City Futures

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Abstract

A short perusal of the concept of "future", its ambiguous relationship with the present. Feed-back and feed-forwards. The craving for certainty and the answer of religions, insurance companies, business, statistical projections, game theory and scenarios.
A tentative proposal for a "structure of the future": continuity, change, shift.
The future of the city as the necessary but (un)predictable outcome of its present culture, the "urban mirror". How everyday life and everyday choices actually shape the future of the city. The three main challenges ahead: air, water, energy, and their consequences on ther urban landscape.
Methods and techniques for long range forecasting, a new way to perceive the future: A-Societies.
Perth: Future Perth scenarios and their implications on the structure of the city.

The next twenty years

In twenty years time two thirds of the World population will live in cities. The energy crunch and the transition to the "non-oil" era will make the challenge even more demanding, crucial and "interesting".
Whatever actually materialises, (the rosy picture of Amory Lovins' Natural Capitalism, or the gloomy one of Jay Hanson's site dieoff.org, New Renaissance City or Blade Runner City) will, most probably, to a large extent, be a result of what we are able to think and set out in the coming five to ten years. Each geopolitical situation will require specific vision, tools, strategies and technologies. Different cultures will be confronted with the same basic challenge.
Large cities in the World already have serious environmental, social and management problems and none of them is even nearly "sustainable": Their ecological "footprints" cover entire regions and, in many areas, the environmental damage is irreversible. Energy, transportation, water, solid waste, sewage, air pollution and climate pathology, social tensions and conflicts - all of which have already reached near catastrophic proportions - will demand strong management and innovative technological responses. The assumption is that only a consistent, comprehensive set of design professions will be able to meet the challenge, bridging the gap between vision and practice.
The problems have historical roots and planetary repercussions, but they require keen local attention and specific political, social, and technical solutions. Whereas

dramatically lacking is cultural and political awareness and credible political leadership. The present interpretation of "democracy" will be challenged: in fact a challenge which is long overdue.
The most serious limitation is the lack of an economic paradigm to represent, and deal with environmental assets, values and exchanges. Currently established macro-economic disciplines and procedures ignore environmental costing and accounting. Worse still, the value of the environment is neglected as an "externality" by current economic practice: a situation that is responsible for the present deadlock.
The United Nations, the World Bank, the International Monetary Fund, the European Union, the United States and many other Institutions and Governments have been promoting awareness and consciousness of the problem of the "city" for decades. The debate and discussions originated in academic and scientific communities have produced some of the most commendable literature and compelling suggestions for the interested professions and political responsibilities. Apparently with very scarce practical consequences to date.

The future

Human beings have always been fascinated by the future: the tools and the ability to predict future events and the consequences of present actions have always been sought and dearly paid for. Humans want to know the future because they crave certainty: insurance companies make money selling certainty in this world, religions draw their power by offering certainty in the next.
It is a general assumption that the present is better controlled if you have a good vision of the future. This is not necessarily true and is sometimes also dangerous. The reverse is another interesting truism: the future is better controlled if one has a good knowledge of the present.
A strong vision of a given future may cause a lot of frustration and chaos in the present, whereas a deep involvement in the knowledge of the present may not necessarily be conducive to a clear vision of the future.
Present and future are connected by an ambiguous system of feedbacks and feedforwards: the roots of the future are indeed in the present, while the present is in many ways informed or deformed by the futures that we wish for.
Since the time of ancient oracles and fortune-tellers, the art of predicting the future has progressed, with models and scenarios based on probabilities, game theory and their sophisticated mathematical algorythms fed to extremely powerful electronic data processing tools.
Not much progress, in fact, and deceitful if we consider the continuous, surprises that we are confronted with on a daily basis.
The future is a deceptive genius. It is always and repeatedly the most logical and banal development of the present situation, but the consequential logic connecting the events appears clearly only after the events have actually taken place.
It is probably true that, even if we were given a precise sequence of future events by some divine entity or by an incredibly powerful computer, our vision of the future would be different but arguably any better than the perception we have now. Our rationality is strongly biased. We have a tendency to discard or underestimate the "data" that we do not like or are not prepared to accept and we introduce values which are influenced by our personal feelings.
In fact, the perception we have of the future is dominated by the present and by personal contingencies. It is related to culture, to feelings, to social and individual behavioural patterns.
Thus our behaviour will always be guided by the vision of the future that we can comprehend and by the reaction to it that our brain is capable of. Our reaction capability is our only effective ability to make consistent decisions and to act in order

scenarios help our assessment of the vision of the future, but they are not sufficient. Sometimes they can be a hindrance. This is why we can say that the "future" is a political matter.
Our ability to plan and make decisions is limited to the future that we are able to perceive, and our reaction to events placed in a future beyond that range of perception will be severely biased by contingent pressures. In some instances, the reactive capability of our brain is limited by our direct participation in an event and we remove from our mind conditions that imply our destruction. What is true for individual behavioural patterns, seems to be also true for collective patterns of conduct. This may very well be the reason for the difficulty in setting up a responsible course of action to check the ongoing environmental catastrophe or to control the demographic time-bomb. The system "rationally"protects itself, with catastrophic consequences, by completely dismissing the dangerous issues: clearly a suicidal pattern of genetic conduct dominated by our unique ability to rationalize.
Qualitative and time categories define our system of priorities, the weight of these two parameters being governed by complex, social and psychological interactions, with time generally dominating. Information may also change behavioural patterns. Our vision of the future and social cultural awareness are influenced by information in a whimsical manner. Hence the uncertainties and contradictions inherent in our perception.
Vision of the future and ways of reacting to perceived future events may be very different for individuals and for groups and they may also vary with time, yielding different values, misunderstandings, conflicts and confrontations.
The problem is to promote both the vision of the future and the conditions for a cultural awareness of it. A vision of the future without consistent social awareness is like a painting in a place where there are no eyes to see it.

A possible "structure" of the future

An organised mental approach to the future can be useful to systematic speculation: with the obvious warning that the "organised" way of thinking does not necessarily lead to a more reliable image of the future. It does, however, lead to a more orderly way of thinking. If we assume the "present" to be "A" and the future to be "B", the process that develops "A" into "B" is generally characterised by:
- **Continuity**
- **Shift**
- **Change**

That is to say: the future is the continuation of the present situation with shifts that will eventually result in changes.
Continuity: nothing "stops", there is no pause for "resetting". Whatever will happen is by necessity a continuation of what is going on now. So the first thing to do is to know and express in clear terms what is going on now. Since what will change is what is going on, it must go on in order to change: this is the inherent concept of continuity. What is not actually happening cannot change.
Shift: What is going on now also contains the germs of shift: it is because it's going on that it will change, it will shift because of the ways and modes of its present deployment and because of the environmental conditions that surround its happening. So the second thing to do is to find and identify the seeds of shift in the present situation. The limits that will influence the present operation, the internal or external conditions that may steer, accelerate, contain or override the ongoing process are hidden/related to its own operation. The seeds of shift are within: they are a peculiarity of the present. They may either be the "weak" elements that will yield or they may also be the "strong" elements that shall induce the shift. Or any combination.

stage sets in. The process is equipped with the appropriate changes to restore effective (or simply better) functioning. No "change" can usually take place out of "continuity" and in absence of "shift". But that can also be arguable.
The "changed" process or trend becomes the new continuity. U.S.W.
Warning: It is advisable to bear in mind that the three dynamics (continuity, shift, change) are not necessarily a sequence in that order. Shifts can take place accidentally or in a completely chaotic way. Even in the emergency of accidental changes continuity is not disrupted: by definition of continuity. (*private conversation with Sik Ay Tan*)

Note:
A few weeks after posting "City futures" on the website I was reading a collection of essays by Karl Popper (1902-1994) where I found these two bits from a lecture he gave in Bad Homburg in 1991 (Alles Leben is Problemlösen). There seems to be some correspondence with things I wrote in my paper and I think the reference could be useful to the reader:
"The future is absolutely open. It relies on us, on all of us. It depends from what we and others do and will do: today, tomorrow and the day after tomorrow. And what we do and will do depends on what we think, on our wishes, our hopes, our fears. It depends on how we see the World and on how we perceive the great opportunities available in the future...
Instead of posing as prophets, we have to create our own destiny. Learn how to do things in the best possible way, check our mistakes and learn from them.
But this means that we have to change ourselves."
"All our actions have unintentional consequences. Some of them, perhaps, could be foreseen, if money and work is spent in order to search and study. Some of the consequences cannot be foreseen."
Karl Raimund Popper
Lecture in Bad Homburg 1991

The city

"*City forms, their actual function, and the ideas and the values that people attach to them make up a single phenomenon."* (Kevin Lynch)
The city has been, throughout time, the most important and complete expression of the productive culture of a society, on the land and in the environment. Nothing is comparable to the city in terms of power, permanence in time, dynamic interactive provocation of its users and actors.
The city is Humankind's ultimate work of art.
The level, the extension, the intensity and the duration the involvement with individual and social subjects are the exceptional and powerful peculiarities of the city as a cultural expression. No other artefact, no work of art, or product of human intelligence or technology provokes levels of involvement anywhere near comparable: for hundreds of generations and for the length of entire individual lives.
Yet "the city" is so pervasive and present in our daily life that we do not detect its awesome cultural power. We feel the emotion in front of an important piece of art, or an important monument, but the "city" that contains them and that was probably the original motivation for their conception is taken for granted. Such is the power of everyday life patterns.
To understand why that happens, some speculation on the complex set of relationships between the form of the city and the "culture" that lives in it may be of interest.
It is an old story that form is related to the content of things by complex and abstract interactions. Another reasonable assumption is that discussion on this

our life and of any social organization. We live comparing consistency between forms and values, fighting for it or against, to understand it, overcome, defy, control or comprehend it. One way to trace the action of our existence is to read it as dialogue between forms and contents. The project of life is to design the way of living which most responds to our values.
While we carry out this design we challenge others, ourselves, the places and the moments in which the project develops and takes place. This notion can be referred to single individuals, groups, social structures and even to the entire nation and it is a field for continuous study and debate of many disciplines.
The city and its growth, the relations between such development and the cultures in the city itself, are a specific peculiar facet of the debate on form and content, because the city is the place that embraces the lives of millions for generations and for centuries.
The size of the investment absorbed by the city is not measured in terms of money (economic or financial) but in terms of history. How much is the life of a generation worth? This is why banks and financiers are not qualified to make the decisions of the city and why their decisions are usually wrong.
To understand the city, we must listen to and comprehend the common social will, or set of values, that is the prime mover of the complex dynamic flow of actions and decisions that shape the city.
The time relationship of the two evolutionary processes, the shaping of the city and the cultural values behind it, induce further complexity and conflict. It is impossible to read it in terms of here and now, because the development of cities takes place over generations and urban forms remain for centuries, while we have only one short life.
Each one of us lives in the city that somebody else designed and designs the city where somebody else shall live.
Thus the present form of the city is the subtle, but active way through which the past continuously struggles with the present and with the project of the future city.
It is not simple to learn and understand this historic commitment. We usually say "my city" and we mean by that something much more involving and intimate than the simple possessive pronoun can imply.
In fact, it is the city of my life. It is the city that, throughout its history, feeds, supports or counters my values; that continuously, directly or indirectly, induces my behaviours, actions and emotions.

Methods
In order to build a vision of the future we can set up "scenarios" with key-words and arrange them according to a specific goal or intention gauging each "key-word" consistently.
A general unqualified "scenario" will then be described by a set of key-words (the following sets are suggested as examples):
Population, Traffic, Income/wealth, Water, Energy, Jobs, Cultures, Welfare, Drugs, Poverty, Climate, Pollution, Freedom, Education….
Each main category can be broken down into sub-categories which could interact with other main key-words i.e.:
Population:
Age groups, Gender, Rate of Increment, Income, Education, Jobless, Drugs ….
The system can reach a high degree of complexity and the algorithms to simulate the whole picture may challenge even a very powerful computational structure.
A lot of work has been done in assessing the future, projecting the present trends with more or less sophisticated mathematical models. The projections may be "critical" and contain correcting functions in order to represent limits or assumed feed-back.
So the number of cars will be limited by the availability of space, the demographic

epidemics, etc. The conditions are, by necessity, a result of subjective evaluation and assessment. Sometimes there is a subtle loop because the conditions are already a "feedback" from the future as perceived by the institution or individuals responsible for the projection.
The danger of future mathematical modelling is in its intrinsic "deterministic" character. The present moves towards the predicted future as if this was a "program". The will of the people and of the political decision-making process is almost hypnotised. The future is almost "dictating" its own happening to the present. The "course" of the future is taken for granted and any alternative is neglected or unseen.
The strategy becomes fixed and the possibility of guiding the development is highly impaired.
It is difficult to integrate into such a model the "cultural" values that motivate a society: the dreams, the tensions, the fears. These can become extremely powerful and, in fact, can change the course of the conformist projections. This is why it can be said that "it is the dreamers that change the world".
Any model can be totally disrupted by surprise events: a typical and tragic example is the September 11 WTC attack.
Scenarios can also be the result of sophisticated panel debates: experts are called upon or interviewed and their "visions" are cross checked in an organized discussion scheme that eventually yields an overall picture where the different visions are mutually moderated or enhanced. It is amazing to see the results of this process that, if properly organized, can be a very powerful tool. Clearly the personalities of the operators, as informed or mature as they may be, will never cover the complexity of the real world.

A new way to perceive the future

Thomas C. Schelling in the late sixties, following his interest in segregated communities, started a research/game that consisted of defining a very simple A-society (Artificial Society) - say a population of red and blue coins simulating persons (agents) and organizing them on a board according to very simple rules: i.e. each agent is happy only if its four nearest neighbours on the board include at least a certain number of agents of his own colour.
What happens after a certain number of "runs" is always segregation, no matter what the given condition is: even when the initial assumption is the most integrated and open (i.e. only two neighbours of the same colour) running the shifts according to the individual preferences leads to a collective outcome indistinguishable from outright racism. As Thomas Schelling put it in his paper (1969): "The interplay of individual choices, where unorganised segregation is concerned, is a complex system with collective results that bear no close relationship to the individual intent."

A lot of work has been carried out on A-Societies since the early experiences of Thomas Schelling and his method has been applied to other situations (notably by Rob Axtell). The overall conclusion of the various tests was that: "Societies are like sand piles: complex systems whose next perturbation is unpredictable, but whose behaviour, viewed on a large scale and over time, follows certain patterns – patterns that the individual actors in the system (grains of sand or human beings) are quite unaware of generating."
The unawareness of "agents" and the specific unpredictability are the meaningful indications of this type of speculation.
So on one hand there is a consolidated science of forecasting or "futurology" based on mathematical simulation, projections, game theories while on the other we have this more vague theory that tells us that the general behavioural pattern of a system

actions can actually give way to unpredictable developments without any specific will or design of those responsible for them. Apparently a much more interesting future.

Perth

The Ministry of Planning has a specific Office systematically dealing with the Future of Perth: Future Perth Project.
I list in the appendix the documents published: a remarkable example of Governmental sensitivity to long range planning and "future thinking".
One of the documents published in November 2000 is particularly interesting: Scenarios of our Future: Challenges for Western Australian Society.
Four "scenarios" have been defined through a sophisticated research and I report here the summary description of them. A full account is given in the document published by the Future Perth project in November 2000.
Prof. Peter Newman (Murdoch University) a world-wide renown expert on "sustainable cities" and on urban transportation systems is now the special advisor of the WA Premier for the "environment": it may be quite possible that WA becomes in the near future a "reference" for "sustainable strategies".

Scenario A: future making.

This is a future based on zest and smart thinking. Co-operative, proactive partnerships among community, commerce, industry, professional organisations, research Institutes and Government generated a sustainable and vibrant West Australian society with excellent prospects for the future.
• a strong global economy and high levels of activity in the mining sector place Australia on a favourable economic footing.
• National and international calls to redress social inequities including indigenous issues are addressed by a government responsive to electorate demands.
• State government establishes centres of excellence in environmental management and remediation.
• The global shift towards a knowledge economy prompt Perth Metropolitan Region and the South West to review traditional economic activities and environmental management methods.
• Working patterns move to a "partnership mentality".
• Quality of life generally improves.

Scenario B: Carpe diem.

This is a scenario of pressure on Perth from a series of external shocks such as volatile fuel prices and unrest in the Asia Pacific region. In response, rising but managed immigration levels and relaxed environmental restrictions on fuel production bring about short term economic benefits to Perth but also long-term social and environmental challenges.
• high levels of immigration generate economic growth but also contribute to problems with urban sprawl and excessive car use.
• Australia lags behind in moving towards a technology based economy, changing work patterns lead to growing unemployment.
• A business led alliance is formed to establish WA as a "global economy" by focusing on its distinctive competencies and supporting local industries and innovations.
• Social inequalities not addressed.
• Uncoordinated economic growth slows development of distinctive competencies.
• Quality of life diminishes.

The economic vulnerability of Perth and the South West to international influences is emphasised in this scenario. Global political and economic crises impact severely on the sustainable development of the region. While WA's natural resource wealth initially affords some protection from the downturn elsewhere, this is not a long term solution. The boom-bust economic cycle reflects the need for a strong, proactive response to identifying new and sustainable means of wealth generation.

- **Highly volatile world oil prices and protectionism cause widespread depression.**
- **Share markets collapse and unemployment increases.**
- **Crime levels increase in the Perth Metropolitan Region and the Southwest.**
- **Perth Metropolitan Region and the Southwest acknowledge their vulnerability to international trends and seek new market opportunities.**
- **The development of world-class alternative energy and specialist IT industries along with medical and bio-technologies provide Western Australia with a growing export income and reputation.**
- **Improving commodity prices supplemented by new industries, lead to an economic recovery for Perth and the South West,**

Scenario D: Rural Revival

In this scenario consistent and widespread economic environmental and social development leads to full integration of Perth Metropolitan Region and the South West as a strong player in the global economy. The area moves toward becoming a global region that bases its economic wealth on technological advances and development while using these developments to enhance traditional areas of expertise such as mining and agriculture.

- **Strong global economy.**
- **Substantial population growth in the South West sees that area increasing in importance within the region.**
- **Rural development based on growth of new technologies in regional locations refocuses Perth as a service centre, with increased integration between Perth Metropolitan Region and the South West to create a vibrant, integrated region.**
- **Climatic change to a cooler wetter climate.**
- **Government provides a long term perspective that enables short- term industry-driven projects to operate within a synergetic framework.**
- **Focus on specific environmental issues brings about highly positive results.**
- **A balanced approach towards globalisation produces high levels of sustainability**

Comments:

The four scenarios are quite interesting and it may be worth while discussing in detail each one of them. They may seem a bit too "sterilised" and "clean": not so if you think at the tough implications of some of the statements. I would propose a fifth scenario which could be assembled by taking bits from each of the ones proposed by the "Future Perth" Commission.

It is of great interest to notice that the Commission is actually worried by the impending energy crunch/transition: this is, to my knowledge, the only official document in which a public Authority of WA acknowledges the coming oil depletion and the subsequent "transition" stage in clear and explicit words.

The scenarios could be further speculated to focus their "fallout" on the city form and structure. The energy transition will radically change the technologies and the pattern of urban mobility and of the "causes" of urban mobility: not too far away into the future, just within ten years from now.

A possible Fifth scenario:

- **The global economy will have to face the energy crunch/transition: heavily energy-dependent countries will suffer more than the less developed or the self sufficient ones.**

already paying energy much more than the US. Australia could be self sufficient shifting to natural gas and setting out alternative energy sources that could be operational within ten to fifteen years (wind, sun, tides).
• Perth shall adapt to a new mobility pattern: the suburban structures will become more independent for jobs and services from the CBD. The CBD will quickly become much more "residential".
• Commuting by car will be for the very few, trains and busses will bear 80% of the mobility load. Many innovative solutions will become a habit: massive car-pooling, mini-busses, e-card hitch-hiking.
• Water will become a very scarce commodity: rain-water tanks and all the related accessories (pumps, filters etc.) will have a huge market .
• Retrofitting existing houses for solar heating and passive solar heating/cooling will become a huge market with a great employment potential.
• Powerful shift of jobs and services towards the local economy, powerful shift of jobs to home- computer workers.
• Delivery of goods will induce interesting changes in everyday life.
• Every household will change towards "self-sufficiency": maintenance, cleaning, gardening etc.
• Wind generators will become part of the urban landscape.
• Sustainability and austerity will reshape the social values: less consumerism and social solidarity will help to face the challenge of the long environmental transition ahead.

What is going to change

The main reasons why the present day city (Perth specifically) is not sustainable in the future can be listed as follows:
• petrol shortages/price will cut private car commuting (5 years)
• water shortages will induce rain-water tank retrofit of existing houses (6-8 years)
• energy shortages/price will promote wind and PV generators on existing houses (6-8 years)
• large sectors of existing city residential suburbs will be rebuilt at higher density (8-16 years)
• new developments (none after 2010) will be at high-very high density (15 years)
• home/computer will allow great reduction of daily commuting (starting now)
• e.commerce will deal 90% of daily grocery shopping: delivery of groceries to homes will be an interesting problem (6-8 years)
• biking and walking will be the main transportation means for distances below 2 k: above 2 k minibuses and e.card hitch-hiking will solve most of the mobility demand. (8-12 years)

Websites

Europa: entrance to European Union sites
http://europa.eu.int/
European Investment Bank
http://eib.eu.int/
Asia Development Bank
http://www.adb.org/
Comedia
www.comedia.org.uk
EGPIS (European Good Practice Information Service)

European Academy of Urban Environment
www.eaue.de/
European Commission Urban Pilot Projects
www.inforegio.org/urban/upp/frames.htm
European Sustainable Cities
ourworld.compuserve.com/homepages/European_Sustainable_Cities/homepage.htm/
European Urban Forum
www.inforegio.cec.eu.int/urban/forum
Forum on Creative Industries
www.mmu.ac.uk/h-ss//sis/foci/welcome1/html
Global Ideas Bank (Institute for Social Inventions)
www.globalideasbank.org/
Habitat-Best Practices Database for Human Settlements
www.bestpractices.org/
Huddersfield Creative Town Initiative
www.creativetown.com/
The Innovation Journal
www.innovation.cc/index.html
International Council for Local Environmental Initiatives
www.iclei.org/iclei/casestud.htm
International Institute for Sustainable Development
www.iisd1.iisd.ca/default.htm
International Urban Development Association
www.inta-aivn.org/
Megacities
www.megacities.nl/
Randers Urban Pilot Project
www.undervaerket.dk/
RSS (European Regional Development Fund and Cohesion Fund Projects)
www.inforegio.org/wbover/overstor/stories/D/RETD/st100_en.htm
SCN Sustainable Communities Network
www.sustainable.org/casestudies/studiesindex.htm/
United Nations Management of Social Transformations
www.unesco.org/most/bphome.htm#1
World Bank Urban Forum
http://www.worldbank.org/html/fpd/urban//forum2000/
World Bank UNDP
http://www.undp.org/gef/sgp/main.htm
World Bank Urban Development
http://www.worldbank.org/html/fpd/urban//agenda.htm
World Bank Global Environmental Facility (how to apply)
http://www.gefweb.org/Projects/Pipeline/pipeline.html
World Bank Global Environmental Facility Contacts
http://www.gefweb.org/Contact_Us/contact_us.html
WasteAge online magazine for waste recycling professionals
http://www.wasteage.com/
Waste links site
http://www.wasteclick.com/default.asp

"Future Perth" Literature

The Future Perth Project was launched in June 1999 for the initiative of the Western Australian Planning Commission and has produced a remarkable set of papers on the different issues. This is the "ground work" that identifies the trends

The following is a list of the papers produced by Future Perth.
Can Perth be more creative? (darft W.P. n. 12) January 2002
Perth Metropolitan Region
Utility Infrastructure (Draft W.P. n. 4) October 2001
Perth Metropolitan Region, Peel Sector
The sustainable City (Draft W.P. n. 10) October 2001
Perth Metropolitan Region
Transport (Draft W.P. n. 7) December 2001
Perth Metropolitan Region
Environment (Draft W.P. n. 6) December 2001
Perth Metropolitan Region
Population (Draft W.P. n. 5) Sept. 2001
Perth Metropolitan RegionCost of Urban Form (Draft W.P. n. 2) September 2001
Perth Metropolitan Region
Planning Context (Draft W.P. n.1) September 2001
Perth Metropolitan Region
Towards Sustainability
Metropolitan Development Options Workshop
18 and 19 July 2001
Rydges Hotel, Perth
Metropolitan Development Options Workshop
Final Report (August 2001) Held on July 18/19th 2001
Scenarios of our Future: challenges for Western Australian Society. November 2000
South-West Urban System Economic Study (November 2000)
What's important to the Community November 2000
Focus Group Outcomes
Economy, October 25th, 1999
A joint conference by the Western Australian Planning Commission, Committee for Economic Development of Western Australia and supported by the Ministry of Planning.
Indicators (June 1999)