based activity centres typically contain about ten times as many jobs as the next largest activity centre in each city (***Figure 2.28***)[235]. If there are several additional centres in Sydney with more than 25.000 jobs, there are not non-CBD activity centres in Melbourne, Brisbane and Perth, that do not contain any suburban centre of the same scale as Parramatta (which is almost considered the second CBD of Sydney, with more than 34.000 jobs and 2% of Sydney[236].

Inner city activity centres also feature strongly in the city pattern beyond CBD that are relatively highly in terms of employment, as the Kingsford Smith Sydney airport, the Tullamarine Melbourne airport and the Brisbane airport and the health or education specialised centres of St. Leonards in Sydney, Parkville in Melbourne, Herston-Kelvin grove in Brisbane and UWA-QEII in Perth.

Since industries have different preferences as to where they locate, the industry mix of job growth in each city has implications for the spatial distribution of employment and in turn for commuting patterns. Identifying the principal industry contributors to employment growth, emerges that Health and community service is the industry with most jobs added in all the four capital cities, while Government administration and defence is the second for all of them expect Melbourne. The more prominent contribution of the Construction industry in Brisbane and Perth at the second place reflects the more rapid rate of residential growth in these cities while

[235] BITRE analysis of ABS (2006) *"Census of population and Housing place of work data for destination zones for 2006",* Canberra
[236] Ibid.

Sydney and Melbourne have Education. Regarding industry with most job losses, Sydney and Melbourne have Manufacturing while Brisbane and Perth have Agriculture, forestry and fishing[237].

Figure 2.28 – Activity centres with highest employment by city in 2006 (number of jobs in thousands)

	1	2	3	4	5
SYD	SYD CBD 300,1	North SYD 35,8	St Leonard 34,4	Parramatta 34,2	Macquarie Park 32
MEL	MEL CBD 216,3	Prahran South 16,1	Parkville Medical ctr. 14,9	Dandenoug CAD 14,6	Box Hill CAD 13,6
BRI	BRI CBD 196,9	Caboolture Morayfield 10,9	Strathpine 10,7	Brisbane airport 10,4	Herston Grove 10
PER	PER CBD 108,7	Subiaco 11,9	UWA-QEII 11,8	Victoria prk 10,3	Joondalup 8

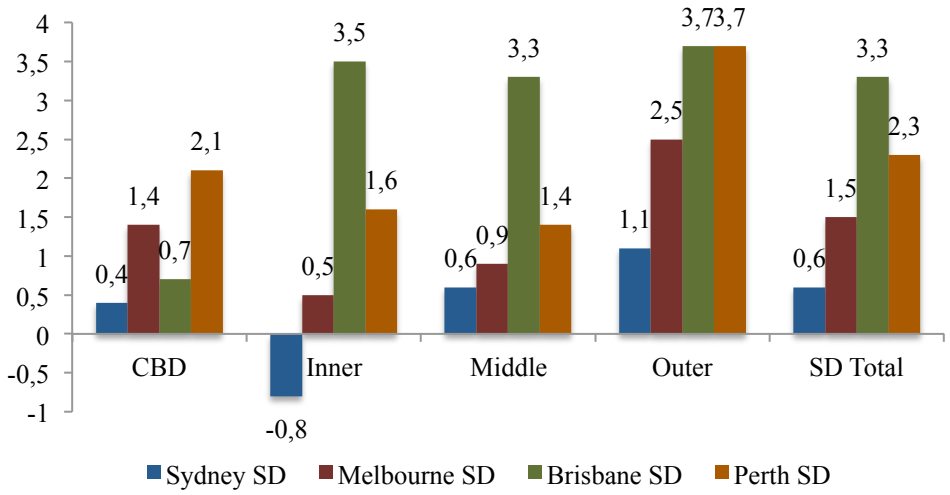
Studying the distribution of jobs growth for the four cities between 2001 and 2006 and displacing them in a chart (***Figure 2.29***)[238], imminent finding can be expressed as follows:

- In the Outer suburbs the number of jobs grew more rapidly than inner and middle suburban jobs, with the high performance of Brisbane and Perth with +3,7% annum. The Health and community service industry was the principal industry contributor to employment growth in Outer Sydney and Outer Melbourne during that period; retail was for Outer Brisbane and manufacturing for Brisbane;
- The great majority of Sydney's employment increase occurred in the Outer Sector (+76%) compared to the around half of Melbourne and Perth's employment increase and around one third if Brisbane's employment increase;

[237] BITRE analysis of ABS (2006) *"Census of population and Housing place of work data for destination zones for 2006",* Canberra
[238] Ibid.

- Middle sector made a significant contribution to employment growth in all four cities, in particular for representing 46% of city's employment growth. The health and community services industry was the principal industry contributor in this sector;
- The CBD was responsible as the minor contributor for Brisbane with only 2%, but for 15-20% concerning the other capital cities.
- The inner sector (with CBD excluded, indeed) experienced a substantial job growth, and by contrast there was a net loss of jobs in Sydney's Inner sector for to the job losses around the Green Square due to redevelopment from employment land to residential land and for the new office construction in the Sydney CBD that caused the cession of the office markets in the North Sydney.

Figure 2.29 – Employment growth occurring in each sector of capital city statistical division from 2001 to 2006



The Central Business District has always dominated the capital city employment since the period it has been recognized as the district having the "centrality of business" above the rest of the city. In the recent period, starting in 1970s with the enlarging of the city patterns, the jobs have been dispersed to suburban locations and

the employment share of the CBD declined[239]. For instance Melbourne Inner employment share declined from 54% in 1971 to 29% in 1991 and 28% in 2011[240].

The intention in the strategic plans of all four cities is to concentrate activity within centres in order to reduce travel time and car dependence and to make better use of existing public transport infrastructure and government services. At the same time development out of the centre is discouraged to avoid the diluting public and private investment away[241]. Sydney plan target is to increase the share of jobs in strategic centres from 39% in 2006 to 42% in 2036[242] and there is a strong emphasis on the economic role of the regional cities, as Parramatta.

A common feature of job growth in the four cities was the rapid employment increase in specialised activity centres, including airport, business parks, hospitals and universities. The centres with the most job growth are Macquarie Park and Olympic Park in Sydney.

The strategic metropolitan plans for all four cities aim to direct employment growth to particular suburban locations: for instance, Western Sydney is the specific suburb concerning Sydney metropolitan plan and Western Corridor is the suburb for Brisbane's growth. Plans for Melbourne and Perth have the goals to decentralise employment in a less targeted manner, as Melbourne plan aiming to provide more jobs outside Central Melbourne[243] and Perth plan to increase the employment self-sufficiency of outer suburban sub-regions[244].

Assessment of trends between 2001 and 2011 concerning the achievements of the capital cities' plans, shows that all four cities experienced a significant increase in the number of jobs located in the specific suburban locations, but, with the exception of Perth, the job growth did not keep pace with job growth for the city

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[239] Pfister N., Freestone R., Murphy P. (2000) *"Polycentricity or dispersion? Changes in centre employment in metropolitan Sydney, 1981 to 1996",* in *"Urban geography*", Vol. 21, n°5, pages 428-42

[240] O'Connor K. (2006) "*The location of employment in metropolitan areas, International Perspective, Melbourne context and research directions,"* Department of Sustainability and Environment, Canberra.

[241] Department of Infrastructure and Planning (2009) "*South East Queensland Regional Plan 2009-2023*", Queensland Government

[242] Department of Planning (2010), "*Metropolitan Plan for Sydney 2036",* New South Wales Government

[243] Department of Infrastructure (2002) *"Melbourne 2030",* Victoria Government

[244] Department of Planning, Planning Commission (2010) *"Directions 2031 and beyond"*, Western Australia Government

as a whole, resulting in a decline in the suburban area's share of city employment[245]. Observed changes in capital cities between 2001 and 2011 have been as follows:

- City of Sydney.

Western Sydney, the specific suburb concerning Sydney metropolitan plan, added 55.000 jobs that are modest compared to the target of 384.000 new jobs before 2036 as the plans for the city foresees. The proportion of employment living in Western Sydney was 33,7% in 2001 and 33,3% in 2011; Western Sydney contributed 30% of Sydney's job growth from 2001 to 2011, which was well below the long-term target of 50%. Moreover employment growth did not follow the residential growth in Western Sydney, with self-sufficiency declining from 77 to 74 jobs per 100 employed residents[246].

- City of Melbourne.

158.000 jobs have been added outside of Central Melbourne, as the plan for the city foresees, compared to the 92.000 jobs added in Central Melbourne, while the growth averaged 1,4% per annum outside of Central Melbourne compared to the 2,1% in Central Melbourne. The proportion of jobs outside Central Melbourne fell from 72,4% to 71,1%. Self-sufficiency declined from 72 jobs in 2001 to 68 jobs in in 2011.

- City of Brisbane.

Western Corridor gained 12.000 jobs in these ten years, with the job growth in the Western Corridor, 2,7%, similar to the one of Brisbane SD, 2,9%. The proportion of jobs located in the Western Corridor fell from 5,8% to 5,7%. The self-sufficiency declined from 76 to 67 per 100 employed residents.

- City of Perth.

The Outer sub-regions of Perth gained 76.000 in these years, which represented 44% of the Perth SD's job growth. The average annual rate of job growth

[245] Bureau of Infrastructure, Transport and Regional Economic analysis of ABS (2001, 2006, 2011) *"Census of Population and Housing place of work and place of usual residence data*", Canberra
[246] Ibid.

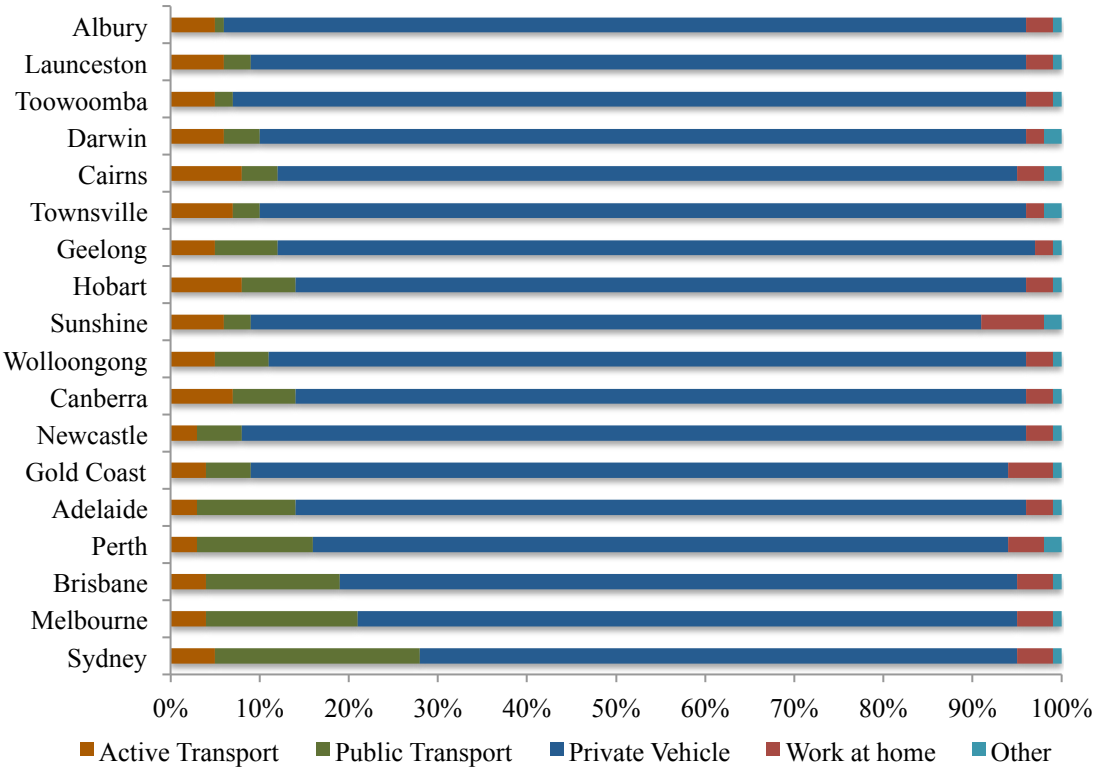
in Outer Perth, 3,9%, was higher than the one of the Perth SD, 2,8%. Consequently Perth's job share rose from 29,5% to 32,9%.

The self-sufficiency, rising from 52 to 53 jobs per 100 employed residents, improved strongly for the Eastern sub-regions and modestly for the North West sub-region, but declined for the South West and South East sub-regions[247].

2.3.3.3 Transportation mode

The intention in this section is to compare spatial differences in the usage of various transport modes by employed people in the capital cities using the journey to work data collected by the Census in 2012, highlighting the recent changes in transport mode use and analysis the trends with respect to the strategic planning intentions of increasing the public transport use, active transport use and concentrating development around public transport nodes.

Figure 2.30 – Transport mode share of employed residents of major cities for journey to work in 2011



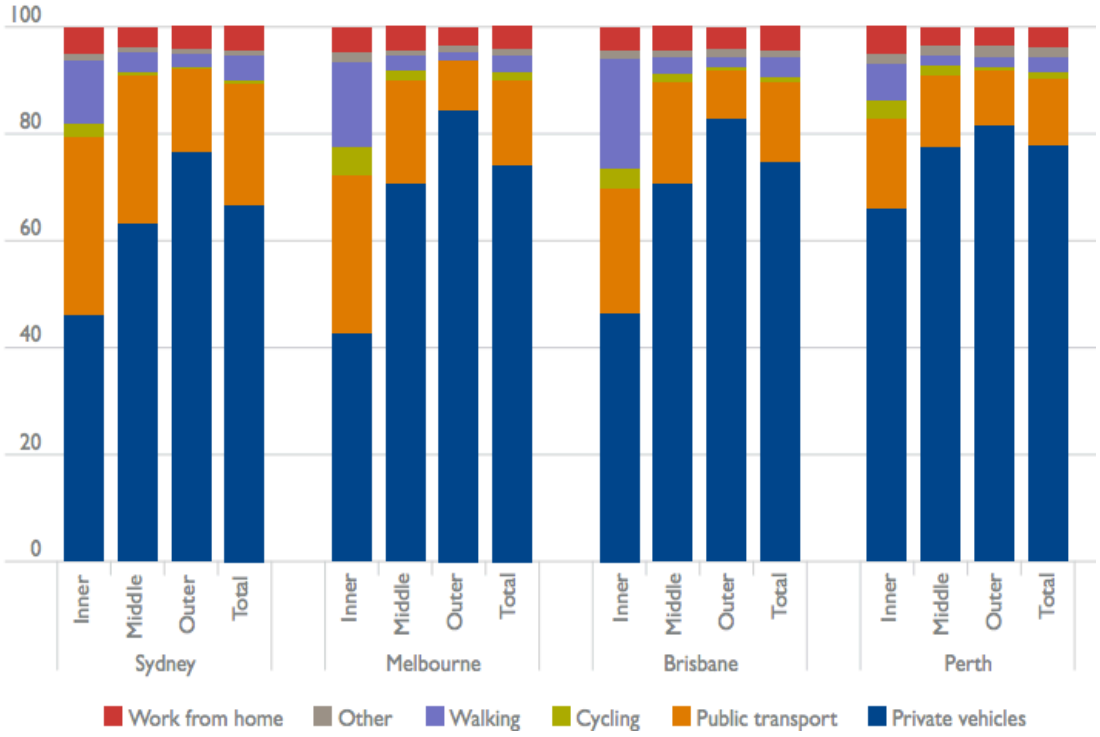
[247] Bureau of Infrastructure, Transport and Regional Economic analysis of ABS (2001, 2006, 2011) *"Census of Population and Housing place of work and place of usual residence data"*, Canberra

Considerations taken in account in this section are concern five different categories: private vehicles (car and motorcycle), public transport (train, bus, ferry, tram, taxi), active transport (bike and walking), work from home and other (other transport mode).

All the capital cities depend largely on the private vehicles for the commute to work, averaging from 67% in Sydney to 77% in Perth. Sydney has the highest overall mode share for public transport at 22%, while Perth has only the 13%, and the highest overall mode share for active transport (***Figure 2.30***)[248].

Considering the different sectors individually, the transport mode share is not the same (***Figure 2.31***)[249]. In fact for all capital cities, the Inner sector show the lowest use of private vehicle compared to the Outer that is the highest. Melbourne for instance, in the Inner sector presents the 42% of use of the private vehicle while in the Outer sector is 83%.

Figure 2.31 – Transport mode share for journey to work by sector of residence for the capital cities, in 2011 (in percentage)



[248] Stone J. and Mees P. (2011) *"Spatial distribution of the journey to work by sustainable modes in Australian cities"*, Australasian Transport Research Forum, Adelaide

[249] Bureau of Infrastructure, Transport and Regional Economic analysis of ABS (2001, 2006, 2011) *"Census of Population and Housing place of work and place of usual residence data"*, Canberra

On the other side, in the Inner sector of all cities the public transport share is the highest compared to the other two. In Melbourne for example the public transport mode is 9% in the Outer sector and reaches the 33% in the Inner sector. Walking and cycling mode share have the same behaviour, being very low in the Outer sector of all the cities and higher in the Inner sector: Melbourne for instance have in the Inner Sector the walking mode share at 16% while in the Middle and Outer sectors at 2% and 1% respectively. Work from home is almost constant in all sectors in all cities averaging 2-4%.

Between 2001 and 2011 the public transport mode share of motorised passenger transport increased in Melbourne, Brisbane and Perth while decreased in Sydney[250] even if the public transport mode share rose in all four cities. In Melbourne, for instance, the significant increase in the public transport mode share was largely due to the increased rail use. The private vehicle mode share decreased in all capital cities, with Melbourne -4,0%, Perth -3,3%, Brisbane -2,7% and Sydney with only 0,8%, with particular decrease in the Inner Sector while the public transport mode share increased. The public transport mode increased in all four cities, with Sydney +0,8%, Brisbane +2,4%, Melbourne +3,0% and Perth +3,4%. Cycling and walking have increased while work from home has decreased, both for all cities and all sectors[251].

The metropolitan planning goals related to the transport use within cities were the increase of the public transport, active sport and concentrate residential and job growth around public transport nodes. In Sydney the plan foresaw the increase of public transport setting out a quantitative target to increase the public transport mode share of journeys to work in the city to 28% by 2016, improving the connections to the centres, timetabling and introducing and electronic ticketing system[252]. In Melbourne the intention is to increase the public transport's share of motorised trips within the city to 20% by 2020, starting at 9% when was set out, by integrating transport and land use planning and expanding infrastructures[253]. Brisbane plan sets a target of increasing the public transport share from 10% in 2006

[250] BITRE analysis of ABS (2013) "*Long-term trend in urban transport",* Australian Government
[251] Ibid.
[252] Department of Planning (2010), "*Metropolitan Plan for Sydney 2036",* New South Wales Government
[253] Department of Infrastructure (2002) *"Melbourne 2030",* Victoria Government

to 20% in 2031 for all trips and from 18% in 2006 to 35% in 2031 for work-related trips; the intention is to increase the public transport mode share of all trips from 7% in 2006 to 14% in 2031[254]. In Perth no quantitative target is presented for the public transport mode share but it is encouraged the introduction of alternatives to private car travels such public transport[255].

Observed changes with respect to public transport mode share targets from 2001 to 2011 are described as follows:

- According to the ABS Census of Population and Housing, the public transport mode share of journey to work travel in the Sydney SD rose slightly from 21,7% in 2001 to 22,5 in 2011 (the intention was to reach 28% in 2016);
- Public transport's share of all motorised trips in the Melbourne SD is estimated to have risen from 8,5% to 10,9% (the intention is to reach 20& by 2020);
- According to the ABS Census of Population and Housing, the public transport mode share of journey to work trips in Brisbane SD rose from 1,6% in 2001 to 19,5% in 2011 (the intention is 35% by 2031);
- There are no any remarkable changing regarding Perth SD because no quantitative target is presented for the public transport mode share.

Concentrating residential and job growth around public transport is one of the common goals of the capital city plans, even if the way they want to achieve their goals is different. Specifically, Melbourne focuses on the designated growth Area (greenfield sites), Sydney focuses in the renewal sites and Perth and Brisbane goals reference transit oriented development principles[256].

Evidences show that from 2001 to 2006 there was an increase in the extent to which Sydney's population was concentrated around railway stations, and a decline in the concentration of employment around railway stations, reflecting the strong job growth occurring in Outer suburban industrial area and non-connected

[254] Department of Infrastructure and Planning (2009) "*South East Queensland Regional Plan 2009-2023*", Queensland Government
[255] Department of Planning, Planning Commission (2010) *"Directions 2031 and beyond"*, Western Australia Government
[256] BITRE analysis of ABS (2006) *"Census of population and Housing place of work data from 2001 to 2006 and NSW BTS online tabulations for 2001 and 2006",* Canberra

specialised centres[257]. Between 2001 and 2011, 42%of Sydney's residential development was concentrated near public transit nodes and rail network.

In Melbourne for the new housing in the designated growth Areas it has been reported that the median distance to a train station, served by high-capacity public transport, has been gradually rising and stood at 3,3 km in 2007.

In Brisbane the population living within 1 km of public transport nodes fell from 26,7% to 26,0% while the share living within 500 metres remained unchanged; moreover the proportion of jobs located within 1 km of these nodes declined while the proportion located within 500 metres remained unchanged; at the same time station catchments experience strong population and jobs growth.

In Perth the trend is different: between 2001 and 2006 on one hand the population became slightly less concentrated around public transport nodes, on the other hand jobs became slightly more concentrated.

2.3.3.4 Commuting patterns

Concerning long distance commutes, usually inward commuting flows are more popular than outward ones in Sydney, Melbourne and Brisbane while in Perth the difference is not so large because of the important role played by the mining industry and the use of the fly-in and fly-out practises, which is a method of employing people in remote areas by flying them temporarily to the work site instead of relocating employees and their families permanently, that is very popular in Australia.

The two main inward flows to the capital cities in 2006 have been from Gold Coast to Brisbane (more than 22.000 people) and from Illawarra-Wollongong to Sydney (almost 20.000 people), while the two main outward flows from the capital cities have been from Brisbane to Gold Coast (almost 13.000 people) and from Perth to South West Western Australia (almost 5.000 people)[258].

Main flows for the capital cities are the inward flows, from the 36% of the total in Melbourne to the 44% in Perth, followed by the within-home Statistical

[257] BITRE analysis of ABS (2011) *"Census of population and Housing customised place of work data for 2001 and 2011",* Canberra

[258] BITRE analysis of ABS (2006) *"Census of population and Housing place of work data from 2001 to 2006 and NSW BTS online tabulations for 2001 and 2006",* Canberra

Local Area flows, from the 17% in Brisbane to the 27% in Sydney. Outward flows are around the 8-12%.

Taking in account the commutes in 2006 in the different three sector of a city, Inner, Middle and Outer, come out interesting considerations[259]:

- Within-sector commuting flows tend to dominate for each city: in Sydney for the 63%, in Melbourne for the 58%, in Brisbane for 56% and Perth for the 51% of the total commutes;
- Outer sector commutes were prominent in all four cities, from 21% to 34%;
- Middle sector commutes were prominent in Melbourne and Brisbane, but not in Sydney and Perth;
- Inner sector inward commuting from Outer and Middle averaged 19% in Sydney, 22% in Melbourne, 24% in Brisbane and 26% in Perth;
- CBD inward commuting for Melbourne and Sydney is very similar, coming for 41% from Inner sector, for 20-21% from Middle sector and for 8-9% from Outer sector;
- CBD inward commuting for Brisbane and Perth is also very similar, coming for 26-27% from Inner sector, for 15-18% from Middle sector and for 6-11% from Outer sector.

At the Statistical Local Area (SLA) scale, commuting flows between SLAs of residence and work in capital cities have their importance in the commuting flows frame. For instance, in Sydney SLA, there are 20 inward flows and 13 outward flows involving more than 4.000 commuters. Larger inward flows to the Inner Sydney SLA are from Randwick (11.000 people), North Sydney (10.300) and Sydney East (8.200). Other large flows, not touching Sydney centre, include the 7.700 people commuting from Southerland Shire West to Southerland Shire East and 7.200 commuting from Gosford East to Gosford West. In Melbourne SLA, there are 20 inward flows and 14 outward flows involving more than 3.000 commuters. Larger inward flows to the Inner Melbourne SLA are from Remainder (5.500 people), Yarra North (5.000) and Prahran (5.000). Other large flows, not touching Melbourne centre, include the 4.500 people commuting from Craigieburn to Broadmeadows and

[259] BITRE analysis of ABS (2006) *"Census of population and Housing place of work data from 2001 to 2006 and NSW BTS online tabulations for 2001 and 2006",* Canberra

the 4.500 people from Kingston South to Kingston North. In Brisbane SLA there are two different commuting focal points, the CBD of Brisbane centre and Ipswitch. The two largest volume inter-SLA commuting flows are from Ipswich East to Ipswich Central (2.300 people) and the reverse flow from Ipswich Central to Ipswich East (2.100). Other prominent flows are commutes from Ipswich East to Wacol (1.500) and from Toowong to the Inner Brisbane SLA (1.300). In Perth SLA most of the flows with more than 2.500 people are inward flows. The largest inter-SLA flow was from the Outer sector SLA of Gosnells to the Middle sector SLA of Canning (8.500 people), followed by the commute from Joondalup South to Stirling Central (5.665)[260].

The commuting distances from home to work are similar in the Sydney SD, Melbourne SD and Brisbane SD. The road network distance estimates averaging between 14,8 km and 15 km, are about one-third higher than the straight line distance estimates, averaging between 11,1 km and 11,4 km. For each city the average commuting distances by place of residence were lowest for Inner sector residents averaging 13-15 km, higher for Middle sector residents averaging 8-10 km and higher again for Outer sector residents 13-15 km[261].

The estimated time for employed residents to reach the work place in 2006 in Sydney is 37 minutes, in Melbourne and Brisbane is 33 minutes and Perth is 28 minutes[262].

The average commuting distance travelled by Outer sector residents was more than double that of the Inner sector residents in all fur cities, that do not translate into longer trip durations of Outer sector residents due to the greater speed of travel. For instance, average commuting speeds are 38 km/h for Outer Melbourne residents compared to just 17 km/h for Inner Melbourne residents[263], due to the high level of traffic congestion. Between 2001 and 2006 the proportion of inward commutes has declined in all cities, by between 0,7% and 1,1%.

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[260] BITRE analysis of ABS (2006) *"Census of population and Housing place of work data from 2001 to 2006 and NSW BTS online tabulations for 2001 and 2006",* Canberra

[261] BITRE analysis of ABS (2006) *"Census of population and Housing place of work data in 2006*" Canberra

[262] BITRE analysis of HILDA Project (2013) *"Commuting times in Australia",* National Centre for Social Economic Modelling NATSEM and AusRoads.

[263] BITRE analysis of ABS (2011) "*Census of population and Housing customised place of work data for 2001 and 2011",* Canberra

At the SD scale the changes in sub-regional self-containment rates were positive for Sydney and Brisbane with 0,2% and 0,6% respectively and negative for Melbourne and Perth with -0,2% and -1% respectively[264].

Within and between sub-regions, from 2001 and 2006 the ten largest changes were all same-subregions flows involving an increase of at least 7.000 commutes. Six of the top seven increases were flows within an Outer subregion, as the 21.300 people within Melbourne's Outer Southern, or the 13.900 people within Outer Northern Brisbane and the 12.500 within North West Sydney.

Relating to commuting flows in cities, two are the metropolitan planning goals: increasing self-containment and reducing commuting times and distances, and they have been contemplated by Sydney and Brisbane cities.

In Sydney the focus was in the Western Sydney, where actually the self-containment of employment increased by 0,6% from 39,7% to 40,3%[265], while in Brisbane the focus was in the Outer North subregion and the Outer East subregion, where the self-containment of employment increase by 0,2% from 43,7% to 43,9%[266]. Results in the census-based evidence show that if in some subregions the self-containment rate increased, in other there has been a significant decline, as Ipswich and West Central Sydney.

Average commuting distances remained essentially unchanged for the capital cities between 2001 and 2006, while between 2006 and 2012 average commuting distances rose by about 1 km for Sydney and also in Melbourne[267], while in Brisbane the results are mixed and minimal changes are concerning Perth. All four capital cities since 2001 have recorded an increase in average commuting times; they have risen moderately in Sydney and Melbourne, while in Perth they increased by 6 minutes and Brisbane by 7 minutes, reflecting the substantial increase in peak period congestion delays.

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[264] BITRE analysis of ABS (2006*) "Census of population and Housing place of work data from 2001 and 2006",* Canberra

[265] BITRE analysis of HILDA Project (2013) *"Commuting times in Australia",* National Centre for Social Economic Modelling NATSEM and AusRoads.

[266] BITRE analysis of ABS (2011) Census of population and Housing customised place of work data for 2001 and 2011, Canberra

[267] BITRE analysis of HILDA Project (2013) *"Commuting times in Australia",* National Centre for Social Economic Modelling NATSEM and AusRoads.

2.3.4 Drivers of change in commuting patterns

After assessing the behaviour of the growth through key features of the capital cities, it becomes interesting analysis how the changing in the commuting flows relate to the observed spatial patterns of residential and job growth within each city, also investigating the role of the other potential drivers of commuting flows as distance, transport, infrastructure and skills.

It is expected that the number of people commuting between an origin location and a destination location will depend on the number of employed residents living in the origin location and the number of jobs available at the destination location. Similarly, changes in commuting flows will depend on spatial patterns of growth in employed residents and jobs.

Spatial patterns of growth are determined by individual's choices about where to live and work as well as by the location decisions of employers along with job access, proximity to family and friends, lifestyle and housing cost. It has been assessed that in Sydney, better work access and prospects was the equal most important consideration, at 21%, in the choice of where to live, alongside lifestyle factors[268].

The extent to which distance acts as an impediment to travel is likely to depend on the mode of travel and the capacity of the transport network. For example, in peak period, commuting times by rail can be substantially quicker than commuting between the same origin-destination pair by car[269].

Changes in commuting patterns will be shaped, to some extent, by development of new transport infrastructure, which changes the relative costs of commuting to different areas as the role of Melbourne's Western Ring Road in reducing the travel times and expanding the spatial labour markets of the West Industrial Node and the North Industrial Node[270].

New transport infrastructure can also shape patterns of population and job growth within a city as it is believed that new motorway infrastructure appears to

[268] Hay A. (2009), "*Household and workplace mobility: implications for travel",* paper presented to the 32nd Australasian Transport Research Forum, Auckland.
[269] Haynes R. (2012) *"Two wheels beats four in race to Parramatta",* The telegraph
[270] Rasmussen B. (2010), *"Global commodity chains and the development of employment nodes and corridors in western Melbourne",* paper presented to Melbourne Knowledge Summit, Melbourne.

have been a strong determinant of employment growth patterns, particularly in the wholesale trade and logistic industries[271].

For Sydney, Melbourne, Brisbane and Perth, between 67% and 85% of the spatial variation in commuting flows can be explained by reference to just a few key factors:

- The number of employed residents in the origin location;
- The number of jobs in the destination location;
- The distance between the two locations;
- Whether there is a direct rail or freeway connection between them;
- The degree of alignment between the skills available in the origin location and the skills demanded in the destination location.

Growth in employed residents and jobs also played an important role in explaining changes in origin-destination commuting flows in these four cities between 2001 and 2006. Factors such as the distance between an origin-destination pair and transport infrastructure investments also made a contribution to explaining the rate of growth in commuting flows for some cities.

2.3.5 Spatial projections of population and jobs

Possible future population and employment patterns concerning the four largest capital cities can be drawn by comparing the population projections coming from the ABS of 2008, the Australian Government Department of Health and Ageing of 2009 and the cities reports of BITRE 2010, 2011, 2012 and 2013.

Based on resident population between 2006 and 2031, Brisbane and Perth are projected to grow 1,9% per annum, Melbourne 1,4% and Sydney 1,2%. Even if Melbourne is expected to increase its population the most by 1,6 million people by 2031 followed by Sydney with 1,4 million, the four capital cities will continue to retain their current population rankings, with Sydney having the largest population followed by Melbourne, Brisbane and Perth[272].

The Outer sector of each city is expected to experience larger increase in population than the inner and Middle sectors, contributing to total growth ranges

[271] BITRE analysis of ABS (2012) *"Estimated Resident population*", Canberra
[272] BITRE analysis of ABS (2008) *"Population Projections Australia, 2006 to 2031",* Canberra

from 56% for Sydney SD to 76% for Perth SD. Melbourne Outer sector is expected to gain the biggest number of resident with 1,03 million people, representing the 60% of the total[273]. Increase in population leads to an increase of swelling need in order to accommodate future growth; for instance it is predicted that almost 500.000 dwellings will be required in Brisbane by 2031, with most of them located in Ipswich, in the Outer sector indeed[274].

Job growth is predicted for all four cities, averaging from 1,3% per annum for Sydney to 2,2% for Brisbane with employment growing faster in the Outer Sector, contributing 55% of jobs growth.

Consequently the spatial projections of population and employment growth have implications for spatial patterns of commuting through to 2031. The first result in predictions is that there will be a significant decline in the proportion of inward commutes in Sydney, Brisbane and Perth while there will be a small decline for Melbourne between 2006 and 2031, and parallel, there is also a small reduction in outward commutes as a proportion of total commutes for all four cities. Regarding commuting within the same SLA, there is a significant increase in the proportion of commutes for Brisbane, Perth and Sydney with a small increase in Melbourne, while regarding the commuting to different SLA but within the same subregion there is an increase for Sydney, Melbourne and Perth and there is a decline in Melbourne.[275]

The spatial projections are expected to influence transport mode shares for commuter travel in several ways. In fact, the increase in same-subregion commutes, involving relatively short distances, may create an opportunity to increase active transport mode share, or declines in the relative importance of inward commutes and the projections of rapid outer suburban job growth will potentially pose a challenge to achieve growth in the public transport mode share[276].

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[273] BITRE analysis of ABS (2009) *"Population Projections",* Australian Government Department of Health and Ageing, Canberra

[274] Office of Economic and Statistical research OESR (2011) *"Residential infill development profile"*, South East Queensland, Number 6, Brisbane

[275] BITRE analysis of ABS (2013) *"Population growth, job growth and commuting flows in South East Queensland",* Report 134, Canberra

[276] BITRE analysis of ABS (2011) *"Census of population and Housing customised place of work data for 2001 and 2011",* Canberra

2.3.6 Conclusion and outlook

Australia's largest cities are all highly suburbanised and low density compared to world standard[277] and, as a consequence, capital city strategic plans have been developed by proposing large scale infrastructure solutions alongside increasing urban consolidation in suburban centres as a mean of accommodating this growth, limiting the rate of suburban expansion by encouraging new dwelling construction in existing built-up area and encouraging higher density residential development. Sydney, Melbourne and Brisbane over the past decade respected the long-term infill targets, while Perth has been below them.

All four cities have experienced a reduction in the typical size of lots, they all gained density of population in their established inner and middle suburbs between 2001 and 2011 and they all recorded an increase in the residential density of activity centres between 2001 and 2006. Moreover Sydney, Melbourne and Brisbane have experienced a clear shift towards higher density forms of housing, with a significant increase in the proportion of high-rise flats, units and apartments and decline of separate houses.

Due to higher density housing the Central Business District of all four cities gained population rapidly from 2001 to 2011 while the Middle Sector recorder average population growth of 1-2% per annum. The Outer Sector of Sydney averaged 0,9% per annum growth and the other cities' averaged until 3%, while the outer suburbs accommodated much of the population growth in all four cities contributing from 46% of Sydney's growth to 68% of Perth's growth.

Even if the population is distributed widely in the middle and outer suburbs, jobs tend to be concentrated in and around the CBDs: Melbourne for instance, has the 30% of city's employment in 2011 in the Inner sector and only 8% living there while the Outer sector contained 32% of jobs and 45% population. Sydney contains several other centres with over 25.000 jobs but there are no non-CBD activity centres of this size in the other three cities.

Concerning the overall spatial structure of commuting flows is similar across the four cities with the main trends of the 35%-45% of commuting flows in

[277] Forster C. (2006) *"The challenge of change, Australian cities and urban planning in the new millennium",* Geographical research, Vol. 4, pp. 173-182

the inward direction and 6%-10% in an outward direction. The remaining 45-55% of flows occurred within the sub-region. Inward commutes constitute about three-quarters of the total public transport use by commuters and most commonly involve commuting to a place of work in the CBD.

Journeys to work between dispersed suburban and destination has led to very high levels of automobile dependence in Australian cities[278] in the last decade even if there are signs that the level of automobile dependence has stopped rising. The public transport mode share rose in each city but the increase was relatively modest for Sydney.

Average commuting distances were similar for residents of Sydney, Melbourne and Brisbane in 2006, and a little lower for Perth. In each city, average commuting distances were lowest for Inner sector residents (5–7 km), higher for Middle sector residents (8–10 km), and highest for Outer sector residents (13-15 km). These average commuting distances remained unchanged between 2001 and 2006 and then rose until 2011-2012 of about 1,1 km in all four cities[279].

Commuting flows are driven by the spatial distribution of the residential population and jobs within the city that reflects the accumulated pattern of development over many decades and keeps on being shaped and influenced by demographic trends, cultural preferences, economic forces and government decisions though strategic plans and transport and infrastructure investments. The construction of the new motorway in Sydney appears to have been a strong determinant of employment growth patterns, particularly in the wholesale trade and logistics industries[280], while the Western Ring Road reduced travel time and expanded the spatial labour market of the West Industrial node and the North Industrial Node in Melbourne[281].

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[278] Forster C. (2006) "*The challenge of change, Australian cities and urban planning in the new millennium",* Geographical research, Vol. 4, pp. 173-182

[279] Queensland Government (2015) "*SEQ Household travel survey 2009-2012",* State of Queensland

[280] BITRE analysis of ABS (2012) *"Estimated Resident population",* Canberra

[281] Rasmussen B. (2010), "*Global commodity chains and the development of employment nodes and corridors in Western Melbourne*," Paper presented to Melbourne Knowledge Summit, Melbourne.

2.4 Sprawl debate in Australia

As previously examined, Australian urban planning presents common prerogatives to cities having recent urban development. In fact the Oceanian country has been colonized only two centuries ago and it has witnessed to a very fast occupation and urban development. Located primary on the coast, with a population up to 4-5 million of people and extremely low-dense, Australian cities have been compared to American cities.

Urban sprawl versus urban densification is a debate that has been raging for decades and dominated academic and popular urban planning discourse: on one side it is supported the theory of expanding at the edges developing sprawl, providing a greater choice of living locality, offering access to more affordable housing and giving the space for privacy and raising family and on the other side the increase of the density is promoted contesting that low urban density is inefficient, not sustainable and problematic for health and environment.

Since the international sprawl debate is going to be broadly disputed in the chapter 3, it is now going to be briefly enlightened the approach regarding urban

sprawl in Australia, from a critic of the strategic urban plans to the different local attempts to face the issue of sprawl.

With the aim of encouraging and facilitating a constructive dialogue about capital city planning systems, the Built Environment Meets Parliament, also called BEMP, works on assessing existing metropolitan strategic framework through independent indicators identifying gaps between planning objectives and practise and proposing solutions. BEMP is dealing with COAG (Council of Australian Governments) national criteria relating to capital city strategic planning, including also population growth, climate change and urban congestion; COAG turned to professional service company KPMG to valuate Australia strategic plans. According to KPMG assessment performed in 2010 is clear that capital cities are not yet operating at a level that demonstrates sound performance in relation to COAG criteria[282], even if must be mentioned that cities plans are at different stages of the reform process and indeed some criteria are more crucial for achieving success in larger cities with rapid growth.

Considering an overall positive performance averaging from 47% for Sydney to 69% from Melbourne, noteworthy reflections are the bad performance of infrastructure development in Perth, the network situation in Canberra, the land release in Brisbane, Adelaide and Canberra and the investments in Sydney. In matter of positive accomplishments, the plans embarked by Queensland Government emerge that they are well integrated to planning and infrastructure and Brisbane's strategic planning system rates well specially when compared with other systems. Adelaide plans meet national priorities in the COAG criteria, with a good integration between spatial planning and major infrastructure initiatives, including rail projects and desalination. Combining the National Capital Plan as the seat of national government and the City Spatial Plan, Canberra's strength is the good integration between plans with regularly updates, even if it lacks of good manage of growth. Darwin needs to develop a land supply program and an infrastructure plan and Hobart lacks of a land supply program and for this reason they both are poorly ranked in the assessment. Melbourne is leading the rank due to its strongest representation of a capital strategic planning system supported by a metropolitan

[282] KPMG (2010) *"Spotlight on Australia's Capital Cities, An independent assessment of city planning systems",* Built Environment Meets Parliament

plan, land supply program and the last Integrated Housing System[283] that attempts to provide housing in established areas along major public transport routes. Perth plan satisfies criteria because of the significant interest in land supply and the urban renewal projects, moving to a strong capital city strategic planning system. In conclusion, Sydney has reached the bottom of the chart due to the poor implementation caused by recent changes in priority to major transport infrastructure projects such as the North West Rail Link, CBD metro and West metro, demonstrating a lack of certainty in the way authorities in Sydney operate[284].

When debating about sprawl the concept of density is crucial, especially in Australia where cities densities are extremely low and cities very broad. For instance, Melbourne has a population density of about 2.500 people per square kilometre which is low compared to two Canadian cities having same size, function and population as Montreal with 3.380[285] and Toronto with 4.150 people per square kilometre[286].

Australian cities are more like Los Angeles than New York: their central regions have lower densities than those of older North American cities, but their suburbs generally have higher densities, thanks to stronger regional land-use planning, which has restricted scattered fringe development. Brisbane, with a weaker tradition of regional planning, has a significantly lower density than any other large Australian urban area[287].

Comparing Melbourne population densities and transport patterns data on a graph an hyperbolic relationship emerges which car use increases exponentially once densities fall below 3.000 people per square kilometre[288]. Moreover, in the close and often combined New Zealand, Auckland is mentioned as the city with the world's

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[283] KPMG (2010) *"Spotlight on Australia's Capital Cities, An independent assessment of city planning systems",* Built Environment Meets Parliament
[284] Ibid.
[285] Spencer A., Gill J. and Schmahmann L. (2015) *"Urban or suburban? Examining the density of Australian cities in a global context*", paper prepared for the State of Australian Cities Conference
[286] Hume C. (2012) *"Urban density is key to smart growth",* Urban Ussues and Architecture, The Start
[287] Mees P. (2009) *"How dense we are? Another look at urban density and transport patterns in Australia, Canada and the USA",* State of Australian Cities Conference, Perth
[288] Banister D. (2005), *"Unsustainable Transport: City transport in the new century",* Routledge, London

lowest urban density due to the extensive motorway system and marginal public transport[289].

Professor David Karoly, member of the International Panel on Climate Change, suggested that Australian need to change their lifestyle: while in past decades they have been encouraged to aspire to individual homes with a backyard, now they should move to higher density living parks, use efficient transport and return to the shopping strip[290]. According to professor Karoly, this is the only solution to achieve an increase of density and aligning with the other large cities' density worldwide.

A practical solution is suggested by the Premier of the Country of Victoria claiming that Melbourne needs new policies allowing flats to be built virtually everywhere in order to avoid becoming as Los Angeles that is considered the symbol of the relationship between low-density urban sprawl and car-dependent behaviour[291].

It is indeed believed that Governments have the key role to manage the issue of sprawling suburban with low density: transport policy can be changed more quickly and cheaply, and with less disruption, than city density, so it might even be possible to make the necessary changes in time to save the planet[292].

According to a two-year research project conducted by the Australian Urban Design Research Centre (AUDRC) on future settlements in the Country to inform public debate and encourage planning policy settings from a national perspective, the population decentralisation is promoted thought the application of broadband telecommunications and high-speed rail to create "*megaregions"* instead of megacities[293]. With the term megaregions is intended the economic dynamism of large cities and the constellation of smaller towns in between. Megaregion planning is meant as the conception of integration between landscape systems and

[289] Mees P., Dodson J. (2007), *"Backtracking Auckland? Technical and Communicative Reason in Metropolitan Transport Planning"*, International Planning Studies, Vol. 12, issue 1, Auckland
[290] Blakston A. (2009), A hothouse of climate ideas, *The Age*, p. 23, 9 June
[291] Boulton M (2005), "Melbourne risks LA-style sprawl: Bracks", The Age,
[292] Mees P. (2010) *"Transport for suburbia. Beyond the automobile age",* Earthscan, London
[293] Weller R., Bolleter J. (2013*) "Made in Australia: the future of Australian Cities",* in "*Scenario 03:Rethinking Infrastructure",* Scenario Journal

infrastructure, where the ecosystem provides the lineaments of settlements and landscape is cultivated with responsibility and renewable energy is gathered[294].

Harvard landscape ecologist Richard Forman, expert of relationship between human settlements and its impact on ecosystem, supports the theory of megaregions and satellite cities opposed to the further sprawl and linear development along roads in Australia. Cities are designed in accordance with their landscape conditions offering diversity of choices[295]. Moving to numbers of population increase and applying this theory on the best suited are in the Country, 25 new cities in the southeast, west and north Australia would born with less than 1 million each, covering the prediction of 20 new Australians by 2015.

This vision is moving against the theory that re-urbanization is the key to combat low density. There is no national long term planning for the future Australia's settlement patterns and this could turn into issues considering that according to Australian Bureau of Statistics (ABS) in the Country in 2101 there could be 62,2 million Australians, making the population triplicate over the century[296].

In the mid of the 21th century Australian cities will reach their limits, dropping in the chart of liveability ratings due to infrastructure overload, environmental despoliation, congestion and social inequity.

As previously debated, cities on the East Coast have become "major cities" in the last decade, as they gained a lot of population and expanded very broadly; they become appealing for people living hinterland, that leave their villages for cities as Sunshine Coast, Gold Coast and Brisbane. Must be mentioned that the fact that 90% of Australians have the feeling to be squeezed along the coast relies on the belief that international migration is the main cause, as it sets at just over 168.000 people each year. The fast growth in population is given not only by Australian citizens but also by the fast growing immigration from India, China, New Zealand, Britain and Korean in order[297].

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[294] Weller R., Bolleter J. (2013*) "Made in Australia: the future of Australian Cities",* in "*Scenario 03:Rethinking Infrastructure",* Scenario Journal

[295] Forman R. T. (2008) *"Urban Regions: Ecology and Planning Beyond the City",* Cambridge University Press, Cambridge

[296] BITRE analysis of ABS (2008) *"Population projections, Australia, 2006-2101",* Canberra

[297] Peta J. (2015) *"Environmental concerns over urban sprawl*", SBS News

Among the chart of world's most liveable cities the average population of the top ten cities is 1,7 million while the less liveable cities are averaging around more than 10 million, suggesting that size does matter. Moreover, it is interesting to notice that in the chart of the ten most liveable cities not only four Australian cities appear and they are Melbourne, Sydney, Adelaide and Perth, but these cities have also the biggest population in the chart[298].

The dominance of the town planning tradition in the academy is a serious and ideologically driven limitation on the ability to understand urban problems and the policies that might improve cities and the lives of their people. Debates about town planning for change aims, especially in the academy, should be relegated to an important but peripheral position within the broader field of political economy[299].

Sprawl debate has been faced from different perspectives in the capital cities, focusing on the topic of urban density, opportunities and individual decisions. It is particular interesting the approach of two university professors debating about the individual choice of people, urban analyst and Professor Patrick Troy and perpetual high-density supporter ex Sydney Sustainability Commissioner Professor Peter Newman. According to Troy, it is believed that "sprawl" is not what exactly is happening in Australia but "lower density development" borrowing badly the term sprawl from American situation. Moreover, a bigger house with a garden is the preference for most of the Australians: in fact 80% of the population who live in houses want to stay in houses and 85% of the population who live in flats want to live in houses. On the other side, according to Newman, urban consolidation is mandatory in order to balance what is available as the 80%-90% of Australian suburbs are car dependent and there is enough chance to live and walk in transit-based suburbs. More over people claim that they have to buy bigger and bigger house in the city fringe because they are cheaper than the one closer to the city centre and younger people prefer getting an apartment close and near to the kind of urbanity offering employment opportunities[300].

In the meanwhile, the recent decision of the Victorian State Government to increase the urban growth boundary by 58 square kilometres in order to

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[298] The Economist (2015) *"The world's most liveable cities",* Charts, maps and infrographics

[299] McLoughlin J. B.(1994) *"Centre or Periphery? Town planning and spatial political economy",* in *"Environment and planning",* Vol. 26, pages 1111-1122

[300] Recsei T. (2006*) "Troy versus Newman", Save Our Sydney Suburbs (NSW)"*, in *"Save Our Suburbs – for Sustainable Living"*, Sydney

accommodate 6 new suburbs provoked controversies in Melbourne. According to a report of the 2011, 48% of Melbournians have preferences for detached houses over other forms of dwellings, the Melbourne housing stock in 2006 was 72% detached houses and 68% of the new dwellings constructed between 2001 and 2010 were detached houses[301], suggesting that the provision of those specific houses should be reduced to match with dwelling preferences.

It has been openly assessed that suburban planning has strong links with health in matter of influence that planning has on lifestyle choices, income and education: low-density housing and long commute reduces the opportunity to make healthy lifestyle choices[302].

Melbourne 2030 plan has expressed the idea more forcefully through its use of a much larger number of centres than in the past or in most plans for metropolitan areas the size of Melbourne[303]: the plan is to create 27 principal activity centres and 82 major activity centres, all are expected to have some statutory influence and capacity under Melbourne 2030, reshaping the city's built from in ways compatible with an ecologically sustainable development pattern that will promote equitable outcomes, match housing choice to the needs of a changing housing market and offer a sense of local community. Concentrating public and private investment in a few centres will improve accessibility to services and perhaps employment for a population spread across the middle and outer suburbs, but the locally focused new-urban world of people living at high density and walking to work is unlikely to emerge in most of Melbourne.

However, efforts by government facing the issue of sprawl are believed are not enough: given the population explosion in Australia's capital cities, particularly Melbourne and Sydney, there is an urgent need for a more diligent approach to urban policy in Australia. Andrew Giles, chair of the Opposition's Committee for Cities thinks that the Country needs a national urban policy to manage this population growth to ensure Australia remains liveable and strongly claims that Abbott Government is in denial. Environment Minister Greg Hunt said: "I believe we are at a moment in history where each Australian city could bring together federal, state

[301] Kelly J.-F. (2011), *"The housing we'd choose",* Grattan institute, Melbourne
[302] Smith M. (2012) *"The urban sprawl debate*", The red and the black architect, Melbourne
[303] Department of Infrastructure (2002) *"Melbourne 2030",* Victoria Government

and local authorities to lay out an overarching physical road map for the next 30 and 50 years."[304]

Being the fastest growing Australian region, Western Australia has a large plan covering the whole country in necessary promoting sustainability and stopping urban sprawl. Perth, must be mentioned, represents a classic example of urban and peri-urban sprawl focused on a single dominant central business district. Government, through the new city plan, applied mobility management strategies to get people to replace some of the car trips with public transport or bike and consequently there has been a 14% reduction in car trips every day, also providing free bus and train trips around the city centre (Free Transit Zone), as Sydney, including three high-frequency bus lines[305].

Moreover it has been assessed in Western Australia that there was a huge gap between perception and reality of time usage in relations to public transport, walking and cycling: people thought their journey would take twice as long as it actually did and that it would cost a third more than the actual fare[306].

In matter of sustainability, sprawl affects surrounding land users and landscapes with damage in biodiversity, energy flows, biochemical cycles, climate condition, hydrology, soil properties at local, regional and even larger scale. In order to manage these impacts, the Australian state of Queensland has introduced the concept of "*Envirodevelopment*" to emphasize the importance of environmental and community sustainability in residential, retail, commercial, industrial and mixed-use development. Envirodevelopment is articulated in different targets[307]:

- Ecosystem target, to protect and improve existing native ecosystems and native biodiversity preserving degraded sites;
- Waste target, to develop waste management procedures and practices reducing waste itself;
- Energy target, to optimize energy use and achieve a 20% reduction in greenhouse gas production;

[304] Farr M. (2015*), "Our government is ignoring problems of our growing cities"*, news.com.au/lifestyle/reallife

[305] Department of Planning, Planning Commission (2010) *"Directions 2031 and beyond"*, Western Australia Government

[306] Danish architecture Centre (2014), "Perth: beating urban sprawl"*, Sustainable City*, Dac&Cities

[307] Urban Development Institute of Australia, UDIA, (2007), *"EnviroDevelopment*", Western Australia Divisio Incorporated, Perth

- Materials target, to utilize materials with lower environmental impacts in preference to other;
- Water target, to achieve at least a 20% reduction in potable water use beyond regulatory measures;
- Community target, to encourage social capital, community spirit, sustainable local facilities, reduce the use of private motor vehicle.

In matter of sustainable design planning Australia is focusing the investments on the professionals of the engineers, essential in achieving managed-growth outcomes because they can help to create convenient and sustainable residential neighbourhoods that display high levels of engineered amenity and durability. Engineering is critical in the land-development process, at the state, regional and local levels, because it encourages a collaborative multidisciplinary approach in which strategic and structural plans are formulated with regard to land use, movement networks, utility provision and community services[308].

In matter of sustainability and Earth damage, The Property Council of Australia (PCA) made a submission to the Queensland government outlining how planning laws that promote densification are likely to increase greenhouse gas emission compared to planning for more urban sprawl: living in smaller dwellings closer to conveniences reduces households' greenhouse gas emission, but being wealthier those households have higher greenhouse emissions overall. Dwelling type is significant correlated with total household greenhouse gas emission from consumption: in fact it has been assessed that compared to separate house, a semi-detached storey dwelling has a change in emission per year from -0,79 to -1,59 tons, a flat or apartment of 1 or 2 storey block around -2,38, a flat or apartment of 3 or 4 storey block from -3,18 to -3,97 and a flat or apartment attached to house until -4,77[309].

[308] Hiller B., Melotte B., Hiller S. (2013) *"Uncontrolled sprawl or managed growth? An Australian case study",* in "*Leadership Manage in Engineering",* in *"American Society of Civil Engineers",* Vol. 13, Issue 3

[309] Foran B. (2012*), "GHG emission",* Integrated Sustainability Analysis, Sydney

PART 3

International debate and influences of sprawl

3.1 Effects of sprawl

3.1.1 Drivers

In order to specified the urban sprawl phenomenon and consequently strategies elaborated by local Government to combat it, forces driving urban sprawl must be fully understood. In the previous chapters have been generally discussed a few causes as the boom of economic activities around 1970 with the consequential development of transport networks due to the increasing passenger and freight transport demand, the increase in the price of already urbanised land, the decrease of the attractiveness of living in the centres and he increase of the attractiveness of the rural areas of the suburbs closer to nature.

Moreover what brought people to consider less centred areas was the low price of agricultural land reinforced by the broad use of expropriation tools that

enabled great profits to be made, especially in the heart of Europe from United Kingdom through Benelux, France and Germany, to the North Italy[310].

Here an attempt to describe drivers of urban sprawl dividing them into different levels and factors:

- Macro-economic level.

At the macro-economic level, globalisation of the economy has been strongly connected with the development of information and communication technologies that demonstrated having impacts into distribution of population and employment not only in the past but also will have in the future[311].

A key role in the developing of the low-density regions is the European Union integration between the Member States that caused the removal of the national boundaries and the investment in longer-distance transport network to facilitate improved accessibility and mobility. For instance, the Trans-European Transport Network, a planned set of road, rail and water transport networks in the EU, has been developed in order to provide integrated and intermodal long-distance and high-speed routes in the continent, solving some of the existing accessibility problems and generating new patterns in population distribution. Moreover, founds given from EU can drive sprawl investing in new motorways and railway lines or can be used to redevelop deteriorating inner cities making them more attractive for housing.

Worldwide competition also changed the location where goods are distributed and consummated, driving changes in the retail sector. In fact most of the stores in the middle of the last century were located in the residential areas while now they are mostly big shopping centres out of town with vast parking and accessible only bat car.

Interaction between areas of commercial, industrial and transport and residential areas is dual: in some cases is the residential area promoting the development of commercial areas and in other cases transport links and nodes facilitate the developing of construction of new houses. In Europe, commercial and

[310] European Environment Agency, EEA (2006), *"Urban sprawl in Europe, the ignored challenge"*, European Commission, Joint research centre, Luxembourg

[311] Audriac I. (2005), *"Information technology and urban form: Challenges to smart growth",* in *"International Regional Science Review",* pages119–145.

industrial areas cover one third of the urban land, while they occupy from 25% to 50% of the all built-up land in the past 55 years[312].

- Micro-economic level.

At the micro-economic level, high land prices in the core of the cities force developers to look for lower prices in the peripheral areas, where agricultural area is, which becomes a highly attractive target for investors and developers. Local municipalities and public agencies are crucial in the process of conversion of agricultural or natural land to space for housing or commercial areas and they usually enter in competition for new income generating jobs and services. Properties on the periphery of cities are considered to be better investments also because the value of the property is expected to rise more rapidly outside the urban core[313].

Capitalism is claimed to be the direct cause of sprawl, because its economic system induces buyers and sellers to act in ways to further their own good. If government did not intervened for instance, developers would maximize their profits by buildings at low densities without taking in account the will of the customers because single-families houses are more profitable than apartments buildings causing social and environmental unpleasantness. Moreover, the relation between sprawl and increasing globalization of markets has been analysed. It is believed that of course it is true that changes in market conditions will have repercussions on the land, but attempts to describe the built environment of a particular city or part of it as the result of globalization have, to date, rarely been useful; in fact, whether the bank is owned locally or by a multinational corporation headquarters in a distant country, the dynamics of local real estate markets seem to play put in similar ways[314].

- Demographic factor.

Not only the increase of population in all the world determines the outward expansion of built-up areas but also the formation of the family unit. For instance

[312] Kasanko M., Barredo J.I., Lavalle C., McCormick N., Demicheli L., Sagris V., Brezger A. (2006), *"Are European Cities Becoming Dispersed? A Comparative Analysis of Fifteen European Urban Areas"* in "*Landscape and Urban Planning"*, Vol. 77 pages 111–130

[313] Couch C. and Karecha J. (2006), *"Controlling urban sprawl: Some experiences from Liverpool"*, in Modarres A.*"Cities",* Vol 23, Iss. 5 pages, 242–363.

[314] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago

families with small children are most likely to move to suburban areas and to rural areas outside the city, while elderly and single area least likely to move out of the cities, As the trend towards an increasingly ageing population and smaller households continues, it may be anticipated that some slowing down of the movement from cities to suburbs will occur in the coming decades[315].

- Housing preferences factor.

Preferences for housing along the decades moved to semi-detached or detached houses in the suburban and rural areas outside the city, as the prime investment to be made in lifetime. Owning a single family detached houses makes not only having more privacy and being more isolated than other family units but also means bigger house and having more space per person.

Moreover, Americans do not like the dirt and disorder that characterized the historic 19th century industrial cities, choosing physical elements that make life more convenient and pleasant for them. For this reason they prefer suburbia as a better place to work, live, raise children while the centre is more for shopping or nightlife, and a tourist destination indeed.

- Inner city problems.

The attractiveness of the suburbs is not only the reason people are driven to move outwards but also many negative aspects of inner city. First above all, the poor environment as polluted air and noisy areas play a big role, but also social problems and safety issue. Unattractiveness of built-up environment is given by the lack of green, open spaces and sport facilities. As families move out the city, social segregation begins to intensify with the consequently municipal tax revenues decrease becoming insufficient to maintain services such as schools and hospitals[316].

- Planning level.

[315] Couch C. and Karecha J. (2006), *"Controlling urban sprawl: Some experiences from Liverpool"*, in Modarres A.*"Cities",* Vol 23, Iss. 5 pages, 242–363.
[316] Burton E. (2000), *"The Compact city: Just of just compact? A preliminary analysis"* in Bannister J. "*Urban Studies",* Vol. 37 pages. 1969–2001.

Urban planning strategies have they key role of generating or not urban sprawl: when the environment is unplanned, decentralised development dominates and sprawl occurs and where growth around periphery of the old city is coordinated by strong urban policy perspectives, more compact forms of urban development are secured.

- Government level

It is claimed that more than capital markets, responsible in the United States of America to force millions of people to live in the suburbia in single-family houses was the federal government with homeowner subsidies, highway network program and tax reductions. Kenneth T. Jackson, in his survey of American suburb "Crabgrass Frontier: the suburbanization of the United States" describes the factors that promoted suburbanization, process of inversion of the old condition of wealthy people living in the city centres and poor in the suburbs to the new situation of moving out by the rich people. He believed that if government had not increased transportations, subsidized suburban infrastructure, pushed self-amortized mortgage and decreased taxes in suburban, many dwellers would have preferred to stay in dense apartments in city centres rather than single-family house in suburbs[317].

- Technological level

Technology related to transportation has been another promoter of urban sprawl, especially in postwar era when mass transportation yielded to the automobile encouraged by government measures. Financing highways in fact become the national policy that subsidized growth on the urban periphery at the expense of older cities and inner suburbs and other pro-automobile measures favouring rural areas become part of the political culture and law of the United States[318].

However, automobile did not directly replace any sort of mass transformation, but the private carriage, and for this reason it would more appropriate

[317] Jackson K. T., (1985) *"Crabgrass Frontier: the suburbanization of the United States",* Oxford University Press, New York

[318] Gutfreund O. D., (2004) *"Twentieth century sprawl: highways and the reshaping of the American landscape"*, Oxford University Press,. New York,

saying that the private transportation and the mass transportation have coexisted and developed together through the 19th and 20th century[319].

3.1.2 Impacts

Urban development has impacts beyond the land consumed by construction and infrastructure and its immediate surroundings.

New urban development generates the need for new transport infrastructures to link them together, have given a powerful economic boost to many disadvantaged regions in Europe and Asia and already powerful regions in United States.

Here an attempt to describe impacts of urban sprawl dividing them into different levels and factors:

- Environmental level.

Urban development involves the consumption of numerous natural resources as land and soil and most of them are non-renewable. Moreover, urban sprawl requires high demand of raw materials typically produced in remote locations and transportation is consequently needed. In Spain for instance, the consumption of concrete has increased by 120% in 1996 reflecting major expansion of construction activity in Spain mostly on the coast and major cities, where urban sprawl has become endemic.

Under the urban transformation, the properties of soil are transformed and it reduces its capacity to perform essential functions; so it is reported the loss of water permeability, the loss of soil biodiversity and the reduction of the capacity of the soil to act as a carbon sink.

Natural resources need also increases according with lifestyle changes and this is confirmed by the fact that individual household requires more resources than a not individual household. In fact it is reported than two people household uses 300 litres of water per day while two single households use 210 litres, for a total of 420 litres per day demonstrating that the first use 20% less energy than the second[320].

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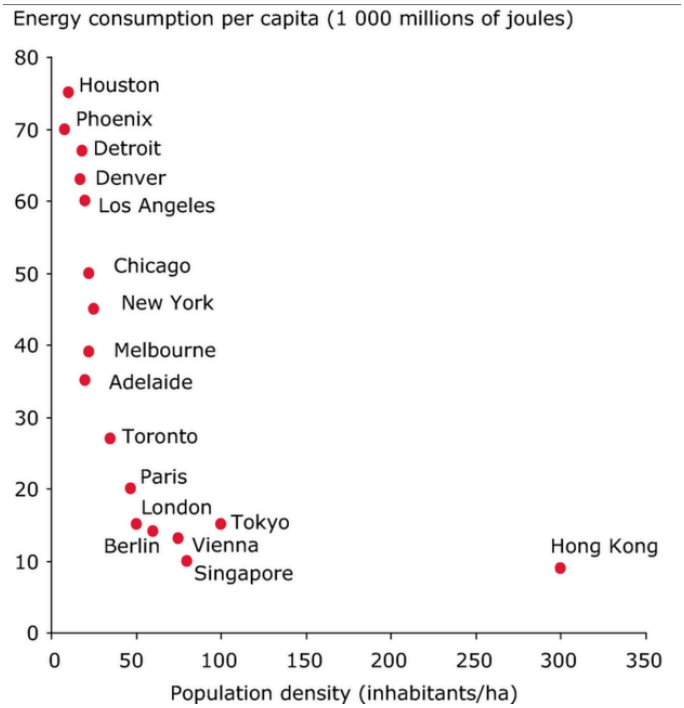
[319] Bruegmann R. (2005), "*Sprawl. A compact history*", University of Chicago Press, Chicago

[320] European Environment Agency, EEA (2006), *"Urban sprawl in Europe, the ignored challenge"*, European Commission, Joint research centre, Luxembourg

Regarding energy in general, compact urban developments with higher population densities are more energy efficient while sprawling environments undermine efficient energy use. Moreover the sprawling city is dominated by relatively energy inefficient car use.

Figure 3.1 – Population density and energy consumption



Increasing transport related energy consumption is leading to an increase in the emission of CO_2 to the atmosphere; this relationship between population densities and CO_2 emissions is apparent as emissions increase progressively with falling urban densities.

The impacts of urban sprawl on natural areas are significant as ecosystems functions, production of food, protection of natural species, water retention and storage are threatened by the increased proximity and accessibility of urban activities, imposing stress, noise and pollution.

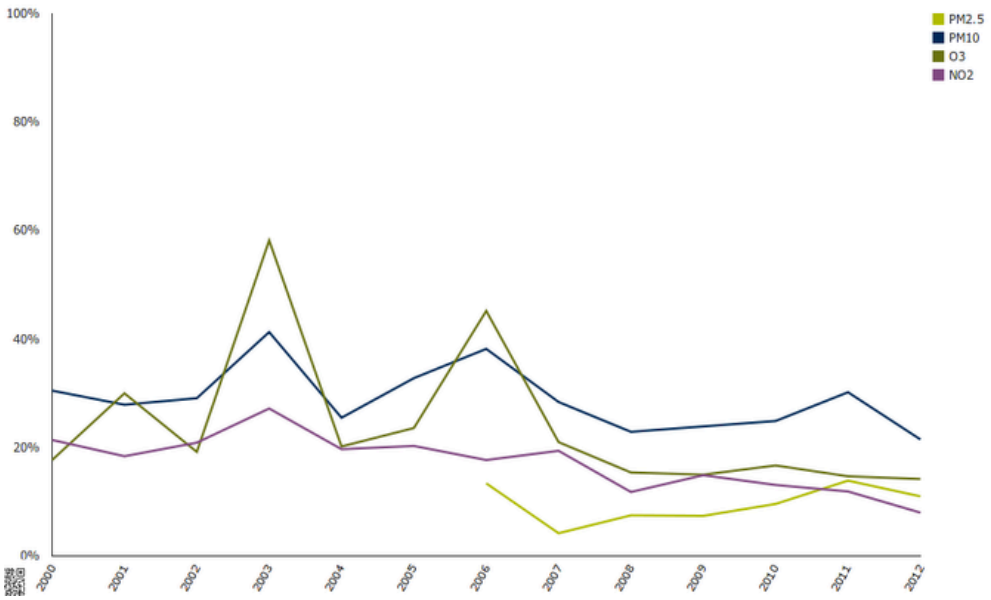
Must be said that in order to face issue of urban sprawl related to environment Queensland introduced the concept of "Envirodevelopment" considering targets of waste, energy, materials, water and community, which has been fully descripted in the previous sector.

- Urban quality of life level.

Individual quality of life is influenced by all the environmental impacts produced by urban sprawl, threatening human health, as poor air and high noise levels, that often exceeded the agreed human safety limits.

Regarding exceedance of air quality limit in urban areas, from 2001 to 2011, an average of 35% of the urban population in European Union was potentially exposed to ambient concentrations of particulate matter (PM10) in excess of EU limit value set for the protection of human health, that is 50 microgram/m^3 daily mean not to be exceeded more than 35 days a calendar year. In the same period, an average of 15% of the same population was exposed to ambient nitrogen dioxide (NO2) above the EU limit of 40 microgram NO2/m3; an average of 40% of the same population was exposed to ambient ozone concentration above the EU limit of 120 microgram O3/m3 daily maximum 8-hourly average not to be exceeded more than 25 times a calendar year with a record in 2003 of 65% of urban population[321].

Figure 3.2 – Percentage of urban population resident in areas where pollutant concentrations are higher than target values.



Sprawl related growth of urban transport and greenhouse gas emissions have major implications for global warming and climate change with the expectations of severe weather events in the future to increase. The risk from the continued development of these areas in the context of a changing climate is evident

[321] Statistical Office of the European Union, Eurostat, (2007) *"GISCO Urban Audit 2007 geographical data set"*, European Environment Agency

in the recent major floods that have effected large urban population in Europe and United States, as the floods in central Europe in August 2002 caused 112 victims and over 400.000 people evacuated from their homes.

Urban planning is focussed on the growth of urban sprawl along the coastal fringes in all the world, from Europe to Unites States and Australia, as quell development of sprawling extensions across greenfield sites in the river valleys and lowlands in Europe.

- Social level.

Segregation of residential development is probably the most severe social problem derived from urban sprawl. The typical character living in the suburban area is the middle and upper income family with children with the necessary of mobility, but also is very popular the young and old groups with lack mobility and for this reason social interaction is reduced.

When urban sprawl is very evident, in the city the concept of the duality can be easily applied with an evident social polarisation in the inner city with poor quality neighbourhoods, unemployed people, elderly poor, single young and minority ethnic groups, and the suburban fringe.

In Canada the Toronto Social Strategy serves a leading examples claiming that first aim of development is the social development, as it includes the principles of public equity, social well-being and healthy communities. The principles composing the Canadian strategy as equity, equality, access, participation and cohesion can be implemented by strengthening communities, supporting building community capacity, encouraging participation in government decisions, increase the access to community space, investing in comprehensive social infrastructure and strengthening the city's role as advocate[322].

- Economic level.

From an economic perspective, urban sprawl requires big investments from not only household but also government. In fact families spend on commuting from home to work over long distances and the distance weights also in investments in transportation systems, congestion business, related services and utilities. In the cases

[322] Toronto City Council (2001), *"The social development strategy"*, in "Toronto Community and neighbourhood services", Social Development and Administration Division, Toronto

of Munich and Stockholm, instances of efficient control of urban sprawl, public transport has been reinforced and promoted and while the cities were enlarging their boundaries the use of the car decreased and the use of the public services increased[323].

In Europe, during the EU enlargement of the boundaries and the accession of new Member States, urban sprawl has caused an increase of land prices in Western Europe provoking the investors to move to new markets in new Member States on Eastern Europe. The input of external capital distorted internal markets, particularly in small countries like Estonia which has a small property market and a population of just 1,3 million people.

3.1.3 Responses

Early attempts to face urban sprawl are dated 1934 when Herbert Morrison, leader of the London County Council, introduced the first proposal for the suburban area outside London with a green belt surrounding the boundaries. Since that moment, throughout the decades, national governments in the entire world handled the problem of suburban development with different methodologies and effective results.

In Europe, fir instance, have been given obligations defining a clear responsibility and mandate for the EU to take an active lead in the development of new initiatives to counter the environmental and socio-economic impacts of sprawl. Urban management has been identified as far back as the 1980s and still remains high on political agendas.

Must be mentioned that urban sprawl has been criticized for social, economic and environmental impacts but also at the same time has many strong supporters. The solution to urban sprawl that has strongly proposed by critics is the "compact city", suggesting an increase of the density within the city boundaries, even if there are still uncertainties regarding intensification and compaction due to ecological, social and economic reasons. The international debate around urban

[323] Lyons T. J., Kenworthy J. R., Moy C. and Dos Santos F., (2003), "*An international urban air pollution model for the transport sector*", in Gao H. O. "*Transportation Research Part D: Transport and Environment*" Vol. 8, Iss. 3, pages 159-167

sprawl is going to be exposed in the following section of this work. In this part is presented an attempt to describe the principles that define the governance framework for action on the territory facing urban sprawl.

In Europe the key factor is the division of responsibilities between different levels of city and regional governance. In fact urban and regional managers at the local level have the duties of the management of the city and its region while the strong connectedness between local, regional and national conditions has the responsibility of the strategies and instruments to control urban sprawl. The commitment of European Union in urban dimension is publish policies at all levels to tackle urban sprawl and help to redress market failures that undermine a sustainable vision for spatial planning of urban Europe, and they can be summed in three categories: policy coherence, to ensure that regional and local decisions are coherent with a broader set of principles common in all the sectors, responsiveness to local condition, to provide legislation and programmes with a territorial impact in local area, and cooperation in policy development[324].

The city of Munich is considered an example of "compact city" and at the same time not-sprawled city in Europe, possibly due to past decisions on urban development, as the postwar rebuilt of the historical centre enclosed by a combined park and traffic ring, followed by the 1960s urban development integrations with guidelines for all municipal responsibilities including economic, social, educational and cultural and planning indeed. Munich claimed slogan was "compact, urban and green" based on reuse of brownfield land, avoidance of expansion, integration of residential and commercial services, improvement of public transport and pedestrian and cycling facilities.

In Australia government agencies are largely responsible for the planning, delivery, operation and management of utility and social infrastructure, main road construction, public transport, community services and facilities, operating with coordinated plans and budges. Planning in a single States in Australia means being influenced by the following levels of governments with associates strategies: at the first level the National Government including National urban Policy and Australian urban Design protocol, at the second level the State Government including State planning strategies and metropolitan region schemes, and at the third level the Local

[324] European Environment Agency, EEA (2006), *"Urban sprawl in Europe, the ignored challenge",* European Commission, Joint research centre, Luxembourg

Government including local planning strategies and district town planning schemes. This three level of control and strategies ensure a strong connectivity and good efficacy.

In United States, lacking of a regional governance structure, there is no a centralized body to plan or control land use which is fragmented among many small localities[325]. The consequence is a result in sprawling suburban fringe development.

The impacts of urban sprawl have for years and decades generated debates among scientists and practitioners as well as supporters and opponents, and ahead in this work the debate around sprawl is going to be deeply illustrated.

[325] Downs A (1998) *"How American cities are growing: the big picture*", in "*Brookings reviw*", Brookings Institutions Press, Vol. 16, pages 8-12

3.2 Sustainability and urban ecology

3.2.1 Introduction to sustainability and theories

The concept of sustainability gained preponderance in modern discourse in the recent decades with the aim to create a future with better harmony between human activities and the natural systems of the biosphere, entering in most political debates worldwide, locally and globally, and offering several diverging perspectives and schools.

The emergence of sustainability as a guiding principle in urban policy can be associated to a fundamental crisis that has posed a challenge to conventional understandings and development during the past quarter century. The model used in the postwar growth has become the frame of reference for Western societies has been substituted with the more recently perceived prospects of economy changes, limited natural resources and fragmentation in the social fabric of societies. As a result the

work of planners in modern era encounters itself in a situation that has changed most profoundly when compared to what was there only 25 years ago.

First in 1970s has been introduced the concept of eco-development approach focusing on the scientific principle with less political applicability and consequently did not have potential to gain widespread acceptance[326].

In the following decade, 1980s, came into use with the application in the report "Our Common Future" published by United Nations World Commission on Environment and Development (WCED) in 1987, that placed environmental issues firmly on the political agenda, aiming to discuss the environment and development as the single issue[327].

Promoter of sustainability is Professor Ernst Ulrich von Weizsächer of Nagoya University who published the book "Factor Five" concerning the increase of resource productivity and change to be made to make the transition to a sustainable future. Supporters think that growth, in this mode, becomes a qualitative rather than quantitative process.

Opponents of sustainability claim that it is a non-growth paradigm as it concerns only wealthy countries while doing nothing for poor countries to overcome their status of social and economic marginalisation and that biosphere's carrying capacity is not so precarious while technology progress can resolve the challenge.

In 1992 in Rio de Janeiro, Brazil, the United Nations Conference on Environment and Development occurred, and in this occasion United Nations Sustainable Development published the "Agenda 21" providing a template for discussion with the following themes: revitalizing growth with sustainability of people and environment (Prospering World), supporting local opportunities and individuals (Just World), taking advantage human settlements (Habitable World), supporting resource conservation and efficiency (Fertile World), targeting the communities' contribution to protect the global commons (Shared World), assuming responsibility for the waste and pollutants and promoting recycle (Clean World) and finally involving all citizens, businesses and experts promoting participations and responsibility (People's World).

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[326] Lele S. M. (1991), *"Sustainable development: a critical review",* in Agrawal A.*"World Development",* Vol. 19, Iss. 6, pages 607-621

[327] Scheurer J. (2001), "*Urban Ecology, Innovations in Housing Policy and the Future of Cities: Towards Sustainability in Neighbourhood Communities"*, Murdoch University Institute of Sustainable Transport, Perth

Earth Summit in Rio claimed that every local government on the planet should initiate a process of elaborating sustainability policies by 1996, with a weak result: at that year only 103 out of 178 signatory nations to agenda 21 have adapted national government structures to those principles[328].

The concept of sustainability has been applied to city in 1999 by Peter Newman, professor of City policy in Murdoch University in Perth, Australia, conceiving the city as a "metabolism"[329] with the "Extended urban metabolism model", where the inputs are various types of resources such as energy and materials, the positive outputs are human wellbeing and prosperity and the negative outputs are waste and pollution. It tries to visualize how a city acts as both consumer of resources and producer of waste while at the same time putting efforts into providing its citizens with a high quality of life. In achieving greater urban sustainability these areas always go together and a more sustainable community necessarily has to live better with less resource flows.

Moving to the attempt to put into practise theories pro sustainability, experts moved to technological solutions as the car catalysts and to social solutions as the participation with respectful behaviours. Norbert Gestring, Professor of urban and city sociology of the Goethe-Universität of Frankfurt, Germany, mentioned a third approach, after the technological and social ones, which is the urban design approach. He claims that a denser and more multifunctional built environment is inherently more resource-efficient and liveable than a dispersed and functionally disintegrated one.

By the way, there is a common vision that is shared by mostly all critics' perspective: the "commons" is believe to play a central role in the sustainable city. Those common areas are land uses precluded from private ownership to support the functioning of a city's vital economic, social and environmental processes. The private is in this way over-emphasised and at the expense of the commons[330]. The aim of the "urban model" is taking back the commons that are currently under-

[328] National Research Council of the National Academies (2002) *"Agenda 21 Implementation: Progress, challenges, and the Role of geographic Data"*, in "*Down to Earth: geographical Information for Sustainable Development in Africa,"* The National Academic Press, Washington, Chapter 2, page 12-28

[329] Newman P. W. G. (1999) *"Sustainability and cities: extending the metabolism model"*, Landscape and urban planning, Perth

[330] Kenworthy J. (2006) *"The eco-city: ten key transport and planning dimensions for sustainable city development"*, in "*Enviroment and urbanization",* Vol 8, chapter 1, pages 67-85

utilised in private ownership in order to improve social, economic and cultural interaction within communities; more activities are concentrated into clusters within pedestrian and bicycle range and liked across the urban region by highly-performance public transport.

In the age of modernism these solutions prove increasing incapable of addressing the challenges of society in an era when individual and community choices become both more significant and less certain, and the need to make urban systems more sustainable become pressing.

Approaches to ecological goals in urban living are given through two synergetic models: the first called "environmental management approach" relies on legislative and regulatory measures initiated by governments and market players with the optional participation of the users and can be described as "top-down"; while the second called "urban ecology approach" relies on creativity of users to incorporate measures of ecological reform in their lives with the optional support of government and it is called "bottom-up".

From the "top-down" and "bottom-up" dichotomy, the previous mentioned four practical implications become manifest in the priorities: the technological, the community, the users' behaviour and the urban form approaches. The good performance of an urban area focusing on sustainability is given not from the individual performance of one approach but the integration of them into one project.

3.2.2 Practical approaches and guidelines

Consequently to commitment towards sustainability, ecological housing policies have been distributed to make neighbourhoods and urban infrastructures more sustainable.

Without doubts, the first approach is to improve the generation and distribution of energy from alternative sources, as bio-fuels as substitutions of fossil fuels or the introduction of the Combined Heat and Power (CHP) as a fast-growing technology to be included in new neighbourhoods under local administration. Expanding the use of CHP, for instance, is generally regarded as an environmentally friendly strategy and has been broadly introduced in Denmark, as the first pioneer Country in UE.

Moreover, the waste must be looked from a new perspective according to Marc Jensen, director of the Lean Institute of the University of Oklahoma United States, sustaining the move towards the utilisation of combustible waste products and bio-fuels extracted from organic waste to substitute for fossil sources[331].

The other major idea of reducing excessive energy use independent of the type of energy generation is associated to the role of the actual buildings. Policies in most countries imposed requirements to decrease the ventilation and transmission loss, as good thermal insulation in relevant components of the building and mechanical ventilation systems to avoid windows opening. The energy-efficient design is not just about the minimisation of heat losses but also is important to make the most of ambient thermal energy supplied by the sun through solar panels and photovoltaic equipment. Both active and passive solar building design, applied in new buildings or also provided to existing ones, are the result of a combination of climatology, thermodynamic, material, technology studies and researching towards a more sustainable human thermal comfort.

The vision of the integration of built and natural spaces become predominant along all the 20th century giving work to all the urban and city planners. It is believed that a process of "renaturalisation" in the city is needed[332], not meant as re-establish a natural environment in itself in the city but facilitate experiences in the city related to what people experience in natural areas. Since demolition would be too devastating, the only available place to act is the public one.

In this vision, nature is not anymore decoration to enhance the pleasure of urban living but cities are now part of the nature. For instance, stormwater that in the past has been channelled away from neighbourhoods as fast as possible now is seen as a resource as in Freiburg, Germany, where soil conditions require specially designed system of percolation trenches allowing stormwater to enter in the aquifer and the share of soft surfaces is maximised reducing the area accessible to vehicles[333.]

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[331] Jensen M. (2014) *"Lean Waste; Reducing Material Use and Garbage Using Lean principles"*, CRC Press, London

[332] Soria y Puig A. (1999) *"El siguiente paso. Disputacio de Barcelona",* Espai Publica urba' Institute d'Edicions, Barcelona

[333] Lange J. (2003), *"Runoff generation from successive simulated rainfalls on a rocky, semi-arid, mediterranean hillslope",* in Tetzlaff D. "*Hidrological Processes",* Wiley Intersiences, Vol. 17, Issue 2, pages 279-296

Food production is another aspect to be mentioned in matter of maximisation of resources that has been debated in the last decades and it reached a peak when was introduced the term "permaculture"[334] to describe a human-made system of cultivation maintaining resilience and stability to natural ecosystems.

Last but not least, the attentions is moved to neighbourhood where happens the reconciliation of built and natural environments with the design of houses and landscape spaces to maximise their ability to support biodiversity and ecological functions. A good network of open spaces consisting of a good density of high-quality natural habitats of different characteristics linked by linear corridors to encourage the exchange of wildlife populations and to consolidate biodiversity in urban environments[335.] This discipline is called " open space management".

In matter of design and infrastructure of the neighbourhood, when it is integrated with the surrounding urban fabric and connected with central facilities, the distance travelled and the use of car fall. Community interaction is also given by a minimum population density to generate a sufficient level of community interaction, estimated to be not less than 3.000 people per square kilometres[336.] Urban transport services must meet specific criteria to provide an alternative to car use, with high frequencies, 24 hours service, well connected in a dynamic system.

It has been assessed that previously mentioned expedients have no achieved expected goals in limiting car use, so further instruments in ecological neighbourhoods have been introduced as concentrating non-dedicated parking facilities at the perimeter of the area, making exemption to people not owning cars from mandatory parking provisions and separating sale and rent of residential units and parking spaces.

At the same time, car sharing is becoming a serious alternative to the prevailing paradigm of broad individual car ownership in the future, reducing the number of vehicles in circulation while maintaining the mobility benefits car offers. Additionally, car sharing schemes have begun to attract the involvement of other

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[334] Mollison Bill (1991*) "Introduction to permaculture",* Tagari, Hobart

[335] Scheurer J. (2001), "*Urban Ecology, Innovations in Housing Policy and the Future of Cities: Towards Sustainability in Neighbourhood Communities"*, Murdoch University Institute of Sustainable Transport, Perth

[336] Newman P. W. G. (1999) *"Sustainability and cities: extending the metabolism model"*, Landscape and urban planning, Perth

industry players, as railway companies in Switzerland, allocating vehicles to their stations to enable rail travellers to reach dispersed destinations.

The practical approach summarized in this section exemplifies the significance of collaboration between environmental management and urban ecology approaches in this sensitive field. Attempts to raise mobility awareness may be futile with users who fail to see supportive changes in the physical environment and the provision for sustainable transport modes occurring.

As motioned before, changes towards sustainability can occur only with community-based approaches that take local culture seriously, giving to the civil society an important role[337].

Alison Girlchrist, Professor at Bristol UWE University and Member of the Executive Committee of the National Standing Conference for Community Development, is a researcher informal networking within community development and strategies for achieving equality and empowerment. She claims that communication between people sharing common interests and environment needs to be intensified, in order to establish relations of trust and respect. The constructive dialogue and the creation of collective empowerment bring to better articulate aspirations and needs more clearly and thanks to the strong sense of personal fulfilment and sheer happiness the individual is feeling better levels of physical and mental health. Vandalism, crime and discrimination as a consequence is going to reduce[338].

Community gets a new position, between formal and informal exchange, public and private spheres, capable on building relations between governments and individuals. Instances of this new vision are the cities of Hamburg and Vienna: in the German city some residents had the opportunity to do the internal fit-out of their units at their own design and expense in return for a rend discount while in the Austrian Capital the participation was even more extensive based on a architectural design competition where participants could suit their needs deciding dimensions of balconies, windows and other features before construction.

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[337] Newman P. W. G. (1999) *"Sustainability and cities: extending the metabolism model"*, Landscape and urban planning, Perth

[338] Gilchrist A. (2000), *"Design for living: the challenge of sustainable communities: the potential for Eco-neighbourhoods"*, Earthscn Publications Ltd, London

Lifestyle choices become crucial when talking about space and contribution to sustainability goals. It has been assessed with a social project in Germany and Denmark that while ecological aspects exercise a certain influence on the life of most urbanities, they rarely provide sufficient motivation o tip personal decisions in their favour unless associated with other consideration[339].

Interesting study regarding different lifestyles and behaviour in the city is given by German urban sociologists Konrad Götz and Thomas Jahn drawning five different categories of mobility styles in the city of Freiburg, Germany[340:]

- Domestic traditionalists (24%), oriented around the home, with inconspicuous mode choice and limited distance travelled;
- Risk-oriented car enthusiasts (20%), admitting to risk and considering the car a symbol of independence; they are mostly males;
- Status-oriented motorists (15%) driving extensively for leisure purposes and regard walking and cycling unsafe and boring public transit;
- Nature-oriented traditionalists (24%), appreciating the experience of nature, walking and cycling even if they are associated with danger so they sometimes use the car; they are mostly women;
- Decided environmentalists (17%), having a high affinity with cycling, public transport and rejecting car for ecological reasons; they are mostly young people.

In order to promote sustainable public transport and active travel, a programmatic framework of mobility management as marketing approaches can foster the process of changing the mobility patterns, releasing the spatial mobility from dominance of motorised vehicle transport.

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[339] Gilchrist Alison (2000), *"Design for living: the challenge of sustainable communities: the potential for Eco-neighbourhoods",* Earthscn Publications Ltd, London

[340] Götz K., Jahn T. (1998), *"Mobility models and traffic behaviour. An empirical Socio-Ecological Research Project"*, in Breuste J. Feldmann H. Uhlmann O. *"Urban Ecology", Springer-Verlag"*, Berlin

3.2.3 Car dependence

No discussions concerning urban development could be debated without considering the topic of car dependence; moreover the concept of urban sprawl is believed to be highly connected with the car use due to its prerogative to be a low-dense zone. The term "car dependence" was coined to describe the outcome of urban transport and land use policies that assume the proliferation and dominant use of the car in urban transport as a given, producing settlement patterns and transport infrastructures which leave very little room for alternative modes[341].

Automobile dependence is regarded as a revolutionary stage in a historical process in which cities have been shaped by technological forces, economics trends and cultural factors.

Regarding the technological factor, in the past cities were generally confined in a walkable radius because of the limitations of the transportation powered by humans and animals, then they have grown thanks to the development of rail-based urban transit systems enabling suburban advancement along arterial roads. Rail corridors shaped the cities, as Copenhagen and its fingers, while the car enabled large-scale urbanization of spaces between these corridors, looking for low-density areas.

Concerning economic trends, cities tend to have the costs maximised with the space-extensive use and the move of industries outward. Moreover the search for better quality of life and the rapid accumulation of wealth led to the development of a new type of city.

The situation emerged in the post-industrial age is the exhaustion of the carrying capacity of the agglomerations' biospheric support systems, with the consequence of the dysfunction of the urban transport systems. The rethink of the transport modes and land use connection is the result.

In order to overcome automobile dependence from a policy perspective, Peter Newman, professor of City policy in Murdoch University in Perth, Australia, claims that should be boosted the development of higher speed freeways and railways in order to increase the more distance-intensive interactions and longer

[341] Newman P. W. G. (1999) *"Sustainability and cities: extending the metabolism model"*, Landscape and urban planning, Perth

trips, boost the transportations based on alternative energy in order to not be dependent to fuel and push public transportation instead of the private one to decrease pollution and noise, accidents and visual segregation[342].

A new reinvigorated role of planning us emphasised based on cleaner vehicles and efficient infrastructures, but also base on the revitalisation of the inner city with the concentration of the development along the existing rail discouraging sprawl.

3.2.4 Towards Habitat III Quito Conference 2016

The interest of urban sustainability is warmly significant because this October is taking place in Quito, Ecuador, Habitat III, the United Nations Conference on Housing and Sustainable Urban development, focusing on the implementation of a "New Urban Agenda", in line with the bi-decennial cycle (Habitat I in Vancouver in 1976, Habitat II in Istanbul in 1996) by the United Nations General Assembly. The main topics of the Conference are to reinvigorate global commitment for sustainable urban development, assess accomplishments to date, address poverty and identify and address new and emerging challenges.

Cities and urban agglomerations represent our future and their growth is also related to the extreme exploitation of resources and environment causing degradation and congestion. For this reason, the improvement of sustainable living is highly the main goal of national and local administration and the understanding of actual urban transformation is an indispensable requirement in order to introduce political actions to manage urban sprawl. Today, more than two thirds of the global population lives in cities with greater levels of inequality than 20 years ago[343].

In 2011, United Nations Department of Economic and Social Affairs (UN-DESA) published an Issue brief for Rio 2012 concerning the topic of Sustainable Cities with the aim to provide a basic reference fact sheet relative to international time-bound commitments in the area of cities to facilitate discussions in preparation of the Rio Conference Sustainable Development in 2012. The targets expressed in

[342] Newman P. W. G. (1999) *"Sustainability and cities: extending the metabolism model"*, Landscape and urban planning, Perth

[343] Habitat III Secretariat (2014) *"The New urban Agenda will be decided in Quito",* Unhabitat

the document will be taken in account also in October 2016 in Quito, confirming efforts of Rio 2012. Some of the targets are[344]:

- To ensure the provision of adequate environmental infrastructure facilities in all settlements by the year 2015, requiring that all developing countries incorporate in their national strategies programmes to build the necessary technical, financial and human resources capacity to ensure better integration of infrastructure and environmental planning;
- To achieve 40% improvements in urban health indicators;
- To promote sufficient financial and technological capacities at the regional, national and local levels, as appropriate;
- To halve the proportion of the population without sustainable access to safe drinking water and basic sanitation by year 2015;
- To achieve a significant improvement in the lives of at least 100 million slum dwellers, as proposed in the "Cities without slums" initiative by 2020;
- To phase out fossil fuel subsidies

Recent in time and advanced is The New Climate Economy Report published in 2015 by the Global Commission on the Economy and Climate aiming to manage the severe impacts of rising greenhouse gas emissions, higher temperatures and turbulence on climatic patterns. It is believed that the world is experiencing a new, different type of urbanisation and by 2030 around 60% of the global population will live in urban areas with cities and urban areas housing nearly all of the world's net population growth over the next two decades.

While structures we build now, including roads and buildings, will last for a century or more, setting the trajectory for greenhouse gas emissions, city administrations are often acutely influential with sharper local powers than national policy-makers; however, climate risk is rarely near the top of their priority list[345].

The aim is Planning for more compact, better-connected cities with strong mass transit systems will help policy-makers tackle these pressing challenges. Such cities are more productive, socially inclusive, resilient, cleaner, quieter and safer.

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[344] UN-DESA (2011) *"Rio 2012 Issues briefs",* in *"Sustainable Development Knowledge Platform",* Sustainable Cities, Issue brief 5

[345] The New Climate Economy report (2015) *"Cities"*, Better Growth better Cities, Chapter 2

They also have lower carbon emissions, showing that the goals of economic growth and climate change can work together.

Cities are also key drivers of global energy demand and greenhouse gas emissions, accounting for around 70% of both[346]. According to the Climate Economy report, the "Emergency Cities" with population from 1 and 10 million people, are likely to account a third of energy-related emission growth over the next two decades.

In much of the world, urban growth is now characterised by poorly managed, unstructured expansion and conventional motorisation. Although this sprawled pattern of urban development has real and perceived benefits the Climate Economy Commission's analysis shows that on balance, the future costs will significantly outweigh the benefits[347].

As noted above, new analysis for this project puts the external costs of sprawl at about 400 billion American dollars per year in the United States alone. Around 45% of those costs are due to the increased cost of providing public services such as water and waste; one-fifth is due to increased capital investment needs for infrastructure such as roads, and the rest is due to the costs of increased congestion, accidents and pollution not borne directly by private individuals. The total costs amount to about 2.6% of US GDP at current prices. If the United States followed an alternative growth pattern without urban sprawl, the savings could cover the country's entire funding gap in infrastructure investment[348].

A shift to more compact urban growth, connected infrastructure, and coordinated governance could boost long-term urban productivity and yield environmental and social benefits. Such an approach has the potential to reduce urban infrastructure capital requirements by more than 3 trillion dollars over the next 15 years. New analysis suggests that the world's 724 largest cities could reduce greenhouse gas emissions by up to 1,5 billion tonnes of carbon dioxide equivalent (CO_2) annually by 2030, primarily through transformative change in transport systems. The growth of transport emissions is a result of specific urban planning and land use policies or their absence. These policies can cause an increase in transport

[346] International Energy Agency IEA (2008) "*World Energy Outlook",* head of Communication and Information office, Paris

[347] The New Climate Economy report (2015) *"Cities"*, Better Growth better Cities, Chapter 2

[348] Litman T. (2004) *"Analysis of public policies that unintentionally encourage and subsidize urban sprawl"*, Victoria Transport Policy Institute, London

emissions even if the population size remains the same and there is no economic growth. This implies that governments need to implement sensible land-use policies. Such policies may not be very visible, but they have a huge impact on transport emissions. Sprawl, measured in the increase of the areas covered by buildings and roads, is a stronger cause of increased road transport emissions than other possible causes, such as the growth of per capita GDP or population growth[349].

3.2.5 Modern instances of ecological neighbourhoods

In the recently years, many experiences in cities have been done with regard to incorporating sustainability elements into the concept plans and everyday operation of residential development. This is evident both in the field of resource-efficient building design, utility infrastructure and behavioural measures towards lower resource use in the household and with regard to strengthening community structures to enable residents to participate and assume responsibility in the planning process and the organization of their neighbourhoods.

In Denmark since the late 1980s a number of well-funded national and municipal programmes have attempted to support the greening of Danish cities, including in the housing sector, while community initiatives in urban ecology also flourished. Copenhagen's urban growth plan follows a corridor model with five "fingers" extending radially from the continuously built-up "palm" which is the inner city, consisting of the Copenhagen and Frederiksberg municipalities. These fingers follow rail and raid links to neighbouring smaller towns and the spaces between them are normally reserved as green wedges.

Instances are the two ecological housing areas in Copenhagen, Skotteparken and Hyldesjældet, that have been managed through different approaches: the first with a top-down policy focussing on building technology, infrastructure and government-initiated social programmes and the second with a bottom-up and community cohesion and low-budget as volunteers, improvements in buildings and open spaces.

[349] Bart I. L. (2010) *"Urban sprawl and climate change: a statistical exploration of cause and effect, with policy for the EU"*, in "*Land Use Policy",* Vol. 27, Issue 2, pages 283-92

Skotteparken, completed in 1992 is owned by the municipality of Ballerup, a suburb at 15 km from the city of Copenhagen, born when the subway was introduced. Neighbourhood's strategies aimed to reduce socially adverse effects like isolation, crime and vandalism from the outset and to introduce arts and aesthetic diversity into the urban space. Due to the integration of all stakeholder groups in the planning process, the integration of residential and non-residential uses, integration of arts and innovative architecture to stimulate diversity and integration of transportation and social interaction functions in all streetscapes, it has been mentioned as "*integrated neighbourhood*"[350].

Hyldesjældet, completed in 1975 is owned by the municipality of Albertlund, as Ballerup also at 15 km from the city of Copenhagen, has been developed with three principles: the will to provide exciting and attractive surroundings for children to grow up, the claim to be significantly more than a dormitory suburb and the take special effort improving the state of the urban environment[351].

The situation in Copenhagen has overcome the barrier of isolation and generated an innovative setting for sustainable housing policy that has its roots in the cohousing movement and the dense-low design tradition of the 1970s. Principles of resource-efficient and community-oriented neighbourhood design, fostered by government-initiated environmental and social programmes as well as popular demand, have since penetrated development practise across the metropolitan area.

Freiburg, Germany, is another example of ecological urban innovation city and has been recognised internationally as one of the world's most liveable, sustainable and child-friendly cities; for this reason has been named the "ecological capital". The city is planned and constructed in such a way that aims to minimise the urban effects on the city's surrounding environment as well as optimising its ecological activity[352]. The city is based on the manifest of creativity that is relevant in urban change not only culturally but also technologically, made richer by the diversity of initiatives from expert and community groups, and on innovation for

[350] Van V., David R. (2009) *"Sustainable community planning and design: a demonstration projects as pathway, the case of Egebjerggård",* University of British Columbia Library, Vancouver

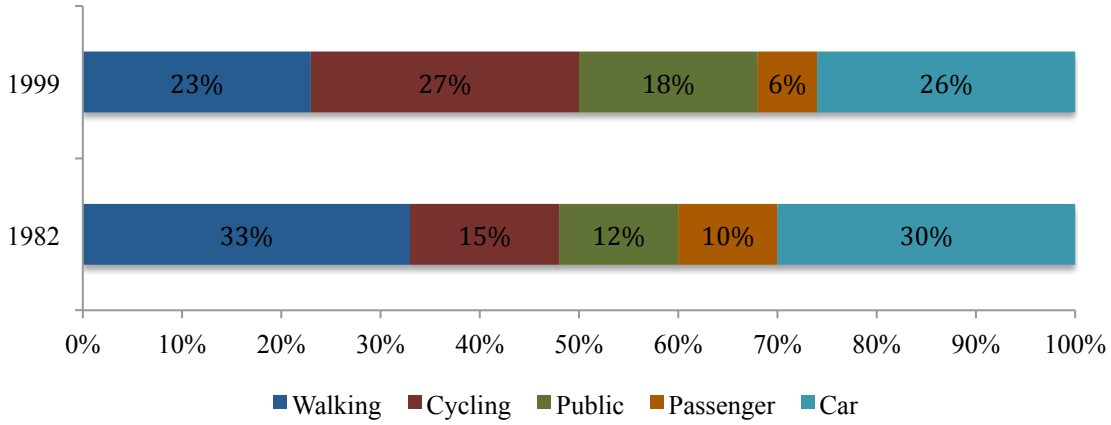
[351] Scheurer J. (2001), "*Urban Ecology, Innovations in Housing Policy and the Future of Cities: Towards Sustainability in Neighbourhood Communities"*, Murdoch University Institute of Sustainable Transport, Perth

[352] Landry C. (2010) *"Excellent Green City: Innovation and Creativity*", Freiburg Economic Development and Tourism Authority, Freiburg

forward-looking vision of urban life in an open discourse. An adequate level of wealth in the region also gives the high quality of life.

Rigorous pedestrian-induced trend and tram priority programme in the city led to the recognition of Freiburg as the worldwide example of car-free urban development with the new district of Vauban[353]. The city's transport strategy rests on the extension of the public transport network, the promotion of cycling, the introduction of traffic restraints, the channelling of motor traffic and the strong parking space management. As a consequence, cycling mode and transport mode almost doubled in 16 years and car use decreased (***Figure 3.3***)[354].

Figure 3.3 – Freiburg Modal Share



[353] Melia S. (2008) *"On the road to sustainability, Transport and Carfree living in Freiburg",* Faculty of the Built Environment, Bristol

[354] Nobis C., (2003), *"The impact of car-free housing districts on mobility behaviour – Case study",* in Beriatos E., Brebbia C. A., Coccoossis C. and Kungolos A., (eds) In: *"International Conference on Sustainable Planning and Developmen", pages* 701- 20.

3.3 International debate

3.3.1 Introduction to international debate

The propensity between urban sprawl or urban densification as the best town plan filled a debate raging for decades and dominated academic and popular urban planning discourse: on one side it is supported the theory of expanding at the edges developing sprawl, providing a greater choice of living locality, offering access to more affordable housing and giving the space for privacy and raising family and on the other side the increase of the density is promoted contesting that low urban density is inefficient, not sustainable and problematic for health and environment. In between of this extremist conviction, other positions appeared in the debate focusing on more sustainable neighbourhood and mixed-use development with residential and commercial areas, concentrating on active transportation as walk and bicycle. Some of the theories have common features but developed with differentiated slogans in different continents.

Europe and America show fundamentally have shown different approaches to the problem of urban development. In fact while European countries focus more on concentric and polycentric compact city structures, United States concentrate more on the decentralised and dispersed settlement patterns; moreover, when the first claim flexible public transit and active transportation with automobile restrictions, the second persist with car dependence.

The attitude towards sustainability through the urban futures approaches appears extremely different in North America, Australia and Europe with a weak concern from United States countries and strong commitment from the other countries of western world of Central and North Europe.

In this section the main schools and positions are presented and divided in five different groups with an example of their practical adaptation in five cities worldwide:

- Urban sprawl apologists and Los Angeles case;
- Smart growth and New Urbanism apologists and the Seaside case;
- Compact city apologists and the Amsterdam case;
- Dispersal apologists and the Zwinschenstadt case;
- Transit-Orientated Development apologists and the Portland case.

3.3.2 Main schools and positions

3.3.2.1 Sprawl Apologists, *the Los Angeles case*

Sprawl apologist position is related to sustainability in balancing land values and housing costs and in the absence of development constrains which translates into high standards of living at great affordability, and providing individuals with the space and control to pursue urban ecology goals within their own space. Main goals are to take advantage of resources into the propagated urban form for equity and economic gains and to empower the individual as a consumer optimizing his lifestyle and eventually to choose technologies of lower environmental impacts[355]. Since there

[355] Newman P. W. G. (1999) *"Sustainability and cities: extending the metabolism model"*, Landscape and urban planning, Perth

is not a strong commitment towards sustainable aims, urban sprawl concept can be considered a weak contributor to ecological goals.

The concept is that ongoing decentralisation will disperse present concentrations of destinations as jobs, retail and services and consequently will shorten journey distances, eventually promoting sustainability in this vision.

Apologists are reinvigorated by the thought that Americans do prefer suburban with low density than high-density central districts and they prefer also car travel than any other urban transportation and these are choices that would be unreasonable to be changed. The fact that cities have been sprawling for a long time makes supporters think that is the most people's preferred lifestyle[356].

It has been assessed that the 80% of the population who live in houses in Australia wants to stay in houses and 85% of the population who live in flats wants to live in houses. More over people claim that they have to buy bigger and bigger house in the city fringe because they are cheaper than the one closer to the city centre and younger people prefer getting an apartment close and near to the kind of urbanity offering employment opportunities[357].

Cars remain the mean of transport to be preferred, while technical improvements can be applied to the automobile in order to reach sustainable goals.

It is believed that there is no evidence that anti-sprawl movements reduce off-site trips, while opportunities for infill development in the central cities as they promote exist but they are limited[358].

Must be mentioned that sprawl apologists have mostly action in North America and Australia, focusing on the introduction of policies empowering individuals and promoting the end of planning interventions.

Los Angeles is probably the first one coming to mind when talking about sprawled city due to its broad dimensions, the tendency to be built horizontally rather than vertically and for the high car possession in the middle of the 20th century.

For this reason the city has been defined as "suburban city" or "the place with no places" by Los Angeles historian Greg Fischer[359]. In the end of 1920s, Los

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[356] Gordon P., Richardson H. W. (1998) *"Prove it. The Cost and Benefits of Sprawl",* in Wassmer R. W. *"Readings in urban Economics: Issues and Public Policy"*, Malden, pages 114-16

[357] Recsei T. (2006*) "Troy versus Newman", Save Our Sydney Suburbs (NSW)"*, in *"Save Our Suburbs – for Sustainable Living"*, Sydney

[358] Gordon P., Richardson H. W. (1998) *"Prove it. The Cost and Benefits of Sprawl",* in Wassmer R. W. *"Readings in urban Economics: Issues and Public Policy"*, Malden, pages 114-16

Angeles had become the United States region most adapted to the automobile, whereby the residents purchased more automobile per capita than did residents of any other city in the country; with two cars every four residents it become the most automobile oriented city in America[360].

As a consequence of limited space and house request after a demographic boom, Los Angeles has recently increased the density. From an assessment lead by the U.S. Census Bureau among the major urban areas in the United Stated in 2010 (***Figure 1.5***), Los Angeles was located at the first place with almost 7.000 people per square mile (2700 people per square kilometres). It is true that the urban core of Los Angeles is much less dense than New York City, but the suburbs, where the most people live, are twice as dense.

3.3.2.2 Smart Growth and New urbanism, *the Seaside case*

Smart growth position relies on the wellbeing of the city through growth expansion, with the aim to reach synergetic and self-reinforcing effects on the welfare of the communities and improve liveability across the board. The motivation is given by the sustainable experience from the traditional suburban development as the poor quality of public space and the variety of isolated housing forms.

Suburban sprawl is seen as an environmental threat, manifest in automobile dependency, excessive energy use and related air pollution, loss of agricultural and bushland and associated water pollution due to the proliferation of impervious surface. More over it is seen as a threat to the integrity and the civic values of society al large, as suburbs are designed for cars more than people and for market segments more than real communities[361].

Smart growth is related to the concept of "New Urbanism", born in the 1980s in the United States by a movement of architects and urbanists, attempting to overcome the lack of spatial and community focus through grouping each

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[359] Rodriguez G. (1997) *"The soul of a new neighbourhood. L.A. neigbourhoods by reviving their old long-forgotten names*", Real Estate '97, Los Angeles

[360] Foster M. S. (1975) *"The model T., the hard sell and Los Angeles. Urban growth, the decentralisation of Los Angeles during the 1920s",* in "*Pacific Historical Review",* pages 459-84

[361] Raimi M. D., Chen D. D., Benfield K F. (1999) "*One there were greenfields: how urban sprawl is undermining America's environment, economy and social fabric",* Surface Transporttation Policy Project NRDC, Washington

neighbourhood in a 400 meters catchment area around a public space acting as a discernible centre, overcome the lack of hierarchical structure in the current urbanisation pattern through establishing a system of neighbourhoods and districts, overcome social segregation through integration oh housing with different incomes and different public services, overcome car use through provision of walking and cycling network and through linking the area into a metro-regional public transit system[362].

Regarding transportation, walkable catchments and good availability of user-friendly public transit are expected to break the dominance of the car and there are efforts to contribute to a better balance between the natural and built environment.

This theory has seen application in mostly all the Australian cities, especially in the States of Western Australia and Victoria, and has been broadly popular in United States. If from one side New Urbanism theory proved highly popular interest, on the other faced a battle against the combined effects of commercial inertia of the development industry and the conservative practice of planning authorities[363].

Seaside in Florida is one of the first cities in America designed on the principle od the New Urbanism becoming appreciated by design professionals from all United States and topic of lectures in architectural schools[364]. It was designed by Andres Duany and Elysabeth Plater-Zyberk in 1981 with post-modernism concept through elements as porches, porticos and fencings and building shapes, colourful cottages and precious details, creating a public space considered remarkable and ruled by a morphologic code. Octagonal squares and boulevard are embracing commercial functions while housing in between is build in a smart urban concept so residents can reach the centre in not more than 5 minutes walking[365]. In this city-resort community, car is not necessary.

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[362] Katz P., Scully V., Bressi T. W. (1994) *"The new urbanism. Toward an architecture of community"*, McGraw-Hill, New York

[363] Kunstler J. H. (1996*) "Home from nowhere: remaking our everyday world for the 21st century*", in *"The Atlantic Monthly",* Vol. 278, N° 3 pages 43-66

[364] Langdon Philip (1988) *"A good place to live",* the Atlantic online,

[365] Spagnoli L. (1997*) "la ricerca della qualità urbana: il New Urbanism americano",* in "*Costruire in laterizio"*, Vol 164

Critics against this city of good urban design and lifestyle has been attacked by critics as Alex Krieger, Professor of urban design at Harvard Graduate School of Design, who deconstructs the record of New Urbanism and Seaside accusing them of creating more sub-divisions than towns, and increasingly relying on private management of communities, low densities, demographically homogenous enclaves, better designed sprawl inextricably linked to marketing strategies that evoke a rose-tinted view of the world and the perpetuation of the suburban myth[366].

3.3.2.3 Compact City, *the Amsterdam case*

The urban situation is Europe is completely different than the American and Australian one for his history as it experienced a rapid suburban expansion at the expense of the functional integrity of their established urbanised areas during the 1950s and 1970s to overcome severe housing shortages following wartime destruction. After 1970s many metropolitan areas experienced decline in population and consequently occurred a reinvigoration of interest in urban centres due to the transition to a post- industrial economy and the emergence of social groups attracted to urban amenities.

Many critics called this development and reconstruction within the city "Smart Growth" assuming it to relieve cities' surrounds from demand for more settlements, promoting social interaction in public spaces that has been crucial for Europe culture evolution and claiming compact urban structures save transportation needs.

A strong critic is moved against decentralisation because it increases social costs for urbanisation and transport, energy consumption, air pollution and noise[367].

The urban district becomes mono-functional, accommodating residential or commercial and rarely a mix of them, while the building formerly designed with versatility in mind to facilitate changes in usage over time is now fitting its original purpose.

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[366] Bressi T. (2002) *"The Seaside debate: a critique of the New Urbanism",* The Seaside Institute, Rizzoli International Publications, Miami

[367] Apel D. (1998) *"Die Zuküftige Stadt: kompakt, mobil, urban",* Deutsches Instituti für urbanistik, Berlin

Practical criteria supported by Compact City theory is based on land use, mobility and functions in they interaction. First is indispensable to have a minimum density of residential units (calculated as 4.000 per square kilometre) to guarantee the viability of user-friendly public transit along with retail and services in the area. Cities must work around a developed node in a hierarchical and monocentric structure, in order to guarantee quick transfers to the other cities and also concentrate share of activities. Last, non-motorised mobility is encouraged along with green, even with high density of houses' concentrations[368].

Inner cities and in particular CBD must be revitalised as an essential first step towards a sustainable city. It is believed that residential sector must be strengthened in the CBDs that have been tended towards retail and office monostructures[369].

The fundamental difference between European Compact City pioneers and American and Australian New Urbanism promoters rotates largely around traffic management. In fact the second even if devoted to a better balance between transport modes in the most conventional suburban development and seek for improved conditions for walking and cycling and mobility around nodes, they advocate the dominance of automobility in travel market, which is evaluated as essential for human activities development. On the other side, Compact City pioneers promote urban sustainability limiting car use through disincentives and public transport incentives. It is stated by European critics that mobility has already fulfilled the emancipation task it had to offer and there is no further step, while it has been reached the pint where the mobility itself must be attacked[370.]

In Holland the model of Compact City was spread out in all the Country and supported by an ambitious regime after the great success in Amsterdam, which became the prototype of this concept. The national aim was to protect valuable open spaces in the existing cities' surrounds and locate new development to minimise transport needs. In Amsterdam, commercial institutions have been classified into 3 groups: high turnover of people and low need of vehicle access (A category), low

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[368] Scheurer J. (2001), "*Urban Ecology, Innovations in Housing Policy and the Future of Cities: Towards Sustainability in Neighbourhood Communities"*, Murdoch University Institute of Sustainable Transport, Perth

[369] Newman P. W. G. (1999) *"Sustainability and cities: extending the metabolism model"*, Landscape and urban planning, Perth

[370] Hoffmann-Axthelm D. (1996) *"Anleitung zum Stadtumbau",* Campus Verlag, Frankfurt am Main

turnover of people and high need of vehicle access (B category) and the same amount of turnover and access (C category). They consequently have been distributed with category A in the centre and along radial routes, category B along orbital areas and category C in some clustered industrial areas.

Another key factor in the Compact City theory is the multi-nodal transport system of nodes becoming the anchor points of social and economic activities, shaping the city into a polycentric and dynamic organism[371].

Even before 1960s when Amsterdam left concentric shape, the cities of Copenhagen and Hamburg in 1920s and 1940s respectively embraced suburbanization along radial corridors, becoming nowadays accessible by rapid urban rail and freeways and high-capacity roads.

3.3.2.4 Dispersal Apologists, *the Zwinschenstadt case*

A fourth group appeared among the urban planning theories, dissociating from the Compact City paradigm accused to be out of realities and from the Sprawl Apologists for being problematic. In fact, an emerging school of urban theorists in Europe have become to a more understanding of the dispersed development, rejecting the reality of urban compactness.

German urban planner Thomas Sieverts examines the new form of urbanity describable as urbanized landscape, or in German, "Zwischenstadt", "in-between-city". His theory is based on the settlement pattern that is neither traditionally urban nor traditionally rural, geographically located between them. He points out new qualities in regional development, making the spatial category of suburbia no longer negatively evaluated but it becomes the object of policies and strategies for improvement and further development, rather than that of disregard and negation[372].

Moreover, he criticises contemporary planners in Europe who admire qualities of old town and obscure their view on qualities belonging to the periphery. In this new concept, hierarchy of the centre and nodes is now lost: the former conception of the CBD as the role of centrality and the decreasing significance

[371] Bartolini L. and Dijst M. (2003) *"Mobility environments and network cities",* in *"Journal of Urban Design", Routlege* Vol. 8, N°1, Pages. 27-43

[372] Burdack J. and Hesse M. (2007) *"Suburbanisation, suburbia and Zwischenstadt: perspectives of research and policy"*, Territorial Cohesion, pages 81-100

towards the periphery is now turned into functions located everywhere in the metropolitan-wide catchment areas.

According to supporters of the Zwischenstadt, since the city and the open landscapes are not anymore two diametrically and opposed environments with different requirements as in the previous school of thoughts, there are further challenges to achieve amore harmonious integration between urbanised and not urbanised land[373]. In this new concept ecological need of the city is guaranteed by cultivation of open areas and the integration of natural cycles for energy generation, food production and water and waste management is guaranteed by the transformation of the built environment.

3.3.2.5 Transit-Oriented Development, *The Portland case*

First introduced from Calthorpe in 1993, this school of thought faces the issue of congestion and mobility in urban settlement focusing the attention on the maximisation of the public transport access, as a railway station or subway station; These transit stop and stations are convenient, comfortable and secure, with features such as comfortable waiting areas.

This theory is inspired by ecological aims to defend and add value to environment through managing the urban development in order to not effect natural resources, agriculture and habitat. The main difference with the postwar suburbs is that TODs are based on a public transport station with mixed-use functions as residential, commercial, offices, meeting spaces, free time spaces for people with social class.

High-density development with behind progressively low-density development are spreading out from the stations at a distance of 500-800 meters, considered to be the appropriate distance for pedestrian to be encouraged to move with public services. Streets have good connectivity and traffic calming features to control vehicle traffic speeds.

Neighbourhoods are designed for cycling and walking and present commercial functions as shops, school and also different housing for price and types.

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[373] Hesse M. and Trostorff B. (2000) *"Raumstrukturen, Siedlungsentwicklung und Verkehr-Interaktionen und Integrationsmöglichkeiten. Diskussionspapier",* Institut für Regionalentwicklung und Strukturplanung (IRS), Erkner

Large scale "Park and ride" facilities tend to conflict with Transit Oriented Development, since a rail station surrounded by large parking lots and arterials with heavy traffic is unlikely to provide a good environment for residential development or pedestrian access.

TOD generally requires at least 1.500 residential units per square kilometres in residential area and 6.250 employees per square kilometres in commercial areas in case of the subway station and double parameters in case of railway station[374]. It has been assessed that it tends to increase property values 5-15%, reflecting the direct benefits to residents and businesses of having diverse transportation options, and resulting automobile and parking cost savings[375].

Portland in Oregon is considered one of the first cities where TOD is developed, along with San Francisco and Vancouver, aiming to reduce automobile dependency and increase the use of public transit. It has implemented several successful transit projects related to TOD including the MAX regional rail system, Portland Streetcar, transit-oriented development projects like the one in the area of Orenco, and programs like TOD property tax exemptions. Portland's transit agency, Tri-Met, has produced a Community Building Sourcebook which describes many of the projects, plans, programs and organizations that make the city region a national model for linking land use and transportation initiatives. This document discusses specific TOD projects, with information on their goals, design, real estate market, financing, neighbourhood issues, and lessons learned[376].

3.3.3 Comparing main schools

The debate around urban development is mostly based on the dichotomy between urban sprawl and compact city, supported by theorists retaining which one is the best to be applied in a specific city with its history background.

Sprawl apologists claim low-density development, mostly in urban periphery, with single-use homogeneous land use in a large scale elaboration based

[374] Portland Bureau of Transportation (2009*) "Portland Streetcar System Concept Plan: A Framework for Future Corridor Planning and Alternatives Analysis*", Department of Transport, Portland
[375] Weinberger Rachel (2001), *"Light Rail Proximity: Benefit or Detriment in the Case of Santa Clara County, California"*, in "*Transportation Research Record",* pages 104-113
[376] Victoria Transport Policy Institute (2016) *"Transit.Oriented Development. Using poublic transit to create more accessible and livable neighbourhoods",* TDM Encyclopedia, Canada

on larger buildings, blocks and wide roads; Smart Growth apologists on the other side claim compact development in the city border and inner areas with mixed land use, in a human scale based on smaller buildings, blocks and roads. Sprawl consists in car dependence and automobile-oriented transportation and area connected by hierarchical road network with numerous loops and dead-end streets, unconnected sidewalks and paths, barriers while streets are designed to maximize motor vehicle traffic volume and speed; Smart Growth is based on multi-modal transportation and land use patters supporting walking, cycling and public transit with roads, sidewalks and paths highly connected while streets are designed to accommodate a variety of activities. Also the public space is a field where the two apologist group have different considerations: Sprawl focuses on private realm with shopping malls, gated communities and private clubs while the Smart apologists on public realm with streetscapes, pedestrian environment, public parks and public facilities.

Opponents of urban sprawls claim that environmental sustainability is a very common reason for people to oppose to this suburban development, as private motor dependence increases fossil fuel emissions, detached houses demand higher energy usage and generated congestion affects environment and city liveability. Moreover it is assessed that living in the city fringe has health bad consequences as causes higher risk of obesity, diabetes and heart disease due to the limited time to eat and it is too far away from hospitals and emergency ambulances take longer to arrive[377].

The challenge of preserving land and natural fauna and flora habitats during urban development is topic of research of many authors demonstrating that changes in land use attributable to urban expansion can significantly affect biodiversity, energy flows, biochemical cycles, climate conditions, hydrology, sol properties at local, regional and even larger scale[378].

The recent focus on neighbourhood design and its role in supporting health and well-being has also made its way into the debate about density. For example, low-density arrangements usually provide better access to nature through the greater availability of public and private green space. Green space is important for exercise

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377 Smith Michael (2012) *"The urban sprawl debate*" ,The red and the black architect, Melbourne

378 Baker L. A. (2002), *"Urbanization and warming of Phoenix, Arizona, Usa: impacts, feedbacks and mitigation",* in "*Urban Ecosystem",* Springer, Vol 6, pages 183-203

and social interaction, while contact with nature more broadly can improve mental well-being and provide psychological restoration[379].

In the attempt of clarify the different positions concerning urban development preferences that are divided among Compact City and Urban Sprawl and all the levels in between, what comes to mind is the statement by Ulrich Beck and Anthony Giddens saying that in the 20th century there is an emerging "Second Modern Era", reclaiming the progress of First Modern Era exacerbating its trends and conflicts. While the First was characterized by the strong role of the nation state, collective life styles, comprehensive welfare states, clear boundaries between sectors and professions and fairly good predictability, the Second shows the loss of control of power by the nation state in favour of global and local and regional development, increasingly obscure boundaries, difficulties in predicting development and general ambivalence[380].

Consequence of this trend is the influences on the city from external realities stemming from globalisation-related trends outside of local control, which is merging with the endogenous pursuit of better liveability and durability of the physical, socio-economic and environmental structures and conditions within.

[379] Ives Chris and Maller Cecily (2013) *"Growing out versus filling in: how about we all grow up?",* RMIT University, Melbourne
[380] Beck U. (2000) *"The brave New World",* Polity Press, Cambridge

PART 4

Sydney urban planning

4.1 History of the Sydney urban planning

In this section the attempt is describing the historical background of the planning transformation and analysis thematic changes in major planning efforts of Sydney, starting from colonisation to the most recent years. First urban planning in Australia, with the original colonial towns established on green field sites where there was no developed hinterland has been introduced since the British colonial settlement in the end of the 1700s. Those centres were of political, military, administrative and commercial power and the locus of the energising force for development and soon become, thanks to the population growth, cities dominating the whole colony.

Sydney has been considered by Australian historical critic Paul Ashton "an accidental city" [381] due to the planning history characterised by opportunistic development and disjointed or abortive attempts at holistic planning rather than the growth guided and controlled by a sophisticated system of urban planning and design. The economic trend of laissez-faire characterized the historical background of the

[381] Ashton P. (1993), *"The accidental city: planning Sydney 1788",* Hale and Iremonger, Sydney

city until three quarters of the 20th century, constantly in conflicts with planning powers between the New South Wales State Government, its agencies and the Sydney City Council. For this reason Sydney has been named as the "no planned city"[382].

This lack of control led to recognise the importance of urban planning intervention and brought to planning action between different tiers of governments after 1980. The first comprehensive planning effort came in 1971 when the Sydney City Council released its first strategic plan, which was reviewed every 3 years until 1983 as a plan series, but not fully accepted by the NSW State Government.

The 1971–1983 strategic plan series was replaced by the Central Sydney Strategy 1988, which, together with a series of post-1988 planning initiatives, marked a watershed in Sydney's planning history, made possible by the cooperation of Council and NSW State.

4.1.1 Early urban planning: *from colonisation to World Wars*

The natural environment of Sydney has excited admiration since it was first discovered by Europeans in1788. Captain Arthur Phillip believed Sydney was one of the finest harbours in the world, in which a thousand sail of the line might ride in perfect security. He chose Sydney Cove for the first settlement because ships can anchor so close to the shore that at a very small expense quays may be constructed at which the largest vessels may un load[383].

By the 1807 the outline of the major north-south streets and of the intersecting east-west arterials further south was emerging. Suburbia began in 1800, when Commissary John Palmer went over the hill and out of town to live in his private world of Woolloomooloo House, looking north over a secluded beach, as it is shown on the map of French explorer Charles Alexandre Lesueur in 1802 (***Figure 4.1***).

The first strategic plan helping to shape the city of Sydney since the origin of European settlements in 1788 was the Governor Lachlan Macquarie's plan between

[382] Freestone R. (2000), *"Planning Sydney: Historical Trajectories and Contemporary Debates",* in Connel J.*"Sydney: The Emergence of a Global City",* Oxford University Press, Melbourne, pages 119–143

[383] O'Connor M. and Birtles T. (2008) *"Australia in Map. Great maps in Australia's history from the National Library's Collection",* National Library of Australia, Canberra

1810 and 1821[384]. With the assistance of Francis Greenway, a talented deportee architect, Governor Macquarie, believing that hat town planning and fine architecture contribute to public morality, of which Sydney was greatly in need at the time, constructed the city centre structure and defined major locations of urban settlement including churches, hospitals, schools, courthouses, roads and bridges, and public parks and gardens. In this occasion, the Circular Quay was founded as the area for public buildings[385]. Moreover he established new satellite towns and encouraged exploration and the opening of the interior to pastoralists with a consequent upsurge in the trade through Sydney[386].

By 1821 when he departed, Governor Macquarie had transformed Sydney from a precarious outpost and penal settlement into a prosperous township and a provincial seat of government[387].

Successively Sydney was incorporated as a city and a few planning efforts were embarked on, providing maps documentation of existing development rather than generate a new urban form. In April 1843 the City Council appointed a Committee to enquire into the paving, draining and cleansing the streets, and Francis Webb Sheilds created the first very detailed map of Sydney after a year of surveys for the NSW Colonial Government (***Figure 4.2***). The map shows streets and names of public places with approximate locations, footprints and name of prominent buildings. A colour legend distinguishes public and private buildings, and the construction materials used while early forms of Sydney's current urban grids are already identifiable.

In 1855 another detailed mapping has been created, through drawings on paper recording survey details of Sydney in the 1850s (***Figure 4.3***)[388]. These drawings show the outline of all existing buildings, a colour coding scheme identifying the buildings as brick, iron, stone or wood. In addition wharves, high

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[384] Briger A. (1988) *"The politics of planning: the 1971 City of Sydney Strategic Plan"* in the Webber Peter *"Design of Sydney: three decades of change in the city centre",* The Law Book Company, pages 30-53

[385] Marsden S. (2000) *"Urban heritage: the rise and postwar development of Australia's Capital City Centre",* Australian Council of National Trusts and Australian Heritage Commission, Canberra

[386] McDermott A. L. (1971) *"City of Sydney, strategic plan"*, Urban Systems Corporation Pty Limited in association with McConnel Smith and Johnson and W D Scott and Company Pty Limited

[387] Briger A. (1988) *"The politics of planning: the 1971 City of Sydney Strategic Plan"* in the Webber Peter *"Design of Sydney: three decades of change in the city centre",* The Law Book Company, pages 30-53

[388] Historical Atlas of Sydney (2009) *"City of Sydney Archives"*

water marks, gas works, gratings, fences, gas lamps, fireplugs, water locks and water closets are identified.

In 1855, only 30 years after the world 's first steam railway, the Sydney-Parramatta line opened to traffic and the suburban and country railway terminus was established between what is today the front of Central Railway Station, and Cleveland Street, today's southern boundary of the Municipality of the City of Sydney . This railway complex effectively settled the location of the southern end of the central spine business district[389].

In 1865, 10 years later, a trig survey of the city has been produced, extending the boundaries from Pyrmont and Chippendale in the west to the eastern side of Darlingurst and from the harbour in the north to the southern boundary of Redfern (***Figure 4.4***)[390].

It shows property boundaries and building footprints, and the location of pipes for sewerage and water reticulation while blue lines are the water pipes. Water provision has been an issue these years, as in 1849 was rationed in the and public criticism of the City Council's inability to provide adequate water supplies resulted in a number of investigations carried out by both the Council and the Legislative Council.

In 1887 two sets of plans were produced by surveyors Rygate & West as commercial products for use by the fire insurance industry with the purpose to record the locations and plan views of properties, the building materials used and the availability of fire precautions (***Figure 4.5***)[391]. Doves Plans cover the City from Port Jackson to what is now Central Station, and from Darling Harbour to the western side of Macquarie St and Castlereagh St. Rygate & Wests Plans cover the Haymarket, Surry Hills, East Sydney, Darlinghurst and Woolloomooloo.

The period 1850-1890 saw a growth in metropolitan Sydney population from less than 60,000 to over 400,000. During this period, most of the tightly packed terrace dwellings of Woolloomooloo, Paddington, Surry Hills, Glebe, Balmain and North Sydney were built. The tramway system spread out on radial routes to serve the

[389] McDermott A. L. (1971) *"City of Sydney, strategic plan"*, Urban Systems Corporation Pty Limited in association with McConnel Smith and Johnson and W D Scott and Company Pty Limited
[390] Historical Atlas of Sydney (2009) *"City of Sydney Archives"*
[391] Ibid.

burgeoning suburbs. The bulk of commercial and industrial activity remained in the central City[392].

With the outbreak of bubonic plague in Sydney in 1900, measures were introduced by the NSW government to upgrade attention to public health issues, especially in the areas along the eastern side of Darling Harbor and Walsh Bay, The Rocks and Millers Point. With the process of resuming land and properties from these areas, a map has been created in 1903 (***Figure 4.6***) including details as property boundaries, names of owners, lessees, mortgage holders and other information relevant to the ownership.

Sydney that was very much a "working harbor", with maritime trade and associated warehouses and other commercial and industrial activity, and nearby residential areas for those whose occupations and low incomes required them to live close to employment.

The second plan is the Report of the Royal Commission for the Improvement of the City of Sydney and its Suburbs in 1909 to address the health problem in the inner working class suburbs and consequent social problems. The report suggested major urban projects and infrastructures that have been undertaken over the next half-century, including the electric rail system and the Harbor bridge. Moreover the trend was influenced by the City Beautiful Movement vision of the time[393].

Sydney grew as an overwhelmingly single-centred metropolis until very recently. The City was not only the most central or accessible place in the whole of the South West Pacific, but also was the only place directly accessible by all modes of transport from the hinterland of the State and from all the metropolitan suburbs[394].

The Commission came at a time of Sydney's rising national, imperial and global status with economic progress after the slump of the 1890s due to the port that brought prosperity and import and exports and with technological advances as electricity, telecommunications and reinforced concrete having impact in the build environment. On the other side, there was not still road or rail connection between the north and the south sides of the harbor and the street condition was criticized for

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[392] McDermott A. L. (1971) *"City of Sydney, strategic plan"*, Urban Systems Corporation Pty Limited in association with McConnel Smith and Johnson and W D Scott and Company Pty Limited

[393] Meyer Bob (2005) *"Lessons from Sydney's Previous Metro Strategies",* Cox Group, Sydney

[394] McDermott A. L. (1971) *"City of Sydney, strategic plan"*, Urban Systems Corporation Pty Limited in association with McConnel Smith and Johnson and W D Scott and Company Pty Limited

being narrow and dirty[395].

The Royal Commission afforded the opportunity to stock-take these ideas, compare and contrast competing infrastructure proposals, integrate them with projects already in train, and look ahead to future needs. A bridge or tunnel to the North Shore, reconstruction of the Circular Quay, a city underground railway, redevelopment of the Rocks, major civic spaces for central Sydney and securing of more suburban open spaces, development of major public buildings, slum clearance, numerous suggestions for new and widened roads, and greater powers over building design were some of the established hot spots and topical issues which coursed their way through the deliberations of the Commission.

Commission secretary Daniel Quin, engineering draftsmen Richard Wilson and Gordon Duff, architectural draftsman Charles Coulter, State parliamentarians, professional people, state government bureaucrats, businessmen collaborated in 1908 in order to produce in 1909 after six months the final report of 50 foolscap-sized pages, 300.000 words of evidence, 60 plans, maps and sketches with statistical appendices (***Figure 4.7*** and ***Figure 4.8***)[396].

The major transport recommendations were for the immediate introduction of underground electric railways for the city and electrification of the suburban network while the major 'aesthetic' recommendation was a new Building Act to regulate the height, style, and character of buildings to secure "unity of purpose and harmony of design in our architecture".

4.1.2 20th century city plans: *from World Wars to 1970s*

Overall, the postwar development boom was developer-driven rather than planning-led for its persistent lack of planning resources[397]. Some efforts were made, for example, to prevent the infiltration of industry into residential areas, but they were too rudimentary to guide such a huge scale of urban development[398].

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395 Historical Atlas of Sydney (2009) *"City of Sydney Archives"*

396 Freestone R. (2010) *"Urban nation, Australia's planning heritage"*, Csiro publishing, The Australian heritage Council

397 Freestone R. (2010) *"Urban nation, Australia's planning heritage"*, Csiro publishing, The Australian heritage Council

398 Punter J. (2005), *"Urban Design in Central Sydney 1945–2002: Laissez faire and Discretionary Traditions in the Accidental City*", Progress in Planning, Sydney

Between the two world wars, the radial suburban rail system was electrified. Construction of the city underground railway was begun, and the sect ion from Central to St. James Station was opened in 1926. The section from Central to Wynyard was opened early in 1932, and in 1933, after the completion of Sydney Harbour Bridge; the North Shore was linked directly by rail to the City[399].

In 1921 the Commonwealth Government purchased an area in Mascot in the south of the city for the purpose of creating a public airfield, and in 1924 the first regular flights began with Qantas, founded in 1921; the airport became the centre of radial system of domestic air services and the nation's major international airport.

At the end of the Second World War the NSW state government embarked on a program to rationalize municipal administration, and introduce town planning principles for orderly post-war development, especially within the County of Cumberland enclosing the whole Sydney conurbation and surrounding rural districts and township[400].

The County of Cumberland Planning System report in 1947 become official in 1951 (***Figure 4.9***) claimed that the center lacks the importance and dignity that should accompany it while retailing in the City has tended to focus between the City underground railway stations which cluster around the mid-town precinct and became more attractive to suburban shoppers than stores uptown and downtown[401].

The government during the legislation on 1945-1951 required all municipalities to prepare town plans for the future developments for a thirty-year period until 1975 and managed the coordination of regional planning with the leading of the County Plan. Intention in coordinated planning and avoiding sprawl began these years (***Figure 4.10***).

Sydney's urban forms changed the most in the postwar decades and in 1949 under the Local Government, a scaled back attempt at large scale local government reform by the McKell government, the City absorbed a ring of surrounding municipalities: Paddington, Redfern, Alexandria, Waterloo, Erskineville, Newtown, Glebe, and Darlington. The effect was to give the City responsibility for a ring of

[399] McDermott A. L. (1971) *"City of Sydney, strategic plan"*, Urban Systems Corporation Pty Limited in association with McConnel Smith and Johnson and W D Scott and Company Pty Limited
[400] Historical Atlas of Sydney (2009) *"City of Sydney Archives"*
[401] McDermott A. L. (1971) *"City of Sydney, strategic plan"*, Urban Systems Corporation Pty Limited in association with McConnel Smith and Johnson and W D Scott and Company Pty Limited

adjacent suburbs containing mostly dilapidated residential and industrial areas (***Figure 4.11***)[402].

At this stage in 1950, 510.540 motor vehicles were registred in NSW that was living a revolution in transportation field. In fact the number passed from 44.856 in 1921 and will become 1.974.376 in 1970 witnessing an increase of 4.000% in 50 years[403]. Suburban sprawl, and the infilling of previously undeveloped wedges of land between the corridors, was intensified. The process of metropolitan decentralization began in earnest between the census years of 1947 and 1954[404]. As a consequence of the difficulty to pay the costs of land and floorspace within the city, the functions of industry, retailing and entertainment have been redistributing themselves throughout the Sydney metropolitan area.

Between 1950 and 1970 Sydney witnessed the transformation from a mono-centric metropolis to a polycentric functioned system of centers as a consequence of fundamental change in the economic structure and daily patterns of activities and a strong shift in the balance of functions within the mother city. Sydney concentrated the most highly specialized activities and increased the headquarters of national and international commerce throughout Australasia and South West Pacific but was not longer the significant center for all the activities of the local regional population.

The region was developing more and more significant sub-centers, shaping systems of local business districts as Parramatta, Newcastle and Wollongong[405].

In 1968 the State Planning Authority of NSW published the Sydney Region Outline Plan with the aim to ensure that Sydney remains the foremost center and port of Australia while the Sydney-Wollongong-Newcastle system should be regarded as closely related urban complex with a wider and more balanced distribution of commercial activity.

The suburban sprawl, the advent of television and of suburban social clubs has resulted in a curtailment of mass entertainment facilities in the City. Older department stores, hotels and theatres are rapidly disappearing. They are mostly being rep laced, not by new ones, but by office space because of the economic effects of

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[402] Ashton P. (1993), *"The accidental city: planning Sydney 1788",* Hale and Iremonger, Sydney

[403] McDermott A. L. (1971) *"City of Sydney, strategic plan"*, Urban Systems Corporation Pty Limited in association with McConnel Smith and Johnson and W D Scott and Company Pty Limited

[404] Ibid.

[405] McDermott A. L. (1971) *"City of Sydney, strategic plan"*, Urban Systems Corporation Pty Limited in association with McConnel Smith and Johnson and W D Scott and Company Pty Limited

existing statutory development control plans and codes. For the same reason, many buildings of historical or architectural significance are disappearing. Sporting and exhibition facilities within the City have contracted and degenerated over the past thirty years[406]. On the other side, cultural facilities have been expanded as art galleries, Australian Museum and the construction of the Sydney Opera House.

By 1969 significant areas of the City have been unsystematically redeveloped by uncontrolled acts of private developers and separate government authorities, bringing the city in an emergency trend in matter of urban planning efficient coordination.

In 1971 the situation in Sydney was witnessing a boom in office development and tertiary activity with massive growth of the north end of the central spine business district between King Street and Circular Quay, a decline in wholesaling, storage and manufacturing activities in the fringe areas and certain types of retailing in the core area itself (***Figure 4.12***).

As a consequence, the City of Sydney Strategic Plan of 1971 was published under the direction of George Clarke whose view was that statutory planning schemes were nothing more than an assemblage of broad and simple land use regulations which legally attempted to prevent the worst sort of development being undertaken (***Figure 4.13***). In the past many fragmentary attempts have been made to re-plan and redevelop small pieces or isolated elements of the City but there has been no agreed strategy to guide or coordinate, let the alone government, the individual decisions, the separate attempts to re-plan and rebuild[407].

It was the principal planning document meant to guide Sydney's urban morphology for almost the following 20 years and meant to be updated every 3 years to incorporate dynamic urban changes and for this reason other updated plans have been published in 1974, 1977, 1980 and 1983. The plan was based on four long-term objectives that are the management of the economic growth with the conservation and redevelopment of the City as a whole, the accessibility to improve the entry and exit in the city, the diversity of the community to be improved and increased and the

[406] McDermott A. L. (1971) *"City of Sydney, strategic plan"*, Urban Systems Corporation Pty Limited in association with McConnel Smith and Johnson and W D Scott and Company Pty Limited
[407] Ibid.

conservation of the physical environment of the City[408] with a flexible structure to meet changing conditions due to unexpected events or technological advances[409].

The sort of the City mentioned in the plan is to remain the dominant metropolitan center with a strong contribution to total metropolitan growth and efforts must be applied in order to arrest residential population decline by conservation of much existing housing and y incentives for new residential development and also in order to increase the workface from 240.000 to 400.000 in 30 years[410].

Accessibility within and to the city is the second objective mentioned in the strategic plan and has been described through four policies[411]:

- Policy transport, seeking the modernization and expansion of public transport and creation an integrated system of greater capacity, convenience and comfort; seeking the action in traffic management of existing streets to achieve short term improvements in the routing, seeking the investment in new technologies;
- Roads, seeking the faster construction of road bypassing the city and harbor, the management of traffic inside the city, the provision of priority in the most congested streets inside commercial areas and movement of pedestrians and public transport;
- Parking, seeking to expand the system of parking stations around and management of a parking control for every neighborhoods, the investigation of potential means of financing parking system with access from arterial roads and footways;
- Pedestrian, seeking to the creation of an integrated citywide pedestrian movement system.

The 1970s plan series proposed a Central Spine concept from Circular Quay to the Central Railway Station to restrict and contain the sprawl of office development within the core of the city and introduced a revised floor space ratio and

[408] Hu R. (2012) "*Shaping a global Sydney: the City of Sydney's planning transformation in the 1980s and 1990s"*, in *"Planning Perspective",* 27:3, pages 347-68
[409] McDermott A. L. (1971) *"City of Sydney, strategic plan"*, Urban Systems Corporation Pty Limited in association with McConnel Smith and Johnson and W D Scott and Company Pty Limited
[410] Ibid.
[411] Ibid.

development control code to control development and protect existing residential, retail, entertainment, services, industrial, wholesaling, and port uses[412].

4.1.3 Contemporary metropolitan plans: *towards the 3rd century*

In 1988 a new plan, "Sydney into its third century" strategic plan, was established by the NSW Department of Planning and the Sydney City Council, as a result of the first joint planning effort of the state and the city to bring Sydney into a financial and commercial center of the Pacific area. The plan has three major objectives to make Sydney become a "central place", a "special place", and a "place for people"[413].

- "Sydney as the central place" is based on an economic theme, providing policies to enhance the future development of the categories of finance, commerce, growing business of tourism, recreation and retail that declined postwar due to the rise of suburbs. The city gained a role as a financial center of the nation and the plan aimed to improve tourism facilities to accommodate increasing overseas and domestic visitors.
- "Sydney as a special place" aimed to introduce policies for physical planning including initiatives for Sydney Harbour settings, parklands and gateways, the urban design for building shapes, public space, public transport and pedestrian friendliness, highlighting the importance of urban image, identified as an urban asset[414]. The plan clarified and redefined the areas of CBD, City Center and Central Sydney: the first embraced business functions while the second included parklands and traditional areas of Ultimo and Pyrmont and the third included business, industrial and residential areas.

[412] Hu R. (2012) "*Shaping a global Sydney: the City of Sydney's planning transformation in the 1980s and 1990s"*, in *"Planning Perspective",* 27:3, pages 347-68
[413] Sydney City Council and NSW Department of Planning (1988) *"Central Sydney Strategy"*, Sydney
[414] Punter J. (2005) "*Urban design in central Sydney 1945-2002: Laissez-faire and discretionary traditions in the accidental city"*, in "Progress in planning", n°1, pages 11-60

- "Sydney as a place for people" concerned about issues of community services and life style creation, including culture and entertainment, living in the central Sydney and community facilities and services[415].

The plan due to the shortage of land and the costs of providing infrastructures on the urban fringe focused on a strategy of concentrated growth, identifying three regional centers as Sydney CBD, North Sydney and Parramatta, continuing to promote Parramatta as the major center for the relocation of government offices[416].

In 1995 the State Government produced a new metropolitan strategy called "Cities of the 21st century" as a new approach to strategic planning that was more broadly based and more flexible due to the trend of more rapid change and diverse global influences[417]. Urban consolidation has become a key strategy by the NSW government partly to avoid paying for new outer area infrastructure whilst there was a perception that existing infrastructure in established areas was being under-utilized[418].

The new metropolitan strategy release in 1998 was called "shaping Our Cities: The planning Strategy for the Greater Coast", based on the wider metropolitan region including Newcastle and Wollongong[419].

The 2000 Olympic Games in Sydney meant far more than a world sports event for the city as it was stimulated in urban renewal through government urban programs, mostly on public space and works in amenities and recreation[420], including most major public realms of the city, such as Chifley Square, Martin Place, Town Hall Square, and Railway Square. Some of these projects received state financial and design contributions and replanted or animated with a holistic principle of conservatism, simplicity, and physical and visual accessibility[421].

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[415] Sydney City Council and NSW Department of Planning (1988) *"Central Sydney Strategy"*, Sydney

[416] Xu J. and Yeh A. G.O. (2011) *"Governance and planning of Mega-City Regions. An international comparative perspective",* Routledge Taylor & Francis group, New York and London

[417] NSW Department of Planning (1995) *"Cities for the 21st century"*, Sydney

[418] Meyer Bob (2008) *"Future Sydney – a city of cities",* Sydney

[419] Department of urban Affairs and Planning (1998) *"Shaping Our Cities: the planning strategy for the Greater Metropolitan region of Sydney, newcastle, Wollongong and Central Coast",* Sydney

[420] Sartor Frank (2008) *"Frank Sartor MP: State Member for Rockdale",* NSW Electorate Office, Sydney

[421] Punter J. (2005), *"Urban Design in Central Sydney 1945–2002: Laissez faire and Discretionary Traditions in the Accidental City*", Progress in Planning, Sydney

4.2 Actual pattern of urban development in Sydney

4.2.1 Current urban settlement and jobs accessibility in Sydney

Throughout much of the 20th century Sydney's urban form mostly consisted of low-density detached dwellings[422] that along with persistent growing population and increasing ownership of cars resulted in urban sprawl. Since the first colonisation in the harbour the city has sprawled radially to south, west and north and it is predicted it will sprawl in the future especially to the west (***Figure 4.14***)[423].

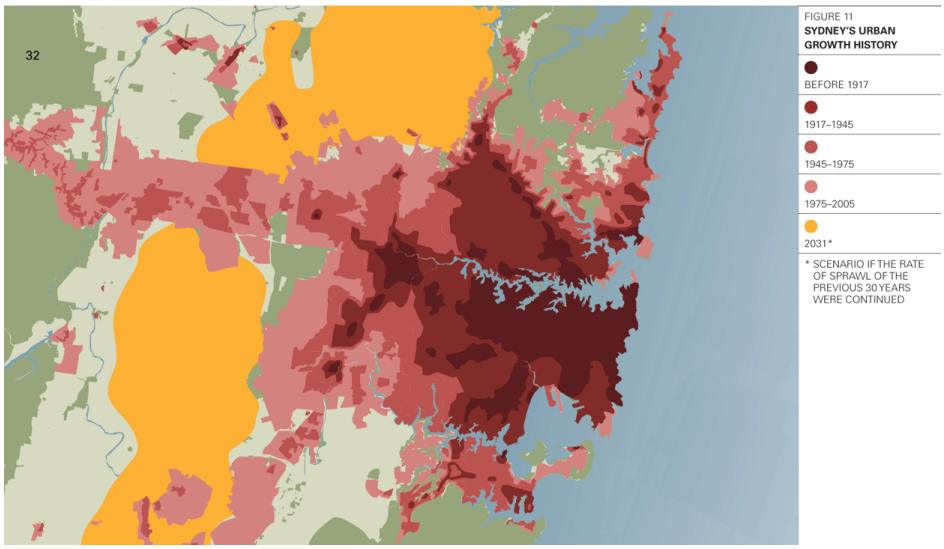
It has been assessed that in matter of regional and urban population the trend of the last century has been leaving rural territories and small villages in order to reach the major cities, including Sydney that shown the most remarkable change: in

[422] Bunker R., Gleeson B., Holloway D., Randolph B. (2005) *"Building the Connection between housing needs and Metropolitan Planning in Sydney, Australia"*, in "*Housing Studies",* Vol. 25, N°5 Pages 771-794

[423] Department of Planning (2005) *Urban Growth of Sydney 1917-2001",* Sydney

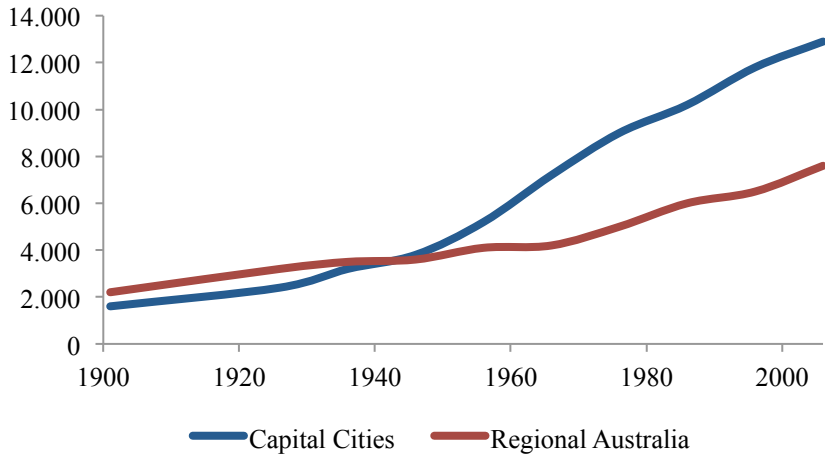
fact the percentage of population in Major Cities compared to the national one increased from 40,4% in 1911 to 60,6% in 2006 (+50%).[424]

Figure 4.14 – Urban Growth of Sydney 1917-2001



In the early years of 20th century population share of Major Capital Cities is around 64%, Regional towns and rural one is 16% (***Figure 4.15***)[425] with the surpass of the first on the second happened around 1950.

Figure 4.15 – Population distribution between towns and rural in Australia (in thousands)



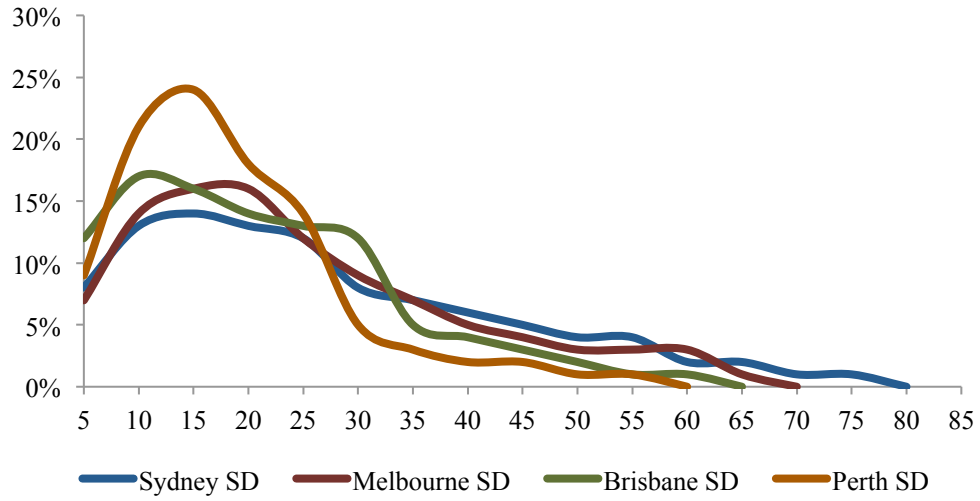
According to the last report made by the Bureau of Statistic published in the 1st of February 2016 the population of the city of Sydney is 4.848.628 people,

[424] BITRE analysis of ABS (2006) *"Census of population and Housing place of work data"*, Canberra
[425] Bureau of Infrastructure, Transport and Regional Economics, BITRE (2014) *"The evolutions of Australian towns",* Commonwealth of Australia

corresponding to the 20,61% of the national population, the biggest city in Australia[426]. Must be mentioned that the overall population of the four Major Cities (Sydney, Melbourne, Cairns and Brisbane) corresponds to the 58% of the national population. Even if Sydney between 2001 and 2011 has added 477.600 people to the already 4.132.400 that translates into an increase of population of 11,56%, equal to 1,1% annually, the outer suburbs accommodated much of the population growth contributing 46% of the city's growth[427].

Analysis the distribution of the population living at various distances from the CBD in 2011, Sydney shows a share of population that is almost constant from 10 to 25 km with 13% of population living in that areas and relatively lower than the other major cities, decreasing gradually until 80 km. Overall, it is the city that sprawled more far away from the CBD than the others (***Figure 4.16***)[428]. The state government population projections suggest that Sydney will experience a population increase of around 1,7 million people between 2006 and 2031 and according with the trend of the last century the outer suburbs will accommodate 65% and 76% of the population[429].

Figure 4.16 – Proportion of population living at various distances from the CBD in 2011.

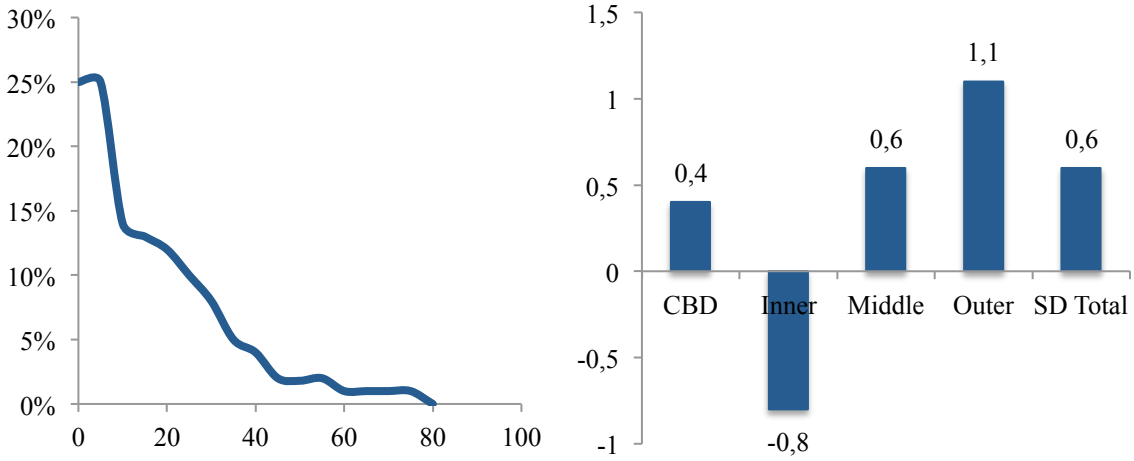


[426] BITRE analysis of ABS (2014) *"Regional Population growth, Australia",* Canberra
[427] Ibid.
[428] BITRE analysis of ABS (2011) *"Census of population and Housing customised place of work data for 2001 and 2011",* Canberra
[429] Australian Infrastructure Audit Background Paper (2015) *"Population Estimates and Projections"*, Australian Government, Canberra

According to the last Bureau of Statistics published in 2012 Sydney SD had 1.874.119 people employed in 2011 and 1.689.519 in 2011 with an increase of 10,9%, while the main industry contributors are retail, property and business services, manufacturing and health and community services[430].

Analysis the of the proportion of jobs at various distances from the CBD in 2006, Sydney shows the highest proportion of its employment located over 40 kilometres[431], and regarding the distribution of jobs growth between 2001 and 2006 comes to light that the great majority of Sydney's employment increase occurred in the Outer Sector (+76%). Between 2001 and 2006 Sydney has shown an employment growth of +0,4% in the CBD, a decrease of 0,8% in Inner Sector, an increase of +0,6% in the Middle Sector and an increase of +1,1% in the Outer Sector averaging a growth of +0,6% in the Sydney SD (***Figure 4.17***)[432].

Figure 4.17 – Proportion of jobs at various distances in km from CBD in 2006 (left) and employment growth in different sectors (right)



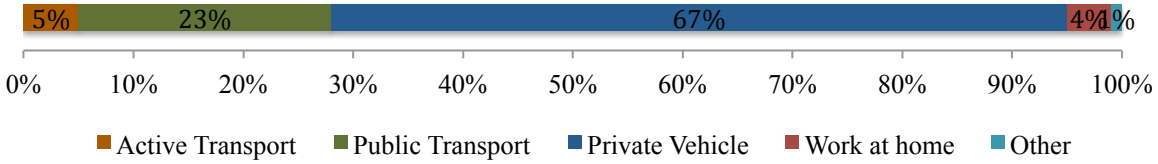
Activity centres with highest employment in the city of Sydney in 2006 are Sydney CBD with 3000.100 employers, North Sydney with 35.800, St. Leonard with 34.400, Parramatta with 34.200 and Macquarie Park with 32.000[433].

John Stone and Paul Mees, Senior Lecturers in Transport Planning at the University of Melbourne, in their studies in monitoring and analysing the trends in

[430] BITRE analysis of ABS (2012) *"Census of population and Housing place of work data 2011"*, Canberra
[431] BITRE analysis of ABS (2006) *"Census of population and Housing place of work data"*, Canberra
[432] Ibid.
[433] BITRE analysis of ABS (2006) "*Census of population and Housing place of work data from 2001 to 2006 and NSW BTS online tabulations for 2001 and 2006",* Canberra

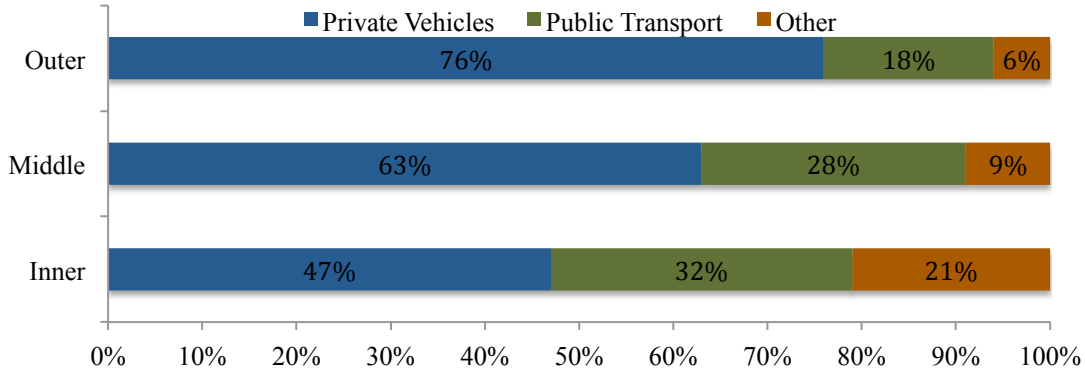
transport behaviour is essential in order to understand impacts of current policies and to guide planning in future infrastructure, claimed that smaller and less densely populated a city, the smaller the public transport mode share tends to be[434]. In Sydney this theory is confirmed with 23% of employed residents for journey to work using public transport compared to the almost 67% using private vehicle and only 4% active transport (***Figure 4.18***)[435].

Figure 4.18 – Transport mode share of employment for journey to work in 2011



It is easy to predict that in the Outer Sector the Private Vehicle is the mean of transport that is mostly use for journey to work and public transport is less used, while in the Inner Sector even if the private vehicle is still the most use, public transport is almost double used than the Outer Sector (***Figure 4.19***)[436]. Must be mentioned that the private vehicle mode share decreased in Sydney with 0,8% from 2001 to 2011 while the public transport mode share increased of +0,8%.

Figure 4.19 – Transport mode share of employment for journey to work in 2011 in the different sectors



[434] Stone J. and Mees P. (2011) *"Spatial distribution of the journey to work by sustainable modes in Australian cities",* Australasian Transport Research Forum, Adelaide
[435] BITRE analysis of ABS (2011) "Census of population and Housing customised place of work data for 2001 and 2011", Canberra
[436] BITRE analysis of ABS (2013) "*Long-term trend in urban transport",* Australian Government

Concentrating residential and job growth around public transport is one of the common goals of the capital city plans, even if the way they want to achieve their goals is different. Specifically, Melbourne focuses on the designated growth Area (greenfield sites), Sydney focuses in the renewal sites and Perth and Brisbane goals reference transit oriented development principles[437]. Evidences show that from 2001 to 2006 there was an increase in the extent to which Sydney's population was concentrated around railway stations, and a decline in the concentration of employment around railway stations, reflecting the strong job growth occurring in Outer suburban industrial area and non-connected specialised centres[438].

It is expected that the number of people commuting between an origin location and a destination location will depend on the number of employed residents living in the origin location and the number of jobs available at the destination location. Similarly, changes in commuting flows will depend on spatial patterns of growth in employed residents and jobs. Spatial patterns of growth are determined by individual's choices about where to live and work as well as by the location decisions of employers along with job access, proximity to family and friends, lifestyle and housing cost. It has been assessed that in Sydney where a lot of commuter inflow occur every day from outer sectors to inners, better work access and prospects was the equal most important consideration, at 21%, in the choice of where to live, alongside lifestyle factors[439].

Journeys to work between dispersed suburban and destination has led to very high levels of automobile dependence in Australian cities[440] in the last decade even if there are signs that the level of automobile dependence has stopped rising. The public transport mode share rose in each city but the increase was relatively modest for Sydney. The accessibility to jobs by private vehicle within 30 minutes in

[437] BITRE analysis of ABS (2006) *"Census of population and Housing place of work data from 2001 to 2006 and NSW BTS online tabulations for 2001 and 2006",* Canberra

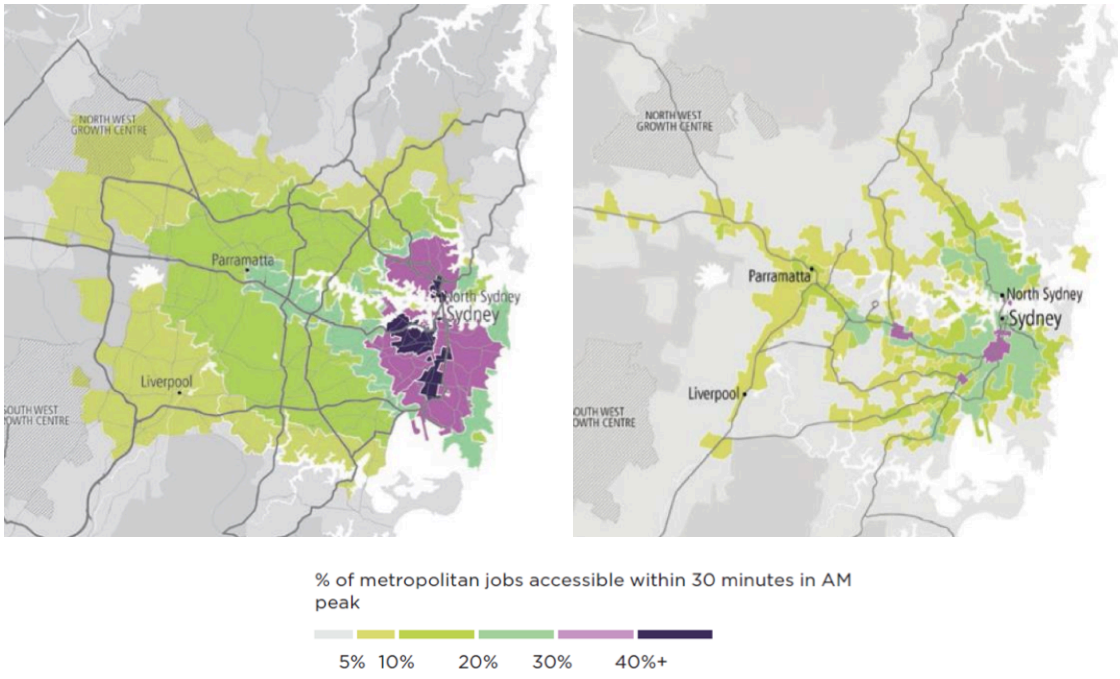
[438] BITRE analysis of ABS (2011) *"Census of population and Housing customised place of work data for 2001 and 2011",* Canberra

[439] Hay A. (2009), "*Household and workplace mobility: implications for travel",* paper presented to the 32nd Australasian Transport Research Forum, Auckland.

[440] Forster C. (2006) "*The challenge of change, Australian cities and urban planning in the new millennium",* in "*Geographical research",* Vol. 4, pp. 173-182

the morning peak is considerably higher than the accessibility to jobs by public transport within the same time and moment of the day (***Figure 4.20***)[441].

Figure 4.20 – Accessibility to jobs by private vehicle and public transport



Combining all the ways to access to jobs in Sydney, what comes to light is that in the inner suburbs the accessibility is higher while in the outer suburbs the accessibility is lower and that the accessibility to job is bigger when closer to radial rail network and national and state roads and highways (***Figure 4.21***)[442].

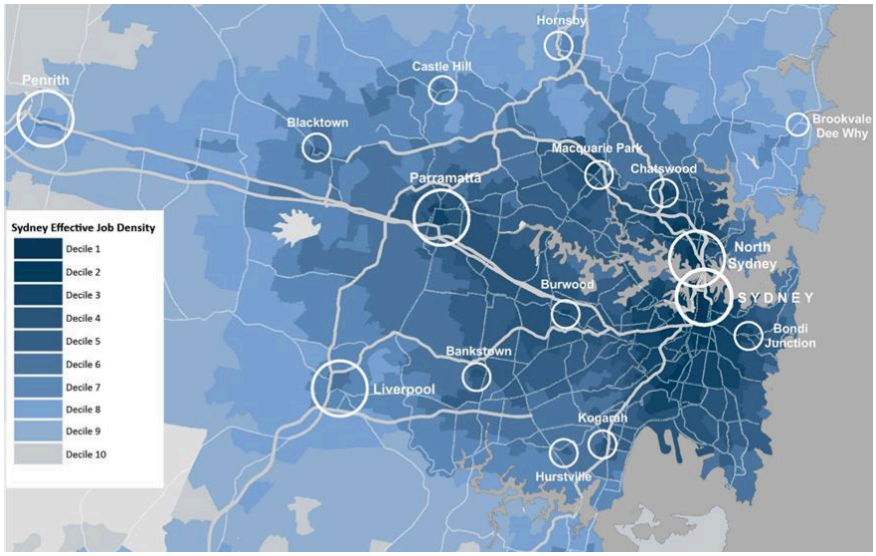
The city shows a crucial situation: on the east side in the inner centralised suburbs it is globally connected within the city's network, in the medium suburbs the links to the city's network is emerging while the outer suburbs are potentially disconnected with fewer high value economic concentrations.

Sydney presents common prerogatives to cities having recent urban development as it was colonized only two centuries ago and has witnessed to a very fast occupation and growth. Urban sprawl versus urban densification is a debate that has been raging for decades and dominated academic and popular urban planning discourse worldwide and also in the city of Sydney: on one side it is supported the

[441] SGS Economics&Planning (2014) *"Millers Point and the Rocks: alternative way forward"*, Canberra
[442] Ibid.

theory of expanding at the edges developing sprawl, providing a greater choice of living locality, offering access to more affordable housing and giving the space for privacy and raising family and on the other side the increase of the density is promoted contesting that low urban density is inefficient, not sustainable and problematic for health and environment.

Figure 4.21 – Accessibility to jobs (job density)



It is believed that Sydneysiders along with all Australians should change their lifestyle, abandoning the aspiration to individual home with a backyard and moving to higher density living parks and returning to shopping strip[443], in order to achieve an increase of density and aligning with the other large cities' density worldwide. On the other side it is suggested to create "*megaregions"* instead of megacities[444] with large cities and the constellation of smaller towns in between, conceived as integration between landscape system and infrastructure where the ecosystem provides the lineaments of settlements and landscape is cultivated with responsibility and renewable energy is gathered[445].

The debate involved also university professors, claiming on one side that "sprawl" is not what exactly is happening in Australia but "lower density development" and that bigger house with a garden is the preference of people living

[443] Blakston A. (2009), A hothouse of climate ideas, *The Age*, p. 23, 9 June
[444] Weller R., Bolleter J. (2013) *"Made in Australia: the future of Australian Cities"*, Rethinking Infrastructure
[445] Ibid.

in Sydney and on the other side it is claimed that urban consolidation is mandatory in order to balance what is available as the 80%-90% of Australian suburbs are car dependent and there is enough chance to live and walk in transit-based suburbs[446].

4.2.2 Urban consolidation as an imminent strategy

As mentioned in the previous chapter, urban sprawl is the trend that is occurring in the major cities of Australia since the last century and as a reaction Sydney councils have elaborated various strategies in order to achieve housing targets and accommodate higher densities housing within the city borders in the already-urbanized area. This strategy is also called "urban consolidation" and has been cited in all the three plans published in Sydney tat are going to be fully described later.

Before even start describing factors and strategies of urban consolidation in Sydney, it is important to define this concept. Urban consolidation can be defined as the process of increasing the density in specific urbanized inner areas in order to increase the population[447] that otherwise would move to less close areas, increasing sprawl. The intention is that higher density housing in existing urban areas will reduce the demand for greenfield development and improve the long-term sustainability of the city. Supporters of the urban consolidation policy claim that it is a sustainable approach to urban development as it supports the ecological need to preserve existing non-urban land.

The five principal housing types that constitute higher density housing include dual occupancy, multiple small lot housing, housing for the aged and disabled, town houses and terraces and residential flat buildings[448].

It is confirmed that one of the aim of the urban consolidation is to maximize the use of infrastructure service and facilities that have already been provided in existing urban areas, representing an economic advantage because of the reduced expenditure on new urban infrastructure. At the same time it is believed that not all

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[446] Recsei T. (2006*) "Troy versus Newman", Save Our Sydney Suburbs (NSW)"*, in *"Save Our Suburbs – for Sustainable Living"*, Sydney

[447] Smith S, (1997) *"Urban Consolidation: Current Developments",* NSW Parliamenty Library Research Service, Canberra

[448] Bunker R., Gleeson B., Holloway D., Randolph B. (2005) *"Building the Connection between housing needs and Metropolitan Planning in Sydney, Australia"*, in "*Housing Studies",* Vol. 25, N°5 Pages 771-794

inner areas have the capacity to support significant increases in population in terms of infrastructure capacity, availability of services, road networks and open space[449].

Sydney councils and NSW government have elaborated various strategies for urban consolidations as a reaction of containing urban sprawl and achieving sustainable aims, whose have been fully described in the three plans published in Sydney: "City of the Cities" in 2005, "Metropolitan Plan for Sydney 2036" in 2010 and "A Plan for Growing Sydney" in 2014. These strategies include a significant focus on the need to provide additional density housing in the city of Sydney for a growing and changing population structure.

In this section the factors which councils consider when selecting sites for higher density housing are going to be fully defined, such proximity to town centres and public transport, capacity of existing infrastructure and services, preserving the character of low density areas and determining appropriate building heights.

It is believed that councils' decisions have strong effect on the success of higher densities and due to their role in managing the local procedures they are addressed the responsibility for residential development strategies[450].

[449] Troy P. (1996*) "The perils of urban Consolidation*", The Federation Press, Sydney

[450] Duxton M and Tieman G. (2005) *Patterns of Urban Consolidation in Melbourne: Planning Policy and the Growth of Medium Density Housing",*in "*Urban Policy ans Research",* Vol 23, pages 137-57

4.3 Current urban plans in Sydney

4.3.1 *"City of the Cities: A Plan for Sydney's Future"* (2005)

This Metropolitan Strategy is the overarching document containing principles and objectives that have been used to inform the Subregional Strategies as well as the Local Council Housing Strategies. It is comprised of seven individual strategies including Economy and Employment, Centres and Corridors, Housing, Transport, Environment and Resources, Parks and Public Space and Governance and Implementation. The key proposal of the plan is dividing the metropolitan area into six regions each with a regional centre each one: they are Sydney CBD, North Sydney, Parramatta, Liverpool, Penrith and Gosford, that is the only one not belonging to the Cumberland basin but in Central Coast.

This is the first ever strategy for Sydney which has adopted this structure and reflects Sydney's expected population of between five and six million by 2031, which requires a multi centred – multi-regional city, if the five million people are to have equal access to jobs, community and recreation facilities. The other innovation

is that 70% of all the future housing must be established within the greenfield growth centre, making an evident change from the previous strategy of distributing population in the new release areas on the outskirts of the region and close to the stations of the City Railway or major bus routes. The intention of concentrating higher density housing at Sydney's most important infrastructure asset and rail network, is given that those who live within one kilometre radius of a station use public transport twice as much and own half the number of cars as those who live beyond[451].

The plan not only aims to raise residential densities around railway stations and main transport routes and to encourage employment around them but also encourages cultural and recreation facilities.

The Subregional Strategies are policies built on the principles and objectives within the Metropolitan Strategy and provide guidelines for housing development, which are specific to each subregion. In relation to urban consolidation policy, the subregional Strategies provide numerical housing targets that are to be accommodated within existing urban areas and town centers. This thesis is focused on the targets delineated in the Inner North, North and North East Subregions. The most significant initiative encouraged within the strategies is that future residential development should be concentrated in and around town centers that contain an appropriate provision of services and access to public transport.

The "Center Policy" is a major focus of the Metropolitan Strategy since centers are fulcrums to focus an articulate growth and change[452], and as a consequence they need high levels of accessibility and connectivity while still protecting the amenity of suburban areas.

The approach of this plan reflects the Transit oriented Development approach, studied in the previous chapter, which encompasses the features of a mixed-use town center with proximity to major public transport links. The Subregional Strategies provide one quantitative stipulation for the location of higher density housing that it is situated in close proximity to public transport nodes, 800 meters or 1 kilometer from a rail station and 400 meters from a high frequencies bus

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[451] Department of Planning (2005), "*City of the Cities: A Plan for Sydney's Future",* New South Wales Government

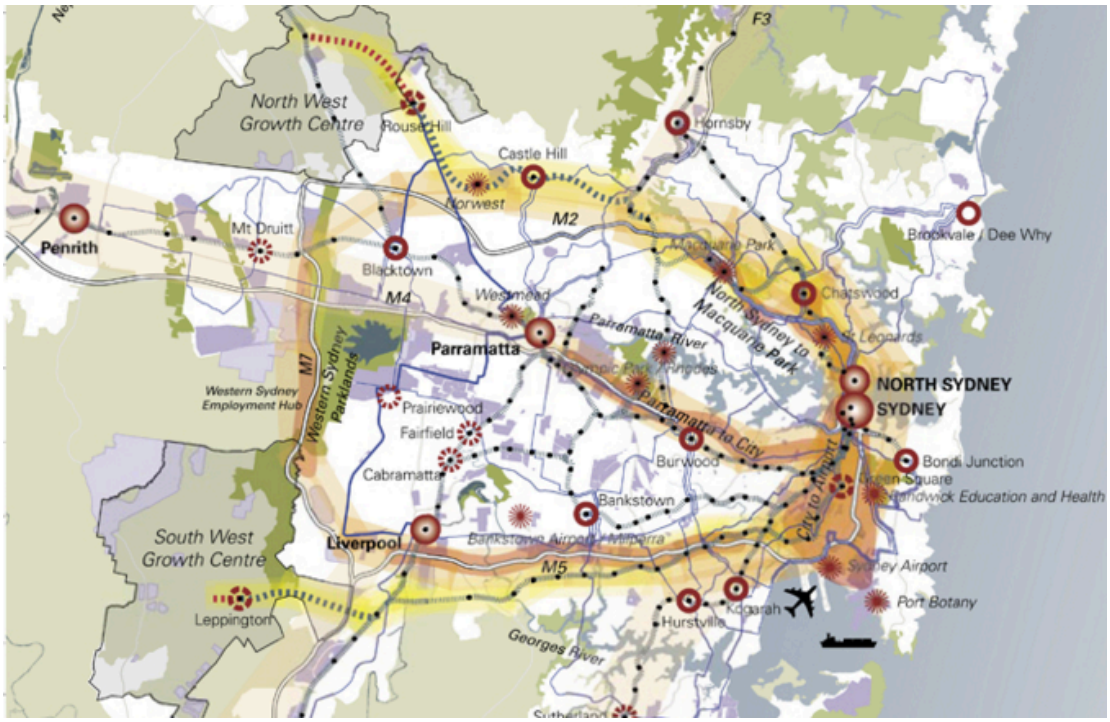
[452] Searle G. (2007) *"Sydney's urban consolidation experience: power, politics and community",* Urban research Program, Research Paper 12, Sydney

service in the morning peak. It is predicted from the plan that some regions are expected to accommodate between 80%-100% of new dwellings in transport nodes as Sydney CBD, Inner West Sydney and North Sydney reflecting that the main rationale for major centers is their good access to public transport[453].

Previous policies did not distinguish between centers of different size and subsequently did not determine housing and employment targets for specific town center, while The current approach encourages the creation of mixed-use town centers that are walkable places, with a mix of housing choices and services, and "cosmopolitan environments and amenities"[454].

The current approach to urban consolidation in Sydney is in accordance with the principles of maximizing public transport use, improving accessibility and connectivity in residential areas and creating town centers that are at the heart of residential communities.

Figure 4.22 – Strategic map of the plan "City of the Cities"



What is clear that is missing from the plan is a strong public transport capable of afford the increment of the use of the railway systems, as there are more

[453] Bunker R., Gleeson B., Holloway D., Randolph B. (2005) *"Building the Connection between housing needs and Metropolitan Planning in Sydney, Australia"*, in "*Housing Studies",* Vol. 25, N°5 Pages 771-794

[454] Gupta P. (2008) *"Creating great town centers and urban villages",* Urban Land Institute, Washington

than 300 stations in the network with future housing development and up to 40% of the jobs at the stations (***Figure 4.22***). In fact the initiative is merging together some old proposals never accomplished, as the North West Railway Metro and the Greenfiel-Leppington line, selling them as a new link between the two fast growing centres and the Sydney CBD. As a consequence, this proposal would reinforce the primacy of the Sydney CBD, that was exactly what the plan managed to avoid in the its strategy. What is also missing is a strong public transport to the new fast growing areas of Liverpool, Parramatta and Penrith and radial links from the suburbs to the rail networks. The plan confirmed the vision of the "global economic corridor" made by the crescent-shaped line through Parramatta, Chatswood, North Sydney, Sydney CBD and Sydney airport and Port Botany, facilitating this fast growing corridor.

4.3.2 *"Metropolitan Plan for Sydney 2036"* (2010)

"Metropolitan Plan for Sydney 2036"[455] published in Sydney tried to arrange the growth and development of Sydney metropolitan area over 25 years ahead, as the extension and update of the *"City of Cities"*[456] of 5 years before, both promoting liveability, economic competitiveness, fairness and protection of the environment. Sydney, as the key of a system of regional cities and major centres connected with rail network, bus corridors and orbital motorway web, need to maintain a global competitiveness. For the first time land use and urban transport are planned together.

Concerning the limit of urban sprawl, it focused the attention on containing the urban footprint by locating at least 70% of new homes in existing suburbs and by focusing land release in the designated Growth Centres. Moreover the aim in matter of residential densities around the centres is locating 80% of all new homes within the walking catchments of the centres. Employment is managed to be focused in strategic centres, promoting economic progress of regional cities, as the key node of Parramatta on the West, and at the same time the aim is accommodating half of the new jobs in Western Sydney. Concerning transportation, the increase of public mode share is at the first place, with the promotion of active transport opportunities. The

[455] Department of Planning (2010), "*Metropolitan Plan for Sydney 2036",* New South Wales Government
[456] Department of Planning (2005), "*City of the Cities",* New South Wales Government

Plan tries to concentrate the residential and job growth around public transportation nodes, with indeed making efforts to ensure more jobs closer to home. Sydney will be regarded as a global city region with a strong and targeted focus on urban renewal in areas with transport and other infrastructure capacity, Sydney CBD will be the primary location for most high order jobs and services, Parramatta will become the Sydney's second CBD and Liverpool and Penrith will mature within their respective catchments over the medium to longer term (***Figure 4.23***).

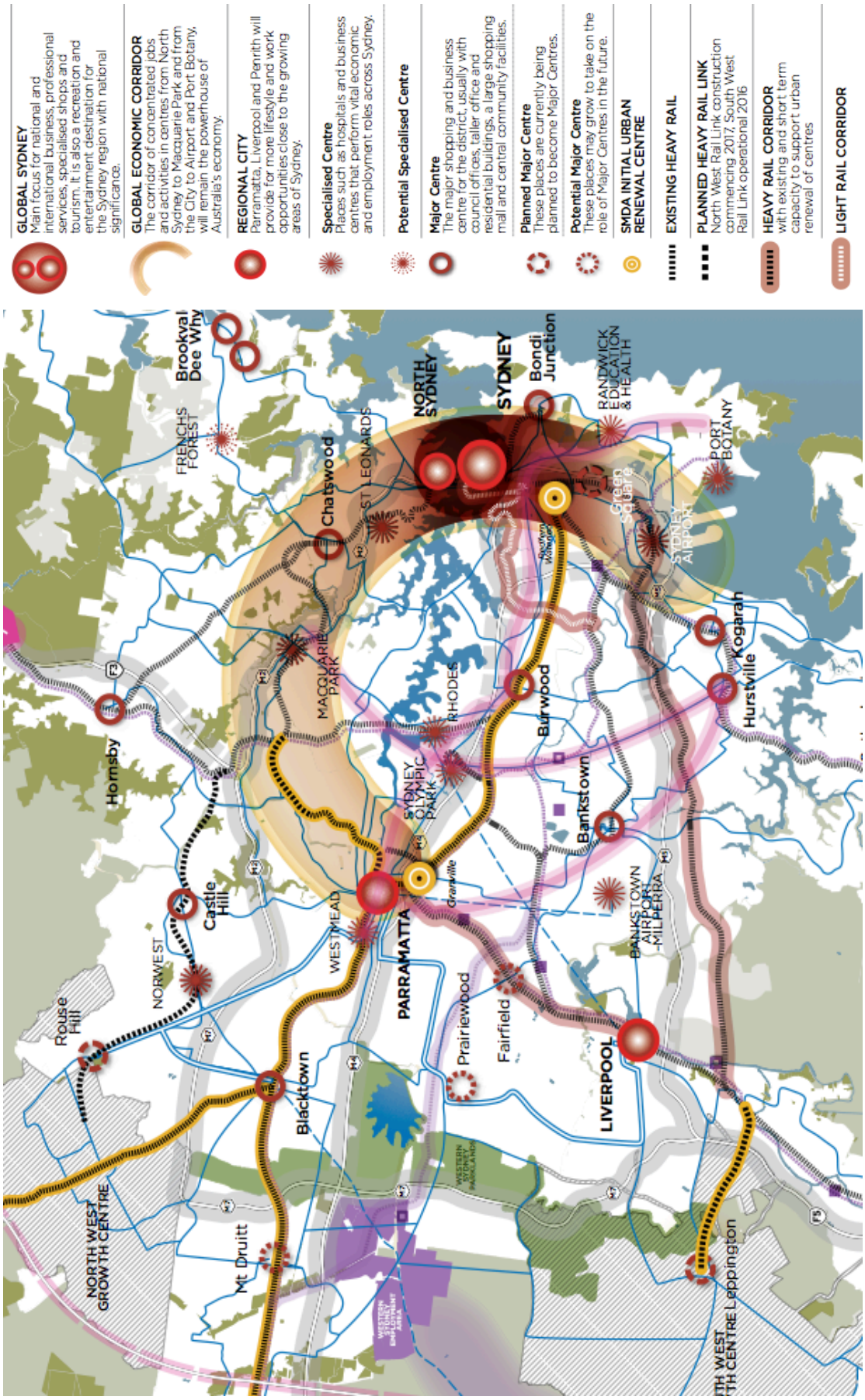
The *"Metropolitan Plan for Sydney 2036"* is base on the previous 2005's plan approach focused on transforming Sydney from a single-centred city to a multi-centred city, but sets out long-term framework with radial public transport links feeding into each city, cross regional transport connections linking more subregions to the Global Economic Corridor and developing network of transport connections serving a range of different trips and strategic centres that support economic activity across more locations. In fact, the announced Parramatta to Epping Rail Link will provide an important planned connection to the Global Economic Corridor.

The plan innovations relies on the fact that, realizing that at least 70% of future population growth in Sydney will occur in established areas it requires a strong ongoing commitment to match growth with existing and planned public transport, so the Department of Planning and Transport NSW working together with the Sydney Metropolitan Development Authority will ensure that existing transport infrastructure is best utilized and Sydney's population has the greatest opportunity to access key Strategic Centers within 30 minutes of home by public transport.

This network will be delivered by an integrated land use and transport strategy that will strengthen access and capacity in existing and new locations across Sydney, providing further competitive advantages to firms seeking to engage with the global economy.

The vision sits in the context of Sydney improving its environmental performanceand response to the implications of climate change. The Metropolitan Plan aims to achieve a sustainable city by reducing Sydney's greenhouse gas emissions and preparing the city for the impacts of climate change through intelligent adaptation.

Figure 4.23 – Strategic map of the "Metropolitan Plan for Sydney 2036"



The prediction is that by 2036 Sydney's population will grow by 40% and the average household size will fall from 2,6 to 2,5 people, creating demand for more, smaller and affordable homes. As a result Sydney will accommodate new 770.000 homes by 2036 with a 46% increase from the current 1,68 million of 2010. The plan strategy is to accommodate the new demand for home is North West and South West. The plan predicts also 760.000 new jobs by 2036 and the location of the 50% of planned employment capacity in Western Sydney.

Property Council NSW Executive Director, Glenn Byres, said the weakness of the plan is the lack of a robust infrastructure agenda, firm deadlines in some areas and a clear commitment to delivery right across government[457]. According to him the NSW Government should create a single Department of Infrastructure, Transport and Planning and create an independent Commission to monitor, report and advise on implementation.

4.3.3 *"A Plan for Growing Sydney"* (2014)

4.3.3.1 Introduction to the plan

"A Plan for Growing Sydney"[458] is going to guide land use planning decisions for the next 20 years, determining where people will live and work and how they will move around the city. The strategy aims to accelerate housing production and to create strong and resilient communities within a highly liveable city through new housing located close to jobs, public transport and services. The most important innovation is that housing development across the city will be matched with investment in infrastructure and services, culture, open spaces for a healthy lifestyle and community life. 61 billion Australian dollars of investment in infrastructure over the following 4 years is the commitment of the Government, delivering much of this investment in projects in the Western Sydney. By 2031, Sydney's population will grow by 1,6 million people with 900.000 of population growth occurring in the Western part (***Figure 4.24***)[459].

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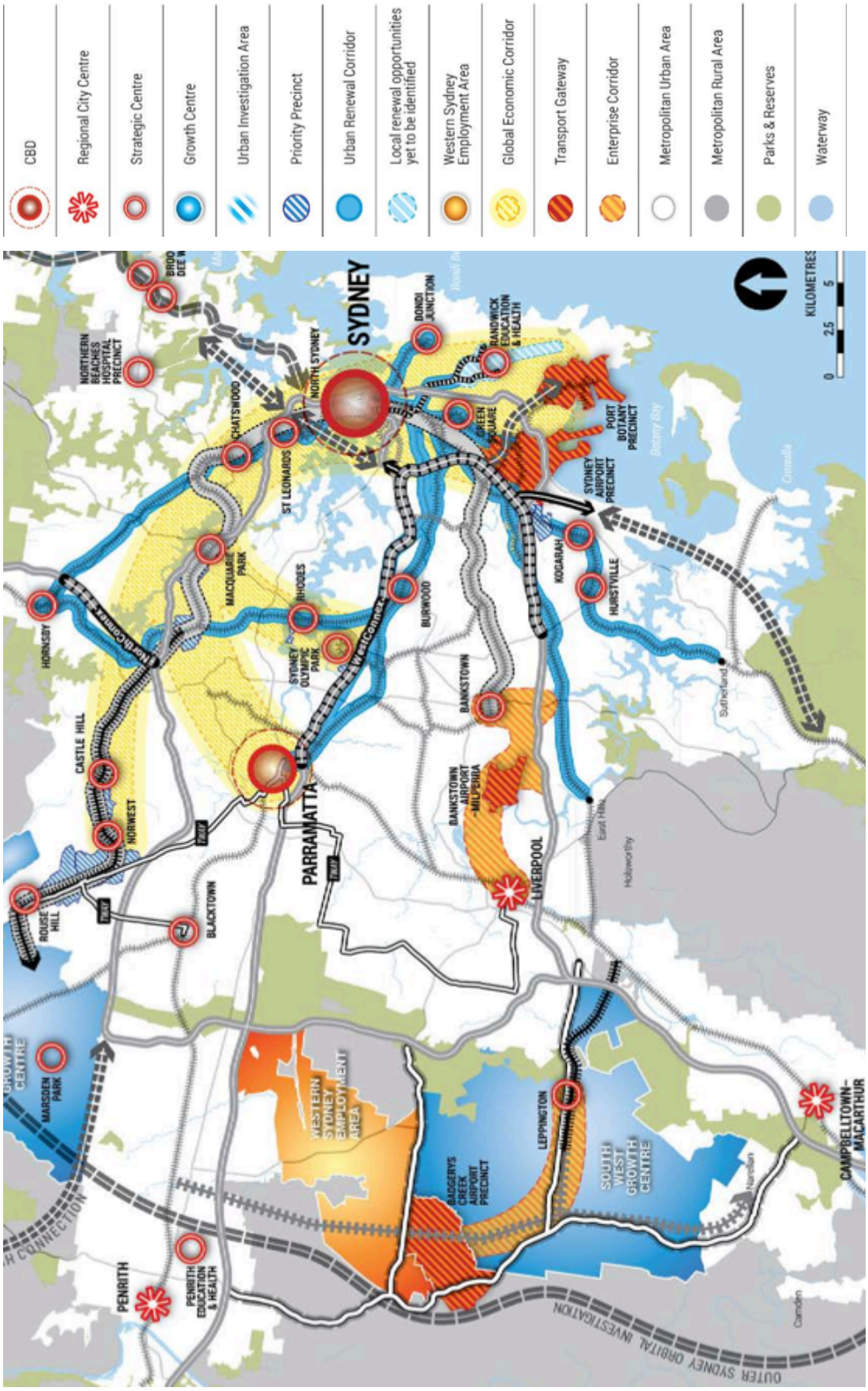
[457] Byres G. (2010) *"Sydney metro plan released",* International Business Time, Sydney
[458] Department of Planning and Infrastructure (2014) *"A Plan for Growing Sydney",* New South Wales Government
[459] Ibid

Figure 4.24 – Strategic "Plan for Growing Sydney"



The vision of Sydney is based on 4 goals: a competitive economy with world-class services, a housing choice with homes meeting people's needs and lifestyle, a great place to live with strong and healthy communities and a sustainable and resilient city protecting natural environment. The plan will work on the following actions: accelerating urban renewal at train stations providing homes closer to jobs, growing a more internationally competitive Sydney CBD, growing a second CBD in Parramatta, investing in productivity the Western Sydney, enhancing capacity at Sydney's Gateways as Port Botany, Sydney Airport and Badgerys Creek Airport, delivering infrastructure, promoting culture and tourism and protecting urban environment.

The plan includes a new approach to delivery with the establishment of the Greater Sydney Commission - a dedicated new body with responsibility to drive delivery of the Plan.

In the following paragraphs the attempt will be introduce the plan's goals, bringing to lights their major prerogatives.

4.3.3.2 Four main goals

- Competitive economy, high standard service, efficient transport.

Global Economic Corridor, running from the airport to Macquaire Park will be extending to Parramatta, meant to become the second Sydney CBD, increasing the intensive economic activity that permits Australia to be the eleventh largest Stock Exchange in the world; in the corridors, employment opportunities and mixed-use activities will be expanded.

Badgerys Creek Airport will emerge as a new hub of intense economic activity and improved new transport connections will enable centres such Liverpool, Penrith and Campbelltown to continue to growth as regional city centres. The Greater Sydney Commission will have the task to work on their growth and investment.

Innovative opportunities will be applied to Sydney CBD office space by identifying redevelopment opportunities and building heights in the right locations will be increased.

The productivity of the Western Sydney will be transformed into growth and investment, supported by the new Badgerys Creek Airport and corridors.

Long-term planning for social infrastructure will be held to support growing communities.

- New sustainable houses with type choice.

The provision of new houses in well-serviced locations meeting household needs, lifestyle choices and individual budgets will be the goal of the plan. Further attention will be paid on infill housing through Priority Precints and Urbangrowth NSW programs and permitted by Greater Sydney Commission support.

The delivery of the greenfield housing supply in the North West and South West Growth Centers will be the focus of the housing plan in order to accommodate the growth in population.

- Strong, healthy and well connected communities.

The reputation of the city in matter of high-qualified life with a vibrant cosmopolitan culture will be confirmed by adding quality public space and precincts while the Cultural Ribbon will link the harbourside venues. The Sydney CBD will continue to act as an international and cultural destinations and Parramatta CBD will also embrace arts and cultural opportunities.

The Sydney Green project will be delivered in order to create a network of interlinked multipurpose open and green spaces across the city, while guidelines for a healthy built environment will be published.

- Sustainable city with balanced approaches to the use of land.

Sydney's environments as the Harbour, Blue Mountains, Cumberland Plain Woodland will be protected as iconic natural assets of the city, which will be also more silent and connected through green spaces. It focuses on sustainably managing the productive and economic uses of its natural assets and minimising the impacts of development on water, air and biodiversity. Green corridors will protect native vegetation and biodiversity.

Western Sydney is the location of major interest about the plan as it is considered the place for greatest opportunities. In 2013 the area has around the 47% of Sydney's residents[460], 36% of Sydney's jobs[461] and 34% of Gross Regional Product[462]. The prevision is to gain 1 million people by 2031.

Since the spread of housing and economic activity across Western Sydney has made it difficult to service the area well with public transport, habitants are more dependent on cars, doubling the average vehicle kilometre travelled per person than in the inner suburbs. With the intention on investment in Parramatta and other Western centre, the situation will change as rather than travelling to inner suburbs for job aims residents will reach specialised locations closer to their homes.

The investment in transport infrastructure will be the key factor to improve resident's access to jobs to new locations for housing growth. The lines that are going to be improved are the South West Rail Link, the North West Rail Link, the Western Sydney Rail Upgrade Program, The Parramatta Light Rail and the Outer Sydney Orbital.

4.3.3.3 Sydney CBD investment

Sydney's global reputation is built around its dominant CBD and iconic harbour setting. More commercial and residential capacity, easier access between CBD precincts and an active mix of retail and world-class culture and arts consolidate Sydney's global reputation and draw capital and skilled workers from around the world.

Barangaroo, west neighbourhood of the CBD, will be the newest precinct and the hub for Sydney's financial and professional services, enhancing the city's appeal for international investment and skilled workers. The goal is to make available sufficient office space capacity in the Sydney CBD in 10-14 years, also redeveloping existing buildings and growing upwards due to the absence of

[460] Department of Planning and Environment (2014) *"State and Local Government Area Population Projections: 2014 Final"*, NSW Government, Sydney
[461] Bureu of Transport Statistics (2014) *"Small Area Employment Forecasting Model"*, NSW Government, Sydney
[462] Regional Development Australia (2013) *"Sydney Metropolitan 2013 Region Economic Baseline Assessment: Update Final",* NSG Government, Sydney

significant large sites. The intention is to increase the heights of the buildings in order to accommodate more offices.

Sydney's appeal to international investment and skilled workers is also driven by the diversity of activities which surround the commercial core. Providing a mix of commercial and retail activity, arts and culture, public spaces and parks, along with the overseas passenger wharf, contribute to Sydney's global city reputation. Moreover actions to promote a more walkable city are set out in order to reach the goal of having the 92% of trips within the city canter made by walking. The 2025 Sydney Rapid Transit will improve access to the CBD by the North West and the South West, increasing the potential of economic activity within the city centre.

One action particular relevant is the goal of diversify the CBD by enhancing the "Cultural Ribbon" (***Figure 4.25***) which connects new and revitalised precincts including Barangaroo, Darling Harbour, Walsh Bay and the Bay Precinct. Projects as Opera House in 1970s and Darling Harbour in 1980s set the scene for a big number of initiatives which will expands adding plans for other venues: in Barangaroo commercial office towers and apartments, a new ferry hub and a world-class open space and foreshore walks will be designed; the Darling Harbour Live will deliver exhibition and convention facilities; the Sydney CBD Arts Precincts will enhance collaboration between institutions and promote better use of facilities and collections.

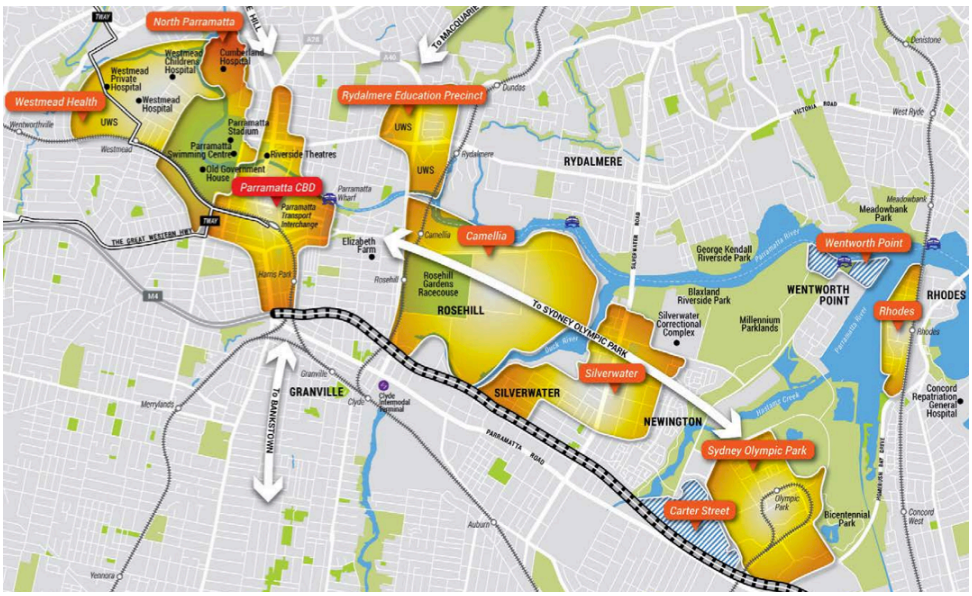
Figure 4.25 – Sydney "Cultural Ribbon"

4.3.3.4 Parramatta as the new city's CBD

Greater Parramatta as a mix of commercial, health and education facilities is a center of metropolitan significance, the Sydney's western CBD. It will continue to grow in significance to Sydney so it will require a critical mass of investment and greater diversity of activities in the area, given that it has been revealed that it is also diversifying with growth in knowledge industries and increasing numbers of more highly qualified people working. The Parramatta Light Rail, already proposed, is the main investment in transportation sector, connecting all the center in the area.

As the Greater Parramatta has the potential to reach 100.000 jobs over the next 20 years, the Council will work with the Government to connect and integrate the precincts which provide jobs, goods and services including Parramatta CBD, Westmead, Rydalmere, Parramatta North and Camellia with the existing commercial one. Moreover there is a most significant concentration of biotechnology, pharmaceutical and medical device companies that are well located to access Western Sydney's growing population and labor force, recognizing the important health contribution.

Figure 4.26 – Greater Parramatta and Olympic Peninsula Growth Area



In order to support the growth of Parramatta CBD it is important to establish a new Priority Growth Area (***Figure 4.26***), delivering homes closer to jobs and creating communities that have good access to schools, child care, recreation and

public space. Population growth in the Priority Growth Area, that will include also the Olympic Peninsula, will support businesses, improve the viability of expanded public transport and bring new life to Parramatta CBD.

4.3.3.5 Western Sydney growth and investments

Western Sydney is the location of major interest about the plan as it is considered the place for greatest opportunities. In 2013 the area has around the 47% of Sydney's residents[463], 36% of Sydney's jobs[464] and 34% of Gross Regional Product[465]. The prevision is to gain 1 million people by 2031.

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Long-term planning in Western Sydney will be necessary to create a setting for jobs, infrastructure and services to meet the needs of current and future population so that growth is targeted towards strategic centers, as Parramatta. This will include taking advantage of opportunities arising from new infrastructure investment such the new airport of the city Badgerys creek Airport, the South West Rail Link, the North west Rail Link and upgrades of the Northern Road, Elizabeth Drive and Bringelly Road. The new airport in longer term will transform and drive future investment and jobs growth in Western Sydney, generating new employment opportunities giving residents the access to jobs close to home and directly link Western Sydney with global market. It is predicted that the airport will create 35.000 jobs by 2035, increasing to 60.000 in the longer term . This will transform the airport into the largest catalyst for employment growth and businesses in the area (***Figure 4.27***).

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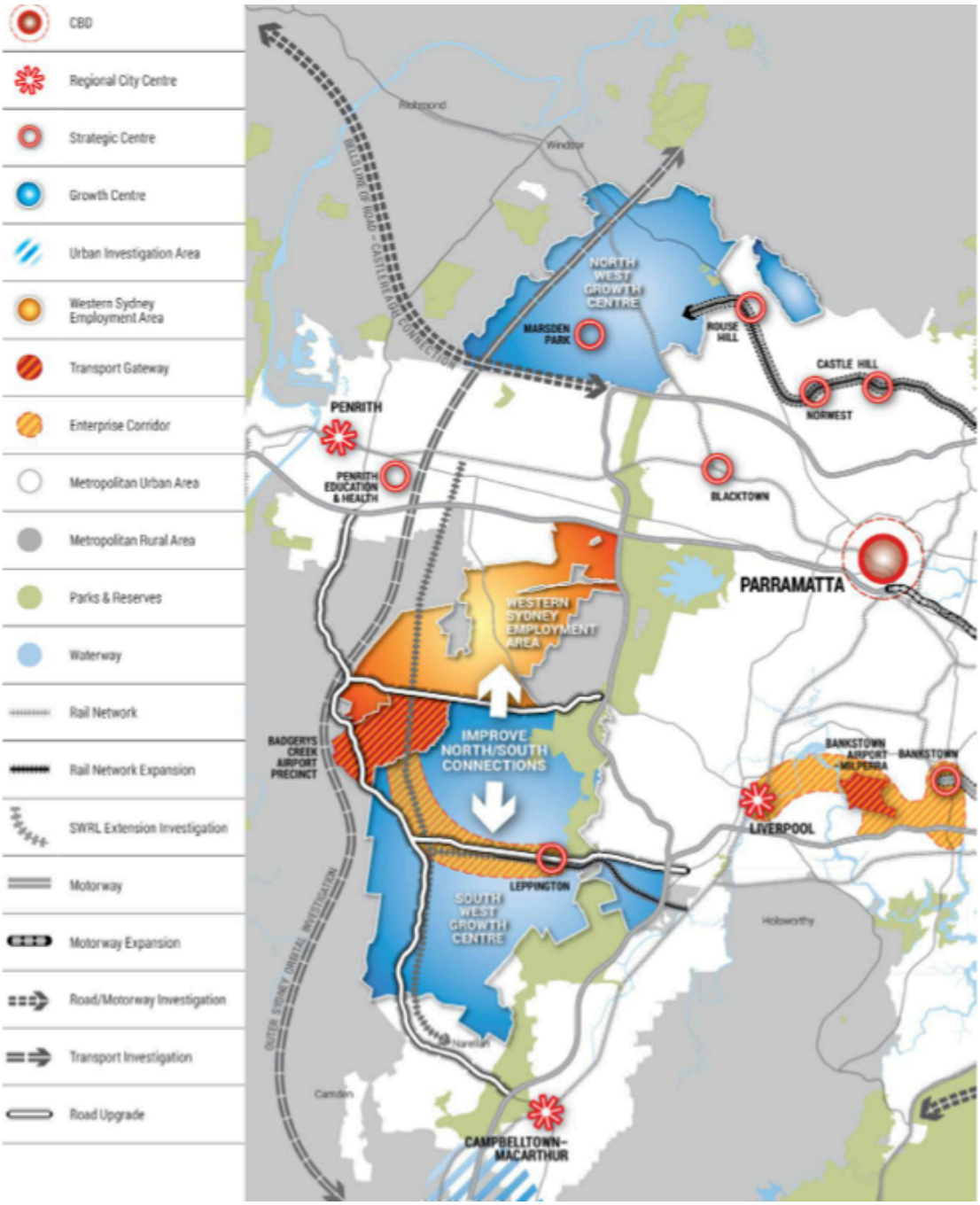
[463] Department of Planning and Environment (2014) *"State and Local Government Area Population Projections: 2014 Final"*, NSW Government, Sydney

[464] Bureu of Transport Statistics (2014) *"Small Area Employment Forecasting Model"*, NSW Government, Sydney

[465] Regional Development Australia (2013) *"Sydney Metropolitan 2013 Region Economic Baseline Assessment: Update Final",* NSG Government, Sydney

Figure 4.27 – Western Sydney connection proposal



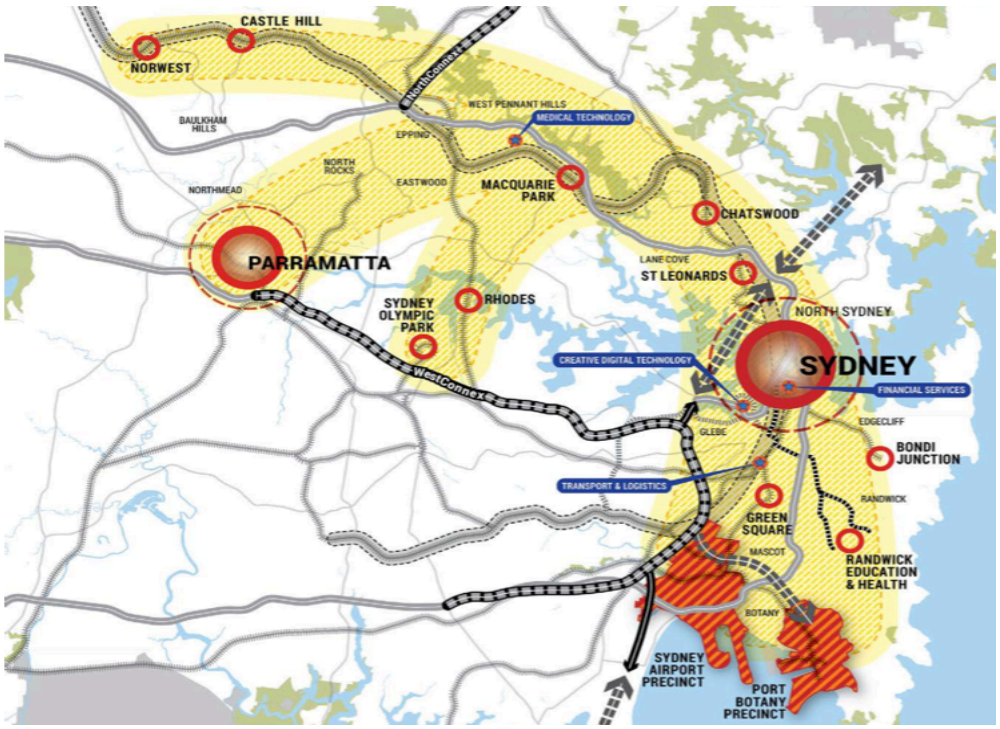
4.3.3.6 Expansion of the Global Economic Corridor

The Global Economic Corridor extends from Macquarie Park through the Sydney CBD to Port Botany and Sydney Airport. It generates over 41 per cent of the NSW Gross State Product (GSP). This economic cluster is unique in Australia due to the extent, diversity and concentration of globally competitive industries. Sydney's knowledge jobs are heavily concentrated within the Global Economic Corridor,

including sectors such as education, financial and other business services, communications, high-tech manufacturing and emerging industries such as biotechnology.

In the last decade the demand for office space has seen overflow activity from the CBD across the Global Economic Corridor, extending it towards Parramatta and to Norwest and Olympic Park. In fact it is predicted that by 2030 there will be a demand for around 190.000 new office jobs, of which 75% will be located in the 10 major office markets, that are all belonging to the Corridor (*4.28*). These markets are Macquaire Park, Chatswood, Norwest, Parramatta, Rhodes, St. Leonards, Sydney Olympic Park, South Sydney, Sydney CBD and North Sydney.

Figure 4.28 – Global Economic Corridor



Commercial cores supporting business activity and jobs must be protected by residential encroachment. As a consequence, restrictive zonings need to be well targeted, also to ease pressure on congested road networks.

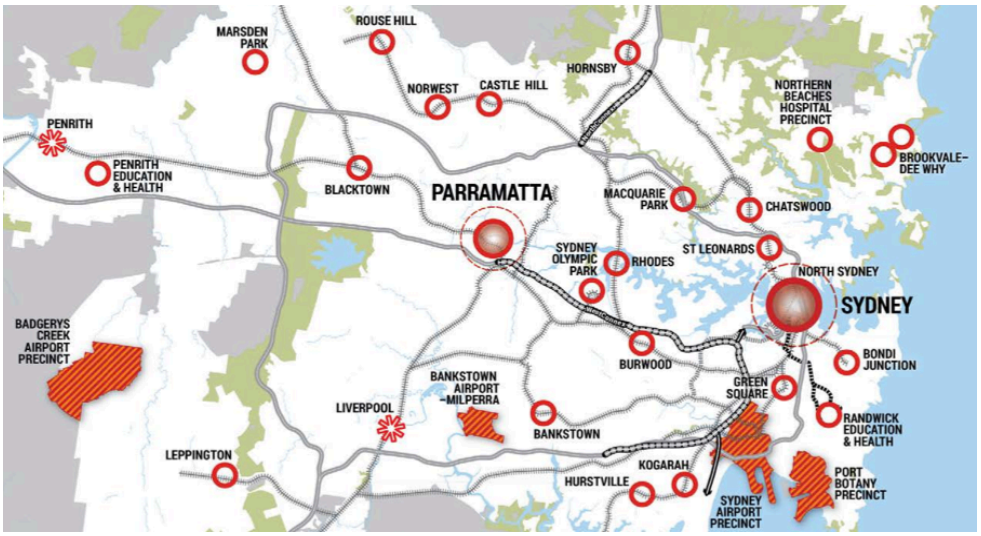
4.3.3.7 Growth of strategic centres

Sydney's largest and most important hubs for business and employment are referred to as strategic centers and transport gateways, accounting for 43% of all jobs

across the city. Clustering business and services in the same center let them benefit of the proximity of the other, creating an agglomeration, important for productivity because it fosters innovation, improves efficiency and economies of scale and supports faster growth than if economic activity is dispersed across a wider area (***Figure 4.29***).

The concept of the plan is to create clusters with mixed economic and social activities built around the transport network and feature major public investment in services as hospitals and educations, as the theory of the Transit-Oriented Development suggests. These centers form a network of transport-connected hubs helping to make Sydney a networked and multi-centered city. Along with strategic centers, transport gateways are locations with major ports and airports, whose present is vital to the city's prosperity supporting concentrations of complementary business activity and employment.

Figure 4.29 – Strategic centres and transport gateways



Investment in strategic centers will focus on removing the barriers to investment and economic activity and unlocking developable land by consolidating fragmented sites for redevelopment and improving planning policies and regulations will encourage flexibility, higher density and a more diverse range of activities. To improve the public spaces in and around centers a better governance is needed, including the management of walkability of the centers, traffic management and car parking improve.

4.3.3.8 Housing supply

Due to the fast population growth in Sydney, projections indicate the need of around 664.000 additional homes over the next 20 years, in the greenfield locations and in the established urban areas, in a variety of sizes and types. Increasing housing supply will boost economic activity and generate viable infrastructure and business investment opportunities. The plan focuses on Government actions to remove the barriers, which impede the delivery of more housing, to stimulate competition among developers and to influence the location and type of new homes being built.

Recently the Housing Diversity Package reform for greenfield areas have been designed to speed-up development processes, first applied to growth Centers and then to all greenfield developments.

Government and councils will work closely to achieve the housing supply goal identifying where the development is feasible and where locations have more attractiveness because of close to jobs and transport network. In fact the most suitable areas for significant urban renewal are those best connected to employment and include in and around centers that are close to jobs and are serviced by public transport services that are frequent and capable of moving large numbers of people and in and around strategic centers. Subregional planning will be the initial focus for driving housing supply and choice and will seek to facilitate the delivery of an additional 664.000 dwellings over the next 20 years.

Another program has been published by the Government, called Priority Precincts program, coordinating planning and investment to revitalize local centers, service and infrastructure. The program selects sites for urban renewal against criteria of being close to an infrastructure that can be boosted, being important to more than one Local Government Area and supported by a local council, being environmentally, socially and economically sustainable and viable, being consistent with market demand. The 10 Priority Precints are: North Ryde Station, Epping Town Center, Wentworth point, Carter Street Lidcombe, Herring Roas Macquaire Park, Showground Station, Bella Vista Station, Kellyville Station, Banksia and Arcliffe. In these locations, the Government is working to match population growth with investment in infrastructure, providing new schools and recreation facilities alongside improvements to roads and public services.

Wentworth Point is one of the ten Priority Precinct, with a mix of industrial buildings and vacant land. A Structure Plan sets out how to integrate new housing with other land uses, transport and social infrastructure, identifying suitable locations for residential development, new school and recreation uses (***Figure 4.30***).

Figure 4.30 – Wentworth Point Priority Precinct renewal

4.3.3.9 Revitalised suburbs and wellbeing communities

The plan aims to create more vibrant places and revitalized suburbs where people want to live welcoming places and centers with character and vibrancy that offer a sense of community and belonging, focusing on the local infrastructure, built environment and open spaces that make Sydney a great place to live and promote the health and wellbeing of urban communities.

Research found that focusing new housing within Sydney's established suburbs brings real benefits to communities and makes good social and economic sense, lowering infrastructure costs, reducing commuting to work between places and giving people more time to relax. Moreover it will reduce the impact of development on the environment and protect productive rural land at the urban fringe, limiting sprawl. Less driving means less traffic, less pollution and people enjoying more exercise; while local businesses benefit from having more customers close by and the wider population benefits from better health outcomes.

The Crime Prevention Through Environmental Design Guidelines established principles that can be applied to the design of centers, streets and other public places. The aim is to minimize the opportunity for crime through surveillance, providing clear sightlines between public and private places, access control, channeling and grouping pedestrians into target areas, territorial reinforcement,

encouraging people to gather in public spaces, and space management, providing activity coordination and site cleanliness.

In order to promote healthier urban development, improve community access to recreation and exercise and encourage social interaction, a city-wide grid of green and open space will be introduced with the "Green Grid" strategic approach. The plan aims to improve the quality of green spaces and create an interconnected network of open spaces and parks, tree-lined streets, bushland reserves, riparian walking tracks and National Parks. It will also encourage innovative uses of these spaces from bushland renewal to outdoor theatres and stimulating children's playgrounds.

4.3.3.10 Revitalised suburbs and wellbeing communities

The plan seeks to build a more sustainable, resilient city that responds to the potential threat of natural hazards such flooding and bushfires. As the city grows, good urban design and planning will be more critical than ever to make the city's built environment sustainable and energy protecting the environment.

A strategic approach to managing long-term biodiversity and promoting environmental resilience as housing and economic development occurs will have greater benefits than site-by-site decision making.

The Government will invest in areas of high conservation value and protect the biodiversity through biodiversity certification, which provides planning authorities with an efficient biodiversity assessment process for areas marked for development, along with a range of options for offsetting the impacts of development on biodiversity. The government will prepare a strategic framework for the Metropolitan Rural Area to enhance and protect its broad range of environmental economic and social assets.

PART 5

Conclusions and Outlines

The final chapter of this thesis is an attempt to express a few considerations regarding relevant findings of previous chapters and successively is aiming to present some reflections about the topic of urban sprawl in the city of Sydney. It will address how the original research statement and objectives of the thesis have been met.

The analysis of the theme undertaken in this paper will lead to the final conclusions, based first on the current condition of Australian urban sprawl along with the efforts by the critics and government to manage it, and secondly on the personal impressions that, through the research, came to light.

Finally, unsolved and unsettled issues will be mentioned in order to suggest further detailed studies and investigations based upon findings in this study.

What is clear at this point is that decentralisation has been a phenomenon in common to all those countries that experienced an expansion outside the borders becoming bigger and leading the territories around. In some countries it has appeared very early in the 20th century while in other later in the century, somewhere became predominant as in United States while in other areas manifested less and has been faced with rigid attempts to counteract it, in some cases it was driven by prosperity along with the interest in finding a less crowded, greener and broader area to build the own house and in other it was induced by the arrival of immigrants occupying the inner centre. The decentralisation, where merging with a less dense house settlements and the compulsive use of the car despite of public transport, has led to the occur of the urban sprawl.

Urban sprawl versus urban densification is a debate that has been raging for decades and dominated academic and popular urban planning discourse: on one side it is supported the theory of expanding at the edges developing sprawl, providing a greater choice of living locality, offering access to more affordable housing and giving the space for privacy and raising family and on the other side the increase of the density is promoted contesting that low urban density is inefficient, not sustainable and problematic for health and environment.

Australia is one of those country where urban sprawl occurred, afflicting the largest cities, including Sydney. Driven by the flourishing industrial and tourist activities, the presence of amenities and services, the high quality of life, the general richness and well-being, Sydney become soon one of the fast-growing population in the Western world gaining people from the rural territories and small villages.

The city experiences an increase of population averaging +1,1% every year, while the outer suburbs accommodate the 46% of the Sydney's growth, and consequently sprawled considerably out of the boundaries. Furthermore, private vehicle use mode share of employment for journey to work is three times than the public transport use, especially in the outer suburb where has reached the 76% of the total. Consequently, the job need boomed.

The recent and current plans managing the growth of the city for the next 20 years have two main goals: initiate a process of urban consolidation and create a networked and connected city.

The current "A Plan for growing Sydney" aims to counteract urban sprawl at the edges, commencing a policy of urban consolidation, with the intention of create higher density housing in existing urban areas reducing the demand for greenfield development and improve the long-term sustainability of the city.

The current situation of the city is a clear contrast: on the east side, the inner centralised suburbs is globally connected within the city's network; in the medium suburbs the links to the city's network is slowly emerging; the outer suburbs are potentially disconnected with fewer high value economic concentrations. The second plan's aim is to maximize the use of infrastructure service and promote the public transport.

The plan is focusing on the "Global Economic Corridor" connecting Sydney CBD with Parramatta new CBD and comprehending other fast growing centres; on the Badgerys Creek new airport, improving new transport connections and enhancing

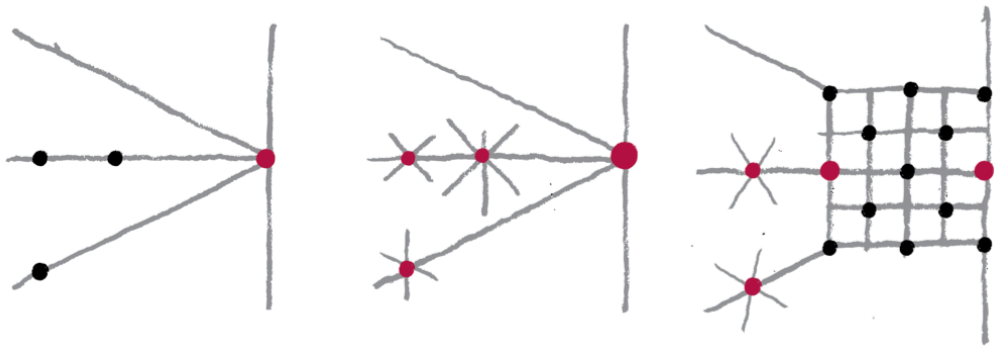
new western centres; on the attractiveness of the Sydney CBD as an international tourism destination also enhancing the "Cultural Ribbon".

Parramatta, from being considered part of the Outer Sydney has now become a centre of metropolitan significance and the Sydney's western CBD. As the growth is still on-going, a critical mass of investment is needed to provide houses and jobs. Consequently, Government is enhancing resources of the Greater Parramatta and Olympic Peninsula as the new corridor for both house and job provision.

Western Sydney, as being broader and more recent in time, lacks of public transport and consequently people prefer car. Through investment in transportation and infrastructures, Government will ensure jobs closer and easier-to-reach from home. The new airport in longer term will transform and drive future investment and jobs growth in Western Sydney, generating new employment opportunities giving residents the access to jobs close to home and directly link Western Sydney with global market.

The uniqueness in Australia of the "Global Economic Corridor" will be the base for further investments, extending it to other economically growing centres. The plan will also create clusters with mixed economic and social activities around transport network and feature major public investment in services. These centres form a network of transport-connected hubs helping to make Sydney a networked and multi-centred city (***Figure 5.1***).

Figure 5.1 – Networked and multi-centred Sydney structure

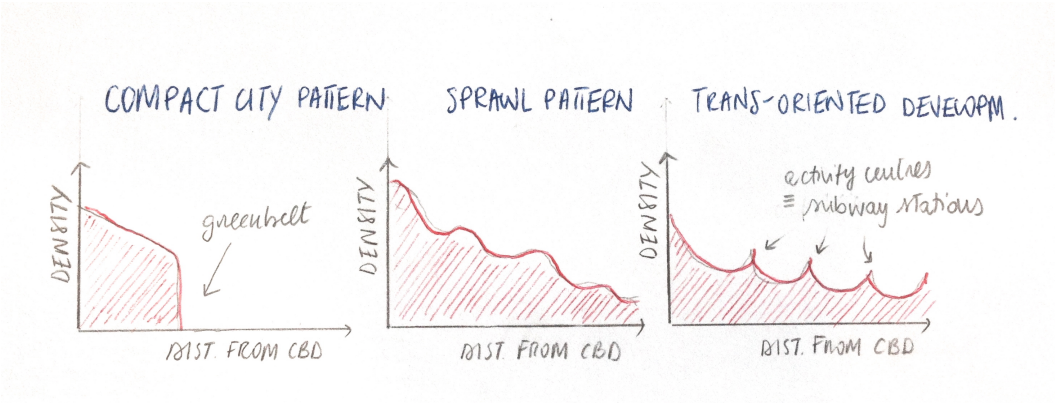


What comes to light in the previous focus upon the dimensions of planning for Sydney are the urgent initiatives for urban consolidation emanated by the Government. The plan innovations relies on the fact that, realizing that at least 70%

of future population growth in Sydney will occur in established areas it requires a strong commitment to match growth with existing and planned public transport, so the Department of Planning and Transport NSW working together with the Sydney Metropolitan Development Authority will ensure that existing transport infrastructure is best utilized and Sydney's population has the greatest opportunity to access key Strategic Centres within 30 minutes of home by public transport.

The thesis has identified that, in the broad international debate regarding urban planning between urban sprawl and compact city, Sydney identified Transit-Oriented Development as the specific type of urban consolidation process. In fact, although the attempt is to boost urban consolidation inside the current borders of the city, the Department of Planning and Environment is specifically encouraging development around transport nodes (***Figure 5.2***).

Figure 5.2 – Transit-Oriented Development structure



This modern concept, where rail, bus and ferry public transport can anchor a more environmentally responsible and socially responsible urban form and help achieve more sustainable outcomes, has become part of Sydney urban planning practice. In addiction to the proposed surface heavily rail network extension in North West and South West Sydney the new "Sydney Metro" lines will provide a strong additional focus for the TOD in existing urban areas of the city.

When expressing consideration regarding urban consolidation it should not be forgotten the extremely low density of Australia that suggests a further interpretation of the topic: compared to other major countries facing the issue of urban sprawl as United States with 32,97 people/km^2 or United Kingdom with 228 people /km^2 due to lack of land, Australia with its 2,34 people /km^2 could provide land for future outer development without any problems. The fact that nationally and locally in Australia

and in the city of Sydney the governments have emanated solid plans for urban consolidation based on Transit-oriented Developments demonstrates the intentions and efforts to make the city become well connected, less-dispersed, quick and easy to move. It clearly comes to light the political aim to confer structure to the detriment of urban sprawl.

The thesis has also identified that, previously-called "outer suburbs" area in the west of Sydney now is become the priority area of investment of the current plan. The Western Sydney, instead of being considered unprofitable for the city, now has become crucial for the future of Sydney, that delivers to western centres the chance to specialize in precise areas. In fact, what is evident is that the Outer suburb has played in history several roles and attracted different social entities. First it has been the destination of nobility seeking for the second house for summer escape, then it has become the most profitable area for industry and commerce due to broader space while a process of centralisation was occurring, then it has turned to be destination of greener and quieter houses agglomeration investment, and now it is in the top of the list of the priority of the Government.

A third aspect the thesis is supporting is that, despite intense efforts in urban consolidations around inner centres and crucial nodes, as a consequence of the strengthening of the new Greater Parramatta, the corridor between Parramatta CBD and Sydney CBD is naturally going to become the most profitable location for developing houses. Sydney at current time shows a huge numbers of daily commuting from house to work, suggesting that the place of work is located far away. With the reinforce of the Sydney CBD and the creation of the second CBD in Parramatta, the 20 kilometres are between them is fated to become objective of a strong attractiveness. Moreover, the destiny of the double-centred city of Sydney bring to light a new concept of the city: not anymore a centre with its periphery but two different cores with concentric rings, that overlapping create new dynamic strengths and corridors. The government intention to create a new medical and nanotechnology centre in Parramatta CBD seems to follow the European examples of Lyon and Munich, that recently have created in their suburbs medical highly-specialized centres, and consequently another pole of future expansions.

This thesis has also identified a social elements threatened by urban consolidation and related planning process, called "sense of place", recognising the emotional relationships that are established through existing cultural elements and

how they affect residents' sense of belonging. Urban consolidation is a rapid stimulator for change affecting existing built and the residents' connection with it.

The thesis is addressing that the consequence of urban consolidation may have been underestimated by politicians and planners, as it decreases the sense of place of residents. Planners need to anticipate and recognise the socio-political factors that are at work in local communities to nurture the existing sense of place, as well as foster acceptance and adaptation to the new; The impact of urban consolidation is place specific[466]. Through a research made in the middle-ring suburbs of Lindfield East and Oatley West in Sydney, it has been assessed that urban consolidated developments are perceived as a threat to residents' sense of place, due to the abrupt change to the built that is altering the socio-cultural aspects of the suburbs at a fast rate[467].

In conclusion from the case of Sydney appears that the thesis of Fishman may be confirmed: as the new traffic networks, communication and the production have been started growing, the logic that has led to the creation of complex central structure has recently been pushed away. Nowadays the centrifugal trend is leading the centripetal one, consisting in urban consolidation policies and the shape of the cities is consequently enlarging, passing over the borders and occupying the farer land. This trend is shared in all worldwide cities that have experienced a high level of wellbeing and overcrowding, and suggested to Fishman the definition of "global suburbs"[468].

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When your backyard opens onto the bush, you don't want to lose it.

Janet Harwood is a migrant fearful of what she sees as a new philosophy - over-development - and population growth at any cost.

"If the majority (of) the world's population is going to live in urban areas in the future we need to start protecting areas of existing forest now", she says.

Originally from India, Janet knows overpopulation. Convinced that stronger and fairer planning laws to stop the bulldozing of forests, for new homes and more people across the highway, is the answer.

The Minister for Population and the Environment says there are plenty of challenges to be faced.

"There are examples of good planning at a local government at a state level, there are also examples of appalling planning", Minister Tony Burke says.

Population growth affects the environment, jobs, housing, transport, roads and infrastructure.

Nine in ten of us live along the coast, and are feeling the squeeze.

"The things that you need to do about population growth ... are the things that politicians should do anyway", says economics expert Dr Oliver Marc Hartwich.

"It is quite tragic, I mean you see what other countries are achieving in very short periods of time - building new underground lines, building new high speed rail lines. And we are still dealing and arguing endlessly over four kilometres of railway land in Sydney, I mean it's ridiculous."

Australia's 22. 7 million population is growing at a rate of 1.6 per cent.

Since fertility and mortality are difficult to change, some believe the answer lies in lowering migration, currently set at just over 168,000 each year.

" I would like to see our humanitarian intake doubled... but I would think our immigration should be about 70 or 80,000 a year", entrepreneur Dick Smith says.

COUNTRY OF IMMIGRATION

After riots on the Gold fields came the infamous White Australia policy to limit numbers.

After losing more than 100,000 people to two world wars, the government launched it's first migration program - "Populate or Perish" - concerned with having enough numbers to repel an invasion.

Then, more than a decade later, came the 'Bring out a Briton' programme - better known as the "10 pound pommies".

Since 1945 Australia's multicultural policy has welcomed in more than seven million migrants: A number still rising.

At least one in every four Australians was born overseas.

Today, our biggest numbers of arrivals are from India, closely followed by the Chinese. From cross the Tasman are New Zealanders in third, then In fourth place - the British. Next, the Koreans.

Many insist that cutting migration will hurt the economy.

"We have massive labour shortages in Australia at the moment...We've got a pipeline of hundreds of billions of dollars of new investment that's looking for workers that's able to get it off the ground", Hartwich says.

But according to businessman Dick Smith, we're not very far away from trouble.

"Because you can not sustain perpetual growth in the uses of resources and energy - it's a finite world."

The Harwoods would agree with that.

Non-app viewers - Check out Peta Jane's web extra below, specifically on the environmental concerns of Janet Harwood and her daughter.

Second interview:

The Red and the Black Architect (2012) "The urban sprawl debate" , on https://theredandblackarchitect.wordpress.com/2012/06/14/the-urban-sprawl-debate-part-1/ consulted the 12th May 2016

Urban sprawl and the urban growth boundary designed to control it, are a hot topic of debate for Melbournians. The Victorian State Government announced yesterday that it would increase the urban growth boundary by 5858 hectares to accommodate 6 new suburbs. To help understand urban sprawl and the surrounding issues, I will attempt to explain the driving influences and common ideas and arguments

Similar to an Essendon versus Collingwood blockbuster, the urban fringe debate has two distinct camps, pitched against each other not willing to give an inch. One side sees the opportunity to build a new house in a new suburb on the fringe of Melbourne as a right, or in some cases even as their only choice. On the other side, players cite environmental, social and economic reasons for their unfaltering position against sprawl.

What is driving urban sprawl?

Urban sprawl is driven by the search for ever cheaper land. Developers want to find more land to sell to the public and the public eat it up. Not only does it look like a cheaper option, but many Australians also have a cultural desire for low density housing.

The middle suburbs of Melbourne grew out of the expanding tram network, which allowed workers to find cheaper housing on the outskirts whilst still commuting to the city. The rise of the automobile allowed this phenomenon to continue to the city we have today which is almost 100 kilometres wide.

What are the arguments for continuing urban sprawl?

The primary argument for continuing the sprawl is that it is essential for keeping housing prices affordable. On the surface it is easy to draw this conclusion. Restrict new land for low density dwelling construction and the price of such homes will increase. This assumes that demand for detached low density housing is a constant. Even if this were the case, the argument right at this moment is not a particularly strong one. This is because of two reasons. Firstly Melbourne's population growth has reduced significantly recently which has a direct impact on the demand for new housing. Secondly with the possibility of a second GFC looming, house prices look likely to continue to fall for some time.

Another common tool in the argument of the pro sprawlers, is their imagined alternative. Spruikers of low density development present the alternative as a high density city like Tokyo, with homes the size of caravans. This argument is saying that because one extreme is bad the alternative extreme must therefore be good.

Perhaps the most logical argument for low density housing is that some people enjoy the lifestyle associated with it. Indeed in a recent Grattan Institute Report it was found that 48% of Melbournians have a preference for detached houses over other forms of dwellings. However the report also found that Melbourne housing stock in 2006 was 72% detached houses. It also found that 68% of the new dwellings constructed between 2001 and 2010 were detached houses. This to me suggests that new supply of detached housing should be curtailed to more closely match our dwelling preferences.

What are the arguments for restricting urban sprawl?

Environmental sustainability is a very common reason for people to oppose urban sprawl. This argument draws upon several factors.

- *Heavy reliance upon private motor vehicles and therefore fossil fuels*
- *Higher energy usage by detached houses (despite 6 star requirements)*
- *Land clearing*
- *Embodied energy in roads and infrastructure*

The second key argument is that living on the outskirts of a city in low density dwellings, have a significant impact on the health of those living there. The reasons for this are

- *With more time spent commuting to and from work, people are less likely to find the time and energy to eat well and exercise causing higher risk of obesity, diabetes and heart disease.*
- *Medical services such as hospitals are further away and emergency ambulances take longer to arrive.*
- *Greater incidence of motor vehicle accidents and trauma due to a greater duration spent in motor vehicles.*

Often people living in low density dismiss the health argument. They claim housing type doesn't make people fat, not exercising and eating rubbish is doing it. They're right that housing is not the only contributing factor, but it's important. My counter point would be that not all people with asbestos in their homes will develop symptoms either. Clearly asbestos in dwellings can be harmful to a significant percentage and therefore as a society we banned it.

The final argument against urban sprawl is the social fragmentation and class division that further sprawl will be creating. The people who have low incomes look at these outer suburbs as a low cost affordable housing solution. What they are really signing up for however is in fact far more expensive.

On average, workers who live in the outer suburbs commute two and a half times further to get to work than their counterparts who live in the inner city. Using RCAV data costs for running a medium sized car and supposing an additional 20 kilometre each way daily commute, the additional travel expenses equate to a weekly travel bill of approximately $140. This weekly expense is the equivalent difference between paying back $300,000 home loan and paying back a $375,000 one over a 25 year period.

So what is the R+BA solution?

Firstly we need to fix the urban growth boundary from now until substantial progress has been made on the infrastructure which is required to make outer suburban living sustainable such as public transport. This mechanism needs to be managed in such a way that the continual political changes every few years don't impact on the long term goal.

New low density dwellings should be built fewer in number and within the now fixed urban growth boundary. They should be built primarily in the north and the west where they can be closest to the city. It is not economically feasible to turn this industry off like a tap and so there needs to be a staged transfer from building low density dwellings to building moderate density ones. Medium and high density dwellings will need to be designed and constructed to a higher quality to ensure the current swing to higher density preferences continue.

We will also need to do our level best to fix the sprawl we currently have. This is done by working towards better infrastructure, particularly transport infrastructure. This will be a big task and probably take many decades. The simple fact is that infrastructure costs a bomb. There has been talk of a train stations at Rowville and Doncaster for decades, yet no government has been able to come up with the goods. Many believe that the 'greedy' developers should pay for this infrastructure in its entirety. The problem with this is that the numbers simply do not stack up. Developers already pay contribution fees for some

infrastructure (ie roads and street lights) but would simply walk away from the deal if they had to pay ten times the amount for a train line and station too.

This debate is about setting the path to the brightest future possible. It is not good enough for one side to blame or alienate the other. In a democracy there needs to be debate and the more educated that debate is the better.

Third interview:

Recsei T. (2006*) "Troy versus Newman", Save Our Sydney Suburbs (NSW)"*, in *"Save Our Suburbs – for Sustainable Living"*, Sydney

Michael Duffy: *Let's begin with a subject closer to our own backyards and that's the changing form of our cities where, in some cases, outwards growth has been restricted and replaced by upwards growth; townhouses and flats. Sydney leads the way and in the past decade about 70% of new housing has been built in existing suburbs. It has become a hot issue elsewhere, especially in Melbourne more recently.*

Today we're going to talk to two experts with opposing views on this. Professor Peter Newman is director at the Institute for Sustainability and Technical Policy at Murdoch University in Perth. His books include Sustainability in Cities and he's been involved in the strategic plans for three Australian cities. Patrick Troy is emeritus professor from the Australian National University and his books include The Perils of Consolidation.

Welcome to the program both of you. Peter Newman, can I ask you for a brief opening statement; what are the main reasons you believe we need urban consolidation?

Peter Newman: *I think that the key is that we have an unbalance in our cities. Eighty to ninety per cent of our suburbs are car dependent and the opportunities for living and walking in transit based suburbs are increasingly where the market is pushing so that people can have easy access to services and employment and all of the good things that a city provides without being so dependant on a car. So it's a matter of balancing what is available. At the moment we are very car dependent and the key thing is to be able to find opportunities for people to live with more urban services nearby, and that is a very real market demand which is driving the processes back inwards.*

Michael Duffy: *One of the implications of that seems to be that people will have to live in smaller houses than they have traditionally. Is there a market demand for that?*

Peter Newman: *Very clearly, and the problem is that much of the market is very structured around the project home which have been getting bigger and bigger with fewer and fewer people in them, and yet the market is for smaller places. I've had a number of people say to me, 'Look, I've had to buy a larger house than I really wanted because they're cheaper.' The strange thing is that we just aren't providing enough of the opportunities for people to live closer to things and that does mean smaller places but it's not necessarily going to have a poorer market for it. There is a substantial and growing market for that smaller place, near things.*

Michael Duffy: *Patrick Troy, can I ask you what you think? Do people actually want to live in denser housing?*

Patrick Troy: *No. One of the great fallacies of this argument is that we know that 80% of the population who live in houses want to stay in houses, and 85% of the population who live in flats want to live in houses. So the argument that there's a big demand there for people who want to live crushed up on top of one another is nonsense. They are basically being forced*

into that situation at the moment, and I should also remind you that the form of the housing does not in fact predetermine whether or not a place is car orientated or not. Australian cities, when they were more public transport orientated, were actually at a lower density than they now are. So the argument that it's just a density issue and that that's primarily related to the car just does not connect with what is going on. Part of the argument that you can reduce the dwelling area or the area in which people live their residential lives, that you'll somehow reduce the size of the city, totally ignores the fact that the area of the city taken up by the residential development is around about thirty to thirty-five per cent, depending on density or where you are in that city. The great bulk of the area of the city, which is what determines the travel distances and so on, is taken up by the demand for open space for playgrounds, golf courses, football fields and also for parks and other preserves, but it's also taken up by large, extensive, flat kinds of industrial estates which we now have rather than...formerly we had high density, high rise industrial concerns which were organised that way because that was the cheapest way to get the energy needed for their manufacturing processes.

Michael Duffy: *Peter, can I ask you what you think of that idea? Do you think the people are on your side?*

Peter Newman: *I've been looking at these preferences for housing statistics that have been around for a long time, and they always reflect the proportion of high density that is available. So that's always been a higher preference in Sydney because there's been a higher amount of it. People generally adapt to what they have available, but the key thing is that that proportion has been going up considerably in the last 10-20 years. The younger person who is faced with the prospect of living 50 or even 80 kilometres out without access to the kind of services that they are looking for and employment opportunities is increasingly very happy to get an apartment close in and near to the kind of urbanity that they're looking for.*

Michael Duffy: *Okay, let's run through some of the environmental claims made for consolidation, and I'm not sure if you agree with all of them, either of you, but you can tell us what you think. The first one, the most basic one you sometimes hear is that urban sprawl (as it's called) is a bad use of land for environmental reasons. Patrick, your view on that please.*

Patrick Troy: *Properly defined, urban sprawl is a bad use of land but that's not what we've got. We don't actually have what is technically urban sprawl, we don't have development which gets ahead of the provision of services, and we haven't actually had that for over 60 years. So people use this very, very emotionally loaded word to prosecute a case which they can't sustain any other way other than by raising these emotional issues.*

Michael Duffy: *But in colloquial terms, people in Australia...when they say 'urban sprawl' they just mean the endless spread of the cities which is happening.*

Patrick Troy: *I would prefer to call it a lower density development rather than sprawl. Sprawl actually has a special meaning for most planners in most environments, and certainly we just borrowed that term, misused an American version of it and applied it to the Australian debate, but that's not where we are at all. A lot of the presupposition behind this argument that you will have an extensive city is actually a function of the structure of the city, not the form of the city. So if you actually have all the activities highly centralised, then of course you're going to get people wanting to come into those cities, but they'll only do that for a short phase of their life. The fact of the matter is that home ownership rates...the owner/occupancy rates of flats is significant...about less than half what it is for houses. So that tells you something else about the preference functions that people have; when they choose to settle down or when they finish their roaming around, they choose to have a house...they want to go for a much more traditional house and garden, and a very high proportion of those people who do stick with a flat in the centre of the city actually have another house up the coast or in the mountains where they really do spend most of their free time. So they're not actually locked into that central city location in the way that is suggested*

that...you know, that there is a big clamour for people to go into high rise accommodation. That's just not the case.

Michael Duffy: *Peter, can I bring you in here? I know you've suggested that there be no more land releases in Sydney after the two current very big ones. Do you think that, for environmental reasons, the city should not extend beyond a certain point?*

Peter Newman: *I think that you have to look at it case by case, and in Sydney those land release areas are essentially the last part that ought to be developed without infringing on to substantial agricultural and bushland areas that are very significant. But they have been carefully designed. As Pat suggests, they're not sprawling out willy-nilly, they are actually planned, but they are planned car dependence generally. We also do have leap-frog developments occurring and certainly the central coast and a lot of the coastal sprawl in Australian cities which are going further and further out is very unplanned and is our example of what leap-frog oughtn't to...*

Michael Duffy: *Can you just tell us very briefly for our listeners what you mean by leap-frog developments?*

Peter Newman: *It means that instead of fitting on to the end of the last suburb and using the infrastructure that was built for that and just extending it, you go out further and then you have to provide that infrastructure, and generally it isn't. So you basically have houses stuck out there without the kind of bus services and sometimes not even linked in properly to physical services. So it's a question of tying in to the provision in an orderly way of infrastructure, both social and physical, and that's what good planning does. But my key thing is that you can do that in a planned way or an unplanned way and my suggestion to Pat and others is that we do need to have a balance, we do need some further development on the fringes, but we have to try and keep that to a minimum and make sure that we are using the areas within the city as much as possible. The problem that I have with Pat's approach is that he just doesn't seem to want any of that, and many of the people in the anti-density movement, they freeze up as soon as there's anything over two stories proposed.*

Michael Duffy: *Could we now move to the...*

Patrick Troy: *Before you move off that, it's a pity that Professor Newman sets up a straw man to argue that people are opposed to anything over two stories; for example, his latest idiotic suggestion. That is just not the case. He should know that all good planners who are concerned about both the equity and the environmental concerns of our urban development are totally opposed to the sprawl development along the coast, we are totally opposed to the misuse of good quality land used for agricultural and food production, generally speaking, and none of us would want to have just unplanned, open development. But that's not the only issue; if we are talking about accommodation of people, we've got to actually have a population policy, we've got to have a population distribution policy, we've got to say how many people should be in Sydney and what do we do if the population increase is going to still keep going on with government policy the way it is. Where do we accommodate them? We don't just assume we can throw them into Sydney and just rack them up in multi-storey blocks of flats and that'll solve the problem. It certainly won't.*

Michael Duffy: *It's one of the problems with this...is that it's more of a national issue, whereby it's the state governments that have to cope. And talking of state governments, can we talk about public transport for a moment? Peter, what about the use of energy? Does consolidation help things like use of public transport, pollution?*

Peter Newman: *We've been studying the question of transport and energy use, particularly oil which is a major issue now with the peak oil now being seen to be a major determinant of our future, so we do have to come to terms with that. We find that if you lived in the city of Sydney, for example, you would use less than 10 gigalitres of energy for transport...I could convert that to litres I suppose, but just see the comparison; if you lived in the inner city in*

general it might rise to 15-20, the outer suburbs are around 30-40, and out on the coasts or the ex-urban areas of the Blue Mountains, central coast, out on the western Port area of Melbourne and so on, you're in the 40-50, even 60. So you're talking six times what you would have in the central area. What we find is that it is possible to develop cities in the suburbs so that you can actually reproduce that opportunity for people in the area where they perhaps have lived or want to live close to the kind of bushland or river areas that they've grown up with and live in an urban kind of location with apartments and so on and have considerably reduced car dependence, and therefore fuel use and air quality issues follow. So it is possible to reproduce that kind of inner city lifestyle in certain specific centres out in the suburbs. It doesn't mean you roll them all over, and I do oppose that kind of infill that happens willy-nilly. It's the same as Pat is opposing the urban sprawl which is willy-nilly, I think we all do that too. So you want to try and focus it and therefore make public transport operate so much better and have the opportunity to be able to walk to certain key things in the centre.

Michael Duffy: *Can I ask you, Patrick Troy, does that make sense to you? Does densification lead to better condition in terms of the use of public transport?*

Patrick Troy: *No, it doesn't. That's one of the fallacies of...it's kind of basic physical determinism which went out with button boots. This is a much more complex set of issues. People have always wanted to travel wherever they wanted to travel under the conditions of comfort and security of their choice, and they've always sought to do that as their economies and the wealth and standard of living has increased. So the idea that we're going to somehow turn the clock back and prevent that runs against not only the development of individual preferences but the way we've actually organised our society. People have got to shift to different jobs because they've got to have several part-time jobs rather than one...you don't now have a career expectation to be in the one place for the rest of your life. You've got to move about all the time. You've got a totally different manufacturing and distributional base which involves different kinds of outlets where you might have to go to different places to secure whatever things you're interested in, whether it's recreational or shopping and so on. So the idea that you're going to be able to do this and have all that flexibility off the public transport system is nonsense. Now, we can agree that there is a problem about the oil supply and its future...well, its failing, there won't be a future for it. But we also have to acknowledge that there are other technological solutions which are coming along which we must not shut out but see what we can do to make sure that those opportunities are taken up as and when they arise. So the idea that it's just a question of getting people to live at high density and that will somehow deliver an urban lifestyle...I find that really...*

Michael Duffy: *Are there overseas examples we can test this against, or is it all theoretical at the moment?*

Patrick Troy: *What we do know is that even in the oldest cities in Europe which were dense for a historical set of reasons, largely to do with defence because they were built inside walls and so on and there was a high degree of control over the land, those same cities now are expanding outwards and have the same kind of suburban developments that we see in Australia. That's what you get around Paris, that's what you get around Berlin, that's what you get around all the big cities in Germany and other big cities in France, it's what you get in England. So the idea that it's just density that will deliver you the urbane lifestyle...it is a very dangerous simplification of what is going on and what are the aspirations of the population.*

Michael Duffy: *I'm afraid we're going to have to leave it there, we're out of time, but thanks very much to both of you for coming on the program.*