

NETWORKED SOCIETY CITY INDEX 2014

APPENDIX 2 – CITY PROFILES



ERICSSON



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The Networked Society City Index compares cities' ICT maturity and their social, economic and environmental development (triple bottom line).

ABOUT THE CITY PROFILES

At the core of the Networked Society City Index are the cities themselves. Each city is unique, each with its own complex interactions of social, political, technological and environmental characteristics. But by profiling a key set of factors, we are able to benchmark cities' levels of ICT use, socioeconomic performance and environmental impact.

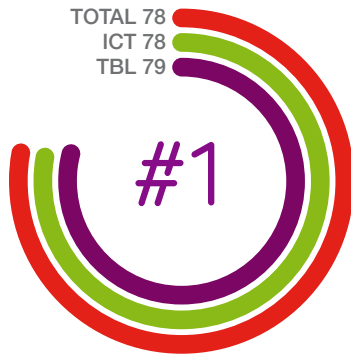
The profiles enable city leaders, policy makers, entrepreneurs and individuals to make meaningful comparisons across cultures and develop insights about the relationship of effective ICT use and cities' overall development. We hope the Networked Society City Index can help cities learn from each other and that it will inspire the development of networked cities worldwide.

The Networked Society City Index 2014 expands to 40 cities (from 31 in 2013), drawing from all parts of the world. In our sampling, we include some of the world's biggest and most dynamic cities with others chosen for the strength of their ICT development or other interesting factors. The 40 cities in the index represent many different stages of development, as the lessons of effective ICT development flow in both directions and instructive examples emerge across the spectrum of development.

The following profiles focus on city-specific results in the six dimensions of the composite index, describing their current state in terms of ICT maturity, and socioeconomic and environmental development. We hope these profiles will raise awareness of how ICT maturity and triple bottom line (TBL) development interact on a local level and spark creative new policy, business and social developments.

The Networked Society City Index is not intended as a recipe for development, nor a set of answers, but rather as a valuable resource to be evaluated in the context of every city's unique character. In the profiles, the indicators of ICT maturity dimensions measure **input** to ICT development, and the TBL indicators measure **output** of social, economic and environmental development in cities. The charts present the results of each city in each of the six dimensions of the index relative to other index cities.





STOCKHOLM

Stockholm is often referred to as one of the world's most beautiful capitals, built on 14 islands around one of Europe's largest and best-preserved medieval city centers. Stockholm has a population of 900,000 and is one of the fastest growing cities in Europe. The Stockholm metropolitan area, with 2.1 million inhabitants, is home to 22 percent of Sweden's population.

The last decade has seen a significant number of jobs created in high technology companies and the city accounts for about 30 percent of Sweden's GDP. Stockholm is home to a highly skilled workforce with a strong research and development capacity. Its people are also some of the world's most advanced users of ICT technology. A major ICT center is located in one of Stockholm's suburbs, and the number of ICT companies in the Stockholm region has grown dramatically during recent years. The service industry accounts for roughly 85 percent of the jobs, and the absence of heavy industry and fossil fuel power plants, makes Stockholm one of the world's cleanest metropolises.

Metropolitan population.....	2,170,000
Density	330/km ²
Population yearly growth	1.7%
GDP per capita PPP\$ 2011	55,200
GDP per capita PPP\$ growth 2010-2011 ..	5.1%
ICT maturity improvement 2013-2014	Low

- + Scores very well in all variables in both the ICT maturity and triple bottom line indexes.
- Needs to address the gender issue in higher education, where boys are underrepresented. An environmental issue is its energy consumption, which is above average.

Stockholm ranks #1 in the ICT index, gaining from high scores in all dimensions. Stockholm has a long, proven track record of focused initiatives and programs to drive the progress of ICT infrastructure. During the deregulation of the Swedish telecom market in the early 1990s, the city set an ambitious plan to provide fiber access and, this year, the target of providing every multi-tenant building with fiber optics was reached. This now makes Stockholm one of the most fiber dense cities globally. With initiatives like Open Data, the general public can access large amounts of government data. Combined, these successes have helped to develop the business sector. A third place in triple bottom line performance still leaves some room for development opportunities, especially in the economic and environmental dimensions.

Stockholm is ranked #1 in the Networked Society City ICT Index. The city performs exceptionally well in all dimensions of both the ICT and the triple bottom line dimensions. Stockholm scores extremely well when it comes to ICT affordability and ICT infrastructure. This is reflected in the city's ICT usage, which is among the highest in the index.



TBL Social

Stockholm ranks high in the social dimension and performs well in health and education, as well as in social inclusion. However, the social inclusion variable reveals challenges. Stockholm needs to be cautious about the unemployment rate and gender equality in education. Boys are underrepresented in higher education, which might lead to a future gender divide. These results imply that even the top performing cities face challenges of social sustainability to become a fully unified city.

TBL Economy

Stockholm performs well in the economic dimension and ranks highest in the economic competitiveness variable. The city scores equally well and above average in knowledge-intensive employment, patents, business startups and tertiary educational attainment. Stockholm is not among the top five in GDP per capita, though it is well above average.



TBL Environment

Stockholm is one of the world's cleanest metropolises with clean air and opportunities to swim and fish in the middle of the city. However, as in many developed cities, the standard of living in the city puts pressure on the environment and stimulates high energy consumption. Stockholm does gain from the fact that a large part of its energy comes from non-fossil energy sources but as a highly developed city it still contributes to climate change.



ICT Infrastructure

Stockholm's ambitious plan to provide fiber access to its inhabitants and businesses makes Stockholm one of the most fiber dense cities globally. Stockholm also has a tradition of early and rapid rollout of mobile infrastructure. A recent example of this is the launch of LTE in Stockholm as early as 2009. Stockholm performs well in all ICT infrastructure variables. However, several cities have ambitious plans, so to continue to rank #1, Stockholm needs to develop its infrastructure continuously.

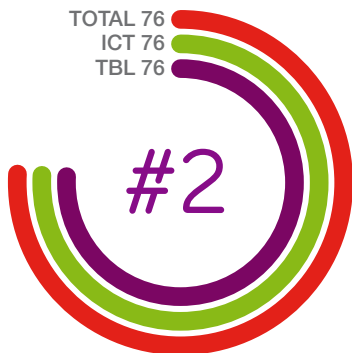
ICT Affordability

The open city-owned fiber network allows individual users to choose their own network service provider. This competitive market with multiple suppliers provides users with competitive prices and affordable connections to the digital world.



ICT Usage

Stockholm performs well in ICT usage. Stockholm scores high in individual and market use and many of the city's services are digitalized, such as applying for daycare. However, Stockholm gets slightly lower results in technology usage, especially penetration rates in tablets and mobile phone subscriptions.



LONDON

London is the capital city of the United Kingdom and is home to approximately 8.4 million people. The London metropolitan area has a total population of 15 million people, representing 23 percent of the country's population.

London is a global city and an international center of financial services, higher education and culture. London is a popular tourist destination. Indeed, it is the world's most-visited city, measured by international arrivals.

Finance is London's largest industry and more than 85 percent of the employed population of the Greater London area works in the service sector. Many technology companies have their base in London.

In 2014, London was named European City of the Future by FDi Magazine. The European Commission has identified London as one of Europe's top three ICT Hubs.

London is ranked #2 in the Networked Society City Index. The city enjoys high ICT maturity rates and scores well in all triple bottom line dimensions. London performs best of all cities in the index in terms of ICT usage. The city has well-developed open data resources and its international broadband capacity is the highest among the index cities. There is a high availability for Wi-Fi hotspots and internet usage in the city is very high.

Metropolitan population..... 15,010,000
Density 1,790/km²
Population yearly growth 1.0%
GDP per capita PPP\$ 201164,200
GDP per capita PPP\$ growth 2010-2011 ..4.3%
ICT maturity improvement 2013-2014... Medium

+ Scores very well on all variables in the ICT index. London has the highest performance in ICT usage.

- London's performance in the social dimension of the triple bottom line reveals that it is a city with socioeconomic inequalities.



TBL Social

London performs fairly well in the social dimension of the index. Life expectancy is high and infant mortality rates are fairly low. London scores high on safety and educational attainment. There is, however, room for improvement regarding unemployment and gender equality in higher education and governance. London's performance reveals that it is a city with socioeconomic inequalities.

TBL Economy

London has one of the highest scores in the economic dimension. The city has a strong economy and one of the highest GDP per capita rates among the cities in the index. London also scores well on economic competitiveness, with the highest score on knowledge-intensive employment and tertiary educational attainment.



TBL Environment

London performs well in the environmental dimension of the index but still has room to improve. London performs well with regard to pollution; however, the city contributes to climate change and environmental degradation through resource use and CO₂ emissions, due to its high standard of living.

ICT Infrastructure

London has a well-developed ICT infrastructure. International bandwidth capacity is high, but fixed and mobile broadband speeds could be better. London receives a high score on internet access and has the highest number of Wi-Fi hotspots among cities included in the Networked Society City Index. The city of London invests in wireless networks in public spaces and aims to become the city with the fastest wireless networks globally by 2016.

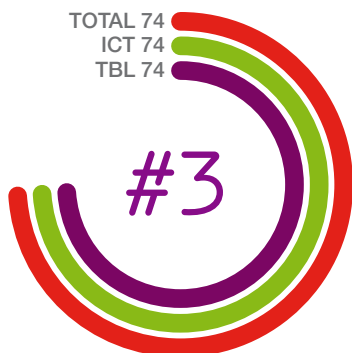


ICT Affordability

London scores well on ICT affordability. The ICT market in London offers competitive prices, according to the index. Many worldwide network operators are present in London.

ICT Usage

In terms of ICT usage, London performs well both on individual and market levels. London scores high in the use of computers, mobile phones, smartphones and tablets. The city of London wants to increase the number of people who think that the use of digital technology has improved London as a city to live in. The city performs well in e-governance with well-developed e-services and open data resources.



PARIS

Paris is the cosmopolitan capital of France, with 2.2 million people living in the central city and almost 12 million people living in the metropolitan area. The population density in the central city is one of the highest in the developed world, and is only slightly lower than Manhattan.

Paris' economy has gradually shifted towards high value added service industries and high tech manufacturing. However, it still remains an important manufacturing center of Europe, especially its industrial sector. The region of Paris is home to the headquarters of 30 of the Fortune Global 500 companies. Paris is also one of Europe's biggest providers of jobs in the IT sector and has around 70 schools and universities providing high-level IT and telecommunications courses to more than 20,200 students each year.

Paris is ranked #3 in the Networked Society City ICT Index. The city performs exceptionally well in all dimensions of both the ICT maturity and the triple bottom line indexes. Paris scores well when it comes to ICT affordability. The ICT infrastructure is also highly mature and a large share of the population has access to the internet. Moreover, broadband quality is high. Given the city's well-developed infrastructure, Paris has the potential to raise its ICT usage, which today is not as high as it could be.

Metropolitan population..... 11,980,000
 Density 700/km²
 Population yearly growth 0.5%
 GDP per capita PPP\$ 201156,400
 GDP per capita PPP\$ growth 2006-2011 ..3.7%
 ICT maturity improvement 2013-2014... Medium

+ High ICT affordability and well-developed ICT infrastructure.

- Below top-performers in educational attainment. Unemployment rate is above average.



TBL Social

Paris performs well in the social dimension. The city rates particularly well in life expectancy, with one of the highest scores in the index. Paris, is however, somewhat below top-performing cities in terms of educational attainment. The city also faces the challenge of unemployment and segregated city districts. Paris has launched several actions to meet the demands of social inclusion. For example, a massive urban renewal project has been launched to achieve a better integration of the city's districts and revitalize the metropolitan economy.

TBL Economy

Paris performs well in the economic dimension of the index. It is a strong economic and financial center and accounts for a large share of the country's GDP. Paris also has a high level of employment in knowledge-intensive sectors and its tertiary educational attainment is also high. Despite a slightly lower number of business startups and patents, Paris is evidently a competitive region. For instance, the city's competitiveness has been awarded a top-ten ranking in the EU regional competitiveness index 2013.





TBL Environment

The city's high environmental performance is mainly due to relatively low CO₂ emissions and fairly low pollution levels, except for nitrogen dioxide pollution which is slightly above average. During recent years, the general livability of Paris

has been improved by reducing pollution and improving facilities for transportation, including cycle paths, pedestrian districts and faster metro lines. The city is, however, prone to smog and a severe smog peak in 2014 resulted in a governmental decision to temporarily ban car-driving in the city.

ICT Infrastructure

Paris scores very high in general regarding access to ICT and is top performing in terms of international bandwidth capacity. A large share of the population has access to the internet and there are several available hotspots in the city. A

few years ago, the city of Paris contracted the second largest mobile telecommunications operator in France to supply and integrate an urban Wi-Fi network in the city, resulting in high access to free wireless broadband for both residents and visitors.



ICT Affordability

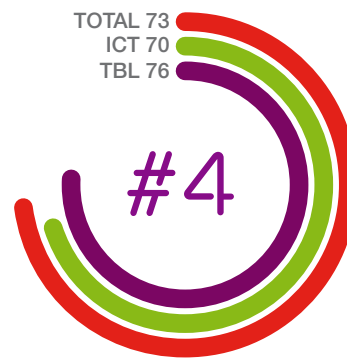
Paris scores well when it comes to ICT affordability, meaning that the cost of using internet and mobile phones is low in relation to income. Low tariffs in fixed broadband, together with low transit prices indicate that Paris'

population enjoys a competitive market with reasonable prices.

ICT Usage

Although Paris performs well when it comes to ICT usage, the rates are not as high as they could be. Given the city's well developed infrastructure, the city has the potential to raise its use of ICT.

Paris has a fairly well developed open data environment and the level of electronic payments is relatively high. However, overall results are lowered by a modest adaptation of new technologies. For example, Paris has a rather low smartphone and tablet penetration rate compared to other top-performing cities.



SINGAPORE

With 5.3 million inhabitants, Singapore is a global financial, industrial and technological hub, which has emerged as a leader in green ICT solutions. Singapore's success in ICT can be explained by its highly skilled workforce, great business climate, well-adjusted logistics, and its centralized compact location.

Singapore offers its inhabitants one of the highest living standards in Asia. For example, in 2014, the city was the highest scoring Asian city in Mercer's Quality of Living Survey. Moreover, the city was proclaimed to have the best infrastructure in the world. It should, however, be noted that Singapore's income inequality is considered one of the highest in the world.

Singapore is worthy of imitation for its work with sustainability. Its government has been determined and has emphasized the importance of green and clean cities. For example, Singapore was the first city to use modern toll roads to reduce road congestion and air pollution. During the past few decades, many green initiatives have been launched in both the public and private sectors. According to the National Climate Change Secretariat in Singapore, the city's green ICT industry comprises more than 80 of the top 100 software

Metropolitan population.....	5,400,000
Density	7,520/km ²
Population yearly growth	3.3%
GDP per capita PPP\$ 2012.....	62,100
GDP per capita PPP\$ growth 2011-2012 ..	1.2%
ICT maturity improvement 2013-2014...	Very low
+ World leader in fiber coverage. Pollution levels are low.	
- Quite high IP transit prices. Lack of highly educated people among the city population.	

and service companies in the world. Thus, Singapore is the undisputable world leader in this sector.

Singapore ranks #4 in the Networked Society City Index and performs equally well in usage, infrastructure and affordability. It has the highest ranking among the Asian cities. In 2012, Singapore had rolled out fiber to 95 percent of all properties, as showcased by the high speed of its fixed broadband. However, its mobile broadband speeds do not reach a comparatively high standard. On the other hand, Singapore still has one of the highest penetration rates of smartphones and tablets. A reason for Singapore's high performance might be the purposeful work by the Infocomm Development Authority of Singapore (IDA). It was formed in 1999 in response to the growing convergence of information technology and telephony. Since 2005, IDA's work has been guided by the Intelligent Nation 2015 master plan, which seeks to transform Singapore into "An Intelligent Nation, A Global City, Powered by Infocomm".



TBL Social

Singapore performs well in the social dimension of the index. The most distinguishing features are low unemployment and homicide rates, with the latter being the lowest of all included cities. However, a slight weakness concerns its

educational attainment rates which fall short compared to most high-performing cities. Singapore has, on the other hand, good gender equality rates in education and governance compared to other index cities.

TBL Economy

The city scores well in the economic dimension of the index. Singapore has the highest productivity, as measured by GDP, of all included South East Asian cities. Future competitiveness is also a strongpoint, with a highly educated labor force and a good business climate, as indicated by the many business start-ups. Singapore, for example, tops the World Bank's ranking for ease of doing business. A slight weakness is the rather low level of employment in knowledge-intensive sectors.



TBL Environment

Singapore performs very well in the environmental part of the index. The city government has worked hard to come to grips with this aspect, such as by implementing the Electronic Road Pricing (ERP) System to manage

road congestion. Air quality is very good, waste water is treated, the generation of waste is low, and recycling levels are high. One area where the city should improve concerns its high energy consumption which relies almost exclusively on fossil fuels.

ICT Infrastructure

Singapore has a very well-developed ICT infrastructure. Of Singapore's residential and non-residential premises, 95 percent can access the ultra-high-speed Next Generation Nationwide Broadband Network, which makes Singapore one of the most fiber-dense cities in the world. Thus, fixed broadband quality is one of the best in the world. On the other hand, mobile broadband is of more moderate quality and that should be the next area of improvement.

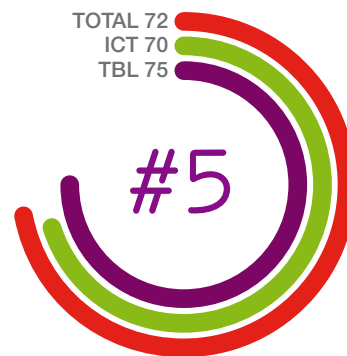


ICT Affordability

ICT affordability in Singapore is quite competitive on the global market. Both mobile phone tariffs and fixed broadband tariffs are comparable to top performing cities. On the other hand, IP transit prices are quite high and this is the reason the city is not one of the leaders in this dimension.

ICT Usage

Singapore has a well developed ICT infrastructure, offered at affordable prices. Therefore, the city also performs well in usage. The city has a high penetration rate of smartphones, computers and tablets. Internet use is around average. The city has a well-developed open data service, and this should spur the possibility of developing new innovations to further develop Singapore's connected society.



COPENHAGEN

Copenhagen is the capital of Denmark and is home to approximately 1.2 million people. Almost 2 million people live in the metropolitan area, which encompasses 35 percent of Denmark's population.

Copenhagen is the political and economic center of Denmark. The economy of the city is service-oriented, with life sciences being an important sector. Copenhagen is also a financial and cultural center in Northern Europe. It is one the most environmentally friendly cities of the world and well-known for its green economy. Copenhagen, therefore, plays a prominent role in sustainable innovation.

Copenhagen has also been ranked first place in Mercer's Quality of Living Survey two years in a row, and also ranked as the healthiest city by CNN. Copenhagen is among the most expensive cities in Europe. Moreover, in terms of gross earnings, Copenhagen is recognized as one of the richest cities in the world. The low taxation of foreign specialists makes the country an attractive alternative for foreign labor.

Copenhagen is ranked #5 in the Networked Society City Index. The city performs well in all dimensions of ICT maturity and in the triple bottom line dimensions. Denmark is a leading information society with high ICT maturity. The use of ICT is particularly advanced in areas such as health and robotics, energy technology, network technology, mobile communication and software development.

Metropolitan population.....	1,980,000
Density	710/km ²
Population yearly growth	0.8%
GDP per capita PPP\$ 2012.....	46,000
GDP per capita PPP\$ growth 2011-2012 ..	2.3%
ICT maturity improvement 2013-2014...	Very low

- + Copenhagen performs generally well in all dimensions of ICT maturity and in the triple bottom line dimensions.
- Copenhagen scores less well on unemployment and gender equality in higher education.

87 **TBL Social**
 Copenhagen performs well above average in the social dimension of the index, though there is still room for improvement. Copenhagen enjoys high educational attainment rates and performs well in terms of safety and in gender equality in governance. However, its score on unemployment and gender equality in higher education could be improved. With regard to health, Copenhagen performs well above average. Its life expectancy rate is somewhat lower, though, than other Scandinavian cities.

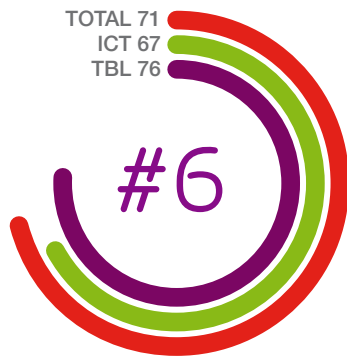
TBL Economic
 Copenhagen scores well in the economic dimension of the index. It also does well on economic competitiveness with a high score for knowledge intensive employment and tertiary educational attainment. With regard to business start-ups and patents, there is room for improvement. In terms of productivity, GDP per capita is high in Copenhagen. However, there is still room for improvement, as many cities in the index receive higher scores.

90 **TBL Environmental**
 Copenhagen performs well in the environmental dimension of the index. Compared to other cities in the index, Copenhagen is a clean city with low levels of pollution. Due to the high standard of living, the city contributes to climate change in terms of resource use and CO₂ emissions.

57 **ICT Infrastructure**
 Mobile broadband quality is fairly high in Copenhagen but there is room for improvement. The same can be said for fixed broadband speeds. Internet accessibility in Copenhagen is high, but a low score on Wi-Fi hotspots lowers the overall result.

97 **ICT Affordability**
 Copenhagen performs well in the ICT affordability dimension. In terms of IP transit prices and tariffs for mobile cellular, Copenhagen performs very well. There is, however, room for improvement in tariffs for fixed broadband. Copenhagen's performance indicates that the ICT market is competitive, with reasonable prices.

72 **ICT Usage**
 Copenhagen performs well in terms of ICT usage, achieving one of the highest scores of all cities for individual use of the internet and social networks. The relatively low level of mobile subscriptions and tablets is balanced by a high rate of smartphones and computers. The use of electronic payments is high and the city has developed an open data homepage. There is, however, still room for improvement compared to other top-performing cities.



HELSINKI

Helsinki is the capital and largest city of Finland, with a population of 616,000 inhabitants. The population of the Helsinki metropolitan area is 1.4 million, representing more than 25 percent of Finland's population. Helsinki receives a high position in many rankings of most livable cities in the world. Finland is known to have one of the best educational systems in Europe and was recently ranked one of the world's most peaceful and economically competitive nations.

As Finland's major political, educational, financial, cultural and scientific center, the Helsinki metropolitan area generates more than one third of Finland's GDP. Most of the largest Finnish companies are currently headquartered in the city and about 70 percent of multinational companies operating in Finland are settled in the Helsinki region. Finland is well known for design, and Helsinki was the World Design Capital 2012. In the autumn of 2012, the City Council also approved a global responsibility strategy, which focuses on outlining the social dimension of global responsibility in, for example, immigration and procurement issues. In addition, global responsibility successfully combines the ecological and social dimensions of sustainable development, which

Metropolitan population.....	1,410,000
Density	380/km ²
Population yearly growth	1.1%
GDP per capita PPP\$ 2011	47,400
GDP per capita PPP\$ yearly growth.....	1.3%
ICT maturity improvement 2013-2014.....	Low

+ High ICT use. Performs well in the social dimension of the index.

- Use of resources in terms of energy consumption and waste per person is higher compared to many other top performing cities. ICT infrastructure could be further improved.

are displayed in the city's application to become a FairTrade Town.

Helsinki is the main ICT cluster in Finland and ranks #6 in the Networked Society City Index. Finland is a highly advanced country in both producing and applying telecommunication services. ICT usage is very high in Helsinki. Indeed, its usage is much higher compared to its performance regarding ICT infrastructure. This indicates that the city has more to gain by further developing its ICT infrastructure. The city also performs very well in triple bottom line dimensions, which is to be expected of a city that performs well in many indexes measuring livability.



TBL Social

Helsinki often ranks high in indexes measuring livability. Life expectancy is high and the education level is one of the highest compared to the other index cities. The unemployment rate is, however, higher compared to many other cities. There are more women than men in education and gender equality is high in Helsinki's municipal parliament. Overall, Helsinki is one of the cities performing best in the social dimension of the index.

TBL Economy

The GDP per capita is not as high in Helsinki as in many of the other well performing cities, but the level is well above average. The competitiveness of the economy is, on the other hand, one of the highest in the index, together with other Scandinavian cities. Helsinki's tertiary education level is high and employment in knowledge-intensive industries is one of the highest. There are many patents per capita and the country ranks highly for ease of doing business.



TBL Environment

Helsinki performs fairly well in the environmental dimension of the index. Pollution levels are low, but energy consumption is around average. Importantly, the growth in energy consumption has slowed down in recent years. Waste per person is above average, but the city has a high recycling rate. The city's CO₂ emissions are average compared to the other cities in the index. The use of public transportation is not as high compared to many other cities in the index. Almost half of the population uses private vehicles as their main form of transportation.

ICT Infrastructure

Helsinki generally performs fairly well on the ICT infrastructure dimension. The city offers high speeds for fixed and mobile broadband. However, the levels are not among the highest in the index and its international bandwidth capacity is below average. Almost all households enjoy internet access, and access to high speed mobile broadband is good. However, fiber network penetration is not as high as in many other top performing cities.





ICT Affordability

Helsinki offers affordable ICT for city dwellers, with low tariffs for fixed and mobile broadband, as well as affordable transit prices, reflecting a competitive ICT market. The high penetration rates of new communication devices, low prices, and

the success of Finnish telecom services and equipment producers can be explained by the early liberalization of the Finnish telecom market.

ICT Usage

Helsinki has one of the highest scores in ICT usage, with only London and Stockholm performing better. Compared to its performance in ICT infrastructure, usage levels are very high.

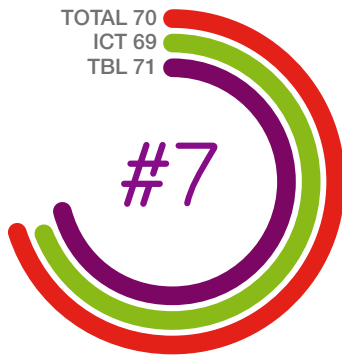
The penetration levels for smartphones and computers are also very high. However, tablet penetration levels are not equally high. Usage rates of internet and electronic payments are also very high and Helsinki has a well-developed open data resource.



Metropolitan population	8,410,000
Density	6,920/km ²
Population yearly growth	0.5%
GDP per capita PPP\$ 2011	67,200
GDP per capita PPP\$ growth 2010-2011 ..	1.7%
ICT maturity improvement 2013-2014	Low

+ Generally high performance in all dimensions of both TBL and ICT. Well-developed open data resources.

- Quite low app coverage compared to other top-performing cities.



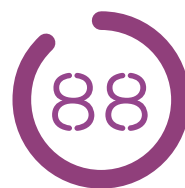
NEW YORK

New York City, also known as the Big Apple, is one of the world's great capitals and is the largest city in the USA, with 8 million inhabitants. It is also one of the most populous metropolitan areas in the world with a total population of 22 million. The city is highly integrated into the global economy and considered to be a political, financial and cultural center – one of the most visited places in the world.

In 2014, the American journal Foreign Policy published its latest update of the Global Cities Index, in which New York ranked first. The criteria for the ranking were designed to find the world's largest, most interconnected and influential cities that serve as hubs for global integration and are an engine of growth in their particular area. New York has a proven ability to attract capital, businesses, talent and visitors. Twenty-six of the Fortune Global 500 companies have their headquarters in the city, and New York is celebrated as a hub for international business activity. The city exerts global impact upon finance, media, art, fashion, research technology, education and entertainment. It also ranks highest on the Innovation Cities Global Index compiled by the agency 2thinknow.

Many districts and landmarks in the city have become well known to its approximately 50 million annual visitors. New York enjoys many symbolically valued institutions, such as the Statue of Liberty, Wall Street and Broadway. With its world leading Open Data Initiative, New York also claims a leading position in the ICT arena. Close to 60 city agencies contribute to providing a wide array of accessible data that can be used in apps or for research purposes. One ICT initiative that has been spurred is the City24/7 Smart Screen project, where obsolete things like pay phones are replaced with interactive platforms, accessible via Wi-Fi to incorporate hyper-local city information for the benefit of both inhabitants and tourists.

New York ranks #7 in the Networked Society City Index and it performs well in each of the ICT dimensions. New York is ranked highest of all cities outside Europe, besides Singapore. The city has a fairly developed ICT infrastructure, although more could be done in this dimension. Moreover, the city's index ranking also suffers from the relatively low proportion of inhabitants who use the full potential of these technologies. A number of projects are being implemented to increase the connectivity of New Yorkers. AT&T has, for example, developed a number of solar-powered street charging stations for smartphones, as a statement on the future importance of both ICT and sustainable development.



TBL Social

New York performs well in the social dimension of the index. The city achieves an especially high value for upper secondary education, which is the highest of all cities outside Europe besides Tokyo. Life expectancy and unemployment rates

are average compared to other index cities, but the homicide rate is above the average level.

TBL Economy

New York has the highest GDP per capita of all the included cities, apart from Abu Dhabi. It is also a competitive city with a highly educated labor force and high employment levels in knowledge-intensive sectors. Its slight weakness concerns a lower number of patent applications and few business start-ups compared to many other top-performing cities.



TBL Environment

New York's weakness concerning its triple bottom line performance is clearly the environmental dimension. The city's waste generation per capita is high, and recycling rates are low. Moreover, it relies heavily on fossil fuel for its energy consumption. The NYCWasteLess project is, therefore, a welcome contribution in aiming to decrease waste levels. At the same time, the environmental impact of the city is quite low and the air quality is quite high for an American city.

ICT Infrastructure

New York enjoys a fairly well-developed ICT infrastructure. Recent years have seen a great expansion of the fiber coverage in the city. This should spur a development in access, broadband speeds and total bandwidth in the city, which at the moment reach few customers compared to other cities with similar fiber coverage. The availability and quality of the mobile network is average compared to other cities in the index.

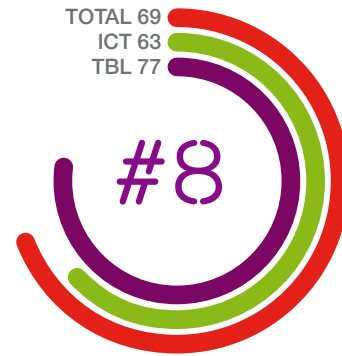


ICT Affordability

New York performs well in affordability, and is highly competitive in the global arena. Moreover, it is important to emphasize the high quality of services that New Yorkers can get for such low prices. The city performs less well in mobile cellular tariffs compared to fixed broadband tariffs.

ICT Usage

New York performs reasonably well on ICT usage. The city hosts many ICT initiatives, most prominently the world-leading project on open data. The city stands clearly at the forefront on both infrastructure and affordability and its moderate use of ICT will probably only increase with time. The city already has high penetration rates for smartphones and tablets.



OSLO

Oslo is the capital and most populous city of Norway. The city is home to approximately 634,000 people, constituting 12 percent of the Norwegian population. Oslo is one of the fastest-growing cities in Europe as a result of record levels of immigration, a rising birth rate and rising life expectancy rates.

With a strong and diversified economy, Oslo is the trading, industrial, financial and shipping center of Norway. Oslo is also a center for Europe's maritime industries and maritime trade. The oil industry is central to Norway's economy and a large number of oil and gas companies are situated in Oslo.

Oslo is also, somewhat paradoxically, known for being one of the world's greenest cities. In 2012, Oslo was ranked number one for quality of life in the European Cities of the Future report by fDi magazine. Oslo is also known for its high cost of living, with high prices for goods and services.

Oslo is ranked #8 in the Networked Society City Index and enjoys the highest performance, bar Stockholm, in the index's triple bottom line dimensions. While Norway is a leading information society, there is room for further improvement in terms of ICT maturity.

Metropolitan population	1,500,000
Density	170/km ²
Population yearly growth	1.9%
GDP per capita PPP\$ 2011	54,400
GDP per capita PPP\$ growth 2010-2011	-2.5%
ICT maturity improvement 2013-2014	Very low

+ Oslo outperforms other cities in the index on gender equality in governance.

- Although Oslo is a leading information society, there is room for further improvement in terms of ICT maturity.



TBL Social

Oslo performs well in the social dimension of the index. With one of the highest life expectancy rates and one of the lowest infant mortality rates, Oslo scores high in terms of health compared to other cities in the index. Educational attainment in

Oslo is high and the unemployment rate is rather low. Oslo outperforms other cities in gender equality in governance. There is, however, room for improvement in safety and in gender equality in higher education.

TBL Economic

Oslo scores high in the economic dimension, having one of the highest GDPs per capita of all cities included in the index. Apart from Stockholm, Oslo outperforms other cities in economic competitiveness. Oslo scores high regarding knowledge-intensive employment and tertiary educational attainment. However, there is room for improvement regarding business startups and patents.



TBL Environmental

Oslo performs well in the environmental dimension, with pollution levels considerably lower than average, though nitrogen dioxide levels in the city are fairly high. There is room for improvement in resources use and CO₂

emissions. Energy consumption is very low in the city, but total waste per person is just below the average level.

ICT Infrastructure

Norway is a leading information society, which is both developing and adapting new advanced technologies and communication techniques. While Oslo enjoys a well-developed ICT infrastructure, there is room for further improvement. Internet access is almost 100 percent and mobile broadband quality is high. Internet bandwidth and access to fiber can, however, be improved. The number of hotspots in Oslo is not extensive and international broadband capacity is low.



ICT Affordability

Oslo performs well in the ICT affordability dimension. The tariffs for mobile and fixed broadband are low, and IP transit prices are also very low. The ICT market in Oslo offers competitive prices according to the index.

ICT Usage

Oslo performs above average in terms of ICT usage. It outperforms other cities in the index in terms of individual internet usage. It scores high on social networking, and on the public and market use of ICT. Computer and smartphone usage is high. However, the city's performance regarding mobile subscribers and tablets could be enhanced. Due to the large number of advanced users with high purchasing power, the Oslo region works as a great test market for new ICT products.



HONG KONG

Hong Kong, once a British colony, became in 1997 a Special Administrative Region of the People's Republic of China (PRC). With more than 7 million people, it is one of the most densely populated areas in the world.

Growing rapidly in the post-war period, Hong Kong soon became industrialized, developing an export-led manufacturing sector. However, in recent decades, its economy has become more service-based, partly due to low taxation and free-trade policies. Indeed, today it is the world's eleventh largest trading entity with its imports and exports exceeding its gross domestic product. Hong Kong is a gateway to China, so many of its exports are actually re-exports – goods produced outside of the territory, especially from the PRC, and then distributed via Hong Kong.

As a sign of its importance, the Hong Kong dollar is the eighth most-traded currency in the world and the Hong Kong stock exchange is the seventh largest in the world. Hong Kong also has one of the world's highest incomes per-capita. As such, it holds numerous high international rankings in various aspects such as economic competitiveness, quality of life and perceptions of corruption. It is therefore not surprising that it is a leading center for management, finance, IT,

Metropolitan population	7,300,000
Density	6,550/km ²
Population yearly growth	0.6%
GDP per capita PPP\$ 2012.....	50,900
GDP per capita PPP\$ growth 2011-2012...	2.4%
ICT maturity improvement 2013-2014...	Very low

- + Hong Kong has the highest fixed broadband speeds and very high technology use.
- Average performance of mobile broadband network and low educational attainment.

business consultation and professional services, with one of the greatest concentrations of corporate headquarters in the Asia-Pacific region.

Hong Kong ranks #9 in the Networked Society City Index, outperforming the majority of assessed cities. Importantly, its performance varies rather widely both within dimensions but also within specific variables, reducing the city's overall position. This is important to note as Hong Kong scores the absolute highest among cities in several indicators, such as health and technology use. However, the performance of its mobile broadband network is around average and there is a need to improve tertiary educational attainment.

83 **TBL Social**
 On the social dimension of the TBL index, Hong Kong performs well, and it ranks the highest of index cities in the health variable. Regarding education, literacy rates are very high although it ranks well below the leaders in educational attainment. Hong Kong also ranks high in social inclusion as it has low unemployment, low homicide rates and balanced gender representation in higher education. However, the gender balance in the city's governance structure is highly unbalanced, decreasing the city's overall ranking in the social dimension.

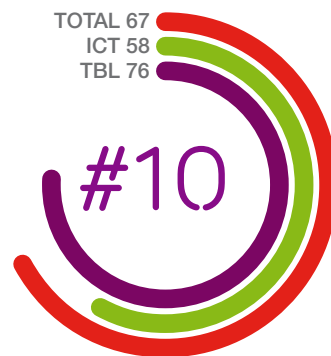
TBL Economy
 Hong Kong does not perform as well on the economic dimension of the TBL index. Its GDP per capita, accounting for PPP, is high and business start-ups are three times higher than its nearest competitor in the index. However, tertiary education is low. There are also very few patents registered, not least when compared to Tokyo, and the city's knowledge-intensive employment levels are low compared to the index as a whole.

85 **TBL Environment**
 Hong Kong performs above average in the environmental dimension. Although it has fairly high waste creation, it also recycles a majority of that waste. However, compared to leading cities, its PM10, PM2.5, sulfur dioxide and nitrogen oxide pollution levels are fairly high. Moreover, the city is highly reliant on fossil fuels to sate its energy demand. In CO₂ emissions, it ranks average.

ICT Infrastructure
 Hong Kong's fixed broadband speeds are by far the highest among index cities. However, in its app coverage and international bandwidth capacity, the city does not perform as well. The internet access rate in the city is high and its fiber optic infrastructure is well developed, although behind leading index cities. As such, Hong Kong's ICT infrastructure provides a mixed picture. This could in part be explained by the disproportionately extensive use of its fixed broadband infrastructure.

96 **ICT Affordability**
 Hong Kong ranks at the top of index cities in ICT affordability, due to very low mobile cellular prices compared to income level. However, fixed broadband prices are slightly higher. Moreover, Hong Kong ranks fairly well on IP transit prices, although they are higher than in leading index cities that also perform well in ICT.

ICT Usage
 Regarding ICT usage, Hong Kong performs surprisingly worse than expected. Although it scores the highest of index cities on the technology use indicator due to widespread diffusion of ICT technology, the use of this technology by individual, private and public actors is well below cities of equal development. Hong Kong does, nevertheless, have well-developed e-services, albeit lacking in open data resources.



TOKYO

Tokyo, the capital of Japan and the largest metropolitan region in the world, is home to approximately 35 million people. As such, it is also the world's largest urban agglomerated economy.

Tokyo was originally a small fishing village named Edo. During the Edo period, Tokyo grew into one of largest cities in the world. In the 19th century, when Emperor Meiji moved to Edo, Tokyo city was established and became the imperial capital. Tokyo experienced two major catastrophes in the 20th century; the Great Kanto earthquake and the Second World War. After the war, Tokyo was completely rebuilt. Today, Tokyo is known as one of the three "command centers" of the world economy and Tokyo is also ranked as the world's "smartest" city according to the IESE Cities in Motion Index (ICIM).

Tokyo's GDP per capita (at purchasing power parity) is one of the highest among index cities. Its economic growth has been low since the economic crisis of the early 1990s, but the city has slowly been recovering. Tokyo is a major international finance center and

houses the headquarters of several of the world's largest investment banks and insurance companies. It also serves as a hub for Japan's transportation, telecommunication, publishing and broadcasting industries.

Public transport, mostly rail-based, is widely used in Tokyo. Indeed, its population enjoys the most extensive urban railway network in the world and an equally extensive network of surface lines. As such, more than 50 percent of Tokyo's population uses public transport as their main mode of transportation. Only one in ten use private motor vehicles. Tokyo's cuisine is internationally acclaimed and the Michelin Guide has awarded Tokyo by far the most Michelin stars of any city in the world.

Tokyo ranks #10 in the Networked Society City Index. The city performs much better in the triple bottom line dimensions compared to its ICT Maturity. It rates lower on ICT usage than in the infrastructure and affordability dimensions, mostly due to lower performance in public usage. The city has much to gain by developing e-services and open data resources to facilitate innovation.

Metropolitan population.....	35,680,000
Density	2,630/km ²
Population yearly growth	0.8%
City GDP per capita PPP\$ 2010	62,500
GDP per capita PPP\$ growth 2009-2011 ...	0.7%
ICT maturity improvement 2013-2014 ...	Medium

+ Good access to high speed broadband networks and high technology usage.

- Lacks well developed open data resources and mobile broadband speeds are low.

TBL Social
 Tokyo performs well in the social dimension. Life expectancy is very high, unemployment rates are low and the homicide rate is among the lowest of the index cities. Educational attainment is high and enrollment is almost equal for men and women. However, women are underrepresented in the Tokyo Metropolitan Assembly.

TBL Economy

Tokyo enjoys one of the highest performances in the economic dimension as both productivity and competitiveness are high. The education level is high, knowledge intensiveness in the economy is high, and Tokyo is the city with most registered patents per capita. The ease of doing business is good, but many cities in the index perform better than Tokyo in this aspect.



TBL Environment

Tokyo performs well in the environmental dimension of the index. Pollution levels are low. Total waste per capita and energy consumption are also low. CO₂ emissions are average compared to the other cities in the index. Use of public transport is high, which is one of the reasons Tokyo performs well in this dimension. The city is aiming to reduce greenhouse gas emissions by a total of 25% by 2020 from its 2000 level.

ICT Infrastructure

Tokyo's ICT Infrastructure is good when it comes to access to high speed fixed and mobile broadband. But broadband quality is not equally good. Fixed broadband speeds are well above average among the cities in the index, but app coverage is low. This may be a result of insufficient capacity in the network. Its international bandwidth capacity is just above average for the cities.



ICT Affordability

Fixed broadband and mobile cellular tariffs are low in the city. IP Transit prices are, however, higher compared to many other top performing cities.

ICT Usage

Tokyo performs less well in its ICT usage compared to its infrastructure and affordability. Technology use, such as smartphones and tablets is quite high, as is internet usage. However, Tokyo performs less well in e-governance. Access to city services through the web is lower compared to many other cities. There is also a lack of open data resources. These problems could hinder further innovations.





LOS ANGELES

Los Angeles – the self-proclaimed creative capital of the world – is the second largest city in the USA with a population of 3.4 million. The Greater Los Angeles Area is home to more than 15 million people. The city is situated in California, and is known for its mild climate, highways, celebrities, shopping and beautiful beaches. Los Angeles has also been recognized as one of the most ethnically diverse cities in the USA.

Los Angeles is an important economic hub in the USA, with a highly developed private sector based around business, media, fashion, science and sports. The city is, however, best known for its creative industry, especially the movie industry based around Hollywood and its music industry. The city is also a world leader in the number of museums and art galleries per capita.

The City's Information Technology Agency (ITA) confirms Los Angeles' position as a technological hub. The Agency is responsible for the planning, design, implementation, operation and coordination of the city's information technology system, its ICT networks, and for its information processing and communication services. The city has also spawned other innovative ICT solutions, such as the Los Angeles Open Budget portal, which aims to increase transparency and clarify financial streams in the region. The LA Express Park is another such project, aiming to inform drivers and decrease air pollution. Finally, the Edge.LA project aims to spur start-ups by increasing the flow of technology and information among companies and people.

Los Angeles ranks #11 in the Networked Society City Index. The city performs at a good or high level on each ICT dimension. The city can, at the moment, offer affordable ICT technologies of a quite well-developed standard. However, it does not stand out in relation to other comparable cities. Fortunately, a city project is being initiated to bring fiber to all Los Angeles residents. This could possibly spur ICT development in Los Angeles and thus transform the city into a world leader in ICT.

Metropolitan population.....	3,880,000
Density	2,980/km ²
Population yearly growth	0.4%
Metropolitan GDP per capita PPP\$ 2011 ..	57,700
GDP per capita PPP\$ growth 2010-2011 ...	2.9%
ICT maturity improvement 2013-2014	Low

+ Affordable ICT services and quite well-developed open data resources. High levels of waste recycling.

- Low fiber coverage. Low proportion of females in the city governance structure.



TBL Social

Los Angeles achieves average performance in the social dimension of the index. The city's performance in health and education is above average. What drags the city down are the relatively high rates of unemployment and homicide and almost total lack of women in its governance structure. The unemployment rate has however been falling but this is due more to people leaving the labor force than people actually getting a job.

TBL Economy

Los Angeles is known to score high in economic power in various global indexes, noted here by a comparatively high GDP per capita. The city's score is, however, reduced by the low proportion of people who have gained tertiary education and the low level of employment in knowledge-intensive sectors. There are, however, initiatives like Edge.LA which aim to spur start-ups. This could possibly attract more well-educated people to the area.



TBL Environment

Los Angeles has set itself a target to become the greenest city in America; this is reflected in notably high waste recycling levels. However, high automobile use is a problem for the city, as it causes an overreliance on fossil fuels, high CO₂ emissions and air pollution. There are many initiatives to address this problem, but it will probably take some time before Los Angeles also stands out as a leading environmental city.

ICT Infrastructure

Los Angeles has a quite well-developed ICT infrastructure. However, more can be done, such as the fiber technology initiative that aims to bring technology to all of the city's inhabitants. This could make the city competitive not only in America but also in the global arena regarding this dimension. The city also achieves an average rating for app coverage.





ICT Affordability

The affordability of ICT in Los Angeles is clearly competitive on a global scale. But it is also clear that more can be done concerning the availability and quality of the services. IP transit prices are low, as are fixed broadband tariffs. However,

mobile cellular tariffs are around average compared to other index cities.

ICT Usage

Los Angeles is considered one of the key technology hubs in the USA. The penetration rates for smartphones and tablets are quite high. Businesses and individuals are relatively high users, but they are not world leading. However, initiatives like the city project to deliver fiber to all inhabitants and the new Los Angeles Open Budget portal initiative give an indication of the city's ambition to spur ICT usage. The city does already perform quite well in e-governance.



SEOUL

Seoul is a city that fascinates the world. Over the years, Seoul has transformed from a fortress town into a gigantic metropolis. The city is now home to 10 million inhabitants and the metropolitan area hosts nearly 25 million people, which is half of the South Korean population. Located at the heart of the Korean Peninsula, Seoul has always been an important strategic point throughout the centuries in terms of defense and economy.

Since the Korean War, Seoul has been the focus of immense reconstruction and modernization efforts. After liberation in 1945 and the end of the Korean War in 1953, extremely rapid population growth caused an urban sprawl extending far beyond the Han river. Beginning in the 1990s, urban development policy changed from growth-oriented to sustainability-oriented. This was the turning point for urban planning, which put quality of life before growth.

Today, Seoul is considered a leading and rapidly rising global city, resulting from an economic boom since the 1980s. With its Digital Media City, a high-tech complex

City population 10,140,000
Density 16,750/km²
Metropolitan population yearly growth 0.9%
Metropolitan GDP per capita PPP\$ 2012.. 30,500
GDP per capita PPP\$ growth 2011-2012... 2.6%
ICT maturity improvement 2013-2014... Very low

+ Highly developed ICT infrastructure, which will be further improved by the 5G master plan.

- Gender equality needs to be addressed for the city to realize full potential of its population.

for digital technologies, Seoul is a world leader in technology and boasts well-known multinational companies such as Samsung and LG. At the time of writing, three new cities are being built outside of Seoul (Incheon Free Economic Zone) where Seoul plans to develop “the undisputed IT powerhouse of the world” by creating an environment for advanced industry, research, manpower, software and hardware development, facilities, and data. The country ranks as number one in the ITU’s ICT Development Index.

Ranked at #12 in the Networked Society City Index, Seoul performs above average, but still faces great challenges, especially regarding the triple bottom line dimensions. Seoul is ranked as higher in ICT maturity than in the triple bottom line index.



TBL Social

Seoul performs above average in the social dimension of the index, with low infant mortality rates, average life expectancy, low unemployment rates and above average educational attainment. Likewise, Seoul performs quite well in health, education and social inclusion. However, Seoul’s average performance in the social dimension is reduced due to the city’s poor performance in gender equality.

TBL Economy

Compared to many other well-performing cities in the index, Seoul scores relatively low in the economic dimension. It performs fairly well on competitiveness with good results in tertiary educational attainment, an average level of employment in knowledge intensive sectors, and an average number of patent registrations. However the city’s productivity rates are below average. GDP growth rates are also increasing after the effects of the global economic recession.





TBL Environment

Seoul performs below average in the environmental dimension. The levels of pollution are around average and the total waste per capita is the highest among the cities in the index, even though high recycling rates

compensate to some extent. However, Seoul's CO₂ emissions are low compared to the city's economic performance. The Seoul government has taken measures to improve the environment. For example, smart meters have been introduced to reduce the city's total energy use by 10 percent, by recording the consumption of electricity, water and gas in homes, offices and in factories.

ICT Infrastructure

Seoul has a highly developed ICT infrastructure and performs well in fixed broadband speeds, internet access, hotspots, high-speed mobile broadband, and fiber. However, Seoul still needs to improve its infrastructure to be at the top. The city's app coverage is average and the international bandwidth capacity is not especially high compared to other top-performing cities. National initiatives are planned to make Korea the world's first 5G mobile nation by 2020, a measure that would greatly improve the city's ICT infrastructure.



ICT Affordability

Seoul performs well in the affordability dimension. However, relative to income levels, affordability could be better. This is true especially for IP transit prices and fixed broadband tariffs.

ICT Usage

Seoul is one of the fastest-moving mobile markets in the world, with an outstanding growth rate in the number of users. Mobile internet usage is also higher than the global average. Fast broadband speeds induce high individual internet and social network consumption. Penetration rates for more advanced technologies such as smartphones and tablets are also fairly high, reflecting the people's role as early adopters of new technology and their high living standard. Public and market use also scores high due to the use of electronic payments and open data.



TAIPEI

Taipei is the capital of Taiwan and is home to about 2.7 million people. Around 7 million live in its metropolitan area. Taipei City is situated in the northern part of Taiwan.

Taipei is the political, economic and cultural center of Taiwan and part of a major industrial region. Together with Singapore, South Korea and Hong Kong, Taiwan is one of the "Four Asian Tigers". Taipei has been the center of Taiwan's rapid economic development. The city has become a major power in the production of high-tech products. In order to develop Taipei into a global high-tech center, the Taipei City Government has, in cooperation with a number of software industrial and technological parks, created the "Taipei High-Tech Corridor".

Taipei ranks #13 in the Networked Society City Index. Taipei performs rather well in terms of ICT maturity but there is still room for improvement. The city performs quite well regarding the triple bottom line dimensions, especially in the social dimension where the city receives one of the highest scores. The Taipei City Government has been devoted to creating innovative

City population	2,690,000
Density	9,910/km ²
Population yearly growth	0.7%
Country GDP per capita PPP\$ 2012.....	38,500
GDP per capita PPP\$ growth 2011-2012...	2.9%
ICT maturity improvement 2013-2014.....	Low

+ Taipei performs very well on its social dimension, having one of the highest scores of the index. App coverage is also very high.

- Even though Taipei performs fairly well in ICT maturity there is room for improvement. The city performs less well in usage compared to its well-developed infrastructure.

services through e-Government, e-Community and e-Life with “Intelligent City and Quality Life” as its vision. At the end of 2013, the city government’s mobile services contained 37 apps.



TBL Social

Taipei performs well in the social dimension, having one of the highest scores of the index. The city’s population enjoys high life expectancy rates and fairly low infant mortality rates. Educational attainment is also quite high. Taipei

also performs very well in terms of social inclusion, having a low unemployment rate and gender equality is high in governance and fairly high in higher education. There is, however, room for improvement in terms of homicide rates.

TBL Economy

Taipei’s economic performance is average. Compared to other cities in the Networked Society City Index, Taipei’s economic productivity in terms of GDP per capita could improve. Taipei’s economic competitiveness in knowledge-intensive employment, patents and business start-ups could be higher. There is also room for improvements in tertiary educational attainment.



TBL Environment

Taipei performs well in the environmental dimension compared to other index cities. The city has quite low energy consumption, and waste per capita and the recycling rate is relatively high. However, Taipei’s climate impact,

in terms of CO₂ emissions in the city, is on an average level compared to other index cities.

ICT Infrastructure

Compared to other cities, Taipei performs well in the ICT infrastructure dimension. Internet access is high as is access to fiber and high-speed mobile broadband. The city’s broadband quality is also rather high but leaves room for improvements, especially in terms of international bandwidth capacity. The city has one of the highest app coverage rates among the cities in the index.



ICT Affordability

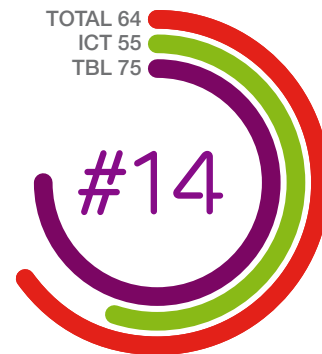
Taipei performs rather well in terms of ICT affordability. Compared to other cities in the index, fixed broadband prices are low. On the other hand, mobile phone tariffs and IP transit prices could be lower.



ICT Usage

Taipei performs fairly well in ICT usage. Technology use in terms of mobile phone subscriptions, smartphone penetration, households’ access to computers, and tablet penetration leaves room for improvement. In particular, smartphone penetration is lower compared to many top-performing cities. Individual internet use and use of social networks is nevertheless rather high compared to other cities in the index. Open data and e-services are well developed in Taipei but the usage of electronic payments is not as common as in many other cities.

TOTAL 64
ICT 55
TBL 75



MUNICH

Munich, located on the elevated plains of Upper Bavaria, is the capital and largest city in the state of Bavaria, Germany. The city has an estimated population of about 1.4 million people, and is one of the fastest growing cities in Germany.

Munich is a prosperous city and has the strongest economy of all cities in Germany. The city is a financial and economic center as well as a center for higher education and research. Many large companies have their headquarters in Munich. Munich is also a center for the software industry, with access to the large pool

City population 1,390,000
Density 4,470/km²
Population yearly growth 1.0%
Metropolitan GDP per capita PPP\$ 2011 .. 59,000
GDP per capita PPP\$ growth 2010-2011 ... 4.9%
ICT maturity improvement
2013-2014.....not applicable, city new to index

+ Munich outperforms other cities in the social dimension of the index.

– Its ICT infrastructure leaves room for improvement, especially in mobile broadband quality.

of IT specialists in Bavaria. The European Commission has identified Munich as Europe's top technology hub. The city has a prominent role in Europe in terms of ICT research & development and ICT innovation.


The Monocle ranked Munich as the world's most livable city with the highest quality of life in 2013. The city is a top tourist destination. However, the rapid population growth in Munich poses challenges such as increasing demands on public space and housing affordability.

Munich ranks #14 in the Network Society City Index. It performs well in the triple bottom line index, especially in the social dimension where it outperforms other cities. Munich performs rather well in terms of ICT maturity but there is still room to improve.




TBL Social
Munich outperforms other cities in the social dimension, having the highest score in the Network Society City Index. Infant mortality rates are low and life expectancy is high. Educational attainment is also high. Munich scores well in social inclusion, with low unemployment rates and high gender equality in governance. Munich has the lowest unemployment rate of any German city with more than a million residents. In terms of gender equality in higher education, there is room for improvement.

TBL Economy
Munich also performs well in the economic dimension of the index but it could still improve. Productivity is high in Munich in terms of GDP per capita. Regarding economic competitiveness, Munich performs very well in terms of patents, with one of the highest scores of all cities included in the index. However, there is room for improvement in business start-ups and knowledge-intensive employment.


TBL Environment
Munich performs well in the environmental dimension of the index. The city performs very well in terms of pollution, but could improve resource usage and CO₂ emissions. Both energy consumption and waste per capita are higher than the index average.

ICT Infrastructure
Even though the European Commission has identified Munich as Europe's top technology hub, the ICT infrastructure in the city can be improved. Internet access and access to fiber are high, but Munich could do better in access to hotspots and high-speed mobile broadband. Its broadband quality can also be improved, especially when it comes to app coverage.

ICT Affordability
Munich score high in terms of ICT affordability. The ICT market in Munich offers competitive prices according to the index. IP transit prices, mobile cellular tariffs, and tariffs for fixed broadband are all low.

ICT Usage
In terms of ICT usage, Munich performs well. It scores highly for public and market usage of ICT, with well-developed open data resources and high use of electronic payments. Individual usage of ICT can, however, be further improved. Smartphone and computer penetration is high but the level of mobile phone subscriptions and tablet penetration could be higher.




MIAMI

Although Miami is a rather small city of around 400,000 people, its metropolitan region is home to more than 5.5 million. This makes it the eighth largest urban agglomeration in the United States. In 2012, Miami was classified as an alpha world city by the Globalization and World Cities Research Network which denotes the city a economic hub for its region, connecting it to the global economy.

Miami is influenced by its Latin American heritage and has been called by some the "capital of Latin America". The city is a leader in a diverse array of areas, including finance, commerce, culture, media, entertainment, arts and international trade. It is also a major television production center, and the city's connection to Latin America makes it the most important city in the United States for Spanish language media. The 38 million annual visitors make tourism one of its leading industries and confirm Miami's attractiveness.

Miami is also emerging as a leading actor in the ICT arena with several interesting ongoing projects. For example, Miami-Dade County and IBM have started a program applying Big Data analytics to, for example, save water in parks with the use of smart valves and computer tracking. Another interesting project is The Energy Smart Miami initiative, deploying smart meters

City population 420,000
 Density 2,930/km²
 Metropolitan population yearly growth 0.9%
 Metropolitan GDP per capita PPP\$ 2011 .. 46,500
 GDP per capita PPP\$ growth 2010-2011 ... 0.9%
 ICT maturity improvement 2013-2014... Very low

+ Provides affordable ICT services to a relatively high standard. One of the least polluted cities.

- Bad fiber coverage in the metropolitan area, no developed open data site. Very high homicide rate.

to homes and businesses to inform the inhabitants and help them manage their consumption, while also providing the Florida Power & Light Company (FPL) information to improve its system efficiency and consistency.

Miami ranks #15 in the Networked Society City Index and performs on a good or quite high level in each of the ICT dimensions of usage, infrastructure and affordability. The infrastructure is quite well developed and, in combination with affordable ICT services, this leads to high usage levels. However, a slight concern arises when comparing the city's future fiber development with the other American cities, as Miami lags behind both New York (with an already more developed fiber network) and Los Angeles (which has advanced plans in place for further development). A further expansion of the region's ICT infrastructure is needed to maintain Miami's place as a competitive city on the world arena.

TBL Social

79

Miami performs at an average level in the social dimension of the index. The city provides fairly high levels of both health care and education services. However, compared to other well-developed, cities Miami unfortunately stands out with a very high homicide rate. One reason for this might be the large income inequality in the city. Another problem is the lack of gender equality in the governance structure as only one out of nine of city officials is a woman.

TBL Economy

43

Miami achieves an average value on the economic dimension of the index. The city has quite high GDP per capita, but it is lower than the other American cities in the index. The city has an average rate in the knowledge-intensive sectors, which is

considerably lower compared to other well-developed cities in the index. Initiatives to improve the access of quality jobs, and to attract a skilled labor force, are clearly needed.

TBL Environment

78

Miami stands out as one of the least polluted cities in the index and has frequently been ranked as one of the cleanest cities in the United States. The city's average score is decreased due to the high waste generation, of which only a low proportion is recycled. Also, the city's energy consumption mostly derives from fossil fuel. The Zero Waste initiative created by a group of students could possibly lead to a brighter future concerning the city's waste problem.

ICT Infrastructure

49

Miami's ICT infrastructure is above index average. Compared to other American index cities, it is slightly more developed than Los Angeles' infrastructure but less developed than New York's. It is, however, clear that the city would benefit a lot from an expansion of its fiber network. AT&T has announced that it is determined to perform this expansion, although the city is yet to make a decision. The availability and quality of the mobile broadband network is around average compared to other index cities.

ICT Affordability

93

The affordability of ICT in Miami is highly competitive on a global scale. This is especially true concerning the tariffs for fixed broadband, and its IP transit prices are low. The one area where Miami lags behind the most affordable cities is mobile cellular tariffs, which are more expensive.

ICT Usage

56

Miami is above index average in ICT usage, although well behind leading cities in this dimension. The public and market usage holds a consistent level. Technology use is average for smartphones and computers, but quite high for tablets. The city should provide more open data to spur innovation. This is especially important when one considers that New York has come much further and Los Angeles, though not yet finished, has agreements in place for more developed open data services.



BERLIN

Berlin, the capital and largest city of Germany, is home to about 3.5 million people. Berlin is an internationally acclaimed city in the fields of science, politics, culture and media.

Berlin is a creative and dynamic city, with a wide range of cultural offerings in opera, festivals, theater, concerts, and literature. Berlin is also a leading center for academia, research and science. Berlin's economy is dominated by the service sector and is based on high tech firms. The tourism industry experiences higher growth rates than any other business sector. Opportunities for growth are also found in the cultural and creative industries, as well as in innovative economic sectors.

ICT is an important sector for Berlin. The city enjoys modern communication networks and one of Europe's most modern science and technology parks. Berlin is known for its high quality of life, with its population enjoying access to recreation areas, diverse cultural

City population	3,520,000
Density	3,940/km ²
Population yearly growth	0.4%
GDP per capita PPP\$ 2011	34,800
GDP per capita PPP\$ growth 2010-2011 ...	3.7%
ICT maturity improvement 2013-2014.....	not applicable, city new to index

+ Berlin achieves more gender equality in higher educational attainment compared to other cities in the index. Access to the internet is high.

- Berlin performs above average in the economic dimension of the index but could do better. Access to and quality of its mobile broadband network needs to improve.

options, and natural environment. The city is also known for its architecture and vibrant nightlife.

Berlin ranks #16 in the Networked Society City Index and performs fairly well in ICT maturity and triple bottom line dimensions. Berlin does however perform much better in the triple bottom line index compared to its ICT maturity.



TBL Social

Berlin performs well in the social dimension of the index. Berlin achieves more gender equality in higher educational attainment compared to other cities in the index, and the city is safe. The level of gender equality in governance is fairly high but leaves room for improvement. There is also clear room for improvement in terms of unemployment rates. The life expectancy rate is high.

TBL Economy

Berlin performs above average in the economic dimension of the index but there is still room for improvement. Berlin's economic productivity in terms of GDP per capita is not one of the highest compared to other cities in the index. Berlin has a high score for knowledge-intensive employment, but still has room for improvement in tertiary educational attainment and patents. In terms of business start-ups, Berlin scores below average.



TBL Environment

Berlin performs well in the environmental dimension of the index compared to other cities. It performs well in terms of pollution, but it could improve its use of resources and reduce its CO₂ emissions. To take a more environmentally friendly approach, Berlin is seeking to modernize the city's infrastructure and present nature and landscape conservation measures.

ICT Infrastructure

In terms of ICT infrastructure, Berlin has room for improvement. Access to the internet is high in Berlin but access to hotspots, fiber and high-speed mobile broadband is rather low. Fixed broadband speeds are average, but app coverage (mobile broadband quality) is very low.

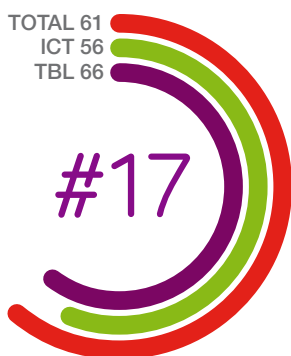


ICT Affordability

Berlin performs fairly well in terms of ICT affordability. It scores well in terms of IP transit prices, but tariffs for fixed broadband could be lower. Berlin's performance indicates that the ICT market is competitive with fairly reasonable prices.

ICT Usage

Berlin performs rather well in terms of ICT usage. Computer use is high, but there is room for improvement in tablet use, smartphone penetration and mobile phone subscriptions. Individual usage levels for the internet and social networks are rather high. Public and market ICT use is also high, as is use of electronic payments. Berlin, along with a couple of other cities, receives the highest possible score in the index for public and market usage of e-services and open data. The spectrum of open data information ranges from data on the power supply network, to the list of books burned in the 1930s, to data from the health care reporting system.



MOSCOW

As the beating heart of Russia, Moscow is the country's political, scientific, historical and financial center. With a population of almost 12 million, it is one of the largest cities in Europe.

Moscow has one of the largest municipal economies in Europe and accounts for more than 20 percent of Russia's GDP. It is also one of the most expensive cities of the world. Hence, Moscow and its surrounding area constitute a regional economic complex, which plays a key role in the economic development of Russia.

Moscow's economy is highly diversified and is home to the country's largest banks and companies, including leading natural gas and oil companies. However, while remaining one of Russia's major industrial centers, it has started transferring some industries out of the city, in an attempt to improve its environmental state.

The city is served by an extensive transit network, which includes four international airports, nine railway terminals, numerous tram systems, a monorail system, and one of the deepest underground metro systems in the world. The Moscow Metro is indeed the fourth largest in the world and the largest outside of Asia in terms of passenger numbers.

Moscow is ranked as #17 in the Networked Society City Index, placing it in the upper half of included cities.

City population	12,110,000
Density	4,820/km ²
Population yearly growth	1.1%
GDP per capita PPP\$ 2011	36,900
GDP per capita PPP\$ growth 2010-2011 ...	4.4%
ICT maturity improvement 2013-2014	High

+ ICT affordability is high. A low unemployment rate highly improves Moscow's results in the social dimension.

– While GDP per capita is relatively high, economic competitiveness – describing much of the city's future prospects – leaves room for improvement.

The city performs better in ICT infrastructure than in ICT usage. Moscow has also made progress and improved its position in the index since last year, but still faces many challenges before it can be regarded as a socially, economically and environmentally sustainable city.



TBL Social

Moscow enjoys a low unemployment rate (considerably lower than the national average) and thus scores relatively high in the social dimension. However, life expectancy is fairly low and differs considerably between men and women. Moreover, the city's educational attainment can be improved to improve Moscow's future prospects. Moscow is also affected by a higher homicide rate than many other cities. It has a rather low representation of women in its city governance structure.

TBL Economy

Moscow is the economic and financial center of Russia. However, that is not reflected in its performance in the economic dimension. While GDP per capita is relatively high (considerably higher than the average in Russia), its economic competitiveness – indicating the city's future prospects – leaves room for improvement. Business startups, patents and employment in knowledge-intensive services could be improved, but tertiary educational attainment is high. Overall, economic stability has improved in recent years. But, crime and corruption continue to hinder business development.



TBL Environment

Moscow's environmental issues include waste recycling levels, high CO₂ emissions, and high fossil fuel energy consumption. These areas could be improved by increased awareness and smart city management. Cars remain the main

cause of air pollution in Moscow, although heavy industry also contributes. The city does, however, perform fairly well in pollution compared to other index cities. Other crucial issues Moscow faces include waste management, fresh water quality and forest conservation.

ICT Infrastructure

Moscow scores around average in terms of ICT infrastructure. Access to ICT is rather high, but Moscow lags behind other high performing cities in the index in terms of availability to high speed mobile broadband. Moscow also needs to improve its mobile broadband quality. Weak ICT infrastructure could have negative effects on the city's competitiveness and role as a business center in an international context.



ICT Affordability

Moscow has a high rating for ICT affordability. Low fixed broadband and mobile cellular tariffs, together with low IP transit prices, indicate that Muscovites have access to a competitive market with reasonable prices. Affordability is an

important aspect for increasing ICT usage and becoming a more connected city.

ICT Usage

Moscow has a high rate of mobile phone subscriptions and computers in the home, but compared internationally, Moscow has not adapted to new technology, such as smartphones and tablets. This could be explained by income disparities and a wide span of personal economic ability. Moscow has well developed open data resources and the official web page offers e-solutions. However, the rate of electronic payments is low, affecting the overall results.



BARCELONA

Barcelona is the capital of Catalonia, Spain, and is Spain's second largest city, with a population of 1.6 million. The metropolitan area comprises a population of more than 5 million. Barcelona receives several million tourists per year and is one of the most visited cities in the world.

Its industrial sector contributes a fifth of the region's total gross domestic product. Barcelona has for a long time been a significant center for the automobile sector. However, as in many modern cities, the service sector has overtaken the manufacturing sector in size. Today, the main sectors that contribute to Barcelona's economy are tourism, fashion, power resources, media and food. Tourism is of particularly great importance.

Lately there have been political tensions between Catalonia and the rest of Spain. The Catalan government has announced its intention to hold a referendum on possible independence from Spain. While Catalonia is bound to contribute financially to the Spanish government, the region, like many countries and cities in Europe, is also confronting a deep economic crisis. Barcelona's unemployment rate is very

City population	1,620,000
Density	15,910/km ²
Population yearly growth	0.7%
Metropolitan GDP per capita PPP\$ 2011 ..	35,000
GDP per capita PPP\$ growth 2010-2011 ...	1.2%
ICT maturity improvement 2013-2014.....	not applicable, city new to index

- + Quite high fixed broadband speeds, performs well compared to other index cities in the environmental dimension.
- Unemployment rate is very high. App coverage in the mobile network is low.

high with more than a fifth of the labor force out of work. Barcelona also has many other issues to handle, including low educational attainment. The housing market has also been greatly affected by evictions because people can't afford to pay their mortgages and rents. These issues have contributed to rising income inequality, and social inclusion has deteriorated.

Barcelona ranks #18 in the Networked Society City Index. The city performs around average in both ICT maturity and in the triple bottom line dimensions when compared to other cities in the index.



TBL Social

Barcelona performs below average in the social dimension. The city performs well regarding health, with high life expectancy and low infant mortality rates. However, upper secondary educational attainment is low and Barcelona

does not perform very well on social inclusion. This is mostly due to high unemployment levels, but also due to a low proportion of seats held by women in the legislature. Barcelona faces many challenges in order to improve the social sustainability of the city.

TBL Economy

Barcelona's economy is affected by the economic crisis and ranks above average in the economic dimension. Its GDP per capita is just below average compared to other cities in the index. However, Barcelona's performance in economic competitiveness holds possibilities for future development if managed in a responsible way. The city has high tertiary educational attainment and high employment levels in knowledge-intensive services.



TBL Environment

Barcelona performs well in the environmental dimension of the index compared to many other cities. This is mostly due to low pollution levels and low CO₂ emissions per capita. However, even though energy consumption is low, it mostly

comes from fossil fuels. Total waste per person is only around average compared to other index cities. Barcelona is a city that could improve its environment by, for example, introducing a smart waste management system. The city faces environmental challenges, but they are not as severe as many other cities.

ICT Infrastructure

Barcelona's ICT infrastructure is well developed in some areas. There has been a wide fiber roll-out in Barcelona and fixed broadband speeds are high. However, its adoption of fiber could be higher. The availability of high-speed mobile broadband is high, but app coverage performance is low. Internet penetration is around average.



ICT Affordability

ICT affordability is on an average level in Barcelona. This is mostly because of low IP transit prices. However, the fixed broadband and mobile cellular tariffs are above average levels.

This could indicate an absence of competition when it comes to ICT services.

ICT Usage

ICT usage is above average in Barcelona, but is low compared to other European cities. The city performs at an average level in technology use, but the penetration of smartphones – and to some degree also tablets – is high in Barcelona.

However, internet usage among the population is below average. Barcelona performs well in public and market use. Access to city services through the web is very good and the city also enjoys quite well-developed open data resources. Barcelona also shows quite high usage of electronic payments.



TOTAL 59
ICT 54
TBL 64



SYDNEY

Sydney is an international gateway to the Asia Pacific region and beyond, and is the most populous city in Australia. Sydney enjoys a talented and multicultural population, with the greater metropolitan area being home to 4.7 million. The city consistently ranks highly in global surveys of quality of life, and it boasts a rich cultural scene, as symbolized by the famous Sydney Opera House.

Sydney is a leading global power city with prosperous residents that enjoy one of the world's highest income levels. The city is known for its healthy business climate, resulting in more than 600 multinational companies having regional headquarters there, benefiting from the city's competent and multilingual workforce. The largest economic sectors in Sydney include property and business services, retail, manufacturing, and health and community services. Sydney has around 20 percent of the country population, but generates more than 30 percent of the country's total GDP.

Sydney ranks #19 in the Networked Society City Index and does not perform at the expected level considering

City population 4,760,000
 Density 380/km²
 Population yearly growth 1.5%
 GDP per capita PPP\$ 2009 44,000
 GDP per capita PPP\$ growth 2008-2009 ... 4.1%
 ICT maturity improvement 2013-2014 Low

+ World leading mobile broadband speeds.
 One of the least polluted index cities.

– Low fiber broadband coverage and severely high carbon dioxide emissions.

the size of its economy. However, it should be noted that its mobile broadband speed is world leading. Sydney's main drawback is its underdeveloped infrastructure for fixed broadband. However, the National Broadband Network is working on increasing fiber rollout across Sydney's metropolitan area. High IP transit prices reduce the affordability of ICT services in Sydney. There are some current initiatives aimed at spurring ICT development and the state is working actively to attract more high technology businesses and investments to the area.

ICT Infrastructure

Sydney's ICT infrastructure quality diverges across its fixed and mobile counterparts. Mobile broadband is well developed. Indeed, its app coverage is the highest of all cities in the index. On the other hand, fixed broadband is underdeveloped, with almost non-existent fiber coverage. Fortunately the National Broadband Network has an ongoing rollout of fiber in Australia.



ICT Affordability

Sydney's ICT affordability is, on the whole, about average. Mobile cellular tariffs are competitive on the global scale, but IP transit prices are high in relation to other well-developed cities. It could be argued that increased competition in the market is needed to decrease prices of ICT services.

ICT Usage

Individual ICT usage scores fairly high for Sydney. Low tablet penetration is surprising, since its mobile broadband is well-developed and prices are quite low. Smartphones are, however, common. One clear area for improvement concerns the city's underdeveloped open data status; an initiative of this kind could probably spur transparency, connectivity and innovation.



TBL Social

Sydney is considered a world city regarding its quality of life. The city's inhabitants are healthy but the low proportion of females in the state government stands out. Australia's Workplace Gender Equality Agency does, however, give an

indication that these inequalities are being dealt with. Sydney's education level is average compared to other index cities. Sydney's unemployment rate is fairly low.

TBL Economy

The city is the financial and economic hub of Australia and performs fairly well in the economic dimension of the index. Sydney's GDP per capita is above average. While many people work in knowledge-intensive sectors, the labor force is lacking in highly educated individuals. The distinguishing strongpoint of the city is the huge amount of business start-ups, second of all of the included cities.



TBL Environment

Sydney is a mixed city when its environmental impact is concerned. Out of the cities included, Sydney's people breathe the least polluted air. However, at the same time, its climate impact is high, resulting from both high CO₂ emissions and

a high energy consumption that mostly comes from fossil fuels. Fortunately, projects like the LED lighting project is evidence of the city's will to become greener.



WARSAW

Warsaw, the capital of Poland, is home to approximately 1,700,000, with 3,200,000 living in its metropolitan area. After a number of difficult decades, sound market-based economic, democratic and socio-political institutions have been developed, enabling civic activity to flourish. Warsaw is now on the path of rapid socioeconomic development, which offers it the opportunity to catch up with other Western European cities.

Warsaw has changed significantly since the fall of communism. The Polish capital has, in recent years, gained a broader cultural life, increased income and quality of life, improved infrastructure, and developed more efficient public institutions. Warsaw's role as the

political and economic center in the economic growth of Poland has also led to a large expansion of the city.

Warsaw used to be the most demographically diverse city in Poland. However, World War II changed the demographics of the city, and to this day there is much less ethnic diversity than in the city's past. Most of the modern day population growth is based on internal migration.

An important landmark in the city's history came in 2004, when Poland became a member of the European Union. Warsaw has seen major infrastructural changes over the past few years amidst increased foreign investment, economic growth and EU funding. In particular, the city's metro, roads, sidewalks, health care facilities, and sanitation have significantly improved. The city is now home not only to many national institutions and government agencies, but also to many domestic and international companies. The number of state-owned enterprises continues to decrease, while the number of companies operating with foreign capital is on the rise, reflecting the continued shift towards a modern, market-based economy.

Warsaw ranks #20 in the Networked Society City Index. It has the biggest concentration of electronics and high-tech industry in Poland, but further investments in ICT development are required in the city. Warsaw's score in the triple bottom line has improved, and enhanced ICT maturity could lead to further growth and development. Warsaw scores less well in the ICT part of the index.

Metropolitan population.....	1,720,000
Metropolitan density	320/km ²
Population yearly growth	0.6%
GDP per capita PPP\$ 2011	41,500
GDP per capita PPP\$ growth 2010-2011 ...	5.6%
ICT maturity improvement 2013-2014...	Medium

+ Low resource consumption and low level of pollution.

- Low ICT usage, requiring investments in infrastructure and increased digital capability in the city administration and among population.



TBL Social

Human and social capital determine a city's economic development in areas such as education and the labor market. Warsaw enjoys a high educational attainment but scores less well in social inclusion, unemployment, safety, and gender equality in higher education. Compared to other European cities, the infant mortality rate is higher and life expectancy is lower. The availability of adequate medical services in Warsaw is mediocre and long waiting times in the health care system are a challenge.

TBL Economic

Warsaw experiences a relatively high GDP per capita, but faces a great challenge to improve its economic competitiveness. The knowledge-intensive sector is relatively small and a more dynamic business sector is needed as Warsaw scores poorly in patents and business start-ups.



TBL Environmental

Warsaw scores above average in the environmental dimension of the index with quite low resource use and pollution levels. However, the city's contribution to climate change needs to be reduced. Warsaw lacks a good ring road system and most traffic goes directly through the city center, leading to one of the highest levels of congestion in continental Europe. Car ownership in the Polish capital has roughly doubled over the past 15 years.

ICT Infrastructure

As a whole, Warsaw's performance in ICT infrastructure is average. Its fiber penetration is not high. The city performs on an average level regarding fixed broadband and mobile broadband speeds, and much lower compared to many top-performing cities. As an EU member, Poland is obliged to implement the European Commission's Digital Agenda to develop a uniform digital market by 2020. Local governments are responsible for the construction of broadband infrastructure in cooperation with private internet providers. However, there are problems with establishing public-private partnerships and local authorities are often unaware of the business aspect of these new investments.



ICT Affordability

Internet access in Poland has been among the most expensive in Europe, largely caused by the lack of competition and know-how. However, new operators are now creating their own provider lines and offer more attractive and cheaper services. As a result, Warsaw scores high in the affordability part of the index with both low IP transit prices and tariffs.

ICT Usage

ICT usage is poor compared to other European cities in the index, reflecting the need for further investments and action from the authorities. Warsaw does not score badly in terms of mobile phone subscriptions and computer usage, but experiences low usage levels of more high-end technology such as smartphones and tablets. The city, therefore, risks falling behind other cities. The city should also strive to improve its e-governance with better open data resources to promote innovation for a better city life.

49



ROME

Rome is one of the oldest continuously inhabited cities in Europe. The capital of Italy, with 2,860,000 inhabitants, it is the fourth most populous city in the European Union (counted within city limits). Rome hosts Vatican City, the only existing example of an independent country within a city.

Rome has a long history that spans more than 2,500 years. The many historical remains in Rome are major tourist attractions. In 2011, Rome was the 18th most visited city in the world, the third most visited in the European Union, and the most popular place to visit in Italy.

City population	2,860,000
Density	2,230/km ²
Population yearly growth	1.8%
GDP per capita PPP\$ 2011	38,300
GDP per capita PPP\$ growth 2010-2011 ...	1.6%
ICT maturity improvement 2013-2014.....	not applicable, city new to index

+ Access to city services via the web is very good and the city also has well-developed open data resources.

- Quality of fixed broadband is very low.

Rome's economy is dominated by its service sector with high-tech companies in areas such as ICT, research, construction and commercial activities. The tourism sector is, of course, also very important to Rome's economy. Other important parts of the economy are its universities and radio, television, and movie industry. Many international companies and agencies have their headquarters in Rome's business districts. The city also hosts the head offices of most of the major Italian companies – for example, the headquarters of three of the world's 100 largest companies: Enel, Eni, and Telecom Italia.

Rome ranks #21 in the Networked Society City Index. The city performs much better in the triple bottom line dimension than in ICT maturity. Rome also experiences a much higher performance in ICT usage compared to its ICT infrastructure. Rome's underdeveloped infrastructure, compared to most of the cities in the index, could be a hindrance to further development.

83

TBL Social

Rome performs quite well in the social dimension of the index, largely due to the high life expectancy enjoyed by its population. The education level is around average and the unemployment rate is high. Only Barcelona has a higher unemployment rate among the European cities in the index. The city does, however, perform quite well when it comes to gender equality in education enrollment and representation in the Rome council.

TBL Economy

Rome needs to improve to compete with most European cities in the index. Today its economic performance in both productivity and competitiveness is average compared to other index cities.

Employment levels in knowledge-intensive industries are high, but tertiary education level is below average. Patent applications and business startups per capita are around average. To secure social and economic development, the city of Rome needs to increase the general educational levels of the population.

41

85

TBL Environment

Rome's environmental performance is burdened by fairly high energy consumption, which mostly derives from fossil fuel sources. The total municipal waste created per person is also above average. The city does, however, have low CO₂ emissions per capita. The pollution levels in the city are also better than most cities in the index.

ICT Infrastructure

Rome's ICT infrastructure performance is well below average. Its broadband quality is low and availability to ICT is also lower than most index cities. The city's app coverage performance and availability to high speed mobile broadband is,

26

however, above average. Rome's international bandwidth capacity is very low. The city has to consider its ICT infrastructure, primarily its fixed broadband quality, so as to not lag behind in the future.



ICT Affordability

ICT affordability is quite good in Rome. IP transit prices are very low. Fixed broadband and mobile cellular tariffs are around average. However, compared to its infrastructure the tariffs are not as affordable.

ICT Usage

Compared to other index cities, Rome's ICT usage is around average. However, when compared to its infrastructure performance, ICT usage can be regarded as high in Rome. Technology use is also quite high. For example, smartphone penetration is well above average, but internet usage is lower than in most of the index cities. Rome performs well regarding e-governance – access to city services through the web is very good and the city does have well-developed open data resources.



DUBAI

Dubai is the largest city in the United Arab Emirates, with a population of 2,110,000. Dubai has emerged as a global city and as a business hub in the Persian Gulf region. The city has also been ranked as one of the best places to live in the Middle East. Dubai is, however, also one of the most expensive cities in the region.

In the 1970s, Dubai continued to grow from oil and trade revenues, even as the city saw an influx of immigrants fleeing the civil war in Lebanon. The Gulf War in 1990 had a negative financial effect on the city, but it recovered through a change in its political climate. Large increases in oil prices after the Gulf War encouraged Dubai to continue to focus on free trade and tourism. Oil and natural gas currently account for less than seven percent of Dubai's revenues. Real estate and construction contribute almost a quarter of Dubai's economy.

About 10-15 percent of the population is made up of Arab UAE nationals. The remaining, foreign, population

City population	2,110,000
Density	510/km ²
City population yearly growth	13.9%
GDP per capita PPP\$ 2012	28,800
GDP per capita PPP\$ growth	-9.2%
ICT maturity improvement 2013-2014.....	not applicable, city new to index

+ Good availability for high-speed broadband. App coverage is also high.

- Low performance in the environmental dimension. The city lacks well developed open data resources.

is predominantly from Asia. In 2013 Dubai was the seventh most visited city in the world, based on air traffic, and it was also the fastest growing destination to visit. Recently, the tourism sector has been affected by increasing inflation, which is driven by the soaring price of property. GDP growth is high in Dubai. However, population growth has outpaced it. This, together with a high inflation, has resulted in a decreased GDP per capita in terms of PPP (purchasing power parity).

Dubai ranks #22 in the Networked Society City Index. It is underperforming in the triple bottom line dimensions compared to its ICT maturity. Dubai's environmental dimension requires special attention and could include initiatives to improve awareness, stimulate changed behaviors, improve traffic flow, increase use of public transport, and reduce energy consumption. Dubai could further improve its rating with long-term policy initiatives to raise levels of governance and by stimulating innovation and cross-industry efficiency, for example, promoting m2m and the internet of things.



TBL Social

Dubai performs below average in the social aspects of the index. The life expectancy, infant mortality rate and unemployment rates are around average compared to the other index cities. Educational attainment is low compared to top-performing cities, but higher than in Abu Dhabi. Education enrollment is equal among men and women, though there are no seats held by women in the General Secretariat of the executive council.

TBL Economy

Dubai's GDP per capita is around average. Dubai is, however, one of the most expensive cities in the region. The future competitiveness of the economy is below average. The tertiary educational attainment and the knowledge intensiveness in the



economy are lower compared to most of the index cities. This is mostly explained by high employment in construction. But even excluding construction and related businesses, employment in knowledge-intensive services is still lower than in top performing cities in the index. Business startups per capita are high.



TBL Environment

Dubai performs well below average in the environmental dimension of the index. Its energy consumption is very high and comes mainly from fossil fuels. Total municipal waste per person is above average and the recycling rate is quite low.

Dubai has one of the highest CO₂ emissions per capita compared to the other index cities. The pollution levels are below average compared to the other cities in the index.

ICT Infrastructure

The availability and quality of mobile broadband is very high in Dubai. Overall, the city performs on average in ICT infrastructure compared to other index cities. This is mostly because of a lower broadband quality, which is related to quite low international broadband capacity. The availability of high-speed broadband is high in the city. Fiber penetration is high, but at the same time the measured broadband speeds are quite low. This indicates that the well-developed fiber network is not used to the full extent.



ICT Affordability

Dubai performs at an average level in ICT affordability. Affordability is especially good for mobile phone tariffs. The broadband tariffs, in relation to the income level, are around average. IP transit prices are high, which affects the

weighted outcome for this dimension.

ICT Usage

ICT usage is average in Dubai, and internet use is well above average. The penetration of smartphones and tablets is around average, but computer penetration is high. The city has a lower performance in the indicators for public and market use. Use of electronic payments and mobile phone payments is low, and the city lacks well developed open data resources. On the other hand, the city ranks high in digital governance compared to other municipalities worldwide according to the Global E-Governance Survey.



ABU DHABI

Abu Dhabi is the capital of the United Arab Emirates and is the second most populous city in the country, after Dubai. The city has a population of 920,000. Abu Dhabi is undergoing a period of rapid urban, social and economic development and today is one of the richest cities in the world.

Abu Dhabi has a diverse and multicultural society, as seen by the multiple languages used by the city's inhabitants. It is also reflected in the many international and local private schools and universities.

Abu Dhabi city was planned in the 1970s for a population of 600,000, but today, the population far surpasses this level. The city's public transport accounts for only five percent of total commuting. Instead, car ownership and usage is widespread. Consequently, commuting time during rush hour is time consuming and prone to traffic congestion. Another issue is the shortage of car parking spaces. Abu Dhabi also suffers from overcrowding.

The UAE has one of the world's highest energy consumption levels per capita. Consequently, it has an

City population	920,000
Density	950/km ²
Population yearly growth	7.9%
GDP per capita PPP\$ 2012	70,900
GDP per capita PPP\$ growth 2011-2012...	-3.7%
ICT maturity improvement 2013-2014.....	not applicable, city new to index

+ High GDP per capita. Good availability of high-speed fixed and mobile broadband.

- Low performance in the environmental dimension. The city lacks well-developed open data resources.

incredibly high environmental impact caused by high pollution levels and CO₂ emissions. Abu Dhabi has taken steps towards reducing its carbon footprint by investing in renewable energy programs and encouraging sustainable energy consumption among its residents. There are also initiatives to trigger a shift towards an increased use of public transportation. Indeed, a target has been set for public transport to account for 33 percent of total commuting by 2030.

Abu Dhabi ranks #23 in the Networked Society City Index. The city has room to improve its triple bottom line performance in relation to its ICT maturity. The environmental dimension requires special attention and could include initiatives to drive awareness, stimulate changed behaviors, improve traffic flow, increase use of public transport, and reduce energy consumption. Abu Dhabi could further improve its rating with long-term policy initiatives to raise levels of governance and by stimulating innovation and cross-industry efficiency, for example, promoting m2m and the internet of things.



TBL Social

Abu Dhabi performs below average in the social aspects of the index. Life expectancy and infant mortality rates are around average compared to other index cities. Educational attainment is low compared to top-performing cities. Together with a high GDP per capita, this indicates a welfare gap in the city, but the unemployment rate is low. Education enrollment is equal among men and women, but only a few of the seats in the General Secretariat of the executive council are held by women.

TBL Economy

Abu Dhabi, with a high GDP per capita, is one of the richest cities in the world. The cost of living has, however, increased over the years. The future competitiveness of the economy is below average compared to other cities in the index. Tertiary educational attainment and knowledge intensiveness in the economy are lower compared to most of the index cities. This is mostly explained by high employment in construction. But, even excluding employment in construction and related businesses, employment in knowledge-intensive services is still lower than in top performing index cities.



TBL Environment

Abu Dhabi performs poorly in the environmental dimension in the index. Energy consumption is very high and comes mainly from fossil fuels. The total municipal waste per person is above average and the recycling rate is quite low. Abu Dhabi has the highest CO₂ emissions per capita compared to the other index cities. The pollution levels are average in Abu Dhabi although its level of PM10 pollution is one of the highest in the index.

ICT Infrastructure

Abu Dhabi has average performance in ICT Infrastructure compared to other index cities. This is mostly because of lower broadband quality, which is related to quite low international broadband capacity. The availability of high-speed broadband is high in the city. The fiber penetration is also high, but at the same time the measured broadband speeds are quite low. This indicates that the well developed fiber network is not used to its fullest extent. Availability and quality of the mobile broadband are quite high.



ICT Affordability

Abu Dhabi performs above average in ICT affordability. Affordability is especially good for mobile phone tariffs. The broadband tariffs are low, but not as low as in other top performing cities. The IP transit prices are high, which affects the weighted outcome for this dimension.

ICT Usage

ICT usage is above average in Abu Dhabi. Technology use and individual use is especially high. The penetration of smartphones and tablets is high and internet use is almost at the same level as in many top-performing cities in the index. The city has a lower performance in the indicators for public and market use. The use of electronic payments and mobile phone payments is low and the city lacks well-developed open data resources.



ATHENS

The city of Athens has been inhabited for over 3,400 years. Famed as the birthplace of democracy, Athens is now the capital of the Greek (Hellenic) Republic. With a population of around 650,000, and a metropolitan region containing 3,750,000 people, it is one of the larger metropolitan regions in Europe.

Athens is the educational capital of Greece, as many of its most prestigious universities are located in the city. Athens is also the country's commercial capital. Important sectors are trading through the Piraeus harbor, financial services, the food industry and tourism.

Metropolitan population.....	3,740,000
Density	1,280/km ²
Population yearly growth	0.6%
GDP per capita PPP\$ 2011	33,600
GDP per capita PPP\$ growth 2010-2011 ..	-5.1%
ICT maturity improvement	
2013-2014.....	not applicable, city new to index

- + High mobile broadband quality, and fairly high educational attainment.

- Fixed broadband quality is low, and the unemployment rate is high.

In recent years, Athens has experienced an unprecedented economic crisis, which has seen the republic's GDP decrease by around 25 percent since 2009. As a result, the unemployment rate has skyrocketed, with 28 percent of Athens' population without work. However, the economy is expected to stop contracting at the end of 2014, partly due to a new stimulus program involving highway construction. The number of startups in Athens has also increased substantially over recent years, rising in number from 16 in 2010 to 144 in 2013. As such, Athens faces multiple challenges, of which ICT could be part of the solution.

Athens ranks #24 in the Networked Society City Index. The city performs below average in ICT maturity and on par in the triple bottom line index. As a result of the economic crisis, the unemployment rate is high and GDP per capita is low compared to other European cities in the index. In terms of ICT, Athens faces an underdeveloped fixed broadband infrastructure and the use of electronic payments is low.



TBL Social
Athens fares well in the social dimension of the index. This is due to scoring high on all variables. However, high unemployment reduces Athens' overall score. Moreover, the gender balance in governance structure should be improved further.

TBL Economy
Athens performs more poorly in the economic dimension. Although its GDP per capita is fairly high, it suffers from poor competitiveness, caused by few registered business startups and patents. A further area of worry is the fairly low employment level in knowledge-intensive sectors. Athens does, however, perform well on tertiary educational attainment.



TBL Environment
Athens achieves average performance in the environmental dimension. However, regarding the resources variable, its population produces more waste than average and only recycles a small share of total waste. Moreover, although total energy use is low, the city is heavily reliant on fossil fuels. The city scores slightly above average on the pollution variable, partly thanks to high levels of waste water treatment. Athens' CO₂ emissions are also fairly high.

ICT Infrastructure
Athens suffers from poor broadband infrastructure. Its fixed broadband rates are lower than both the index average and comparable cities in the region. The city also suffers from low international bandwidth capacity. However, its mobile broadband infrastructure is better than average. Athens fares better on the access variable, although its underdeveloped fiber network decreases its rating further.



ICT Affordability
Athens scores well on the ICT affordability dimension. It enjoys low IP transit prices, and fixed broadband prices are also below average. To improve its position still further, mobile prices would need to fall.



ICT Usage
Athens also scores less well on the ICT usage dimension as a consequence of scoring below average on all variables. Internet usage is below average and use of electronic payments is low. Of note, however, is the high availability of open data resources, though e-services could be improved further.





SÃO PAULO

São Paulo is the largest city in Latin America with about 12 million inhabitants. Its metropolitan area is home to approximately 21 million people. While São Paulo is not the capital of Brazil, it is the capital of Brazil's most populous state. The city exerts a strong regional impact on the region's cultural, financial and political spheres. São Paulo was chosen as the leading Latin American state of the future, in a study performed by fDi Intelligence.

São Paulo was acknowledged as a global alpha city by the Globalization and World Cities Research Network, for its impact as a regional economic hub. This should come as no surprise, since the city is the largest Latin American economy as measured by GDP. São Paulo is also considered the financial capital of Brazil, as it is home to the headquarters of many major corporations and the country's most renowned banks and financial institutions. Sixty-three percent of all the international companies with business in Brazil have their head offices in São Paulo. Moreover, the São Paulo Stock Exchange is the largest in Latin America. Although the city used to have a strong industrial character, its economy has followed the global trend of shifting to services.

Metropolitan population.....	20,820,000
Density	2,620/km ²
State population yearly growth	0.6%
State GDP per capita PPP\$ 2011	17,800
GDP per capita PPP\$ growth 2010-2011 ...	4.8%
ICT maturity improvement 2013-2014.....	High

+ Remarkably high fiber coverage. Low CO₂ emissions and quite clean air.

- High prices of ICT services and low app coverage.

São Paulo ranks #25 in the index. While São Paulo's performance is average in comparison to all the included cities, in comparison to similar developing megacities, it is performing very well. The impact of hosting the the FIFA World Cup in 2014 cannot be exaggerated, as it worked as a catalyst for city development. The city mayor's office had to face up to world requirements and launched a number of initiatives to improve ICT in the city. Examples such as the launch of 120 Wi-Fi hotspots and new internet-enabled buses with free Wi-Fi form part of the broader scheme to improve the city's outdated infrastructure. São Paulo has seen rapid growth over the past decade. But while significant initiatives have been taken to spur development, many of the city's challenges remain, especially concerning continual rapid growth.



TBL Social

São Paulo performs below average in the social dimension. It has problems with its health care, indicated by a high infant mortality rate. Educational attainment is also low, despite several efforts in the past decade to address this issue. Life expectancy is average compared to other index cities. Unemployment rates are above average and the homicide rate is high.

TBL Economy

The city scores rather low in the economic dimension of the index. Its GDP per capita, tertiary education levels and employment levels in knowledge-intensive services are low compared to other index cities. The future does, however, seem brighter, as indicated by the choice of São Paulo as a future leading state in the Americas by fDi Intelligence. The region has great potential for attaining foreign direct investments. The labor market and the business climate are seen as strong points for São Paulo.



TBL Environment

São Paulo performs comparatively well in the environmental dimension. The city air is relatively clean and CO₂ emissions are very low. Moreover, São Paulo's energy consumption is quite low, but the city could improve the proportion of waste water it recycles.

ICT Infrastructure

São Paulo attains an average score in the ICT infrastructure dimension. While the city's broadband quality is low – especially app coverage – it scores fairly well in the ICT access variable. This is due to the city's remarkably high fiber coverage.



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ICT Affordability

São Paulo's performance in the affordability dimension of the index does not compare favourably to more well-developed cities. The mobile cellular tariffs are especially high. The fixed broadband tariffs and IP transit prices are

also quite high. Thus, there is clearly room for improvement when it comes to prices.

ICT Usage

The city scores just below average on ICT usage. The city's fiber coverage is quite good, but is clearly not used to its full potential. Internet usage and smartphone penetration are also below average. Individuals and businesses might need time to adopt to new technologies, but the affordability of services is a major obstacle in making this possible in the near future. The city has a well-developed official homepage with e-services, but its open data resources are not equally well developed.

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BEIJING

Beijing, capital of the People's Republic of China, is home to more than 21 million people. Beijing is China's second-largest city by population and one of the most populous cities in the world.

The city has benefited from the efforts of the central government and local authorities to promote its international standing, resulting in large-scale infrastructure investments. This has resulted in an improved business environment for business startups and other innovative activities. Moreover, Beijing is a center for higher education in China and home to many universities. Additionally, most headquarters of the country's state-owned enterprises are located in the city.

Beijing's population and urban development have increased rapidly in the past decade. Changes in the city's transportation infrastructure and the lifestyle of its people have led to an explosive increase in automobile use. This has led to more congestion and poor air quality. There are, however, attempts to address these issues, such as the decision to close coal-fired power stations by 2020, and the city is limiting the registration

Metropolitan population 21,150,000
 Density 1,290/km²
 Population yearly growth 4.7%
 GDP per capita PPP\$ 2012 20,400
 GDP per capita PPP\$ growth 2011-2012... 7.0%
 ICT maturity improvement 2013-2014..... High

+ Low unemployment rate. Well-developed access to high-speed mobile broadband.

- Low ICT usage, especially relating to public and market use.

of new cars while simultaneously increasing investments in public transportation.

In the Networked Society City Index, Beijing ranks #26. The city performs better in TBL than in ICT. Beijing's ICT maturity is low compared with the city's ICT infrastructure. This indicates that Beijing could be underutilizing its ICT infrastructure. It is recommended that the use of ICT be stimulated further, not least to unleash entrepreneurial opportunities in this field and improve the life of its residents.

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TBL Social

Beijing ranks quite well in the social dimension of the index as it scores quite well on the health, education and social inclusion variables. The low unemployment and homicide rates are especially impressive. Further gains can still be made, however, not least to improve educational attainment levels and the gender balance in the city's governance structure.

TBL Economy

Beijing scores low in the economic dimension. This is due to its GDP per capita being below average and tertiary education attainment levels being very low. The city's ranking is also affected by fewer than average patents being registered, although the city fairs well in comparison to most other east Asian index cities in that respect. A positive aspect, however, is the relatively high level of employment in the knowledge-intensive sector, boding well for future competitiveness.

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TBL Environment

Beijing scores below average in the environmental dimension of the index. Mirroring Shanghai in several aspects, the city currently relies heavily on fossil fuel for its energy consumption. In conjunction with the presence of heavy industry, CO₂ emissions are well above average and pollution levels are high. Investments in smart grid technology and the

retirement of coal-fired power stations will hopefully alleviate the situation. Additionally, although total waste creation is below average, recycling efforts can be improved. Local and federal authorities should increase the deployment of ICT solutions to address these challenges.

ICT Infrastructure

According to the index, Beijing can further improve its ICT infrastructure. The quality of the city's fixed and mobile infrastructure rate below average both in the index and when compared to other East Asian index cities. Beijing scores above Shanghai on internet access, but below other East Asian cities. The city also has a fair number of hotspots and well-developed access to high-speed mobile broadband. However, Beijing can further improve its fiber network.



ICT Affordability

Reflecting Shanghai, Beijing's ICT affordability fluctuates across the variables. While it rates quite well on cellular tariff costs, fixed broadband tariffs are above average and IP transit prices are the highest of the index. This causes Beijing's ranking

in this dimension to be reduced considerably.

ICT Usage

Beijing's use of ICT is slightly higher than Shanghai's but below other East Asian index cities. As in Shanghai, mobile phone and computer ownership is widespread but smartphone and tablet ownership is less common. People's use of ICT products is also below average, especially their use of social networks. Another area of improvement can be found in public and market use of ICT. Access to open data, the provision of e-services and use of electronic payments are far below average. Consequently, it is recommended ICT usage be further stimulated, not least to unleash entrepreneurial opportunities in this field.



ISTANBUL

Istanbul, located on the border between Europe and Asia, is the economic, cultural and historical center of Turkey. Istanbul's population is slightly over 14 million, making it the largest city in Turkey, and it is predicted to soon become the largest in Europe.

Istanbul is one of the fastest-growing metropolitan economies in the world. It hosts the headquarters of multiple companies and accounts for more than a quarter of Turkey's gross domestic product. This results in a much higher GDP per capita and productivity than the national average, in part because of the greater focus on high-value-added activities. However, the proportion of the low-value-added manufacturing sector is still substantial and represents four-fifths of the city's total exports.

Istanbul's draw as a tourist destination is increasing each year. In the TripAdvisor Travelers' Choice Destination 2014 Report, the city has actually leapt to the top spot. While the economy is expanding rapidly, so too is the population, leading to a surge of social unrest and social polarization.

Istanbul is ranked #27 in the Networked Society City Index. Its ICT infrastructure is lacking. While the

Metropolitan population.....	14,160,000
Density	2,650/km ²
Population yearly growth	2.2%
GDP per capita PPP\$ 2011	21,900
GDP per capita PPP\$ growth 2010-2011 ...	9.1%
ICT maturity improvement 2013-2014.....	High

+ Relatively high affordability of ICT services.
Low use of resources.

- Underdeveloped ICT infrastructure. No females holding seats in the city leadership.

affordability of services is actually quite high, it remains arguably too expensive for a large part of the population. Thus, the city needs to develop its infrastructure while making the services affordable to a higher proportion of the city's inhabitants. Fortunately, the city's fiber coverage is presently being increased, due to a layout performed by Turkcell, with the target of making Istanbul the fiber optic internet center of its region. This is an essential step on the way to transforming Istanbul into a modern, connected city.



TBL Social

The social dimension in Istanbul does not compare favorably to the other cities included in the index. The score on the health variable is modest, and the educational attainment of the population is low. The social rifts in Istanbul

might be partly explained by immigration from less prosperous parts of Turkey. However, the absence of women holding seats in the city leadership makes gender inequalities stand out as a major concern for the city.

TBL Economy

The city scores below average in all economic aspects of the index. Its GDP per capita is modest and the results for all aspects of economic competitiveness are low. The city needs to attract knowledge-intensive industries and a more well-educated labor force to the area to attain economic growth. The fast growth of Istanbul's population proves a major challenge and might have a negative effect on the city's current economic results, but could also be seen as a potential resource for the future.



TBL Environment

Istanbul scores relatively high in the environmental dimension. Istanbul's similarities to developing cities implies low waste generation and low energy consumption. However the recycling of waste is low and the energy

consumed comes mostly from fossil fuel sources. In terms of further economic development, smart ICT solutions will be needed to tackle problems and help Istanbul avoid the traps that presently hold more developed cities in their grip.

ICT Infrastructure

Istanbul's ICT infrastructure is not yet properly developed. Its people have grown accustomed to relatively low speeds of both fixed and mobile broadband. Turkcell is, however, developing the city's fiber network with the target of making Istanbul the regional fiber optic internet center. This is an essential step on the path of transforming Istanbul into a modern connected city with the potential to spur new smart innovations and tackle upcoming challenges.



ICT Affordability

Istanbul performs well in ICT affordability. IP transit prices are competitive in comparison to Europe. On the other hand, mobile cellular tariffs are quite high. Istanbul's ICT market is clearly competitive.

ICT Usage

Istanbul scores slightly below average in ICT usage. Even though the services are affordable, the moderate economic ability and education levels of many people limit ICT penetration. The city should develop its open data resources to increase transparency and spur creativity in the local community.



SHANGHAI

Shanghai, the world's largest city by population, is home to more than 24 million people. Shanghai is an international economic, commercial and financial center and one of the fastest developing cities in the world.

As the commercial capital of China, the city has the world's busiest port, which has developed partly due to Shanghai's multiple export zones. The city also holds a key position in several of China's heavy industrial sectors, such as shipbuilding and automobile manufacturing. Moreover, Shanghai is a major center for higher education in China with a large number of universities and colleges.

The city has undergone a period of rapid urban expansion. Unsurprisingly, this development has necessitated and been driven by giant infrastructure projects such as the high speed railway line between Shanghai and Beijing and the magnetic levitation train which runs between the city and the Shanghai Pudong International Airport.

However, the city's rapid economic development poses environmental challenges. During the past decades, car ownership has risen rapidly, and Shanghai's economic growth has also increased the city's energy demand. Shanghai now faces the challenge of decreasing its

Metropolitan population.....	24,150,000
Density	3,810/km ²
Population yearly growth	3.6%
GDP per capita PPP\$ 2012	20,000
GDP per capita PPP\$ growth 2011-2012...	3.4%
ICT maturity improvement 2013-2014.....	High

- + High life expectancy. Many Wi-Fi hotspots in the city.
- Low ICT usage, especially in public and market use. Low educational attainment levels.

reliance on fossil fuels while energy demand is forecasted to continue increasing.

Shanghai ranks #28 in the Networked Society City Index. The city performs better in the triple bottom line dimensions compared to its ICT maturity level and the city has a lower performance in ICT usage compared to its ICT infrastructure. The city needs to further stimulate the use of ICT. If this does not occur, the city risks losing out in the rapid development of ICT-based consumer solutions and business models.



TBL Social

A city's social capital strongly influences its future economic potential. Shanghai presents a mixed picture regarding the strength of its social capital. On the one hand, it rates very high on the health variable and social inclusion. On the

other hand, it could improve its educational sector by raising the educational attainment of its population.

TBL Economy

Despite its rapid economic development, Shanghai's economic productivity and competitiveness rate poorly in comparison to other index cities. This is partly due to its GDP per capita being below average. However, it is mostly caused by low tertiary educational attainment, poor patenting levels, and low employment levels in knowledge intensive industries. Consequently, Shanghai has the potential to further develop its economy.



TBL Environment

Shanghai performs below average in the environmental dimension of the index. The city relies heavily on fossil fuel for its energy consumption and consequently its CO₂ emissions are elevated. Moreover, although total

waste creation is below average, recycling efforts are poor. The city also has problems with its pollution levels. However, Shanghai has a well-developed website for accessing information concerning air quality, including real-time pollution data.

ICT Infrastructure

The index shows that Shanghai's ICT infrastructure is average compared to other index cities. Fixed broadband speeds are average and app coverage is below average. The city's bandwidth capacity is also limited, even when compared to other cities in the region. Shanghai rates considerably stronger on the access variable, beating the index average with many Wi-Fi hotspots and quite good availability to high-speed mobile broadband. However, the index indicates the city can do more to develop its fiber network.



ICT Affordability

Regarding ICT affordability, Shanghai's rating fluctuates widely between variables. Tariff-wise, it is one the leading cities of the index when it comes to mobile cellular tariffs. Fixed broadband tariffs, however, rate above average. IP transit

prices are the highest of the index, thus reducing Shanghai's overall ranking in this dimension.

ICT Usage

Shanghai's ICT usage is poor compared to other cities in the region, bar Beijing which sees similar, although slightly higher levels of use. Although dissemination levels of mobile phones and computers are high, smartphone and tablet ownership is below average. The city also rates below average on individual use, not least in terms of using social networks. The most dire variable is public and market use of ICT. The index ranks the city's provision of access to open data, city e-services and use of electronic payments far below average. This indicates the need to further stimulate the use of ICT.





JOHANNESBURG

Johannesburg’s metropolitan area has more than 4.4 million inhabitants, making it the largest city in South Africa. However, its population density is modest as the city’s area is large compared to many other cities. Johannesburg is the economic and financial hub of South Africa, producing 16 percent of national GDP.

Due to its location, it is also a center for the gold and diamond sectors. The city’s manufacturing industries extend across a range of areas, though it relies greatly on heavy industries, such as steel and cement plants. Other prominent industries include banking, IT, real estate, as well as the leisure and consumer retail market.

Johannesburg is the telecommunications hub of South Africa. The city hosts the headquarters of numerous local and international organizations, and serves as the base for multinational corporations operating in the rest of the continent. The country has one of fastest growing GSM markets in the world. According to the Johannesburg 2030 Strategy, the city will actively work on developing its ICT sector.

Metropolitan population.....	4,430,000
Density	2,700/km ²
Population yearly growth	3.0%
Province GDP per capita PPP\$ 2009	16,100
Country GDP per capita PPP\$ growth 2011-2012.....	2.9%
ICT maturity improvement 2013-2014...	Medium

+ Given the city’s underdeveloped ICT infrastructure, it scores relatively well in ICT usage.

- Low access rates in the ICT dimension, low life expectancy and high unemployment.

Johannesburg ranks #29 in the Networked Society City Index. The city performs better in the triple bottom line index than in ICT maturity. In recent years, Johannesburg has launched several projects and partnerships with business and the ICT industry to raise awareness of ICT and boost investments in the region. Although, the overall score is relatively weak, Johannesburg presents a mixed picture when it comes to the ICT dimension. On the one hand, the ICT infrastructure is quite underdeveloped with slow fixed broadband speeds, and a large share of the population lacks access to the internet. On the other hand, app coverage is average, smartphone penetration is slightly above average, and the share of people using the internet is relatively high in relation to the low access rate.



TBL Social

Johannesburg’s performance in the social dimension is rather weak compared to the other cities in the index. Infant mortality is far above average and life expectancy is low. One reason for the low life expectancy is the HIV/Aids epidemic that is prevalent in Johannesburg and South Africa as a whole. Unemployment and homicide rates are very high compared to other cities. Literacy rates in the city are around average, but educational attainment is below average. In comparison to many other cities in the index, the share of women in the government is fairly high.

TBL Economy

Johannesburg is sometimes referred to as the economic powerhouse of South Africa. Despite generating a large share of the country’s GDP, Johannesburg presents a rather weak performance in the economic dimension compared to other cities in the index. Educational levels and the level of employment in knowledge-intensive sectors are both rather low. The number of business startups is, however, relatively high, indicating a good business climate.



TBL Environment

Johannesburg performs fairly well when it comes to the environmental dimension of the index. The high score is mainly due to the city’s low energy consumption. On the other hand, Johannesburg has a wide range of environmental problems associated with its rapid urbanization. Most of the water is badly polluted and the city suffers from fairly high air pollution. PM10 and PM2.5 levels are well above average. Moreover, total waste generated per capita is low in the city, but the recycling rate could be improved.

ICT Infrastructure

The ICT infrastructure in Johannesburg is rather underdeveloped. The speed for fixed broadband is below average and access to the internet is remarkably low. The mobile broadband network is, however, more mature and the app coverage is slightly above average compared to other index cities.



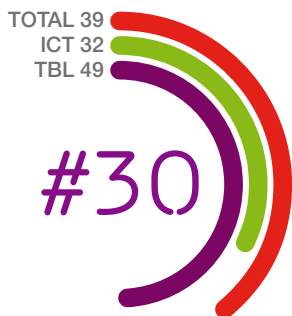


ICT Affordability

There is room for improvement in the city's ICT affordability. The mobile cellular tariffs are high in relation to the income level in the city, but despite the high tariffs, mobile phone and smartphone penetration rates are high. The fixed broadband tariffs are also above average compared to income levels. In relation to the other cities in the index, IP transit prices are also rather high.

ICT Usage

The city scores relatively well on ICT usage given the city's underdeveloped ICT infrastructure. Mobile phone subscriptions are above average and smartphone use is also slightly above average. Although individual internet use is below average, the share of people using the internet is still relatively high in relation to the high share of people lacking access to the internet at home. One explanation for this could be that the internet to a large extent is accessed by smartphones, or by public computers in cafés and schools.



MEXICO CITY

Mexico City, the capital of Mexico, has an estimated population of almost 9 million people but with more than 21 million people living in its metropolitan area. The densely populated city is one of the largest urban agglomerations in the world.

Mexico City is the political, educational, financial and cultural center of Mexico. The global city is an important financial center in North America. The city experienced three decades of heavy population growth from the 1960s through the 1980s. Since then, population growth has decreased through a policy of decentralization to reduce the environmental pressure on the city.

Mexico's electronics industry has grown during the past decade and is now one of the largest in the world. The communication services market in Mexico is also among the largest in Latin America.

Mexico City ranks #30 in the Networked Society City Index and performs modestly in terms of ICT maturity.

City population	8,850,000
Density	5,960/km ²
Metropolitan population yearly growth	2.2%
Metropolitan GDP per capita PPP\$ 2012.....	9,900
GDP per capita PPP\$ growth 2011-2012...	4.5%
ICT maturity improvement 2013-2014.....	Low

+ Mexico City performs well in gender equality in higher education and governance.

- Mexico City performs rather modestly in ICT infrastructure, affordability and usage.

Mexico City also receives a rather low score in the triple bottom line. The score reflects the early stages of economic and ICT development in Mexico. However, Mexico is Latin America's largest exporter of high technology goods according to the World Bank.



TBL Social

Mexico City's performance in the social dimension of the index is modest. The infant mortality is fairly high and the life expectancy is rather low compared to other cities in the index.

The level of educational attainment is among the lowest in the index. Mexico City does, however, perform quite well in terms of gender equality, both in higher education and in governance. There is room for improvement in homicide and unemployment rates in the city. Income disparity and poverty is a persistent problem in Mexico.

TBL Economy

Mexico City performs well below average in the economic dimension of the index. Economic productivity in terms of GDP per capita is among the lowest in the index. There is also room for improvement in terms of economic competitiveness. The city scores low in terms of patents, business startups and knowledge-intensive employment. There is also room for improvement in terms of tertiary educational attainment.



TBL Environment

Mexico City performs fairly well in the environmental dimension of the index. Compared to other cities in the index, it does rather well in terms of use of resources and has low energy consumption and waste per capita. The city also performs rather well in terms of CO₂ emissions compared to many other cities in the index. Pollution, however, is a problem, and the city performs below average compared to other index cities.

ICT Infrastructure

Mexico City scores low in ICT infrastructure. The broadband quality leaves room for improvement. Access to the internet, high-speed mobile broadband and fiber is rather low. Fixed broadband speeds and app coverage are low, but broadband quality is slightly better compared to the availability of ICT infrastructure. Mexico City's performance reflects its early stages of development.



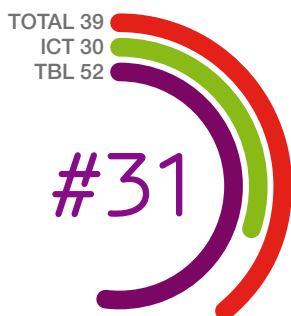
ICT Affordability

Mexico City also scores low in the affordability dimension, compared to other cities. The city scores well in terms of IP transit prices, but ICT costs are rather high in relation to income. The city also scores low in terms of mobile cellular tariffs. There is also room to improve fixed broadband tariffs.



ICT Usage

Mexico City performance on ICT usage is also modest. The city scores low in terms of mobile subscriptions, smartphone penetration, and usage of computers and tablets. There is work to be done to enable individual usage of the internet and social networks, as well as public and market ICT usage. The city does not have a well-developed homepage and access to open data is lacking.



BUENOS AIRES

Buenos Aires is the capital of Argentina. With a metropolitan population of nearly 13 million, it is both the largest city in Argentina and the second largest in South America. The city is highly influenced by its European heritage, and famous for its tango scene. The city-sponsored technology districts and the high density of theaters and small scale art galleries has helped to establish Buenos Aires' reputation as a technological and cultural hub. It is also a top tourist destination.

In 2012, Buenos Aires was ranked as an alpha global world city, meaning that it is the economic center of its region. The city is also the political, financial, industrial, commercial, and cultural hub of Argentina and is home to one of the busiest ports in South America. The city's

Metropolitan population	12,740,000
Density	2,680/km ²
City population yearly growth	0.3%
City GDP per capita PPP\$ 2011	33,600
GDP per capita PPP\$ growth 2010-2011 ...	0.9%
ICT maturity improvement 2013-2014 ...	Medium

+ Affordable ICT services. Scores quite well in most variables in TBL when compared to similar cities.

- Low quality of provided ICT services. Stale business climate, few business start-ups and patent applications.

service sector is diversified and well developed in accordance with top international standards. It accounts for 76 percent of the city's economy, a notably high proportion for a city in the region. The financial and real estate sectors contribute to around 31 percent of the city's economy. Manufacturing is, nevertheless, still a prominent sector in the city's economy.

Buenos Aires is ranked #31 in the Networked Society City Index. The city's ICT performance is lacking in all dimensions. ICT infrastructure is underdeveloped and affordability is low, contributing to low ICT usage. It is clear that the city of Buenos Aires needs to invest in ICT and also make it easier for private actors to participate in this development. However, some things are already being done. The city has, for example, formed a new department with a target of making it easier for businesses to become established in the city. The department uses Microsoft Dynamics CRM to increase the efficiency of its work, with the help of social information, business intelligence and campaign management.



TBL Social

Buenos Aires is home to a well-educated and healthy population when compared to cities like Mexico City and São Paulo. The city is known as the home of the first purely artificial heart, and yet cannot measure up to the most well-developed cities in the health dimension. The education level is average compared to all cities in the index. The city also experiences average unemployment and homicide rates compared to other index cities.

TBL Economy

The city is one of the leading financial cities in South America, with a comparably high GDP per capita. A quite high proportion of its population also enjoys a high education level, and



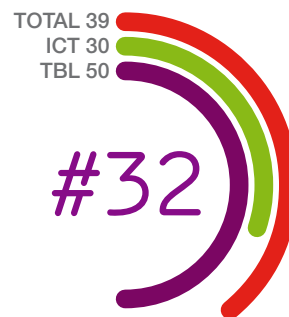
employment levels in knowledge intensive sectors are high. However, the business climate is seemingly stale, with few patents being registered and few firms being started. The city has launched a new initiative to improve matters on this front.

58 **TBL Environment**
 Buenos Aires performs poorly on the environmental dimension. The city air is fairly clean and the CO₂ emissions are moderate; however, waste recycling rates are low and the city relies mostly on fossil fuel energy. The city also suffers from very low levels of treated waste water. One controversial topic is the privatization of the water sector in the 1990s, which failed when an economic crisis struck around 2002. Many agreements were terminated and the sector is still recovering.

15 **ICT Infrastructure**
 Buenos Aires can improve considerably on the ICT infrastructure dimension. While the inhabitants' use of internet and mobile phones has flourished, city investments in ICT have been lacking. This has resulted in customers experiencing slow connections and feeling generally dissatisfied. Argentina falls behind most South American countries on the Ookla speed tests.

77 **ICT Affordability**
 The affordability of ICT services in Buenos Aires is not up to the standard of top-ranking cities. However, as an issue, affordability is less critical than the city's lack of quality of services.

37 **ICT Usage**
 Even though the use of internet and mobile phones have been said to be thriving, Buenos Aires scores below average in the ICT usage dimension. A reason for this might be the lack of ICT infrastructure. This result is, however, improved by a well-developed open data site, compared to other South American cities, and an advanced city home page.



MUSCAT

Muscat, the capital of Oman, has an estimated metropolitan population of about 1.2 million people. The city is located in northeast Oman, on the eastern edge of the Arabian Peninsula.

Muscat is the governmental center and largest city in the Governorate of Muscat. The city has played a prominent role historically due to its strategic location. It is a commercial center and a significant trading port for the Gulf and the Indian Ocean.

Muscat has a vibrant economy and has experienced rapid infrastructural development. The city's economy is dominated by trade and petroleum. Dates, fish and mother of pearl are traditional exports.

Muscat ranks #32 in the Networked Society City Index. Muscat scores rather low in terms of ICT maturity. The city also has a modest performance in the triple bottom line dimensions. However, Oman is developing its digital economy and the mobile market has recently become liberalized. The partly government owned Oman Telecommunication Company (Omantel) is the primary internet and telecommunication service provider in the country.

Metropolitan population.....	1,210,000
Density	300/km ²
Population yearly growth	3.9%
Country GDP per capita PPP\$ 2012.....	28,800
GDP per capita PPP\$ growth 2011-2012...	3.5%
ICT maturity improvement 2013-2014.....	not applicable, city new to index

- + Fairly high rollout of fiber broadband network. Access to internet at home is well above index average. Many business start-ups.

- Low broadband quality, very high IP transit prices, and CO₂ emissions are rather high.



TBL Social

Muscat performs below average in the social dimension of the index. Improvements are needed in education as educational attainment and literacy rates are rather low compared to other index cities. There is also room for improvements in terms of gender equality in governance. Moreover, life expectancy and infant mortality in Muscat are only average. However, the city performs rather well in terms of safety and gender equality in education.

TBL Economy

Muscat has a modest performance in the economic dimension of the index. Economic productivity in terms of GDP per capita is below average in the index. There is also room for improvement in economic competitiveness as the city scores low in terms of patents and knowledge-intensive employment. There is also need for improvements in tertiary educational attainment. However, the city performs well in terms of business start-ups.



TBL Environment

Muscat receives one of the lowest scores in the environmental dimension of the index. The air pollution is on an average level and waste water treatment is low compared to other index cities. Use of resources is fairly high. Energy consumption of fossil fuels (derived mostly from gas) is higher than most index cities and recycling of waste is very low. CO₂ emissions are also rather high in Muscat.

ICT Infrastructure

Muscat scores rather low in ICT infrastructure. The broadband quality leaves room for improvement with low fixed and mobile broadband speeds. However, access to internet and fiber is rather high. This indicates that its well-developed fiber network is not used to its full extent.



ICT Affordability

ICT costs are rather high in relation to income in Muscat. The city scores rather well in terms of mobile cellular tariffs. However, fixed broadband tariffs could be lower. IP transit prices are the highest of the index, thus severely reducing Muscat's overall ranking in this dimension.

ICT Usage

Muscat has a modest performance in terms of ICT usage. The level of mobile phone subscriptions, computers and tablets is fairly high but could still improve. Smartphone penetration is, however, rather high. Internet usage is below average compared to other index cities and use of social networks is rather low. In addition, the public and market ICT usage leaves room for improvement, especially in the use of electronic payments. The city has well-developed e-services, but lacks advanced open data resources.



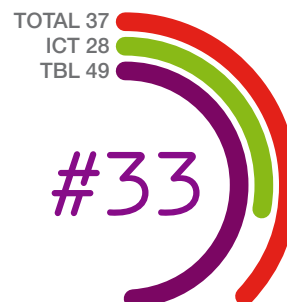
MANILA

As one of the most densely populated cities in the world, the city of Manila allows for an unprecedented agglomeration of economic activities. Together with 15 other cities, it makes up the National Capital Region called Metro Manila, which has a population of 12 million inhabitants. Manila's vulnerability to the impact of natural hazards, as well as unplanned urban expansion towards the peripheral areas in the region, is causing the city to face multiple challenges.

Manila is home to some of the most historically and culturally iconic landmarks in the country, as well as governmental, scientific and educational institutions. Its economy is multi-faceted.

With its well-protected harbor, the city serves as the country's chief seaport. Diverse manufacturers produce industrial-related products, such as chemicals, textiles, clothing and electronic goods. The food-processing industry is one of the most stable manufacturing sectors in the city. Tourism is another of Manila's most important sources of income, and the city attracts over 1 million tourists each year.

Manila ranks #33 in the Networked Society City Index. It achieves a comparatively higher ranking in the triple



Metropolitan population	11,860,000
Density	18,570/km ²
Population yearly growth	1.3%
GDP per capita PPP\$.....	11,600
GDP per capita PPP\$ growth 2010-2011 ...	4.3%
ICT maturity improvement 2013-2014.....	High

- + Low energy consumption and CO₂ emissions are far below average.
- Underdeveloped ICT infrastructure with a large share of the population lacking access to the internet.

bottom line index compared to its ICT maturity index. The city's ICT maturity is at an early stage of development and needs to be improved to fully use its ICT capability. Currently, a large share of the population lacks access to the internet and household computer access is far below average.



TBL Social

Although Manila performs around average in the social dimensions of the index, there is room for improvement. Both educational attainment and literacy rate in the city are slightly below average. The social inclusion variable is at an average

level. In comparison to many other Asian cities, Manila has a higher share of women in parliament.

TBL Economy

The economy in Manila is diverse and multi-faceted. Although the size of the region in itself allows for an agglomeration of economic activities, the city does not perform well in the economic dimension of the index. GDP per capita is relatively low and the city faces several challenges to strengthen its economic competitiveness. Its share of employment in knowledge-intensive sectors is low and tertiary educational attainment is below average. In order to improve its achievements within the economic dimension, the city should also strive to increase patent registrations and business start-ups.



TBL Environment

During the last decade, Manila has been exposed to several natural hazards, such as flooding and tropical storms. However, Manila performs quite well in the environmental dimensions of the index. Energy consumption is low and the city's

CO₂ emissions are below average. Overall, the city's performance is negatively affected by a relatively low share of waste water being treated. Air pollution levels are average compared to other cities in the index.

ICT Infrastructure

The index shows that Manila's ICT infrastructure is underdeveloped, both in terms of quality and access. In Manila, the quality of both fixed broadband and mobile broadband is insufficient. Moreover, access to the internet is below average. In order to improve its ICT infrastructure, the city should also strive to develop its fiber network and high-speed mobile network. There is also a large share of urban poor. High income inequality levels are, in turn, causing unequal access to ICT infrastructure.



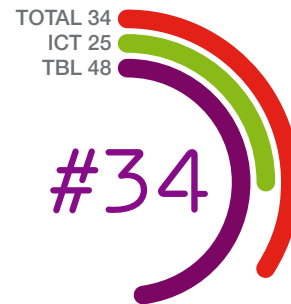
ICT Affordability

Manila experiences a low score in the ICT affordability dimension, meaning that costs related to using the internet and mobile phones are high in relation to income. The low score in ICT affordability is undeniably a reflection of the

city's early stage of economic development, ICT infrastructure and high income inequality.

ICT Usage

Regarding ICT usage, Manila's rating fluctuates between different types of technologies. The city has an average score when it comes to the number of mobile phone subscriptions. However, use of tablets and smartphones is below average and household access to computers is far below average. The city also rates below average in internet use. In comparison to many other Asian cities, a common online entry point in Manila is social networking. To improve ICT usage, the city should also develop its public and market use. Both e-governance and electronic payments are below average.



JAKARTA

Jakarta is the economic, cultural and political capital of Indonesia, the most populous country in Southeast Asia. The country's economy also enjoys the status of being the largest in the region.

Jakarta is home to around 10 million people, with a further 2 million people commuting daily to the city. Greater Jakarta has seen sustained growth levels during the past decades, making it one of the largest urban agglomerations in the world, with a population of 28 million people. As a consequence, slums and semi-legal settlements have expanded, negatively affecting inhabitants' access to services.

Metropolitan population	9,590,000
Density	1,250/km ²
Population yearly growth	4.3%
GDP per capita PPP\$ 2010	14,300
Country GDP per capita PPP\$ growth 2011-2012.....	6.6%
ICT maturity improvement 2013-2014...	Very high

- + Low use of resources, high use of mobile phones and fairly low mobile cellular tariffs.
- High pollution levels, underdeveloped ICT infrastructure and low ICT usage.

The city has for a long time been an important trading port in Southeast Asia, a role which grew in importance during the Dutch colonial period. As such, Jakarta has a long history of hosting a multicultural population. In the aftermath of the 1997-1998 East Asian Financial Crisis, which negatively affected the city, democracy was introduced. Since then, Jakarta has experienced a period of sustained economic growth and is now seen as one of the more promising economies in the Asia-Pacific region. Consequently, the city has a strong service sector, especially in finance and trade. Jakarta also enjoys a vibrant manufacturing sector in areas such as electronics, automotive, chemicals, mechanical engineering and biomedical sciences.

Currently, the city is facing the effects of an historic overreliance on developing its road infrastructure, leading to severe traffic congestion. To counter this problem, a rapid bus transit system has been developed over the last decade. Moreover, an underground rail network is currently being built. To further decrease use of cars, an electronic road pricing system is expected to become operational in 2016. Affected by flooding, due to its geographic location, Jakarta is also sinking, increasing its exposure to the effects of climate-change-related sea water rise. To counter this threat, the construction of a giant dyke is being evaluated.

Jakarta ranks #34 in the Networked Society City Index. Jakarta performs better in ICT maturity compared to the triple bottom line part of the index.

TBL Social
 Jakarta rates relatively well in the social dimension, as it performs fairly well on the social inclusion variables. In turn, this is due to low homicide rates and a perfect score on the gender education proxy. When it comes to the health variable, they have above average infant mortality rates and average life expectancy. The city could improve its standing further by decreasing unemployment rates and improving the gender balance in the city's governance structure. Moreover, although the city enjoys a high literacy rate, educational attainment is low, which decreases Jakarta's overall position.

TBL Economy
 Jakarta performs less well on the economic dimension despite its recent economic growth. On a positive note, the city's GDP per capita fares well compared to several comparable index cities, although it is below the index average. Additionally, employment levels in knowledge intensive sectors are quite high. On a less positive note, the city suffers from few business start-ups, low patenting levels and low tertiary educational attainment.

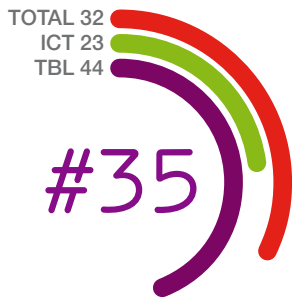
TBL Environment
 Regarding the environmental dimension, there is space for Jakarta to improve its ranking in the index. It scores relatively poorly, due to high pollution levels, especially high levels of sulfur and nitrogen dioxide and the close to non-existent treatment of waste water. The city performs better on the resource and climate change variables, due to low energy consumption and low waste levels. However, if economic growth continues, these variables can be expected to worsen unless sufficient efforts are made to address future developments.

ICT Infrastructure
 Jakarta scores low on the ICT infrastructure dimension. This is due to its broadband infrastructure being underdeveloped, both in terms of quality and access. Most of the residents lack internet access at home and the mobile broadband network is underdeveloped.

ICT Affordability
 The city scores fairly well on the ICT affordability dimension. Impressively, the city scores well on the tariff variable, especially in relation to comparable cities in the region. Moreover, IP transit prices are below average.

ICT Usage
 Concerning ICT usage, Jakarta performs poorly. The city has high levels of mobile phone subscription, but the dissemination of smartphones, computers and tablets is below average. Individual use of internet and electronic payments is low. Another area of improvement is providing more e-services and open data resources.





CAIRO

Cairo is the capital of Egypt, with a metropolitan population of over 20 million people. It is the largest city in the Middle East, and has a long history of being the political and cultural center of the region.

Famous for hosting the second oldest institution of higher learning in the world, the al-Azhar University, it is also host to the largest and oldest film and media industry in the Arab world. Due to its position and importance, multiple international media, business and public organizations such as the World Food Programme also have their regional headquarters in Cairo. Importantly, Cairo is the commercial center of Egypt.

During the past few years, Cairo has been the epicenter of continued political turmoil affecting the country. During the Arab Spring, protesters used social media to organize themselves, which led the government to attempt to close down the country's internet access. Political instability has continued till this date, which has harmed the country's economy. As seen in the index results, there is need to address the population's social and economic situation as a way to decrease the political instability.

Metropolitan population 2013.....	20,440,000
Density 2013	220/km ²
City population yearly growth	1.0%
GDP per capita PPP\$ 2011 (estimated)	17,300
Country GDP per capita PPP\$ growth 2011-2012.....	1.6%
ICT maturity improvement 2013-2014...	Very high

- + The city has low CO₂ emissions, low energy consumption and a high recycling rate.
- Cairo performs poorly in the ICT infrastructure and ICT usage variables.

Cairo ranks #35 in the Networked Society City Index 2014. The city performs slightly better in the triple bottom line dimensions compared to the city's ICT maturity. Improved ICT infrastructure could have a positive impact on the city's economy by improving its competitiveness. The city faces substantial problems with pollution and there is need to implement ICT solutions to improve these areas.



TBL Social

Cairo does not perform well in the social dimension of the index. This is due to the inadequate provision of clean water, good-quality health care and education, and is reflected in high infant mortality rates and low educational attainment. Rising inequality is a further issue facing Cairo that risks exacerbating these issues.

TBL Economy

The city also performs less well in the economic dimension. GDP per capita is low, reflecting poor productivity, and the city also scores low in the economic competitiveness variable, mainly due to the occurrence of few business startups and few patent applications. The city does, however, score higher in employment levels in knowledge intensive services and tertiary educational attainment than several other cities in developing economies.



TBL Environment

Cairo performs considerably better in the environmental dimension due to quite low CO₂ emissions and overall low energy consumption. The total waste per capita is above average, but the recycling rate is high. However, the city faces substantial problems with air pollution and untreated waste water. As such, there is ample opportunity to implement ICT solutions to improve these areas.

ICT Infrastructure

Cairo performs poorly in the ICT infrastructure dimension of the index. This is due to underdeveloped broadband quality and low internet access. Consequently, improved ICT infrastructure could have a positive impact on the city's economy by improving its competitiveness.



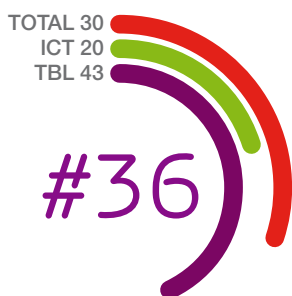
ICT Affordability

Cairo performs considerably better in the ICT affordability dimension as both tariff and IP transit prices are either below, or far below, the index average. This is highly positive for the city and could result in increased activity in the ICT field. Unfortunately, the quality of provided services is low.

ICT Usage

Despite the affordability of ICT use in Cairo, internet use is low. There are multiple explanations for this. First, although mobile phone subscriptions are higher than average, there is less diffusion of smartphones, tablets and computers. Second, market and public use of open data are lower than average. Moreover, next to no electronic payment services are being used. Third, individual use of social networking services is below average. As such, underdeveloped ICT infrastructure could partly explain low adoption rates of new ICT products and services. On the positive side, the city has a quite well-developed homepage with e-services.

26



DELHI

The Delhi metropolitan region includes New Delhi, the national capital city of India. As one of the most populous cities in the world, the main challenges for Delhi are to reap the economic advantages of urbanization and to meet the social and economic needs of its population in an environmentally sustainable way. Like most of India's cities, Delhi is characterized by rapid population growth, high population density and a high proportion of non-motorized forms of transportation.

Delhi has received immigrants since antiquity. As such, its character and culture have continued to evolve with each immigration wave. People migrating from rural areas in search of work have been the main drivers for Delhi's population increase since 1951.

Delhi is the largest commercial center in northern India. Its economy is dominated by the service sector, representing over 70 percent of the region's GDP. IT, telecommunications, hotels, banking, media and tourism are all key service sectors. The construction, power, real estate, health and community services sectors also contribute to the city's economy.

Delhi is ranked #36 in the Networked Society City Index. Delhi attains a higher score in the triple bottom line dimensions than in ICT maturity. The city's ICT achievements present a rather weak picture. Although India has witnessed a huge leap in computer literacy in both urban and rural areas, internet usage in Delhi is

Metropolitan population..... 21,750,000
Density 470/km²
City population yearly growth 2.7%
GDP per capita PPP\$ 2011 8,400
GDP per capita PPP\$ growth 2010-2011 ... 8.9%
ICT maturity improvement 2013-2014... Very high

+ Lower energy consumption and CO₂ emissions compared with many other cities.

- High levels of pollution, underdeveloped ICT infrastructure and low internet usage.

remarkably low. To advance its ICT infrastructure, the city should strive to increase the download speed for both fixed broadband and mobile broadband.

55

TBL Social

For growth to be sustainable, it must be inclusive and improve issues related to health, education and social inclusion. On these social aspects, Delhi's performance is rather weak. Exceptions are the low unemployment and homicide rates compared to many other cities in the index. The achievements in the education sector could, however, be improved and, although the government has introduced policies to improve access to education, much more needs to be done to increase educational attainment levels in the city.

TBL Economy

Although Delhi accounts for a large share of the country's GDP, the city does not perform well in the economic dimension of the index. GDP per capita is relatively low and the city faces several challenges to strengthen its economic competitiveness. The share of employment in knowledge intensive sectors is low and the share of people with tertiary education is below average. In order to build a more dynamic business climate, the city should also strive to increase the number of business start-ups and registered patents.

19

77

TBL Environment

One of the main environmental challenges for Delhi concerns its air quality. Although several measures and policies have been implemented to tackle this problem, Delhi still suffers from a high level of pollution. The city's performance in the environmental dimension is, therefore, negatively affected, especially by the levels of PM2.5 and PM10 particles that are far above average. Nitrogen dioxide levels are also above average, although sulfur dioxide levels are below average. Delhi's overall score in the environmental dimension is lifted by the city's low energy consumption and low emissions of CO₂.

ICT Infrastructure

Delhi faces several challenges related to its ICT infrastructure. Although the city has witnessed a radical transformation of its telecommunication sector during the past decade, the ICT climate is overall very weak, especially in relation to other cities in the index. The average download speed for both fixed broadband and mobile broadband remains remarkably slow and a large share of the population lacks access to the internet.

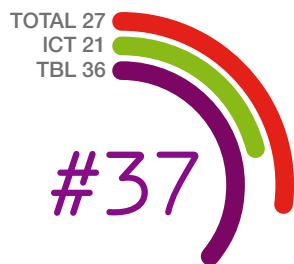


ICT Affordability

Delhi performs fairly well when it comes to ICT affordability. Fixed broadband tariffs are on an average level compared to index cities. Meanwhile, tariffs for mobile cellular phones are slightly below average in relation to GDP per capita. The IP transit prices are, however, higher than in many of the other cities.

ICT Usage

India has witnessed a huge leap in computer literacy in both urban and rural areas. This can be attributed to the increased impetus placed on IT education in schools, colleges and offices. Despite this, ICT usage in Delhi is poor compared to other cities in the index. Household penetration of computers is below average and individual internet use is also far below average. The same pattern holds for smartphone use and mobile phone subscriptions, which are both below the average level of the index. Moreover, Delhi performs below average in e-governance and in use of electronic payments.



MUMBAI

Since India's economic liberalization process began in 1991, Mumbai has experienced sustained economic growth. Mumbai, situated on India's west coast, has several geographical advantages, such as a deep harbor. Overall, Mumbai accounts for 70 percent of the maritime trade in India and generates approximately 5 percent of India's GDP.

Mumbai is a center for India's financial institutions and some of the country's premier scientific institutes. Additionally, Mumbai is the country's largest film producing center and is often referred to as Bollywood.

Metropolitan population.....	21,000,000
Density	4,820/km ²
City population yearly growth	4.7%
GDP per capita PPP\$ 2010	4,900
GDP per capita PPP\$ growth 2009-2010...	4.6%
ICT growth 2013-2014.....	High

+ Low energy consumption and low CO₂ emissions. The unemployment rate is also below average.

- A large share of the population lacks access to the internet and broadband speeds are poor.

The metropolitan area of Mumbai has a population of approximately 21 million people, which makes it one of the most populous cities in India and the fourth most populous in the world. As in many other Indian cities, rapid population growth is putting pressure on Mumbai, especially as the city suffers from poor air quality and traffic congestion. One of the main challenges for Mumbai is, therefore, to reap the economic advantages of urbanization while meeting the demands for new infrastructure and improved quality of life for its people.

Mumbai is ranked #37 in the Networked Society City Index. A large share of the population lacks access to the internet and computer usage is below average. Consequently, Mumbai has huge potential to further develop its infrastructure and raise ICT awareness. On the triple bottom line index, Mumbai scores high in the environmental dimension, due mainly to the city's low energy consumption and low CO₂ emissions.



TBL Social

Mumbai's performance in the social dimension is low, with the exception of the unemployment and homicide rates, which are relatively low compared to many other cities in the index.

Achievements in the education sector could, however, be improved. Educational attainment in Mumbai is far below average, and a vast number of young people receive no or next-to-no education. Further gains can also be made to improve health related issues such as raising life expectancy and tackling high infant mortality.

TBL Economy

Since the beginning of the 1990s, Mumbai has experienced sustained economic growth. Although Mumbai accounts for a large share of the country's GDP, the city does not perform well in the economic dimension of the index. The share of employment in knowledge-intensive sectors is low and the share of people with tertiary education is below average.



In order to boost a more dynamic business climate, the city should also strive to increase the number of business start-ups and patent registrations.



TBL Environment

Mumbai performs quite well in the environmental dimension, largely due to its low energy consumption and CO₂ emissions. A major challenge for the city is to improve its air quality.

The city's performance in the environmental dimension is negatively affected especially by PM10 pollution levels that are far above average. On the other hand, nitrogen dioxide and sulfur dioxide pollution levels are below average. To strengthen the city's performance in the environmental dimension, the city should also strive to improve waste water treatment.

ICT Infrastructure

Mumbai faces several challenges related to ICT infrastructure. Although the city has witnessed a leap in the telecommunication sector during the past decade, the infrastructure is overall very weak, especially in relation to other cities in the index. The average download speed for both fixed broadband and mobile broadband remains remarkably poor and a large share of the population lacks access to the internet. However, in comparison to Delhi, the bandwidth capacity is higher in Mumbai.



ICT Affordability

Mumbai's performance regarding ICT affordability is moderate. In relation to other cities in the index, tariffs for both fixed broadband and mobile phones are above average. IP transit prices are also slightly above average.

ICT Usage

India has witnessed a huge leap in computer literacy in both urban and rural areas. Reasons for this include the increased emphasis placed on computer education in schools, colleges and offices. Despite this, Mumbai presents a rather weak performance when it comes to ICT usage. The number of mobile phone subscriptions is below average and smartphone penetration is also low. The same pattern can be found in household usage of computers and individual internet use, of which both indicators are below average. Moreover, Mumbai's e-governance is underdeveloped and use of electronic payments is low.



LAGOS

Since the turn of the 20th century, Lagos has grown at a rapid pace, both demographically and in spatial terms. Located in the southern part of Nigeria, Lagos has a population of 21 million. As such, it is now the largest city in Africa. Lagos is also the second fastest growing city in Africa and is expected to be the sixth fastest growing city in the world during the next 10 years. The rapid population growth in Lagos is causing an urgent need for urban management and inclusive growth.

Most of the population in Lagos lives on the mainland, and most industries are located there too. The city is a major port and it is the economic focal point of the country, generating about a quarter of Nigeria's GDP. The commercial center is on Lagos Island, hosting the headquarters of banks and insurance and oil companies. Lagos is one of the world's largest cities but it has less developed infrastructure than any of the cities of similar size, which severely hampers its economic development.

Although Lagos has one of the highest living standards in Nigeria, this city faces several challenges. One of the greater challenges facing Lagos is tackling issues related to waste management and pollution. Another urgent issue to address is the high unemployment levels, and the emergence of increasingly marginalized groups in society.

Metropolitan population	21,000,000
Density	21,010/km ²
Population yearly growth	3.5%
GDP per capita PPP\$ 2010	6,300
Country GDP per capita PPP\$ growth 2011-2012	5.5%
ICT maturity improvement 2013-2014	Very high

+ Relatively high individual internet use despite a lack of affordable ICT infrastructure.

- Low life expectancy and high level of pollution.

Lagos is ranked #38 in the Networked Society City Index. Nigeria's infrastructure is regarded as a major constraint facing businesses in the country. However, over the past 10 years, the country has experienced massive improvements in its ICT infrastructure. It has also started to gradually reform its telecom sector by privatizing selectively and managing competition in different segments of the telecom market.

35

TBL Social

Given Lagos' low score in the social dimension of the index, the city faces many challenges. A great challenge for the city is to reap economic advantages from the rapid population growth and simultaneously meet social demands.

Unemployment continues to be a severe problem; the city's unemployment rate is one of the highest in the index. Lagos has also one of the highest infant mortality rates and its life expectancy is below 50 years. Reasons for this can be attributed to issues such as pollution and poverty, which is prevalent in Lagos and in the country as a whole. Lack of access to health care is also one contributing factor to the low life expectancy.

TBL Economy

Although Lagos has a fast growing economy, the city performs poorly in the economic dimension. However, this does not take informal industry into account, which represents a large part of the economy. GDP per capita is relatively low and the city faces several challenges to strengthen its economic competitiveness. The share of employment in knowledge-intensive sectors is low and the share of people with tertiary education is below average. Although business start-up numbers are below average, the number of new enterprises per capita is, in fact, higher in Lagos than in similar cities. One reason could be the liberalization of the telecom industry which may have brought advantages for the economy as a whole.

15

52

TBL Environment

One of Lagos' main environmental challenges is to tackle issues related to waste disposal and pollution. In comparison to all other cities in the index, Lagos has the highest levels of sulfur and nitrogen dioxide pollution. The level of PM10

pollution is also far above average. The high level of pollution is indeed a severe problem for the city, especially as it affects the quality of drinking water and consequently has a negative impact on people's health. Despite its high pollution level, the overall result in the environmental dimension is moderate. This is mainly due to the city's low energy consumption and very low emissions of CO₂.

ICT Infrastructure

Lagos faces several challenges related to ICT infrastructure. The average download speeds for both fixed broadband and mobile broadband remain low. Despite the fact that internet awareness is increasing in the country, a large share of the population lacks access to the internet in Lagos.

12

36

ICT Affordability

Price levels in relation to income in Lagos are among the highest in the index. This is especially true for fixed broadband tariffs, which are far above average. The tariffs for mobile phones are, on the other hand, more affordable. The price differences between fixed and mobile broadband could be explained by the liberalization of the telecom industry. Evidently, one of the main objectives in the adopted market reform concerns reducing tariffs, especially for mobile phones.

ICT Usage

Although Lagos presents a low score on ICT usage, the results are not too bad given the city's poor performance in the infrastructure and affordability dimensions. The penetration of computers, smartphones and tablets is all below average, whereas individual internet use is slightly above average. Evidently, a large share of the online population in Lagos is using social media as a point of entry for online purposes. The overall results indicate a willingness to adopt new technologies and to stay connected.

27



KARACHI

Karachi is the most populous metropolitan area in Pakistan, with an estimated population of 23.5 million people. The city is located in southern Pakistan and is one of the largest and most rapidly growing cities in the world.

At the time of Pakistan's independence in 1947, Karachi had become a metropolis with just below half a million people. During the 1960s, Karachi was seen as an economic role model around the globe. The city has since then underperformed, due to a lack of development efforts partly because of war and unrest.

Today, Karachi is the center of economic activity, banking, education, industry and trade in Pakistan. The GDP of Karachi is around 20 percent of the total national GDP. The city is home to the largest corporations in the country, and the World Bank has identified Karachi as the most business-friendly city in Pakistan. However, Karachi faces significant challenges such as poverty.

City population 2013 23,500,000
 Density 2013 6,660/km²
 Population yearly growth 5.2%
 GDP per capita PPP\$ 2011 (estimated) 6,800
 GDP per capita PPP\$ growth 2010-2011 ... 3.1%
 ICT maturity improvement 2013-2014 High

+ Karachi performs fairly well in the environmental dimension of the index.

- Karachi performs poorly in terms of ICT maturity and has especially poor ICT infrastructure and low usage.

Karachi ranks #39 in the Networked Society City Index. Karachi's performance in ICT maturity and triple bottom line is among the lowest in the index. The score reflects the early stages of economic and ICT development in the city. However, Pakistan has become one of the fastest growing mobile phone markets among the emerging telecom markets. Karachi is the software-outsourcing hub of Pakistan and has seen an expansion of information and communications technology.

TBL Social
 38 Karachi performs well below average in the social dimension of the index. The infant mortality rate is high and the life expectancy rate is rather low. The level of educational attainment in Karachi is among the lowest in the index. Karachi

has the lowest scores for gender equality in higher education. There is also room for improvement in regard to safety, unemployment and gender equality in governance.

TBL Economic

Karachi's performance in the economic dimension of the index is modest. The economic productivity in terms of GDP per capita is among the lowest in the Networked Society City Index. Karachi also performs well below average in terms of tertiary educational attainment, knowledge-intensive employment, patents, and business start-ups.

TBL Environmental
 70 Karachi performs fairly well in the environmental dimension of the index. Karachi's low level of development leads to low levels of CO₂ emissions, waste, and energy consumption. There is, however, need for improvement with

regards to pollution. Karachi faces environmental challenges such as poor air quality, inadequate sanitation and poor transport systems.

ICT Infrastructure

Even though Karachi is the software outsourcing hub of Pakistan, the city's ICT infrastructure is modest. Karachi scores low in terms of ICT infrastructure, which reflects its early stage of development. However, Karachi performs fairly well in terms of broadband quality compared to cities with similar potential in the Networked Society City Index. The app coverage is low, but slightly better compared to the fixed broadband speeds.



ICT Affordability

Karachi also performs low in the affordability dimension compared to other cities. ICT costs are high in relation to income in Karachi. The score reflects the early stages of economic development and ICT maturity in Karachi. A large number of the city's population lives below the poverty line.

ICT Usage

Karachi scores low in terms of ICT usage. Modest economic and ICT infrastructure development hinder the use of ICT. However, Karachi's rate of technology use is rather high compared to other cities with similar potential. This indicates a positive development in ICT usage during the past years.



DHAKA

Dhaka is the capital of Bangladesh and has an estimated population of more than 14 million people. Dhaka is one of the most densely populated and fastest growing cities in the world.

Dhaka is the economic hub of Bangladesh. The city has, in recent years, experienced growth in its financial, manufacturing, telecommunications and service sectors. The World Bank has identified Dhaka as the country's most business-friendly city. However, Dhaka's telecommunication services are in need of development and there is a lack of advanced ICT in the city. On a national level, ICT has been recognized as a means to lift Bangladesh out of poverty.

Dhaka ranks at the bottom as #40 of the Networked Society City Index and has the lowest score in terms of both ICT maturity and in the triple bottom line

Metropolitan population 2013..... 14,400,000
 Density 2013 17,650/km²
 Population yearly growth 2.0%
 GDP per capita PPP\$ 2011 (estimated) 2,300
 GDP per capita PPP\$ growth 2010-2011 ... 6.9%
 ICT maturity improvement 2013-2014... Very high

+ Dhaka performs rather well in the environmental dimension of the index.

- Dhaka received the lowest score for ICT maturity in the Networked Society City Index.

dimensions. Dhaka's performance reflects the modest economic development of the city. Dhaka has the lowest score in terms of ICT infrastructure and ICT usage of all cities included in the index.

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TBL Social

Dhaka performs below average in the social dimension of the index, but there are cities with poorer performance. With a fairly high infant mortality rate and below average life expectancy rate, health care is in need of development.

Dhaka has the lowest literacy rate among cities in the index and residents' educational attainment is among the lowest. There is room for improvement regarding safety, gender equality in education, and governance in Dhaka. The unemployment rate is, however, low compared to other index cities.

TBL Economic

Dhaka has the lowest performance in the economic dimension of the index. It has the lowest score in terms of economic productivity and one of the lowest scores for economic competitiveness. Even though Dhaka is a center for the country's economy, the city faces many challenges.

4

82

TBL Environmental

Dhaka performs fairly well in the environmental dimension. Its low level of development results in low waste and energy consumption together with low levels of CO₂ emissions. There is, however, room for improvement in terms of pollution. Rapid

growth leads to environmental pressures. Even though Dhaka ranks well in the environmental dimension of the index, the city faces environmental challenges such as overpopulation, traffic congestion, and air and water pollution.

ICT Infrastructure

Dhaka receives a low score for ICT infrastructure, reflecting the city's early stage of development. Broadband quality is low, as is access to the internet, hotspots, high-speed mobile broadband and fiber. A country assistance strategy for Bangladesh, offering financial and technical assistance has been created by the World Bank. The strategy, which runs from 2011 to 2014, recognizes the ICT sector as playing a key role in supporting the country's growth, competitiveness and governance agendas.

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ICT Affordability

Dhaka performs rather low on the affordability dimension compared to other cities in the index. ICT costs are high in relation to income in Dhaka. The score reflects the early stages of economic and ICT development in Dhaka.

Poverty is a significant problem in the city and many people live beneath the poverty line.

ICT Usage

ICT usage is limited in Dhaka. Smartphones and tablets are almost absent in the city. The level of mobile phone subscriptions and computer penetration is low. Individual usage of the internet and social networks is the lowest in the index. Public and market usage of ICT is slightly higher than its individual usage but is still very low. ICT usage in Dhaka is modest, due to low economic development and undeveloped ICT infrastructure.

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Ericsson is the driving force behind the Networked Society – a world leader in communications technology and services. Our long-term relationships with every major telecom operator in the world allow people, businesses and societies to fulfill their potential and create a more sustainable future.

Our services, software and infrastructure - especially in mobility, broadband and the cloud – are enabling the telecom industry and other sectors to do better business, increase efficiency, improve the user experience and capture new opportunities.

With more than 110,000 professionals and customers in 180 countries, we combine global scale with technology and services leadership. We support networks that connect more than 2.5 billion subscribers. Forty percent of the world's mobile traffic is carried over Ericsson networks. And our investments in research and development ensure that our solutions – and our customers - stay in front.

Founded in 1876, Ericsson has its headquarters in Stockholm, Sweden. Net sales in 2013 were SEK 227.4 billion (USD 34.9 billion). Ericsson is listed on NASDAQ OMX stock exchange in Stockholm and the NASDAQ in New York.

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