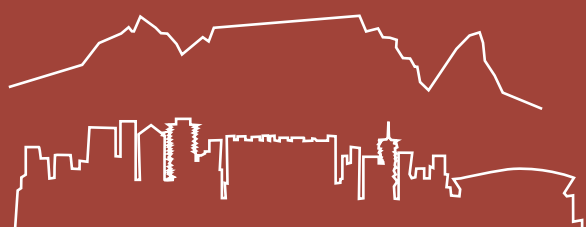

Cape Town

African City of Opportunity





Cape Town



Cape Town performs well
in South Africa and the
continent.
Now it looks to the world.

Cities of Opportunity are more than just places of work or travel. To the millions of people who live in and visit them, they are the communities, people and stories that make up everyday life. In our view, the cities that will succeed in the future are those that can provide a balance between economic and physical security, nurtured aspiration and quality of life and environment.

Foreword



In 2008, the world's urban population passed the 50% mark, meaning that, for the first time, you were more likely to live in a city than elsewhere.¹

In the same year, in an attempt to understand the characteristics that would help the growing cities of the future succeed, PwC launched its first Cities of Opportunity report. Ten years and seven editions later, we turn our attention to one of Africa's great opportunities: The City of Cape Town.

While urbanisation has so far lagged behind in Africa, this cannot be said of the continent's most developed country, South Africa, where 55% of people now live in towns and metros, and their number grows by 2% every year.

¹ 50.46%, see: World Urbanization Prospects, United Nations Population Division (2008).

This influx of people brings with it an influx of human problems. At the same time, cities like Cape Town are experiencing a wider set of global megatrends. These include technological breakthroughs and social changes that transform the nature of work and the role of government, global economic shifts that require cities to redefine themselves to compete internationally, and climate change and resource scarcity that threaten lives and livelihoods. The latter could hardly be illustrated more vividly than by Cape Town's current water crisis.² Although 'Day Zero' is no longer expected in 2018, the region is still suffering the worst drought in more than 300 years, and this may still make it the first major city in the world to turn off the water taps. On current trends, it is unlikely to be the last.

But the megatrends also bring great opportunities to cities that can grasp them. New ways of working empower staff, digital government engages citizens and green technologies promise not only to fight climate change but to end many of the other downsides of urbanisation; pollution, waste, congestion and issues of public health.

Cape Town is at a crossroads between African problems and global ambitions. Its future success will depend on its ability to solve longstanding problems at home while keeping up with a rapidly changing world.

In order to succeed in a changing world, Cape Town must understand its position relative to other global cities. This involves answering two questions:

- How do they do things?
- How well do they do?

² Note that the water crisis does not dominate this report's findings. Although the fieldwork was carried out before the 2017-18 crisis, Cape Town did score poorly for Water-related business risk (27th of 31 cities). However, this had limited effect on its overall ranking as the 66 scores in this study are equally weighted and no one factor outweighs another.

The first question involves organisational strategy, performance and capabilities – and is the subject of our *Future Cities* model – introduced briefly on page 15.

The second question forms the basis of this report, in which we have benchmarked Cape Town against the 30 cities featured in our seventh annual report. These are global centres of finance, commerce and culture and represent among them a sizeable proportion of the world economy. But Cities of Opportunity contends that urban success means more than just spending power: It requires a balance of social, economic and environmental factors to provide the best quality of life for citizens.

Our findings across the ten indicator areas describe a city with strong fundamentals, aspiring talent and a palpable excitement, set against a backdrop of inequality, which is borne out of the country's past but which will play a role in the city's future.

Notable strengths include the city's transport system, its business-friendly environment, the cost of living and doing business, and its natural beauty.

Implications for government, aside from the current water crisis, include strengthening local, national, public and private collaboration, fully embracing digital technology and data, and building on the success of tourism. All of these areas will be explored further in the following pages.

We would like to extend our thanks to various individuals who engaged with us on this project, and provided us with their views on the city they live and work in. Particular thanks must go to the City of Cape Town and the Western Cape Government whose insights have allowed us to present not only the city as it is today, but the detailed plans that are currently being put into place to build the city of tomorrow.

Cape Town has played an important role in South Africa's history. We now look to the future of this African City of Opportunity.

Jon Williams
Head of Cities & Urbanisation
PwC Africa



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*About the
study*



About the study



Cities of Opportunity

The first edition of the global *Cities of Opportunity* study was developed in 2007 by PwC in collaboration with the Partnership for New York City. The question which gave birth to this study was what New York had to do to remain competitive on the world stage after the existential events of 9/11. The purpose of this study continues to be to comparatively measure the performance of a range of global cities against a set of 10 indicators, which jointly provide a holistic view on how successful cities thrive in sustainable urban development.

Like cities, the research itself continues to evolve and the analysis has grown from the 11 cities included in the first edition to the 30 cities covered today. The group of global cities in the study is determined by three indicators: They are capital market centres, with vibrant economies and a good quality of life. Each year this set of cities is re-assessed, with upcoming cities joining the ranks while those falling back in their development being removed. The challenge of developing a city, keeping it on top and evolving with changing needs, is the dynamic we are seeking to illuminate. The hypothesis for this global research is that the more well-balanced a city is socially, economically and environmentally, the better it will fare for businesses, residents and visitors.

The measures we use are selected to develop an accurate reflection of that balanced city. This shows the connection that exists between good economic, social and environmental indicators. Among the 10 indicators, five correlate in a close positive pattern – *Intellectual capital and innovation; Health, safety and security; Ease of doing business; Technology readiness; and Demographics and liveability*. In other words, when one goes up, the others tend to do so as well. For example, the indicators from the 2011 global study found that health and intellectual capital correlated to a striking +87%.

The 10 data indicator groups are based on 66 variables which jointly provide an image of city success. In this robust sampling of variables, each individual variable has to be: Relevant; consistent across the sample; publicly available and collectible; current; free of skewing from local nuances; and truly reflective of a city's quality or power. See Appendix A for an overview and definitions of the variables.

Data is normalised, where appropriate, minimising the likelihood of a city doing well solely because of its size and historic strength. This is usually done using land area, population or changes over time so that, for example, GDP growth is used rather than nominal GDP and affordability of rent is a proportion of local wages.

Transparency, simplicity, consistency and balance

Cities of Opportunity is based on publicly available data supported by extensive research, using three main sources:

- Global multilateral development organisations such as the World Bank and the International Monetary Fund;
- National statistics organisations such as UK National Statistics and Statistics SA; and
- Commercial data providers.

For the Cape Town study, this data was collected in 2017, but in most cases, it pertains to 2015 or 2016 to allow for a fair comparison with the other cities, the data for which was collected as part of the seventh global study in 2016. This means that some care should be taken in using the statistics in this report as current – some variables change frequently and this report is a snapshot in time.

The Cape Town study uses all of the 67 indicators in the seventh global report bar one: *Airport to CBD access*. This variable, which was also not included in the 2014 *Into Africa* study, compares airport access on the basis of rail links rather than access to the city centre per se.

In some cases, national data was used as a proxy for city data. This was only done in cases where consistent, highly reliable sources of publicly available city data were unavailable for all study cities. The scoring methodology was developed to ensure transparency and simplicity for readers, as well as comparability across cities. The output makes for a robust set of results and a strong foundation for analysis and discussion.

In attempting to score cities based on relative performance, we decided at the outset of our process that for maximum transparency and simplicity, we would avoid giving overly complicated weights to the 66 variables.

Consequently, each one is treated with equal importance and weighted the same. For each individual variable, the 31 cities are sorted from the best to the worst performing, with each receiving a score ranging from 31 for best to 1 for worst. In ties, cities are assigned the same score. This approach makes the study easily understandable and usable by business leaders, academics, policy makers and the public alike. Once all of the 66 variables had been ranked and scored, they were placed into their 10 indicators (for example, *Economic clout* or *Cost*).

Within each individual indicator group, the variable scores were summed to produce an overall indicator score for that topic. Here as well, the city order from 31 to 1 is based on these scores, however, for ease of presentation, the cities scores are presented in reverse order – i.e. rank. Therefore, if Paris receives a score of 31, it will be shown as 1 (first) in the tables and charts.

The table at the start of each section also shows the summary score for the category.

This produced 10 indicator league tables that display the relative performance of the study cities from best performing to worst performing, and an overall table that shows all 10 indicators and the overall score.

This global comparative assessment for Cape Town is based on the land area covered by the municipal authority, stretching from Atlantis in the North-West to Gordon's Bay in the South-East. The only exception to this is that the University of Stellenbosch, which is included in the study rankings despite being located in neighbouring Stellenbosch municipality. The University and the city have close ties and it was judged that because many Cape Town residents commute to the University and many graduates of Stellenbosch live and work in Cape Town, it should be included.

This study provides Cape Town the opportunity to measure its performance against a set of comparator world cities across the range of holistic indicators and variables. How does the city rank amongst its peers, which areas are key to its success and in what areas does the city need to improve to compete globally as successfully as it competes in Africa? These are the questions this study seeks to answer.

Adjusting for income

This study adds a new element to the analysis, borne out of two realisations: First, that the prosperity of a country is a strong (though not predictive) determinant of the success of its cities (see page 10). Second, that benchmarking is most useful when it compares like with like. For this reason, we report each of the indicators in this study using two sets of scores. The first is versus all 30 other cities, and the second against only the 12 cities which, like Cape Town, are situated in middle-income countries, as defined by the World Bank. These are: Beijing, Bogotá, Jakarta, Johannesburg, Kuala Lumpur, Lagos, Mexico City, Moscow, Mumbai, Rio de Janeiro, São Paulo and Shanghai.

This method also has its flaws – the inclusion of China and Russia may not be representative – but on the whole, the two groups represent two different cohorts; the mean GDP per capita of the 13 middle-income countries (MICCs) is \$6,400, seven times lower than that of the richer 18.³

In addition, throughout the study, we have complemented our global rankings with a series of South Africa-only analyses which compare Cape Town to the other metros in the country. This provides a view of the city within the context of South Africa's young democracy and the unique challenges it faces.

3 MICCs mean = \$6,446. High income country cities mean = \$44,219. See: World Bank data catalog, GDP per capita (current US\$, 2016), World Bank (2017).



Fig. 1 Distribution of study rankings per indicator with country income level highlighted



Income drives success – but does not determine it

Figure 1 shows the rankings of all 31 study cities, highlighting the income category of their host countries, according to the World Bank.⁴ The results are striking. For the overall score, the 13 lowest ranked countries are all middle-income countries, while the top 18 are high-income. A similar pattern is seen for *Intellectual capital and innovation*, *Transportation and infrastructure* and *Health, safety and security* and *Economic clout* – all areas where significant long-term investment in physical and human

capital is required to succeed. Indeed, education levels, health and safety outcomes and infrastructure all tend to be poorer in less developed countries, and their cities. This also makes Cape Town's success in *Transportation and infrastructure* more laudable.

Scores for *City gateway* and *Sustainability and the natural environment* are slightly more nuanced, which highlights the fact that these are areas where developing country cities can outperform the global leaders due to factors – often geographical, or historical – that cannot be replicated.

For example, Kuala Lumpur and Johannesburg have airports that are regional hubs, Moscow was designed around its public parks, and Cape Town has beaches and mountains which cannot be airlifted to London.

This highlights a broader point. City indexes can be misunderstood when they are used to create black and white findings from colourful places. Instead cities should seek to understand the many parts that make up their unique 'place' and to focus on the ones that are most relevant and controllable.

Inequality of Opportunity

The graph on page 11, shows the relationship between country income and study ranking in more detail. The y-axis shows cities' overall score in this study, while the x-axis shows GDP per capita. The first thing that can be seen is the striking differences in income – the richest middle-income country, Malaysia, has a GDP per capita of \$9,500 compared with \$26,500 in Spain, the lowest for the high-income countries.

A strong correlation appears to be observable between the two scores ($r^2 = 77\%$). If this is the case, cities that appear above the dotted line can be considered to have achieved a good score in this study for their respective income levels, while those below the line should perform better given their income levels.⁵

4 The World Bank recognises four income groups – low, lower-middle, upper-middle and high. There are no low income countries in the study, and we have grouped the lower-middle-income countries (India, Indonesia, Nigeria) with the upper middle ones (Brazil, China, Colombia, Malaysia, Mexico, South Africa) to show a middle-income group. For the 2018 fiscal year, low-income economies are defined as those with a GNI per capita, calculated using the World Bank Atlas method, of \$1,005 or less in 2016; lower middle-income economies are those with a GNI per capita between \$1,006 and \$3,955; upper middle-income economies are those with a GNI per capita between \$3,956 and \$12,235; high-income economies are those with a GNI per capita of \$12,236 or more. See: World Bank Country and Lending Groups, World Bank (2018).

5 Please note that this is illustrative, not scientific, as it infers a linear relationship between the two variables which has not been proven.

Is income everything

However, there are a multitude of factors that contribute to a *Cities of Opportunity* score and this box explores only one. In fact, our full global report found that the scores most strongly correlated with success were those pertaining to quality of life factors, as well as intellectual capital.⁶

In other words, **to be a successful City of Opportunity, it is necessary to be highly productive, to attract the best people, and to look after them well.**⁷

Throughout this study, we will report Cape Town's rankings in two ways:

1. Compared with all cities; and
2. Compared with only the 13 middle-income-country cities (MICCs).

⁶ Cities of Opportunity 7, PwC (2016), pg.22.

⁷ GDP per capita, or output created per person, is a measure of prosperity but it is also a proxy for productivity which is normally calculated using total hours worked.

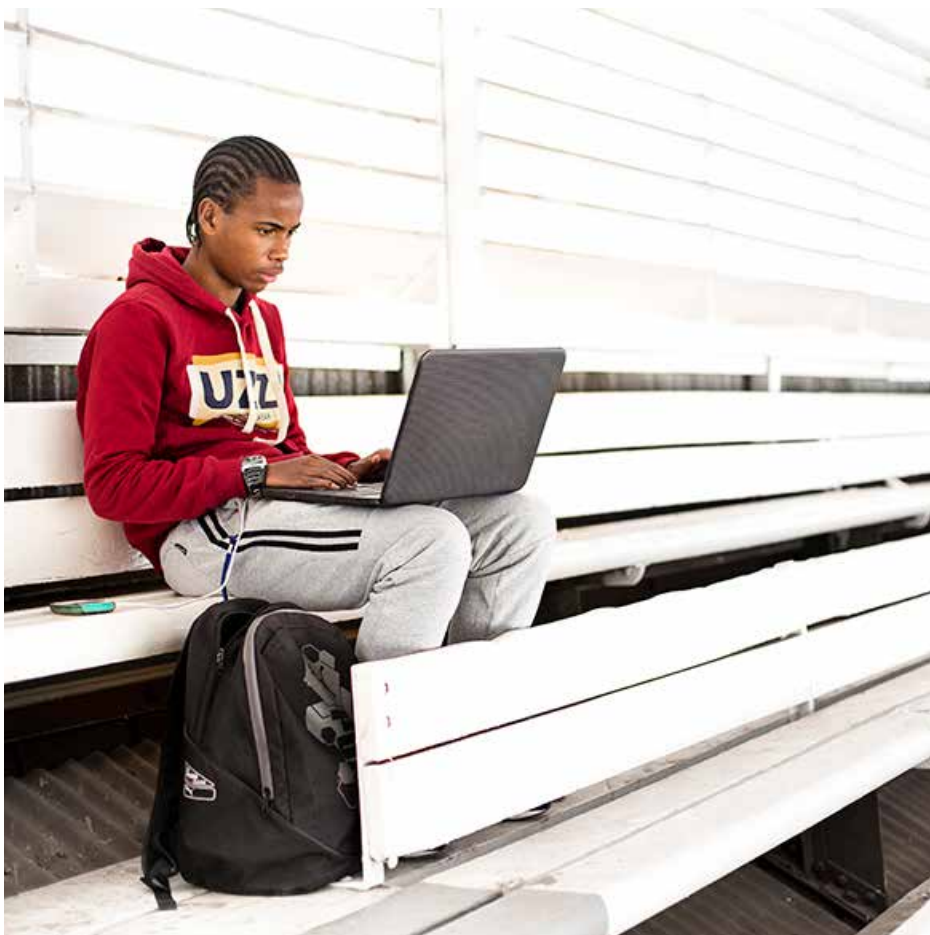
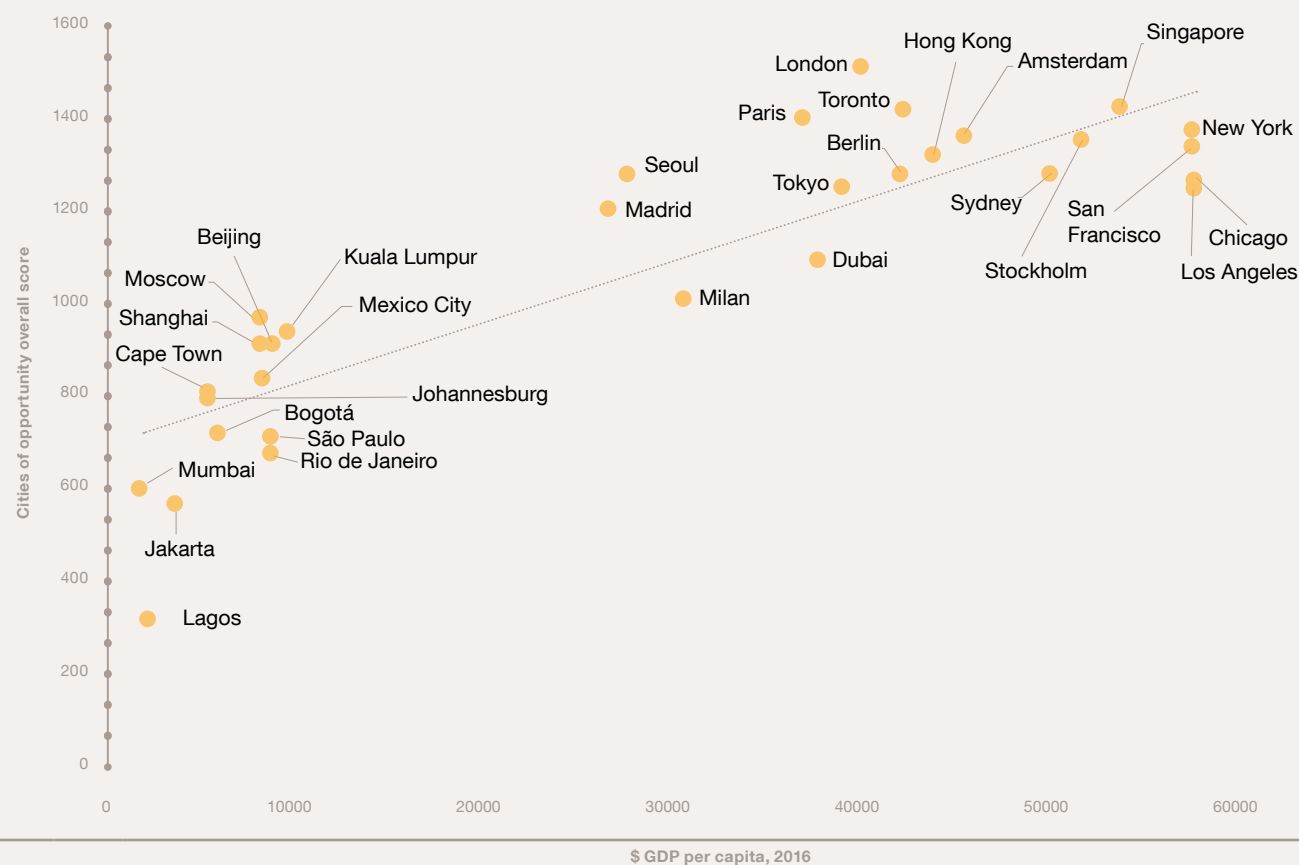


Fig. 2 Worlds apart

GDP per capita vs Cities of opportunity score





Future cities



Future cities



How to meet the needs of changing citizens in a changing world

PwC's *Future Cities* model asks how cities can meet the needs of changing citizens in a changing world. We consider the **outcomes** that make a successful city of the future, and the **strategies** and **capabilities** cities must adopt to achieve these.

These include 10 areas, both traditional and modern, that should be high on all cities' agendas. Although some of these may gain more press coverage, we do not view any one area as more important than another. Every city has its own problems, culture, capacity and politics and these determine what will work best.

Strategy to execution

Three of these areas involve re-thinking strategy to change the way cities think, seven involve strengthening capabilities to enable cities to work better. Planning ambitious digital strategies and future resilience are important, but they must be grounded in the physical world of balance sheets, maintenance spending and technology implementations.

None of the 10 areas are unfamiliar, and even the least mature city will have elements of some or all of them, but in our experience many cities lack the capacity to perform highly in more than a few.

We recognise that each area forms part of a city value chain with the ultimate outcome of citizen satisfaction, and that as well as being important on its own, each of the areas interacts with the others: Digital enables citizen-centricity, finance must be transversal. In our experience, many cities have initiatives that focus on some or all of these areas but few do this in a co-ordinated way, and none that we know of benchmark themselves over time, or against their peers to understand their readiness for the future.

Who is responsible for change?

Our focus is primarily to help city governments succeed, but there are few urban problems that can be solved without the involvement of local businesses, charities, communities, academics – and you and I.



Future cities

How to meet the needs of changing citizens in a changing world

Fig. 3 Future cities model



**City
outcomes**

*Recognising how
cities succeed*

**Citizen
strategies**

*Changing how
cities think*

**City
capabilities**

*Enabling how
cities work*

City outcomes


Personalised Services	<p><i>Treat citizens like customers:</i></p> <p>Citizens have diverse and complex needs which vary with their life stage and circumstances. Service delivery must be both personalised and responsive.</p> <p>Example: Being able to see your bills online and up-to-date, or receiving an extra wheelie bin if you have a larger family</p>
Resilience & Sustainability	<p><i>Plan for the worst:</i></p> <p>Ensure that when things go wrong, services can be maintained, people and assets protected, and resources preserved.</p> <p>Example: Contingency planning and up-to-date, independent risk surveys, or greenhouse gas and pollution controls that go beyond national limits</p>
Growth & Liveability	<p><i>Plan for the best:</i></p> <p>Build a city where people can live happy, healthy, productive lives, from cradle to grave.</p> <p>Example: Investing in education, skills and safe, cohesive communities; making the city a desirable place to invest, do business and trade with; helping people get around easily and ensuring equality of opportunity</p>

Citizen strategies

Citizen-centricity	<p><i>Put citizens at the heart of decisions – it's a win-win:</i></p> <p>Example: Citizen engagement app, one phone number to reach any city department</p>
Transversal Management	<p><i>Break down departmental silos to achieve better cross-government outcomes</i></p> <p>Example: Combined departments for health and social care or housing, transport and land</p>
Collaboration	<p><i>Work with partners inside and outside of government to improve whole city outcomes</i></p> <p>Example: College courses that teach subjects needed by city employers; transport systems that are coordinated between different levels of government</p>

City capabilities

Powers & Incentives	<p><i>Use the fiscal, legislative and persuasive power of government to create change</i></p> <p>Example: Carpooling lanes, flexible water pricing, investment in large-scale inclusionary housing</p>
Data-led Delivery	<p><i>Use data to understand performance and actively drive delivery</i></p> <p>Example: Mayor's dashboard with real-time tracking of key priorities</p>
Digital City	<p><i>Embrace 'digital as default' to reimagine government</i></p> <p>Example: 'Smart streetlights' that can help with parking, monitor air pollution and fight crime; Open data and 'City as a platform' mindset</p>
Urban Intelligence	<p><i>Solve complex city problems by revealing the answers hidden in data</i></p> <p>Example: Optimised transport routes and timetables, better matching of housing supply and demand</p>
People & Culture	<p><i>Create a working environment built on collaboration and fostering innovation</i></p> <p>Example: Flexible / remote working for city staff</p>
Infrastructure & Transport	<p><i>Build productive assets and connect people to opportunities</i></p> <p>Example: Fully integrated bus, rail, and taxi system with electronic ticketing</p>
Urban Finance	<p><i>Collect and use public money as efficiently as possible</i></p> <p>Example: Mature leveraging of large city-balance sheet to fund new transport investment</p>



“In education, it is our responsibility to equip our children to be active citizens in our economy, and provide much-needed skills to ensure that our learners are able to participate in the modern world. One of the ways that we as the WCG are equipping our young people is by improving e-Learning, which has been a priority for the WCED for over a decade. We have now accelerated it to make e-learning a reality in all schools.

We believe that e-learning holds a lot of potential to enable learning and teaching in a more differentiated way, and can also provide access to excellent quality resources in places where they are not currently accessible. It is also simply inconceivable to educate anyone in today’s world without making sure that they are ‘tech ready’ to enter the world of work when they leave school”

Debbie Schäfer
MEC for Education, Western Cape Government



*How Cape
Town
compares*



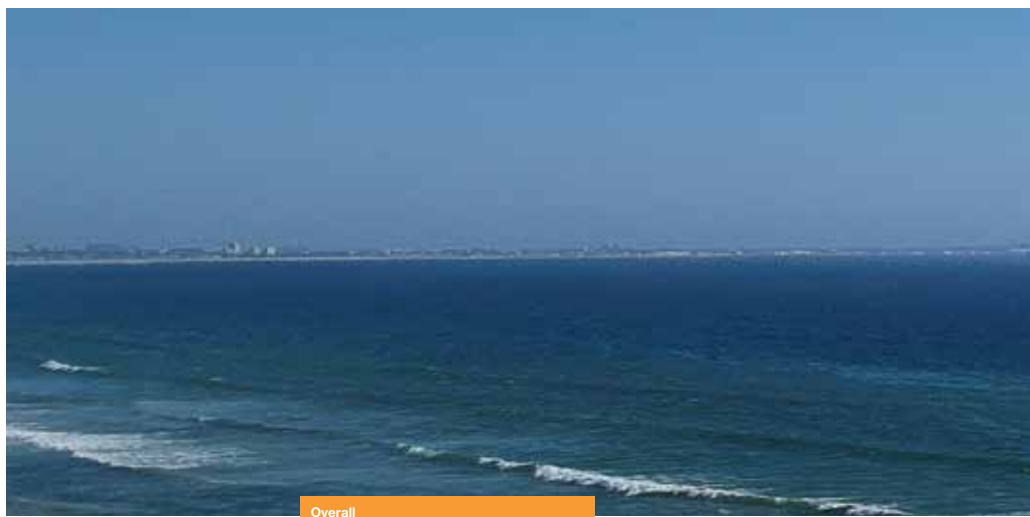
Picture taken by Wessel Van Wyk

How Cape Town compares



“...we often looked across Table Bay at the magnificent silhouette of Table Mountain. To us on Robben Island, Table Mountain was a beacon of hope. It represented the mainland to which we knew we would one day return.”

Nelson Mandela



		Overall			
		Score	Total	Intellectual capital and innovation	Technology readiness
London	1	1500	1	1	2
Singapore	2	1417	2	12	1
Toronto	3	1407	3	4	6
Paris	4	1389	4	3	11
New York	5	1364	5	6	3
Amsterdam	6	1353	6	4	4
Stockholm	7	1345	7	9	4
San Francisco	8	1325	8	2	7
Hong Kong	9	1313	9	14	10
Berlin	10	1275	10	14	20
Sydney	11	1273	11	9	14
Seoul	12	1269	12	13	12
Los Angeles	13	1256	13	7	8
Chicago	14	1245	14	11	13
Tokyo	15	1244	15	8	8
Madrid	16	1197	16	21	17
Dubai	17	1088	17	18	17
Milan	18	1006	18	20	21
Beijing	19 (1)	965	19 (1)	16 (1)	15 (1)
Kuala Lumpur	20 (2)	937	20 (2)	25 (7)	22 (4)
Moscow	21 (3)	912	21 (3)	17 (2)	17 (3)
Shanghai	21 (3)	912	21 (3)	19 (3)	16 (2)
Mexico City	23 (5)	838	23 (5)	23 (5)	26 (8)
Cape Town	24 (6)	803	24 (6)	22 (4)	29 (11)
Johannesburg	25 (7)	797	25 (7)	26 (8)	28 (10)
Bogotá	26 (8)	720	26 (8)	23 (5)	23 (5)
São Paulo	27 (9)	711	27 (9)	27 (9)	24 (6)
Rio de Janeiro	28 (10)	681	28 (10)	30 (12)	27 (9)
Mumbai	29 (11)	602	29 (11)	27 (9)	25 (7)
Jakarta	30 (12)	569	30 (12)	29 (11)	30 (12)
Lagos	31 (13)	328	31 (13)	31 (13)	31 (13)

High-income countries

Middle-income countries

Cape Town

High-income countries
 Middle-income countries

Cape Town



Picture taken by Wessel Van Wyk

City gateway	Health, safety and security	Sustainability and the natural environment	Demographics and liveability	Transportation and infrastructure	Economic clout	Ease of doing business	Cost
1	8	13	3	8	1	3	27
6	6	21	17	1	9	1	12
18	2	3	7	11	13	4	3
2	10	7	1	8	8	6	27
7	16	15	1	7	2	7	26
11	7	5	6	16	10	13	16
22	4	2	10	3	10	5	19
20	12	8	5	5	4	13	19
4	11	18	11	13	13	2	15
15	4	5	8	4	26	12	5
19	3	1	13	8	6	15	16
10	13	4	15	14	18	8	14
16	15	14	4	20	19	9	4
17	16	11	9	5	19	11	8
3	1	16	12	19	17	16	25
12	9	9	14	12	5	17	9
8	18	30	18	2	13	21	6
21	13	9	23	17	16	18	24
5 (1)	23 (5)	23 (6)	22 (5)	24 (6)	3 (1)	25 (7)	31 (13)
13 (3)	25 (7)	27 (10)	25 (7)	18 (2)	12 (3)	9 (1)	7 (3)
14 (4)	24 (6)	12 (1)	19 (2)	22 (4)	24 (7)	24 (6)	29 (11)
9 (2)	20 (2)	24 (7)	21 (4)	24 (6)	7 (2)	28 (10)	30 (12)
26 (8)	19 (1)	22 (5)	16 (1)	23 (5)	21 (4)	22 (4)	18 (7)
29 (1)	21 (3)	17 (2)	30 (2)	14 (1)	28 (10)	18 (2)	2 (2)
24 (6)	22 (4)	20 (4)	27 (9)	28 (10)	24 (7)	20 (3)	1 (1)
30 (12)	30 (12)	26 (9)	26 (8)	26 (8)	30 (12)	23 (5)	10 (4)
23 (5)	25 (7)	25 (8)	24 (6)	26 (8)	28 (10)	26 (8)	12 (6)
27 (9)	28 (10)	19 (3)	20 (3)	21 (3)	31 (13)	27 (9)	23 (10)
28 (10)	29 (11)	28 (11)	28 (10)	29 (11)	21 (4)	29 (11)	19 (8)
25 (7)	25 (7)	31 (13)	29 (11)	30 (12)	23 (6)	30 (12)	11 (5)
31 (13)	31 (13)	28 (11)	31 (13)	31 (13)	27 (9)	31 (13)	22 (9)

Rank out of 31 cities (rank out of 13 middle income country cities, if applicable)

Cape Town: African City of Opportunity

In this special edition of *Cities of Opportunity*, PwC builds on the success of our latest global study and our 2014 publication *Into Africa*. Cape Town, the oldest city in South Africa, is the newest addition to our series. For this report, we used the scores of the 30 cities included in our latest (seventh) global study, and scored Cape Town against the same metrics.

Although the city is old historically, it has only existed in its current political form since 2000 when the seven administrative regions were merged to form a 'Unicity'. This move was in keeping with a global trend towards city-devolution, putting Cape Town on a par with cities like London, which gained a powerful assembly in the same year.

However, unlike London, Cape Town's new government inherited a disjointed system with poor finances, crumbling infrastructure and basic service delivery that was struggling to reach the people that needed it most. Under these circumstances, the administration was unable to devote its full attention to solving the city's many socioeconomic problems, such as unemployment, crime, drugs and illiteracy.











Seventeen years later and the story is one of comparative success. Revenue collection and capital budget spending are near 100% and the city is rated as having both the cleanest audit (by the Auditor General) and the best service delivery (by citizens) of any South African metro.^{8,9}

⁸ General Report on the Local Government Audit Outcomes 2015-16, p. 8, Auditor-General South Africa. Cape Town was the only metro to receive a fully unqualified audit opinion.

⁹ The State of Basic Service Delivery in South Africa: In-Depth Analysis of the Community Survey 2016 Data, Statistics South Africa (March 2017). Citizens were asked to rate the quality of overall service delivery for water, electricity, sewerage and refuse. The proportion of respondents saying "good" for each service was highest, on average, for Cape Town.

How Cape Town compares

Fig. 4 Overall score (Middle-Income-Country City (MICC) score)

Top	 Transport & infrastructure	14 (1)
	 Sustainability & natural environment	17 (2)
	 Ease of doing business	18 (2)
	 Cost	2 (2)
Middle	 Intellectual capital & innovation	22 (4)
	 Health, safety, security	21 (3)
Bottom	 Economic clout	28 (10)
	 Tech readiness	29 (11)
	 City gateway	29 (11)
	 Demographics & liveability	30 (12)

This table shows Cape Town's scores for each of the 10 indicators relative to the other 30 global cities. The score in brackets shows its score compared with the 13 cities in middle-income countries

These strong fundamentals have allowed the city to pursue an agenda of socioeconomic development, embodied in the strategic pillars of its five-year Integrated Development Plan (IDP):

- *Opportunity City*
- *Safe City*
- *Well-run City*
- *Caring City*
- *Inclusive City*

These goals are symbolic of the context in which many aspiring African cities find themselves:

- How to find the balance between creating economic opportunity for those who can grasp it and extending the safety blanket of the state to those who need it?
- How to create a modern economy with high paying jobs, when a large number of the population cannot read or write?
- How to convince people that education is their route to prosperity when their route to education is often unsafe and unfordable?

With such polarised needs and ambitions, citizen-centric government is a real challenge.

This study asks an important question: As urbanisation and global competition increase, how can African cities compete with the best in the world?

With an unemployment rate 13 percentage points lower than the national figure, and 10 points lower than the average metro, Cape Town is a city of genuine opportunity for millions of people. But the city's ambitions go beyond South Africa, as evidenced by its membership of some of the world's most influential urban forums, such as *C40 Cities*, *100 Resilient Cities* and the *Partnership for Healthy Cities*.¹⁰

In order to compete on the global stage, it is important to know where the city currently stands. This study aims to answer that question by benchmarking Cape Town against 30 of the world's leading cities across 10 indicators of urban success. These indicators are grouped under three headings as follows:

Tools for a changing world

- Intellectual capital and innovation
- Technology readiness
- City gateway

Quality of life

- Health, safety and security
- Sustainability and the natural environment
- Demographics and liveability
- Transportation and infrastructure

Economics

- Economic clout
- Ease of doing business
- Cost

These indicators, and their 66 underlying data points, have been refined over the past 10 years we have conducted this study, but the central thesis behind them remains the same: **The more well-balanced a city is socially, economically and environmentally, the better it will fare for businesses, residents and visitors.**

¹⁰ Expanded definition of unemployment: Cape Town: 23.4%, Average of 7 other metros: 33.1%, South Africa: 36.1%. See: Quarterly Labour Force Survey, fourth Quarter 2017, Statistics South Africa (February 2018).

Does income drive success?

This study adds a new element to the analysis, borne out of two realisations:

- That the prosperity of a country is a strong (though not prescriptive) determinant of the success of its cities.
- That benchmarking is most useful when it compares like with like.

For this reason, we analyse each of the indicators throughout this report using two sets of scores. The first score is versus all 30 other cities, and the second against only the 12 other cities which, like Cape Town, are situated in middle-income countries, as defined by the World Bank (see page 10).

Power, establishment and inequality

Overall, Cape Town comes 24th out of all 31 cities, and sixth out of the middle-income country cities (MICCs), behind Beijing, Kuala Lumpur, Moscow, Shanghai and Mexico City. It is also top in Africa.

Its strongest scores are for *Cost*, *Ease of doing business*, *Transportation and Infrastructure*, and *Sustainability and the natural environment*, with moderate scores in *Intellectual capital and innovation* and *Health, safety and security*. Areas for improvement include *Economic clout*, *Technology readiness*, *City gateway*, and *Demographics and liveability*.

While each of these scores has its own unique, underlying factors, there are some themes that come through more than once. More often than not, the city's areas of strength are those that it has been devolved more power to control, while its areas of development often come down to one of two factors: Global competition and, most notably, inequality.

City of unequal opportunity?

South Africa remains the most unequal country in the world, and though this is less pronounced in Cape Town, it remains very unequal by international standards (see page 56).¹¹ Inequality means that even as Cape Town's universities produce Nobel Prize

¹¹ Of countries with populations greater than 1m; some small islands may be more unequal. See: GINI Index (World Bank estimate), Development Research Group, World Bank (2011).

winners in Chemistry, Medicine and Literature, its population as a whole remains uneducated, and while tourists can relax in its safe Waterfront areas (see page 48), city-wide crime statistics reflect the dangerous daily lives of its many informal township dwellers.¹²

Because *Cities of Opportunity's* indicators are weighted towards measures of the population as a whole, Cape Town scores poorly in some areas that surprised the research team.

For example, many global ranking bodies rate Cape Town as both a global tech hub and a city with unrivalled quality of life. The outsized number of start-ups and venture capital firms and the rate of house price inflation on the Atlantic seaboard are testament to this.

However, in all of these areas (*Tech readiness*, *Intellectual capital and innovation*, *Quality of life*) Cape Town scores average or below because the indicators chosen reflect not only the well-educated graduates who live in Green Point and work in the vibrant tech sector. Metrics such as *Percentage of population with higher education*, *Maths/science skills*, *Health system performance*, and *Internet access in schools* are all areas where the rich and the poor experience life very differently.

Much of this is easily traceable to South Africa's apartheid past – two-tiered systems of education and health, for example, have a legacy that has proved hard to erase. Such entrenched problems cannot be solved at the city level, but can be alleviated with long-term collaborative action from government, business and civil society. Cape Town's unemployment rate – more than 10 points lower than the national level – demonstrates the power of cities to lead the national fight against inequality.

Monopoly capitals

Although *global economic shifts* are a significant megatrend, the world's leading cities are still found mainly in the 20th century's centres of global wealth – Europe and North

¹² Among others: Literature, JM Coetzee, 2003 (UCT); Physiology and Medicine, AM Cormack, 1979 (UCT); Chemistry, Aaron Klug, 1982 (UCT).

America.¹³ This places Cape Town at a disadvantage in certain categories, in particular *City gateway* and *Demographics and liveability*.

In the latter category, many of the variables measure traditional cultural metrics. For example, the top three cities for *Entertainment and attractions* are, predictably, London, Paris and New York, whose museums and art galleries are world renowned. Cape Town may be home to the continent's largest contemporary art museum, but this is always likely to be a threshold competency for the city, when compared to some of its more core offerings – beauty, nature, outdoor activities and wine. Cities need to understand their 'whole place' and some benchmark scores require less attention than others.

A low score for *City gateway* reflects Cape Town's position in the world, geographically and historically – excluding China, just eight of the world's 50 busiest airports are in middle-income countries.¹⁴ Nevertheless, this is an area where many other middle-income cities are beginning to redefine themselves with great success – albeit often as part of a wider strategy built around their national carrier.

Power and control

There are certain scores that a city administration cannot control at all – such as demographics or *Thermal comfort* – but in most other areas control will be shared between several different stakeholders, including the different spheres of government (see page 81). We find that in many areas where the city government is largely responsible – *Transportation and infrastructure*, *Ease of doing business* – it scores well. In areas where power is shared and there is little collaboration – *Health system performance*, *Crime* – scores are lower.

However, in some cases the city has collaborated well with other bodies to improve scores – examples include *World Top 100 airports* and *Ease of entry*. In other areas, this study has uncovered collaborative initiatives that have recently been put in place to solve

some of these problems – *Road safety*, *Crime*, *Internet access in schools*, but which are too recent to have affected the respective scores. Devolution is likely to continue in South Africa but cities will only ever control a piece of the jigsaw that determines outcomes for their residents; for the rest they must collaborate.

The following section highlights some of Cape Town's top, middle and lower scores.

Top of the table

Transportation and infrastructure is one of the city's strongest areas, finishing top among the MICCs and 14th in the global study – ahead of Amsterdam, Milan and Tokyo. Interestingly, the city's best scores – for traffic and commuting – are actually areas the city and its citizens are most concerned with (see page 61). Rapid urbanisation and limited space between an ocean and mountains mean enabling people to get around is a competency that requires constant investment. Cape Town has largely achieved this so far, and has future plans that, if realised, will unlock transport as a way to tackle the city's structural and spatial inequality.

Sustainability and the natural environment is another of Cape Town's better scores, finishing 17th out of 31 and second among the MICCs. This will come as no surprise to the millions of annual visitors to the Western Cape's nature reserves, mountains and blue flag beaches. For business, a host of green initiatives and job-creation programmes look set to build on Cape Town's status as a tech hub with new green technologies and associated industries.

However the drought – the region's worst in over 300 years – has brought the city to the brink of turning off the taps, highlighting the need for serious investment in both supply and demand measures. As the global climate continues to change, it is likely that other cities will have much to learn from Cape Town's ongoing water resilience project.

Ease of doing business is another top area for Cape Town, which reflects the strength of South Africa's legal and tax institutions, and which seems likely to be strengthened in the eyes of business by the recent presidential election.

The city also benefits from a business-friendly regulatory environment and low costs, ranking first for *Cost of business occupancy*.

Indeed, for *Cost*, Cape Town boasts a much greater quality-of-life to cost-of-living ratio than all other global cities, bar Johannesburg, the difference between the two largely explained by the cost of housing. Expatriates who move to the 'Mother City' can enjoy a quality of life afforded by few other places in the world, a factor that increases the city's scores in many other areas – for example, *Relocation attractiveness*.

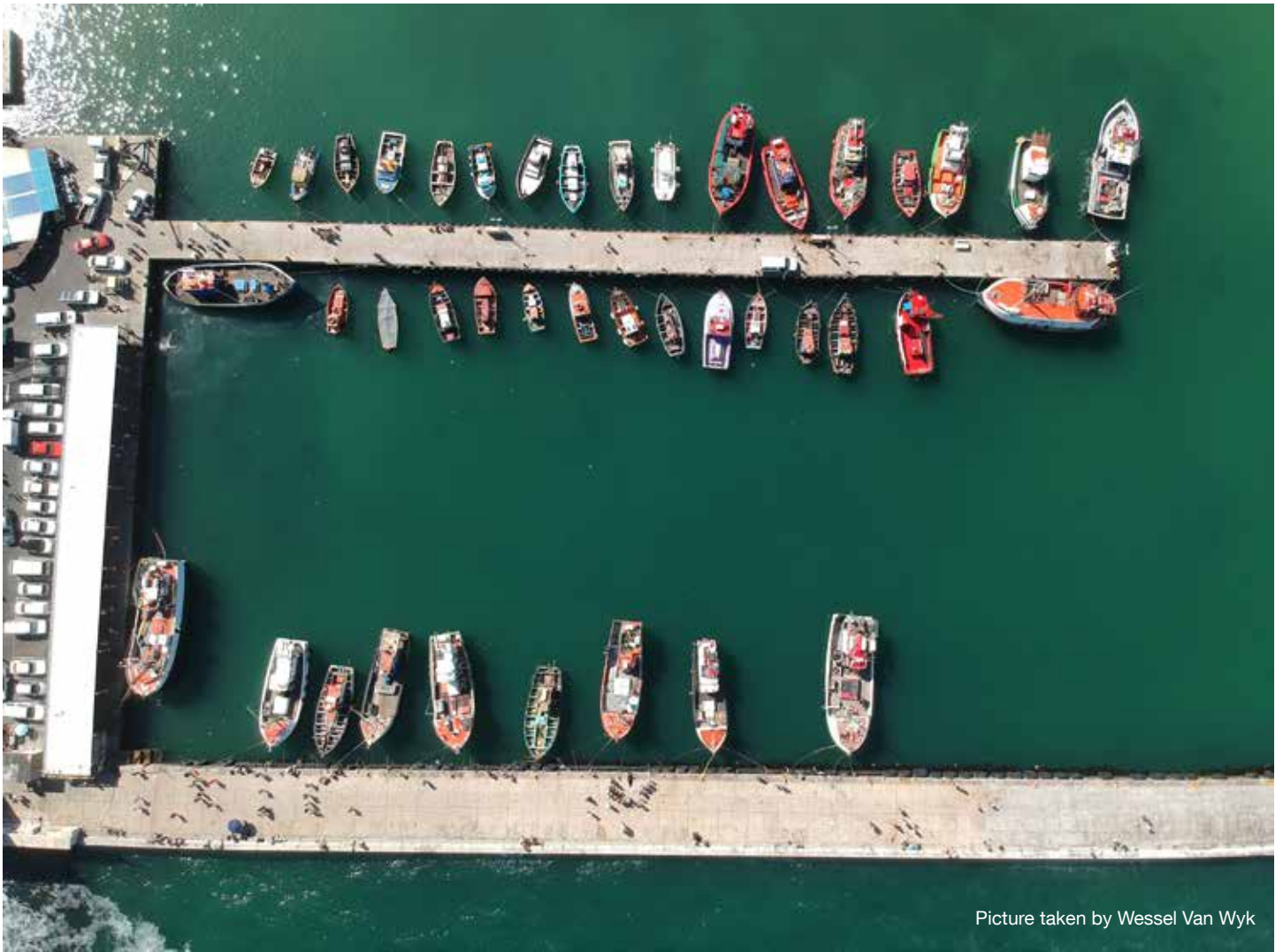
Areas of good hope

Cape Town is in the bottom third of the global study but the top third of the MICCs for *Intellectual capital and innovation*. Inequality dampens the city's ability to compete in overall levels of higher education and maths skills. Despite this, its world-class universities, a supply of well-educated immigrants (see page 57), and a coalition of successful ventures – such as the *Cape Innovation and Technology Initiative* (CiTi) – have allowed it to become an innovation hub – with more than 20 accelerator programmes and incubators.

Health, safety and security is an area where Cape Town does moderately, finishing 21st out of 31 and third amongst the MICCs. The scores describe a city that has a low macroeconomic, political and disease risks, partly driven by the sound governance of the city administration. However, providing quality healthcare and personal safety to large numbers of the population remain development areas.

¹³ Megatrends, Issues, PwC UK, web page (2018).

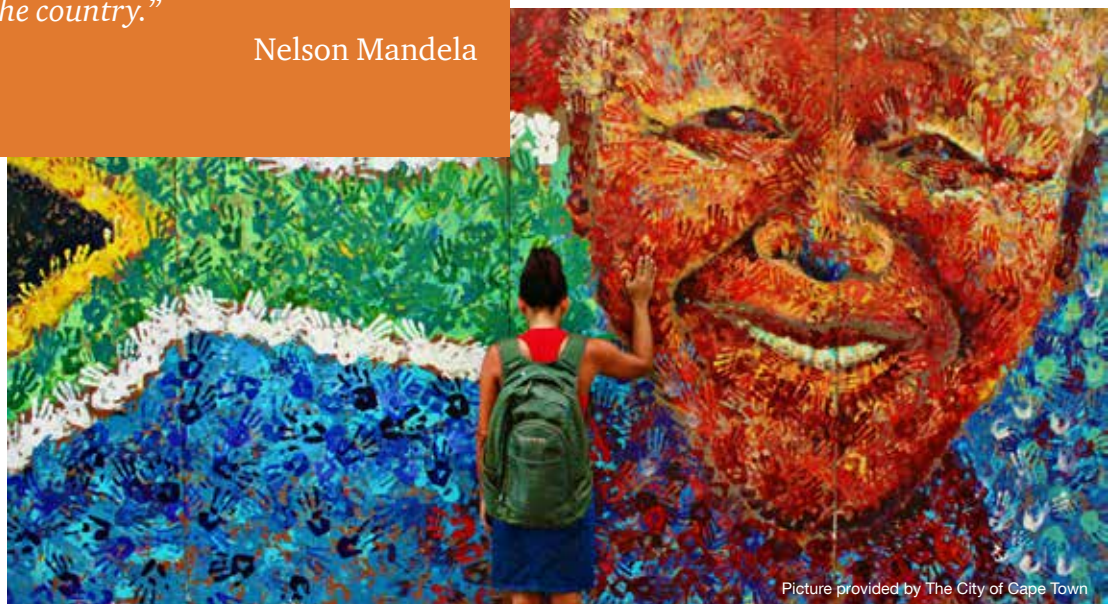
¹⁴ Worldwide Airport Traffic Report, Airports Council International (2016).



Picture taken by Wessel Van Wyk

“To the people of South Africa, the Table Mountain Range represents a great deal more than the rocky remains of millennia of sediment. It is of immense ecological, cultural, religious and economic significance not only to the Western Cape Region, but also to the rest of the country.”

Nelson Mandela



Picture provided by The City of Cape Town

Warning signals

Technology readiness is an area where Cape Town's low score belies a rising trajectory and a real sense of excitement. Technology is both a major area of success for the city within South Africa – it is home to around 60% of all tech start-ups – and a key strategic focus area.¹⁵ Furthermore, the city was recently named amongst just 22 “cities at the forefront of global tech”.¹⁶

Its low score in this study can also be explained partly by low education levels – for example, in *ICT and software design* – which may take time to rectify. The city's digital infrastructure, on the other hand, is rapidly changing: While we were carrying out this study, a major rollout of internet across the city and in schools was underway. While this means that the city is likely to fare better in future studies, it should be noted that other cities in this study may have also made similar investments in what is a crucial area:

In the digital world, standing still is moving backwards.

Cape Town's low score for *City gateway* is easier to explain – it is at the very tip of Africa and Johannesburg's airport is the established regional hub. But this is also an area of rapid recent growth: Airport passenger numbers are up 24% year on year and it has been voted ‘the best city in the world to visit’ by readers of the *Telegraph* newspaper in the UK for the past three years.¹⁷

A low score in *Demographics and liveability* may raise eyebrows – Cape Town was recently voted Africa's most liveable city (and can do little to change its demographics).¹⁸ This score is partly methodological; Cape Town's high quality of life is derived from factors covered elsewhere in this study, for example the cost of living (*Cost*) and the beach and mountains (*Sustainability and the natural environment*).

¹⁵ Cape Town Tech Centre Infographic 2017, Silicon Cape Initiative (2017).

¹⁶ Tech Cities 2017, Savills World Research, web page: Savills world research/2017.

¹⁷ The World's 50 greatest Cities – according to you, Travel Section, The Telegraph Online (29 August 2017).

¹⁸ The Top 10 Most Liveable Cities in Africa, Africa.com (2016)

This category places high value on cultural assets, in which many of the cities in this study excel. London's National Gallery, one of many in the city, welcomes three times more visitors per year than Cape Town International Airport.¹⁹ The recent opening of the biggest museum of contemporary art in Africa, will strengthen, but not redefine, Cape Town's place as a global art and culture centre.

With national GDP per capita the fourth lowest among cities in this study, it is little surprise that Cape Town comes third bottom for *Economic clout*, though this is not black and white. The city comes seventh overall for *Employment growth*, while a look at its *Foreign-direct investment* (FDI) reveals an area of huge potential. Cape Town's FDI strategy was recently voted in the top 25 in the world.²⁰

Opportunities for improvement

Studies like this are of minimal use if they simply present a set of numbers. Instead, we have tried to present each measure within its South African, continental and global context, to give an understanding of why the city performs well or poorly and to make recommendations for the future. Our recommendations are based on the findings of this global study, further analysis of local data and also take into account our *Future Cities* framework (see page 15) which asks whether cities are set up to succeed.

¹⁹ Cape Town International Airport – Passenger Traffic, Airports.co.za (September 2017).

²⁰ Global Cities of the Future 2016/17 – Winners, fDi intelligence (division of the Financial Times) December 2016

These implications are aimed not just at the City of Cape Town and the Western Cape Government. A common theme in this report is the need for collaboration and collective responsibility. Businesses and citizens are as much responsible for – and have much to gain from – a successful Cape Town. We set out ways in which each of these groups can help to make that a reality in the coming years.

Implications

- Make education and safety top priorities, even though they are complex;
- Embrace technology and innovation and don't be scared to experiment;
- Make resilience about more than water;
- Learn from the best;
- Build on the success of tourism;
- Collaborate widely;
- Adopt citizen-centric government;
- Embrace big data to solve big problems;
- Actively drive data-led delivery;
- Attract and retain the best people; and
- Build on strong foundations.



Cape Town has made significant progress in tackling one of the country's most pressing problems – unemployment. **Education and safety** are problems with similar roots in historical inequality. Solving these will be as difficult as they are rewarding for both city and citizens.

At the same time, the city should continue to embrace **technology and innovation**, adopting a 'digital by default' mindset which accepts that in the digital world failure is often the first step towards success.

Cape Town has embraced **resilience** as a concept (employing a Chief Resilience Officer in 2017) but the city's recent water crisis has required a hard shift from theory to reality. Resilience is about more than just responding to physical threats such as drought (see page 52). As the city draws up plans to provide water in the long term, it should also be aware of and ready to react to financial, economic and social shocks.

This study highlights innovative solutions from across the world to water shortages, recycling, citizen engagement and many more. In an ever-more connected world, Cape Town should constantly look to **learn from the best** cities in each of these areas. Its membership of bodies such as *C40 Cities* and *100 Resilient Cities* will aid this.

Tourism is one of the pillars of the Western Cape economy, and grows every year. The city must look to **build on the success of tourism** by using it as a shop-window for the wider economy. **Collaboration** between government, business and citizens is key and bodies such as *Invest Cape Town* and *Accelerate Cape Town* can help to coordinate this.

If it can be achieved, **citizen-centric government** results in tailored, responsive services for each citizen, which improves satisfaction levels and saves duplication and waste. Doing this would require significant data on Cape Town's four million residents and reliable, accessible communication channels, both of which can be achieved with digital channels like citizen engagement apps.

Data in government is important to Cape Town in two other ways. First, **big data can be used** to help government find more efficient ways of delivering services, whether in improving refuse collection or housing waiting lists. Second, the administration can measure performance data to **actively drive data-led delivery** of its key priorities, from opportunity creation to water resilience and safe streets and homes.

The real test of delivery is to successfully tackle the city's most longstanding and complex problems – **inequality, education and safety**. Doing this will take considerable effort and wide collaboration across the many responsible and affected groups, of which the city government is just one.

In order to realise these opportunities, the City of Cape Town must **attract and retain the best people**. As the future of work changes, this means accommodating new, technology-driven ways of working and using data to help better match the needs of the organisation and the employee.

At the same time, the city should continue to **build on its foundations** of urban finance, infrastructure and governance that have given it the strong platform it enjoys today.

"The Western Cape Government's project to expose over 1,1million learners to a new way of teaching and learning by 2019 is a significant commitment to system-wide change strategy.

The eLearning Game Changer is delivering the infrastructure and technology required to support future-ready school leavers, but also focuses on developing willing and competent teachers to integrate quality digital content into the learning experience.

The impact of this holistic approach is closely monitored to ensure that this investment supports government's desire for improved literacy and mathematics results, creating better opportunities for young people in the Province to succeed"

Penelope Tainton, Lead of eLearning and After School Game Changers,
Western Cape Government





Tools for a changing world

In today's ever-changing world, people, technology and information are cities' most valuable assets. Success depends on the ability to nurture or attract the best talent and to create the right conditions for these 'tools for a changing world'. We assess cities' future readiness with three indicator groupings: *Intellectual capital and innovation*, *Technology readiness* and *City gateway*.



1. Intellectual capital and innovation

One of the great benefits of urbanisation is increased productivity.²¹ This is due not only to traditional economies of scale in production, transportation and service provision, but also to knowledge spillover effects – where ideas are shared and opportunities realised more quickly when people and companies physically interact.

However, crowding alone does not lead to better outcomes. In order to benefit, cities must have well-educated workers and an enabling culture.²² For those who succeed, these effects are self-reinforcing – cities with high levels of *Intellectual capital and innovation* attract well-educated, innovative people.

Being known as a knowledge economy hub is a huge advantage for cities. For example, despite the UK's vote to leave the European Union, few commentators think London will lose its place as the global centre of finance anytime soon. Much of this is due to the pool of talent at its disposal, and the pedigree of its universities, which are hard for other cities to recreate – more than 60% of London residents are university

graduates compared with 5.5% in Cape Town.²³

Cape Town scores moderately in this study for *Intellectual capital and innovation*, finishing 22nd out of the 31 global cities and fourth out of the 13 middle-income country cities (MICCs).

The city's best score is for *Libraries with public access*, where it outperforms global leaders such as Amsterdam, Tokyo and Toronto. It also scores well for *Intellectual property (IP) protection*, which is measured at the country level and is testament to South Africa's robust legal institutions – particularly among developing countries.

Start-up city

Cape Town has become a hub for incubators, start-ups and tech firms in the past few years (see page 36), all of which depend on the protection of IP. However, a poor score in the *Innovation Cities Index* and *Entrepreneurial environment* indicates that Cape Town still has some work to do in positioning itself as a global tech hub when compared with cities such as San Francisco and Amsterdam.

A city's *Intellectual capital and innovation* score is driven by levels of education – both basic and higher. Of the MICCs, Cape Town comes a close second to Beijing for *World University*

		Score
1	London	191
2	San Francisco	178
3	Paris	175
4	Toronto	172
4	Amsterdam	172
6	New York	164
7	Los Angeles	157
8	Tokyo	155
9	Sydney	153
9	Stockholm	153
11	Chicago	152
12	Singapore	142
13	Seoul	141
14	Hong Kong	137
14	Berlin	137
16	Beijing	113
17	Moscow	100
18	Dubai	99
19	Shanghai	96
20	Milan	92
21	Madrid	83
22	Cape Town	74
23	Mexico City	71
23	Bogotá	71
25	Kuala Lumpur	69
26	Johannesburg	54
27	São Paulo	46
28	Mumbai	46
29	Jakarta	43
30	Rio de Janeiro	42
31	Lagos	28

High-income countries Cape Town
Middle-income countries

rankings thanks to the reputation of the Universities of Cape Town (UCT) and Stellenbosch.²⁴

The Times ranked UCT 171st in the world for 2018, and fourth out of the BRICS/Emerging economies.²⁵

21 The World Bank finds that a doubling of city size increases productivity by 5%. See: *Africa's Cities: Opening Doors to the World*, World Bank (2017).

22 This is hard to measure, but Glaeser finds that a 10% rise in the percentage of city workers with a university degree in cities leads to a 22% rise in output. See *Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier, and Happier*, Glaeser (2012).

23 See: *Graduates in the UK Labour Market 2013*, Office of National Statistics (2013); and *Community Survey 2016*, Statistics South Africa (2016).

24 The University of the Western Cape was also added to the Times Higher Education World University Rankings 2018, finishing 102nd out of BRICS/Emerging economies, but it was not ranked at the time of this research and does not affect Cape Town's score.

25 See: *World University Rankings 2018*, Times Higher Education, (2018).

Intellectual capital and innovation	Libraries with public access	Maths/science skills attainment*	Percent of population with higher education	World university rankings	Innovation Cities Index	Intellectual property protection*	Entrepreneurial environment*
1	2	11	4	1	3	3	9
2	6	15	1	10	1	11	2
3	1	12	10	4	4	7	11
4	9	8	7	11	6	6	5
4	8	7	2	17	5	5	8
6	11	15	9	9	2	11	3
7	15	15	13	3	9	11	1
8	10	5	16	8	10	2	18
9	12	10	17	6	12	8	6
9	5	20	6	12	11	10	7
11	13	15	8	7	14	11	4
12	25	2	14	15	15	1	10
13	20	4	11	2	7	23	16
14	21	3	24	5	13	4	17
14	14	9	15	14	8	15	12
16 (1)	29 (11)	6 (2)	5 (2)	13 (1)	18 (2)	20 (5)	20 (3)
17 (2)	4 (2)	19 (3)	3 (1)	21 (4)	20 (3)	30 (12)	27 (9)
18	27	21	12	26	16	9	14
19 (3)	30 (12)	1 (1)	21 (5)	19 (3)	17 (1)	20 (5)	20 (3)
20	18	14	19	16	19	24	22
21	19	13	27	20	22	25	15
22 (4)	7 (3)	30 (12)	31 (13)	18 (2)	25 (7)	16 (1)	23 (5)
23 (5)	3 (1)	26 (8)	20 (4)	26 (9)	27 (9)	26 (8)	25 (7)
23 (5)	17 (5)	25 (7)	18 (3)	23 (6)	28 (10)	29 (11)	13 (1)
25 (7)	24 (8)	23 (5)	22 (6)	26 (9)	23 (5)	18 (3)	19 (2)
26 (8)	16 (4)	30 (12)	30 (12)	24 (7)	30 (12)	16 (1)	24 (6)
27 (9)	22 (6)	27 (9)	25 (8)	22 (5)	24 (6)	27 (9)	31 (13)
27 (9)	31 (13)	22 (4)	28 (10)	25 (8)	21 (4)	22 (7)	29 (11)
29 (11)	26 (9)	29 (11)	26 (9)	26 (9)	29 (11)	19 (4)	26 (8)
30 (12)	23 (7)	27 (9)	23 (7)	26 (9)	26 (8)	27 (9)	30 (12)
31 (13)	28 (10)	23 (5)	29 (11)	26 (9)	31 (13)	31 (13)	28 (10)

Rank out of 31 cities (rank out of 13 middle-income country cities, if applicable)

This contrasts markedly with basic education. With just 5.5% of the population educated to degree level or above, Cape Town comes bottom of all cities for *Percentage of population with higher education*. This contrasts with its record within South Africa where only Tshwane (7.1%) does better.²⁶

Changing the game in education

Without homegrown talent, cities must compete globally to be attractive. An analysis of education levels among expats (see page 57) shows that Cape Town does this better than any other city in South Africa, but it is still not enough to compete internationally.

Recognising this, the Western Cape Government has made education its number one priority over the coming years, with several major ‘game changer’ initiatives underway, including broadband roll-out in schools,

e-learning and after-school activities, as well as an apprenticeships programme for those who have left school early.

Such a multipronged approach is necessary, but long-term commitment will be key; although potentially transformative, education reform is notoriously difficult to deliver. Neither will increased funding necessarily solve the problem: As a proportion of income, Singapore spends around half as much on education as South Africa, yet it ranks second in this study for *Maths/science skills attainment*. Cape Town ranks joint last (with Johannesburg).

²⁶ Tshwane includes Pretoria, the administrative capital. NB: Johannesburg is on a par with Cape Town, at 5.5%. See: Community Survey Statistics South Africa (2016).

2. Technology readiness

As cities around the world announce future bans on cars, the end of cities connected by tarmac is in sight. This contrasts with the ever-increasing importance of digital technology in determining connectivity. Technology maturity and uptake by residents is an increasing driver of city competitiveness.

Technology readiness comprises six indicators across two broad themes – digital infrastructure and security and the digital readiness of citizens.

Although Cape Town scores relatively poorly overall, there are many areas of promise, starting with the City administration's ambitious vision, to be the 'Digital gateway to Africa' and its recent ranking in the 22 'cities at the forefront of global tech'.²⁷

A closer look shows that it has many of the attributes required to make this a reality in the coming years: A start-up culture (see page 36), world-class universities, venture capital firms – as well as plenty of good coffee shops.

Digital readiness

One area of concern is *Digital security*. With a largely English speaking population, European time zones and competitive wages, Cape Town has become a leading destination for business process outsourcing (BPO) in the past decade. However, as online

attacks become more pernicious and widespread, businesses in the city will have to increase their investment in cybersecurity to remain attractive.

Globally, businesses are finding it more and more difficult to find experienced cybersecurity professionals – some have taken to employing robots.²⁸ Although this study does not measure levels of cyber skills specifically, Cape Town scores poorly for its residents' overall levels of *ICT usage* and for *Software development and multimedia*.

These scores may simply reflect broader levels of education, which are low across the country. But they bely the fact that Cape Town is home to many of the continent's most talented and successful tech entrepreneurs, with a booming start-up sector and strong universities. In order to achieve its digital vision, city government should strongly encourage the uptake of skills such as coding, cybersecurity and digital marketing by locals. This will involve close collaboration with education providers and provincial government.

Digital infrastructure

Cape Town also lags behind in some areas of digital infrastructure. The city administration is well underway in rolling out 1,300km of fibre-optic cables, and providing free Wi-Fi in

		Score
1	Singapore	171
2	London	148
3	New York	146
4	Stockholm	142
4	Amsterdam	142
6	Toronto	132
7	San Francisco	130
8	Tokyo	129
8	Los Angeles	129
10	Hong Kong	128
11	Paris	127
12	Seoul	120
13	Chicago	116
14	Sydney	109
15	Beijing	101
16	Shanghai	98
17	Moscow	96
17	Madrid	96
17	Dubai	96
20	Berlin	90
21	Milan	82
22	Kuala Lumpur	73
23	Bogotá	69
24	São Paulo	66
25	Mumbai	57
26	Mexico City	52
27	Rio de Janeiro	41
28	Johannesburg	38
29	Cape Town	35
30	Jakarta	23
31	Lagos	14

High-income countries Cape Town
Middle-income countries

parks, libraries, buses and elsewhere. However, this research highlights the relative maturity of competitor cities' digital networks: Cape Town's scores for both *Broadband quality* and *Mobile broadband speed* are better than most middle-income country cities (MICCs), but in the bottom quartile globally.

A further example is *Internet access in schools*. Enabling young people to become 'digital natives' is key to becoming a technology-ready city, yet Cape Town and Johannesburg both lag behind the global leaders.

²⁷ See: Tech Cities 2017, Savills World Research (2017).

²⁸ See: With too few cyber experts, a firm proposes a bot to fill the gap, Steve leVine, Axios (1 November 2017).

Technology readiness	Internet access in schools*	Broadband quality score	Mobile broadband speed	ICT Usage	Software development and multi-media design	Digital security
1	2	2	1	4	10	2
2	3	12	13	1	3	12
3	8	8	14	6	7	3
4	4	6	10	2	22	6
4	1	10	2	3	21	13
6	5	14	9	4	18	10
7	8	11	16	7	13	7
8	15	5	22	19	1	1
9	8	9	17	9	15	5
9	12	1	15	9	23	4
11	22	4	4	7	9	19
12	6	3	20	12	2	25
13	8	13	18	9	19	9
14	7	21	3	14	27	11
15 (1)	16 (2)	18 (4)	6 (1)	26 (6)	4 (1)	21 (4)
16 (2)	16 (2)	17 (3)	7 (2)	27 (9)	5 (2)	22 (5)
17 (3)	18 (4)	7 (1)	19 (3)	18 (2)	6 (3)	28 (11)
17	21	15	11	15	16	18
17	13	22	5	20	28	8
20	19	19	12	12	20	20
21	25	20	8	16	26	15
22 (4)	14 (1)	25 (7)	28 (10)	16 (1)	11 (5)	25 (8)
23 (5)	23 (6)	30 (12)	21 (4)	21 (3)	12 (6)	16 (2)
23 (6)	27 (9)	16 (2)	25 (7)	21 (3)	14 (7)	23 (6)
25 (7)	24 (7)	27 (9)	31 (13)	31 (13)	8 (4)	14 (1)
26 (8)	26 (8)	24 (6)	27 (9)	29 (11)	17 (8)	17 (3)
27 (9)	27 (9)	23 (5)	26 (8)	21 (3)	30 (12)	24 (7)
28 (10)	30 (12)	26 (8)	23 (5)	24 (6)	24 (9)	27 (10)
29 (11)	30 (12)	28 (10)	24 (6)	24 (6)	25 (10)	26 (8)
30 (12)	20 (5)	29 (11)	29 (11)	30 (12)	31 (13)	30 (12)
31 (13)	29 (11)	31 (13)	30 (12)	28 (10)	29 (11)	31 (13)

Rank out of 31 cities (rank out of 13 middle-income country cities, if applicable)

The Western Cape Government is close to completing an extensive rollout of internet to schools, but this was not in place when this research was carried out. This is a stark reminder of how fast technology changes: There is no 'end-goal' for technological progress.

Leapfrog or catch up?

In 2011, Amsterdam had the highest proportion of household with internet access in Europe, at 94%.²⁹ In the

same year, just 35% of South African households had access although, in an indication of the pace of change, this had increased to 53% by 2016.^{30,31} Among the MICCs, Kuala Lumpur has had 4G access in most of its schools for many years, and is in the process of upgrading these connections to speeds of 15Mbps or more.

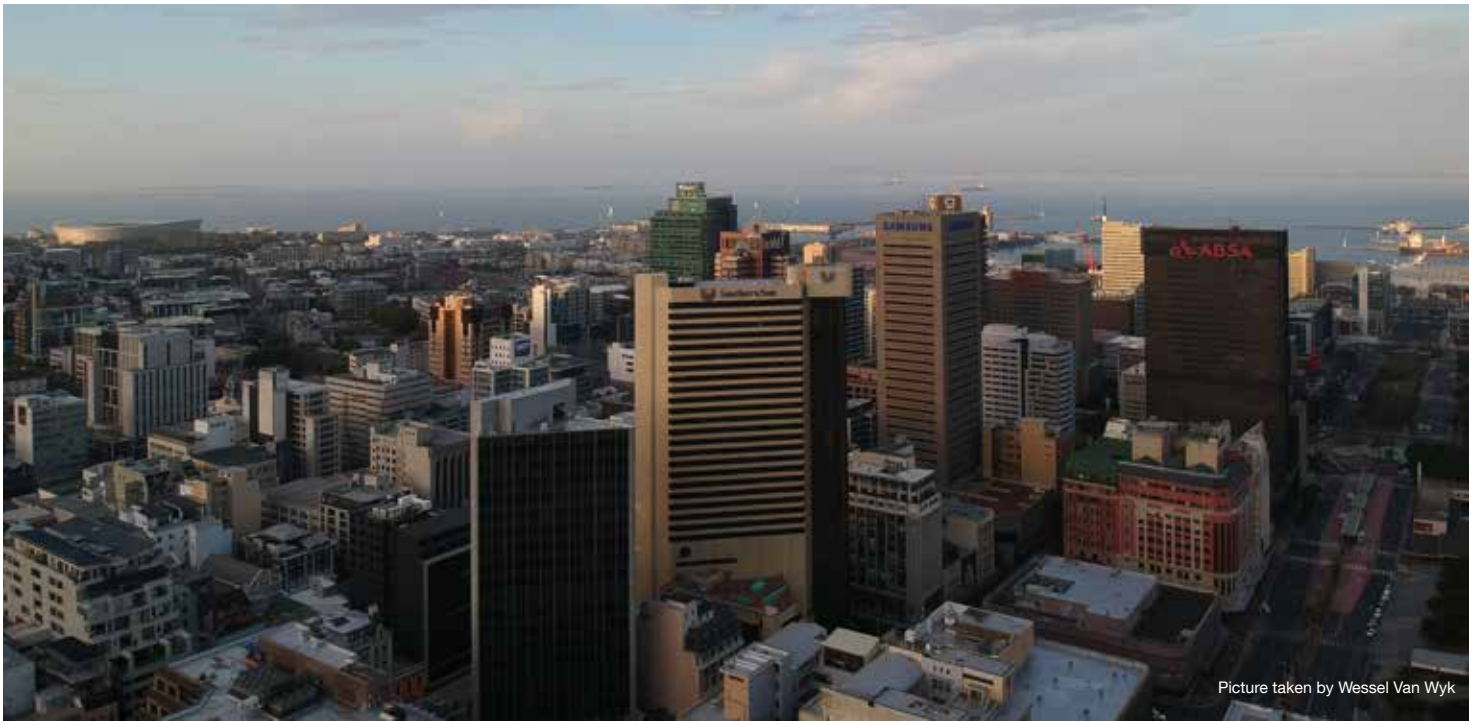
Connectivity is only the beginning of technology's power to transform education. The Western Cape's e-learning initiative also involves the creation of more than 5,000 tech enabled classrooms, an e-learning curriculum and teacher training courses that focus on the integration of ICT into teaching and learning. This coordinated approach gives Cape Town the potential to 'leapfrog' developed cities by harnessing the new technologies of the Fourth Industrial Revolution.³²

²⁹ The Netherlands leads Europe in household Internet access, Carly Blair, I Am Expat (20 June 2012).

³⁰ National Census 2011, Statistics South Africa (2011).

³¹ General Household Survey 2016, Statistics South Africa (2016).

³² Enabling a sustainable Fourth Industrial Revolution, PwC, G20 Insights, (May, 2017).



Picture taken by Wessel Van Wyk

Learning to innovate

Technology and innovation go hand in hand. As important as digital infrastructure and skills is the culture that accompanies them. Innovation was previously considered an innate quality, but increasingly companies and governments are learning that it can be taught. Many modern cities are home to *Accelerator*, *Incubator* and *Innovation-as-a-service* programmes, all of which aim to increase innovation in different areas of a city economy. Some focus on existing firms – ‘teaching businesses to innovate’ while others are aimed at start-ups – ‘teaching innovators about business’. Many cities are now launching innovation programmes or incubators of their own.

Cape Town is home to more of these programmes than anywhere else on the continent. The Cape Innovation and Technology Initiative (CiTi) was formed in 1999 and more than 20 others (including PwC) have followed since. Global incubator *Startupbootcamp* launched its first programme on the continent in September 2017 in Cape Town.³³ The following month, it became the first African city to be labelled a Unesco ‘City of Design’.³⁴

Smart city?

Innovation involves finding creative solutions to seemingly unsolvable problems. Modern African cities are full of such problems, from inequality and transport, to housing, employment and security. More than perhaps any other city, Cape Town sits at a crossroads between African problems and digital solutions – the reason it was recently chosen as the headquarters of the continent’s first EdTech incubator, *Injini*. Innovators and policymakers should seize the opportunity to make Cape Town the test bed for the African smart city solutions of tomorrow.



³³ Our Top African Innovators arrive in Cape Town, Heinrich Tessororf, Startupbootcamp, (4 September 2017).

³⁴ Cape Town is the first city in Africa to be named a UNESCO City of Design, DesignIndaba.com (14 Nov 2017).

"I believe Cape Town has inherent competitive advantages to make it an EdTech innovation centre for the world. It has a timezone, talent pool and cost base to buttress any tech industry; but a concentration of great universities and global education companies that make it the education capital of Africa. This is augmented by an urgent pan-African demand for improved education that makes EdTech innovation not just crucial to Cape town as a hub, but crucial to the future of the whole country and entire continent."

Jamie Martin, Head CiTi EdTech cluster,
Co-founder of Injini,
Africa's first EdTech incubator



Picture taken by Wessel Van Wyk

Start-ups in Cape Town

Cape Town is fast becoming Africa's digital start-up hub: The city boasts more than 25 co-working spaces and 20 acceleration programmes – each of which supports between 10 and 15 start-ups annually.³⁵ Global and local African entrepreneurs are choosing Cape Town for many reasons including its access to the African market, access to funding, a culture of innovation, tax incentives and a lifestyle and natural beauty that are hard to match.

Cape Town's innovation community is thriving. With over 60% of South Africa's total tech start-ups and 58% of its venture capital firms headquartered in the city. Such companies represent fintech, edtech, traveltech, e-commerce, agritech, gaming, healthtech and more.³⁶

These innovations are filling essential gaps for citizens and transforming the way people live in the city. Many were formed in response to the city's complex social and economic problems, as highlighted below.

Helping small businesses grow	Providing quality education at low cost	Helping people to move around the city
Snapscan Provides a cardless and cashless payment method for over 40,000 South African merchants for easy and safe payments. Snapscan has also partnered with the Street Parking Solutions to provide motorists the ability to pay parking marshals in cities via the app.	GetSmarter Provides world-class online education courses to + 50,000 learners. The company democratises education by giving working professionals access to courses by world-renowned institutions like the University of Cambridge, the University of Chicago, HarvardX and the University of Oxford Said Business School.	GoMetro A smart mobility company helping cities generate accurate transport data for both formal and informal sectors, providing on-demand mobility solutions, and journey-planning applications with live updates and schedules to more than 25,000 people in seven cities in South Africa.
Greenfingers Mobile A mobile technology platform which manages and finances smallholder farmers, reducing transaction costs and enabling efficient access to global value chains with the aim of improving food security and alleviating poverty in rural Africa.	School in a Box Run by the Social Project, it provides an educational pack of gamified, interactive courses for up to 100 children from Grade 1 to Matric in English, maths, science and IT. It provides the necessary hardware, including devices, and content to run the lessons.	Jumpin Rides Allows commuters in South Africa to offer a ride to commuters going the same way or find a ride. Carpooling reduces costs and congestion, and the platform verifies users and allows them to rate one another.
SweepSouth An online home cleaning service, matching domestic workers to work in their local area. They recruit a large portfolio of domestic cleaners in South Africa, who are provided with a guaranteed minimum hourly rate and transport costs. Users can rate cleaners afterwards.	Paper Video Offers free online video tutorials linked by QR codes to past-paper exam questions to help students to study before their final exams from Grades 8 to 12. Over 11 000 video tutorials are available, making it South Africa's largest collection of education videos, which can also be watched offline using micro SD cards.	WhereIsMyTransport Has completed the first ever data collection project for informally run public transport in all South Africa's major cities, allowing organisations to access unique information inclusive of journey time, fares and frequency.

³⁵ City-led development is the answer to South Africa's jobs crisis, Democratic Alliance (da.org.za) (29 Aug 2017).

³⁶ Cape Town Tech Centre Infographic 2017, Silicon Cape Initiative (2017).

Digital cities

Why now?

Although ‘digital’ technology has been around for years, in the last decade or so, several trends have collided at once:

- Fast, cheap data;
- An alignment of hardware and software standards;
- Access to consumers and citizens via smartphone; and
- A willingness to share open data and open source technology.

All of these trends have made barriers to entry lower, which has, in turn, transformed the technology world from one of big, corporate IT and engineering firms, to a jungle of college-dorm room start-ups and ‘unicorns’. This is good news for cities in two ways:

- First, because many of the most exciting new solutions have the potential to solve big, longstanding urban problems like housing, transport and resource scarcity; and
- Second, because such commoditisation means increased speciality and better value for money – in short, less supplier power.

But the scale of change will bring both threats and opportunities to cities.

Fig. 6 Digital cities: The future

Digital is one of the key focus areas set out in our Future Cities model (see page 15). Digital is sometimes thought about as just hardware and software – and both are crucial. But its transformative nature means that it also affects the city in much wider ways. We recognise four crucial areas that should form the basis of any Digital / Smart city business case.



“Cape Town provides an incredible home for the innovation ecosystem for Africa. The beauty of the city and its people is matched with the energy and creativity of entrepreneurship. At Startupbootcamp, we are thrilled to call Cape Town our home in Africa as we attract talent and nurture ideas into exciting businesses. Cape Town’s infrastructure is world class and it is a diverse and truly global city”

Paul Nel, StartupBootcamp

Digital cities

Continued



Digital strategy

Digital can help the city achieve its existing goal of improving citizens' lives through:

- **Efficiency & improvement** – getting better value for money in everything from more efficient city admin functions to optimised fleet-maintenance regimes, and personalised services that avoid waste.
- **Engagement & inclusion** – using user-friendly digital platforms, crowdsourcing ideas, or finding new ways to gather data to help the city better understand its citizens. This can both improve service delivery across the board and plug the gaps that the vulnerable most often fall through.
- **Trust** – simultaneously opening up government data and securing its systems to increase innovation and trust. Using e-controls, big data transactions analysis and blockchain to tackle fraud and corruption.
- **Economy & environment** – growing the local economy through government demand for services, new digital infrastructure, skills and innovation, and the investment these encourage. Reducing pollution and greenhouse gases with green energy and more efficient technology.



Doing digital business

Benefiting from new technologies requires cities to change their traditional business models:

- **City as a buyer** – cities will still procure technology, but in a best-of-breed approach that will require more flexible procurement to ensure better value for taxpayers' money.
- **City as a regulator** – transformative tech trends such as Airbnb and Uber create winners and losers – cities must understand these trends and regulate where unfairness exceeds economic gains.
- **City as a platform** – many apps use city data to provide services to users for free – particularly real-time transport apps. Their success depends on cities being willing to embrace open data and the ability to govern the data environment to ensure common standards and practices.
- **City as a service provider** – new technology will give citizens and private firms the ability to offer traditional city services – such as electricity and recycling – for less. Cities must adapt or face irrelevance.



Digital organisation

Cities can become more productive and more innovative organisations by embracing digital tools and modern ways of working:

- **Collaborative digital tools** – such as real-time editable documents and mobile-ready spreadsheets that ensure staff can actively collaborate whenever and wherever.
- **Ways of working** – such as virtual teams, flexible working and a relaxed corporate culture and dress code.
- **Physical space** – evidence shows that our physical surroundings affect our creativity – 'innovation zones' and other interior revamps can help.
- **Mental frameworks** – often the human mind must be encouraged to innovate, using frameworks such as 'design thinking'.
- **Innovation as a department** – many cities have set up cross-government departments to instill innovation, and even Chief Innovation Officers.
- **Open data and open innovation** – encouraging anyone who is interested to contribute to city goals, making financial and operational city data freely available online, and running open events such as 'hackathons' to solve important problems.

Digital cities

Continued



Digital solutions

Many emerging technologies will have the biggest effect on urban environments. PwC's 'essential eight' recognise the ones that will have the greatest effect in the coming years.

Technology	Description	Potential uses in cities
1. Internet of Things (IoT)	A network of physical objects embedded with sensors, software, network connectivity, and computing capability	Sensors on buses to assist with transport analytics, optimisation and fleet management; Water meters that analyse usage inefficiencies and pipes that sense low pressure and leaks; Smart poles that act as energy-saving streetlights and are embedded with sensors that can show granular spatial data of air pollution, noise levels, traffic or any other sense-able phenomenon.
2. Augmented reality	Visual and/or audio 'overlay' on the physical world	Apps to help citizens get around; Virtual street signs or bus stops; Architecture and planning that can be overlaid on existing city structures.
3. Virtual reality	A completely computer-generated simulation of a three dimensional environment where anything is possible	Reimagined simulation of greenfield urban planning and architecture; Citizen experience simulators in new modes of transport.
4. Blockchain	A 'distributed ledger' which takes cybersecurity to the next level and can eliminate fraud	Unbreakable security for storing citizen data, increasing trust and engagement in and with the city.
5. Artificial intelligence	Software algorithms that automate complex decision-making tasks, improving human outcomes	Analysing big citizen data to inform the most effective, popular revenue raising measures; Optimisation of transport routes based on supply and demand in real time.
6. Drones & autonomous vehicles	Unmanned vehicles or robots that can sense and survey and can carry data or goods where other methods are impractical or costly, or can transport people or freight more safely and conveniently than traditional methods	Surveying hard to reach places such as telephone masts or the seabed in ports; Aerial mapping for urban planning; Nano-drones that can flow through water pipes and sense - or fix - leaks; Security surveillance.
7. 3D printing	Creates three-dimensional objects based on digital models by layering or 'printing' successive layers of materials	Create replacement parts for vehicles with no delay; provide cheap and easy building materials for informal settlements.
8. Robots & robotic process automation (RPA)	Machines (or programmes) with enhanced sensing, control, and intelligence used to automate, augment, or assist human activities. Robotic process automation (RPA) automates human processes on computers.	Unpopular tasks such as cleaning streets, beaches, oceans and sewers; RPA can automate back-end tasks, reducing human error (e.g. lost utility bills) making cities run much more efficiently.

3. City gateway

Welcoming the world

Positioned at the very tip of Africa, thousands of miles away from the huge consumer markets of Europe and North America, Cape Town has challenges to overcome in the *City gateway* variable – a reminder of the natural and geographic constraints faced in competing as a *City of Opportunity*.

This can be seen in low scores for *Airport connectivity*, *Incoming/outgoing passenger flows*, and *International tourist numbers*.

While Cape Town International Airport serves around two million passengers a year, London (ranked top for *City gateway*) serves 163 million.³⁷ Cape Town also scores lower than Johannesburg, whose OR Tambo International Airport serves four times as many passengers, and around three times more international routes. However, it should be noted that these figures do not account for the many passengers that stop over at OR Tambo on their way to Cape Town, in particular those from the United States, from where there is no direct flight.

In response to this, the Western Cape government has created an *AirAccess* team to focus on route expansion.

This is having marked success. Cape Town has added ten new direct international routes in the past two years, including Frankfurt, Istanbul and Vienna, as well as two more flights on the highly popular route to London.³⁸

This has seen rapid passenger growth of 24% over the past two years, compared to 2% for OR Tambo.³⁹

Numbers aside, Cape Town's airport is one of the best performers in *Top 100 World Airports*, beating such cities as San Francisco, Madrid and Dubai. In 2017 it was voted Africa's leading airport in the World Travel Awards.⁴⁰

Tourism is taking off

In the same awards, the City of Cape Town also received the award for *Africa's Leading City Destination*.⁴¹ However, the city's appeal extends well beyond Africa, as evident in its higher score for *International association meetings*. The city's convention centre was proactive in taking advantage of the city's showcasing during the 2010 FIFA World Cup. In the intervening years, Cape Town's international reputation has gone from strength to strength. In 2011 it was voted the

		Score
1	London	176
2	Paris	155
3	Tokyo	147
4	Hong Kong	143
5	Beijing	141
6	Singapore	140
7	New York	136
8	Dubai	135
9	Shanghai	132
10	Seoul	127
11	Amsterdam	124
12	Madrid	120
13	Kuala Lumpur	114
14	Moscow	110
15	Berlin	105
16	Los Angeles	93
17	Chicago	90
18	Toronto	88
19	Sydney	77
20	San Francisco	76
21	Milan	75
22	Stockholm	70
23	São Paulo	68
24	Johannesburg	59
25	Jakarta	58
26	Mexico City	56
27	Rio de Janeiro	52
28	Mumbai	44
29	Cape Town	41
30	Bogotá	31
31	Lagos	15

● High-income countries
 ● Cape Town
 ● Middle-income countries

world's best tourism destination by TripAdvisor⁴², and again in 2014, by the New York Times.⁴³ It has been voted the 'best city in the world to visit' by readers of the *Telegraph* in the UK for the past three years.⁴⁴

³⁷ Cape Town: Airports Company South Africa, passenger data for FY2015/16, 2016/17 and YoY up to September 2017, web page: Airport.co.za;

London: data comprises Heathrow, Gatwick, Stansted, Luton, City and Southend airports; data from Terminal and Transit Passengers 2016, Civil Aviation Authority (2016)

³⁸ Route Expansions for Cape Town, AirAccess, Wesgro, (November 2017).

³⁹ Airports company South Africa, passenger data for FY2015/16, 2016/17 and YoY up to September 2017.

⁴⁰ Africa's Leading Airport 2017, World Travel Awards (2017).

⁴¹ Africa's Leading City Destination 2017, World Travel Awards (2017).

⁴² TripAdvisor users vote Cape Town tops, Brand South Africa, (5 May 2011).

⁴³ 52 Places to Go in 2014, The New York Times, (2014).

⁴⁴ Expert Guide to Cape Town, Travel, The Telegraph.

City gateway	Hotel rooms	International tourists	International association meetings	Incoming/ outgoing passenger flows	World Top 100 airports	Airport connectivity
1	3	2	4	1	5	1
2	7	4	2	4	17	3
3	6	11	10	3	4	11
4	8	1	7	12	3	18
5 (1)	1 (1)	18 (6)	8 (1)	7 (2)	7 (1)	10 (3)
6	11	3	5	16	1	16
7	2	6	22	2	20	4
8	4	5	17	10	15	6
9 (2)	9 (2)	9 (2)	14 (3)	6 (1)	13 (5)	9 (2)
10	22	8	9	11	2	13
11	24	12	6	15	6	5
12	10	19	1	18	12	12
13 (3)	13 (3)	7 (1)	13 (2)	17 (5)	8 (2)	20 (4)
14 (4)	15 (5)	14 (3)	25 (9)	8 (3)	18 (6)	2 (1)
15	12	16	3	24	25	7
16	5	13	23	9	24	19
17	16	27	24	5	22	8
18	17	22	15	20	16	14
19	25	23	12	21	9	25
20	19	21	26	13	14	23
21	23	10	19	25	25	15
22	26	20	11	27	21	17
23 (5)	13 (3)	28 (10)	18 (5)	19 (6)	25 (9)	21 (5)
24 (6)	31 (13)	15 (4)	27 (10)	28 (10)	10 (3)	22 (6)
25 (7)	20 (7)	25 (8)	28 (11)	14 (4)	19 (7)	28 (10)
26 (8)	21 (8)	24 (7)	20 (6)	22 (7)	25 (9)	24 (7)
27 (9)	18 (6)	26 (9)	16 (4)	26 (9)	25 (9)	29 (11)
28 (10)	27 (9)	17 (5)	30 (12)	23 (8)	25 (9)	26 (8)
29 (11)	29 (11)	23 (11)	21 (7)	30 (12)	11 (4)	31 (13)
30 (12)	28 (10)	31 (13)	23 (8)	29 (11)	23 (8)	27 (9)
31 (13)	30 (12)	30 (12)	31 (13)	31 (13)	25 (9)	30 (12)

Rank out of 31 cities (rank out of 13 middle-income country cities, if applicable)


Fully booked

Despite its popularity with tourists, Cape Town has a relatively low number of *Hotel rooms*. This is despite strong demand for, and success of, the city's existing hotels.⁴⁵ It is possible that the hotel sector is simply in the process of catching up.

One way of assessing whether there is excess demand is by looking at the city's number of listings on short-term rental site Airbnb. Cape Town has 17,000 active listings (40% of South Africa's total), which puts it just behind the site's top 10 most popular destinations, and on a par with cities such as Amsterdam, Sydney and Copenhagen.

While some cities have regulated Airbnb strictly, Cape Town has taken a partnership approach, recently concluding a 'hospitality collaboration agreement' with the company, the first such agreement in any African country. The aim is to promote Cape Town as a destination on the Airbnb website and app, and will also celebrate Cape Town as an 'Ideas Capital' by hosting the Africa Travel Summit.

⁴⁵ The One & Only was voted the best hotel in South Africa in 2017. See: South Africa's Leading Hotel 2017, World Travel Awards (2017).



“As a business, we have never been more aware of our responsibility to make a meaningful socio-economic contribution into the lives of the people of Cape Town. So as well as taking our jobs at the airport very seriously, we are committed to making a positive and lasting impact on the lives of our neighbours. And we see the airport’s growth as the catalyst to doing just that. As a growing airport it is our responsibility to ensure that our surrounding communities grow with us. We are excited about what the future holds for the airport and the City”

Deon Cloete
General Manager, Cape Town International Airport

“The city of Cape Town is both a special and a unique destination in many ways, offering spectacular natural beauty and a lifestyle to match for both visitors and locals. History, industry, commerce and tourism are intertwined to make for an incredibly special place. With a waterfront that is one of the best in the world and the most successful and frequently-visited destination in Southern Africa, the opportunities remain vast for innovation and enterprise, something that Cape Town continues to showcase in ways that inspire.”

David Green, CEO, V&A Waterfront

“As the gateway to an attractive destination such as Cape Town, Cape Town International Airport has an important role to play in the region. We are well aware that airports are catalysts for socio-economic growth. Cape Town Airport has organically been growing into an aerotropolis – a concept which sees an airport at the core of extensive economic activity. Together with our regional partners we are actively driving this opportunity to see Cape Town and the Western Cape continue to grow and to leverage off the advantages that comes from a well-run airport.”

Deon Cloete
General Manager, Cape Town International Airport



Quality of life

Although they may move to cities in search of work, people bring their lives with them. In the age of ubiquitous connectivity, remote working and virtual teams, cities must offer more than just employment and education. This section considers the overall quality of life offered to citizens using four indicators: *Health, safety and security, Sustainability and the natural environment, Demographics and liveability* and *Transportation and infrastructure*.



4. Health, safety and security

In crowded, complex cities, safety and health are major concerns. Citizens who are healthy and feel safe will also be more economically productive. And as well as its primary cost, crime deters investment. Cities differ in the level of control they have over health and public safety systems, but all share the desire to get these fundamentals right.

Cape Town ranks mid-table for *Health, safety and security*, but its individual scores are mixed.

Driving safety forward

The city can improve on *Road safety* where it finishes joint bottom with Johannesburg. South Africa's road network is by far the best in Africa, but road deaths remain stubbornly high despite awareness campaigns, education initiatives and law enforcement. The Western Cape's figures are only slightly better than the national average, 9% of the country's total road deaths in 2016.⁴⁶

In a good example of collaborative government, however, the city, provincial and national governments have recently teamed up to launch the 'Safely Home' campaign, which is based on an Australian model of random breath testing, speeding fines and awareness around the use of mobile devices and pedestrian

visibility. In Australia, the programme saw a 20% reduction in alcohol-related traffic injuries within two years of implementation.⁴⁷

Crime

Cape Town also scores poorly on *Crime*. Gang violence in Cape Town brings extremely high levels of crime and homicide and, although such crime is mainly confined to certain areas (see page 48), the overall figures have led to Cape Town being ranked the 13th most violent city in the world, albeit slightly improved from 2015 when it was ranked ninth.⁴⁸

The City of Cape Town Metropolitan Police Department has a dedicated Gang Unit which focuses on combating drug dealing and gangsterism, but many of the resources and powers remain with the national South African Police Service (SAPS). In 2014, the *Khayelitsha Commission* found that in Cape Town some of the highest crime areas in the country had the lowest SAPS police-to-population ratios.⁴⁹

⁴⁷ See: It Won't Kill You to Slow Down, Safely Home, Campaigns, Western Cape Government webpage (2017).

⁴⁸ The 50 Most Violent Cities in the World, Mexican Council for Public Security and Criminal Justice, (2016).

⁴⁹ Towards a Safer Khayelitsha, Report of the Commission of Inquiry into Allegations of Police Inefficiency and a Breakdown in Relations between SAPS and the Community of Khayelitsha (August 2014).

Score		
1	Tokyo	159
2	Toronto	156
3	Sydney	145
4	Berlin	142
4	Stockholm	142
6	Singapore	141
7	Amsterdam	139
8	London	138
9	Madrid	132
10	Paris	130
11	Hong Kong	127
12	San Francisco	126
13	Milan	121
13	Seoul	121
15	Los Angeles	119
16	Chicago	116
16	New York	116
18	Dubai	97
19	Mexico City	78
20	Shanghai	67
21	Cape Town	65
22	Johannesburg	63
23	Beijing	58
24	Moscow	46
25	Jakarta	45
25	Kuala Lumpur	45
25	São Paulo	45
28	Rio de Janeiro	44
29	Mumbai	43
30	Bogotá	42
31	Lagos	12

High-income countries Cape Town
Middle-income countries

To make matters worse, the national paramedics' trade union recently threatened to withdraw its services in some of these areas due to the targeting of ambulances by criminals.⁵⁰

If the need for collaborative policing was clear, the solution may be forthcoming. In 2016, the city administration launched a new technology solution, 'EPIC', which aims to 'draw a balance between safe cities

⁴⁶ South Africa's shocking road death numbers at highest level in 10 years, BusinessTech, (9 June 2017).

⁵⁰ Red Zone Declared after Armed Robbers hit Ambulance in Cape, Daily Maverick (17 November 2017).

Health, safety and security	Road safety*	Health system performance*	End of life care*	Crime	Political environment	Security and disease risk
1	8	2	13	4	5	1
2	11	4	10	6	3	2
3	10	16	2	5	6	8
4	7	12	3	15	2	11
4	2	7	14	9	1	17
6	5	1	11	1	13	20
7	4	15	4	8	3	19
8	3	13	1	12	13	12
9	6	5	18	10	15	6
10	9	8	9	17	6	13
11	1	9	17	2	15	21
12	13	18	5	11	9	10
13	12	3	16	14	8	18
13	18	6	15	7	18	7
15	13	18	5	19	9	9
16	13	18	5	17	9	14
16	13	18	5	16	9	15
18	17	14	12	3	23	26
19 (1)	19 (1)	22 (4)	24 (6)	26 (8)	20 (3)	3 (1)
20 (2)	23 (5)	9 (1)	29 (11)	13 (1)	26 (8)	25 (8)
21 (3)	30 (12)	29 (11)	19 (1)	27 (9)	17 (1)	5 (3)
22 (4)	30 (12)	29 (11)	19 (1)	29 (11)	18 (2)	4 (2)
23 (5)	23 (5)	19 (1)	29 (11)	22 (4)	27 (9)	24 (7)
24 (6)	25 (7)	27 (9)	25 (7)	23 (5)	30 (12)	16 (4)
25 (7)	20 (2)	26 (8)	26 (8)	20 (2)	28 (10)	27 (9)
25 (7)	29 (11)	23 (5)	21 (3)	23 (5)	21 (4)	30 (12)
25 (7)	27 (9)	24 (6)	22 (4)	28 (10)	24 (6)	22 (5)
28 (10)	27 (9)	24 (6)	22 (4)	30 (12)	22 (5)	23 (6)
29 (11)	21 (3)	28 (10)	27 (9)	21 (3)	24 (6)	28 (10)
30 (12)	22 (4)	17 (3)	28 (10)	25 (7)	29 (11)	29 (11)
31 (13)	26 (8)	31 (13)	31 (13)	31 (13)	30 (12)	31 (13)

Rank out of 31 cities (rank out of 13 middle-income country cities, if applicable)

and smart cities'.⁵¹ This programme integrates six emergency and policing services onto one common technology platform with a joint command centre. However, the system does not include SAPS, meaning that the full benefits available cannot be realised.

All levels of government can benefit from technology-enabled collaboration if the motivation can be found to embrace such partnerships.

⁵¹ Cape Town's new Technology-Based Public Safety Programme could be an Epic First, IT Web (30 September 2016).

City improvement districts

Another example of successful collaboration is in the formation of city improvement districts (CIDs) in which property owners in an area pay a little more in return for extra services – usually in the form of street cleaning, extra security and extended services like recycling. The first of these districts was founded in 1999 by the City of Cape Town along with the South African Property Owners Association and the Cape Town Regional Chamber of Commerce and Industry. Today there are 39 in the city. CIDs have been very

powerful vehicles for regeneration in Cape Town, but they are not appropriate in poorer areas where there are very few or no property owners and little excess disposable income. In such areas government must intervene actively to improve outcomes.

Health and resilience

Cape Town scores poorly on *Health system performance*, and moderately for *End of life care*, both of which are also scored at the national level. As with safety, health is an area of overlapping responsibilities between the provincial

and city governments with the city delivering some primary care and mainly responsible for environmental health. Functions such as the monitoring of food and water quality, waste management, air and noise pollution and prevention of diseases are unlikely to improve citizen satisfaction scores or win votes, but they are fundamental to achieving resilience in a city of four million people.

Achieving ‘resilience’ is a key focus area for many cities in a turbulent world, as set out in box 4. The City of Cape Town has embraced this approach – it is a member of the 100 *Resilient Cities* programme, and has appointed a Chief Resilience Officer.

This study finds that in some ways, the city’s need for resilience may actually be less than most – it comes in the top five for Security and disease risk, as measured by nine broad metrics in the *Lloyd’s City Risk Index 2015–2025*.⁵²

Two exceptions to this are the water shortages (see *Sustainability and the natural environment*) and *Political environment*, where the city’s mid-table score is based on national political factors.

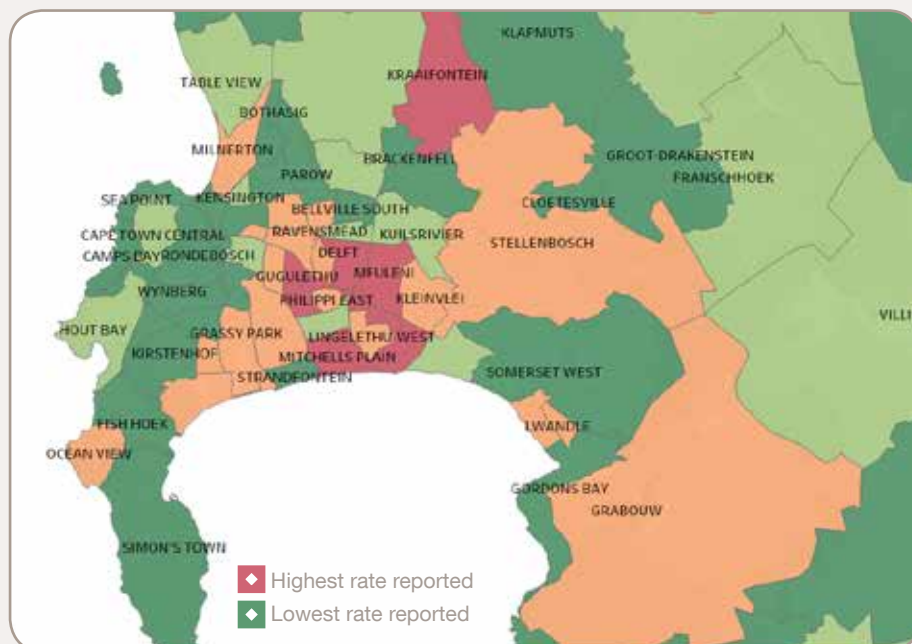
52 See: Lloyd’s City Risk Index 2015–2025, Lloyd’s (2015).

Box 3

Crime in Cape Town

A tale of two cities

Fig. 7 Murders reported across different parts of Cape Town



PwC visualisation of *Crime Statistics in SA* (South African Police Service, 2017)

Crime is a problem in Cape Town, as shown by the city’s strategic focus on becoming a ‘safe city’. However, an analysis of the spatial distribution of crime reveals that this is a tale of two cities, as can be seen from the reported murder rate at police precincts in 2017. The most serious crimes are largely confined to the sprawling informal settlements on the Cape Flats and absent from the tourist areas around the CBD and Atlantic seaboard.

This can be attributed in part to a gang culture in the townships, but disparities in security provision are also evident. In 2014, the *Khayelitsha Commission of Inquiry into allegations of police inefficiency and a breakdown in relations between SAPS and the community in Khayelitsha* found that some areas of Cape Town had the highest crime rates in the country, and the lowest SAPS police-to-population ratios, highlighting the importance of local and national policing collaboration.⁵³

Such disparities are increased by the widespread use of private security firms in the areas that are able to pay for them.

The City of Cape Town’s new EPIC technology solution (see page 46) is improving response times, but further integration is required, particularly with the South African Police Service.

Safety interventions can have outsized returns: If people do not feel safe, they are less likely to be economically productive, or socially integrated. This is particularly harmful in early life – children who miss school because of safety concerns are less likely to get good grades, meaning their chances of affording safe housing in later life is diminished further.

53 Towards a Safer Khayelitsha: Report of the Commission of Inquiry into Allegations of Police Inefficiency and a Breakdown in Relations between SAPS and the Community of Khayelitsha, Khayelitsha Commission (August 2014).

Urban resilience

Traditional asset management and disaster planning has given way in recent years to ‘resilience’, with many organisations including the OECD, World Bank and Rockefeller offering different frameworks.

In our view, urban resilience means being able to withstand shocks in four areas, all of which government has a role in fostering:

Environment

Cities are a mix of the natural and the man-made physical world, and environmental resilience involves both. Building codes, pollution controls, flood defences, early-warning systems, water supply and public health are all areas where cities can have a major impact.

Measured by: carbon footprint, air pollution, compliance with building standards, immunisation rates, water-related business risk*

Economy

Achieving economic resilience is challenging but government can play a key role. In a direct sense, government spending can create transformative economic infrastructure, such as roads, dams and servers, or can be used to subsidise education, training, small businesses and start-ups. Indirectly, cities have even more power to create the right balance of legislation and incentives that will attract investment, trade, talent and create a productive economy.

Measured by: gross fixed capital formation, broadband speed, productivity, ease of doing business score, number of start-ups.



Organisation

Cities should be both financially and fiscally independent organisations, which involves sustainable revenue management and cash flow and the effective use of these funds to achieve outcomes. This requires motivated and competent staff from finance through to service delivery.

Measured by: financial ratios, grant funding as a % of revenue, audit opinion, qualification levels of staff, vacancies.

Society

Much of social resilience is determined by factors such as diversity, inequality, culture and social cohesion – all of which are hard for city governments to affect. However, genuine citizen engagement, good service delivery, transparency and good governance all help to create trust in government and institutions making better civic behaviour more likely.

Measured by: number of open data downloads, transparency scores, citizen satisfaction scores, service delivery statistics, happiness indices.

*As provided by the World Resources Institute for this study (see appendix A for details)

The City of Cape Town has embraced the concept of resilience. As one of the members of the Rockefeller Foundation’s 100 Resilient Cities program, it employs a Chief Resilience Officer and was chosen as one of the pilot cities to develop the foundation’s ‘City Resilience Index’, currently underway.

The recent drought has also given the city first-hand experience of the importance of water resilience, which is a lesson many other cities around the world will have to learn in the coming decades.

Developing water resilience may be Cape Town’s biggest priority in 2018, but becoming a resilient city involves much more than drought alleviation.

5. Sustainability and the natural environment

A key determinant of quality of life is a city's natural environment and the extent to which it is being sustained for future generations. Nestled between the Atlantic Ocean and Table Mountain, and with more than 30 nature reserves and conservation areas within the city boundaries, Cape Town scores well for *Sustainability and the natural environment*, beating all other middle-income country cities (MICCs) except Moscow.

However, this variable measures more than just natural beauty, and in doing so, it also uncovers areas where the city can improve.

The city's highest score is for *Thermal comfort* – a 'goldilocks' measure that rewards cities that are neither too hot nor too cold – and one of a few factors in this study that policymakers have no control over.

Green Cape?

A mid-table score for *Public park space* belies the fact that many areas, in particular the Cape Peninsula, are wild, undeveloped terrain which improve air quality and increase biodiversity but are not officially designated as public space.

And Cape Town's public parks are particularly impactful: The city's CBD is overshadowed by Table Mountain National Park. As well as providing a natural playground for residents, and habitat for many species, Table Mountain is one of the country's most

popular tourist attractions, with more than a million visitors a year.

The city's top 10 score for *Air pollution* (first among the MICCs) is partly a result of this green space. Its coastal location may help (at the cost of windy weather), but this is not a guarantee – some of the world's most polluted cities are coastal, including Shanghai, which ranks close to the bottom of this study.

Cape Town's clean air owes more to the fact that most of its economic activity is in non-industrialised services, and it has almost no mining. Nevertheless, some areas are much more polluted than others; heavy traffic has an impact along trunk routes, and informal settlements, where residents commonly burn wood and other materials to stay warm, are the most polluted areas in the city.⁵⁴

Recycled waste is an area where Cape Town has room for improvement internationally despite performing well in South Africa (see page 53).

Natural resilience

Natural disaster preparedness is an area where the city (judged at the national level) has a low score, but where there have been exciting new developments (see EPIC on page 46).

Cape Town's *Natural disaster exposure* is relatively low, though its dry, windy summers mean that wildfires are

		Score
1	Sydney	174
2	Stockholm	173
3	Toronto	156
4	Seoul	155
5	Amsterdam	150
5	Berlin	150
7	Paris	146
8	San Francisco	141
9	Madrid	136
9	Milan	136
11	Chicago	129
12	Moscow	125
13	London	119
14	Los Angeles	114
15	New York	113
16	Tokyo	112
17	Cape Town	106
18	Hong Kong	103
19	Rio de Janeiro	102
20	Johannesburg	100
21	Singapore	99
22	Mexico City	95
23	Beijing	93
24	Shanghai	92
25	São Paulo	91
26	Bogotá	88
27	Kuala Lumpur	70
28	Lagos	63
28	Mumbai	63
30	Dubai	55
31	Jakarta	50

High-income countries

Cape Town

Middle-income countries

an ominous threat. The prevalence of informal settlements and illegal electricity connections means that these fires can have tragic consequences.

However, Cape Town's most pressing concern is not fire, but water. A poor score for *Water-related business risk* highlights the threat to water-intensive industry, but the city's primary concern is keeping water flowing for its four million residents.

⁵⁴ Cape Town air among the Worst, Sisi Lwandle, IOL, (12 February 2013)

Sustainability and the natural environment	Natural disaster exposure	Natural disaster preparedness	Thermal comfort	Recycled waste	Air pollution	Public park space	Water-related business risk
1	4	7	3	8	2	9	17
2	13	8	24	2	1	2	1
3	4	5	23	10	9	13	4
4	17	3	18	4	20	4	3
5	30	5	16	2	8	5	8
5	15	14	20	1	3	10	11
7	21	17	14	7	14	3	2
8	19	20	7	5	5	7	20
9	2	13	11	26	10	17	9
9	16	10	15	11	17	14	5
11	1	16	22	12	3	19	22
12 (1)	3 (1)	21 (4)	25 (9)	23 (8)	19 (3)	1 (1)	7 (2)
13	19	4	13	15	7	28	19
14	22	22	6	6	15	11	28
15	11	19	18	24	10	6	23
16	31	1	10	20	6	26	18
17 (2)	12 (6)	25 (7)	2 (2)	27 (10)	10 (1)	15 (4)	27 (10)
18	28	2	11	14	16	29	21
19 (3)	6 (2)	29 (11)	8 (5)	31 (13)	25 (7)	8 (2)	15 (7)
20 (4)	7 (3)	26 (8)	3 (3)	29 (11)	26 (8)	20 (7)	13 (5)
21	9	9	28	16	13	24	26
22 (5)	22 (9)	23 (5)	1 (1)	19 (5)	27 (9)	21 (8)	16 (8)
23 (6)	9 (5)	12 (2)	21 (8)	17 (3)	30 (12)	12 (3)	30 (12)
24 (7)	22 (9)	11 (1)	17 (7)	13 (2)	28 (10)	16 (5)	25 (9)
25 (8)	14 (7)	28 (10)	5 (4)	30 (12)	20 (4)	30 (12)	6 (1)
26 (9)	27 (13)	24 (6)	9 (6)	22 (7)	17 (2)	27 (11)	10 (3)
27 (10)	22 (9)	18 (3)	31 (13)	24 (9)	22 (5)	25 (10)	12 (4)
28 (11)	8 (4)	31 (13)	27 (11)	21 (6)	29 (11)	31 (13)	14 (6)
28 (11)	17 (8)	26 (8)	25 (9)	9 (1)	30 (12)	23 (9)	31 (13)
30	29	15	29	28	22	22	24
31 (13)	26 (12)	30 (12)	30 (12)	17 (3)	24 (6)	18 (6)	29 (11)

Rank out of 31 cities (rank out of 13 middle-income country cities, if applicable)

South Africa is the 30th driest country in the world, but uses 30% more water than the average country in the world.⁵⁵ In Cape Town, this has been sustainable until recently, as winter rainfall has been able to replenish dams for the dry summer. However, as the graph on page 52 shows, winter rains have fallen short for the past three years, making the situation critical. The city has taken the unprecedented step of announcing a ‘Day Zero’ – when Cape Town would become the world’s first major city in the modern age to turn off

the taps. However, a huge decrease in water usage by residents has so far been successful in pushing back this date beyond 2018, by which time it is hoped rainfall will have replenished the dams.

In keeping with its wider resilience agenda, the City of Cape Town’s recent Water Resilience plan is a comprehensive and ambitious attempt to solve this pressing problem.⁵⁶ It is primarily focused on the supply side,

with 500 additional megalitres (ML) per day from groundwater sources, land and sea-based desalination and re-use schemes. However, the city is also tackling demand for water, both through ‘soft’ awareness campaigns and ‘hard’ usage restrictions (currently Level 6B, meaning 50L per person per day) with heightened enforcement programmes.

This has seen great success so far: Total usage (which includes agricultural and industrial users) fell from 1 200 ML/day in 2015 to 519 ML/day in May 2018.⁵⁷

⁵⁵ Running on Empty: What Business, Government and Citizens must do to confront South Africa’s water crisis, Action Aid (April 2016).

⁵⁶ Advancing Water Resilience: Getting to an additional 500 million litres of new water a day, Speech by the Mayor of the City of Cape Town, Patricia de Lille, City of Cape Town (17 Aug 2017).

⁵⁷ City of Cape Town: Water Dashboard, 02 March 2018

The figure shows that tourists contributed to the cause, using much less water than had been forecast over the busy Christmas period, but it is likely that such water restrictions, if maintained, would hamper tourism in the long run.

Further examples can be found within this study. Officials in Los Angeles, situated in drought-prone California, have come up with the innovative solution of floating plastic balls on the surface of reservoirs, which prevents evaporation and could save 300 million gallons of water a year.⁵⁸

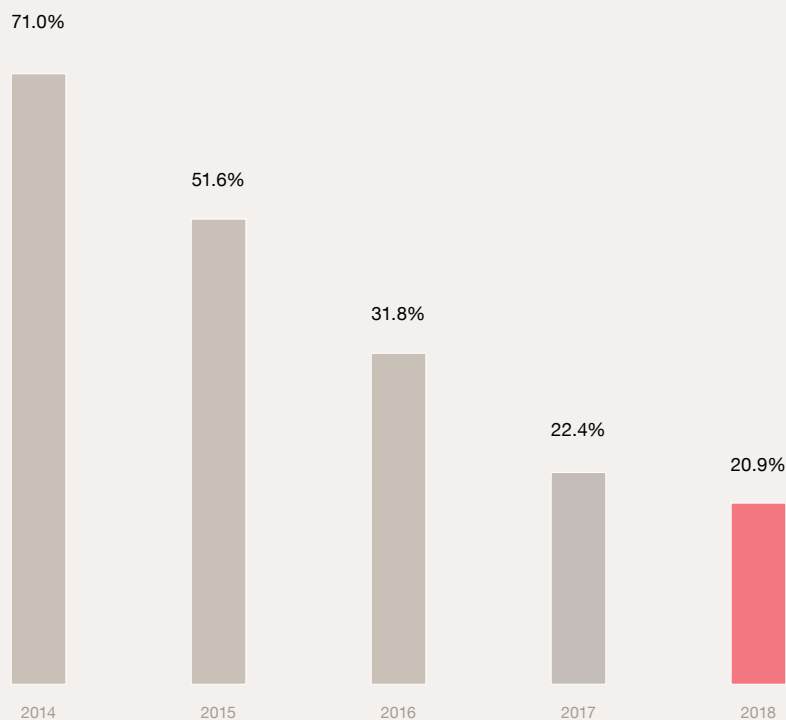
São Paulo is proof of the need for water resilience: It ranks sixth for *Water-related business risk* but since this study was concluded, it has been hit by its worst drought in 80 years.⁵⁹

58 Millions of ‘Shade Balls’ to Prevent Evaporation in California Reservoirs, Danny Clemens, Discovery.com (8 December 2015).

59 Lessons from São Paulo’s Water Shortage, Sandra Postel, National Geographic (March 2015).

Fig. 8 Three years of drought

Percentage storage in Cape Town’s major dams (Recorded 7 May each year)



Source: City of Cape Town, 2018.

Note: Dam Levels, City of Cape Town Webpage, available weekly.

“The city was the first municipality in the country to allow legal connections of small-scale embedded generation systems (such as solar PV), with a feed-in tariff. Nineteen (80%) of municipalities have since adopted similar systems. This work has unlocked significant opportunities for innovation and investment for businesses in the renewable energy space.”

Mike Mulcahy, CEO, GreenCape

Trash talking

In 2016, 27% of Capetonian households separated waste for recycling, compared with an SA metro average of just 16% (see chart below).⁶⁰ However, the city should note that almost all of this recycling is driven by formal households – with just 2% of those living in informal dwellings separating waste. By extending recycling services to informal households – of which there are more than a quarter of a million – the city could drastically reduce the amount it sends to landfill.

The European Union requires all member states to recycle or compost more than 50% of waste by 2020, and plans to raise this to 70% by 2030.⁶¹ In South Africa, by contrast, this figure was less than 10% when baselined in 2011. Cape Town does better at 14.4%, but for the city to continue to improve, it should act locally, rather than waiting for the rest of the country.

The benefits of recycling include the conservation of finite resources, an improved environment and increased employment, all of which justify government intervention. But the city already spends around R2 billion a year on solid waste management, and there are many other pressures on public funds.

An example can be taken from Mumbai, which ranks top of the middle-income country cities in this study and where it is estimated fully 80% of solid waste is recycled. The centre of the city is home to *Dharavi*, a huge slum – made famous by the film *Slumdog Millionaire* – where around a quarter of a million people are estimated to work in informal recycling plants, collecting trash from all over the city, separating it by hand and eventually feeding it into large recycling plants for a profit.

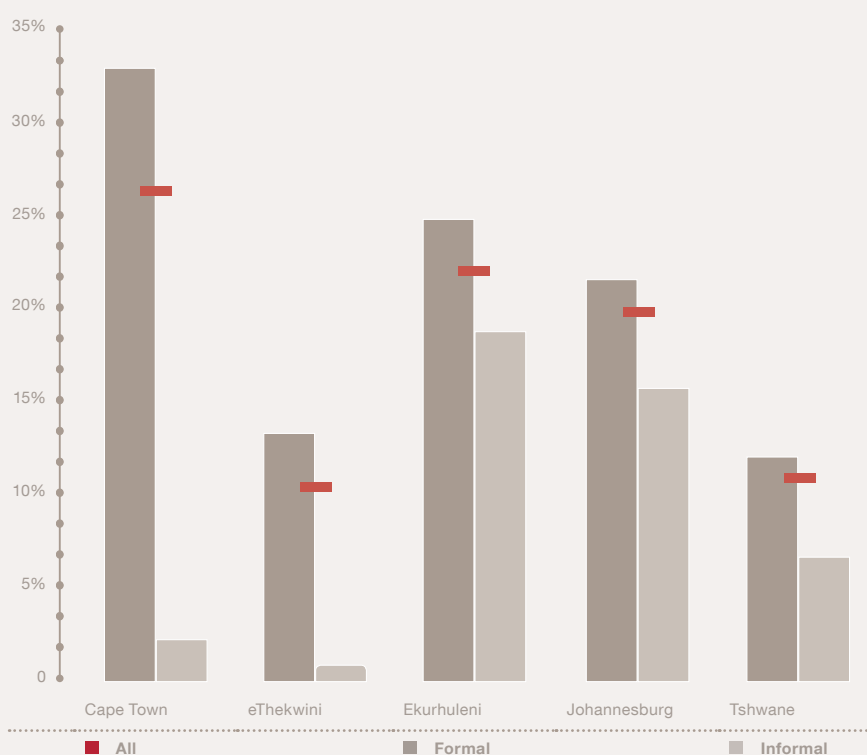
This unique system was borne out of necessity rather than design, and it should be noted that municipal involvement in the process is minimal. However, for Cape Town, where recycling levels are relatively low, and unemployment high, putting in place the incentives that would allow for such a system could be an opportunity to solve two important problems at once.

“Globally, the underlying economics of alternative green infrastructure is changing rapidly. The city’s commitment to resilience and the green economy puts it at the forefront of these efforts in sub-Saharan Africa. Through this deliberate leadership, a strong vision, and a provincial government dedicated to green economic growth, Cape Town has become a great place for green businesses. GreenCape supports the city’s efforts by helping businesses and investors unlock opportunities for investment and growth.”

Mike Mulcahy, CEO
GreenCape

Fig. 9

Recycling by type of dwelling: Big five SA metros



Source: General Household Survey, Statistics SA (2016)

60 General Household Survey, Statistics South Africa (2016).

61 Waste: Boost Recycling, cut Landfilling and Curb Food Waste, Parliament says, Press Release, Plenary Session, European Parliament (14 March 2017).

6. Demographics and liveability

Every city has its own unique character, the product of the people that live there, the way things are done and the city's history, cultural assets and 'buzz'. Such factors are of huge importance to city success; our latest global *Cities of Opportunity* study finds a strong correlation between quality of life factors and overall ranking.⁶²

Cape Town ranks close to the bottom for *Demographics and liveability*, uncovering an uncomfortable paradox. While the city's reputation as a holiday destination goes from strength to strength, with passenger numbers up 24% annually (see *City gateway*), the proportion of people living in informal settlements also continues to grow.⁶³

It is hard to miss the sprawling tin roofs of Khayelitsha as your plane approaches Cape Town International Airport, but aside from such brief encounters, tourism and township life in Cape Town are worlds apart.

Neither is solving this simply a matter of building enough houses to keep up with new arrivals. South Africa's past has left the country divided in both wealth and spatial inequality; rectifying the latter means changing the city's urban form

⁶² Cities of Opportunity 7 Report, PwC (2016).

⁶³ Cape Town is the only city in South Africa where the proportion of people living in informal settlements increased in the five years from 2011 to 2016, largely due to population growth in the City. See: The State of South African Cities Report 2016, South African Cities Network (2016)

through both housing and transport links. The City's new Transit and Urban Development Authority seeks to do this over the coming years.

Inequality in Cape Town – although lower than the country as a whole (see page 56) is very high by international standards – also explains its poor scores for *Quality of living* and *Senior wellbeing*.

Competing on culture

The city scores poorly for *Entertainment and attractions*, a surprising result given Cape Town's success in recent years with tourism and its role as a host venue for of the 2010 FIFA World Cup (see *City gateway*). This variable focuses on man-made attractions rather than the ecotourism Cape Town is renowned for. However, the city is hardly a cultural backwater, boasting tens of theatres and museums, countless wine farms, a travelling open air cinema, and its own philharmonic orchestra.

Furthermore, August 2017 saw the opening of the continent's latest and largest contemporary art museum. The *Zeitz Museum of Contemporary Art Africa* houses the largest collection of contemporary African art in the world and helps make the case for Cape Town as the continent's arts and culture capital.

Realistically, Cape Town is unlikely to ever compete on completely equal terms with some of the other cities in this study. In 2016, London's National

		Score
1	New York	172
1	Paris	172
3	London	169
4	Los Angeles	165
5	San Francisco	164
6	Amsterdam	158
7	Toronto	154
8	Berlin	153
9	Chicago	140
10	Stockholm	139
11	Hong Kong	136
12	Tokyo	129
13	Sydney	128
14	Madrid	127
15	Seoul	126
16	Mexico City	117
17	Singapore	114
18	Dubai	113
19	Moscow	101
20	Rio de Janeiro	97
21	Shanghai	95
22	Beijing	93
23	Milan	89
24	São Paulo	76
25	Kuala Lumpur	72
26	Bogotá	70
27	Johannesburg	67
28	Mumbai	53
28	Jakarta	47
30	Cape Town	42
31	Lagos	10

High-income countries

Middle-income countries

Cape Town

Gallery alone opened its door to 6.3 million people,⁶⁴ three times more than Cape Town's International Airport.⁶⁵

Cape Town's score for *City brand* is also low. This variable takes into account many different factors, and is affected by the city's high crime statistics. Although this is a major priority for the city government, crime in Cape

⁶⁴ Visits made in 2016 to Visitor Attractions in Membership with ALVA, Association of Leading Visitor Attractions, (2017).

⁶⁵ Cape Town International Airport – Passenger Traffic, Airports.co.za (September 2017).

Demographics and liveability	Entertainment and attractions	Quality of living	Working age population	City brand	Relocation attractiveness	Senior wellbeing*	YouthfulCities Index
1	3	16	23	2	2	5	1
1	2	4	17	5	5	13	6
3	1	15	22	3	1	11	2
4	7	10	21	1	6	5	9
5	18	13	7	9	4	5	4
6	13	7	11	4	16	4	11
7	15	1	16	21	8	2	7
8	5	6	20	22	12	3	3
9	12	9	25	14	11	5	8
10	20	3	29	10	17	1	5
11	23	8	8	6	10	19	14
12	6	5	24	26	13	9	12
13	22	2	28	16	3	12	13
14	8	11	26	13	9	14	16
15	11	17	6	7	20	22	15
16 (1)	10 (3)	27 (9)	4 (3)	16 (3)	23 (5)	17 (2)	10 (1)
17	26	13	13	15	7	10	26
18	17	21	1	11	15	15	31
19 (2)	4 (1)	19 (2)	15 (9)	12 (2)	27 (9)	26 (8)	20 (4)
20 (3)	16 (5)	24 (6)	19 (11)	8 (1)	18 (1)	24 (6)	18 (2)
21 (4)	14 (4)	22 (4)	2 (1)	28 (10)	19 (2)	20 (3)	24 (8)
22 (5)	9 (2)	20 (3)	3 (2)	29 (11)	25 (7)	21 (4)	24 (8)
23	21	12	31	22	14	18	17
24 (6)	19 (6)	24 (6)	14 (8)	20 (6)	26 (8)	24 (6)	21 (5)
25 (7)	28 (10)	18 (1)	10 (6)	27 (9)	24 (6)	16 (1)	29 (12)
26 (8)	24 (7)	28 (10)	5 (4)	25 (8)	30 (12)	23 (5)	19 (3)
27 (9)	27 (9)	24 (6)	9 (5)	24 (7)	22 (4)	29 (11)	22 (6)
28 (10)	30 (12)	29 (11)	12 (7)	18 (4)	28 (10)	27 (9)	27 (10)
29 (11)	25 (8)	30 (12)	18 (10)	19 (5)	29 (11)	28 (10)	28 (11)
30 (12)	29 (11)	23 (5)	27 (12)	31 (13)	21 (3)	29 (11)	22 (6)
31 (13)	31 (13)	31 (13)	30 (13)	30 (12)	31 (13)	31 (13)	30 (13)

Rank out of 31 cities (rank out of 13 middle-income country cities, if applicable)

Town is mainly confined to the poorer townships and suburbs, with tourist areas such as the V&A Waterfront having the lowest crime rates in the city (see page 48).

Invest Cape Town, which was launched in 2016, aims to bring all interested parties together to improve the city's international brand in the coming years.

People power

Cape Town's *Working age population* is a relatively small proportion of the total population, particularly compared with other middle-income countries. Where cities are close to full employment, this can prove challenging as economic output is hampered by a lack of workers or large dependent populations (children and the old). This is not the case in Cape Town where unemployment, although much lower than the national average, is still very high.

Cape Town scores relatively well in the *Youthful Cities Index*, which looks at how youth live, work, and play in urban settings.

It does better still for *Relocation attractiveness*, a measure of how attractive a city is to footloose migrants with many location options. This is emphasised by Cape Town's high proportion of educated immigrants, as shown on page 57.

Shared growth in South African cities

Rapid urbanisation means that many of humanity's problems are felt in cities first and most forcefully. Many of the agglomeration effects that make cities so much more productive than rural areas also bring side-effects, including rising inequality. Higher productivity often comes at the cost of lower wages, and the cost of living in cities is usually higher, especially for housing (see *Cost*).

City governments face a dilemma: Allow inequality to rise, or intervene by taxing the wealthy and distributing to the poor. The former is a recipe for political unrest, the latter may discourage investment. Creating inclusive growth is one of the central tasks of any democratic city government.

In South Africa, long the world's most unequal country of any significant size, inequality is particularly entrenched, but the country's metros have relatively strong redistributive powers that they can use to tackle this.⁶⁶ Examples of this include providing free basic services and housing, direct grants and the use of their balance sheets to create social and economic infrastructure that benefits everyone.

The *Gini coefficient* is the most popular way of showing income inequality. It is a number from 0 to 1 where 0 means that everyone earns exactly the same amount, and 1 means that one person receives all the income.

Figure 10 presents two separate Gini coefficients for South Africa's big five cities. The 'market' Gini roughly describes how unequal income would be if the government didn't provide any redistribution – no grants, no taxes. The 'real' Gini shows the score as it is after all interventions. By subtracting one from the other we can get a measure of how much each city manages to distribute.

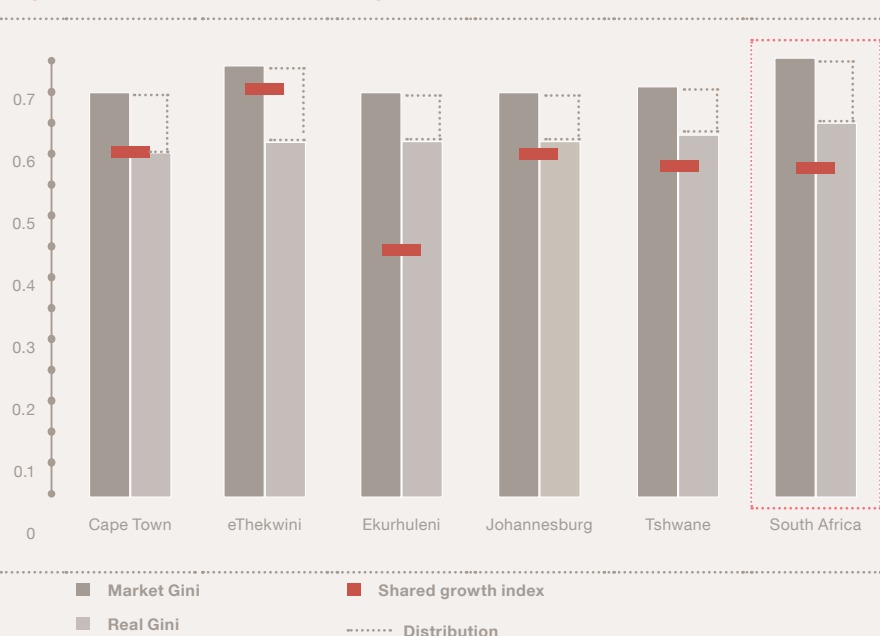
Cape Town has the lowest income inequality (real Gini) of any of the metros and along with eThekweni, it manages to achieve lower levels of real inequality than the country as a whole.

For this study, we also created a 'Shared growth index', which shows the cities that manage to redistribute the most while maintaining healthy economic growth.⁶⁷ To be able to do this, cities must build strong relationships with business and residents and demonstrate efficiency and transparency with how they use money raised from the public.

Again, Cape Town and eThekweni come top, this time with the order reversed.

The 'Shared growth index' is not meant to be indicative of success, and has no specific policy implications, but may provide food for thought. The index could be much improved by replacing gross-value-added (GVA) growth with better proxies such as foreign and local investment, business confidence and purchasing managers' indexes, though these can be difficult to obtain at the city level.

Fig. 10 Income inequality in SA's big five metros



Source: PwC analysis of data from Quantec (2018); Real gross-value-added (GVA) growth average 2010-2016; Gini coefficients for 2014

Note: For Ginis, lower is better (fairer); for shared growth index (SGI), higher is better. Distribution is a policy choice.

66 Of countries with populations greater than 1m; some small islands may be more unequal. See: Gini Index (World Bank estimate), Development Research Group, World Bank (2011).

67 Shared Growth Index = Average annual GVA growth x Gini redistribution x 100

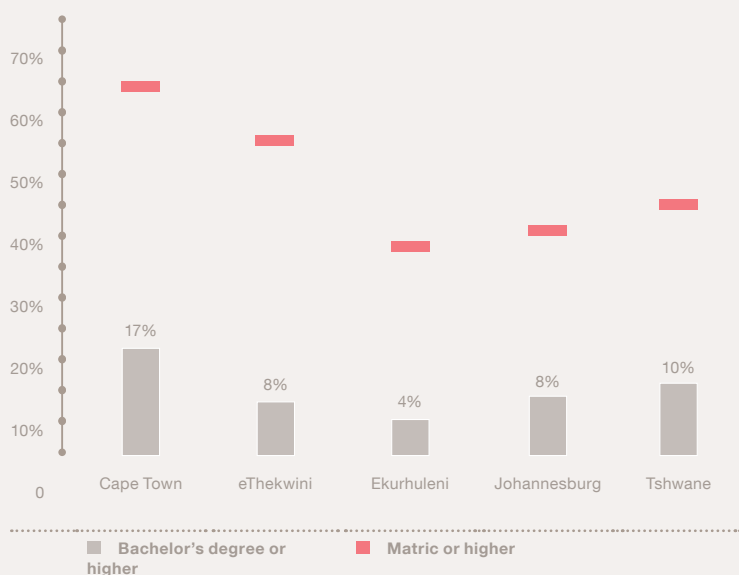
Relocation attractiveness

The brain drain

The education level of expatriates is a good indication of a city's relocation attractiveness and shows how cities can import intellectual capital, either to complement or replace home-grown talent.

An analysis of South Africa's top five metros (population >2m) shows that Cape Town outperforms all other metros with 17% of expats having a bachelor's degree or higher. This is more than three times higher than the figure for the city's population as a whole (5.5%).

Fig. 11 Highest level of education among foreign-born population



Source: PwC analysis of Community Survey, Stats SA (2016)

This might go some way to explaining why Cape Town has more skilled jobs and much lower unemployment than other SA metros, but it is not an ideal solution. Relying on foreign talent means competing against the rest of the world, and this can be undermined easily by factors outside of the city's control.

Foreign work visas are not easy to obtain in South Africa and political uncertainty and currency fluctuations discourage foreigners from seeking to earn rands.

Indeed, Cape Town's foreign born population is still small by global standards, at just 150 000, or less than 4%. Compare this with top-placed London where 41% of the inner-city population is foreign-born.⁶⁸ This follows global trends – the United Nations finds that on average international migrants account for a much higher proportion of the workforce in developed (12.6%) than in developing countries (1.9%).⁶⁹

Cape Town, which has many of the features of a developed country, has the potential to attract more educated migrants.

The figure above also shows vast differences in the basic education levels of foreigners between the metros. In Cape Town, 61% of expats have at least the equivalent of a high-school diploma (i.e. Grade 12/matric) compared with less than 40% for the three Gauteng cities.

This is probably due both to geography and industry. Gauteng is much closer to neighbouring African countries, where education levels are lower and, notwithstanding its large financial sector, many of its migrants still come to work in mining and other menial jobs which are less prevalent in the Western Cape.

68 Migrants in the UK: An Overview, Migration Watch (21 February 2017).

69 Population facts, No. 2010/6, Population Division, Department of Economic and Social Affairs, United Nations (November, 2010).

"The mark of any advanced civilisation is the collective achievements of that civilisation. If we understand each other better, which really is what art does, we create a world we all want to live in. I think that is what is so extraordinary about this moment, the new Zeitz Museum of Contemporary Art Africa in Cape Town, and the collective vision and labour that brought it to fruition. Why a museum? Why here? Why now? And why at the tip of Africa? It's a symbol, it's an icon of the confidence we feel about being Capetonians, the confidence we feel about being Africans, the confidence we feel about our place in the world."

Mark Coetzee, Executive Director and Chief Curator
Zeitz MoCAA Museum of Contemporary Art Africa

7. Transportation and infrastructure

Of all the challenges posed to city governments by increased urbanisation, mass infrastructure – in particular transport and housing – is one of the most pressing. Many cities find it hard to build fast enough to keep up with new arrivals. Cape Town is no exception: The city's population has increased by three quarters of a million, or 15% in the past decade⁷⁰, and its location – between a mountain and an ocean – compounds the problem.

Despite this, Cape Town scores highly for *Transportation and infrastructure*, at 14th out of all 31 cities and top of the middle-income countries (MICCs). It also scores in the top five globally for *Traffic congestion*, and is top of the MICCs for *Ease of commute*.

These scores may surprise Capetonians – traffic problems are a favourite topic of conversation. This study is a reminder that Cape Town's 5pm rush is not unique – across the world, congestion is one of the unfortunate prices paid for living in big cities.

However, the problem may be growing: Recent data from the City of Cape Town Government shows that in the past two years, peak morning traffic times have doubled in duration from a 7-9am

window, to a 6-10am one.⁷¹ In response the city has launched a congestion management programme (CMP), which devotes R750m in funds across innovative areas such as:

- Extending dedicated lanes;
- Park-and-ride plans;
- Flexible working hours;
- Congestion charge / fuel levy; and
- Encouraging bicycle use through bike sharing.⁷²

In addition, the *MyCiTi* bus-rapid transport system (BRT), which has dedicated lanes and is popular with residents, is currently being extended.

Cape Town scores moderately for *Affordability of public transport*, which is key to making the city work for everyone and in overcoming the city's pre-1994 spatial legacy (see *Cost* section). It should be noted that the city performs well in South Africa. PwC analysis shows that of the country's big five metros, citizens in Cape Town on average spend less of their disposable income on transport (see page 60).

⁷¹ Travel Demand Management Strategy for the City of Cape Town, Policy Number 53760, City of Cape Town Transport and Urban Development Authority, (29 March 2017).

⁷² City Council Approves Projects to Alleviate Traffic Congestion, Transport and Development Authority (10 December 2015).

⁷⁰ Community Survey 2016, Statistics South Africa (2016); Community Survey 2007, Statistics South Africa.

		Score
1	Singapore	180
2	Dubai	158
3	Stockholm	156
4	Berlin	146
5	Chicago	144
5	San Francisco	144
7	New York	136
8	London	133
8	Paris	133
8	Sydney	133
11	Toronto	130
12	Madrid	129
13	Hong Kong	126
14	Seoul	125
14	Cape Town	125
16	Amsterdam	120
17	Milan	118
18	Kuala Lumpur	113
19	Tokyo	110
20	Los Angeles	106
21	Rio de Janeiro	97
22	Moscow	95
23	Mexico City	91
24	Beijing	88
24	Shanghai	88
26	Bogotá	78
26	São Paulo	78
28	Johannesburg	76
29	Mumbai	67
30	Jakarta	61
31	Lagos	11

● High-income countries ● Cape Town
● Middle-income countries

Making tracks

Cape Town scores less well for *Mass transit coverage*, which measures the extent of developable space devoted to rail networks. Rail has long been an area of concern for Cape Town, whose poor network is coupled with poor train performance. Net-satisfaction scores are just 3% – three times lower than the average for South African metros.⁷³

⁷³ The number of people who were satisfied or very satisfied with the overall train service, minus those who were either dissatisfied or very dissatisfied – PwC calculations from: National Household Travel Survey, Statistics South Africa (2013).

Transportation and infrastructure	Mass transit coverage	Affordability of public transport	Licensed taxis	City brand	Housing	Traffic congestion	Ease of commute
1	10	7	9	5	1	1	11
2	19	12	12	1	7	7	8
3	3	27	4	23	8	2	1
4	4	21	24	18	3	6	2
5	18	4	19	13	11	10	5
5	2	2	23	23	10	17	3
7	8	5	27	9	12	18	9
8	11	30	18	4	8	8	12
8	1	9	3	28	16	15	19
8	23	24	29	7	1	3	4
11	13	13	26	12	3	13	14
12	5	22	7	25	14	9	13
13	14	29	20	2	16	11	6
14	7	8	5	21	20	22	16
14 (1)	21(5)	17 (6)	21(9)	19 (8)	6 (1)	5 (2)	10 (1)
16	6	25	11	30	13	12	7
17	9	10	13	29	16	14	15
18 (2)	17 (3)	19 (8)	2 (2)	15 (5)	22 (4)	16 (3)	20 (4)
19	15	14	14	14	15	20	22
20	24	1	31	6	3	25	28
21 (3)	26 (8)	18 (7)	8 (4)	3 (1)	25 (7)	21 (5)	26 (9)
22 (4)	16 (2)	20 (9)	10 (5)	8 (2)	29 (11)	28 (10)	18 (3)
23 (5)	20 (4)	6 (2)	1 (1)	27 (12)	25 (7)	31 (13)	23 (6)
24 (6)	27 (9)	3 (1)	15 (6)	25 (11)	22 (4)	23 (6)	21 (5)
24 (6)	22 (6)	23 (10)	25 (11)	10 (3)	20 (3)	19 (4)	17 (2)
26 (8)	29 (11)	15 (4)	6 (3)	17 (7)	28 (10)	24 (7)	27 (10)
26 (8)	25 (7)	11 (3)	22 (10)	10 (3)	24 (6)	29 (11)	25 (8)
28 (10)	28 (10)	28 (12)	28 (12)	20 (9)	16 (2)	4 (1)	24 (7)
29 (11)	12 (1)	26 (11)	16 (7)	16 (6)	30 (12)	27 (9)	30 (12)
30 (12)	29 (11)	16 (5)	17 (8)	22 (10)	25 (7)	25 (8)	29 (11)
31 (13)	29 (11)	31 (13)	30 (13)	31 (13)	31 (13)	30 (12)	31 (13)

Rank out of 31 cities (rank out of 13 middle income country cities, if applicable)

This problem has been made worse as protesters, unhappy with poor service, have taken to setting train carriages alight, devastating around half the rolling stock in the city.

One solution might lie in the devolution of powers to the city. Although rail is currently a national responsibility, the Department of Transport recently announced plans to devolve all urban rail networks to metro governments, and the City of Cape Town has indicated its readiness to comply.⁷⁴ In

doing so, it would following the leading cities in this study: Many have close to full control over all modes of transport within their boundaries, allowing them to realise gains in efficiencies, coordination of schedules and pricing, integrated ticketing and user applications.⁷⁵

⁷⁵ The case for devolution of rail to cities is well made by the Mayor of London – Rail Devolution business case narrative, Submission to HM Government, Mayor of London, Sadiq Khan, Transport for London (14 October 2016).

Hailed the world over

Cape Town scores poorly in the number of *Licensed taxis* per capita, but this should not concern residents for two reasons. First, since 2014, the launch of Uber and other ride-sharing services has dramatically increased the number of taxis on the road – and lowered prices as a result. So far, Cape Town has not been affected by the protests against Uber which have taken place across other South African cities.

⁷⁴ National Rail Policy Draft White Paper, Department of Transport, Government of South Africa (July 2017).

Second, unregulated minibus taxis, while not seen in most European and American cities, are ubiquitous in developing countries and are the main method of getting around for a fifth of the population in Cape Town (see chart opposite).⁷⁶

Informal taxis plug a sizeable gap in the market of many developing cities, where public transport is either not available or too expensive. But they bring their own problems. Often poorly regulated, they have less incentive to drive safely, have unpublished routes and schedules, and can be magnets for crime. Large taxi operators also have significant workforces and political influence. Any true integrated transport plan in a city like Cape Town must incorporate informal taxis.

The City's recently announced Comprehensive Integrated Transport Plan (CITP) aims to do this in two ways:

- To integrate minibus taxis as 'feeder routes' for the formal MyCiTi buses – similar schemes have been successful elsewhere; and
- To embrace new technologies such as e-hailing which would reimagine the system, with benefits for passengers, taxis and the city alike.^{77, 78}

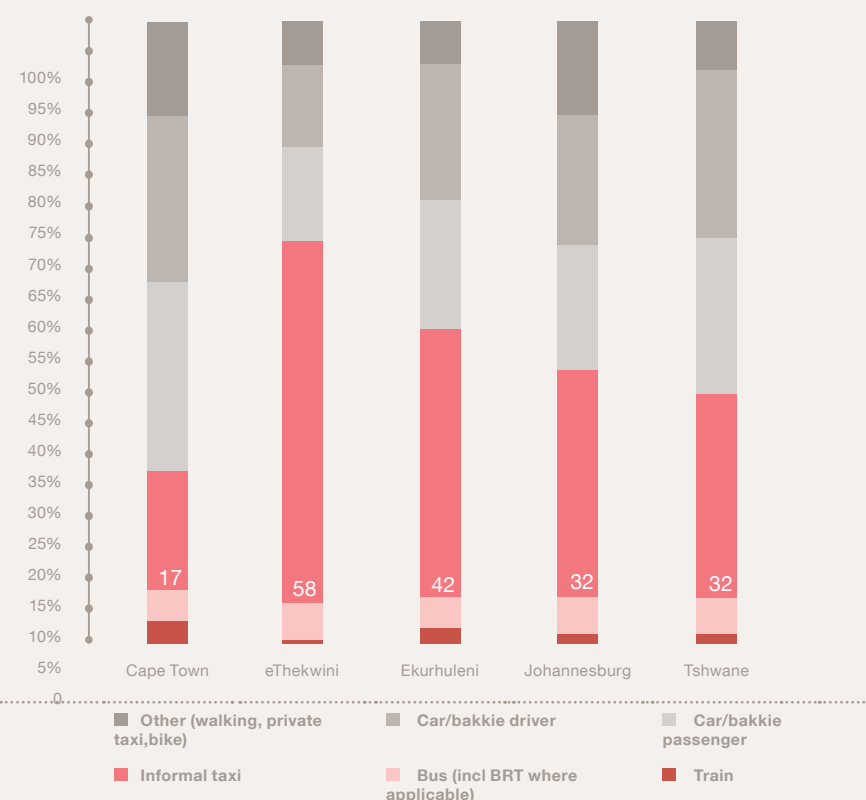
Cape Town scores very well for its current levels of *Housing*, but less well for *Major construction activity*. These measures are explored further in the *Cost* section.

⁷⁶ National Household Travel Survey, Statistics South Africa (2013).

⁷⁷ Comprehensive Integrated Transport Plan 2017 - 2022, Transport and Urban Development Authority, City of Cape Town (Draft, July 2017).

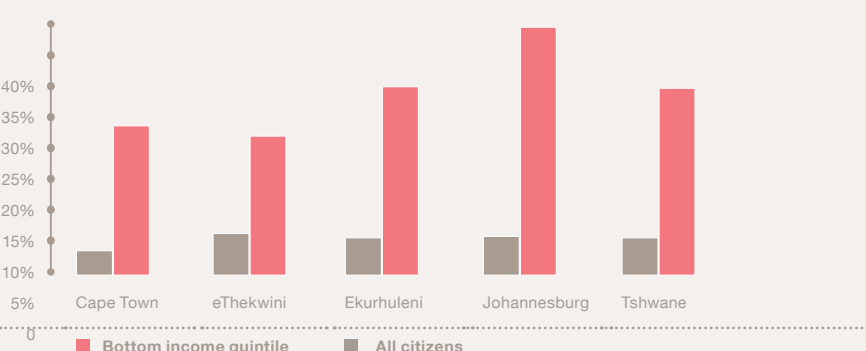
⁷⁸ Expanding the public transport network through a feeder bus system –challenges and need, Embarq India, (2013).

Fig. 12 Main method of getting around in South Africa's big five metros



Source: National Household Travel Survey, Statistics SA (2013).

Fig. 13 Percentage of total monthly expenditure spent on public transport*; all citizens versus the bottom income quintile



Source: PwC analysis using data from General Household Survey, Statistics SA (2016)
*Train, bus and taxi

"The City of Cape Town is using public transport to achieve a more compact and sustainable city. We have identified major public transport corridors where we are pursuing transit-oriented development (TOD) to transform Cape Town's spatial reality. TOD is the new order of business – we are pursuing changes in land use and higher densities in support of the transport system. Ultimately, the right development must happen in the right places, with a mix of land uses and densification to stimulate economic activity along the transport corridors and to bring down the cost of transport. This is key as lower-income households spend approximately 43% of their monthly income on transport."

Cllr Brett Herron, City of Cape Town's Mayoral Committee Member for Transport and Urban Development

Traffic trends

This study and other datasets paint a nuanced picture of traffic in Cape Town. Tom Tom's *Traffic Index* which uses live vehicle speeds from SatNav devices, shows congestion in Cape Town to be 35% (as of March 2018) – this is worse than many smaller cities but ahead of most of the cities in this study.⁷⁹

However, public sentiment paints a different picture. Using *Google trends* data, which tracks the popularity of a search term over time it is possible to show how concerned residents are about one issue relative to all others.⁸⁰ We compared searches for the term 'traffic' in four English speaking cities – Cape Town, Johannesburg, Los Angeles (which fares badly in both this study and the Tom Tom index) and Sydney (which fares well in both).⁸¹

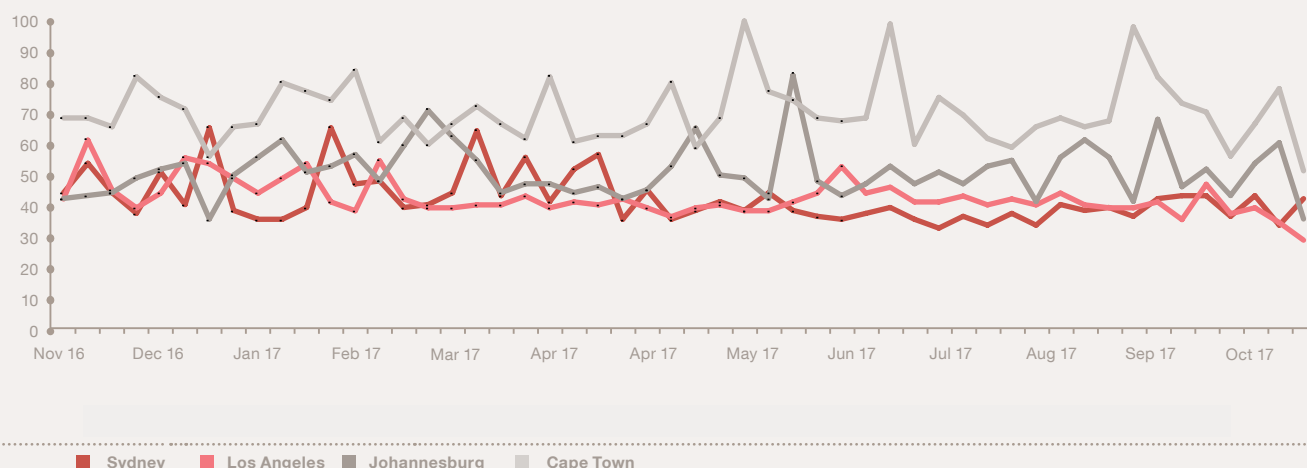
The figure below shows that over the course of a year, Cape Town's searches are significantly higher than the other three cities, and that Johannesburg's are also higher than Los Angeles.

Several possibilities lie behind these scores. Neither Cape Town nor Johannesburg have mass-transit rail systems, meaning road is a more important part of the average commute. Cape Town also suffers from a 'mono-mode' spatial legacy, whereby a large majority of the jobs are in the city centre and a majority of housing is in the suburbs, resulting in inefficient 'tidal' passenger flows (empty buses on return journeys). While many LA residents might work in a business near to their suburban home, this is not possible for most Capetonians.

However, it is possible that residents of Los Angeles – well known for its traffic – have been resigned to live with it and assume longer journey times, while South Africans are still motivated to search for a quicker route, or at least to make their views known publicly.

Note that search data should be interpreted with caution; culture, internet penetration and dilution from other high-impact search terms, such as political events, can all affect the results.

Fig. 14 Frequency of Google searches for the term 'traffic' in the year to October 2017



* Note that these figures are not numbers but are a proportion of the total searches – i.e. impact, see Pew research for full Google Trends methodology

⁷⁹ Tom Tom Traffic Index, Tom Tom (2018).

⁸⁰ For a full explanation of how Google Trends data works, see: Using Google Trends data for research? Here are 6 Questions to Ask, Galen Stocking and Katerina Eva Matsa, Pew Research Center, (April 2017).

⁸¹ Note that Google trends does not provide data for Cape Town, Johannesburg or Sydney per se, but for the Western Cape, Gauteng and New South Wales respectively. All three provinces are dominated by the three cities, and can be used as fair proxies.



Economics

As countries rapidly urbanise, their cities become their most important economic engines, generating the majority of national output. But even as they dominate at home, cities face increasing competition for talent, business and investment from abroad. The final section of our report considers how cities compete across three indicator dimensions: *Economic clout*, *Ease of doing business* and *Cost*.



8. Economic clout

No city is an island⁸², all compete and trade in global markets. *Economic clout* is a measure of a city's economic size, vigour and attractiveness relative to the others.

Unsurprisingly, Cape Town ranks near the bottom of this study for *Economic clout*, along with most of the other middle-income country cities (MICCs), though ahead of those in South America.

The same is true for *Number of Global 500 headquarters*. Although Cape Town is home to more than 25 of the companies listed on the Johannesburg Stock Exchange (JSE),⁸³ African companies remain under-represented in global markets with only three South African firms making the top 500 in 2016.⁸⁴

Attracting investment

As public sector finances are squeezed, cities will increasingly rely on private sector and donor funding to co-finance infrastructure and other socio-economic spending. *Attracting foreign direct investment (FDI)* is therefore a key goal of many cities, and its success depends on many factors. Many of these – national political stability, institutions, exchange rate – are outside of cities' control. The World Economic Forum

recently rated South Africa 85th in the world for *Business impact of rules on FDI*, behind Nigeria, Guinea and Bangladesh.

FDI is also driven by local *Ease of doing business* factors (see next section), good governance, shovel-ready, projects and active promotion, which are the responsibility of many different city departments. This means that as well as depending on national and global headwinds, investment also relies on collaborative city government.

In the past year Cape Town has made strides in this area by launching *Invest Cape Town*, an investment promotion initiative which aims to develop a business brand narrative that emphasises the unique characteristics of the city-region.

In this study, Cape Town scores poorly overall for *Attracting foreign direct investment* but initiatives like *Invest Cape Town* may already be changing this. In 2017, the *Financial Times' fDi Intelligence* division rated Cape Town one of the *Global Cities of the Future*, ranking its FDI strategy 21st in the world.⁸⁵ Furthermore, the outcome of the recent presidential election is expected to have a positive impact on FDI in South Africa.⁸⁶

		Score
1	London	157
2	New York	148
3	Beijing	140
4	San Francisco	132
5	Madrid	125
6	Sydney	121
7	Shanghai	116
8	Paris	114
9	Singapore	111
10	Amsterdam	106
10	Stockholm	106
12	Kuala Lumpur	103
13	Dubai	102
13	Hong Kong	102
13	Toronto	102
16	Milan	95
17	Tokyo	94
18	Seoul	92
19	Chicago	88
19	Los Angeles	88
21	Mexico City	84
21	Mumbai	84
23	Jakarta	81
24	Johannesburg	80
24	Moscow	80
26	Berlin	75
27	Lagos	68
28	São Paulo	59
28	Cape Town	59
30	Bogotá	57
31	Rio de Janeiro	47

High-income countries Cape Town
Middle-income countries

Working solutions

Cities must also create their own prosperity, by generating productive employment. In this regard, Cape Town's scores are mixed, mainly due to historical factors. South Africa's apartheid government vastly under-invested in education and opportunity for the majority of the population, leading to unemployment rates that have been stubbornly high for generations (see page 67).

Although Cape Town's unemployment and youth unemployment rates are

⁸² Except Singapore

⁸³ Cape Town Tech Centre Infographic 2017, Silicon Cape Initiative (2017).

⁸⁴ Global 500 List, Fortune (2016).

⁸⁵ PwC

⁸⁵ Global Cities of the Future 2016/17 Winners, Top 25 FDI strategy. fDi (2016)

⁸⁶ Investment decisions: Why South Africa, and why now? Forward-looking scenarios for the Ramaphosa presidency (2018–2022). PwC, March 2018

Economic clout	Number of Global 500 headquarters	Employment growth	Financial and business services employment	Attracting FDI	Productivity	Rate of real GDP growth
1	3	10	3	3	8	8
2	5	6	9	7	2	15
3 (1)	1 (1)	17 (8)	5 (1)	5 (2)	23 (5)	1 (1)
4	18	2	6	26	1	7
5	10	4	11	14	17	11
6	14	9	12	11	12	13
7 (2)	7 (2)	27 (11)	16 (4)	2 (1)	21 (3)	3 (3)
8	3	29	4	9	7	26
9	18	8	20	1	15	19
10	14	23	1	15	11	22
10	18	20	7	26	5	10
12 (3)	23 (9)	3 (2)	19 (6)	20 (6)	19 (1)	5 (5)
13	27	13	28	4	9	9
13	12	18	22	6	14	18
13	10	15	8	16	13	28
16	23	19	2	18	10	25
17	2	28	23	12	6	27
18	6	26	18	16	18	16
19	14	21	13	29	4	23
19	27	11	21	28	3	14
21 (4)	14 (6)	14 (6)	27 (10)	21 (7)	20 (2)	12 (7)
21 (4)	9 (4)	24 (10)	29 (11)	13 (5)	31 (13)	2 (2)
23 (6)	18 (7)	12 (5)	30 (12)	23 (9)	24 (6)	4 (4)
24 (7)	27 (11)	5 (3)	10 (2)	24 (10)	28 (8)	20 (9)
24 (7)	8 (3)	30 (12)	15 (3)	7 (3)	22 (4)	30 (12)
26	23	25	14	18	16	21
27 (9)	27 (11)	1 (1)	31 (13)	29 (12)	30 (12)	6 (6)
28 (10)	12 (5)	31 (13)	24 (7)	10 (4)	25 (7)	31 (13)
28 (10)	27 (11)	7 (4)	17 (5)	31 (13)	27 (9)	24 (10)
30 (12)	23 (9)	16 (7)	25 (8)	25 (11)	29 (11)	17 (8)
31 (13)	18 (7)	22 (9)	26 (9)	22 (8)	28 (10)	29 (11)

Rank out of 31 cities (rank out of 13 middle-income country cities, if applicable)

routinely ten points below the national average, and the lowest of all the SA metros, official unemployment is still over 20% – very high by international standards.⁸⁷

This study finds that although the city continues to enjoy *Employment growth*, this is not having the desired feed through effect on *Productivity* or *Rate of real GDP growth*.

This may be an unavoidable consequence of redressing the past. In 2016/17, Cape Town reports creating more than 100,000 jobs through the

Expanded Public Works Programme (EPWP) and other municipal projects – far more than the country's other seven metros combined.⁸⁸

These are often low-pay and low-productivity jobs, but they provide opportunity to citizens who would otherwise be unemployed, and help to create a culture of employment in the city. Tackling South Africa's

unemployment legacy will take many years, but using the government's spending power for such schemes is often the best way to start.

At the other end of the income scale, the city punches above its weight for *Financial and business services employment*. Cape Town has long been home to many of the continent's biggest insurers and has more recently become a hub for asset management, venture capital and other professional services firms, whose well-educated staff enjoy Cape Town's unique setting and lifestyle.

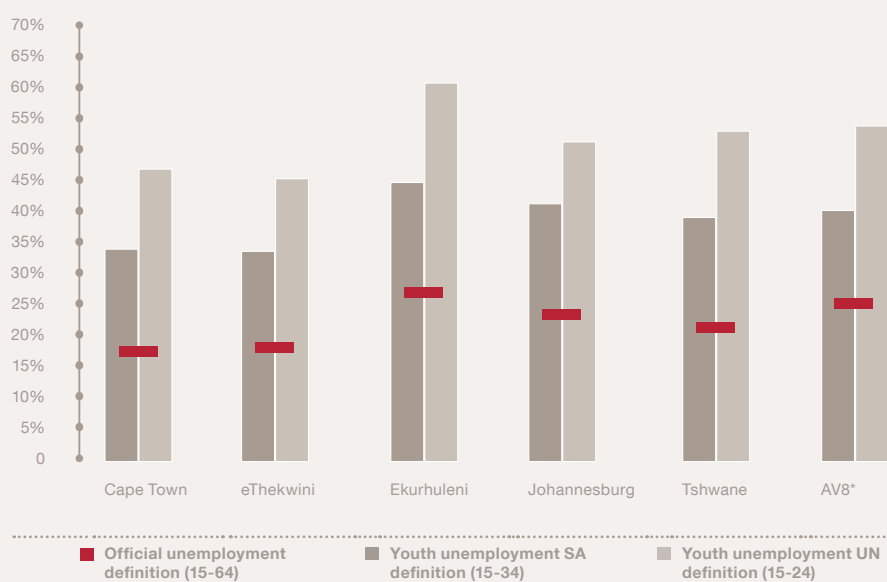
⁸⁷ Quarterly Labour Force Survey, Financial Quarter 3, Statistics South Africa (2017).

⁸⁸ Metros Q3 Performance Indicators Master File 2016 - 17, Service Delivery and Budget Implementation Plans, National Treasury (2017). Note that this figure is for budgeted EPWP jobs to be created in the year 2015/16, as reported to National Treasury. Actual figures will be available in the coming months



Fig. 15

Unemployment in the big cities



Note: Youth unemployment in South Africa is defined as people between 15-34; most countries use the United Nations definition of 15-24.

Source: Quarterly Labour Force Survey, Q3 2017, Statistics SA (2017)

*Average for the eight South African metros

9. Ease of doing business

While all of the *Cities of Opportunity* indicators are potential determinants of foreign investment, *Ease of doing business* is one of the areas watched most keenly by governments for two reasons.

First, it is an area where government intervention can work quickly – local regulations and taxes are easier and quicker to change than road networks or education levels. Second, it is widely accepted that such changes have a real and relatively fast impact on foreign-direct investment (FDI).⁸⁹

For cities in lower and middle-income countries, this is an area where real progress can be made without significant cash outlays. The development of Hong Kong, Singapore and Dubai – all of which use English law to a large extent – are good examples.

Who sets the rules?

The conundrum for cities is that many of the determinants of *Ease of doing business* are controlled at the national level – for example, corporate tax levels, the rule of law and shareholder protection. For 2018, South Africa

⁸⁹ The World Bank (Does Doing Business matter for Foreign Direct Investment, John Anderson and Adrian Gonzalez (2013)) draws strong links between the two, while Piwonski (Does the 'Ease of Doing Business' in a Country Influence its Foreign Direct Investment Inflows?, unpublished paper, Bryant University (April 2010)) shows that by increasing its Ease of Doing Business rank by one level, a country can bring in over \$44 million per annum as FDI.

scores moderately well in national ease of doing business rankings – 82 out of 190 in the World Bank list⁹⁰ and 61 out of 137 according to the World Economic Forum.⁹¹

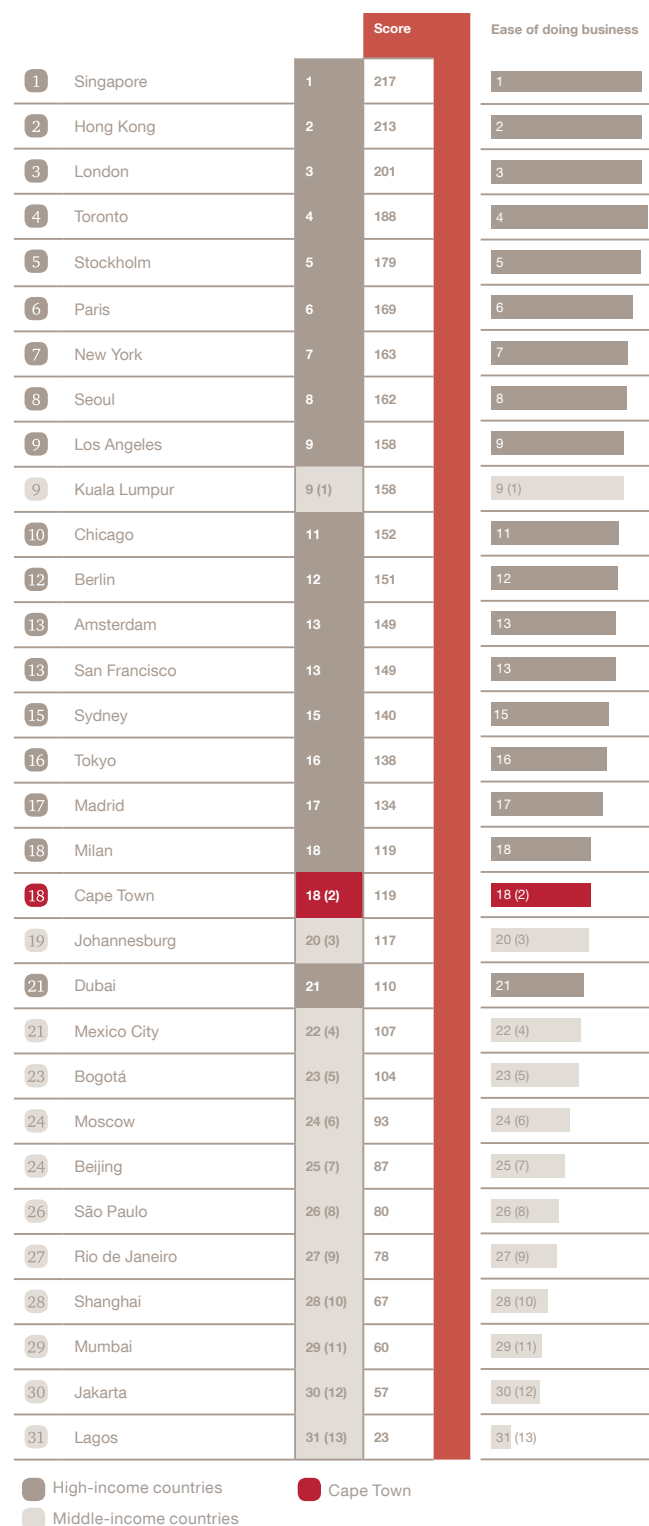
These scores have deteriorated significantly in recent years. In 2006, when the World Bank study was introduced, South Africa ranked 28th; it has declined in every year

⁹⁰ Economy Rankings, Doing Business 2018, World Bank (October 2017).

⁹¹ The Global Competitiveness Report 2017–2018, Klaus Schwab & Børge Brende, World Economic Forum (2018)

since. However, this course might be altered by the recent election of Cyril Ramaphosa as South Africa's President, a move which was welcomed by both business and the Rand. PwC analysis points to favourable economic outcomes – including a doubling of GDP growth in his first term – if the new President delivers the ethical leadership he campaigned on.⁹²

⁹² Investment decisions: Why South Africa, and why now? Forward-looking scenarios for the Ramaphosa presidency (2018–2022). PwC, March 2018



Ease of starting a business**	Resolving insolvency**	Ease of entry: Number of countries with visa waiver *	Number of foreign embassies and consulates	Level of minority shareholder protection**	Operational risk climate*	Workforce management risk	Tax efficiency
2	13	2	13	2	2	2	3
4	16	3	10	1	1	6	2
11	10	6	1	3	11	4	9
1	8	19	18	5	4	3	10
9	12	13	8	18	4	9	4
8	14	18	2	8	13	13	11
16	3	21	12	13	6	1	21
6	7	4	7	11	18	16	25
15	3	21	17	13	6	5	18
5 (1)	20 (3)	1 (1)	11 (3)	4 (1)	16 (1)	18 (1)	23 (8)
14	3	21	22	13	6	7	18
24	2	10	5	24	12	14	14
7	9	7	28	28	6	10	12
13	3	21	25	13	6	8	18
3	11	26	20	27	2	12	15
22	1	17	4	18	13	15	28
21	15	15	9	17	15	17	13
12	18	14	15	11	19	21	27
19 (4)	21 (4)	11 (5)	28 (11)	8 (4)	20 (2)	23 (5)	7 (3)
18 (3)	21 (4)	11 (5)	31 (13)	8 (4)	20 (2)	23 (5)	7 (3)
17	29	25	25	22	16	11	1
20 (5)	17 (1)	16 (7)	16 (5)	25 (9)	23 (5)	27 (9)	5 (1)
23 (6)	19 (2)	5 (2)	24 (9)	7 (3)	20 (2)	30 (12)	24 (9)
10 (2)	27 (10)	27 (9)	6 (2)	29 (11)	30 (12)	28 (10)	6 (2)
26 (8)	23 (6)	29 (11)	3 (1)	30 (12)	23 (5)	19 (2)	16 (5)
31 (13)	25 (8)	7 (3)	21 (7)	18 (6)	26 (8)	22 (4)	26 (10)
30 (12)	25 (8)	7 (3)	25 (10)	18 (6)	26 (8)	25 (7)	22 (7)
25 (7)	23 (6)	29 (11)	23 (8)	30 (12)	23 (5)	20 (3)	16 (5)
29 (11)	31 (13)	29 (11)	19 (6)	5 (2)	28 (10)	26 (8)	29 (11)
28 (10)	28 (11)	20 (8)	14 (4)	22 (8)	28 (10)	29 (11)	30 (12)
27 (9)	30 (12)	28 (10)	30 (12)	25 (9)	31 (13)	31 (13)	31 (13)

Rank out of 31 cities (rank out of 13 middle-income country cities, if applicable)

In this study, Cape Town's score for *Ease of Doing Business* is also middle-of-the-road: 19th out of 31 overall and second out of the 13 middle-income countries.

The city's highest score is for *Tax efficiency*, painting the South African Revenue Service (SARS) in a favourable light compared with its high-income country counterparts.

Similarly, Cape Town scores well for *Minority shareholder protection*, which is testament to the strength of South

Africa's courts and its King IV Report on Corporate Governance™ for South Africa, 2016.⁹³

Another national competency that scores highly is *Ease of entry* – a measure of the number of countries with visa waivers – in which Cape Town places above high-income cities such as Paris, Toronto and Stockholm.

⁹³ The King (I-IV) corporate governance codes have been referred to as “the most effective summary of the best international practices in corporate governance” – Management: Fresh perspectives, Steve Banhegyi, Pearson Education South Africa (2007), p. 317.

However, it should be noted that even under visa waiver conditions, onerous regulations can impact on both the *Ease of doing business* and – notably for Cape Town – tourism. A recent tightening of rules for children entering the country was estimated to have cost the country R1.4 billion in tourism alone⁹⁴ – much of which drives Cape Town's economy (see *City gateway*).

⁹⁴ Child Visa Impact Biggest on SADC Countries, Tourism Business Council of South Africa (June 2015).

This episode highlights the importance of communication between city and national governments.

Risk and reward

Cape Town also scores well in terms of *Operational risk climate*, coming second out of the MICCs. This variable is critical to the *Ease of doing business* since it is made up of 10 individual risk criteria – including political, legal and macroeconomic – which seriously impact companies' likelihood of success in a city.

However, the city scores less well for *Workforce management risk*, an indication that the city's labour supply is poor by international standards. This reflects poor education standards – only a third of citizens have finished high school – as well as the fairly rigid labour laws and high propensity for industrial action that are a characteristic of doing business in South Africa.

Nevertheless, Cape Town is making strides in attracting global business in certain key industries. Recent successes have included the film industry, manufacturing and business process outsourcing (BPO): Cape Town accounts for two-thirds of all BPO jobs in SA's big cities.⁹⁵

Cape Town scores moderately in this study for *Ease of starting a business*, and *Resolving insolvency*. These indicators are taken from the 2015 World Bank study that compared all of South Africa's metros, in which Cape Town came out top (see figure 16 below).

In terms of *Number of foreign embassies and consulates*, Cape Town is near the bottom of the list – most diplomats are based in the administrative capital, Pretoria. Nevertheless, given its status as the seat of Parliament, Cape Town is likely to gain many of the benefits implicit in this variable, such as close business-government relations.



"In terms of physical infrastructure, the standard of buildings and roads in cities such as Cape Town are comparable with those in Western Europe. In addition the cost of living is relatively low with the cost of living in Johannesburg estimated to be 56% lower than that in London, Cape Town 62% lower than London, and Durban 67% lower than London"

Nelson Hall/BPESA*

*Analysis of South Africa as a BPO Delivery Location, Business Process Enabling South Africa, Nelson Hall (2015).

95 Analysis of South Africa as a BPO Delivery Location, Business Process Enabling South Africa, Nelson Hall (2015).

Fig. 16

Doing business: Scores for South Africa's big five metros



Units: 'Distance to frontier' where 100 = global best practice
Source: Doing Business in South Africa 2015, World Bank (2015)



Picture taken by Wessel Van Wyk

“Our members consistently rate Cape Town as a great place to do business. The city is well connected, efficient and is becoming known as a continental tech hub. From a bilateral UK/SA perspective, due to a long history of engagement, both socially and commercially, the ease of doing business is significant. It’s also an easy sell to staff who can experience a quality of life amongst Cape Town’s beaches, mountains and wine farms that is hard to match in either Africa or the UK!”

David Dawson, Chief Executive,
British Chamber of Business in
Southern Africa

10. Cost

One of the downsides of rapid urbanisation is its effect on the cost of living and working in cities: The more people move in, the more cost increases. This is a critical factor in the relocation decision for workers, businesses, and students alike. Increased costs are seen most clearly in housing where many cities around the world cannot match supply with demand, but the cost of city living is also affected by other variables, which this indicator explores.

Cape Town's overall score for *Cost* outperforms all other cities barring its local partner Johannesburg, making it the city's best-performing area in this study.

The city also earned the top global position for *Cost of business occupancy* and was in the top five for *Corporate total tax rate*, both important in attracting footloose foreign businesses. *Cost* is a major driver of competitive industries such as Business Process Outsourcing (BPO) jobs (see also *Ease of doing business*).

Cape Town does well for *Cost of living*, bettered by only Mumbai and Bogotá, and is in the top ten for *Personal tax*. Both are critical for attracting the talent who will shape the city's future workforce. Add to this the fact that many of Cape Town's most alluring features are free – the beach, the mountains, the wildlife – and it becomes clear that young educated professionals can afford a quality of life in Cape Town that is hard to achieve in many other places in the world.

However, it is not all rosy for residents: The city's scores for *Purchasing power* and *Affordability of rent* are low (though it does well among MICCs). This is to be expected – both indicators reflect low wages, which are a corollary of a low cost of doing business.

The fact that Cape Town does well for *Cost of living* but badly for *Affordability of rent* will come as no surprise to residents. The global cost of living database *Numbeo* reports that rent is 23% higher in Cape Town than in Johannesburg,⁹⁶ a trend that looks set to continue: *TPN Credit Bureau* reports average rental increases in 2017 of 13% for the Western Cape but only 5% for Gauteng.⁹⁷

In the medium term, it is unlikely that these trends will discourage educated foreigners from choosing to relocate to Cape Town – housing costs remain competitive globally (see page 74) and expats are, on the whole, likely to be less price-sensitive than locals. However, more than 95% of Cape Town's workforce is South African born and pricing them out of the city may have economic as well as social consequences.⁹⁸ If local innovators cannot afford to live, work and interact in Cape Town, they cannot start the city's businesses of the future.

⁹⁶ Cost of Living Comparison between Cape Town and Johannesburg, Numbeo Online, (November 2017).

⁹⁷ Residential Rental Monitor 2017 Q1, South Africa Rental Monitor, TPN Registered Credit Bureau (May 2017).

⁹⁸ Community Survey, Statistics South Africa (2016).

		Score
1	Johannesburg	1 (1) 143
2	Cape Town	2 (2) 137
3	Toronto	3 129
4	Los Angeles	4 127
5	Berlin	5 126
6	Dubai	6 123
7	Kuala Lumpur	7 (3) 120
8	Chicago	8 118
9	Madrid	9 115
10	Bogotá	10 (4) 110
12	Jakarta	11 (5) 104
12	São Paulo	12 (6) 102
13	Singapore	12 102
14	Seoul	14 100
15	Hong Kong	15 98
16	Amsterdam	16 93
16	Sydney	16 93
18	Mexico City	18 (7) 87
19	San Francisco	19 85
19	Mumbai	19 (8) 85
19	Stockholm	19 85
22	Lagos	22 (9) 84
23	Rio de Janeiro	23 (10) 81
24	Milan	24 79
25	Tokyo	25 71
26	New York	26 70
27	London	27 68
27	Paris	27 68
29	Moscow	29 (11) 66
30	Shanghai	30 (12) 61
31	Beijing	31 (13) 51

High-income countries Cape Town
Middle-income countries

There are also political consequences. Several high profile groups such as *Ndifuna Ukwazi* and *Reclaim the City* have organised protests at development sites in the past year, decrying gentrification and the lack of affordable housing close to the city centre.

Meanwhile, people continue to move to the Mother City, often settling in the only place available: Townships. The State of South African Cities Report 2016 found that Cape Town was the

Cost	Corporate total tax rate	Personal tax	Cost of business occupancy	Cost of Living	Purchasing Power	Affordability of rent
1 (1)	5 (1)	9 (6)	2 (2)	7 (7)	17 (1)	9 (2)
2 (2)	5 (1)	9 (6)	1 (1)	3 (3)	19 (2)	18 (5)
3	3	21	5	20	8	6
4	12	25	11	14	1	2
5	19	23	3	16	4	1
6	1	1	17	15	18	17
7 (3)	11 (5)	11 (8)	9 (4)	6 (6)	24 (6)	11 (3)
8	15	27	4	19	5	4
9	21	18	8	13	14	3
10 (4)	31 (13)	4 (2)	6 (3)	2 (2)	25 (7)	14 (4)
11 (5)	7 (3)	2 (1)	14 (6)	4 (4)	30 (12)	31 (13)
12 (6)	29 (11)	6 (3)	16 (8)	11 (11)	20 (3)	8 (1)
12	2	15	24	27	9	13
14	9	5	20	21	21	16
15	4	3	30	18	15	24
16	13	31	7	24	12	12
16	18	22	21	30	3	5
18 (7)	23 (7)	13 (10)	10 (5)	5 (5)	27 (5)	27 (9)
19	14	25	18	26	2	22
19 (8)	24 (8)	8 (5)	15 (7)	1 (1)	29 (11)	30 (12)
19	20	28	13	25	11	10
22 (9)	10 (4)	14 (11)	19 (9)	12 (12)	30 (12)	23 (7)
23 (10)	30 (12)	6 (3)	22 (10)	10 (10)	22 (4)	21 (6)
24	26	30	12	22	16	7
25	22	16	27	23	13	20
26	16	29	23	29	6	19
27	8	19	31	31	10	25
27	25	24	25	28	7	15
29 (11)	17 (6)	12 (9)	28 (12)	17 (13)	23 (5)	29 (11)
30 (12)	27 (9)	17 (12)	26 (11)	9 (9)	26 (8)	26 (8)
31 (13)	28 (10)	20 (13)	29 (13)	8 (8)	28 (10)	28 (10)

Rank out of 31 cities (rank out of 13 middle-income country cities, if applicable)

only city in South Africa where the proportion of people living in informal settlements had increased in the previous five years.⁹⁹

The city and provincial government are acutely aware of the housing problem. In solving it, they face similar problems as other global cities – lack of investment, regulatory complexity, and nimbyism – as well as the unique challenge of overcoming the spatial legacy left by South Africa's apartheid regime. Before 1994, housing for

black South Africans was typically located far outside of cities and had poor transport links. Although transport has been improved, the city's urban form remains 'mono-modal' – with the majority of jobs in the city centre and the majority of housing in the periphery.

In 2017, recognising that solving this task is both a housing and a transport issue, the City of Cape Town created a Transport and Urban Development

Authority – a merger of departments, focused on long-term transit-oriented development (TOD). Such 'outcome-based' government recognises the interdependence of departmental goals and refocuses priorities and funding on broader citizen outcomes.¹⁰⁰

¹⁰⁰ Also called 'transversal management', city and national governments are implementing similar schemes across the world. For example, in Manchester, UK, health and social care services are being merged to create a seamless care system which will improve patient outcomes and save costs.

⁹⁹ State of South African Cities Report 2016, South African Cities Network (2016).

One solution the city has turned to is legislation: It plans to declare the whole city a restructuring zone, allowing any suitable land to be used for social housing.¹⁰¹

It is also using its balance sheet – several multi-billion rand mixed-use housing developments are underway or planned.¹⁰² Many of these have been designed explicitly to avoid the problems of the past, by requiring a significant proportion of properties to offer capped, affordable rents in multistorey buildings in central areas, recognising the role of densification in creating productive, liveable cities.¹⁰³

101 Cape Town Municipal Spatial Development Framework (MSDF) 2017–2022, City of Cape Town (July 2017).

102 For examples, the Harbour Arch development and the Foreshore.

103 Many African cities are poorly designed and sprawl, which impacts transport systems but also affects economic growth as the city misses out on agglomeration effects and economies of scale – see for example: *Africa's Cities: Opening Doors to the World*, Lall, Somik Vinay, Henderson, J. Vernon and Venables, Anthony J, World Bank (2017).



Box 9

Housing

The tipping point

In most cities the megatrend of rapid urbanisation looks set to intensify, but this will be most pronounced in middle and lower-income countries: According to the World Bank and the IMF, 96% of urban growth between now and 2030 will take place in the developing world.¹⁰⁴

This is partly due to the fact that low- and middle-income countries have higher *national* population growth rates and, usually, lower urbanisation levels to begin with. But there are signs that the big cities of the developed world may have reached a ‘tipping point’, as the cost of living and housing increase and technological and social trends make remote-working more achievable.

In the US, 2016 census data shows that population growth in the urban centres of big metros slowed for the fifth consecutive year. Net domestic in-migration to the New York City metro area is down by 900 000 since 2010.¹⁰⁵

In South Africa, on the other hand, 3 700 000 more people live in the eight metros than a decade ago, with urban population growth stable at around 2% per annum.

Among the many differences between Cape Town and New York is the cost of housing: In 2017, the average house price in the Cape Town CBD was R 2 300 000, or \$160 000.¹⁰⁶ In Manhattan, in the same year, the average apartment cost \$2 200 000m – 14 times more.¹⁰⁷

House prices continue to rise fast across urban South Africa and the size of the current gap underlines the competitive cost advantage Cape Town – and Johannesburg – enjoy over global megacities. However, although New York is in the bottom five for *Cost*, as this study strives to highlight throughout, several factors are needed to be a City of Opportunity – and New York leads Cape Town in the other nine indicators.

In addition, while New York’s net domestic migration is down by almost a million since 2010, its net *international migration* increased by almost the same amount.

This may paint a picture of the rich-world megacities of the future; still large, prosperous, and slowly growing, but inhabited fleetingly by new migrants and well-educated young professionals yet to start families, while the rest of the country moves to the suburbs and smaller cities to stretch their legs and ease their wallets.

While New York may be reaching this ‘tipping point’, it is likely that Cape Town has many years of continued urbanisation, growth, and rent increases ahead. And while it must continue to try to attract foreign talent and investment, Cape Town’s medium-term population growth will be driven by South Africans. In fact, between 2011 and 2016, the city’s foreign-born population actually decreased, from more than 200 000 (5.4%) to 150 000 (3.8%).¹⁰⁸

104 Global Monitoring Report 2013: Rural-Urban Dynamics and the Millennium Development Goals, World Bank and International Monetary Fund (2013)

105 Why so Many Americans are Saying Goodbye to Cities, Derek Thompson, The Atlantic (4 April 2017).

106 The Wealth Report: The Global Perspective on Prime Property and Wealth, 11th Edition, Knight Frank (2017).

107 Manhattan Sales 3Q 2017, Elliman Report, Millar Samuel Inc (2017).

108 Community Survey, Statistics South Africa (2016); Census 2011, Statistics South Africa (2011).



“The dire need for housing for Cape Town’s most vulnerable households is the single biggest challenge we are facing as a local government today. We are therefore doing all we can to expedite the development of inclusionary housing and to ensure that housing opportunities for lower-income families are situated on well-located land, close to work opportunities and public transport. In this sense we are leveraging City-owned assets to achieve spatial transformation, and we are moving towards a Precinct Development Approach which promotes densification in well-located precincts.”

Cllr Brett Herron, Mayoral Committee Member for Transport and Urban Development, City of Cape Town.



Implications





Working together to build a better Cape town

These recommendations are primarily for the city and provincial government as the bodies elected to govern the city, but they also apply to national government, business and civil society, all of whom have an interest in the success of Cape Town.

This study has uncovered many areas of strength, but also areas where Cape Town can improve. Some of these are difficult, or largely uncontrollable: The longstanding problems of inequality of income, education and opportunity will not be solved overnight, but can be alleviated. Many others have more straightforward solutions.

As well as observing patterns in the scores, we have used our *Future Cities* framework to categorise these implications (see bold italics). This approach (see page 15) involves ten steps that cities can follow to achieve three broad citizen outcomes.

Data-led delivery + Collaboration

Make education and safety top priorities, even though they are complex

The City of Cape Town has full control over neither education nor safety. Nevertheless, this study finds that both areas are implicated time and time again. Some cities, such as Seoul, have made great progress in recent years thanks to national education policy changes. Other cities have taken matters into their own hands. When it comes to policies, New York went from being synonymous with crime in the 1990s to be rated the 10th safest city in the world in 2015.¹⁰⁹ Both of these

stories share a theme: Commitment and collaboration. Crime and education were made major strategic priority areas and delivery was driven actively with advanced data collection and regular reporting. Cape Town has the power and the ambition to be the catalyst for such a change, as it has shown with its success in tackling unemployment.

Digital city

Embrace technology and innovation and don't be scared to experiment

Cape Town's use of its enterprise resource planning (ERP) system is regarded as one of the best examples of the software's deployment in the world. But ERP systems are a long way from the new technologies of the fourth industrial revolution. When it comes to many of these 'smart city' solutions, there is no set playbook. Cities across the world are experimenting with technology and applications to see which one works best for them.

Cape Town has all the right ingredients to become a test bed for new smart city innovations, yet the city has yet to launch an official citizen engagement app, and its use of the Internet of Things (IoT) and other smart city solutions is limited. The majority of activities that a city carries out day to day can be improved with technology – there might not yet be 'an app for that' – but there could be. In the fast-moving digital world, cities cannot apply the traditional ways of doing business and should not be scared to fail along the way; it might be the birth of the next success.

Resilience and sustainability

Make resilience about more than just water

The megatrend of *climate change and resource scarcity* means that natural disasters such as the drought Cape Town is currently experiencing will become more common in cities across the world. Cape Town's water resilience plan is progressing rapidly, with the demand side responding especially well – households have halved their usage in the past year. But this may not be enough. Although the taps are likely to stay on this year, the drought will affect businesses both large – farmers, South African Breweries' Newlands Brewery, – and small – car washes and swimming pools, as well as tourism.

São Paulo provides a cautionary tale: It ranks sixth for *Water-related business risk* but since this study was concluded, it has been gripped by its worst drought in 80 years.¹¹⁰

Cape Town should assess its **resilience** to withstand other natural disasters.

For example, the city sits on the Milnerton fault, meaning earthquakes are a 'rare but very real threat'.¹¹¹ And resilience is about much more than being able to withstand environmental damage. As set out on page 49, the City also needs to constantly assess its ability to stand shocks of the organisational, social and economic type.

¹¹⁰ Lessons from São Paulo's Water Shortage, Sandra Postel, National Geographic (March 2015).

¹¹¹ Dr Chris Hartnady, Umvoto Africa, quoted in: Major Quake in SA just a Matter of Time?, IOL (5 March 2010).

¹⁰⁹ Safe Cities Index, The Economist (2015)

Power and incentives + Data-led delivery

Learn from the best

This study is full of success stories that are replicable: tech-enabled schools in Kuala Lumpur, *Ease of doing business* in Singapore, water resilience in Los Angeles, recycling in Mumbai.

Cities are often lured into thinking that they are prevented by legislation or funding from doing things differently.

These examples, and many others, show that there are a host of innovative ways to solve even the most complex of problems, often without legislating and at little cost. Cape Town should study the innovative strategies, smart regulations and incentives that leading *Cities of Opportunity* use to make life better for their citizens.

One example the city could prioritise is land reform. The City owns vast tracts of land, both greenfield and brownfield, and the need for affordable housing in the city is very real, with multi-year waiting lists for social housing.

The city government cannot single-handedly transform housing supply; this requires private sector involvement which, along with promotion and active collaboration could be improved by simplifying the city's complex land regulations, many of which have not been reviewed in years.

Collaboration + Citizen-centricity

Build on the success of tourism

Through initiatives such as *Invest Cape Town* and *Wesgro*, the city is building a strong brand and has a clear idea of what the region should be known for, including technology, business process outsourcing, ecotourism and wine. Since the 2010 FIFA World Cup, tourism in particular has gone from strength to strength, with airport passenger numbers 24% up year on year and a succession of international travel awards – but an equivalent rise in foreign direct investment or educated talent has not yet followed. Government and businesses should challenge themselves to think: “*What would I remember if I came here on holiday?*” By focusing on customer-centric solutions

like fast 4G/5G networks, visible security and apps to help people get around, the city can use the success of tourism as a springboard for the rest of the economy.

Collaboration + Transversal management

Collaborate widely

City governments cannot control much of what happens within their boundaries – but they have more influence than anyone else. This study uncovers many examples of the city government working with others to achieve better outcomes, whether with property owners in City Improvement Districts, with provincial government to encourage safe driving, or with national government to encourage investment promotion.

There have also been great improvements when city departments work together, as shown by the EPIC emergency response system, and the Transit-Oriented Development approach. But there are many more opportunities on the horizon, whether in the devolution of powers from PRASA and Transnet, or in working to simplify business and tourist visas. As with innovation, a culture of collaboration does not always come naturally to government, but it often leads to the best solutions.

Citizen centricity + Digital city

Citizen-centric government is a win-win

The most powerful form of collaboration is with citizens. Understanding their needs helps to ensure public funds are spent efficiently – for example sending bills via email. Being able to change behaviours – whether it's carpooling, recycling or using less water – changes outcomes. Inviting citizens to use city data openly may result in the solving of a problem thought too difficult to solve, or the discovery of unknown risks.

Citizen-centric government does not *require* technology, but it has greatly changed the dynamic. The city currently has multiple, distinct points of contact with its citizens, most of which could be moved from paper and

premises into people's pockets. This might start with a citizen engagement app that allows citizens to view and pay bills, report potholes, or check the latest dam levels.

Such a platform could be updated to host any number of city functions and, in so doing, lead to a re-imagining of the citizen-city relationship. As well as real-time warnings about fires and location-specific transport updates, the app could allow the user to 'rate' water engineers like TripAdvisor, or even to hail the police like Uber.

Neither is inclusion any longer an insurmountable problem. Around two-thirds of citizens have access to the internet on a mobile device,¹¹² many of the rest have handsets with basic functions like USSD, and data costs can be overcome by partnering with the networks. Several South African banks have recently demonstrated this by providing online banking access with no data costs.¹¹³

Urban intelligence

Big data to solve big problems

One of the biggest benefits of increased citizen engagement is increased data, but even without citizen engagement apps, the City of Cape Town holds more data on its four million residents than anyone else. If data is the new oil, Cape Town sits on an unexploited oilfield. As with digital technology, it is hard to think of a service the city delivers that could not be improved with better use of data and analytics:

- Optimised fleet maintenance and transport routes;
- People analytics to improve staff engagement;
- Mining big data to close gaps in billed revenue; and
- Predictive analytics to provide more efficient, tailored basic services.

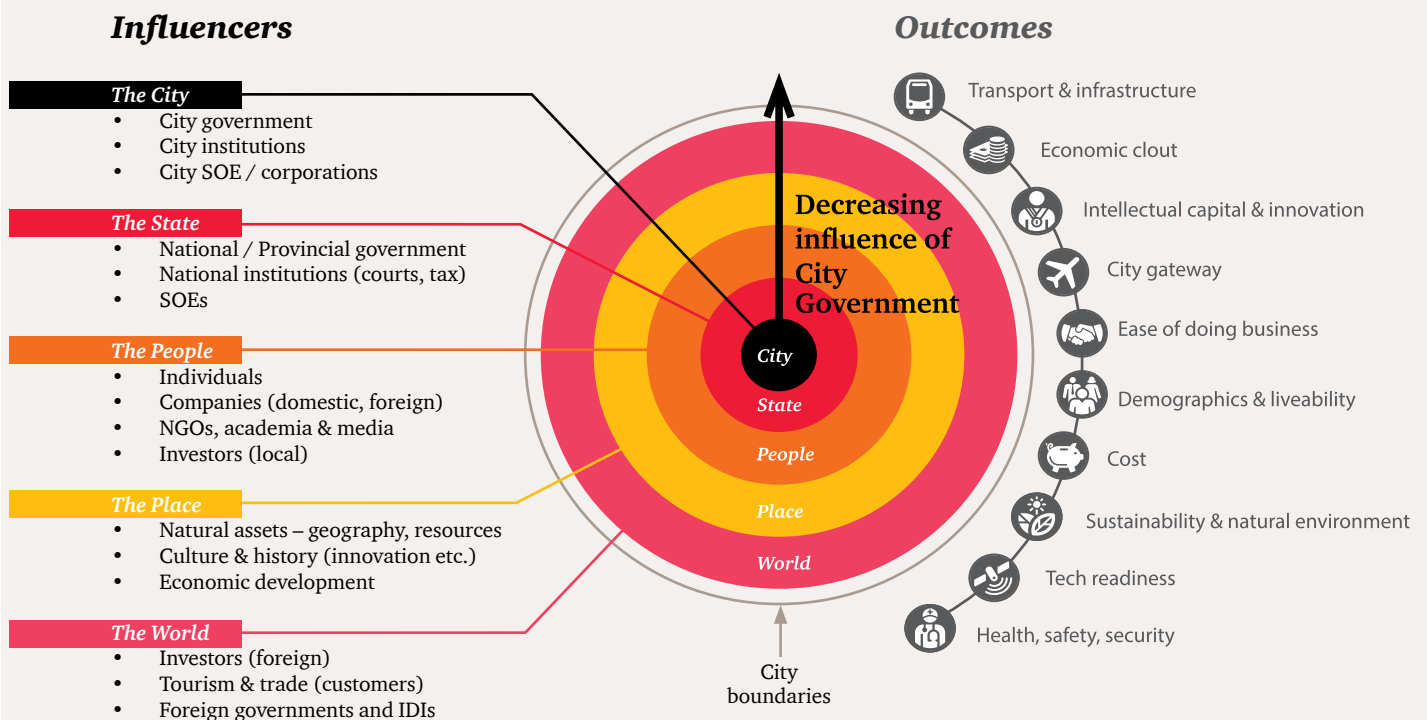
¹¹² Community Survey, Statistics South Africa (2016).

¹¹³ Many South African banks now subsidise all data costs on their apps

Collaboration

City governments do not have total control over city outcomes

- No city is an island*, and no city government has the power to change everything within its borders – but they have more influence than anyone else.
- The figure shows that the 10 Cities of Opportunity outcomes are affected by five ‘**influencers**’ in different, overlapping ways. These include, national competencies such as education levels, immigration rules, political and regulatory stability and infrastructure such as airports and national highways.
- Achieving genuine citizen satisfaction involves these influencers **working together** in a deliberate, coordinated manner. PwC research shows that this is a key success factor for cities.**
- Government is often siloed and culture can be difficult to change.
- A successful strategy can be to assign an organisation to be responsible for bringing together different groups with shared interests in the city’s success. Examples include London First, the Partnership for New York City, the Amsterdam Economic Board and Invest Cape Town.



Despite a lack of control, citizens expect city governments to deliver these outcomes

* Except Singapore

** See PwC Reports: iUrban – Innovative city strategies for delivering sustainable competitiveness, PwC (2014); Making it happen, PwC (2011)

Data-led delivery

Actively drive data-led delivery

City administrations are often elected on the basis of ambitious visions but fail to implement them, eroding trust in government. The gap between the two is filled by focusing relentlessly on what has recently been termed ‘the science of delivery’.¹¹⁴ Many governments – including the Western Cape – have implemented delivery support units whose sole focus is to drive delivery in a handful of key strategic priority areas, such as education. As well as emphasising routines, people and leadership, this approach relies heavily on data, but not of the ‘big’ variety described above. Instead, the emphasis is on *collecting the right strategic data* to understand the performance of government and on actively using it.

The former might involve city benchmarking reports (such as this study) or tracking outcome areas over time, to observe the effectiveness of different interventions. The latter requires data to be accessible on mobile devices, presented in a compelling way, often with visual dashboards, and kept up-to-date. Many cities have a ‘mayor’s dashboard’, which senior stakeholders can use to track key political priorities. London has gone a step further by making its Mayor’s dashboard accessible to the most senior stakeholder – citizens.¹¹⁵

People and culture

Attract and retain the best people

As well as attracting foreign talent to Cape Town, government must also ensure that it attracts and retains the best talent itself. The City of Cape Town alone employs almost 30,000 people, their job satisfaction translates directly into citizen satisfaction. As the future of work changes, the public sector must keep up with what the private sector is increasingly offering. This is twofold: The future of work is both social – flexible, remote working – and technical: employing the skill sets of tomorrow.¹¹⁶

The City of Cape Town has recently transformed its organisational structures and is in the process of implementing programmes around flexible working and transversal management. But there is an enormous amount of untapped potential in every workforce and people analytics can be used to understand and improve human relations.

Similarly, in the modern world of work, there is an increasing need for specialist cross-governmental teams that can support existing departments. These include the Delivery Support Units mentioned above, but also teams that specialise in areas such as digital, innovation and data analytics (see *Future Cities* figure on page 15)

Urban Finance + Infrastructure and transport

Build on strong foundations

Although none of the indicators in this study directly relate to the city’s balance sheet or finances, our *Future Cities* model recognises that these are critical building blocks for success in citizen outcomes.

Unlike many African cities, Cape Town has a reputation for sound urban finance and infrastructure, consistent service delivery and open governance which have translated into success in this study: high scores for *Transportation and infrastructure*; collaborative partnerships such as City Improvement Districts; and successful public employment programmes.

But there is always room to do more. For example:

- Does the city leverage its assets to their full effect?
- Is maintenance spending in areas like water enough to ensure current efficiency and future resilience?
- What steps could be taken today towards a fully integrated transport system?

As Cape Town embraces new strategic and digital city solutions, it should continually revisit these fundamentals.

¹¹⁴ How to Run A Government So that Citizens Benefit and Taxpayers Don’t Go Crazy, Michael Barber (2016).

¹¹⁵ See, for example, Gangs Dashboard, Data and Statistics, Mayor of London; Public Voice Dashboards, Data and Statistics, Mayor of London.

¹¹⁶ Workforce of the future: The competing forces shaping 2030, PwC (2017)





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Picture provided by The City of Cape Town



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Appendices





Key to the variables

1. Intellectual capital and innovation

Libraries with public access

Number of libraries within each city that are open to the public divided by the total population and then multiplied by 100,000.

Math/science skills attainment*

Top performers' combined mean scores on the math and science components of the Program for International Student Assessment (PISA) an Organisation for Economic Co-operation and Development (OECD) assessment of 15 year-olds' academic preparedness. Top performers are defined as those students who achieved in the top two proficiency levels (Level 5 and Level 6) on the math and science portions of the test. Comparable examinations are used wherever possible to place cities not included in the OECD assessment.

Percent of population with higher education

Number of people who have completed at least a university-level education divided by the population aged 15+. A university-level education is set equivalent to a Bachelor's degree or higher from a US undergraduate institution.

World university rankings

The Times Higher Education World University Rankings 2014-2015 powered by Thomson Reuters are the only global university performance tables to judge world

class universities across all of their core missions - teaching, research, knowledge transfer and international outlook. The top universities rankings employ 13 carefully calibrated performance indicators to provide the most comprehensive and balanced comparisons available, which are trusted by students, academics, university leaders, industry and governments.

Innovation Cities Index

The 2thinknow Innovation Cities™ index is comprised of 445 cities selected from 1,540 cities based on basic factors of health, wealth, population, geography. The selected cities had data extracted from a city benchmarking data program on 162 indicators. Each of the benchmarking data were scored by analysts using best available qualitative analysis and quantitative statistics. (Where data were unavailable, national or state estimates were used). Data were then trend balanced against 21 global trends. The final index had a zeitgeist (analyst confidence) factor added and the score reduced to a three-factor score for Cultural Assets, Human Infrastructure and Networked Markets. For city classification, these scores were competitively graded into five bands (Nexus, Hub, Node, Influencer, Upstart). The top 33% of Nexus and Hub (and selected Node cities of future interest) final graded scores were ranked by analysts based on trends over 2-5 years. A node ranking is considered globally competitive.

Intellectual property protection*

Leading business executives' responses to the question in the World Economic Forum's Global Competitiveness Report 2014-15 that asks, "In your country, how strong is the protection of intellectual property, including anti-counterfeiting measures?" [1 = extremely weak; 7 = extremely strong]. The 2014 edition of the Survey captured the opinions of over 14,000 business leaders in 148 economies between February and June 2014.

Entrepreneurial environment*

The Global Entrepreneurship & Development Index measures the '3As' of entrepreneurial development: attitudes, aspirations and activity. The index was created by the Global Entrepreneurship and Development Institute to help provide better understanding of economic development by analysing the contextual nature of business formation, expansion, and growth.

2. Technology readiness

Internet access in schools*

Leading business executives' responses to the question in the World Economic Forum's Global Competitiveness Report 2014-15 that asks, "In your country, how widespread is Internet access in schools? [1 = nonexistent; 7 = extremely widespread]". The 2014 edition of the Survey captured the opinions of over 14,000 business leaders in 148 economies between February and June 2014.

* Data collected at country level

** Data based on country's most populous city

Broadband quality score

Based on millions of recent test results from Pingtest.net, this global broadband index from Ookla compares and ranks consumer broadband connections around the globe. Our overall broadband index score encompasses the following weighted metrics which were collated over a six month period to generate an average - upload speed (40%), download speed (40%), quality of connection (10%) and value/cost (10%).

Mobile broadband speed

Based on millions of recent cellular test results from Ookla Speedtest iOS and Android apps, this index compares and ranks cellular upload and download speeds around the globe. Each city receives a score based on the rolling mean speed in megabits per second (mbps) over the previous 30 days. Only tests taken within 300 miles of the server are eligible for inclusion in the index. Data were collected and averaged over a three month period in 2015.

ICT usage

Ericsson's Networked Society City Index 2014 measures the performance of 40 cities from two perspectives: their maturity in information and communications technology (ICT) and triple bottom line, specifically sustainable urban development in a connected society. The ICT usage score is based on three variables—technology use, individual use, and public and market use. Within technology use, the following metrics were analysed: mobile phone subscriptions per 100 habitants, number of smartphones per capita, percentage with a computer at home, and number of tablets per capita. Within individual use, the following metrics were considered: Internet usage as a percentage of the population and social networking penetration. Within public and market use, the following metrics were analysed: open data and web presence, and electronic and mobile phone payments.

Software development and multi-media design

Combination of scores for each city in fDi magazine's Best Cities for Software Development and the Best Cities for Multi-Media Design Centres. Both fDi indices weight a city's performance 70% based on the quality of the location and 30% based on the cost

of the location. The software design index is based on an assessment of 120 quality competitiveness indicators. These indicators include availability and track record in ICT, availability of specialised-skills professionals such as scientists and engineers, access to venture capital, R&D capabilities, software experts, quality of ICT infrastructure and specialisation in software development. The Multi-Media Design Centre rankings are based on an assessment of 120 quality competitiveness indicators, including the size of the location's leisure and entertainment sector, its specialisation and track record, information technology infrastructure, quality of life and skills availability.

Digital security

This variable measures a city's levels of digital security based on factors such as dedicated cybersecurity teams (input) and the frequency of identity theft (output). Input metrics measured are privacy policy, citizen awareness of digital threats, public-private partnerships, level of technology employed, and dedicated cybersecurity teams. Output metrics are frequency of identity theft, percentage of computers infected, and percentage with Internet access. Data are produced by the Economist Intelligence Unit's Safe Cities Index 2015.

3. City gateway

Hotel rooms

Count of all hotel rooms within each city.

International tourists

Annual international tourist arrivals for 100 cities collected by Euromonitor International. Euromonitor's figures include travelers who pass through a city, as well as actual visitors to the city.

International association meetings

A measure combining both the number of international association meetings per city in 2014 and the compound annual growth rate (CAGR) from 2009-2014. The meetings measured take place on a regular basis and rotate between a minimum of three countries. Figures provided by the International Congress and Convention Association.

Incoming/ outgoing passenger flows

Total number of incoming and outgoing passengers, including originating, terminating, transfer and transit passengers in each of the major airports servicing a city. Transfer and transit passengers are counted twice. Transit passengers are defined as air travelers coming from different ports of departure who stay at the airport for brief periods, usually one hour, with the intention of proceeding to their first port of destination (includes sea, air and other transport hubs).

World Top 100 airports

Each city receives a score based on the ranking of that city's top airport in the World's Top 100 Airports ranking, compiled by Skytrax. The World Airport Awards are based on over 13 million survey questionnaires completed by airline customers between May 2014 and January 2015 across 550 airports worldwide. The survey evaluates travellers' experiences across different airport service and performance indicators from check-in, arrivals, transfers, shopping, security and immigration to departure at the gate.

Airport connectivity

A measure of the number of routes operating from the airports servicing a city as identified by World Airport Codes. A greater weight is given to international destinations, but domestic routes are also included so as not to penalise countries with larger land areas.

4. Health, safety and security

Road safety*

A count of the estimated number of road deaths in each country per 100,000 inhabitants. Raw figures are calculated by the World Health Organisation based on 2013 survey data and are published in the Global Status Report on Road Safety 2015.

Health system performance*

Measurement of a country's health system performance made by comparing healthy life expectancy with healthcare expenditures per capita in that country, adjusted for average years of education (years of education is strongly associated with the health of populations in both developed and developing countries). PwC Global

Healthcare team adapted methodology from the 2001 report “Comparative efficiency of national health systems: cross-national econometric analysis”.

End of life care*

Ranking of countries according to their provision of end-of-life care. The Quality of Death Index by the EIU assesses the availability, affordability and quality of palliative care for adults in 80 countries across the world. The index scores countries across 20 indicators grouped in five categories: palliative and healthcare environment, human resources, affordability of care, quality of care and community engagement. These indicators are grouped into qualitative and quantitative categories and are normalised to form an overall index score.

Crime

Weighted combination of Mercer Quality of Living report (2014) crime score (50%); intentional homicide rate per 100,000 of the city population (30%); and the Numbeo Crime Index (2015), which is an estimation of the overall crime level in each city based on how safe citizens feel (20%).

Political environment

Measure of a nation’s relationship with foreign countries, internal stability, law enforcement, limitations on personal freedom and media censorship. Data is from the Mercer Quality of Living 2014 reports.

Security and disease risk

An analysis of the potential effects of crises on economic output in each city, calculated by measuring the percentage of GDP at risk from a series of individual health and security threats between 2015 and 2025. The nine threats measured were cyber attack, market crash, nuclear accident, oil price shock, sovereign default, terrorism, power outage, human pandemic, and plant pandemic. Data are taken from the Lloyd’s City Risk Index 2015–2025

5. Sustainability and the natural environment

Natural disaster exposure

A measure of a city’s exposure to natural disaster risk, calculated by PwC’s actuarial and forensics practice using data from Swiss Re’s CatNet GDP

Loss Index and the People Risk Index. This variable measures the economic and people effect of river and coastal floods, earthquakes, windstorms, and tsunamis. The economic effect is measured by lost GDP output in the immediate aftermath of an event relative to the country’s GDP. The people effect is both the potential for fatalities and casualties, as well as people who need to be evacuated and are unable to access their home or workplace (in the immediate aftermath of an event) as a proportion of the population of the city. The indices are derived from Swiss Re’s Mind the risk study (www.swissre.com/rethinking/climate_and_natural_disaster_risk/Mind_the_risk.html), results of which are available at CatNet (www.swissre.com/clients/client_tools/about_catnet.html).

Natural disaster preparedness

This measure takes into account each city’s disaster preparedness. Using a method developed by PwC’s actuarial and forensics practice, each city receives a score based on its preparedness. This measure considers whether the city has put in place early warning systems, made efforts to reduce the underlying risk factors, regularly conducts training drills, and implements strategies to increase public awareness. Fifty percent of the score is taken at a country level from the UNISDR’s web platform, PreventionWeb, which has collated national progress reports on the implementation of the UN’s 10-year plan to make the world safer from natural hazards, the Hyogo Framework for Action. Each city’s average performance in the variables of public transport systems, health system performance, and operational risk climate are also factored into the disaster preparedness measure to make up the remaining 50%.

Thermal comfort

A thermal comfort score was created for each city by calculating the average deviation from optimal room temperature (72 degrees Fahrenheit). January, April, July and October heat indices were calculated for each city using an online tool that integrates average high temperature and corresponding relative evening humidity during each month. A final thermal comfort score was derived by first taking the difference between a

city’s heat index for each month and optimal room temperature and then averaging the absolute values of these differences.

Recycled waste

Percentage of municipal solid waste diverted from landfill. This includes, but is not limited to, recycling and captures other methods such as waste-to-energy.

Air pollution

Combination of measures of particulate matter 10 micrometres (PM10) outdoor air pollution levels from the World Health Organisation (WHO) and the Numbeo Pollution Index of overall pollution in each city. The WHO’s Public Health and Environment database provides annual mean concentrations of PM10 in diametres or less, reflecting the degree to which urban populations are exposed to this fine matter. The Numbeo Pollution Index is generated via survey-based data. Numbeo attributes the biggest weight to air pollution, then to water pollution/accessibility as the two main pollution factors. A small weight is given to other pollution types.

Public park space

Proportion of a city’s land area designated as public recreational and green spaces to the total land area. Excludes undeveloped rugged terrain or wilderness that is either not easily accessible or not conducive to use as public open space.

Water-related business risk

Water risks in a city related to quality, quantity, and regulatory risk. Quality risks are defined as the exposure to changes in water quality that may impact industrial production systems, resulting in the need for further investment or an increase in the operational costs of water treatment. Risks related to quantity are defined as the exposure to changes in water quantity (e.g., droughts or floods) that may impact a company’s direct operations, supply chains, and/or logistics. Regulatory risk refers to the unpredictability of regulations within the business environment. These risks arise when an unexpected change in water-related law or regulation increases a business’s operating costs, reduces the attractiveness of an investment, or changes its competitive landscape. Data produced by the World Resources Institute with Aqueduct.

6. Demographics and Liveability

Entertainment and attractions

Cultural experience from the A.T. Kearney Global Cities Index is measured by the number of diverse attractions in a city, including the number of major sporting events a city hosts; the number of museums, performing arts venues, and culinary establishments; the number of international travelers; and the number of sister city relationships.

Quality of living

Score based on more than 30 factors across five categories: socio-political stability, healthcare, culture and natural environment, education and infrastructure. Each city receives a rating of either acceptable, tolerable, uncomfortable, undesirable or intolerable for each variable. For qualitative indicators, ratings are awarded based on the Economic Intelligence Unit analysts' and city contributors' judgments. For quantitative indicators, ratings are calculated based on cities' relative performances on a number of external data points. Data sourced from the Economist Intelligence Unit's Liveability ranking.

Working age population

Proportion of a city's population aged 15-64 to the total population of the city.

City brand

The Guardian Cities global brand survey measures two aspects of a city's brand: its "assets"—attractions, climate, infrastructure (particularly transport), safety, and economic prosperity—and its "buzz," a combination of social media (Facebook likes and Twitter sentiment analysis) and media mentions. The assets and buzz elements were both given a score out of 10; the numbers were then added to produce a total score.

Relocation attractiveness

PwC employees in each of the firms' offices in the 30 cities were asked "Based on the other 29 cities in Cities of Opportunity, please rank the top three cities that you would like to work in most?" Data provided by the PwC employee survey conducted for the 'We, the Urban People' study.

Senior wellbeing*

The Global AgeWatch Index presents a unique snapshot of the situation of older people in 96 countries. It highlights which countries are doing best for their older populations and how this links with policies toward pensions, health, education, employment, and the social environment in which older people live. The overall score takes account of income security, capability, enabling environment, and health status of the over 60s.

YouthfulCities Index

A measure produced by YouthfulCities, a global database that measures, compares, and ranks 55 cities across 20 urban attributes using a total of 101 indicators. The indicators consist of primary and secondary data that Urban Decoders (a globally dispersed team of young urban researchers) collect locally and submit using collaborative, cloud-based research workbooks. The YouthfulCities Index is an ambitious collaborative effort to analyse the largest cities around the world from a unique youth perspective to rank them as best suited for young people aged 15–29. It looks at how youth live, work, and play in their urban setting in order to examine how cities are serving their youth. It asks how youth can be better integrated and engaged in their cities.

7. Transportation and infrastructure

Mass transit coverage

Ratio of kilometres of mass transit track to every 100 square kilometres of the developed and developable portions of a city's land area. A city's developable land area is derived by subtracting green space and governmentally protected natural areas from total land area.

Affordability of public transport

The affordability of the longest mass transit rail trip from a city's boundary to the CBD, calculated by using a city's average hourly wage (UBS Prices and Earnings 2015) to determine the amount of time a citizen needs to work to be able to buy a single ticket. The cost of a bus trip is used in cities where there are no rail systems.

Licensed taxis

Number of officially licensed taxis in each city divided by the total population and then multiplied by 1,000.

Major construction activity

Major construction activity is composed of three equally weighted measures: the number of planned and under construction buildings in the Emporis database; the number of properties sold and recorded by Real Capital Analytics' database; and construction employment from Oxford Economics. The Emporis database is the count of planned and under construction buildings categorised as a high rise, skyscraper, low rise, hall, or stadium; the number of properties sold is based on the number of properties valued at more than \$10 million, recorded between February and July 2015; and construction employment is taken as a percentage of total employment.

Housing

Measure of availability, diversity, cost and quality of housing, household appliances and furniture, as well as household maintenance and repair. This measure is based on the Mercer Quality of Living report 2014. Tied cities were differentiated by looking at the annual percentage change in house prices.

Traffic congestion

Measure of traffic congestion and congestion policies for each city scored on the level of congestion as well as the modernity, reliability and efficiency of public transport. Assessment based on Mercer Quality of Living reports 2014. Tied cities were differentiated using the ease of commute variable.

Ease of commute

PwC employees in each of the 30 offices were asked "On a scale from 1 to 10, where 1 is difficult and 10 is easy, please rate your commute to work?". Data provided by the PwC employee survey conducted for the 'We, the Urban People' study.

8. Economic clout

Number of Global 500

headquarters

Number of Global 500 headquarters located in each city, as per the Fortune Global 500 list.

Employment growth

2014-2016 percentage growth rate of employment in the city. Data provided by Oxford Economics.

Financial and business services employment

The number of jobs in financial and business services activity as a share of total employment in the city. Financial services include banking and finance, insurance and pension funding, and activities auxiliary to financial intermediation. Business services include a mix of activities across the following sub-sectors: real estate and renting activities, IT and computer related, R&D, architectural, engineering and other technical activities, legal, accounting, bookkeeping and auditing activities, tax and consultancy, advertising, and professional scientific and technical services and business services where not elsewhere classified. Data provided by Oxford Economics.

Attracting FDI

Combined variable ranking the number of greenfield (new job-creating) projects, plus the total US\$ value of greenfield capital investment activities in a city that are funded by foreign direct investment (FDI). Data cover the period from January 2005 through December 2014 provided by fDi Intelligence.

Productivity

Productivity is calculated by dividing the gross domestic product (GDP) in 2015 US dollars by employment in the city. Data provided by Oxford Economics.

Rate of real GDP growth

2014-2016 gross domestic product (GDP) percentage growth rate in real terms expressed in 2015 US\$. Data provided by Oxford economics.

9. Ease of doing business

Ease of starting a business**

Assessment of the bureaucratic and legal hurdles an entrepreneur must overcome to incorporate and register a new firm. Accounts for the number of procedures required to register a firm; the amount of time in days required to register a firm; the cost (as a percentage of per capita income) of official fees and fees for legally mandated legal or professional services; and the minimum amount of capital (as a percentage of per capita income) that an entrepreneur must deposit in a bank or with a notary before registration and up to three months following incorporation. Assessment scores gathered from Doing Business 2015 report, The World Bank Group. U.S. cities were differentiated from each other using the United States Small Business Friendliness 2013 Small Business Survey by Thumbtack.com in partnership with Kauffman Foundation.

Resolving insolvency**

This topic identifies weaknesses in existing bankruptcy law and the main procedural and administrative bottlenecks in the bankruptcy process. Assessment scores gathered from Doing Business 2015, The World Bank Group.

Ease of entry: Number of countries with visa waiver *

Number of nationalities able to enter the country for a tourist or business visit without a visa. Excludes those nationalities for whom only those with biometric, diplomatic or official passports may enter without a visa.

Number of foreign embassies and consulates

Number of countries that are represented by a consulate, embassy, high commission, depute high commission or representative office in each city. Figures sourced from Embassypages.com

Level of minority shareholder protection**

Measurement of the strength of minority shareholder protection against misuse of corporate assets by directors for their personal gain. The Strength of the Investor Protection Index is the average of indices that measure “transparency of transactions,” “liability

for self-dealing” and “shareholders’ ability to sue officers and directors for misconduct.” Assessment scores gathered from Doing Business 2015, The World Bank Group.

Operational risk climate*

Quantitative assessment of the risks to business profitability in each of the countries. Assessment accounts for present conditions and expectations for the coming two years. The operational risk model considers 10 separate risk criteria: security, political stability, government effectiveness, legal and regulatory environment, macroeconomic risks, foreign trade and payment issues, labor markets, financial risks, tax policy, standard of local infrastructure. The model uses 66 variables, of which about one-third are quantitative. Data produced by Economist Intelligence Unit’s Risk Briefing.

Workforce management risk

Ranking based on staffing risk in each city associated with recruitment, employment, restructuring, retirement and retrenchment. Risk was assessed based on 30 factors grouped into five indicator areas: demographic risks associated with labor supply, the economy and the society; risks related to governmental policies that help or hinder the management of people; education risk factors associated with finding qualified professionals in a given city; talent development risk factors related to the quality and availability of recruiting and training resources; and risks associated with employment practices. A lower score indicates a lower degree of overall staffing risk. Rank scores sourced from the 2013 People Risk Index produced by Aon Consulting.

Tax efficiency

Combination of the number of tax payments and the time required to comply by businesses during their second year of operation. The tax payments element reflects the total number of taxes and contributions paid, the method of payment, the frequency of payment, the frequency of filing, and the number of agencies involved for the case-study company. Time to comply measures the time taken to prepare, file, and pay three major types of taxes

(corporate income taxes, value-added taxes, and labor taxes). Data provided by PwC UK from Paying Taxes 2016; taxes are accurate for the year ended 31 December 2014. The Paying Taxes 2016 report can be found at <http://www.pwc.com/gx/en/paying-taxes/>.

10. Cost

Corporate total tax rate

The corporate total tax rate measures the amount of taxes and mandatory contributions payable by the businesses in the second year of operation, expressed as a share of commercial profits. The corporate total tax rate is designed to provide a comprehensive measure of the cost of all the taxes a business bears. Data provided by PwC UK from Paying Taxes 2016; taxes are accurate for the year ended 31 December 2014. Some cities that were not included in the Paying Taxes 2016 study were calculated separately by our PwC local office using the through-the-cycle methodology. The Paying Taxes 2016 report can be found at <http://www.pwc.com/gx/en/paying-taxes/>.

Personal tax

The personal tax data reflect the average employee effective tax rate across manager, assistant, and support staff levels in each city economy. The employee effective tax rates were generated by PwC UK using data supplied for Paying Taxes 2016. Taxes are accurate for year ended 31 December 2014. The Paying Taxes 2016 report can be found at <http://www.pwc.com/gx/en/paying-taxes/>.

Cost of business occupancy

Annual gross rent divided by square feet of Class A office space. Gross rent includes lease rates, property taxes, maintenance and management costs. Data produced by CBRE Global Office Rents in US\$.

Cost of living

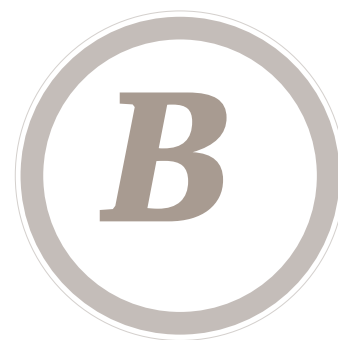
A relative measure of the price of consumer goods by location, including groceries, restaurants, transportation and utilities. The CPI measure does not include accommodation expenses such as rent or mortgage. Figures provided by Numbeo.

Purchasing power

Domestic purchasing power is measured by an index of net hourly wages (where New York = 100) excluding rent prices. Net hourly wages divided by the cost of the entire basket of goods and services excluding rent. The basket of goods relates to 122 goods and services. Data sourced from UBS Prices and Earnings 2015.

Affordability of rent

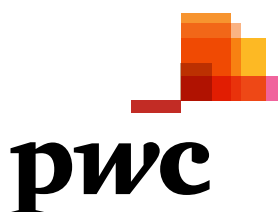
A measure of the affordability of rental accommodation in a city, calculated by offsetting the monthly rental cost of a 120m² apartment against a city's average wages (UBS Prices and Earnings 2015). Rental prices were sourced from the Global Property Guide – where the cost of a 120m² apartment was not available, the closest equivalent was used.



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