



# ***Building Better Cities: Competitive, sustainable and livable metropolises in APEC (and how to become one)***



**28** cities

studied in the 21 APEC economies

**39** indicators

to evaluate urban health

**3** lenses

to view basic city development,  
what differentiates a city  
and what compromises its growth













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# 210 million people

## Introduction

Two hundred and ten million people. That's the aggregate population of the 28 urban centers covered in our first-ever Asia-Pacific Economic Cooperation (APEC) city study. Two hundred and ten million people who are looking for work, for a safe home, for food, water, and care. Two hundred and ten million people who might hope for even more: maybe a more responsive government, public transport, and clean air. Or, perhaps, an airport with regular connections to the rest of the world or rapid-fire online access to global knowledge.

They're also expecting that their home city is working to provide such benefits equitably—that each and every resident has the possibility of playing in parkland with their children or finding care in a well-functioning hospital. They might aspire to intellectual stimulation and a quick route to beauty.

How do 210 million people create a home like this for themselves? And can that welcome be extended to all the home's visitors, and to its businesses and investors? Is it possible?

We looked at just that. Our *Building Better Cities* study ranks 28 APEC cities—representing all APEC's 21 economies—according to their relative performance across 39 indicators measuring, quite simply, a city's livability, sustainability, and competitiveness.

**How do you grow innovation, equality, and integrity across huge populaces? How do you do that in the cities that are, in some cases, just beginning to build out their urban infrastructures?**

**Why this study now?**

APEC has experienced rapid urbanization in the last couple of decades. Just consider, for instance, that in 2014 Malaysia's population was 74% urbanized, up from 50% in 1990, adding 13 million urbanites; and that Thailand's urban population rose to 48% from 29% over the same period.<sup>1</sup>

These numbers clearly have worldwide ramifications, since APEC's area, with 39% of the world's population, constitutes 46% of global trade and 57% of the GDP.<sup>2</sup>

In this study, we focus on the role urban centers play in the context of APEC's economic and social growth. We also explore their growing influence outside their city borders. If **Lima** represents 70% of Peru's GDP, and if **Los Angeles** boasts a GDP almost 1.5 times greater than Saudi Arabia, then some cities essentially carry the opportunities and responsibilities of nations.<sup>3</sup> APEC cities, then, will likely continue to become more influential, forming deeper economic ties to other cities—and even to other national economies. Yet, we were surprised, when creating this report, how few formal mechanisms exist to share innovative ideas (and products and

services) amongst cities. And city officials in the region were relieved to have an opportunity to exchange solutions and forge connections at an APEC City Summit held in **Cebu**, Philippines, in September 2015.

APEC's idea to begin studying cities as a separate agenda item is wise and welcome. City mayors know they need models. They often want a more fluid process than national government and infrastructure offers; they fear that rapidly evolving technology developments will make large tech bets outmoded overnight; and they contend with stretched municipal budgets. Therefore, they want to learn from each other, whether it be how to install a bike-sharing program or gradually grow an entire new business district; how to protect relics of their past or build a highway for flood relief. Formal exchanges could be put in place to speed the process. This report aims to push that sort of dialogue along.

<sup>1</sup> The World Bank <http://wdi.worldbank.org/table/3.12#>

<sup>2</sup> 2015 Meeting of APEC Ministers Responsible for Trade, Boracay, the Philippines; May 24, 2015;

<sup>3</sup> For Los Angeles statistic: Mathew Boesler, *12 American Cities That Rank Among the Biggest Economies in the World*, *Business Insider*, July 20, 2012; <http://www.businessinsider.com/12-american-cities-that-rank-among-the-biggest-economies-in-the-world-2012-7?top=1>; For Peru: *APEC Cities – Urbanization and Economic Sustainability in Latin America: Chile, Mexico, Peru* [http://mddb.apec.org/Documents/2014/SOM/PD/14\\_som\\_pd\\_006.pdf](http://mddb.apec.org/Documents/2014/SOM/PD/14_som_pd_006.pdf), p 6



**The scope**

APEC, which spans 21 economies from Russia to Chile, from Canada to Australia, from China to the United States, needs to rapidly and prudently solve a multi-trillion dollar challenge: How do you grow innovation, equality, and integrity across huge populaces? How do you do that in the cities that are, in some cases, just beginning to build out their urban infrastructures?

APEC covers five continents, home to some of the most advanced high-tech urban wonders, such as **Singapore**, and some of the vastest and most populous cities, such as **Tokyo**, both of which are included in this report. The region includes histories that span millennia—from **Beijing**, founded in 1045 BC to newcomers like **Los Angeles** which became a municipality fewer than 200 years ago, also both included in this study.

## How we ranked the cities

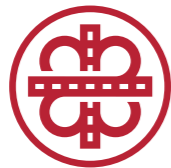
Our guiding principle in choosing these 28 cities was to have at least one from each of the 21 APEC economies. All of the chosen cities are vital geographic and economic gateways to their respective markets, as well as to the wider APEC region.

The metropolises were then analyzed according to 39 different indicators grouped into five categories which we believe begin to inscribe urban health.



### Culture & Social Health

We assess a city's cultural character, such as its cultural vibrancy and how well educated its citizens are. We also measure other strands binding the social fabric, including income equality, tolerance and inclusion, and the openness of government and commerce.



### Connectivity

We consider indicators of physical connectivity—that is, how cities accommodate the movement of people within (and in and out) of their environs—including mass transit, road congestion, and airport connectivity. We also look at the movement of information, how a city builds and promotes equitable digital connectivity, namely via accessible broadband and mobile communications.



### Health & Welfare

We look at how well a city is tending to the health and well-being of its citizens through conventional indicators such as physician density and health care system performance. But we also consider other factors critical to the well-being of residents, including crime levels and food security.



### Environmental Sustainability

We rank cities' relative sustainability in two ways. First, we measure cities' vulnerability to environmental risks such as natural disasters and water shortages. We also include indicators reflecting a city's performance on environmental protection—such as air pollution, waste management and renewable energy generation.



### Economics

We examine urban economies as if they were national economies, looking at their GDP growth, household consumption, and foreign direct investment. But we also consider other key aspects of economic health including incidence of economic crime, ease of doing business, and cost of living.

*This is the first report looking at comparative rankings of cities specifically within APEC across so many indicators, and we hope the report offers more than numbers....We wanted to be sure to not only measure tangibles, such as housing, hard infrastructure, and doctor headcount, but also examine intangibles, such as cultural vibrancy, and tolerance and inclusion.*

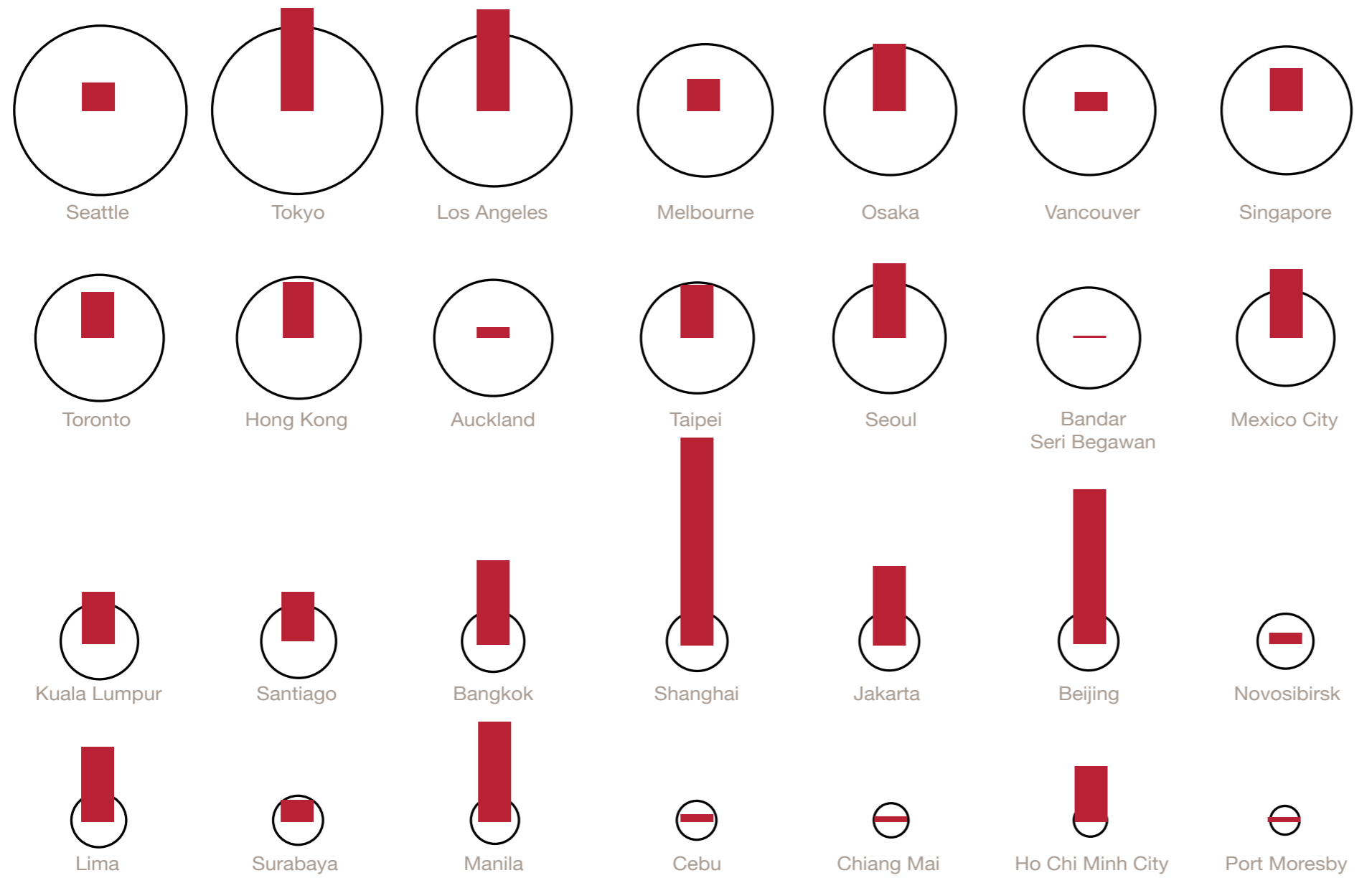


### How this report differs from other urban assessments

This is the first report looking at comparative rankings of cities specifically within APEC across so many indicators, and we hope the report offers more than numbers. Ranking on economic clout alone is incomplete. In choosing our data sets, we wanted to be sure to not only measure tangibles, such as housing, hard infrastructure, and doctor headcount, but also examine intangibles, such as cultural vibrancy, and tolerance and inclusion. Urban citizens don't just measure their livability in square footage but also in quality of life. Businesses don't just invest in new territories or enterprises based on internet bandwidth, but on whether they are likely to find a talent pool fully engaged, fully motivated.

We want this report to capture the experience of the people of these cities. It assesses and hopefully promotes the ways in which city and business leaders can provide a safe, welcoming home for their citizens that allows those citizens to optimize their talents. We found numerous examples of excellence in this regard, and we were encouraged by our background interviews with city stakeholders on how those efforts can be shared across cities of varied economic clout and populations.

## Population and GDP per capita of APEC cities in this study



Source: Canback Global Income Distribution Database



### Three lenses on urban evolution

In creating this report, we considered the fact that our 39 indicators represent the distinct stages of urban development. We sorted those variables according to three lenses:

At the ground level, a city must provide civic **basics** for its citizens if it hopes to create a strong foundation for growth—health, housing, good air quality, public transport, to name just a few of the 17 we identified.

Higher along the evolutionary chain, a city might develop its **differentiators**: access to higher education, public park space, good international airports, and openness to trade, among others.

But a city's condition can also be altered by **compromisers**: crime rates, corruption, tolerance and inclusion, or ease of doing business, to name a few. A city must always be on the move in improving these indicators and watchful to not slip down.

Not surprisingly, our top-ranked cities fared well in all three lenses. They have the basics in place. They have developed attractive differentiators. And they stayed clear of the compromisers that might pull them downward, all the while nurturing the compromisers that elevate them.

This report attempts to describe the progress in developing economies as well. We included indicators such as rates of middle-class population and gross domestic product growth (key for investors) and the status of mobile broadband access (for cities that might leapfrog fixed-line internet) to give fast-growing cities an opportunity to accurately describe their progress achieved and future growth potential.



## Our goal: An evolving urban portrait

*We hope to give cities a view of where they are now—even as they improve and grow, as they share ingenuity and commerce.*

Echoing the evolving nature of cities, the standings in this report are intended to be only a snapshot. We hope to give cities a view of where they are now—even as they improve and grow, as they share ingenuity and commerce. We want to track the pivot points where a high functioning city might face challenges—such as those caused by sustainability issues, or overstretched infrastructure. We hope the report will inspire cities within APEC to collaborate, to borrow best ideas, and seek advice on tenacious problems. This report is not a ruling. It is a progress report and hopefully it is the start of a web of city connections.

We root for cities. Nations might be able to compartmentalize problems but cities don't have that luxury. Due to their population concentrations, citizens can immediately notice what is working, who is working for them, and how they can work together. In this report, we note those cities that have resolved demands most effectively: which cities, through the power of their stakeholders, have created a center that is competitive, sustainable, and most importantly, enjoyable.

At the end of this report, we offer a few takeaways, opportunities we see for collaboration—an APEC stock market of city ideas—and an agreement on common standards of data collection. We suggest that governing bodies in each economy consider creating national-urban partnerships to ease innovation and growth. And we urge cities to consider their identity in a formal way, to further develop their 'brand.'



# The bottom line: Who is on top?

## Overall Ranking



So which city topped our list? The top city managed to gain its position by charting strongly in city basics, compromisers and differentiators. It is mid-sized, but has successfully navigated the challenges of a diverse population, 46% foreign-born.<sup>4</sup> The city is **Toronto**. What's interesting is that Toronto was number-one in just one of our five categories—but did well across all five (although even that city has room for improvement in such indicators as connectivity, middle-class growth, and most significantly, cost of living). Number two (**Vancouver**) and number three (**Singapore**) also showed balanced performance.

From **Tokyo** (ranked four) on down the list, we begin to see less consistent performance. In Tokyo's case, it was relatively lower in just one pillar—environmental sustainability—due largely to its vulnerability to natural disaster; it also had middling showings on recycling and water available for industrial use.

<sup>4</sup> Statistics Canada, 2011 *Immigration and Ethnocultural Diversity in Canada* (public-use microdata file). Statistics Canada (producer); <http://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-010-x/99-010-x2011001-eng.cfm>

All cities' rankings, though, need to be approached with added perspective. For instance, it's important to consider that Tokyo's population is twice as big as Toronto's. For cities of its scale, then, Tokyo is a best performer. So, if it were to seek areas of improvement, it might look to a city closer to its peer group—**Seoul**, for example, for recycling ideas that would keep it climbing.

Similarly, if we break the rankings by population, high-performing **Auckland** and **Vancouver** could very well have lessons to teach each other in the areas in which they excel—Auckland on its political environment, and Vancouver on its handling of air, water, and waste.

If we look to cities midway through the rankings, a few suggest promise for improvement. Like Toronto, **Chiang Mai** gets its best scores in Culture & Social Health and Environmental Sustainability, albeit at a lower level of development. Its weakest areas are Connectivity and Economics but those are linked—shoring up its transport and digital infrastructure would surely have a multiplier effect on other areas, especially Economics. In this way, we see a great interconnectedness among our five categories, and encourage readers to appreciate our rankings with that in mind.

City	Culture & Social Health	Connectivity	Health & Welfare	Environmental Sustainability	Economics
1 Toronto	28	21	26	27	21
2 Vancouver	25	20	25	28	20
3 Singapore	20	28	24	20	27
4 Tokyo	24	26	28	17	26
5 Seattle	23	17	21	26	23
6 Auckland	26	14	22	25	18
7 Seoul	22	23	19	24	12
8 Melbourne	27	16	23	23	15
9 Los Angeles	22	13	20	22	24
10 Osaka	20	25	27	10	20
11 Hong Kong	17	27	18	11	28
12 Taipei	11	15	17	21	23
13 Shanghai	14	24	16	19	18
14 Beijing	10	22	15	15	16
15 Kuala Lumpur	13	19	11	12	25
16 Bangkok	18	18	8	8	13
17 Santiago	16	11	12	4	14
18 Mexico City	6	11	10	16	10
19 Novosibirsk	7	12	13	18	2
20 Chiang Mai	10	5	9	14	4
21 Bandar Seri Begawan	2	7	14	13	3
22 Manila	15	9	2	3	7
23 Lima	10	6	6	1	11
24 Ho Chi Minh City	5	8	7	2	9
25 Jakarta	4	4	5	7	8
26 Cebu	12	2	3	6	6
27 Surabaya	3	1	5	5	5
28 Port Moresby	1	3	1	9	1

High
  Medium
  Low
  Highest rank in each variable

# Culture & Social Health

Culture & Social Health  
(by overall ranking)



**What's a city's signature?**  
In our coverage, the answers are as varied as the cities we studied.

## Making APEC cities livable for all

People are the soul of a city, and fulfilling them (and enabling them to contribute in return) is crucial to any great city. This means nourishing the urban society with many ingredients: education, economic opportunity, arts and cultural venues, vibrant nightlife scenes, safe and clean neighborhoods. Making a city livable also means promoting social health—working toward inclusivity for all citizens and building toward a transparent government, a tolerant society.

## Building on uniqueness

What's a city's signature? In our coverage, the answers are as varied as the cities we studied: **Bangkok's** BTS SkyTrain or its street vendors off Sukhumvit Road; **Osaka's** all-night karaoke bars; **Jakarta's** Grand Indonesia Mall; **Bander Seri Begawan's** mosques; **Novosibirsk's** State Academic Opera and Ballet Theatre. Not all cities can own the multi-faceted character of London or Tokyo, nor should they; but, in many cases, they already have what others don't. Cities are revitalizing their unique assets—including idiosyncrasies that might have been long-neglected or underappreciated (and under-monetized). **Taipei**, for instance, recently restored a 1920s traditional Japanese-style building, registered as a heritage site in 2006, creating a Japanese restaurant and arts studio. Part of the city's Old House Cultural Movement, it is one of 22 other planned restorations in the works.<sup>5</sup>

Urban culture is also being sparked by emerging cultural and foodie movements. Take **Beijing's** surging indie music scene, pulling big crowds at music festivals (as opposed to arenas). Modern Sky, the Beijing-based alternative rock band, holds the annual Strawberry festival—drawing hundreds of thousands of people in Beijing and Shanghai over one weekend in May.<sup>6</sup>

It's probably no coincidence that most of the cities ranking high in our study's cultural vibrancy indicator are meeting new and evolving expectations of what makes a great city, and attracting millions of visitors as proof positive. Just consider that ten cities included in our study made a top-20 list of most popular urban destinations globally: **Bangkok** (ranked 2); **Singapore** (7); **Kuala Lumpur** (8); **Seoul** (9); **Hong Kong** (10); **Tokyo** (11); **Taipei** (16); **Shanghai** (17); and **Los Angeles** (20). To put this in perspective, Bangkok will host an estimated 18.2 million travelers in 2015, second only to number-one ranked London with 18.8 million.<sup>7</sup>

<sup>5</sup> Historic building enriches Taipei cultural scene, *Taiwan Today*, January 5, 2015.  
<sup>6</sup> What's driving Beijing's indie boom?, *The Guardian*, October 21, 2014.  
<sup>7</sup> Dr. Yuwa Hedrick-Wong and Desmond Choong, *MasterCard, 2015 Global Destination Cities Index: Tracking Global Growth: 2009–2015*, MasterCard, 2015.

## Culture & Social Health

(by overall ranking)

	Basics	Compromisers	Differentiators						
	Literacy and enrollment*	GINI Index*	Percentage of population with higher education	Innovation Cities Index	Middle-class population growth	Cultural vibrancy	Political environment	Corruption Perception Index*	Tolerance and inclusion*
1 Toronto	22	23	22	27	14	26	28	26	28
2 Melbourne	27	28	16	22	10	27	23	24	25
3 Auckland	26	24	17	14	12	25	28	28	26
4 Vancouver	22	23	20	18	9	25	28	26	28
5 Tokyo	17	26	25	24	11	25	25	23	18
6 Seattle	24	15	27	28	5	22	22	21	24
7 Seoul	28	27	26	26	4	18	17	15	19
7 Los Angeles	24	15	18	25	3	28	22	21	24
9 Osaka	17	26	23	19	6	20	25	23	18
9 Singapore	19	8	24	21	17	20	20	27	21
11 Bangkok	15	17	28	13	22	14	7	13	10
12 Hong Kong	18	1	6	23	7	22	19	21	21
13 Santiago	20	4	15	7	16	16	18	18	22
14 Manila	11	12	13	8	24	14	12	13	15
15 Shanghai	7	7	19	20	28	9	10	8	6
16 Kuala Lumpur	12	9	7	15	18	16	14	14	8
17 Cebu	11	12	10	4	21	14	12	13	15
18 Taipei	7	21	11	16	1	10	17	17	6
19 Lima	13	10	9	6	20	5	7	13	16
19 Chiang Mai	15	17	3	5	15	14	7	13	10
19 Beijing	7	7	12	17	27	6	9	8	6
22 Novosibirsk	25	13	21	11	8	3	1	2	7
23 Mexico City	4	5	14	12	2	18	15	6	13
24 Ho Chi Minh City	2	20	2	10	25	2	9	3	12
25 Jakarta	9	19	5	9	19	8	4	5	3
26 Surabaya	9	19	4	3	23	8	4	5	3
27 Bandar Seri Begawan	3	4	8	2	13	4	14	16	1
28 Port Moresby	1	4	1	2	26	1	2	1	11

\*country-level data    High    Medium    Low    Highest rank in each variable

### Smart people, smart cities

An educated populace tethers closely to other foundations of social health and prosperity—driving income equality, reducing poverty, and spurring economic growth. We also see a strong link between an educated citizenry and open government and a more tolerant and well-informed society. Reforming an educational system is a long trek, but efforts are underway in cities we rank. Take **Santiago**, Chile, which ranked very low in the GINI Index category (ranking income inequality) in our study and placed last in income ‘inequality rate’ among its Organization for Economic Co-operation and Development (OECD) member countries.<sup>8</sup> But the new Chilean government is moving to promote economic mobility, recently pledging \$15 billion for a raft of reforms including free higher education and the opening of more nurseries and pre-schools.<sup>9</sup> Take ‘Educar Chile,’ a free online education portal created in 2001 by the Ministry of Education and Fundación Chile, aimed at helping less affluent secondary students prepare for the national university entrance exam and which guides them through the college application process.<sup>10</sup>

Some educational initiatives are long-standing, such as Filipino cities’ century-old tradition of an English-based school curriculum. **Manila** and **Cebu**, for example, are now two of the biggest markets globally in the business process outsourcing sector. Online education, too, is expanding to fortify bricks-and-mortar education. **Ho Chi Minh City**, which ranked relatively low in tertiary education in our study, is now nurturing talent pipelines for its manufacturing and technology sectors through more innovative electrical, mechanical, and industrial engineering programs—such as the Higher Engineering Education Alliance Program.<sup>11</sup>

8 *In It Together, Why Less Inequality Benefits All*, OECD, 2014; [http://www.keepeek.com/Digital-Asset-Management/oced/employment/in-it-together-why-less-inequality-benefits-all\\_9789264235120-en#page1](http://www.keepeek.com/Digital-Asset-Management/oced/employment/in-it-together-why-less-inequality-benefits-all_9789264235120-en#page1)

Note: The OECD calculates an inequality rate by comparing the disposable income of a country’s wealthiest 10% with that of the poorest 10%.

9 *Chile’s incoming president Bachelet and her policies*, Reuters, March 11, 2014.

10 Educar Chile website, <http://educationinnovations.org/program/educar-chile#sthash.rSnR69Pq.dpuf>

11 HEAPP website, <http://www.heapp.org/who-we-are/impact>

**Corruption casts a pall over urban societies in the same way high violent crime does. No city with entrenched corruption can realistically expect to join the ranks of the most attractive cities until it can reverse course.**

### **Growing APEC's urban middle class**

Creating the conditions for economic mobility and greater participation in the city's cultural life is key not only for the poorer stratum already in a city, but also for those migrating into it.

**Beijing** and **Shanghai** have added an impressive three million people to their middle-class ranks since just 2013, or more than Vancouver's entire population. One path, of course, is to attract foreign firms that invest in new facilities and workplaces. Take **Manila**, with a high middle-class growth rate—adding about 670,000 to its middle-class ranks since 2013. With a population of nearly 13 million (including a large, young, educated, and English-speaking population), it's reaping the rewards of two decades of attracting business process outsourcing (BPO). Beginning with a single call center in 1992, it is now the world's second largest BPO destination and has employed 900,000 Filipinos in the BPO sector with revenues growing to \$15.5 billion from \$1.5 billion in the last decade.<sup>12, 13</sup> Meanwhile, **Cebu**, Philippines, with its middle-class growth rate of 6.4% since 2013, was ranked the eighth-biggest global BPO destination.<sup>14</sup> Other notable middle-class growth rates among cities in our study include: **Port Moresby** (15.1%); **Ho Chi Minh City** (9.2%); and **Surabaya** (8.5%)—though they are growing off low economic levels relative to other cities in our study.<sup>15</sup>

Income disparity affects not only the poor and middle class; it can also blunt economic growth. The GINI Index measures income distribution among individuals within an economy, ranging from zero, indicating perfect equality, to 100, indicating extreme inequality. **Melbourne** topped our rankings in GINI Index, while **Hong Kong** ranked last in the cities we studied. Numerous factors contribute to these income distribution rankings—economic, social, and cultural—so it's hard to pinpoint any single reason for a high or low score. But it is interesting to note Australia's relatively generous Aus\$17.29 an-hour national minimum wage for a 38-hour week.<sup>16</sup> Or that, in the upper GINI rankings, Hong Kong records over one million of its residents living in poverty (or about one in five)—as rents and housing costs continue to soar. Since 2007, incomes in that city have gone up some 42%, yet home prices have jumped 154% (with a 2015 median housing price of US\$520,000 or about one-third more than New York).<sup>17, 18</sup>

According to a 2015 International Monetary Fund (IMF) analysis of developing, emerging, and advanced economies over a 32-year period, greater income equitability actually boosts economic growth overall: GDP growth slows by 0.08% five years after the wealthiest 20% increase their share of total income by one percent, while economies grow by 0.38% five years after the poorest 20% experience a one percent increase in their share of total income.<sup>19</sup>

Indeed, eradicating poverty has been a long-standing APEC goal, and one which will serve to improve not only the lives of the poorest, but also the entire socio-economic health of cities. “The very poor, the forgotten people, are isolated, and the children are the ones really at risk,” said Kate Clemans, executive vice president, Washington, D.C.-based C&M International, Ltd., in an interview with PwC. “They must be brought into society and must benefit from city public services for their own well-being and for the well-being of the city. Do the benefits of including into society the disadvantaged and vulnerable populations exceed the costs of doing so? I would say benefits far outweigh the costs. There are real public health issues that need to be addressed, such as containing the spread of infectious disease. Securing access to health and education services, potable water, safe food, city sewerage systems and solid waste management will lift the whole urban eco-system and the surrounding environments,” she added.

<sup>12</sup> Philippines poised to be BOP capital of the world—CBRE, Manila Bulletin, September 24, 2015.

<sup>13</sup> 2015 Top 100 Outsourcing Destinations, Tholons, 2015.

<sup>14</sup> Ibid.

<sup>15</sup> Canback & Company CGIDD data, PwC analysis.

<sup>16</sup> Australia government website, <http://www.fairwork.gov.au/about-us/policies-and-guides/fact-sheets/minimum-workplace-entitlements/minimum-wages>

<sup>17</sup> Hong Kong Poverty Line Shows Wealth Gap With One in Five Poor, Bloomberg Business, September 29, 2013.

<sup>18</sup> In Hong Kong, the Apartments Are Fit for a Mosquito, The Wall Street Journal, June 2, 2015.

<sup>19</sup> Era Dabla-Norris, et al., Causes and Consequences of Income Inequality: A Global Perspective, International Monetary Fund, June 2015.



### **Lifting corruption's fog**

Corruption, too, has its own ripple effect on society, one of stifling growth. Global anti-corruption campaigns and enforcements have intensified over the last decade, slowly cracking entrenched attitudes and behaviors toward bribery and graft. But corruption is still exacting a hefty price. According to The World Bank, it costs the global economy about \$1 trillion annually; but 'good

governance and corruption control and rule of law,' could lead to a four-fold increase in per capita GDP for a '400% governance dividend'—and reduce child mortality by 75%.<sup>20</sup> Corruption casts a pall over urban societies in the same way high violent crime does. No city with pervasive corruption can realistically expect to join the ranks of the most attractive cities until it can reverse course.

APEC's cities have much to gain through anti-corruption enforcements. In 2014, APEC established ACT-NET (APEC Network of Anti-Corruption Authorities and Law Enforcement Agencies) to work collectively; as a result, case information exchanges among member economies are already up.<sup>21</sup> Our study, too—not surprisingly—reveals a high statistical correlation between a nation's Corruption Perceptions Index and political environment to both the city's overall ranking and its Culture & Social Health ranking.

A bright spot among cities in our study which rank low on corruption perception is the Corruption Eradication Commission of Indonesia (KPK), which has the power to probe and prosecute public officials, and has made some landmark enforcements, including a life imprisonment sentence for a constitutional judge charged with accepting bribes of \$4.7 million.<sup>22</sup> Indonesia's Corruption Perceptions Index (an annual ranking of perceived corruption conducted by Transparency International, with a CPI score of one indicating the most corruption-free economy) has risen to 107 (out of 174 nations) in 2014 from 133<sup>rd</sup> a decade earlier.<sup>23</sup>

<sup>20</sup> Six Questions on the Cost of Corruption with World Bank Institute Global Governance Director Daniel Kaufmann, The World Bank; <http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:20190295~menuPK:34457~pagePK:34370~piPK:34424~theSitePK:4607,00.html>

<sup>21</sup> Anti-Corruption Case Sharing Accelerates Under APEC Network, APEC press release, August 26, 2015.

<sup>22</sup> Why KPK is more successful than MACC in the graft fight, The Ant Daily, July 3, 2014; <http://www.theantdaily.com/Main/Why-KPK-is-more-successful-than-MACC-in-the-graft-fight>

<sup>23</sup> Transparency International's website, including historical CPI report results; <http://www.transparency.org/cpi2014/results>

# Connectivity

## Connectivity (by overall ranking)



*We ventured to evaluate how well cities are connected, both physically and digitally; that is, how well they are faring with growing pains such as congested roads, overstretched mass transit or insufficient digital ecosystems.*

### The well-connected city

Part of the allure of any great city is its churn, its density, its interconnectedness. But all cities are in a perpetual state of adaptation to strike the right balance of density and growth. We ventured to evaluate how well cities are connected, both physically and digitally; that is, how well they are faring with growing pains such as congested roads, overstretched mass transit or insufficient digital ecosystems. Building digital connectivity creates value that is only beginning to be tapped—value for growth, for greater inclusiveness, for new types of businesses not yet imagined.

From 2010 through 2020, developing Asian countries will have experienced a demand for \$2.6 trillion in roads, airports, ports, and rail infrastructure.<sup>24</sup> Vietnam alone pegs its demand for transportation infrastructure investment at \$45 billion between 2016 and 2020.<sup>25</sup> Not surprisingly, our study revealed a strong correlation between a city's public transport systems and its overall ranking.

Cities are also finding ways to squeeze more out of their existing assets—largely through the deployment of information and communication technology (ICT), the 'mobile miracle' and the burgeoning Internet of Things (IoT). Moving people around a city seamlessly isn't just about convenient commutes, nor is sharing knowledge only about city travel apps—connectivity has far-reaching implications on a city's social and economic well-being.

<sup>24</sup> *Engaging the Private Sector in Public-Private Partnerships*, Asian Development Bank Institute, 2015.

<sup>25</sup> *Vietnam's transport development in a mess*, vietnamnet.vn, September 10, 2015.

### Whole connectivity

As expected, the highest ranking cities in our Connectivity category—notably **Singapore**, **Hong Kong**, and **Tokyo**—are making impressive strides across all our Connectivity indicators, moving people and things relatively easily and efficiently through digitalization and Internet-of-Things innovations. But these cities have benefitted from decades of hard and soft infrastructure advancements and planning: they were smart and digital well before terms 'smart cities' or 'e-gov' were even coined.

Meanwhile, those cities ranking with relatively low scores are playing catch-up across these spheres. To rise in rank relative to other APEC cities we analyzed, cities such as **Surabaya** or **Bandar Seri Begawan**, could find solutions available today and tomorrow that are more advanced—and less expensive—than solutions carried out by Singapore two decades ago.

Cities ranking in the middle pose interesting prospects—they can rise quickly or fall behind the pack. They also seem to be held back by one or two low-ranking indicators. Consider **Kuala Lumpur**, which ranks well across all indicators except broadband and mobile connectivity. **Mexico City**, which performs relatively strongly across all indicators, suffers overall due to traffic congestion and poor public transport rankings.

Getting multi-modal infrastructure right is vital not only for transporting people, but also for creating a well-oiled logistics infrastructure cluster to distribute goods both within and outside a city, particularly in the age of online shopping and commerce.

# Connectivity

(by overall ranking)

		Basics		Compromisers		Differentiators				
		Broadband quality	Mobile broadband	Public transport systems	Mass transit coverage	Traffic congestion	Airport to CBD access	Airport connectivity	International tourists	Hotel rooms
1	Singapore	28	27	28	27	28	16	22	27	24
2	Hong Kong	26	18	28	25	18	23	20	28	26
3	Tokyo	27	19	28	26	13	15	25	17	28
4	Osaka	25	16	28	24	25	20	13	14	26
5	Shanghai	20	20	19	20	13	25	28	24	20
6	Seoul	24	14	28	28	10	20	24	19	20
7	Beijing	18	24	16	14	10	28	26	22	24
8	Toronto	16	22	28	15	18	21	23	16	20
9	Vancouver	13	23	28	13	25	27	15	12	15
10	Kuala Lumpur	8	9	16	16	18	23	18	26	21
11	Bangkok	12	10	16	9	10	27	27	25	17
12	Seattle	22	21	19	8	25	25	14	5	13
13	Melbourne	11	26	21	21	25	6	9	9	22
14	Taipei	21	25	21	18	10	2	21	23	8
15	Auckland	15	28	19	12	25	8	7	14	16
16	Los Angeles	19	17	16	11	10	3	19	21	27
17	Novosibirsk	23	8	16	23	25	10	8	1	4
18	Mexico City	14	7	6	22	1	18	17	18	11
18	Santiago	9	11	16	17	25	11	6	8	11
20	Manila	3	2	8	19	10	17	16	10	15
21	Ho Chi Minh City	17	1	2	7	18	13	10	20	7
22	Bandar Seri Begawan	6	12	16	7	27	14	1	3	3
23	Lima	2	13	6	10	18	1	11	15	11
24	Chiang Mai	10	6	16	7	13	12	4	8	6
25	Jakarta	7	5	6	7	10	5	12	11	13
26	Port Moresby	5	15	2	7	27	9	5	3	2
27	Cebu	4	3	8	7	10	7	3	6	2
28	Surabaya	1	4	6	7	10	5	2	4	5

High Medium Low Highest rank in each variable

**Chronic road congestion costs Asian economies an estimated 2–5% of GDP per year in lost time and higher costs, according to the Asian Development Bank (ADB), with about 80 percent of Asia’s city air pollution attributable to transport.**

### Congestion costs

If you think of a city’s transport system as a utility—with, say, commuters as the water needed to be moved and distributed—systemic failures experienced by some APEC cities are equivalent to ‘water main breaks’ in wasted time and human resources. The problem of road congestion is entrenched, unfortunately. And yet the number of motor vehicles on Asia’s roads roughly doubles every seven years, stretching the limits of existing infrastructure.<sup>26</sup>

Chronic road congestion costs Asian economies an estimated 2%–5% of GDP per year in lost time and higher costs, according to the Asian Development Bank (ADB),<sup>27</sup> with as much as 80% of Asia’s city air pollution attributable to transport. Consider that **Beijing’s** annual bill for traffic congestion amounts to some \$11 billion.<sup>28</sup> And then there’s all that idling. Indeed, cities in our report ranking poorly in the traffic congestion indicator face numerous issues beyond air quality. Consider that, in some APEC cities, commuters sit in traffic for more than two full working weeks each year. In **Mexico City**, it’s 110 hours, for second-worst globally; followed by **Los Angeles**, 95 hours (ranked 10); **Taipei** 92 hours (ranked 11); and **Vancouver**, 86 hours (ranked 20); just to name a few.<sup>29</sup>

<sup>26</sup> Asian Development Bank website, <http://www.adb.org/print/sectors/transport/key-priorities/urban-transport>

<sup>27</sup> Ibid.

<sup>28</sup> Traffic jams cost Beijing \$11.3b a year, China Daily, September 29, 2014.

<sup>29</sup> TomTom Traffic Index, [http://www.tomtom.com/en\\_gb/trafficindex/#/](http://www.tomtom.com/en_gb/trafficindex/#/), retrieved on September 5, 2015.



### **Making urban networks smarter**

As cities embed Internet-of-Things technology in their transportation, expect more conversations to be happening between people and things. Intelligent transport systems (ITS), the layering of IoT technology upon transportation infrastructure to get real-time snapshots of traffic, are increasingly a viable option as smartphone ownership rises and costs of sensors, advanced ICT, and computing power fall. **Singapore**, ranking at the top of our Connectivity category, already monitors an ITS infrastructure spanning over 164 kilometers of expressways and road tunnel systems and it's preparing for its next wave of smart transport, called Mobility 2030. It envisions a road network with driverless cars communicating with other cars and with road infrastructure, and is already testing autonomous vehicles on its expressways.<sup>30</sup> Thailand, too, launched its ITS in 2013, as part of its 'Smart Thailand via Intelligent Transport System.' It includes collecting real-time location data from vehicles and making it available to commuters and traffic police.<sup>31</sup> It is predicted to pay off handsomely. One study estimates that a robust deployment of ITS technology in **Bangkok** would cut travel times, emissions, and accidents, yielding up to US\$1 billion in annual social and economic benefits.<sup>32</sup> **Auckland** is planning an ambitious overhaul of its mass transit network with a strong emphasis on multi-modal transport: roads, rail, trams, buses, bikes, ferries. At its heart is a \$2.5 billion City Rail Link planned to start in 2018 and to be completed by 2023—which doubles the number of commuter trains to move up to 25,000 commuters

per hour. Adding light rail (trams) for congested bus routes could shift 18,000 commuters an hour compared to 2,500 on a bus.<sup>33</sup> Or consider **Manila**, which ranked low in Connectivity in part due to its low public transport systems ranking. However, the city is proposing an \$8 billion subway network (the first to be built in the Philippines) dubbed the Mass Transit Loop, as part of a long-term multi-modal transportation build-out.<sup>34</sup>

The era of digital connectivity has also enabled a proliferation of national and city e-government websites and apps, creating virtual city halls. For example, Brunei recently launched a digital government strategy through 2020 to bolster its 'e-Darussalam' government portal to enable greater two-way communication between citizens and governmental agencies. As of spring 2015, 78 government services had been integrated.<sup>35</sup>

Digital connectivity also means applying high-tech solutions to low-tech issues. Take finding a parking spot. An estimated 40% of city traffic is caused by cars looking for parking spaces.<sup>36</sup> Tingchebao, a Shanghai-based parking mobile app has plans to roll out another service: valet parking. Drivers meet valets curbside, and the valet then takes the car to the nearest parking spot.<sup>37</sup> Getting more commuters out of cars or cabs and on to bikes is gathering momentum in numerous cities, such as **Santiago** and **Mexico City**. Ecobici, Mexico City's government-backed bike-sharing program, for instance, is the largest in North America. Since 2010, it's logged over 27 million rides, which are free up to 45 minutes, and charged for longer periods.<sup>38</sup>

### **The era of digital connectivity has also enabled a proliferation of national and city e-government websites and apps, creating virtual city halls.**

### **Cities and their airports: improving the relationship**

Increasingly, a city's easy and fast connection to airports is just as critical as getting around the city. Good air transport connectivity is crucial in unlocking a city's growth potential, too, improving prospects for investment, drawing talent, and spurring tourism. The Asia Pacific region drew 2.3 billion air transport passengers in 2014, up 7.1% from 2013, compared to 1.6 billion in North America (for a 3.2% rise) and 1.8 billion in Europe (up 5.5%). Indonesia is forecast to increase from 77 million resident trips in 2013 to 117 million by 2020.<sup>39</sup> Major Asia-Pacific hubs such as Singapore, Hong Kong, and Seoul have had advantages as main routes to Europe and Australasia. But some fast-growing economies are playing catch-up as hubs ripe for expansion. **Taipei**, for instance, was the fastest growing destination among the top 20 destinations in a recent study, increasing travelers by about 15% a year (CAGR) for the 2009–2015 period. Other fast-growing destinations (with at least one million international travelers visiting) over the 2009–2015 period include: **Osaka** (19.8%), **Tokyo** (14.6%), **Lima** (13.9%), and **Ho Chi Minh City** (12.9%).<sup>40</sup>

Numerous airport projects are in the works to release the pressure valve on some overstretched airports. Take the Philippines, which ranked 108 out of 144 economies in quality of air transport infrastructure by The World Bank.<sup>41</sup> Our study ranks **Cebu**, the

Philippines' second-largest city, low in Connectivity, including airport connectivity and access from the airport to the business district center. However, the city plans to add a second terminal to its Mactan-Cebu International airport, nearly tripling capacity to 12.5 million passengers when completed in 2018.<sup>42</sup> **Beijing** has improved its airport connectivity by adding its Airport Express line which whisks passengers 28 kilometers on high-speed rail from the Beijing Capital International airport to the center (Dongzhimen) in 20 minutes.<sup>43,44</sup>

30 Singapore's Land Transport Authority, website <http://www.lta.gov.sg/content/ltaweb/en/roads-and-motoring/managing-traffic-and-congestion/intelligent-transport-systems.html>

31 Thailand launches new intelligent transport project, [roadtraffic-technology.com](http://roadtraffic-technology.com), February 25, 2013.

32 Building digital societies in Asia: Making transportation smarter, GSMA, 2015.

33 From apps to zones: Is this how we get city moving? *The New Zealand Standard*, January 26, 2015.

34 1st PH subway project awaits final green light, [rappler.com](http://rappler.com), January 27, 2015.

35 E-Darussalam Portal to Offer All Gov't Services, *The Brunei Times*, June 9, 2015.

36 U.S. traffic headaches grow steadily worse, roads alone can't cure them, [smartcitiescouncil.com](http://smartcitiescouncil.com), September 9, 2015.

37 Chinese parking app rolls out on-demand valet service with fresh \$2.6M funding, [techinasia.com](http://techinasia.com), March 16, 2015.

38 Ecobici Mexico government website <https://www.ecobici.df.gob.mx/en> (as of September 28, 2015).

39 2014 World Airport Traffic Report, Airports Council International, 2015.

40 Dr. Yuwa Hedrick-Wong and Desmond Choong, *MasterCard, 2015 Global Destination Cities Index: Tracking Global Growth: 2009–2015*, MasterCard, 2015.

41 *The Global Competitiveness Report 2014–2015*, The World Economic Forum, 2015.

42 Mactan airport terminal 2 to open in 2018, *Sun Star Cebu*, June 30, 2015.

43 Beijing Olympic Village Rail Link Construction, China, [railwaytechnology.com](http://railwaytechnology.com); <http://www.railway-technology.com/projects/beijing-metro/>

44 <http://www.chinahighlights.com/beijing/transportation.htm>

# Health & Welfare

## Health & Welfare (by overall ranking)



**APEC cities are struggling to keep pace with their population's health-care demands, and it's not a new or exclusive problem.**

### **A citizen's well-being**

We combined health and welfare in our study because the two are inextricably linked. If the basics of safe survival are not covered—housing, food, safety from crime—then the health system cannot function at its best and often gets overloaded. Yet cities struggle to oversee the basic benchmarks of healthy living—not only medical care, but also crime reduction and housing—because these services tend to be overseen by governmental infrastructures outside their control. In many APEC cities, health care is usually either offered on a private level or as a national policy before it is handled on the municipal level. Or health care becomes a global issue that impacts cities hardest, as with global pandemics that spread in urban transportation hubs. Mitigation of these crises often relies on international cooperation, not municipal emergency response teams.

APEC cities are struggling to keep pace with their population's health care demands, and it's not a new or exclusive problem. While we can see a correlation between higher health and welfare marks for the more established cities, and lower rankings for the burgeoning municipalities, it is not precisely true that experience can be the excellence differentiator. The

long-standing metropolises have had to struggle through legacy issues—of health care moving from private to charitable to public to private—while newer cities are struggling to keep pace with population explosions, along with fast-paced medical innovation, expensive specialization, and aging populations.

### **Crime: The most basic marker of well-being**

Violent crime is the starkest indication of an unhealthy city. Residents deserve to live without high levels of fear, able to move about their city unhindered. Interestingly, in our study, we did not find an ironclad corollary between crime and the GINI Index, nor crime and literacy rates, although one might expect income equality and education to be large factors in creating a less crime-ridden society. There were definite overlaps; the biggest cities with the lowest incidents of crime—**Tokyo** and **Seoul**—also had high literacy rates, a component of the literacy and enrollment variable, and Seoul also fared well on the GINI Index. But among the middle population groups in this study, **Ho Chi Minh City** had the highest crime rate, and yet was among the higher ranked in GINI Index.

## Health & Welfare

(by overall ranking)

	Basics	Compromisers	Differentiators				
	Health system performance*	Hospital bed density*	Physician density*	Crime	Electricity access and consumption*	Food security index*	Housing
1 Tokyo	27	28	23	26	19	20	21
2 Osaka	27	28	23	26	19	20	20
3 Toronto	25	15	21	23	27	24	25
4 Vancouver	25	15	21	21	27	24	25
5 Singapore	28	9	17	28	20	26	28
6 Melbourne	18	21	27	16	23	22	28
7 Auckland	15	13	26	22	28	21	28
8 Seattle	12	18	25	14	25	28	25
9 Los Angeles	12	18	25	13	25	28	25
10 Seoul	20	26	21	20	22	18	18
11 Hong Kong	10	23	14	27	16	25	20
12 Taipei	23	24	13	19	21	13	14
13 Shanghai	22	20	16	18	14	13	18
14 Beijing	22	20	16	17	14	13	16
15 Bandar Seri Begawan	13	16	12	24	9	16	6
16 Novosibirsk	1	25	28	6	17	10	2
17 Santiago	19	12	8	12	10	17	7
18 Kuala Lumpur	7	7	11	10	15	15	16
19 Mexico City	14	6	21	2	8	14	14
20 Chiang Mai	9	12	5	15	12	9	6
21 Bangkok	9	12	5	11	12	9	6
22 Ho Chi Minh City	17	9	11	7	7	6	3
23 Lima	16	6	9	5	6	7	10
24 Jakarta	6	2	3	9	6	3	14
24 Surabaya	6	2	3	9	6	3	14
26 Cebu	4	4	7	4	3	5	10
27 Manila	4	4	7	3	3	5	10
28 Port Moresby	2	22	1	1	1	1	2

\*country-level data    High    Medium    Low    Highest rank in each variable

### Best practices can't be quantified in beds and doctors

Interestingly, the sweet spot for a city's providing optimum health care is not necessarily in the numbers. Russia can get the doctor and bed density right, but fare poorly on overall health performance, which has effects on cities such as **Novosibirsk**. Then there is the mystery of why **Chiang Mai** in Thailand can be so highly considered as a medical tourist destination, when Thailand shows statistically middle levels of excellence for bed density and low doctor density, along with a relatively low health score: it may be because the city's excellent private hospitals, which seem low cost for tourists, are often out of reach for the general populace; the majority of patients are served by the more cramped public hospitals.

Meanwhile, **Singapore** appears to get more done with fewer beds and doctors. The government takes an active role in the health system, from subsidizing medical educations to setting insurance rates to covering all of its citizens fully, including the poorest.<sup>45</sup> Its low hospital bed density and moderate physician density are a result of a widely recognized excellent health system rather than a sign of inadequate resources. Japan's cities in this study, **Osaka** and **Tokyo**, provide excellent healthcare, primarily by increasing annual visits and capping provider charges.<sup>46</sup>

### E-health: an emerging solution to city health problems

In China, mega hospitals had been absorbing the lack of care at the clinic level, but are now a problem of their own due to costs and crowding. **Beijing's** Hospital of Traditional Chinese Medicine, one of the largest hospitals in the world, sees 4,000 outpatients a day, not only from the municipality but also from rural areas. Patients seek the expertise offered, as opposed to relying on more local care.<sup>47</sup>

Asia is forecast to increase its health care IT market by 15.4% CAGR in the next five years, which will likely do much to maximize the current infrastructure.<sup>48</sup> **Hong Kong**, which has spent three years digitizing patient records, is set to hit the button on a system that will link all health care facilities so a patient's progress and history can be tracked accurately and cut down on wait times; now they just need the finalization of legislation that will allow the system to be used.<sup>49</sup>

45 Singapore Ministry of Health website, [https://www.moh.gov.sg/content/moh\\_web/home/our\\_healthcare\\_system.html](https://www.moh.gov.sg/content/moh_web/home/our_healthcare_system.html)

46 2014 International Profiles of Healthcare Systems; edited by Elias Mossialos and Martin Wenzl, London School of Economics and Political Science; Robin Osborn and Chloe Anderson, The Commonwealth Fund; January 2015; [http://www.commonwealthfund.org/~/media/files/publications/fund-report/2015/jan/1802\\_mossialos\\_intl\\_profiles\\_2014\\_v7.pdf](http://www.commonwealthfund.org/~/media/files/publications/fund-report/2015/jan/1802_mossialos_intl_profiles_2014_v7.pdf)

47 Alexandra Harney, *Bigger may not be better for China's 'super hospitals'*, Reuters, Zhengzhou, China, July 14, 2015; <http://www.reuters.com/article/2015/07/15/us-china-health-hospitals-idUSKCN0PP04420150715>

48 Healthcare IT Market Growing at 13.4% CAGR to 2020 Driven by HIEs and EHR Systems, PR Newswire, Pune, India, September 29, 2015; <http://www.prnewswire.com/news-releases/healthcare-it-market-growing-at-13-4-cagr-to-2020-driven-by-hies-and-ehr-systems-529912211.html>

49 Corinne Reichert, *Hong Kong leading the way on digital government*, ZDNet, September 24, 2015; <http://www.zdnet.com/article/hong-kong-leading-the-way-on-digital-government/>



**The sharing economy may offer cities [health] solutions too, but it will take a while for cities to step up the tech.**

Although in its infancy, e-health may help solve problems at some highly used hospitals. The World Health Organization set a minimum threshold of 23 doctors, nurses and midwives per 10,000 population as what would be required to deliver essential maternal and child health services.<sup>50</sup> By that calculation, **Shanghai** would require somewhere in the area of 63,000 medical professionals for children and child-bearing women alone. The Philippines Medical Association says that 930,000 doctors are needed to serve their whole country, and yet a good percentage of Filipino doctors are becoming nurses or leaving the country to practice elsewhere.<sup>51</sup>

In an interview with PwC, Lux Rao, the country leader for Hewlett Packard Future Cities and CTO, says the biggest health challenge for developing cities in Asia are the migrant populations. “They come for itinerant work, like construction jobs and end up staying. So they become squatters or even slum dwellers. When they need to see a doctor, the care is inaccessible, or hospitals are overcrowded and it takes too long. The people I’m talking about are under the poverty line.” E-health units are screening for conditions by having a nurse in one location electronically link patients to a doctor. The patient also gets a ‘digital locker’ (an e-health record). The pilot has worked with about 100,000 patients in India, and HP began introducing some of these programs to the Philippines in 2014.<sup>52</sup>

**Can a health sharing economy go transnational?**

The sharing economy may offer cities solutions too, but it will take a while for cities to step up the tech. The innovations range from the personal to the hospital level. In **Los Angeles**, the HEAL app delivers a doctor to your doorstep for \$99 a call. While the service doesn’t take insurance, its customers prefer the convenience and time savings and so are willing to pay the increase over what their deductible would be. Another US business proposition is Cohealo, which shares expensive technical equipment between hospitals. Rather than purchase full laparoscopy equipment, for example, hospitals can go online to see availability at another hospital and have it shipped to them for their use.

In Papua New Guinea, health care is now provided nationally at the primary level but when it moves to the specialist level, patients often have to pay out of pocket.<sup>53</sup> The governor of **Port Moresby**, Papua New Guinea, Powes Parkop, envisions a day when hospitals themselves could be shared like an Airbnb home, he told PwC in an interview. Why would a city, hard-pressed for resources, build a new specialist wing to increase capacity when a hospital in another city or nearby country has a regular supply of empty beds?

<sup>50</sup> *Health workforce: Achieving the health-related MDGs. It takes a workforce!* World Health Organization, accessed September 17, 2015; [http://www.who.int/hrh/workforce\\_mdgs/en/](http://www.who.int/hrh/workforce_mdgs/en/)

<sup>51</sup> Crispin R. Aranda, *Prescription for Migration*, *Manila Times*, Manila, Philippines, March 8, 2015; <http://www.manilatimes.net/prescription-for-migration/168029/>

<sup>52</sup> HP website, *Living example: eHealth Centers*; <http://www8.hp.com/us/en/hp-information/social-innovation/ehealth-center.html>

<sup>53</sup> *Health Services Delivery profile, Papua New Guinea*, WHO and the National Department of Health, Papua New Guinea, 2012; compulsory health insurance scheme for public servants and private sector employees is planned. [http://www.wpro.who.int/health\\_services/service\\_delivery\\_profile\\_papua\\_new\\_guinea.pdf](http://www.wpro.who.int/health_services/service_delivery_profile_papua_new_guinea.pdf)

# Environmental Sustainability

## Environmental Sustainability (by overall ranking)



**How exactly do the APEC cities in this report reduce the ecological footprint of their 210 million people who need food, water, heating, cooling, work, and transport—not to mention those who commute in and do business in the city?**

Since a city must constantly be balancing the needs of its citizens with the resources at hand, we examined Environmental Sustainability as a key city category. We included such indicators as air pollution, recycling, and non-hydropower renewable energy generation. In disaster resilience we noted vulnerability to natural disaster. The quantity of public park space, also measured here, plays a key role in both air quality and in flood management. In studying our 28 cities, a high recycling rate correlated with a high performance in this category.

### Waste management

We all know now, we don't throw things away. Around the world, cities produce 1.3 billion tons of solid waste per year and that volume does not simply disappear—it fills landfills, pollutes oceans, or filters into our lungs when burned.<sup>54</sup> APEC economies are particularly vulnerable to the ill effect of badly managed waste. East Asia is escalating its production of waste faster than all other world regions. In 2005, China produced 520,000 tons of waste per day—a figure that is estimated to escalate to 1.4 million by 2025. **Jakarta** generates enough garbage daily to fill a football field up to 5 meters.<sup>55</sup>

Those numbers obviously represent daunting challenges when the trash is carted to landfills—including the resulting fumes and toxins. Open-air burning—common in China for residents, and in China, Brazil, and Mexico at dumps—accounts for 40% of trash disposal globally.<sup>56</sup> This puts dangerous particulate matter into the air. In 2014, a fire consuming the landfill in **Bangkok** inflicted smog on the 9.3 million residents for weeks, creating air quality near level with Beijing, the city that ranked the lowest performance in our air pollution indicator.<sup>57</sup>

Problems compound when a lack of waste management allows trash to be dumped into the ocean. Plastic particles and other pollutants migrate directly to food stocks. A recent study found that China and Indonesia are likely responsible for one-third of the plastics reaching the ocean. If that trend continues, by 2025, that could amount to ten bags of plastic per foot of coastline.<sup>58</sup>

It would be easy to simply lament these staggering statistics, but first we need to acknowledge the magnitude of the challenge cities face. How exactly do the APEC cities in this report reduce the ecological footprint of their 210 million people who need food, water, heating, cooling, work, and transport—not to mention those who regularly commute in and do business in the city? Behavioral changes, both at the individual level, and at the institutional level, are necessary. Small steps can turn into big municipal initiatives.

The good news is that cities, by nature of population densities, are often powerful laboratories for solving waste issues. **Seoul**, with a population of ten million, earned its position as the top performer in our recycling variable by recycling 89% of its municipal waste through its series of laws, programs, and regulations that span the full cycle of waste, from requirements and restrictions on waste producers to supporting the innovation of waste recycling technology, to imposing a deposit system on consumers.<sup>59</sup>

Most significantly, the city charges for anything its citizens *don't* recycle. Their comprehensive program could almost serve as a playbook for other cities looking to begin building solutions of their own.

54 *What a Waste: A Global View of Solid Waste Management*, World Bank, 2013; <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTURBANDEVELOPMENT/0,,contentMDK:23172887~pagePK:210058~piPK:210062~theSitePK:337178,00.html>

55 *Building Indonesia's Future Through Smarter Cities*, Malcolm Foo and Andano Priantano, 2014-15 PwC, <http://www.pwc.com/id/en/media/indonesia-smarter-cities.html>

56 *Global trash burning more polluting than expected*, Associated Press, August 27, 2014, <http://www.dailymail.co.uk/wires/ap/article-2735519/Global-trash-burning-polluting-expected.html>

57 *Singapore's Innovative Waste Disposal System*, Eric Yep, *The Wall Street Journal*, September 13, 2015; <http://www.wsj.com/articles/singapores-innovative-waste-disposal-system-1442197715>

58 *Which countries create the most ocean trash?*, Robert Lee Hotz, *The Wall Street Journal*, February 12, 2015; <http://www.wsj.com/articles/which-countries-create-the-most-ocean-trash-1423767676>; <http://jambeck.engr.uga.edu/landplasticinput/>

59 *Seoul Statistical Tables, status of collecting waste*, 2013, <http://stat.seoul.go.kr/jsp3/index.jsp>

# Environmental Sustainability

(by overall ranking)

	Basics	Compromisers	Differentiators			
	Air pollution	Water quality and risk	Natural disaster risk*	Recycled waste	Non-Hydro Renewable Electricity generated*	Public park space
1 Vancouver	28	27	17	26	25	21
2 Toronto	22	24	17	24	25	24
3 Seattle	27	22	12	25	27	22
4 Auckland	27	20	18	21	28	15
5 Seoul	13	25	13	28	18	28
6 Melbourne	27	11	7	22	23	26
7 Los Angeles	18	5	12	27	27	25
8 Taipei	19	14	24	23	19	12
9 Singapore	20	6	28	18	17	10
10 Shanghai	2	7	24	20	16	20
11 Novosibirsk	14	28	27	5	5	8
12 Tokyo	23	13	2	13	22	13
13 Mexico City	3	16	26	14	12	14
14 Beijing	1	3	24	17	16	23
15 Chiang Mai	15	23	20	9	11	5
16 Bandar Seri Begawan	27	26	6	2	2	19
17 Kuala Lumpur	11	18	26	11	6	9
18 Hong Kong	17	10	24	19	3	7
19 Osaka	22	12	2	8	22	12
20 Port Moresby	9	21	9	2	9	27
21 Bangkok	13	19	20	7	11	2
22 Jakarta	9	4	15	17	8	18
23 Cebu	11	15	5	17	14	1
24 Surabaya	17	2	15	11	8	6
25 Santiago	7	8	3	3	20	17
26 Manila	6	9	5	7	14	16
27 Ho Chi Minh City	5	17	10	4	1	3
28 Lima	5	1	8	12	4	4

\*country-level data    High    Medium    Low    Highest rank in each variable

## Waste to Worth: Recycling

Deposit systems, such as Seoul's, are examples of the continuation of a two-hundred-year-old concept now trending: waste to worth. The best way to make people care about where they put their trash is to emphasize its value to them. Worth includes everything from revenue (from basic recycling of plastics, metals, paper, and glass for raw goods), energy production (including through biofuels or pyrolysis), jobs (from a better managed system of garbage pickers to high-tech innovation), to health benefits (cleaning water systems, air, and soil to improve the health of citizenry). In 2012, **Seoul** claimed to have created enough energy from its waste-to-energy incineration to equal heating for 14% of its homes.<sup>60</sup> Innovations in pyrolysis, heralded for its ability to create energy from everything from plastics to food scraps to oil-tainted soil, is still being developed and optimized, but one neighborhood in **Jakarta** recently opened a pyrolysis center with the hope that it can handle one ton of the 16 tons generated each day.<sup>61</sup>

We noted one caution for cities that currently rank high in our air pollution metric. Clean air sometimes can go hand-in-hand with signs of economic slowdowns. **Vancouver**, which had earned high points for its air quality, is coming to discover that its recession, and the resulting lower traffic and industrial output, may have had more to do with its clean air than changes in citizen behavior. With the economy back on track, pollution levels are creeping up (even if one doesn't include the wildfires during the summer of 2015). The city faces one of those key moments where it needs to aggressively encourage mass transit use and the adoption of more fuel-efficient

vehicles, or backslide.<sup>62</sup> On the flip side, to get cleaner skies, China has begun to push clean air measures over GDP growth and Beijing will close its last four coal power plants next year.<sup>63</sup> But is there a city that has managed to keep GDP high along with air quality? Of the top five cities in air quality in our study, **Seattle** has the highest GDP growth rate.

## Water to worth, without raising prices

Water represents a trickier problem for cities than the waste issue, because as a resource required for survival, worth cannot be imposed by high tariffs; costs for consumers must be kept low.

So, how do you insert 'worth' into the water equation without raising the price of water prohibitively high? One way is to focus on smart water technology. Municipalities and industry require sufficient water for survival and manufacturing, so the potential market for innovation is huge. **Jakarta**, with a population of over ten million, loses almost 50% of its water production to line leaks.<sup>64</sup> That represents not only a daunting loss of water resource; it is an energy waste. In the US, 4% of electricity generation goes to water treatment, so line losses are both water and electricity down the drain.


60 Seoul recovers energy from 730,000 tonnes of waste, *Waste Management World*, March 20, 2012; <http://www.waste-management-world.com/articles/2012/03/seoul-recovers-energy-from-730-000-tonnes-of-waste-.html>

61 Sita W. Dewi, *Trash facility employ pyrolysis machine*, *The Jakarta Post*, July 28 2015; <http://www.thejakartapost.com/news/2015/07/28/trash-facility-employ-pyrolysis-machine.html>

62 Kelly Sinoski, *Metro Vancouver air quality suffers as driving increases*, *The Vancouver Sun*, March 3, 2015; [http://www.vancouversun.com/business/Metro+Vancouver+quality+suffers+driving+increases/10858837/story.html?\\_\\_lsa=8da2-d32f](http://www.vancouversun.com/business/Metro+Vancouver+quality+suffers+driving+increases/10858837/story.html?__lsa=8da2-d32f)

63 Jason Lee, *Chinese capital shuts third coal-fired plant in war on smog*, Reuters, Beijing, March 20, 2015 <http://www.reuters.com/article/2015/03/20/us-china-pollution-beijing-idUSKBN0MG1D120150320>

64 City of Jakarta, Asian Urban Information Center of Kobe, an international cooperation organization, Kobe Japan; <http://www.kicc.jp/auick/database/apc/apc021/apc02102.html>



*Monsoons, earthquakes, typhoons, tsunamis, and hurricanes all rake the region. In 2012, APEC economies weathered seven out of ten of that year's costliest disaster events.*

Meanwhile, **Singapore**, a smart urban solutions leader, transformed its greatest liability—water shortage—into a producer industry. Some 100 companies in Singapore export their \$7 billion worth of water-tech solutions internationally. Visenti, a Singapore-based spinoff from MIT, not only runs its advanced leak detection system in its home city, it's also exporting the technology to other APEC cities in this report, including **Los Angeles, Hong Kong, and Melbourne**.<sup>65,66</sup>

**Lima**, Peru, which faces the most critical water issues of any city in our study, due to its dry climate and reliance on ever-retreating mountain ice caps, has launched an intense effort to change the behaviors of its ten million residents. The city, through its water and sanitation ministry, embarked on a program to instill water culture, including essay-writing contests for children and education courses for all media outlets, with the belief that the youth and information outlets must overhaul thinking around this issue.<sup>67</sup>

### **Disaster holds back development**

Disaster management is becoming an ever critical imperative for the sustainability of many of the cities we studied throughout APEC. Monsoons, earthquakes, typhoons, tsunamis, and hurricanes all rake the region. In 2012, APEC economies weathered seven out of ten of that year's costliest disaster events.<sup>68</sup> Asia and Australia are bracing for a particularly potent El Niño in the coming year. Factors accelerating the Asian economy, including rapid urbanization, may make the region even more vulnerable to the negative impact of disasters.<sup>69</sup> As such, APEC CEOs cite potential disruptions from natural disasters as a key reason they would hold back on investments in the region.<sup>70</sup>

Cities have become more serious about disaster preparedness in

warnings and contingency plans, but they also have recognized they must design for the weather events that will inevitably come. **Kuala Lumpur** has been particularly forward thinking in designing a double-decker highway that can be used for flood runoff in bad weather. In dry periods, both tunnels alleviate rush hour congestion. During minor flooding, the lower six-mile tunnel is closed to traffic and used for water dispersal. In more serious weather, both tunnels can be used to channel flood waters.<sup>71</sup> That city has also become serious about its public park space and the value it creates, not only in livability and real estate values, but as a necessary flood mitigator.

Mayor Tri Rismaharini, who took office in **Surabaya**, in 2010, also sees the need for water dispersal aligning with efforts to provide a better environment for her citizens. Formerly the head of the city's parks department, as mayor she continues efforts to turn the city green.<sup>72</sup> And **Taipei 101**, the world's tallest green skyscraper, in the heart of that city, is almost a one-building environmental sustainability innovation hub. It was built to endure earthquakes and monsoons while boasting the fastest elevators, and highest speed internet. In 2011, the building's owners retrofitted to receive LEED classification.

### **Renewable energy in infancy**

Large-scale renewable energy is often national in nature, so some cities are challenged to take the lead in adoption. (We found that the cities in the United States and New Zealand led in our study for the generation of non-hydro renewable energy.) But big facilities in urban settings are experimenting with rooftop solar. A notable initiative in rooftop solar atop the **Shanghai Hongqiao Railway Station** generates 6.3 million kW hours of electricity per year, enough to power 572 US homes, or for Shanghai's home country, about

ten times the number of homes.<sup>73</sup> Across APEC, net-metering programs are still in their infancy but promoting residential and commercial renewable energy generation could help ease energy demand pressures. Government will need to play a key role in promoting uptake: Consider the Philippines, where net metering for residents is capped at 100 kW, hardly an incentive for installing solar.<sup>74</sup>

As technology costs for renewable energy decline, more cities are finding that wind and solar farms are viable and affordable alternatives to traditional coal-fired power plants. Since they often require large tracts of land, they are most easily situated well outside city limits, for instance, **Los Angeles' Solar Star** Voltaic, but, because such projects typically require the cooperation of varied district stakeholders, they can be more involved to build out.

65 Sustainable Melbourne Fund website, <http://sustainablemelbournefund.com.au/case-studies/>; and *Real-Time Monitoring and the Development of a Smart Water Grid*, Andrew J. Whittle, Department of Civil & Environmental Engineering, MIT ILP R&D Conference, MIT, November 2013; <http://ilp.mit.edu/images/conferences/2013/rd/presentations/whittle.pdf>

66 Hal Hodson, *Smart sensors warn instantly of citywide water leaks*, *New Scientist*, November 2014; <https://www.newscientist.com/article/mg22429942-700-smart-sensors-warn-instantly-of-citywide-water-leaks/>

67 Lima running dry: Promoting water culture in the second driest capital in the world, Water and Sanitation Program, part of the World Bank Group's Water Global Practice; <https://www.wsp.org/featuresevents/features/lima-running-dry-%E2%80%93-promoting-water-culture-second-driest-capital-world>

68 *Disaster risk financing in APEC economies*, this report was delivered to APEC Finance Ministers at their meeting on September 19-20, 2013, in Nusa Dua, Bali, Indonesia. 2013, p. 7; [http://www.oecd.org/daf/fin/insurance/OECD\\_APEC\\_DisasterRiskFinancing.pdf](http://www.oecd.org/daf/fin/insurance/OECD_APEC_DisasterRiskFinancing.pdf)

69 Ibid.

70 PwC, 2015 APEC CEO Survey, November 2015.

71 Stormwater Management and Road Tunnel (SMART) website, <http://smarttunnel.com.my/>

72 The City Mayors Foundation website, London, UK; <http://www.citymayors.com/mayors/surabaya-mayor-tri-rismaharini.html>

73 Enerdata, World Energy Council; secondary source, <http://shrinkthatfootprint.com/average-household-electricity-consumption>

74 Robert Verzola, *Net metering in the Philippines — not really net metering*, *Cleantechica*, September 13, 2015; <http://cleantechica.com/2015/09/13/net-metering-in-the-philippines-not-really-net-metering/>

# Economics

## Economics

(by overall ranking)



**A snapshot of a city's economic strength only tells part of the story of a city's economic health. It's also an indicator of a city's promise, its aspirations.**

### Growing a better city

Urban economies are increasingly forging the economic fates of nations. Collectively, APEC's urban centers generate some 70% of APEC's total GDP. **Bangkok** alone is expected to account for 46% of Thailand's GDP in 2015; **Ho Chi Minh City** is forecast to comprise 27% of Vietnam's total economic output.<sup>75</sup> And these figures will likely rise with greater urbanization. A snapshot of a city's economic strength only tells part of the story of a city's economic health, however. It's also an indicator of a city's promise, its aspirations. And, looking forward, what are the untapped aspirations and needs of APEC's cities, and which players are best-suited as partners to help those cities realize them?

### Different models, different stages of growth

The cities on our list are at vastly disparate levels of maturity, have different identities, hold different hopes. Let's compare **Singapore**, which ranked second in our Economics category (and third overall), to **Ho Chi Minh City**, which ranks 20 in the Economics category and 24 overall. In some ways, Singapore is APEC's oldest new city. Fifty years after its independence, it's been an exemplar of growth, and its industrialization has been largely built on decades of investment by multinational firms. Its GDP growth is in line with an economy of its heft. Now, with an aging population and as a leader on many fronts—including advanced manufacturing, smart urban solutions, and financial services—what is its next act? The answer may simply be: it wants to be itself and is looking inward for homegrown innovation—for Singapore-based companies. In the words of Singapore Finance Minister

Tharman Shanmugaratnam, "We are moving from value adding to value creation."<sup>76</sup>

If Singapore is APEC's elder economic statesman, then Ho Chi Minh is its wunderkind. Note that Singapore is the joint topped-rank city in our attracting FDI [Foreign Direct Investment] indicator, but that Ho Chi Minh City is only a few places behind. Ho Chi Minh City's economy is firing on all cylinders, it has an unusually young workforce and benefits from Vietnam's strong FDI (almost \$12.5 billion in 2014 and nearly \$9.7 billion in the first three quarters of 2015).<sup>77</sup> Over the last decade, the city has been host to a parade of major multinational companies which have built and employed and exported—including Intel, which built a \$1 billion plant in 2012 in the city's Saigon Hi-Tech Park (SHTP), and Samsung, which broke ground on a \$1.4 billion facility in early 2015.<sup>78</sup> The influence of such foreign companies on Vietnam's exports has been profound. In the last five years the share of exports driven by foreign firms has gone from about 50% to 70%.<sup>79</sup> But cities such as Ho Chi Minh are correct when they begin to ask themselves whether they are on the right FDI bullet train. Is its trajectory changing? Recently, Nguyen Tan Dung, prime minister of Vietnam announced: "The country will target high-quality FDI inflows, focusing on FDI projects using advanced and environmentally friendly technologies, and use natural resources in a sustainable way."<sup>80</sup> Vietnam's Da Nang City, for instance, recently rejected two proposals from investors from Hong Kong and South Korea to build textile plants due to concerns that proposed outmoded technology could cause environmental pollution.<sup>81</sup>

<sup>75</sup> Oxford Economics and PwC analysis.

<sup>76</sup> *Beyond 50: Singapore's growth strategy shifts*, *The Business Times*, August 11, 2015.

<sup>77</sup> *Vietnam's Jan-Sept FDI inflow seen up at \$9.65 bln-govt*, Reuters, September 25, 2015.

<sup>78</sup> *Samsung breaks ground on \$1.4bn complex in Ho Chi Minh City*, *tuoiere news.vn*, May 20, 2015; <http://tuoiere news.vn/business/28162/samsung-breaks-ground-on-14bn-complex-in-ho-chi-minh-city>

<sup>79</sup> *Vietnam among the most attractive investment destinations*: Aaron Batten, ADB, *dealstreetasia.com*, September 23, 2015.

<sup>80</sup> Quoted from a World Economic Forum blog authored by Nguyen Tan Dung entitled *Why foreign investment in Vietnam is booming*, posted May 23, 2014; <https://agenda.weforum.org/2014/05/foreign-investment-booming-vietnam/>

<sup>81</sup> *Vietnam focus on attracting FDI with high technology and clean environment*, *yarns and fibers.com*, September 26, 2015.

## Economics

(by overall ranking)

	Basics	Compromisers	Differentiators					
	Ease of doing business**	Cost of living	Household consumption per capita	Attracting FDI	GDP per capita	Rate of real GDP growth	Openness to trade*	Incidence of economic crime*
1 Hong Kong	27	10	21	26	20	10	27	26
2 Singapore	28	2	17	28	22	13	28	23
3 Tokyo	15	7	26	24	27	5	24	28
4 Kuala Lumpur	24	21	13	18	14	23	16	24
5 Los Angeles	26	13	27	15	26	12	20	7
6 Seattle	26	5	28	12	28	17	20	7
6 Taipei	20	15	18	15	18	18	17	22
8 Toronto	17	9	23	21	21	11	22	16
9 Vancouver	17	6	24	12	23	14	22	16
9 Osaka	15	11	22	7	24	3	24	28
11 Auckland	22	4	20	8	19	15	26	18
11 Shanghai	8	14	11	28	11	25	13	22
13 Beijing	8	18	7	26	9	27	13	22
14 Melbourne	22	3	25	23	25	9	18	2
15 Santiago	13	16	15	15	13	7	25	19
16 Bangkok	19	19	9	19	12	19	11	13
17 Seoul	23	8	19	20	17	8	15	7
18 Lima	12	17	10	12	7	16	14	25
19 Mexico City	11	22	16	18	15	6	6	17
20 Ho Chi Minh City	6	25	1	23	2	26	3	16
21 Jakarta	2	24	8	18	10	20	8	9
22 Manila	5	23	6	12	5	24	5	13
23 Cebu	5	27	5	4	4	22	5	13
24 Surabaya	2	28	3	6	6	21	8	9
25 Chiang Mai	19	26	4	2	3	4	11	13
26 Bandar Seri Begawan	10	12	14	1	16	2	9	4
27 Novosibirsk	9	20	12	6	8	1	1	1
28 Port Moresby	3	1	2	3	1	28	2	3

\* country-level data \*\* data based on country's most populous city  
 High Medium Low Highest rank in each variable

### City, Inc.: what if cities were managed as businesses?

Fulfilling economic promise or potential—especially in the region's fast-growing cities—will come with time. Consider infrastructure. The Asian Development Bank estimates demand for infrastructure spending in developing Asian economies at about \$8 trillion from 2010–2020, touching on everything from transportation networks to communications, housing, energy, schools, and hospitals.<sup>82</sup>

However, if a mayor and his/her team were to look at their city as a business, perspectives on the challenges in development might change. For example, taking a long view on growth strategy would mean planning far beyond one's political term. Also, the plan would consider the returns on investments—in adding to economic activity and growth.

Just as a business courts investors, cities, too, need to make a sound pitch—whether it be for public financing or funding from multilateral development banks, pension funds, or commercial banks and for forging public-private partnerships. “What we see is a big piece missing in the early phase of infrastructure projects, the quality of the feasibility studies, the risk assessments and bankability,” said Katharina Schneider-Roos,

deputy executive director of Global Infrastructure Basel, a Switzerland-based research group. Other typical problems Schneider-Roos noted hinge on whether an infrastructure plan can survive multiple mayoral administrations and whether the project possesses the highest levels of engineering integrity in an era of more frequent—and severe—climate change-related weather events. “Municipalities often overlook the sustainability of the infrastructure—is it resilient enough so it can withstand massive weather events, for example?”

### Creating a more open environment

And, as our rankings illustrate, promoting an open, transparent, and ‘user-friendly’ business environment impacts a city's overall economic condition and does much to improve its ability to carry out well-managed development projects. We found, for instance, a strong correlation between how cities performed in the openness to trade indicator with how they performed in the Economics category—as well as to their overall rankings. Take **Shanghai** and **Beijing**, both of which suffered in their overall ranking in Economics due to relatively poor ranking in ease of doing business.

<sup>82</sup> Investing in the potential of New Asian Infrastructure Investment Bank, Forbes, March 23, 2015.



**The economic performance of cities covered in this study is, in a sense, a pulse-taking of the four other categories we analyze in this report.**

***New wage-earners, new consumers***

As discussed in the Culture & Social Health section of this report, greater income equality both helps the middle- and low-income brackets and can stimulate the economy for all residents. Looking at economic mobility reveals a lot about the breadth of a city's economic health. Some cities we studied have made great strides in providing the conditions for movement. Take **Kuala Lumpur**, which ranked well overall in the Economics category, buoyed not only by a high rate of GDP growth but also by its relatively high rank in the ease of doing business indicator and its fairly strong rank in attracting FDI. In 2005, the number of Kuala Lumpur households earning US\$5,000–\$7,000 stood at 172,000 but fell to 32,000 by 2015. Meanwhile, the number of households in the US\$35,000–\$70,000 income bracket rose from 67,000 to 603,000 over the same period. That upward mobility also helped lift Kuala Lumpur's average household personal disposable income (in current prices) from US\$17,000 to \$40,000.<sup>83</sup>

Looking ahead, which cities already have a future pipeline of residents that could help drive their economies over the next decade or two? We looked at cities with relatively large younger populations, which give those cities a built-in labor-force advantage over aging cities even two or three decades out. Consider **Hong Kong**,

with a population of 7.3 million, which was the top-ranked city in our Economics category. In the last decade, its under-14 population has declined by about 50,000, while its 65-and-over population has risen by about 300,000—and is forecast to account for 30% of the population in 2041.<sup>84,85</sup> Some approaches to a potential workforce shortfall include getting more women into the workforce, extending the retirement age and luring new young talent from outside the city. Compare this to **Jakarta** (with a population of ten million), ranking in the lower third in our Economics category; the city added some 770,000 under-14-year-old residents yet also had 307,000 more older residents in 2015 than it did a decade ago.<sup>86</sup> With that large youth population, Jakarta is in the position to develop homegrown talent rather than prioritize enlisting talent outside its city borders in the way that cities with aging populations must.

The economic performance of cities covered in this study is, in a sense, a pulse-taking of the four other categories we analyze in this report. While a city's economic health and clout tells a story about where a city has come from and possibly where it is headed, our study places equal import on the other categories which dictate its economic activity, strength, and promise.

<sup>83</sup> Oxford Economics and PwC analysis.

<sup>84</sup> Ibid.

<sup>85</sup> *Hong Kong Seeks More Women Workers as Aging Population Looms*, Bloomberg News, November 26, 2013.

<sup>86</sup> Oxford Economics and PwC analysis.

# Imperatives: Paths to building better cities

This study is about performance, and about how cities stack up relative to other APEC cities' standards and priorities. But how can our snapshot assessment be used as a platform that city leaders and its residents might push off to enhance their urban homes?

Through our research and analysis, we spotted a few key areas where collaboration would make a real contribution to improving the conditions of APEC cities overall.

## For city managers, including mayors:

### **Building a brand that goes deep**

Cities in 2015 know that it is not enough to simply meet certain standards. They must underscore their distinctions. For better or worse, 'building brand' is necessary in attracting talent and investment. Cities compete to corral an increasingly mobile, global workforce. Talent collects where the live/work mix is right. Even in a city with top rankings for indicators, if the city is not known for a specific asset, it will probably lose out on expertise and investment capital.

The question for city managers becomes: What is my city? What makes my dot on the map reverberate with compelling memories or intrigue or dreams? How can my city live beyond its location pin?

Brand cannot just be a slogan or logo. It has to be built on growth and ring true for all stakeholders. Cultural vibrancy and social equitability count. No city wants to be known for its flaws, for the acute divide between wealth and poverty within its limits, for example. It must preserve its unique past while inspiring residents to imagine a rich future.





## ***For city and national leaders:***

### ***Time for a new urban-national partnership***

In researching this report, we heard repeatedly the call for urbanization to become a national issue—for a new collaboration between national and urban governments to rapidly resolve metropolitan issues, via an urbanization agency, if you will. It only stands to reason: if cities are absorbing greater percentages of national population and producing greater percentages of national GDP, then national attention needs to be directed toward facilitating a city's ability to address its challenges in a fluid manner.

Some cities, such as Singapore, already benefit from harmonization; others do not. We saw developing cities under pressure to quickly work out major infrastructure

planning, and yet hampered by a lack of coordination with the national government. The result, as the city awaits national input, could be a private solution that impinges on any other possible strategy for controlling sprawl.<sup>87</sup>

Finally, an urban-national partnership could help inform cities on the political power they already have. Mayors, cycling through office, sometimes are unaware of the full autonomous powers they hold and the effects their metropolis has on the rest of the nation. The partnership could help identify for cities the moments when they get to make and act on big decisions which could have national or even international repercussions.

87 Note: APEC's Urban Infrastructure Network (UIN) is studying this very issue of overlapping local, regional and national jurisdictions.

## For APEC:

### **City to city: Need for an APEC stock market of ideas**

When Governor Powes Parkop of **Port Moresby**, Papua New Guinea, tried to address the high crime rate that has plagued his metropolis for more than four decades, it is interesting which city he considered a model for his hoped-for policing innovation. Surprisingly enough, he did not look to another southern hemisphere capital that had recently passed the half million mark. He looked nine thousand miles away, to a global capital 14 times the size. New York's 'broken windows' policy of policing had managed to send its notorious crime rates plummeting. Parkop took a lesson from their strategy. "They did not do big things," he told PwC in an interview. "They did small things that work."

That philosophy—growing a small solution into a big improvement—echoed throughout our research. When **Cebu**, the Philippines, wanted to imagine the optimal bus transit system, it went to Curitiba, Brazil, for answers.<sup>88</sup> When **Melbourne** adopted its tree canopy program to lower city temperatures, it shared its advice with New Zealand. We believe

this idea exchange could be made easier for cities through an online interactive archive and more consistently held city summits. Cities have learned through trial and error what works and what doesn't, and the APEC economies could create a more robust future by sharing their knowledge.

### **Collecting for growth: taxes, data, common standards**

It is interesting to note that—although we did not track tax income as a key indicator—many of our cities fail to collect the bulk of projected taxes owed from their citizens.<sup>89</sup> We do not consider a high tax revenue guarantee of a great city, but it is a backdrop for quality indicators. A realized tax base helps build better infrastructure or service core needs. Lacking that base, cities end up soliciting the national government which can move too slowly for its needs; or rely on private investment, which might not consider a city's long-term goals. Local tax collection opens options.

But the gaps in tax collection also parallel the gaps we, at times, found in data for this report. There are

solutions. In this digital age, people vote moment by moment, with their credit cards, or their mode of transport, or their test scores. They tell a story to city officials in what they buy. They explain which bus systems are most efficient by how they get through rush hour. And they reveal what skills they have for financial security by how they fare on literacy tests.

Cities could help planning—and help investors and non-governmental organizations interpret their challenges on deeper levels—if they collected better data. As with tax collection,

data harvesting requires an infrastructure that begins at the government level and carries through to the street level of processing. We believe that the APEC cities would do well to agree on a few matters as a beginning: 1) which urbanization data ought to be collected across APEC cities in a standardized form; 2) what would be the most reliable and cost effective means of doing so; 3) what knowledge-sharing platform can be used for real-time data access; and 4) how to protect that data.



<sup>88</sup> Yen Makabenta, *Cebu takes the bus to the future*, *Manila Times*, September 20, 2014; <http://www.manilatimes.net/cebu-takes-bus-future/127957/>; <http://motioncars.inquirer.net/30051/bus-rapid-transit-system-planned-for-metro-manila-cebu>

<sup>89</sup> *For More Efficient Tax Administration in Asia*, Satoru Araki, Public Management Specialist (Taxation); Regional and Sustainable Development Department, Asian Development Bank, The 5th IMF-Japan High-Level Tax Conference for Asian Countries, Meguro City, Tokyo, April 21, 2014, p. 11; <https://www.imf.org/external/np/seminars/eng/2014/asiatax/pdf/Araki.pdf>; also "Ho Chi Minh City region should sharpen competitive edge for economic-breakthrough," *Tuoi tre news*, Vietnam, August 23, 2015, <http://tuoitrenews.vn/business/30002/ho-chi-minh-city-region-should-sharpen-competitive-edge-for-economic-breakthrough-pundit>

## Methodology

*Building Better Cities* draws on the methodology devised for PwC's *Cities of Opportunity* study, and aims to shine a light on urban success in APEC cities by measuring their livability, sustainability, and competitiveness.

The study is based on publicly available information supported by extensive research. Data were collected for 39 variables across five categories reflecting the fundamentals of a well-balanced city (Culture & Social Health, Health & Welfare, Connectivity, Environmental Sustainability, and Economics). All the variables were subject to a robust review in terms of their relevance and reliability: each variable needs to be applicable across the sample of cities; publicly available and collectible; and free from skewing or distortion from local nuances. With this in mind, data are normalized where possible or appropriate, minimizing the likelihood of a city doing well solely because of its size or historic strength. In some cases, national data are used as proxies for municipal data. As consistent comparisons across all cities are critical to assure objectivity, country-level data are used when other reliable sources of publicly available municipal information are unobtainable.

The data were collected during the second and third quarters of 2015 using three main sources: global multilateral development organizations, such as the United Nations and the World Bank; national statistics organizations and municipal administrations; and commercial data providers.

The method of scoring is designed for transparency and simplicity for readers and to ensure comparability across cities. The 28 cities are sorted from best performing to the lowest in each variable, and then assigned a score from 28 (top) to 1 (bottom). In the case of a tie, cities are assigned the same score. Once all 39 variables are scored, they are placed into their respective category. Within each group, the variable scores are averaged to give each city an overall mean score for that category, producing five category tables showing the relative performance of the 28 cities. The same process is also applied to the three development lenses. The overall result is the sum of the mean scores in each of the five categories. It is worth noting that different research methodologies produce different results. Our rankings aim to facilitate observations on APEC cities in a clear and simple manner, and are not an expression of opinion or criticism.

## Key to our indicators

### Culture & Social Health

#### Literacy and tertiary enrollment\*

Combination of relative performance in literacy and tertiary enrollment. Literacy is the percentage of the adult population (aged 15+) who can, with understanding, read and write a short, simple statement on their everyday life. The World Bank indicates that 'literacy' also encompasses 'numeracy', reflecting the ability to make simple arithmetic calculations. Total enrollment, also from The World Bank, reflects tertiary education (ISCED 5 and 6), regardless of age, expressed as a percentage of the total population of the five-year age group following on from secondary school leaving.

#### GINI Index\*

The GINI index measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution. A GINI index of zero indicates perfect equality while an index of 100 implies perfect inequality.

#### Percentage of population with higher education

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

#### Innovation cities index

The 2thinknow Innovation Cities™ index is comprised of 331 cities selected from 1,540 cities based on basic factors of health, wealth, population, geography. The selected cities had data extracted from a city benchmarking data program on 162 indicators. Each of the benchmarking data were scored by analysts using best available qualitative analysis and quantitative statistics. (Where data were unavailable, national or state estimates were used). Data were then trend balanced against 21 global trends. The final index had a zeitgeist (analyst confidence) factor added and the score reduced to a three-factor score for Cultural Assets, Human Infrastructure and Networked Markets.

#### Middle-class population growth

Each city receives an index score relative to the best-performing city according to the projected rate of growth (%) and absolute growth in the city's middle-class population from 2013-2015. Data is sourced from Canback & Company's Global Income Distribution Database (CGIDD) and includes socio-economic groupings D+ (lower middle-class), C (middle-class) and C+ (upper middle-class).

#### Cultural vibrancy

A snapshot of the cultural scene in each city measuring the variety of restaurants, theatrical and musical performances, cinemas and sport and leisure activities in each city. Data is taken from the 2014 Mercer Quality of Living Survey. Cities whose cultural activities offer

greater variety, quality and level of service receive a higher score.

#### Political environment

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

#### Corruption Perceptions Index\*

Using expert opinion, Transparency International's Corruption Perceptions Index 2014 measures, at a country-level, the perceived levels of public sector corruption across the globe. Corruption is measured on a scale of 0 (highly corrupt) to 100 (very clean) and a poor score gives an indication that a country has widespread bribery, lack of punishment for corruption and public institutions that do not respond to citizens' needs.

#### Tolerance and inclusion\*

A measure of social progress in a society based on how tolerant and inclusive a society is based on five areas: tolerance for migrants, tolerance for homosexuals, discrimination and violence against minorities, religious tolerance and a 'community safety net'. Data is sourced from the Social Progress Index 2015, published by the Social Progress Imperative, a non-profit organization focusing on highlighting societal issues.

### Connectivity

#### Broadband quality

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

#### Mobile broadband

Based on millions of recent cellular test results from Ookla Speedtest iOS and Android apps, this index compares and ranks cellular upload and download speeds around the globe. The value is the rolling mean speed in megabits per second (Mbps) over a two month period. Only tests taken within 300 miles of the server are eligible for inclusion in the index.

#### Public transport systems

Reflects the efficiency, reliability and safety of public transport networks as defined and rated by the Mercer Quality of Living reports 2014. Cities with a more extensive and reliable public transport system receive a higher score.

#### Mass transit coverage

Ratio of kilometers of mass transit track to every 100 square kilometers of the developed and developable portions of a city's land area. A city's developable land area is derived by subtracting public park space from total land area.

#### Traffic congestion

Measure of traffic congestion and congestion policies for each city scored on the level of congestion as well as the modernity, reliability and efficiency of public transport. Assessment based on Mercer's 2014 Quality of Living Survey.

#### Airport to CBD access

A measure of the ease of using public transit to travel between a city's central business district and the international terminal of its busiest airport. Cities are separated into categories according to whether a direct rail link exists, the number of transfers required, or whether a bus or taxi is recommended. Cities with direct rail links are preferred. Rail links with the fewest transfers are ranked higher than those with more. Within these categories, cities are ranked according to the cost of a one-way adult weekday trip and the length of the trip, with each factor weighted equally.

#### Airport connectivity

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

#### International tourists

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

#### Hotel rooms

A measurement of a city's hotel infrastructure in terms of capacity and occupancy rates. Each city receives a relative score based on the total number of hotel rooms in the city as well as the average occupancy rate over a given 12-month period.

### Health & Welfare

#### Health system performance\*

Measurement of a country's health system performance made by comparing healthy life expectancy with healthcare expenditures per capita in that country, adjusted for average years of education (as years of education is strongly associated with the health of populations in both developed and developing countries). PwC Global Healthcare adapted methodology from the 2001 report "Comparative efficiency of national health systems: cross-national econometric analysis".

#### Hospital bed density\*

The number of hospital beds per 1,000 people—this serves as a general measure of inpatient service availability. Hospital beds include inpatient beds available in public, private, general, and specialized hospitals and rehabilitation centres. In most cases, beds for both acute and chronic care are included. Because the level of inpatient services required for individual countries depends on several factors—such as demographic issues and the burden of disease—there is no global target for the number of hospital beds per country.

### Physician density\*

The number of medical doctors (physicians), including generalist and specialist medical practitioners, per 1,000 of the population. Medical doctors are defined as doctors that study, diagnose, treat, and prevent illness, disease, injury, and other physical and mental impairments in humans through the application of modern medicine.

### Crime

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

### Electricity access and consumption\*

Combination of the relative performance of the percentage of population in a country with access to electricity and the electrical energy consumption per capita (in kilowatt-hours). Electric power consumption measures the production of power plants and combined heat and power plants less transmission, distribution, and transformation losses and own use by heat and power plants. Higher consumption has been assumed to indicate a more developed power infrastructure.

### Food Security Index\*

An assessment of each city's vulnerability to food insecurity, looking specifically at the affordability, availability, quality and safety of food supply. Data is

sourced at a country level from the Economist Intelligence Unit's (EIU) Global Food Security Index 2015—a benchmarking model which measures food security across 28 qualitative and quantitative indicators.

### Housing

Measure of availability, diversity, cost and quality of housing, household appliances and furniture, as well as household maintenance and repair. Data is from the 2014 Mercer Quality of Living Survey.

### Environmental Sustainability

#### Air pollution

Combination of measures of PM10 outdoor air pollution levels from the World Health Organisation (WHO) and the Numbeo Pollution Index of pollution in each city. The WHO's Public Health and Environment database provides annual mean concentrations of particulate matter 10 micrometers (PM10) in diameters or less which reflect the degree to which urban populations are exposed to this matter. The Numbeo Pollution Index is generated via survey based data. Numbeo attributes the biggest weight to air pollution and water pollution/accessibility as the two main pollution factors, with a smaller weight given to other pollution types.

#### Water quality and risk

Water risks in a city related to quality, quantity and regulatory risk. Quality risks are defined as the exposure to changes in water quality that may impact on

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

#### Natural disaster risk\*

Each city receives a score based on its level of exposure to five types of natural disaster (earthquakes, storms, floods, droughts and sea level rise), calculated by analysing the number of people exposed to risk in urban areas as a percentage of the overall urban population. The data is sourced from the UN University's World Risk Index 2014 and is calculated at country-level using a country's urban population.

#### Recycled waste

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

### Non-Hydro renewable electricity generated\*

Non-hydro renewable electricity generated per 1,000 of the country's population. Total non-hydro renewable electricity comprises the total geothermal, wind, solar, tide and wave, biomass and waste, electricity generated.

### Public park space

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

### Economics

#### Ease of doing business\*\*

Each city receives a score based on the Doing Business 2014 report, published by the World Bank. The report is a measure of business regulations and their enforcement across 189 economies. The report reflects each economy's performance across 10 areas: starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts and resolving insolvency.

#### Cost of living

A relative measure of the price of consumer goods by location, including groceries, restaurants, transportation and utilities. The Consumer Price Index (CPI) measure does not include accommodation expenses such as rent or mortgage.

### Household consumption per capita

A per capita measure of consumer spending in each city, taking into account the value of all goods and services purchased by a household to meet their everyday needs. Household consumption expenditure and population are projected figures for 2015, expressed in constant 2005 US Dollars, and population values are an estimate for 2015. Data is sourced from the Canback Global Income Distribution Database (CGIDD).

### Attracting FDI

Combined variable ranking the number of greenfield (new job-creating) projects plus the total USD value of greenfield capital investment activities in a city that are funded by foreign direct investment (FDI) between 2005 and 2014. Data provided by fDi Intelligence.

### GDP per capita

Distribution of gross domestic product (GDP) per capita in 2015 expressed in constant 2005 US Dollars. Data sourced from Canback & Company's Global Income Distribution Database (CGIDD).

### Rate of real GDP growth

2013-2015 gross domestic product (GDP) percentage growth rate in real terms expressed in constant 2005 US Dollars. Forecast data sourced from Canback & Company's Global Income Distribution Database (GCIDD).

### Openness to trade\*

As increasing value is placed on the importance of trade and trade facilitation to foster economic growth and welfare, the World Economic Forum's Enabling Trade Index assesses the extent to which economies have in place institutions, policies, infrastructures and services facilitating the free flow of goods over borders and to their destination. This set of trade-enabling factors is organized in four main categories: market access, border administration, infrastructure and operating environment.

### Incidence of economic crime\*

The proportion of respondents indicating their organization has experienced economic crime in their country within the last 24 months, sourced from PwC's 2014 Global Economic Crime Survey.

\* country-level data

\*\* data based on country's most populous city

## Acknowledgements

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