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Strategic Planning in a Turbulent and Uncertain Context`

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STRATEGIC PLANNING IN A TURBULENT AND UNCERTAIN CONTEXT

A report for Group Strategy, Policy Coordination and Relations, City of Johannesburg

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1. Introduction

Uncertainty and turbulence is a perennial feature of the context within which cities must plan but there are time periods in which a sense of uncertainty is heightened. This has been the case in the period since the Global Financial Crisis of 2007/08 where the experience of uncertainty has reached levels not known since the Great Depression of the 1930s. The Financial Crisis was an 'uncertainty shock' but it has left tremors in its aftermath. As one commentator put it, the recovery from the crisis has been "anaemic, brittle and fraught with uncertainty" (Tyson 2015). The combination of economic uncertainty in the contemporary period with political turbulence, global terrorism, and anxieties over climate change has created a 'perfect storm' of uncertainty.

Wiltbank et al. (2006) write that "unknowability (true unpredictability) can be a disquieting and disruptive phenomenon." This is especially so for the activity we call 'planning' which, almost by definition, requires some degree of confidence in our expectations for the future. The legitimacy of planning depends on the extent to which is can handle radical uncertainty. While the more traditional forms of planning may be helpless in the face of this uncertainty, there are, fortunately, approaches to planning within contexts of uncertainty that have evolved in both corporate and public sector planning practice since at least the late 1960s.

In this paper we begin by outlining some of the dimensions of uncertainty, both globally and for the context of Johannesburg, focussing on aspects relating to demography, environmental threats, economy, society and politics, acknowledging, of course, that these are all profoundly interrelated. We then explore the multifaceted literature on planning for uncertainty, using the framework provided by Wiltbank et al. (2006) which distinguishes between approaches which are concerned with the better *positioning* of an institution within an uncertain environment, and those which actively attempt to *shape* environments. We apply the useful elements of the varying approaches to a brief analysis of Johannesburg's current Growth and Development Strategy (GDS) exploring the extent to which the GDS has successfully accommodated uncertainty. We conclude with recommendations on how a new or revised GDS may better respond to uncertainty.

Our approach to this study is broadly informed by a key insight offered by Peter Drucker in his seminal piece, 'Planning for Uncertainty' published in *The Wall Street Journal* in 1992. Drucker asked the question "What must we do—in fact, what must we become—if we are to successfully navigate the treacherous waters of unpredictability?" He argues, with reference to corporate planning but with

relevance to public sector planning, that traditional approaches to dealing with uncertainty are not helpful:

> Uncertainty—in the economy, society, politics—has become so great as to render futile, if not counterproductive, the kind of planning most companies still practice: forecasting based on probabilities. (Drucker 1992)

Drucker suggests an alternative approach to thinking about the future. Instead of asking "what is most likely to happen?" planning for uncertainty asks, instead, "what has already happened that will create the future?" This is the approach we take below in outlining dimensions of uncertainty. Our analysis is not futuristic and speculative but rather asks what the existing or emergent trends, and identified risks, are and what this *may* mean for the future. The reality, of course, is that the future is thoroughly unpredictable and we can only present these dimensions as illustrative of the scope of uncertainty and not as the basis of any form of projection. More important, appreciating these *sorts of* uncertainties, is how we can proceed with non-predictive forms of planning. A critical question that will address further in the text is whether our planning should focus only on adapting to uncertainty, or whether it should actively seek to shape the nature of the uncertainty.

We do not assume that uncertainty is necessarily negative. In the corporate literature, at least, there is a strong recognition that *uncertainty brings opportunity.* This is arguably also the case in planning for the future of large and complex cities. Kaplan (2008) writes that, with uncertainty "often the basic meaning of a situation is up for grabs". With uncertainty comes the opportunity to rewrite scripts in more desirable ways. However, there are massive risks if trends are misread or ignored.

2. Dimensions of Uncertainty

In the international literature on future uncertainty there are two broad approaches. The first is to focus on the *potential risks* and the second is to identify and track *possible trends.* A 'risk' is the perceived likelihood of a future event or a condition that generally has a negative outcome while a 'trend' is a longer term pattern with negative, positive or mixed outcomes.

2.1 Risk

In this section of the report we deal mainly with uncertainties around trends, but it is important to acknowledge the significance of risk in planning. The challenge is that there is no objective way of specifying risk, and what is perceived as being a risk changes over time. The World Economic Forum (WEF) tries to respond to this with an annual *Global Risks Report* which is developed through interviews with experts and leaders globally.

The WEF distinguishes between perceived risks for the immediate future and perceived risk for the longer term. In its 2016 report, for example, it identifies the immediate causes of uncertainty globally as being focussed around:

- Large scale involuntary migration,
- State collapse or crisis,
- Interstate conflict.
- Unemployment, and
- Failure of national governance.

Taking a longer term perspective, however, the key perceived sources of uncertainty are:

- Water crises,
- Failure of climate change mitigation and adaptation,
- Extreme weather events,
- Food crisis, and
- Profound social instability (WEF, Global Risks Report 2016)

The Economist has a Risk Assessment Unit which produces monthly bulletins on global market risk, including assessments of impact and probability. As an illustration, the Top Risks for May 2016 were:

1. China experiencing a hard economic landing (high probability, high impact)
2. Currency volatility culminating in an emerging markets corporate debt crisis (high probability, high impact)
3. Beset by internal and external pressures, the European Union begins to fragment (moderate probability, very high impact)
4. "Grexit" (Greek withdrawl from the Eurozone) is followed by a Euro breakup (moderate probability, very high impact)
5. Donald Trump wins the US Presidential elections (moderate probability, high impact)
6. The rising threat of jihadi terrorism destabilises the global economy (moderate probability, high impact)
7. Global growth surges in 2017 as emerging markets rally (low probability, very high impact)
8. The UK votes to leave the EU (low probability, high impact)
9. Chinese expansionism prompts a clash of arms in the South China Sea (low probability, high impact)
10. A collapse in investment in the oil sector prompts a future oil price shock (very low probability, high impact) (The Economist Intelligence Unit 2016)

These are global risks (as perceived by a particular agency) but a similar analysis may be understand for different scale, including, for example, emerging economies, Africa, South Africa, and Johannesburg. Some of the risks may be shared but the impacts may be very different across scales and in different parts of the world.

Handling risk, through planning for uncertainty, is a critical theme to which we return later in the report. We shift below to a discussion of the key trends which we address in the interrelated themes of demography, environment, economy, technology, society and politics.

2.2 Demography

Demography has been referred to as the "mother of all trends" (What's Next 2016) and yet it is often oddly neglected in planning processes. The tendency is often to assume straight-line projections of current trends, leading to often serious miscalculations. While it is impossible to project trends into the far future there are existing trends that will work out in terms of consequences over the next twenty to forty years at least. There may, perhaps, be less uncertainty around demographics than other areas, including economy, as demographic trends work through the population structure over a relatively long

period, but the demographic future still remains uncertain. The uncertainties include pandemics, attitudes to procreation, medical advances or setbacks, immigration policies, and shifts in the labour market (especially in terms of female employment).

The twentieth century was massively shaped by demographic trends. This was a century in which world population exploded from 1.6 billion to 6.1 billion, and urbanisation levels increased from around 13% to 45%, with much variation in different places across the globe. Other major shifts included rising life expectancies, reduced mortality rates, declining fertility levels in wealthier countries, the entry of women into the labour market, the youthfulness of the population, and the rise of the nuclear family. It is hard to overestimate the impact of these shifts on the lives of people across the world.

These twentieth century trends, and especially the stories of rapid population growth, still shape the perceptions of policy makers. There is, however, now a more complex picture, with the likelihood of quite different pattern in the twenty first century. The Centre for Global Development (n.d.) put it like this: “the population story is no longer about growth alone. It's a story about slower growth, increasing decline, older people, and more urban living.” Although there is recognition that these trends are evolving at a different pace across different parts of the world, even in the poorer parts of the world population growth rates are on a declining trend, after peaking around 1970 (Centre for Global Development, n.d.).

Some of the emergent (inter-related) trends currently are:

- Steadily declining fertility rates,
- Delayed age of reproduction,
- The ageing of the global population,
- The expansion of single person households,
- The decline of the ‘traditional’ nuclear family,
- Lower marriage rates,
- Personal debt delaying retirement,
- Slowing rates of urbanisation,
- More racial and ethnic diversity in cities as a result of transnational migration, and
- Continued increase in women’s role in the labour force, including in leadership positions.

The combination of these trends is likely to have a massive impact on life into this century in ways that are not easily predictable. It is very possible that trends may reverse or shift in unexpected ways. There are also some differences of opinion over trends—for example, over whether the trend towards increased participation of women in the labour market will continue and what impact shifts will have on fertility rates.

It is impossible here to address the complexity of these trends but we illustrate impacts below by referring to the specific trends of ageing and increased human mobility, and then it's application in a South African-specific context.

Ageing

Demographic ageing is happening as fertility rates drop, largely in response to increased female education and participation in the labour market, and as life expectancy continues to increase. In 2000 the proportion of the population over the age of 60 exceeded the proportion of children for countries in Europe, as well as Russia, and Japan (which is already experiencing the severe effects of this process) (UN DESA, 2015).

In low and middle income countries the current challenge seems to be the youth bulge which is understandably preoccupying policy makers, but ageing is an emergent trend, and will pose a challenge in the future. It is anticipated that, in aggregate, in these countries the proportion of plus 60s will exceed children by around 2045 (UN DESA, 2015). In middle income or emerging economies this process is happening faster than in poorer countries. It is happening particularly fast in China as a result of the one-child policies but also in countries in Latin America, and in South Africa (UN DESA, 2015).

There are multiple consequences to this trend. First, growing economies require an expanding skills base which will be in short supply with an ageing population. A leading demographer suggested that "the world as a whole won't have the demographic ingredients to keep the global economy humming at a pre-2008 tempo" (Preston 2015). Secondly, there are the burdens on pension funds and on health care. Thirdly, there are the strains that an ageing population will place on the working age population and on individual households.

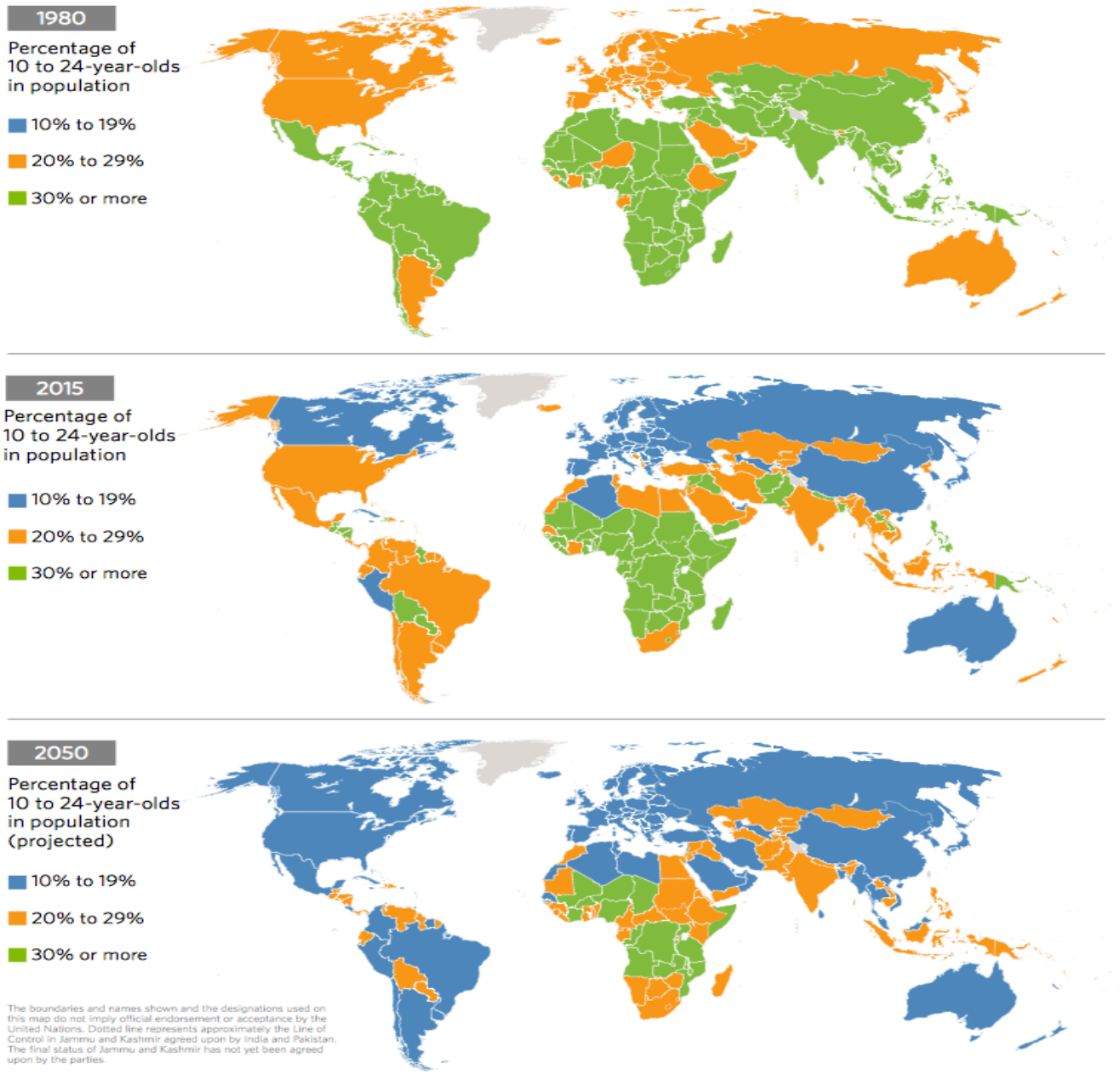


Figure1: Young in the world: Changing Proportions in 1980, 2015 and 2050. Source: UNFPA, 2014

Although the general trend appears to be towards demographic ageing there is clearly variation and uncertainty. Not all countries are equally affected by ageing. The USA, for example, is less affected by ageing than other OECD countries, for example, as it has a positive fertility level replacement, largely because natural population growth is augmented by continued in-migration. There are recent some indications that in Europe fertility levels have recovered due to shifts in the labour market while the decline in fertility levels has stalled in parts of Africa where conflicts and other factors have impacted negatively on development (Lutz 2008) (Preston 2015).

Migration

Migration is a key demographic uncertainty that will have multiple impacts on other trends, including its potential to reduce the trends of demographic ageing. The impacts of migration are complex and largely depend to on the way in which migration is managed as well as social attitudes towards migration.

There are benefits to countries in both sending and receiving migration. Many countries which are net exporters of migrants benefit enormously from remittances while net importers often receive an injection of skills, entrepreneurialism and cultural energy. Poorly managed processes however can lead to problems such as social unrest, human trafficking and social discrimination.

Popular reasons for migration include economic and educational opportunities, but in recent years involuntary migration as a result of political conflict has risen to levels unknown since the immediate aftermath of World War II. Crawford et al. (2015) observe that in 2014, 59.5 million people were forcibly displaced in the world, compared to 40 million at the time of World War II. For Europe, at least, the flows of migration have emerged as a key social and political risk, and a major factor for the future of the continent, with undoubted global impacts.

There are other emergent trends in terms of migrations. There is, for example, a greater proportion than before of females in migrant flows, with the United Nations (UN) Population Division reporting that 48.2% of transnational migrants in 2015 were female (UN 2015). Another trend is the longer period spent by migrants in host countries. In the 1980s the average length of displacement in involuntary migration was nine years but this time increased to 20 years by the mid-2000s (WEF, Global Risks Report 2016). Displacement is becoming a more urban phenomenon with a far smaller proportion of displaced people than before being held in camps.

The key uncertainties moving forward lie in what will happen with these migration trends and what responses they will garner. The current surge in involuntary migration has exposed multiple problems in the institutional architecture handling migration, and has also revealed again the risks associated with the responses of host societies to migrants. The extent to which receiving countries develop an absorption capacity for migration that is able to maximise the potentials of migration is critical to demographic, social, economic and political futures.

South African Trends

The South African case reveals some of the uncertainties in demographic projection. It reinforces once more the point that even with something as seemingly predictable (in the short- to medium-term, at least) there are uncertainties.

In some respects, South Africa's trends have followed global trends. There has, for example, been a steady drop in crude birth rates from over 40 per 1000 in the 1960s to the current 22.7 per 1000. Infant mortality rates nearly halved from the 1950s until the 1980s. Since 2002, infant mortality rates have dropped from 51.2 to 34.4 per 1000 live births (Stats SA, 2015)

However, South Africa has also faced unpredicted events, most notably, the HIV/Aids epidemic and subsequently the further surprise of the recent success in stabilising the epidemic. Projections made in the 1980s had no means of taking the epidemic into account, while projections in the late 1990s were overly dire in terms of demographic consequences. Consistent with global trends, crude death rates dropped from around 20 per 1000 deaths annually around 1960 to 8.5 per 1000 in the early 1990s. There was however then a sudden rise to around 15 per 1000 in the early 2000s, before dropping moderately to the current 9.6 (Stats SA, 2015).

This shift has affected both natural population increase and overall population growth rates. The rate of natural population increase has fluctauted between 1.12 and 1.3 between 2002 and 2015 (Stats SA, 2015). Overall population growth reached a low of around 1.28% per annum in the early 2000s; it is estimated 1.65% for the 2014-2015 year (Stats SA, 2015).

With the HIV/Aids epidemic stabilised it may seem possible to make demographic projection, but we simply do not know what is around the corner. At most we can say with a relative degree of confidence that certain emergent trends are likely to become more dominant into the future including, importantly, declining fertility rates, a demographic ageing process, and reducing rates of urbanisation.

On urbanisation, we know that there was a demographic surge in the 1990s and early 2000s but that the rate of urbanisation is slowing. According to the United Nation's World Urbanization Prospects report, the project level of urbanisation for 2016 in South Africa is 65.3% which is significantly up from the 52% in 1990 (UN, World Urbanization Prospects 2014). However, the urbanisation curve appears to be levelling with a project gradual increase in urbanisation levels to 71.3% in 2030, after which the curve will be almost flat (as in the case of present day Brazil or Russia).

Since Gauteng, including Johannesburg, is currently the major beneficiary of urbanization what does this mean for anticipate population growth? Gauteng is also most affected within South Africa by declining fertility levels. The fertility rate for Gauteng is 2.08, the lowest in country and progressively declining. This is also lower than the calculated fertility replacement rate of 2.1. (Stats SA, 2015).

The possible effect of these changes for Johannesburg is revealed in the UN historical data and projections of annual population growth to 2030 indicated below in Figure 1 and begs the question of whether our current strategizing and planning is based on a forward projection from the heady days of population growth in the 1990s and early 2000s.

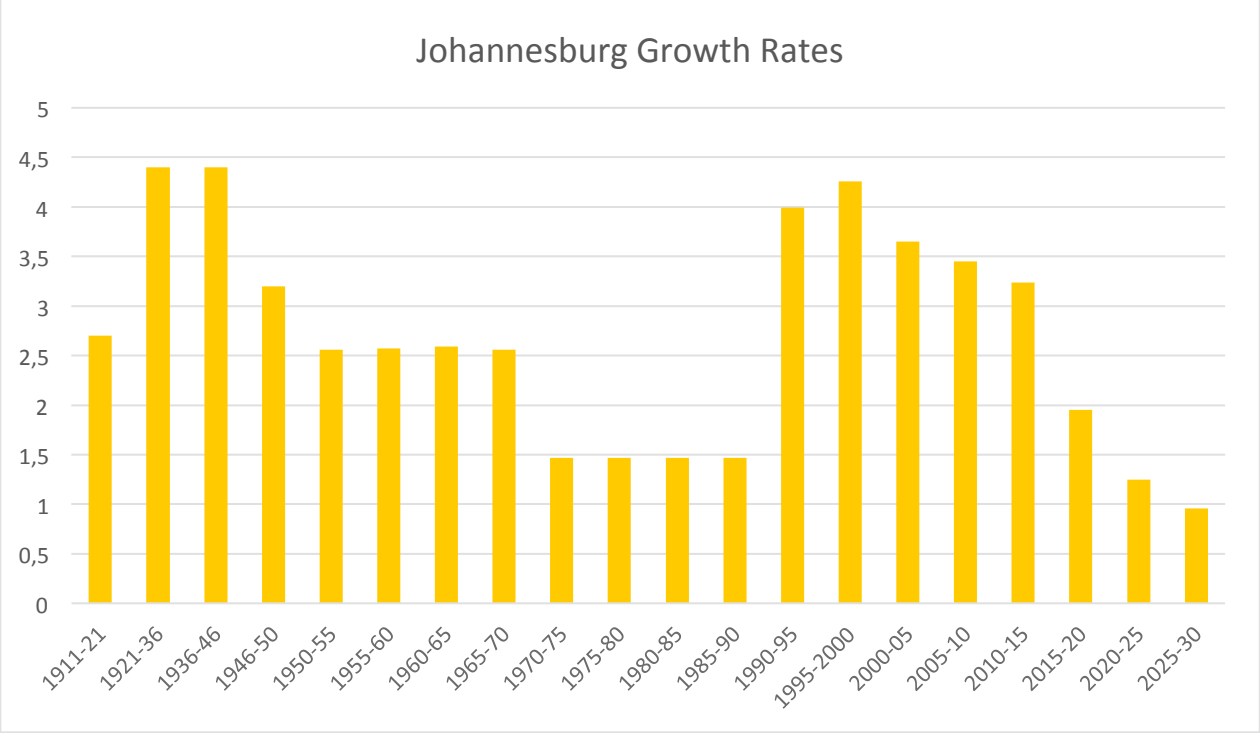


Figure 2: Historical and Projected Annual Population Growth Rates for Johannesburg, 1950-2030. (UN, 2014)

With the probable continued decline in fertility rates in Gauteng and Johannesburg, continued population growth will increasingly be driven by in-migration. With domestic in-migration tailing off, transnational migration may become increasingly important.

According to the 2011 Census, foreign migrants accounted for 26.3% of arrivals into Gauteng between 2006 and 2011 with the predominant flows from Zimbabwe, Mozambique, Lesotho, Malawi, UK, Nigeria, Zambia, India, Swaziland, DRC, Congo, Namibia, Portugal, Ethiopia, Germany, China and Pakistan (Stats SA, 2014). If these migration flows were to continue, some of the effects of the anticipated population

slowdown and eventual ageing will be ameliorated. There are, however, a range of uncertainties including: the slowdown of South Africa's economy relative to the rest of Africa which reduces the desirability of Gauteng as a destination; unfavourable exchange rates and xenophobic violence.

2.3 Environmental

Environmental risks and trends are now widely acknowledged but high levels of uncertainty remain. Climate Change, energy, water and food are described below to illustrate the uncertain and insecure future of environmental resources. However, there are additional areas of resource and broader environmental insecurity that we do not address here. These include, for example, loss of biodiversity, the health effects of Johannesburg's relatively high levels of air pollution[1], and waste management in a context where landfill sites have limited spare capacity.

Climate Change

The major environmental uncertainty is arguably around climate change but unlike others areas of uncertainty globally there is a single source of authoritative analysis which represents a near consensus within the scientific community on the nature of the uncertainty. The Intergovernmental Panel on Climate Change (IPCC) set up under the auspices of the United Nations Environmental Programme and World Meteorological Organisation brings together leading scientists globally in an extensive on-going process of research and deliberation. The consensus that emerges from this process is published in major assessment reports. It is an *evolving consensus* that responds to the new data or insight that emerges over time, providing a model that could be replicated in other areas of global uncertainty and at other spatial scales, including the level of the city.

The IPCC's Fifth Assessment Report provides a comprehensive view of the likely outcomes of climate change, emphasising probabilities rather than predictions. The consensus is that it is *extremely likely* that the massively increased concentrations of carbon dioxide, methane and nitrous oxide since the pre-industrial era are primarily the result of human action, and that these changes have already caused impacts on natural and human systems on all continents and across the oceans. There is *high confidence* that climate change to date has affected the activities and movement of a range of terrestrial, marine and freshwater species, and that the negative effects of crop yields have been higher than the positive

[1] Johannesburg is well into the top ten percent of the worst air polluted cities globally and, rather shockingly, in the same league as many notoriously polluted cities in China and India (WHO, 2014)

effects. There is *medium confidence* that hydrological and water systems globally have been altered because of this change. (IPCC 2015)

There is, of course, greater degrees of uncertainty concerning the future. Although there is a high level of existing consensus over possible impacts as displayed in Figure 2, there are still a range of potential scenarios dependant on whether increased temperature can be kept below 2°C higher than pre-industrial levels. We cannot explain the complexity of the report here but suffice to indicate the high levels of existing consensus that:

- Surface temperature is projected to rise over the 21st century under all assessed emission scenarios.
- It is *very likely* that heat waves will occur more often and last longer, and that extreme precipitation events will become more intense and frequent in many regions.
- It is *very likely* that he ocean will continue to warm and acidify, and global mean sea level to rise.
- Climate change will amplify existing risks and create new risks for natural and human systems.
- Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development.
- Many aspects of climate change and associated impacts will continue for centuries, even if anthropogenic emissions of greenhouse gases are stopped.
- Substantial emissions reductions over the next few decades can reduce climate risks in the 21st century and beyond, increase prospects for effective adaptation, and reduce the costs and challenges of mitigation in the longer term.
- There is high confidence that without additional mitigation efforts beyond those in place today, and even with adaptation, warming by the end of the 21st century will lead to high to very high risk of severe, widespread and irreversible impacts globally
- Taking a longer-term perspective, in the context of sustainable development, increases the likelihood that more immediate adaptation actions will also enhance future options and preparedness. (IPCC 2015)

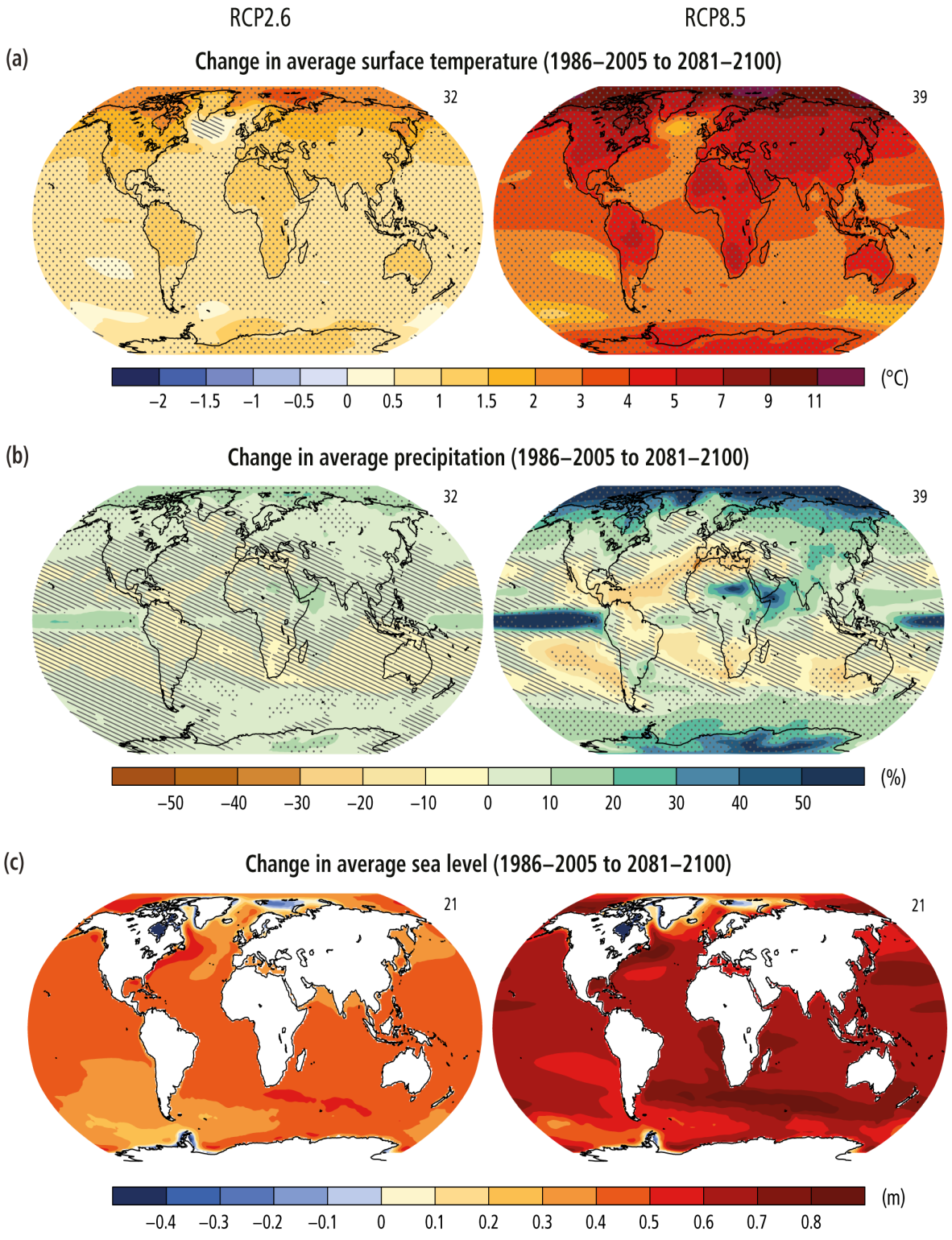


Figure 3: Spatial Modelling of Existing and Anticipated Climate Change. (IPCC, 2015)

While uncertainty around climate change and its effects is high globally, it is considerably amplified at a local level. The IPCC has undertaken some spatially referenced modelling which indicated, for example, the expected disproportionately large rise in average surface temperatures in the southern African interior; decreases in average precipitation across most of southern Africa with small areas of exception such as the east coast; a more than average rise in sea-level along the sub-Saharan African coastline; and so forth (IPCC 2015).

The City of Johannesburg (COJ) has commissioned its own modelling which suggests that temperatures in the city may increase by around 2.3 degrees C in the near future (2056 - 2065) and by around 4.4 degrees C in the far future (2081 - 2100), with projected variation across seasons. It also suggests that there is a substantial risk that Johannesburg will experience a higher frequency of storm events, and a longer and wetter rainy season, with intensifying heat island effects (COJ 2009).

While Johannesburg may experience intensified flooding and storm damage, and more frequent heat waves, the biggest impacts of climate change on Johannesburg may however come from the transmitted impacts from the wider region. Joubert (200881) writes that "the west of South Africa will become hotter and drier, the east will become hotter and possibly wetter, but this will not spare it from the impact of increasing drought stress". The IPCC has predicted that drought may reduce food production in Sub-Saharan Africa by as much as a 20% and this could well have an effect on food security in the city. There is also a danger that water supply to the Vaal River (including from the augmented supplies from other catchments) will become increasingly variable resulting in worsening water shortages in Johannesburg.

While of huge importance, not all environmental challenges relate back to climate change, and an analysis of environmental uncertainty must explore a range of other impacts on the quality of the natural environment and resource security. Energy, water and food security are also major concerns which may be exacerbated by climate change but have other sources of uncertainty.

Energy

The World Energy Council reports that "the energy sector is once again affected by high levels of uncertainty" (WEC 2015). It acknowledges the insecurities brought by climate change but identifies a range of other sources of insecurity. Energy prices are currently a major uncertainty creating

considerable insecurity around key investment decisions in sustainable energy, for example. Energy prices have plunged over the past few years as a result of weaker global demand and oversupply in some markets. While there are signs of price recovery, the longer term market is highly unpredictable. The energy sector is also strong influenced by geopolitics with key concerns including United States energy policy, developments in the Middle East, tensions involving the European Union and Russia, and developments in China and India. There are also other critical factors in the mix such as regulation and technology. There has been considerable progress in many parts of the world in the shift towards renewable sources of energy but it is uncertain whether the progress can be sustained. The coal and oil lobbies remains powerful in many parts of the world but there are also technological bottlenecks. For example, while progress has been made in the production of green energy, there has been far less progress on the storage of energy and on developing transmission systems that can cope with the intermittent supplies provided by small scale independent producers (WEC 2015).

There are additional uncertainties in the South African and Johannesburg context. Since 2007 South Africa has been in the throes of an energy crisis which was caused largely by deficiencies in long-term planning and by long delays in bringing planned capacity online (i.e. the Kusile and Medupi power stations). The short term supply constraints are easing as the new power stations are gradually coming on line and as new supply sources are emerging through Independent Power Producers (IPPs). There are, however, medium- to longer-term uncertainties which include the effects of the global uncertainties, national policy decisions (currently obscured by controversies over nuclear planning in the energy mix), and planning and operating capacity. Johannesburg's extremely high dependence on Eskom and the national power grid means it has little leverage in responding to these uncertainties. While the city may pursue a longer term policy of reducing dependencies, and gaining greater control over energy sources, its' primary point of impact for the foreseeable future is in promoting greater energy efficiency across a range of sectors. Through wheeling agreements it may however be able to increase the mix of its energy sources, including through procurement of green energy from IPPs.

Water

Water supply is another area of considerable uncertainty. In the period 1900 to 2010, global water use expanded by eight times, an entirely unsustainable rate of growth into the future. As water supply and demand are highly uneven spatially, the effects of this non-sustainable use are being felt unequally. Wada et al. (2016176) indicate that estimations of likely water balance across regions globally is highly complicated and subject to multiple uncertainties in relation, for example, to "global climate change,

population growth, land use change, globalization and economic development, technological innovations, political stability and the extent of international cooperation". There are nevertheless attempts to quantify water stress globally using global hydrological or water resource models. Wada et al. (2016) point out, however, that the results of this modelling have been highly variable, with Africa being the continent of greatest uncertainty, and that there is not enough information to validate any particular modelling approach. Wade et al. call for the need to simultaneously plan for uncertainty *and* improve the quality and reach of data and modelling.

In relatively water scarce South Africa these are matters of considerable importance. There have been water reconciliation studies for each of South Africa's major catchments, but considerable risks remain at the level of both assessment and implementation. The uncertainties surrounding the multiple variables influencing both demand and supply mean that the assessments may well be proven incorrect. Equally serious is the capacities to timeously implement the measures need to secure water supplies in each catchment. Johannesburg, and more broadly, Gauteng, is especially vulnerable as there is no supply of water in the near vicinity able to support its growing population and economy, with Turton et al. (n.d.145) writing that securing Johannesburg's water supply is "likely to become one of the single most important challenges in the mid-term future."

The city has relied on technical ingenuity to secure water supplies—from the Vaal Dam in the 1930s, to the Tugela-Vaal water transfer in the 1970s, to the Lesotho Highlands Water Scheme from the 1990s. A key question is how long will it be before further augmentation of water supply is required, and where will the additional water come from. A 2009 study indicated that with these measures and the planned augmentation, a major new augmentation scheme could be delayed until 2040 (Department of Water Affairs and Forestry, 2009). However, this was contingent on a range of demand management and other measures being implemented including improved enforcement of unlawful water use, demand management by municipalities to reduce losses in the system; re-use of treated effluent to improve the water balance; and, use of water pumped from the gold mines. Early indications are that there are long lags in implementing such measures. The water restrictions introduced in 2015 were a combination of both technical failures in pumping and storage and fears of a drought-relates shortage.

Ultimately, augmentation will almost certainly be required if Johannesburg is to continue growing. There has been a longstanding proposal to direct water from the Zambezi River to Gauteng through a system of pipelines and open canals, but there are analysts who point to the extreme difficulties of achieving this in terms of both the institutional and political difficulties in drawing water from a catchment which

crosses the jurisdiction of six countries, and the emerging shortage of water in the upper reaches of the Zambezi River where the water take-off would have to happen (Hill 2015).

Food

Uncertainties around food security are another concern. The demand for food is expected to increase by 50% to 2050 but there are considerable uncertainties around food supply which is affected by long-term climate change and shorter-term weather anomalies, international conflicts, breakdowns in distribution and transport infrastructure, viral outbreaks, exchange rate volatility, land and water competition, public policy and regulation (e.g. in relation to GMOs and bioenergy subsidies), and a lot more. Rudoph et al. (2012) conclude that for Johannesburg the current challenge of food insecurity has less to do with supply shortages or volatility and more to do with problems of income, poverty, unemployment and economic volatility. Put simply, households in Johannesburg are food insecure because they cannot afford to put food on the table. However, into the longer-term, supply constraints driven by the regional effects of climate change may drive up food prices the city in the context of already high levels of affordability produced food insecurity.

2.4 Economic

Perhaps more than anything else, it is the volatile global economy which has provoked the heightened sense of uncertainty in recent years. Of course there is a massive cone of uncertainty over the longer term, but even the short-term is highly uncertain in economic terms.

Global Economy

The UN's *Economic Situation and Prospects Report* (2016) indicates that in 2015 and 2016 the overall global gross domestic product (GDP) growth rates were an anaemic 2.4% with problems associated with weak demand, low investment, low commodity prices and financial market turbulence. The International Monetary Fund (IMF) has titled its 2016 report on global prospects "Subdued Demand, Diminished Prospects" referring to problems such as: the global slowdown and rebalancing of the economy in China but with a faster than expected slowdown in imports and exports; low energy and commodity prices; and, the gradual tightening of monetary policy in the United States (IMF 2016). There is however considerable variation across regions and countries, as indicated in Figure 3.

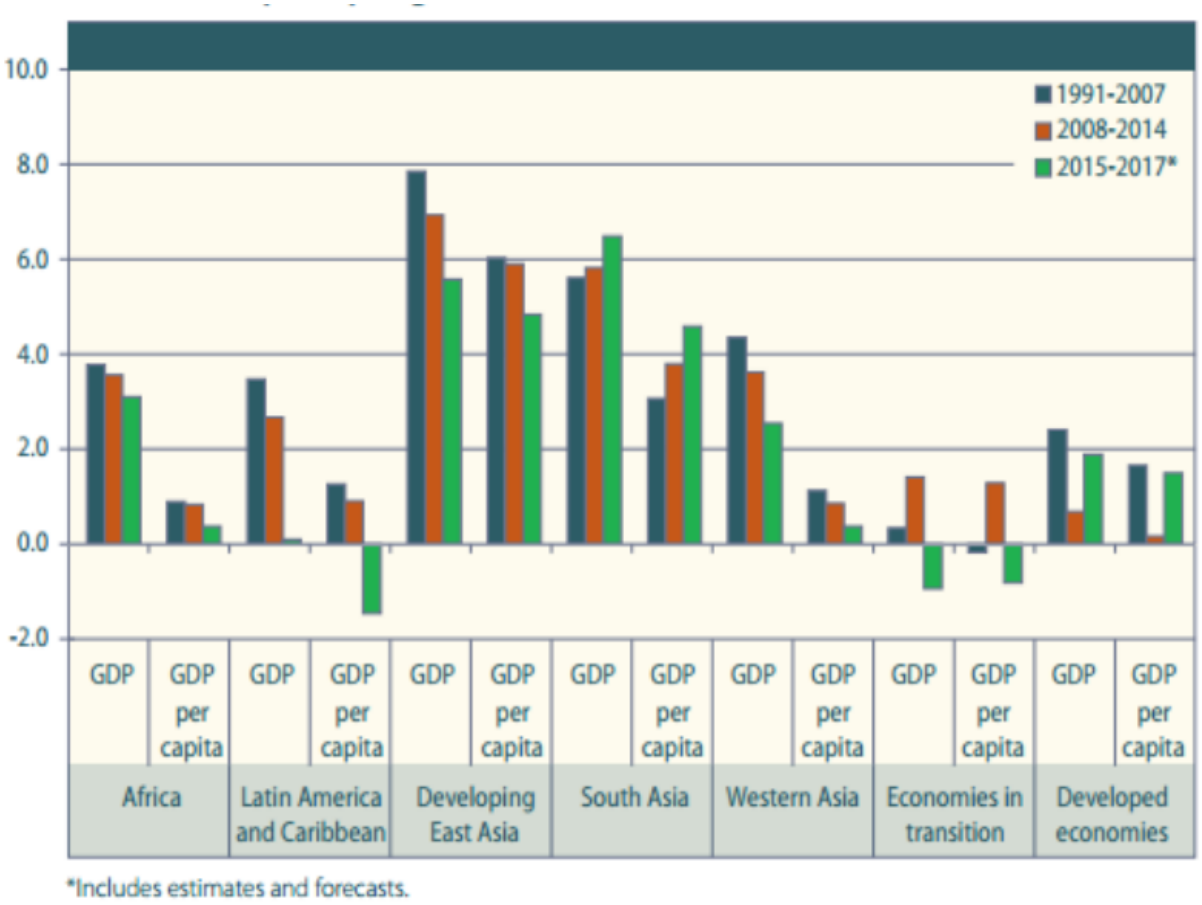


Figure 4: Global Variations in GDP and GDP per Capita Change (UN 2016)

The United States, on average, has done relatively well in the post-crisis years with annual growth rates sustained above 2%. Japan's economy has been volatile with GDP growth of only 0.5% in 2016 and the threat of recession. Europe has struggled in the post-crisis years with considerable divergence in the core and margins of the continent which has threatened to unravel the European Union. In 2016, the European economy expanded by 1.6% with considerable variance between the relative stable core (especially Germany) and the fractious periphery (e.g. Greece, Italy, Spain and Portugal). The so-called 'economies in transition' (mainly the previous Soviet Union) have performed poorly in recent years, with growth prospects still deteriorating. The Russian Federation is in recession as a result of the slump in energy prices and international sanctions, with smaller countries in Central Asia and the Caucasus also in trouble. Eastern Europe has performed better. (UN 2016)

There has also been a serious recent deterioration in the situation of emergent and poorer economies. Since the 1990s, China's growth has frequently exceeded 10% per annum, but the Chinese leadership now refers to a "new normal" with growth rates of around 7-7.5%, with the actual growth rate in 2016 around 6.4%. The slowdown in this 2nd largest economy in the world has had a knock-on effect across

the world. South Asia has been the exception with India's economy accelerating to 7.3% in 2016 and Iran's economy recovering momentum after the effects of international sanctions. The UN advises however that there are still serious structural constraints to be overcome in this region, including low female participation in the workforce, energy shortages and infrastructure gaps. Latin America has experienced a sharp decline in GDP (and GDP per capita) with its leading economy, Brazil, in a prolonged recession exacerbated by political turmoil, and this crisis spilling over into Argentina and other neighbouring countries. (UN 2016)

Closer to home, Africa's growth performance has also declined recently. Despite some attempts at economic diversification, the continent as a whole remains very dependent on commodity and so the drop in commodity prices has had a severe effect on performance. This has been compounded by factors such as energy shortages, infrastructure deficits, pandemics (i.e. Ebola) and security concerns. GDP per capita growth over the period 2015 to 2017 is only expected to average 0.4% per annum, a setback after two decades of significant progress (UN 2016).

The situation outlined above reflects the immediate conditions across the globe with the UN and IMF, for example, only projecting as far as 2017[2]. The reality is that there is extreme uncertainty with even medium-term forecast impossible. There is a real danger that the world is trapped in a "low growth equilibrium" for the foreseeable future (UN 2016) but there are opportunities that may emerge from new technologies, for example. Some of the risks and possibilities are outlined briefly below:

Long-term Decline in Productivity (but with a possible turnaround)

Growth in productivity is widely regarded as a primary driver of economic growth and so this decline suggests that long term global growth prospects are not positive. There are uncertainties with the possibility that emergent technologies will lead to a new wave of productivity growth by stimulating business and individual innovation. (WEF 2016)

China's Performance

China's economic performance, and the risks that it faces in making its economic transition from an economy based on infrastructure investments and industrial exports to an economy geared to internal consumption and service industries, weighs heavily on the global economy. As China is now

[2] The IMF does envisage a slight pick-up in growth in parts of Europe, the Middle East and Africa into 2017 but warns that the recovery is likely to be weaker than expected (IMF, 2016).

the world's second largest economy, and has been driving growth in the demand for commodities, a sharper than expect slowdown would have a serious knock-on effect globally, especially in terms of commodity process, financial markets, and general confidence in the global economy. The major source of current concern is the massive debt build-up in China, and especially with the corporate sector, and in local and regional government. In 2014, the ratio of debt to assets in China's construction sector exceeded 250:1 (WEF, 2016)

There is a huge risk for China's still inadequately regulated financial sector as much of the credit expansion in the recent past was in sectors which are now in decline. There is a catch-22 for public policy as tightening credit might strangle consumption with would undermine the basis of China's emergent new economy while loosening credit would increase levels of indebtedness, worsening future risks. The hope is that service based industries and high-end manufacturing will grow sufficiently to compensate for the troubles in construction and low-end export oriented industry. (WEF 2016)

Fiscal Space

This is an opportunity that may support higher growth into the future. While there are high corporate debt levels, levels of national debt are at an all-time low, leaving many countries with the 'fiscal space' to expand public investment and absorb fiscal shocks. This is the case in China, for example, where there are still large foreign reserves and low levels of *national* debt. The UN (201616) estimates that "an increase in fiscal expenditures of 1 per cent of GDP in the G7 countries and China could raise world gross product growth from 2.4 to 3.8 per cent this year". There is also ample room, argues the UN, to improve fiscal efficiencies and achieve greater leverage by co-ordinating stimulus measures across national boundaries.

Geopolitical Tensions

Most analysts advise that geopolitical tensions globally are a severe threat to the medium-term prospects of the global economy (UN 2016) (WEF 2016) (IMF 2016). There is a deep concern that an escalation in tensions could negatively affect global confidence; disrupt trade, financial, energy and tourism flows; and create non-sustainable migrant flows.

Again, this is not a comprehensive account and there are likely to be factors, some not even recognised now, which will emerge as major shapers of global, regional and national economic prospects.

South African Economy

Of particular concern to South Africa and Johannesburg are the prospects for emerging economies. Emerging economies generally did better than advanced economies until around 2011, but there has been a negative turnaround. Major problems facing emerging economies are commodity prices related in part to China's decreasing demand; the corporate debt build-up; volatile currencies; and rising interest rates in advanced economies. There is divided opinion over the short- to medium-term prospects of emerging economies. Optimists point to very recent data which shows a slight turnaround in commodity prices (with China, for example, moving to cap the oversupply of steel), the reluctance of the US Federal Reserve to further raise interest rates, and India's strong economic performance. Redlinghuys (2015), a South African financial market analyst writes of a "messy and confusing world [where] forecasting what is happening is incredibly difficult." In asking the question "have emerging economies come back into favour?" he concludes hesitantly, "Yes, for the time being."

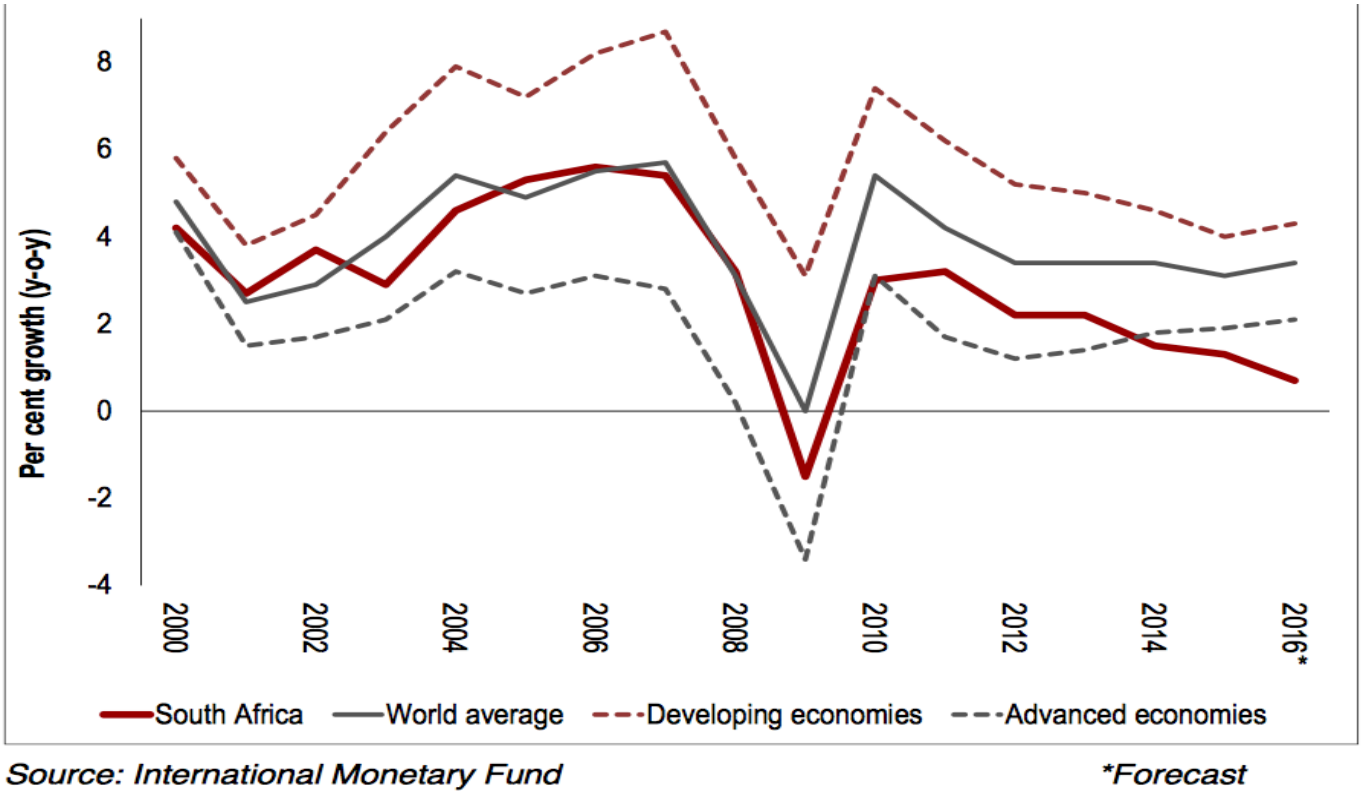


Figure 5: South African and global economic growth, 2000-2016. Source: National Treasury, 2016

In addition to those facing the global economy, South Africa, and Johannesburg, has its own risks and uncertainties. The National Treasury's Budget Review (2016) warned that since around 2010 South Africa's growth rates were lower than the world (and emerging economy) average, suggesting national factors dampening prospects and increasing uncertainties (see figure 4). The review downgraded growth projections from 1.7% for 2016 to a mere 0.9%, raising the real prospect of recession (National Treasury, 2016). Among the South African concerns (shared, of course, with some other countries) are the troubles in the mining sector, labour conflicts, energy shortages, and political and policy uncertainty. A recent study shows, for example, that South Africa ranks high on a policy uncertainty index (Business Day, 2016) with the IMF (2016) also identifying policy and political uncertainties in South Africa as a growth dampener, a problem reflected, for example, in the extreme volatility of the Rand (see figure 5)

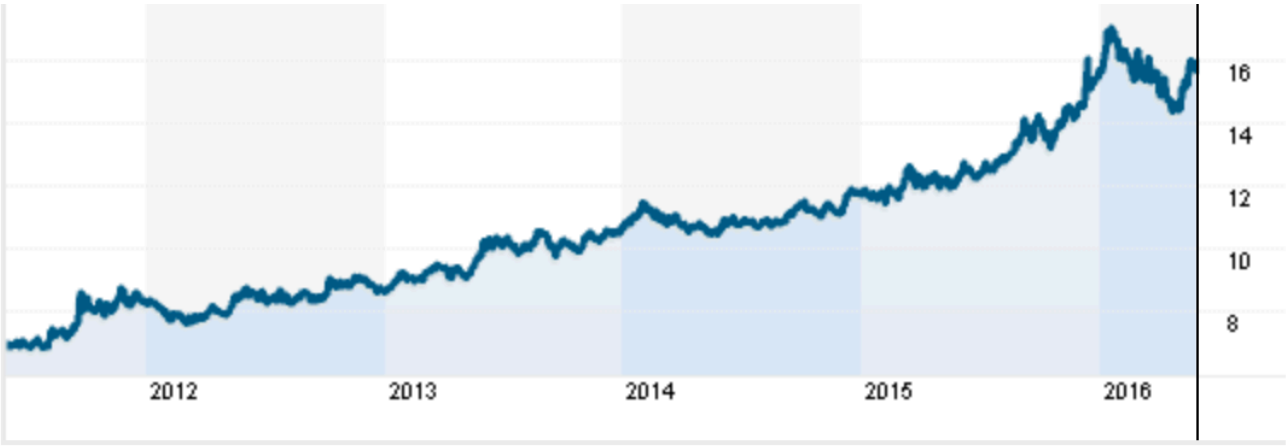


Figure 6: Rand-US Dollar Exchange Rate over 5 years. Data captured on 31 May 2016. Source: Reuters

Johannesburg is even less able than South Africa to shape its economic fortunes, although good city management does clearly play a role in growth prospects. Johannesburg's economy was given a boost with the ending of apartheid rule, with both increased population growth rates which stimulated the development of the service sector and expansion of the corporate sector, mainly headquartered in Johannesburg, into Africa and beyond. There was especially rapid growth in the financial and business services sectors which became the leading edge of the city economy. Data from Global t suggests that Johannesburg's economy outperformed the national economy in the early post-apartheid years (Data derived by GSPCR from Global Insight). Between 1996 and 2004, the city economy grew at an estimated average of 4.5% per annum, and Gauteng's economy at 3.9%, compared with the national average of 2.9

%. Growth in Johannesburg and Gauteng accelerated to around 6.4% in 2007, reflecting improved national conditions, but maintaining a lead over the national economy. In 2008/09 the city and city-region economy dipped steeply into recession, as did the national economy. The most recent data for the city economy is for 2013, and suggests a growth of only 2.1%, marginally *lower* than the 2.2% for South Africa (Data derived by GSPR from Global Insight).

Spatially disaggregated data on economic output is not sufficiently current or reliable as an indication of Johannesburg's performance relative to the regional or national economy. There is however the

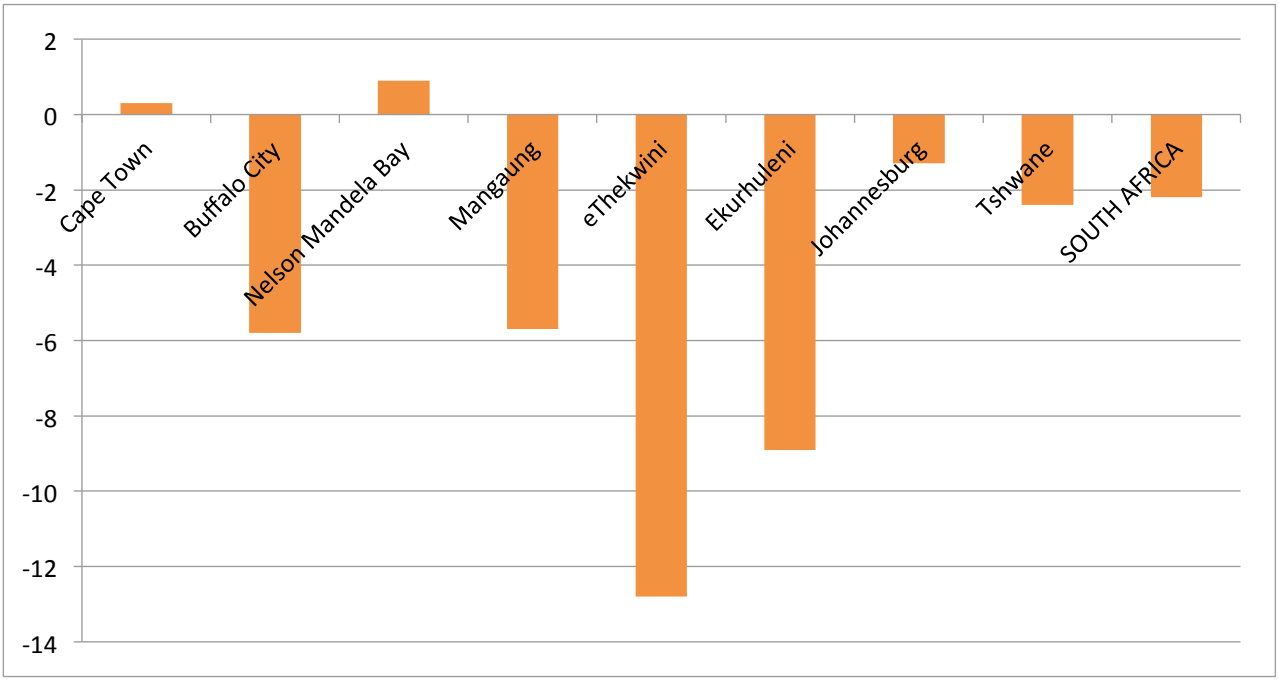


Figure 7: Percentage Change in Employment between March 2015 and March 2016 (Stats SA, 2016)

Statistics SA Quarterly Labour Force data (2016). The May release for the first Quarter of 2016 provided a grim picture of South Africa's national economy indicating a 2.2% decline in employment for the year ending March 2016 (representing the loss of 355,000 jobs). As indicated in Figure 4, the data for the metropolitan cities indicated a mixed picture. While Johannesburg's overall decline of 1.1% in employment (a net loss of 1.3%) was slightly better than the national average it is still of deep concern. It does not indicate a city economy that is driving national development.

Johannesburg and its wider region is facing a troubled economic present and uncertain longer-term prospects. There are critical questions to answer, especially in relation to the mediocre performance of the city relative to the national economy. Is this a cyclical problem or are we facing a much deeper

structural issue? Have the post-apartheid growth drivers in the local economy dissipated, and if so what might new growth drivers be?

2.5 Technological

Technological change, mainly but not only in information and communications technology (ICT), is transforming economic and social relations in ways that are now commonly labelled as the *Fourth Industrial Revolution*. Symbolized in popular life by ubiquitous smart phones, new forms of technologically-enabled business such as Airbnb and Uber, advances in engineering (e.g. smart materials), and fibre optic internet roll out, technology continues to have profound impacts on cities. While progress in technology is both undeniable and unavoidable, the forms that technological advancement will take are unpredictable and its ramifications uncertain.

Risks and Trends

It is impossible to predict technological impact as there is not real way of knowing—at an early stage, at least—which of these trends will take hold, and what the societal impacts will be. For example, whether the now technologically feasible self-driving cars will have any real take-up or impact, is currently unknown; and is subject to varying speculations. There is often a long lag—sometimes twenty to thirty years—between the actual technological innovation and its widespread take-up, and an even longer lag between the innovation and real social impact. In the process, many innovations fall by the wayside.

While outcomes are unpredictable they do eventually become gradually apparent, and there is a strong reason to carefully monitor advances in science and technology, the benefits and risks they present, and their emergent outcomes. The majority of management consulting firms (e.g. Deloitte and AT Kearney) publish annual reports that attempts to identify risk and trends in technology, and their potential impact on business. For 2016, the key trends of identified concern range from 'cyber insecurity' to 'the rise of the machines' (AT Kearney, 2015).

The Global Risks Report details the key risks facing the world in various spheres including the "adverse consequences of technological advances; breakdown of critical information infrastructure and networks; large-scale cyber attacks; massive incident of data fraud/theft" (WEF 2016, 9). The report argues that neglecting the risks involved in technology—especially cyber risks and potential information infrastructure collapse—could have calamitous economic results. The potential socio-economic

ramifications of technological uncertainty will be discussed later in this section. Some of these risks and trends are indicated below as illustrations.

Risk: Cyber Warfare

The risk of large-scale cyber attack has featured prominently on the *Global Risks Report* since 2012. While this risk is greatest in North America, cyber attacks could also be targeted elsewhere. While cyber attacks have historically been isolated to an individual entity or nation, as technological systems become increasingly interconnected and cyber attacks increase in frequency, the risk increases (WEF 2016). For cities in particular, there is a risk of cyber attack to urban infrastructure such as electricity grids and rapid transit systems. At a NATO workshop on cyber warfare in 2015, "the risk of escalation, both in the nature and in the number of conflicts, was perceived as realistic by both the speakers and the audience attending the workshop. Deterrence therefore emerged as one of the most pressing challenges posed by cyber warfare" (Taddeo, 2015). Despite cyber warfare posing a risk to the global political balance, deterrence, monitoring and justice are difficult to achieve, given the privacy issues of surveillance and the challenges of capturing cyber criminals (AT Kearney, 2015).

Risk: Data Exchange and Infrastructure

The rapid exchange of data across the world has become one of the hallmarks of the twenty-first century. Given its central role in contemporary economies, the maintenance and protection of infrastructure required for the exchange of data is paramount. The physical infrastructure of data sharing, like undersea cables, could become a terrorist or warfare target, and if infrastructure is inadequately maintained, data exchange could be compromised (WEF 2016). In addition to physical infrastructure, international legal frameworks need be better developed to allow for the unhindered exchange of data. "The current regulatory regime is underdeveloped and lacks the necessary legal certainty in areas such as privacy, transparency, encryption control, the effect of intellectual property regimes on data that cross borders, and the impact of proprietary data on competition" (WEF 2016, 18).

Trend: Move towards Artificial Intelligence

Since the first commercial microprocessor chip was built in 1971, the key focus in computing has been on making chips smaller and more powerful; a success easily visualised comparatively—if construction and architecture has progressed as fast as computing since 1971, the tallest building would now reach half way to the moon (The Economist 2016b). However, this rapid rate of progress, as well as the form

of progress, has now changed. Advancements in chips have slowed, since there is no longer a demand to make it smaller and more powerful; the focus in computing is now on software, specialized hardware and the 'cloud'. Hardware is becoming increasingly specialized by industry, and advances in the 'cloud' mean that high quality internet connectivity is more important than ever before.

Software development has extended to 'deep learning' and Artificial Intelligence (AI) is progressing rapidly (The Economist 2016). Significant voices in the technology and science community—from Stephen Hawking to Bill Gates and Elon Musk—have warned that AI is one of the greatest risks facing humanity, pointing to job threats, the undermining of human liberty with the potential to monitor conversations and face recognition and also the more broadly defined "threat of autonomous machines with superhuman cognitive capacity and interests that conflict with those of Homo sapiens" (The Economist 2015a). However, other voices point to the enormous potential benefits of AI such as such as advancements in healthcare and education, and increased economic productivity (The Economist 2015a).

Trend: E-commerce

E-Commerce is already a well-established trend, particularly in advanced economies. Goldman Sachs predicts that e-commerce will gain greater market share worldwide, and in India, it is expected that the e-commerce sector will triple from $23 billion to $69 billion by 2020 (Overdorf 2016). While in advanced economies, e-commerce has relied on existing commercial and logistics infrastructure, in India, e-commerce has built a financial infrastructure with innovative payment methods and small business loans and is attempting to better connect rural areas to the centre of the economy (The Economist, 2016A)

E-commerce in India has gained a large market share, with the combined sales of the top three e-commerce retailers exceeding that of their top ten offline counterparts (The Economist, 2016A). According to Amazon, 6,000 Indian businesses are now retailing internationally; likewise, Chinese e-commerce giant Alibaba has connected 780 rural Chinese villages to online retail; at least 10% of households in these areas are now engaged in e-commerce as buyers or sellers (The Economist, 2016A). The immense success of e-commerce in India could be mirrored in other developing countries, including South Africa, although on a smaller scale. This would impact urban economies and spatial form, particularly as offline retailers face increasing competition.

Trend: The Increasing Digital Divide

One of the key social issues emanating from improvements in technology is the rapidly increasing digital divide, where some (usually the wealthy and better educated) have access to the internet and new forms of technology, while others are omitted from this increasingly significant aspect of the global economy. Exclusion from ICT fosters social discord and exacerbates inequality. Castells (2001: 248) argues that internet access is "a requisite for overcoming inequality in a society which dominant functions and social groups are increasingly organized around the internet".

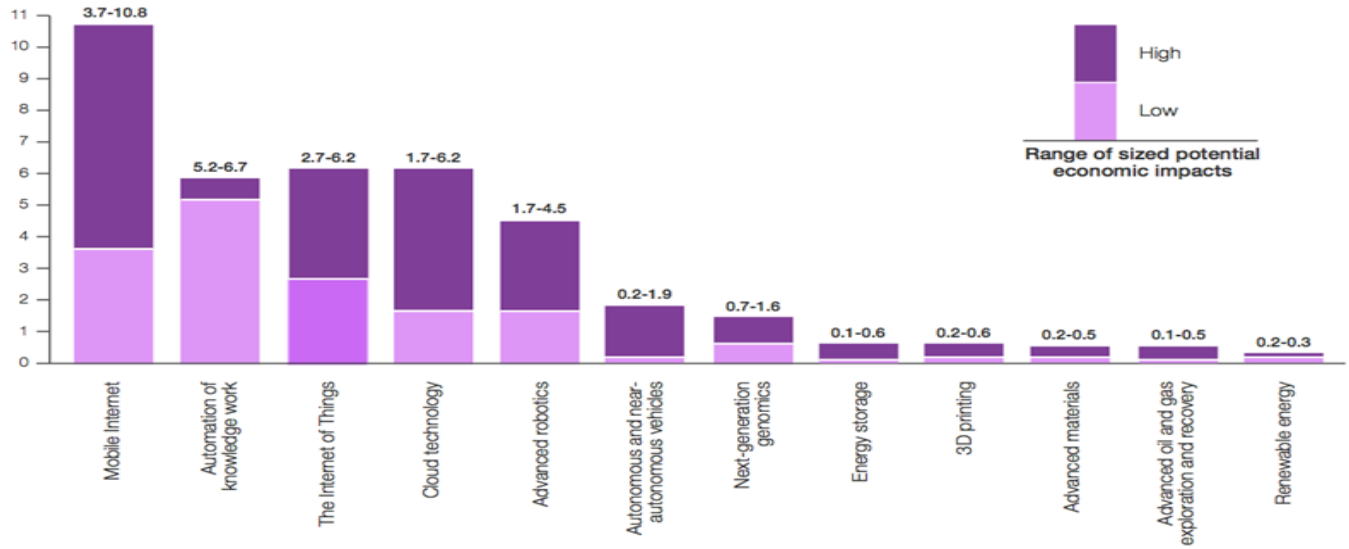
The digital divide also extends beyond simple access to a computer; the ability to access information, particularly that behind paywalls, is significant (Graham and Foster, 2016). "An overemphasis on the mere presence of computers or Internet connections, without a corresponding emphasis on social mobilization and transformation, can squander resources while leaving inequity intact processes that underlie social development and inclusion" (Warschauer, 2003: 303). This is one of the key areas of technological turbulence that need not remain uncertain as government intervention providing comprehensive ICT access can quell the potential social ills of technology and the digital divide.

Since there is so much uncertainty in the field of technology, it is important to understand the potential areas of socio-economic impact, in order to protect against such eventualities.

Economic Implications

There is much economic hope invested the technology sector*; The Global Risks Report* (WEF 2016) outlines potential areas of economic impact and shows that new technologies could have an annual economic impact of between 16.7 trillion dollars and 40.4 trillion dollars. Work in mobile internet, cloud technology, the Internet of Things, and the automation of knowledge is predicted to have the highest economic impact, as displayed in Figure 5.

However, there are also concerns about the potential of an economic 'bubble' bursting in the technology sector, similar to the 'dotcom crash' of 2000. Although contemporary technology businesses are more robust, the industry is insular and the majority of Silicon Valley's companies are private and funded by a small pool of investors, meaning little public accountability (The Economist 2015b). If a 'tech-bubble' were to burst in Silicon Valley, it could have global economic ramifications.



Source: Based on Manyika et al. 2013.

Note: Projections are to 2025 and include sized applications and consumer surplus.

Figure 8: Estimated Potential Impact of Technologies, US $ trillion, annual (WEF, 2016, p. 18)

The labour market could also be changed by the ability to work remotely, although the uptake in remote work has been lower than expected, with most firms wishing for their employees to work centrally. Upon reviewing existing trends it seems more likely that jobs will continue to be computerized, creating greater unemployment, especially among lower-skilled workers. *The Global Risks Report* (WEF 2016, 20) suggests "skills in STEM (science, technology, engineering and mathematics) are expected to increase in importance in the medium term, with longer-term needs projected to focus on skills such as creativity, problem- solving and social intelligence." Growth in unemployment is a well-documented social and political issue, and the potential for job losses through technology must be realized and combatted.

Governance Challenges

Technological innovation often has unexpected governance implications. As has already been seen in Johannesburg, Uber and Airbnb have been difficult to regulate with little precedent for such phenomena. The Uber car service app has already had a significant impact on Johannesburg's transportation network and causing a regulatory conundrum. The San-Francisco-based company has been accused of avoiding taxation and other regulation in South Africa and abroad (Gedye, 2015). Airbnb, which enables people to rent rooms in private homes, has faced disputes with city authorities in Berlin, New York, San Francisco and elsewhere, with Barcelona fining the company 30,000 euros for violating local tourism laws (Kassam, 2014). Unprecedented technological trends, such as Uber and Airbnb, speak to the need for flexible regulatory systems.

While there is much speculation about the future of technology, it is impossible to be certain of what will become transformative in society and what will falter. However, there are three vital steps that can be taken to ensure that the rapidly changing field of technology is not a hindrance.

1. Be aware of technological trends, cyber threats and their potential.
2. Ensure that systems of governance and regulatory networks adapt to the challenges posed by technology (e.g. around privacy and surveillance).
3. Since the only unquestionable variable is that technology is going to continue to play a massive role in shaping cities and human lives, substantial efforts should be made to lessen the digital divide.

2.6 Social and Political

The nature of politics and social relations has changed substantially in the twenty-first century. As visible in news reports across the world, youth social movements and social media have overtaken traditional political parties and trade unions as the dominant forms of civil society activism. Although there is rapidly declining faith in traditional institutions, traditional institutional models are still dominant, leaving considerable socio-political uncertainty about the future forms of activism and political relationships. Widening global inequality, especially in cities, is fostering social unrest, as well as the increasing self-imposed isolation of the wealthy (UN-Habitat, 2016). The WEF's *Global Risks Report* (2016) highlights the risk of social instability; although social instability can result in positive gains, the outcomes are uncertain.

International Movements

The clash of institutions with social movements and the general mistrust of institutions are immensely prominent in 2016. "The most recent edition of the *Edelman Trust Barometer* found that in a higher proportion of the surveyed countries than ever before in the barometer's 15 year history, people were distrustful of both governments and businesses" (WEF, 2016). NGOs were not as strongly mistrusted as governments, but faith in NGOs had also declined (WEF, 2016). Globally, governments are perceived as unable to respond to global challenges, unwilling to regulate big business, privileging the wealthy and unaccountable to citizens (WEF, 2016). Regional groupings, likewise, appear impotent, resulting in the potential exit of the UK from the European Union, and severe doubt about the capacity of regionalism. The decline in support for labour unions in advanced economies is further proof that traditional political structures are being rejected. In the United States, union membership has hit a 97 year-low, with only

11.3% of workers unionised (Liu 2013). This trend is likely to continue, and will foster uncertain outcomes.

In many countries, politics is becoming increasingly polarised, particularly by an extremist right gaining ground. Should the ultra-right wing conservatives come to power—such as UKIP in the United Kingdom or, most pertinently, Donald Trump in the United States—protectionist policies would be their hallmark, and international trade, especially in emerging economies, could suffer (The Economist, 2016c). The growth in right-wing politics is also fuelled by the migrant crisis resulting from the Syrian war and the increased threat of terrorism from Islamic State. These provide justifications for increased securitisation of cities, Islamophobia and racism. Hatred or fear of the 'other' has become a defining factor in contemporary social interactions and political discourse; especially in the global north. Islamophobia has been labelled a threat to European democracy, as European countries become increasingly authoritarian in the name of restricting migration (Tharoor 2016).

Meanwhile, activism against institutions and social norms has taken new forms. The prevalence of social media has created a new brand of 'hashtag activism': a term coined during the US Occupy (Wall Street) movement to describe activism that is organised or conducted on social media (Augenbraun 2011). The international #blacklivesmatter movement arose in response to the institutional failure of the American court system to bring the killers of young, innocent black men to justice. While it began as a social media campaign, the #blacklivesmatter movement has been labelled a new civil rights movement, achieved concrete gains in the US and made international headline news (Day 2015).

Social media has also brought renewed vigour to the issues of gender inequality, racism, Islamophobia and other forms of discrimination. The politics of race and gender has become increasingly pronounced. In addition to #blacklivesmatter, #MuslimsAreNotTerrorist has tried to address rampant European and American Islamophobia in the wake of terrorist attacks in Paris (Marans, 2015). #BringBackOurGirls, #WhyIStayed, #YesAllWomen have drawn attention to feminist issues and arguably ignited a growing global feminist imagination (Hossain 2014).

Hashtag activism, although labelled 'slacktivism' by some, should not be underestimated. It has drawn global attention to social and political issues and many hashtag movements have translated to substantial 'real world' gains. Perhaps the most impactful movement of hashtag activism enabling collective organising was the Arab Spring. Social media has correlated with a rise in youth political engagement, which has had a significant global impact, ranging from the Arab Spring to the 2014 Hong

Kong protests. Recently, in Brazil, youth politics and social media were central in mobilising the protests that led to Rousseff's impeachment (Winsor 2016).

South African Movements

In South Africa, youth activism has played a profound role in shaping politics in recent years; especially since the #RhodesMustFall movement began at the University of Cape Town in March 2015. The following #FeesMustFall protests have illustrated the immense power underlying hashtag activism and politicised, active youth. Students, in each of these cases, have challenged the institutions of universities and the state, to bring about concrete change. The reallocation of government spending following #FeesMustFall has created additional uncertainty about national fiscal pressures and the financial sustainability of South African universities.

South Africa is also facing widening inequality, growing unemployment and economic stagnation, all of which result in increased social unrest, especially among unemployed or underemployed youth. As is the global case, South Africans have lost trust in institutions. According to AfroBarometer, a public attitude survey across much of Africa, trust for public institutions has dropped dramatically since 2011 (Afrobarometer 2015).

Given the current trends towards hashtag activism, youth social movements and a lack of trust in traditional institutions, institutions need to become more responsive to public demands, engage in social media and recognise the importance of public accountability. Given the changing nature of social relations and political power, it is important to prioritise adaptability in all spheres and highlight accountability.

2.7 Implications

The outline of trends provided above is not intended to be comprehensive or authoritative but rather to be indicative of the high levels of uncertainty across sectors of concern. However, it does suggest implications for the COJ as outlined below:

- The COJ should progressively strengthen its capacity to address risk, including through deepening its understanding of risk. Specifically, the COJ could adopt at city-level the forms of risk assessment that have been developed by global institutions[3].

- Take the shifting demographic trends more seriously in planning processes. Instead of assuming the continuation of the previous trends of high urban growth, begin responding to a possible future of declining urban population growth rates, near-saturation levels of urbanisation and demographic ageing.

- Recognise the potential role of transnational migration in addressing future demographic challenges (and, importantly, communicate positive messages around the role of migration to the public as xenophobia remains a major threat to realising the positive benefits of migration).

- Put in place systems for the systematic monitoring of the effects of climate change in Johannesburg and its wider region, and progressively strengthen adaptation measures.

- Progressively reduce the dependence of the city on both carbon-based and external sources of energy through demand management, increasing local generation of energy (electricity and fuel) and changing energy procurement practices (e.g. through the use of wheeling agreement that would allow access to IPPs).

- Vigorously implement measures to delay the need for large-scale water augmentation but engage energetically with national government over plans to ensure the long-term sustainability of water supply for the city.

- In this period of economic crisis across all geographic scales, place the economy, and especially job creation, at the heart of all the city does. Do all that is possible to attract the inward investment that addresses the developmental challenges of the city and to unlock local entrepreneurialism. Increase the capacity for economic analysis and especially for identifying possible future drivers of the city's economy.

- While the outcomes of technological change cannot be predicted, it is possible to increase capacities to benefit positively from this change and reducing risks by continual monitoring,

[3]For example, the WEF's annual surveys of short- and long-term risk assessments that draw on the perceptions of a range of selected experts and leaders across segments of society.

reform and adaptation of regulatory frameworks, and dealing proactively with the challenges of the digital divide.

- Engage with the changing nature of political organisation and social organisation, and the declining faith in formal institutions by expanding the openness, accessibility and accountability of government, and by strengthening mechanisms of communication, including the use of social media.

3. Managing Uncertainty

In the first section of the report we explored multiple dimensions of uncertainty. We have shown that there are emergent trends to explore but that in relation to each of them uncertainties are vast. How then do we plan, given that planning would seem, almost by definition, to require a degree of confidence around knowledge of the future? Fortunately, there is some guidance in the international literatures, although with very different positions and orientations.

The literature on responding to, and planning for, uncertainty has been evolving since at least the late 1960s. The social turbulence in cities in North America and Western Europe challenged assumptions around stability and uncertainty that underpinned policy-making and planning in the politically and economically dominant global North in the post-war era. This was reinforced in 1973 with the Global Oil Shock which effectively ended a prolonged era of global economic stability. We are currently in a period of renewed uncertainty and instability globally which is redirecting attention to ways to plan without certainty.

There is a considerable literature on corporate planning and strategy in contexts of uncertainty, and a lesser literature on planning within the public sector. There is an especially extensive recent literature on adaptive governance which is derived largely from work on responses to climate change, but has expanded into addressing other areas of uncertainty. There are also literatures on uncertainties in the production environment, on innovation in uncertain contexts, and on specific approaches and methods such as foresight and back-casting.

It is difficult to make sense of it all but Wiltbank et al. (2006) helpfully categorised the different approaches to dealing with uncertainty. As shown in Figure 6, they used a quadrant-based categorisation with two dimensions of difference—that is, the extent to which *prediction* is emphasised and the extent to which *actors* attempt to control the future.

In terms of *prediction*, at the one extreme are 'planning' approaches that emphasise the accuracy of prediction but there are also 'visionary' approaches that are predicted on an ability to actively shape the future (and are therefore also able to predict). At the other end of the spectrum are the approaches which are concerned with adaptation or incremental strategy-making which assume that prediction is not possible within a radically uncertain environment. In terms of *control*, there are approaches which are primarily concerned with positioning an institution within an environment shaped by exogenous

forces. At the other end of the spectrum are approaches that are concerned with actively attempting to shape forces and construct futures.

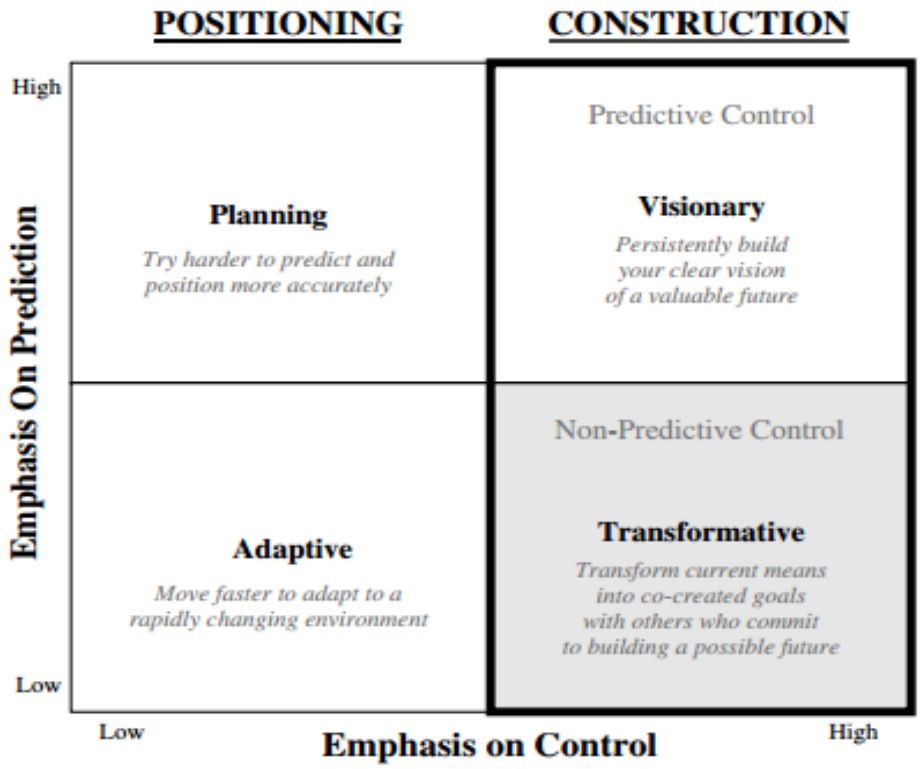


Figure 9: Approaches to Handling Uncertainty (Wiltbank et al., 2006)

Wiltbank et al. (2006) brought these two dimensions together to in identifying four categories of response which are indicated in Figure 6 and below:

1. *Planning* (high prediction, low control) – in this approach the dominant strategy is "try harder to predict and position more accurately."
2. *Adaptive* (low prediction, low control) – "move faster to adapt to a rapidly changing environment."
3. *Visionary* or predictive control (high prediction, high control) – "persistently build your clear vision of a valuable future."
4. *Transformative* or non-predictive control (low prediction, high control) – "transform current means into co-created goals with others who commit to building a possible future."

In the section below the literatures on each approach is briefly discussed. The reality in practice, of course, is that institutions may combine approaches, or adopt more than one simultaneously. It is possible to draw elements from each approach, and this we do in a concluding sub-section.

3.1 Planning

This refers to particular approaches to planning that are highly dependent on projection or prediction, and which then attempt to respond with strategies that accommodate the anticipated change. In the field of land-use planning, for example, predictions of economic and demographic growth would be translated into land allocations for industry, housing, and social services. This approach has, of course, been notoriously unreliable with very few examples of successful predictions, and multiple examples of under- or over-supply of land or services.

Given the widely accepted critique of traditional forms of predictive planning we don't spend time on it here. We refer instead to more responsive forms of predictive planning that take account of uncertainty. Most important are the corporate strategic planning processes that emerged in the 1970s and which were later taken up in public sector planning although these eventually evolved into 'visioning').

During the turbulence provoked by the oil shocks of the 1970s, both rigid business planning and an informal approach of intuition and trial-and-error proved inadequate for firms. What emerged was a method for best positioning a firm within the external environment. One of the more popular tools in this approach was the SWOT analysis which identified the internal **S**trengths and **W**eaknesses of an organisation, and the **O**pportunities and **T**hreats posed by the (often turbulent) external environment. This analysis then fed into the development of a Strategic Plan which provided strategies for the competitive positioning of the firm. This approach was taken up in public sector planning, especially for large cities, where a strong thrust in strategic planning was improving the competitive position of a city.

This form of strategic planning has provoked a considerable debate. The major concern is with consolidating the outcomes of the analysis into an actual plan as this is considered to be dangerously limiting in the context of extreme uncertainty. Miller and Cardinal (19941649) explained that these critics "maintain that a plan channels attention and behaviour to an unacceptable degree, driving out important innovations that are not part of the plan". Mintzberg (1994a) wrote that explicit strategies "are blinders designed to focus direction and block out peripheral vision" (p.184) and that "setting oneself on a predetermined course in unknown waters is the perfect way to sail straight into an iceberg"

(p.26). Mintzberg (1994b) argued that managers must be *strategic thinkers* but that strategic planning is not the same as strategic thinking. Strategic thinkers must have the space to respond to the complexity of a fluid complex and should be able to exercise creativity and use intuition without the constraints of a prior plan.

Miller and Cardinal (1994) suggest that in turbulent, unpredictable environments there is a need for more strategic analysis than otherwise. There is also a need for more thought—more planning—around the big decisions that are needed around capital outlays, for example. Miller and Cardinal reviewed the findings of 26 studies of strategic planning in firms and concluded that active use of strategic planning has made a positive contribution to corporate success. Grant (2003494) positioned himself between these two positions suggesting that the various studies offered "inconsistent findings."

The debate was heated but some form of synthesis eventually emerged. Mintzberg (1994a & b) conceded a role for planning in support of strategic thinking. He referred to planners as analysts who provide crucial informal to the strategic thinkers—the managers—and advise on possible strategies. Shalev-Shwartz et al. (2016) offer an approach of "long term planning by short term prediction." For them, planning is about finding immediate actions that would optimise a long term objective. Because long-term prediction is impossible given the uncertain environment, we need constant planning of action based on continuous short-term prediction. The planned actions may shift but the long-term objective remains constant.

Grant (2003) used a different method. Instead of proposing an approach, he considered what firms are actually doing in contexts of uncertainty. He indicates that large corporations have not abandoned strategic planning despite the now widespread awareness of its limitations and pitfalls. Instead, the practice of strategic planning has evolved in quite complex ways. In its initial (1970s) form, corporate strategic planning was a formal, rational, top-down process, generally managed by the CEO of a firm. Increasingly, however, strategic planning has become less formal (with less reliance on structured methods); more decentralised with inputs received from across the corporation; and, often, with shorter time-horizons (especially where markets are highly volatile). There is much more attention now to communication within the firm, and to the use of strategic planning to build organisational relationships.

To some extent these changes have been paralleled in public sector planning. Traditional modes of predictive planning have been sharply criticised but strategic forms of planning, which offer the long

range vision but also the space for short-term prediction and adaptive action, have emerged as a dominant feature of the governance of large cities. This will be discussed under the heading 'visionary' as long-range strategic plans for cities are increasingly intention-driven and not simply about competitive positioning.

3.2 Adaptive

This approach does not rely on predictive methods, but rather suggests the formation of an adaptive system that can react to change more quickly and easily. The focus is on strategies that can enhance adaptive capacity with little, if any, emphasis on strategic intent.

In 1980, Rosenhead argued that the recognition of uncertainty should be the key element of planning and that planning activity "should keep options open, and aim at a loose fit on the planned for activities" (Rosenhead 1980, 331). He spoke of the need for instruments of planning that are explicitly about achieving flexibility and of methods of planning that are about "continuing strategic choice" (Rosenhead 1980, 331). Rosenhead's approach has been expanded in a recent and now considerable literature on adaptive governance. The term is a short-hand for a variety of collaborative, flexible and learning-based approaches to governance that allow us to (i) respond effectively to short-term shocks, (ii) anticipate and respond on an ongoing basis to longer-term shifts such as demographic growth and climate change, and (iii) deal effectively with pre-existing challenges such as spatial and institutional fragmentation, urban inequality, and non-sustainable growth paths. Importantly, it encompasses both a response to a sudden shock and to on-going incremental changes which have gradual cumulative effects.

The theory of adaptive governance is based on the idea of complex adaptive systems: a scientific term that refers to structures such as the brain, the ecosystem, the cell and the immune system; in non-biological terms, it can make reference to the stock exchange, the global macroeconomic system or the internet (Pereira and Ruysenaar, 2012). These systems are sufficiently complex and adaptable so that a small shock would have almost no impact on the overall system, and change can be absorbed easily. Taking its cue from social-ecological systems, scholars of environmental governance, in particular, have championed the concept of adaptive governance to deal with the uncertainty and complexity of challenges such as climate change (Chaffin et al. 2014; Birkmann et al. 2010). They argue that the system of governance should be sufficiently 'flexible, dynamic and responsive' to react to a variety of contexts, unexpected feedback and complex change (Chaffin et al., 2014).

Adaptive governance is however also influenced by conceptions of adaptive management—a field that highlights the need for continuous learning, and for building the networks through which learning happens. What is important here is the recognition of how important social relationships, both formal and informal, are in ensuring adaptive capacity.

The other concept and field of investigation which is becoming increasingly important is 'innovation'. In his critique of strategic planning, Mintzberg (1994109) wrote , "search all those strategic planning diagrams, all those interconnected boxes that supposedly give you strategies, and nowhere will you find a single one that explains the creative act of synthesizing experiences into a novel strategy." The concept of 'urban innovation' has emerged strongly post-2008 as an alternative to cutting down on the scale and quality of services, or continuing to spend recklessly to maintain political support. Urban innovation requires new and creative ways of improving urban services within an existing, or shrinking, resource envelope (Harrison and Rubin, forthcoming).

The most recent literature on urban innovation underlines the ways in the knowledge, skills, creative capacity, experiences, and resources of multiple actors combine to produce innovative responses to urban problems (Harrison and Rubin, forthcoming). Sørensen (20141) writes that "collaboration between interdependent actors [is] a key driver of innovation." For Sørensen, the learning networks within government, and also those which connect government to other actors, are more important than well managed government hierarchies. The approaches to governance which emerged from the New Public Management (NPM) are arguably now an increasing hindrance to adaptation and innovation. They tend to leave the executive leadership of local government isolated at the top of an administrative hierarchy and prioritise performance management systems that reward compliance to existing conceptions of good practice, rather than incentivise efforts to invent the next round of good practice (Harrison and Rubin, forthcoming).

There is now a fairly extensive literature offering guidance to municipalities on approaches to adaptive governance. This literature is not prescriptive, indicating instead that each city has to work out its own means of adaption. However, the literature is clear that traditional understandings of government cannot facilitate the adaptability required to deal with the uncertainties facing cities. Slow bureaucracies, tensions across spheres of government, and the traditional separation of government from actors in the private sector and civil society will hinder the ability of cities to respond to uncertainties and threats.

The required ingredients for adaptive governance include:

- Less hierarchical and institutional rigid structures (i.e. more polycentric, with strong informal and formal linkages between the units of governance),
- More attention to linkage and coordination across the scales (or spheres) of governance,
- Co-production between government and non-government actors;
- Deliberate effort to incentivise a culture of innovation with support for constant experimental learning and learning feedbacks,
- Mobilisation and energisation of social actors in response to the critical challenges and uncertainties of the city,
- Intelligence and analysis of trends and risks feeding into governance systems,
- Strategic and visionary leadership,
- Appropriate and consistently administered legislative and regulatory frameworks, and
- Enabling financial arrangements (Harrison et al., 2014).

Promoting adaptive governance within a large hierarchy means confronting many entrenched practices and mind sets. Lampis (2013) explains, for example, that in Bogota, Colombia, city officials frequently thwarted the implementation of adaptive governance techniques to combat climate change. She argues that the transformation of a system to become more adaptive should be accompanied by a "framework based on incentives and obstacles," so as to ensure that city officials are willing to participate in the adaptive governance initiative.

The major limitation of an adaptive approach is that it is built entirely on responsiveness to change rather than any attempt to influence change. It is possible, for example, that adaption may merely mean adjustments that allow a currently unsustainable or unjust development path to persist. However, recognition of this limitation does not negate the fact that there are powerful forces operating from global to local levels that are far beyond the capacity of a city government to influence, and that adaptation in relation to these is a necessity.

3.3 Visioning

Visioning is an intentional process and in this sense can be distinguished from both adaptation and earlier approaches to strategic planning which were simply about competitive positioning. It is an

approach which responds to uncertainty by providing clarity of intention but which also provides the necessary flexibility in realising the intent.

The famous British sociologist Anthony Giddens spoke of a 'utopian realism', arguing that "we can envisage alternative futures whose very propagation might help them be realised (Giddens, 1990, p.154). His hope is that an imaginative construction of the future might "rebound on how the future actually develops" (p.178). In other words, by bringing new possibilities for the future within the realm of popular imagination through the construction of vision, we may make possible what otherwise might not be.

The intention through a visioning process is to create a compelling statement of what the future might be like that would lead behaviours and actions in the present-day. Visions present positive, desirable images of the future that inspire us to act in ways that would help in realising them. Visions, however, have to be believable. As Giddens (1990) explained, to work they cannot be wild fantasies. They are most effective when they are based on the possible positive outcomes of processes that are already evident. In this sense they are a form of utopian realism.

From the 1990s an increasing number of cities have introduced visioning processes. The logic of these has been described by Gaffikin and Morrissey (1999, p. xi):

> Vision planning, in seeking to get beyond land-use planning and zoning (the traditional concerns of planning), seeks to dissolve old demarcations, integrating the various dimensions to ensure a holistic development. It looks far enough ahead to avoid the immediate concerns about feasibilities such as cost. Such considerations inhibit imaginations about preferred futures by emphasising the current limits of resources, agencies, or the dispositions of key actors. By contrast vision planning, supported by an informed view, is offering more of a blank canvas to sketch from, and scratch the shape of tomorrow's society. Thus the vision is intended to be free from a blinkered vision which perceives current problems and visions to be largely unchangeable.

Gaffikin and Morrissey do however make the point, as Giddens made earlier, that the vision "is not simply the product of untamed imagination and flights of fancy." They insist that this would amount to "no more than wishful thinking at best or authoritarian utopianism at worst" and visions "must be influenced by an acute understanding of the complex forces driving social change." (1999, p. xi)

One of the methods for producing visions is the sketching of possible scenarios, using an analysis of trends, and then the selection of the desired alternatives. This is very different from single point forecasting. Scenario selection can be developed into plans through a process of backcasting. While forecasting is about predicting the future based on an extrapolation of current trends, backcasting involves sketching out a desirable future outcome and then identifying the steps that are needed to achieve this outcome.

Visioning exercises form part of the new generation of strategic spatial plans for cities. As Newman (20081373) explains, strategic spatial planning "is intended to be an active force for change." These plans are almost all guided by statements of strategic intent, often called city visions. But they also generally reflect the insights of systematic analysis of current realities and emergent and established trends. They are *strategic* because they are selective in focus, long-range in orientation, and vision-focussed, and are therefore, arguably far more responsive to traditional forms of spatial planning (Albrechts, 2006).

Much of the literature on strategic spatial planning is concerned with how vision-directed strategic plans are produced, and this takes us to the forth quadrant. In the corporate sector visions were frequently produced by the senior executive as a form of 'predictive control'. In some city governments, too, processes were highly technocratic although the need for buy-in across a range of actors did prompt more participatory process. To use the phrase introduced by Gaffikin and Morissey there is a danger of "authoritarian utopianism".

3.4 Transformative

This approach is transformative in that the process of developing conceptions of the future allows for the relationships between actors to change. It is about building the diverse networks that ensure greater resilience into the future as much as it is about the substance of the vision. In this approach, the vision or the strategy is *emergent* rather than imposed.

This is not about "participation" which frequently involves inviting other actors into a city government-led process and therefore maintains the authority of government in defining vision and strategy. In a genuine process of co-production or co-creation actors outside the planning agency are able to meaningfully influence all stages of the visioning and planning process including in the way issues are affected, problems are defined, policies and actions are shaped, and implementation is structured. In a

process of co-creation, for example, there would be sustained arenas for dialogue both across the agencies and spheres of government, and between government and multiple other actors. These would not simply be formal structure of interaction but rather spaces in which multiple actors can meaningfully hear each other and co-produce plans on how urban territory could evolve. It is not a case, for example, of provincial and city government producing their strategic plans and then seeking alignment between them, but rather of co-producing a plan, also involving other key actors.

In the field of strategic spatial planning, this approach has been propagated by writers such as Albrechts and Healey. They envisage strategic planning processes bringing multiple actors together within forums of deliberation that co-create alternative futures (e.g. Healey, 2006; Albrechts, 2013 & 2015). Albrechts (2015) refers to co-production as being:

> grounded in a deeper understanding of the complex dynamics of urban and regional relations where value systems can be articulated, local and scientific knowledge can be combined on an equal base, shared strategic conviction can grow, and conflicts are reframed in a less antagonistic manner.

Healey (2006) writes of the "mobile, dynamic, relational complexity of urban regions," and argues that a lack of spatial imagination draws us towards narrow and static responses to this complexity. There is a strong tendency in government to narrow down the complexity and unify rather than developing a "multiplex, relational understanding of planning" (2006). For Healey (2006), developing new spatial imaginations through this more transformative approach "takes time—to explore, to think, to learn, to struggle, to diffuse." However, she is hopeful that "changes evolve in many small ways, building a ground of understanding and experiences which, over time, eventually come together in what history may then describe as a "transformative moment" (Healey 2006, 540).

This approach, of course, does not easily fit with the pressures of government where timeframes are important, and where planning cycles and performance management systems predominate. It requires willingness on the part of government to accept open endedness in terms of timeframes, process, problem definitions and outcomes, and to cede a degree of authority for plan-making. For Healey, many of the opportunities arise in tensions, stresses, fissures and cracks in governance processes which are also difficult for planning agencies to embrace given government's aversion to conflict and potentially risky situations.

Healey does ask whether it is all an "impossible venture" but she nevertheless finds hopeful examples in various cases across Europe. She acknowledges, however, the enormous effort required given the ways in which government is organised across scales and in sector silos; the skills and relational capacities needed; and, the ever-present threat of dominant interests or discourses taking over processes.

Newman (2008) is rather more sceptical of the extent to which government institutions can sustain the enormous complexities of a genuinely collective endeavour which crosses scales and sectors. He suggests that Albrechts and Healey have provided scant evidence of a transformative strategic spatial planning in practice and that we may be "shifting our gaze too far from the current realities of planning practice" (1372). He points to the slow pace of institutional development, the way agents of government constantly compete to carve out their spheres of influence, and the constant realities of everyday politics. He suggests it is the "ordinary politics of planning that may need more attention than the grander expectations of strategic spatial planning" (p.1373).

Newman (2008) argues for a more limited ambition focussed around specific moments of opportunity rooted in an understanding of the political process within which government officials are embedded. For Newman, the apparent inadequacies of planning are not a case of planners failing to achieve the grand ideal of co-produced strategic spatial planning, but should rather be understood as the "normal outcome of multiple decisions, reflecting multiple interests, strivings for legitimacy and responses to opportunities and constraints"(p.1381).

Again, we may find a useful synthesis of positions. Albrechts and Healey have offered the possibility of a practice of strategic spatial planning that is more transformative than city-led visioning processes, but Newman has grounded us in the realities of governance, suggesting more modest and incremental ambitions. The common ground may be a commitment to taking strategic planning in a more transformative direction, deliberately building the capacities and platforms to achieve more over time.

3.5 Bringing the Elements Together

The risk with the categorisation provided by Wiltbank et al. is that we may be forced into either-or choices in terms of responses. The reality is that while we may aspire, for example, to the transformative approach associated with processes of co-creation, elements of other approaches may be necessary. Brinckmann et al. (2010), for example, call for a "a concomitant and dynamic approach that combines planning and learning."

We may conclude that a mix of planning, adaptation, visioning, and transformative co-production is required of a city administration acting within a hugely complex and uncertain environment. We need to be quick and nimble but also strategically informed, visionary, and collaborative in our approaches. The challenge is framing the balance in this mix. Recent literature suggests the following:

- The focus should be on developing the capacity for on-going *strategic thinking*, but strategic thinking must be continually informed by strong *strategic analysis*.

- There is nevertheless *a critical role for strategic plans* especially for city government, which must make big decisions around large investments that provide path dependencies into the future.

- These *strategic plans must have robust long term objectives* informed by desired futures, but should not be descriptive in terms of actions, leaving open the *space for continual action-based planning* informed by short-term predictions.

- The mode of strategic planning may need to shift away from the top-down ('central strategy') model to a more decentralised model which draws in inputs from across the organisation, and which uses the strategising process to build organisational relationships.

- Explicit attention is required to incentivise a culture of adaptation and innovation within city government, and build the learning networks within the administration, and with actors beyond the administration.

- We must build alternative narratives of the future in the hope that our imaginings will rebound on how the future actually happens.

- Visioning processes should involve creative imagining of alternative futures but should be grounded in an understanding of possible outcomes of established and emergent trends.

- Processes of co-production should be systematically extended with institutional and political boundaries continually tested in this regard, but nevertheless with an understanding of institutional realities and the "ordinary politics of planning".

- Within the context of a complex city-region, specific attention is needed to building networks and relationships across spheres of governance, and to developing processes of co-creation with the other spheres (and with neighbouring municipalities).

- To support all the proposals above, specific on-going attention is needed to improve the competency, dispositions and knowledge ('intelligence') required to support the required response to change and uncertainty.

None of this is simple and intelligent assessment is continually required. Courtney et al. (1997), for example, suggest that the approaches taken should follow an assessment of the actual level of uncertainty. They refer to four levels of uncertainty as represented in Figure 7 and described below:

Level One: In this case the uncertainty exists not because the trends are *unknowable* but because the strategic analysis has not been done. Here there is room for fairly standard approaches to strategy formulation.

Level Two – Here there may be two or more discrete alternate outcomes dependent on clearly defined variables (for example, whether a city government makes a decision to invest in broadband infrastructure).This is a form of uncertainty best suited to scenario-type analysis, and to the use of probabilities in assessing possible outcomes[4].

Level Three: There is a range of possible outcomes that will be shaped by a number of identifiable variables. There may not be any natural or easily defined scenarios, but there is still value in using scenario planning to elaborate a range of possible outcomes, and establish the risks in following one path rather than another.

Level Four: This is a position of true ambiguity where there are multiple, interacting dimensions of uncertainty that are impossible to predict with a range of possible outcomes that cannot even be identified. A more flexible and qualitative approach is needed here but Courtney et al. (199772) advise that "it is critical to avoid the urge to throw up your hands and act purely on gut instinct." Managers need to differentiate between what is unknowable and knowable, and at least develop analysis for sub-sets of information, gaining strategic insight from indicators and other signals of change.

[4]In scenario building it is important not simply to predict the possible outcomes but also identify actions to reach alternative futures, and identify the triggers which will indicate which scenario path is evolving.

It is important to note that even in cases of most extreme uncertainty (level four) Courtney et al. acknowledge the importance of careful, strategic analysis. While no amount of good analysis will enable us to predict the future, good analysis does, on balance, lead to better decision-making.

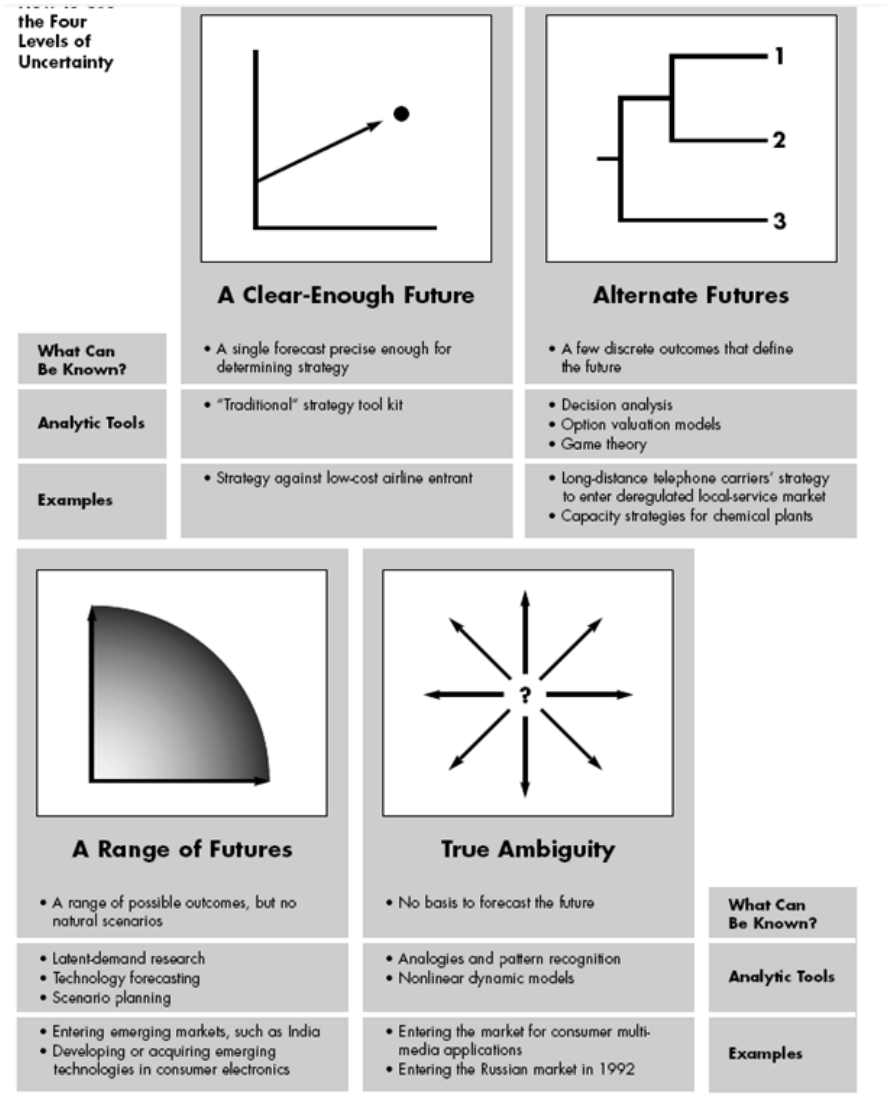


Figure 10: Levels of Uncertainty Informing Strategic Responses (Courtney et al, 1997)

4. Comments on Joburg 2040: Growth and Development Strategy

4.1 On the Right Track

The Growth and Development Strategy (GDS) is a statement of vision and intent, with strategies and a framework for implementation. It is clearly strategic in orientation. As stated within the document itself:

> The GDS therefore frames the IDP [Integrated Development Plan], charting long-term ambitions, strategies and overarching decisions relating to prioritised areas of focus" (GDS, 2011: 5)

The GDS states clearly the role of long-range strategic planning. It refers to:

- Pragmatically confronting complex challenges and defining long-term strategic choices;
- Framing medium-term operational plans;
- Allowing for the timeous conceptualisation and initiation of projects that require extensive lead times and long-term development;
- Linking long-term citywide outcomes with operational outputs; and
- Stimulating public interest in and action towards agreed and commonly held future outcomes. (GDS, 2011: 7)

In this respect, the COJ is already meeting many of the recognised requirements for responding to uncertainty. The GDS is a combination of adaptation to identified trends, and an intentional attempt to shape these trends towards better urban futures. The vision is of:

> Johannesburg—a World Class African City of the Future—a vibrant, equitable African city, strengthened through its diversity; a city that provides real quality of life; a city that provides sustainability for all its citizens; a resilient and adaptive society. (GDS, 2011)

While emphasising vision, the GDS also stresses the importance of adaptation:

> The changing paradigm means that the City of Johannesburg has no choice but to embrace uncertainty. To cope with these drivers of change, the City must build its adaptive capacity, ensuring it is more resilient to change and more adept at seizing opportunities as they arise. (GDS, 2011: 8)

The introduction specifically frames the GDS as a response to uncertainty. It is titled "City strategies in the context of a rapidly changing reality." There is an understanding also that we need to balance adaptation with the need for clear direction and robustness in policy:

> In this context, city strategies must navigate the uncomfortable tension between defining a chosen development growth path, and accommodating uncertainty. The current context reinforces the notion that city development is not a linear process—and that change itself is never linear. As such, it is important to develop an open ended and holistic city strategy that provides a 'rough consensus' of strategic choices, to guide future development. Strategies of this nature can then meaningfully inform a range of long-term strategic plans and programmes. (GDS, 2011: 7)

The tension is however not quite as clear as suggested in the GDS. Having a *chosen direction* is not necessarily in tension with accommodating uncertainty but is, in fact, a key strategy in handling uncertainty. The tension exists between purely adaptive and purely visionary responses but the GDS has handled the mix well.

Through a layering of strategic and operational document, the GDS is linked to more detailed shorter-term terms. It sets the strategic direction for the medium-term IDP and shorter-term business and operational plans. In this respect, it maintains its strategic orientation and avoids being entangled in detail, and falling into the trap of prediction. With the revision every five years there is an opportunity to respect to unanticipated change (although the *extent* to which the GDS is rewritten is debateable as robustness of vision and strategy is also important).

The GDS also recognises key drivers of uncertainty including 'migration', 'globalisation', 'climate change', 'natural resource scarcity', 'technological innovation' and 'inequality', providing a brief description of each. Deeper into the report it also deals with key contributors to the shifting global context which it identified as the 'global financial downturn', 'shifting geo-politics', 'climate change', 'global population growth and natural resource protection' and 'the global network revolution and impact of social movements'. The GDS does not claim to be comprehensive in terms of its analysis but it has covered many of the key trends and risk (as were evident in 2011, at least).

The preparation of the GDS (2011) was significantly more participatory than previous version of long-range planning for Johannesburg. There was a nine week process of structured engagement leading to the preparation of the GDS which is detailed in the chapter entitled "Listening to our people's voices".

It is clear that, in many respects, the GDS is on the right track in terms of handling uncertainty and that our strongest advice for the next round of strategy formulation is to continue on this track, strengthening, elaborating and fine-tuning the approaches. There are, however, some concerns which we indicate below.

4.2 Some Concerns

The first concern relates to the element of co-production and the extent to which the GDS has transformed organisational and societal relations in its construction. While the construction of the GDS has been participatory, it has not approached ideals of co-production. The highly structured nine-week process is very different from a gradual, emergent process of co-production in which the city allows other actors to play key roles in all aspects of the planning starting with problem definitions, and in which forums of dialogue surface tensions and interests in an *agonistic* (as opposed to antagonistic) way. It is our view that institutional and political boundaries can be stretched further in the direction of co-production while being mindful of institutional and political realities.

In the complex city-region of which Johannesburg is a part there is particularly important issue around multi-scalar governance. The GDS does indeed recognise this:

> Rather than develop a blueprint plan for the future, the Joburg 2040 GDS lays the foundation for multi-level, multi-scalar and integrated responses to the challenges the city faces. (GDS, 2011: 9)

However, in terms of both process and content the GDS falls short in this area. The dominant model if still of city-wide and provincial strategies which are prepared mainly separately, although with some attempts to ensure formal alignment, at least. A cross-scalar process of co-production in which the visions and tensions across scales are brought into a meaningful dialogue is still some way off.

A second broad area of concern relates to the strength of the implementation framework. It is, of course, not the purpose of the GDS to specify the details of implementation, but it is important that the approach to implementation is well framed. We note that many of the indicators and targets have been left vague or are still unspecified. These are important in giving guidance to actors across the city administration and in improving the accountability of the city administration to its citizens.

Thirdly, there are a few issues in terms of the substantive content of the plan—at least in terms of the way it addresses key elements of uncertainty. Perhaps the most obvious is in terms of the economy. The GDS does address economic issues, providing also an analysis of the structure and relative growth of the

city economy. However, given the enormous significance of this issue, a far deeper analysis of the drivers of the urban economy is required, as well as clearer responses to the economic challenge. The GDS was prepared in 2011 at a time when there was hope of a robust recovery from the global financial crisis. The recovery has been weaker and more erratic than expected, and has also seen deterioration in the position of emerging economies. A GDS prepared in 2016 would need to profile economic issues far more strongly than the existing GDS has done.

All other areas, of course, require some updating given trends that have become more apparent since 2011, but we don't detail these here. The response to demographic change, for example, requires some attention. The dominant narrative is still of rapid growth and urbanisation, without consideration to a future of reduced growth and demographic ageing. The GDS (2011) was prepared in the wake of the Arab Spring including the rise in South Africa of popular movements that have been labelled "hashtag activism". The implications of the decreasing interest of the youth in traditional forms of political formation, such as political parties, and their growing involvement in issue-based movement arguably requires deeper reflection and a strategic response from the city administration. Similar points may be made in relation to other areas of concern where the issues were recognised in 2011 but where trends have evolved or new insight has emerged.

Finally, a GDS could give more attention to the institutional requirements for building a city, and a city administration, that is resilient to both change and transformative. What is required to build the necessary database, gather intelligence, and produce the required high-level analysis to inform not only the next GDS but also the on-going requirement of strategic thinking and decision-making? Also, what is required to incentivise the city administration to be more strategic, innovative, adaptive and transformative?

5. Recommendations

Our recommendations are brief and follow from our assessment of the GDS (2011). The primary recommendation is, indeed, to continue on the broad direction of strategic planning, periodically assessed, that the COJ has set itself to do.

In addition to this, however, we have the following recommendations:

1. Strengthen assessment of risk, and mechanisms to respond to risks (e.g. contingency plans, early warning systems, data storage, redundancy in infrastructure) giving consideration to a local

version of the sort of global risk assessment undertaken by international agencies such as the WEF.

2. Take the shifting demographic trends more seriously in planning processes, responding to probable new demographic trends such as reduced growth rates and ageing demographics, and continuing the current positive approach towards the role of migration.

3. In this period of economic crisis across all geographic scales, place the economy, and especially job creation and livelihood support, at the heart of strategic planning and, indeed, at the heart of all the city does.

4. Engage deeply with the changing nature of social mobilisation and political formation, emphasising the openness, accountability and accessibility of city government.

5. Maintain the strong strategic focus on climate change adaptation and resource efficiency, implementing with urgency measures to improve water, energy and food security, with active efforts to reduce external dependencies or ensure that external agents are planning and implementing timeously to protect the urban future.

6. Consider shifting the model of strategic planning away from the top down mode to a more decentralised approach which draws in inputs from across the organisation, and actively uses the strategising process to build organisational relationships.

7. Give explicit attention to the requirements for building a culture of adaptation and innovation within city government (which may require incentives, regulatory changes, changes to performance management, less hierarchical and more networked structures, and so forth).

8. Push institutional and political boundaries towards the ideals of co-production in strategic planning which may require longer timeframes, more energy in engagement, new arenas for dialogue, and more open-endedness in expectations.

9. Pay particular attention to other spheres of government and neighbouring municipalities both in the process of developing plans and in substantive content.

10. Actively build the capacities for strategic planning (e.g. in terms of data, intelligence, analytical capacity, and monitoring and evaluation).

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