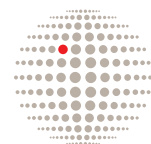




Cities of Opportunity



Partnership for New York City



Cities of Opportunity 2011 makes its fourth analysis of the trajectory of 26 cities, all capitals of finance, commerce and culture—and through their performance, seeks to open a window on what makes cities function best.

The Upper East Side of Manhattan,
with Midtown in the background.

www.pwc.com

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The more cities change, the more forward-looking perspective matters...

The notion of the city has come a long way. But the heart of what a city is remains the same: people drawn together, today in ever-increasing densities and numbers, to work as a community.

Cities of Opportunity is dedicated to understanding what makes urban dynamics work, and communicating what we learn to government officials, policymakers, businesspersons, scholars and citizens mutually invested in the success of their city or cities.

This marks our fourth study. Like cities themselves, we keep evolving. *Cities of Opportunity 2011* includes more cities, greater analysis and

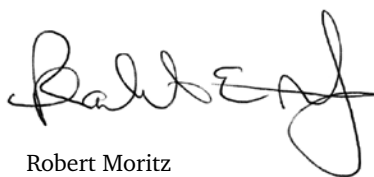
deeper exploration of core issues. This year we compare 26 cities—with San Francisco, Berlin, Madrid, Moscow, Istanbul and Abu Dhabi joining and Houston rejoining. We also look closely at a few of the challenges that are most pressing at the moment—regional management, education, sustainability, density, transportation and preservation.

It is not a coincidence that images of innovative and historic libraries (in Seattle and Stockholm) begin and end the interviews in our study. Nor is the focus on transportation, energy, environment, housing and health that weaves throughout. Both tangible and intangible—physical and intellectual capital—

have to be in balance for modern cities to enjoy healthy growth. Minds spur innovation; roads, rails, communications networks, schools and hospitals lay the groundwork on which new ideas can grow. In an ideal world, prosperity follows. But, as we all know, progress toward any ideal requires day-to-day work. This study represents our part in the effort.

Yes, *Cities of Opportunity* is changing. But the heart of what we are doing—trying to shed light on what makes major cities healthy—remains the same. All three of us sincerely hope you find value and interest in the study.

Yours truly,



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Chairman and Senior Partner
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Kenneth I. Chenault
Chairman and CEO
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1. Technology readiness

2. Main report

Technology readiness: Honing the right stuff for the digital age

This year's study clearly distinguishes between the tangible and intangible assets a city needs to lead in intellectual capital and innovation and straightforward technological preparedness. Here we focus purely on the software, hardware and bandwidth that are required for economic and academic progress. And correlation analyses of all the data do show an 81% positive correlation between cities with a robust technology backbone and strong intellectual assets. (See page 16 for an indicator heat map and www.pwc.com/cities for a modelling tool.)

Forward thinking nations and the top cities within them have had the resources and foresight to make high-tech plans, put them into action, and attract

big populations of tech-heads and related investors; notably including New York, Seoul, Stockholm, San Francisco, Chicago, Singapore and Hong Kong.

New York, home to more than 10% of the nation's financial technology workers, tops the list overall in technology infrastructure and measures of the city's potential to nurture a high-tech future. Stockholm scores near perfect in every area except software development and design and is the only European city among the top 10 finishers. San Francisco performs lower than might be expected not because creative, high-tech drive is lacking but rather because funding sources are more likely to be found in Silicon Valley than in the city itself.

	Internet access in schools	Broadband quality score	Digital economy score ¹	Software and multi-media development and design ²	Score
26 New York	21	21	25	23	90
25 Seoul	23	26	16	24	89
24 Stockholm	26	25	26	7	84
23 San Francisco	21	21	25	16	83
22 Chicago	21	22	25	12	80
21 Singapore	25	13	20	20	78
20 Hong Kong	24	16	20	17	77
19 Los Angeles	21	15	25	15	76
18 Houston	21	17	25	11	74
18 Tokyo	10	24	14	26	74
16 London	16	12	15	25	68
15 Toronto	22	10	17	10	59
14 Paris	9	19	12	18	58
13 Moscow	5	23	1	22	51
12 Berlin	11	18	13	6	48
11 Shanghai	15	7	4	21	47
11 Sydney	13	11	18	5	47
9 Beijing	15	7	4	19	45
8 Madrid	7	9	11	13	40
7 Istanbul	6	14	5	4	29
6 Santiago	8	8	10	2	28
6 São Paulo	3	5	6	14	28
4 Abu Dhabi	12	2	9	1	24
3 Mexico City	2	4	7	8	21
2 Mumbai	4	3	2	9	18
1 Johannesburg	1	1	8	3	13

Each city's score (here 90 to 13) is the sum of its rankings across variables. The city order from 26 to 1 is based on these scores. See maps on pages 18–19 for an overall indicator comparison.

1. The Economist Intelligence Unit (EIU) renamed this study this year. It previously was titled, "E-readiness." Given the prevalence of Internet-connected consumers, businesses and governments and the indispensable role that digital communications and services now play in most of the world's economies, the EIU believes that the countries included in its study already have achieved at least some degree of e-readiness. The study's new title, the "Digital Economy Rankings," captures the challenge of maximizing the use of ICT that countries face in the years ahead.

2. The index takes into account factors such as: education levels; size and track record of the ICT sector; quality of IT, air, port, road and railway infrastructures; quality of electrical supply; size of labor force; labor productivity; hiring and firing flexibility; labor relations; foreign ownership restrictions; business costs of terrorism; and cost of establishing a business.

■ High
■ Medium
■ Low

■ Highest rank in each variable



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Commuters crossing London Bridge.



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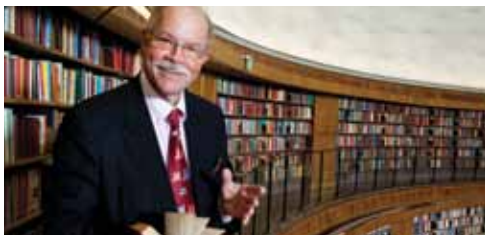
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See the web at www.pwc.com/cities for greater depth and functionality. **Model your own city** and perform customized correlation analyses by selecting the variables and cities you want to focus on for an interactive look at the results. **See videocasts** and hear podcasts with Rem Koolhaas and Mortimer Zuckerman. **Read the full text** of all the interviews condensed here in the report. **Learn the detailed background** on all sources and definitions for the 66 variables in the study.

About the study



Traffic traverses a new diagonal crossing at Oxford Circus, London, inspired by the Shibuya crossing in Tokyo.



Overview: Looking closer at the *alphas*, *betas* and *chais* of holistic cities

When the first edition of *Cities of Opportunity* was developed, we made a decision to rank cities only in their 10 indicator categories and to forego showing overall rankings to avoid the misperception of a contest. That risk seemed especially significant in 2007, when the media cast New York and London in a death match for global capital market kingship.

In hindsight, the New York versus London tug of war seems a figment of the about-to-burst bubble, a comparison that deserved headline attention only through the looking glass of irrational exuberance. And a curious reader, then and now, might be expected to ask, quite commonsensically, ‘who does win?’

This fourth edition of *Cities of Opportunity* for the first time shows an overall ranking. But which city wins is far from our message or motivation. If anything, we honor the admonition of Walt Whitman, a 19th century editor of *The Brooklyn Eagle*: “Be curious, not judgmental.”

Rome, Amsterdam, Beijing were all once the centers of their worlds. Each remains a great city but at a different stage of evolution. Detroit stood mid-20th century at the epicenter of the US economy, to the point that it was said, “What is good for the nation is good for General Motors and vice versa.” Today, that story has taken a different turn. But even for Detroit, detours don’t doom the city to dead ends.

In terms of overall results this year, New York finishes first with a slim, perhaps ephemeral, lead (see page 12). But the real news lies elsewhere.

Toronto, San Francisco, Stockholm and Sydney round out the top five after New York. These beta cities arguably may not “have it all” if you’re seeking to crown a heavyweight champion among world cities where size, a major capital market and 24/7 buzz do matter. But they just may have what they need for a world that is growing less reliant on geography and more dependent on attracting and nurturing good people to innovate and build the future with fresh eyes.

Interestingly, the cities of Toronto, San Francisco, Stockholm and Sydney all are part of vital regions—a relationship we examine this year.

Notably also, the “alpha” cities like London, Paris, Tokyo and New York are not bunched at the top. These “usual suspects” of broad, Western socioeconomic leadership (with rich recent histories, deep resources and major capital markets) are spread through the top 10 and, in the case of Tokyo, fall to 14th overall.

Taking a step back, there actually are no alpha and beta differentiators among our 26 cities—nor is there any reason to categorize cities as one or the other more than to acknowledge differences among histories, opportunities and challenges. As all city

dwellers know (at least in quiet moments), the density that packs us on metros, highways, markets and streets guarantees that we're "all in it together." Sooner or later, cities and their citizens prosper or fail as a piece. What one person or city learns can help another; and our objective is to look at policies and performance to communicate useful insights.

Winners also would be much different if *Cities of Opportunity* were recast as *Cities of Growth* or *Cities of Fun*. As it is, our study defines the ideal differently. Perhaps we're seeking the *chai* of cities, to switch from Greek letters to a Hebrew character that signifies life force.

Our measures are designed to favor holistic capital market centers with vibrant economies and strong quality of life. Our thesis is that a successful city going forward will balance both social and economic strengths so the people and infrastructure support each other. The challenge of building a city, keeping it on top and evolving with changing needs is the dynamic we're seeking to illuminate. The measures we use—reconsidered and significantly recast this year—are selected to develop an accurate reflection of that balanced city and its metamorphosis.

Correlation analyses provide one signal we're going in the right direction. A parallel exists between good economic indicators and social ones. Among the 10 indicators, five correlate in a close positive pattern—intellectual capital and innovation; health, safety and security; ease of doing business; technology readiness; and demographics and livability. In other words, when one goes up, the other tends to do so as well. For instance, the indicators that include health and intellectual capital correlate a striking +87%. (See page 16 for a heat map of the 10 indicators and www.pwc.com/cities for a look at all

66 variables, also offering users the interactive ability to customize any combination of 10 variables.)

This year in addition to refining our data selection and analysis and presenting interviews with authorities at the center of urban ideas and action, we discuss several critical urban issues in depth. These include the:

Paradox of measuring and improving education in a world where intellectual capital and innovation increasingly form the brick and mortar of future cities (see page 28).

Regional struggle from Beijing to Berlin to São Paulo and Sydney to effectively manage cities in the contexts of their surrounding areas—often places with different governments, measures of success, funding sources and economic motivations (see page 36).

Changing popular and real definition of what a cityscape looks like as some cities rise, some spread, some choose to stay low and some combine a bit of each (see page 40).

Progress being made on sustainability as cities from Mexico City to Johannesburg to Shanghai, Abu Dhabi and New York adopt plans to suit their own situations to clean their environments and conserve resources (see page 47).

Costly and maddening toll of traffic congestion and what Singapore, Stockholm and London are doing to solve the problem (see page 68).

Friction playing out between progress and preservation as governments, businesses, developers, architects, historic conservationists and citizens each regard the value of the past and road to the future through slightly different prisms (see page 72).

Interviews add an extraordinary level of insight from people at the center of thought and action. These include conversations with: Rem Koolhaas, architect, writer and Harvard professor; Judith Rodin, president of the Rockefeller Foundation and formerly the University of Pennsylvania; Mortimer Zuckerman, developer and publisher; Klaus Baur and Guenther Krug, chairman of Bombardier Transportation, and a member of Berlin Parliament and advisor to Bombardier, respectively; Kerry Zhou, director of strategy and planning at Goldwind Technologies, one of China's leading wind power companies; René Gurka, managing director of Berlin Partner, and Leif Edvinsson, an urban futurologist and pioneer in understanding the dynamics of intellectual capital.

Our website, www.pwc.com/cities, offers much more. Interactive tools allow users to perform their own correlation analyses and comparisons for any city. Videocasts are available with Rem Koolhaas and podcasts with Mortimer Zuckerman. Full-length transcripts of the interviews are posted. You can also find detailed background on all sources and definitions of the variables.

In closing, we hope all this proves entertaining, enlightening and valuable to everyone interested in the factors that make cities thrive.

Approach: The mix of variables and cities is refined; the parameters of research stay consistent

Like cities, *Cities of Opportunity* continues to evolve. PwC and the Partnership for New York City first considered the report seven years ago asking what New York had to do to remain competitive on the world stage. We immediately extended the research to other cities around the world to find patterns and lessons. In four editions of our report, we have grown from 11 to 26 cities.

Last year, we reported that economics and quality of life are tightly linked in successful modern cities. The study continues to grow into a more holistic look at socioeconomic balance.

We moved deeper into underlying issues this year, realizing that numbers themselves may create interest, but, very often, the policies behind statistics require analysis and comparison to tell the story

properly. Discussions are included on regional management, measurement of education, cityscapes, sustainability, traffic congestion and preservation.

This fourth edition of our report expands and changes the mix of cities, enriches the data with more and different variables, and further complements the quantitative nature of the research with insight from world authorities on urban issues.

Three key factors governed the cities we chose:

Capital market centers. Many of the cities included are hubs of commerce, communications and culture. But all are financial capitals of their region—meaning each plays an important role not only locally but also as a vital part of a globalizing economic fabric.

Broad geographic sampling. While each city is a center of finance and commerce in its own region, and in many cases the world, collectively, the 26 cities form a representative international distribution.

Mature and emerging economies. Sixteen mature cities and 10 emerging ones are included.

This year, six new cities joined the study, one rejoined from the 2008 report and a few were removed. At 26 cities, the sample size remains small enough to allow deep and wide-ranging research yet large enough to be representative.

Madrid, Moscow, Istanbul and Houston were added in order to create better regional coverage.

Abu Dhabi replaced Dubai as the former is rising as a business center while the latter's growth slowed markedly during the Great Recession.

San Francisco joined for a number of reasons. Close links to Silicon Valley provide



San Francisco Bay Area.

Madrid, Moscow, Berlin, Istanbul, Abu Dhabi and San Francisco join the study and Houston rejoins. Variables are added on airport transit, health systems and end-of-life care, among others.

a useful regional focus. As the financial hub of that area, the city itself plays a major role in one of the most innovative economies in the US. It also is at the leading edge of US cities enacting social policies that affect business, which adds interest to its performance.

Berlin replaces Frankfurt, the nation's financial and banking hub, to represent Germany. The capital's fast and targeted growth in recent years adds a layer of interest in seeing if it can accomplish in business what it already has achieved in government and culture, becoming the heart of a reunified nation.

In terms of the data indicators, we constructed a robust sampling of variables, each of which had to be: relevant; consistent across the sample; publicly available and collectible; current; free of skewing from local nuances; and truly reflective of a city's quality or power. (See pages 79-82 for a brief key and www.pwc.com/cities for a detailed listing of definitions and sources.)

Data this year were normalized where appropriate, minimizing the likelihood of a city doing well solely because of its size and historic strength. This eliminated the need to differentiate between variables that reflect a city's raw power (such as the number of foreign embassies or greenfield projects) and its quality or intensity (such as percent of population with higher education). Now more variables are stated in a way that is normalized for either land area or population than in previous editions.

The 66 variables selected and divided into 10 indicator groups changed significantly this year in order to develop an even more accurate image of city success.

Intellectual capital and innovation and technology readiness indicators were more cleanly delineated this year. The former shows what hardware facilitates in a city, such as education, R&D effort and entrepreneur-

ism. The latter measures hardware itself. The demographics and livability indicator focuses more closely on how pleasant people find living in a city. Only working age population remains to show the size of a city's potential workforce.

New variables include: airport to central business district access to measure the ease of using public transit between those two key places; health system performance; and end-of-life care. We strengthened our sustainability indicator variables, adding newly available data. The study's result is an unbiased, quality-controlled and rich look at the pulse of key cities at the heart of the financial, commercial and cultural world.

Understanding the scoring: Seeking transparency and simplicity

Because *Cities of Opportunity* is based on publicly available data supported by extensive research, three main sources were used to collect the relevant data:

Global multilateral development organizations such as the World Bank and the International Monetary Fund, **national statistics organizations**, such as UK National Statistics and the US Census Bureau, and **commercial data providers**.

The data were collected during the second and third quarters of 2010. In the majority of cases, the data used in the study refer to 2009 and 2010.

In some cases, national data were used as a proxy for city data. Renewable energy consumption is an example. Use of national data tends to disadvantage the 26 cities in our study, all of which are either national or regional capitals of finance and business that would be expected to outperform national averages in measures of socioeconomic advancement. This affect might be more pronounced in developing parts of the world and areas with greater rural populations.

However, because consistent comparisons across all cities are critical to assure objectivity, country-level data were used when consistent, highly reliable sources of publicly available data were unavailable for all 26 cities.

The scoring methodology was developed to ensure transparency and simplicity for readers, as well as comparability across cities. The output makes for a robust set of results and a strong foundation for analysis and discussion.

In attempting to score cities based on relative performance, we decided at the outset of our process that for maximum transparency and simplicity, we would avoid applying overly complicated weights to the 66 variables and, in so doing, treat each variable with equal importance. This approach makes the study easily understandable and usable by business leaders, academics, policymakers and lay persons alike.

Taking the data for each individual variable, the 26 cities were sorted from the best performing to the worst. The cities then were assigned a score from 26 (the best performing) to 1 (the worst performing). In the case of a tie, the cities were assigned the same score.

Once all of the 66 variables had been ranked and scored, they were placed into their 10 indicators (for example, economic clout or demographics and livability). Within each individual group, the variable scores were summed to produce an overall indicator score for that topic. This produced 10 indicator league tables that display the relative performance of our 26 cities.

Definitions for all variables are provided on pages 79-82.

The city in focus



Visitors walk through the glass cupola of the German lower house of Parliament, the Bundestag, designed by Sir Norman Foster.

Holistic balance characterizes the top 10 cities in our rankings: all are well established centers of economic energy and intellectual vitality. Although dispersed among four continents, their common bond is depth.

A look across the overall rankings reveals several interesting patterns. Our top five cities include only one, New York, that might be called a traditional economic powerhouse. Most of the other alpha cities—London, Paris and Hong Kong—finish in the bottom half of the top 10. Tokyo falls to number 14. Toronto, San Francisco, Stockholm and Sydney round out the top five this year rather than the historic centers of global finance, commerce and culture.

Holistic balance characterizes the top 10 cities in our rankings: all are well established centers of economic energy and intellectual vitality. Although dispersed among four continents, their common bond is *depth*: of economic infrastructure and networks; of law and jurisprudence; of commercial protection; of educational systems and cultural foundations; of civic organizations; and of social security.

These cities are hardly identical, and they do not excel in every indicator. But they all represent a modern consensus that cities are the most effective agents of what Leif Edvinsson calls “social intelligence” (see page 76); that is, the *concentrated* knowledge and insight of an entire human network.

The most resilient societies are those in which citizens feel they have a stake; economically, politically, socially, and even emotionally. As it turns out, emotion—which we tried to mea-

sure with our life satisfaction variable—might be an especially sensitive indicator of the top and bottom of our rankings given that seven out of 11 cities scoring least in life satisfaction also were at the bottom of the overall rankings.

Still, the notions of top and bottom in this report, by definition, are relative. A major reason to look at every ranking *indicatively* rather than literally—as guideposts to the future rather than markers of the past—is precisely because every city in this study does something, or many things, well. Looking at the overall rankings without examining the actual details behind them, therefore, obscures the compelling reasons why each city here has been included as one of the foremost cities in the world today.

New York narrowly finishes first in terms of rankings, dominating only the lifestyle assets indicator measuring cultural vibrancy, sports, hotel rooms, skylines, tourism and green space. But balance may be the city’s greatest strength. New York finishes in the top three places in six out of 10 indicators.

By contrast, London maintains the greatest economic clout (coming in ahead of Paris and New York in that indicator, respectively) but finishes in the top three overall only one other time. In context, balance may have helped New York weather the worst of the Great Recession and hurt London, whose economy relies more heavily on one sector: financial services.

A potential sign of shifting patterns emerges looking at the four cities that follow New York in the top five—Toronto, San Francisco, Stockholm and Sydney. In an increasingly virtual world, these beta cities

How the cities rank

may pose significant competition to great cosmopolitan centers such as London, Paris, Tokyo and New York.

Toronto, San Francisco, Stockholm and Sydney all are smaller cities that, a quarter of a century ago, were regarded as regional or national centers. Not any more. Stockholm ranks first in intellectual capital and innovation; health, safety and security; and, remarkably, demographics and livability, which includes the thermal comfort variable that quantifies the idea that more temperate and consistent climates are more attractive.

Toronto, meanwhile, finishes second overall and also ranks second in intellectual capital and innovation as well as health, safety and security, the two indicators that are most highly correlated in a positive way (see page 16).

Findings of interest arise throughout the results. São Paulo, for example, finishes in the top 10 in cultural vibrancy and fourth in the “zeitgeist” portion of that variable, signaling the city’s global appeal as a dynamic metropolis coming into its own as the largest city in the Southern Hemisphere. It also does very well in sustainability, performing in the top 10 overall and ranking second in both carbon footprint and renewable energy consumption.

Johannesburg, too, does extremely well in sustainability, coming in fourth overall. While its top ranking in cost of business occupancy might be expected, coming in second in airport to central business district (CBD) access is both surprising and impressive.

Istanbul ties for third place with Abu Dhabi and New York in skyscraper construction activity; equals every US city in ease of starting a business; beats Tokyo, San Francisco and Berlin in international tourists; and, finally ties for third with San Francisco, Sydney and Singapore (among other cities) for the quality of its air.

Abu Dhabi itself ranks in the top three places in 10 different variables, from the quality of its air to its hospitals to commute time to its economic competitiveness in everything from tax rates to ease of hiring to working age population.

	Intellectual capital and innovation	Technology readiness	Transportation and infrastructure
26 New York	174	90	158
25 Toronto	186	59	127
24 San Francisco	174	83	156
23 Stockholm	205	84	134
22 Sydney	168	47	129
21 London	162	68	149
20 Chicago	166	80	159
19 Paris	172	58	168
18 Singapore	119	78	126
17 Hong Kong	118	77	149
16 Houston	168	74	92
15 Los Angeles	169	76	93
14 Berlin	149	48	113
13 Tokyo	168	74	152
12 Madrid	120	40	154
11 Seoul	130	89	145
10 Beijing	77	45	133
9 Abu Dhabi	74	24	104
8 Shanghai	83	47	127
7 Mexico City	77	21	134
6 Moscow	107	51	128
5 Santiago	68	28	82
4 Istanbul	38	29	99
3 São Paulo	58	28	80
2 Johannesburg	51	13	55
1 Mumbai	41	18	80

At a time of great nation and city building in China, Shanghai leads all cities in attracting foreign direct investment in terms of both capital inflow and new greenfield projects. Beijing comes in third and fourth in these variables, respectively, and posts the best airport to central business district commute in the study. Shanghai’s modern skyline is the fourth most powerful in our study.

Shanghai and Beijing jointly finish in the top 10 in nearly a third of the variables (21 of 66); notably including software and

multimedia design and development, recycled waste and renewable energy. All this shows China investing to continue the growth of its cities and taking actions now in the economy and environment to yield dividends in the future.

Beyond the highs and lows, two noteworthy points should be made about the middle range of this table. The first is that Tokyo dropped from eighth in last year’s ranking to 14th this year—a steep drop by any measure

Continues on page 14

Health, safety and security	Sustainability	Economic clout	Ease of doing business	Cost	Demographics and livability	Lifestyle assets	Score
93	49	163	178	77	97	147	1226
112	71	139	163	94	133	111	1195
104	69	101	154	96	131	104	1172
113	81	103	143	79	137	68	1147
104	83	107	162	87	134	105	1126
90	52	170	166	59	83	123	1122
107	42	101	156	99	116	94	1120
85	57	166	119	51	116	125	1117
97	52	140	188	64	113	90	1067
66	47	149	191	60	107	97	1061
103	35	100	152	116	116	94	1050
89	46	84	159	101	124	102	1043
98	86	100	121	91	122	88	1016
91	45	114	140	45	81	103	1013
79	58	144	102	62	124	84	967
58	56	89	119	57	83	56	882
37	47	114	76	39	78	83	729
86	28	71	117	70	110	21	705
37	54	119	54	41	49	86	697
41	43	66	97	58	90	65	692
18	33	88	60	37	47	95	664
30	61	65	138	86	76	24	658
25	57	68	90	46	74	72	598
21	67	80	74	30	92	65	595
42	78	67	87	86	71	43	593
25	71	88	61	29	49	30	492

Each city's score (here 1227 to 492) is the sum of its rankings across indicators. The city order from 26 to 1 is based on these scores. See maps on pages 18–19 for an overall indicator comparison.

■ High
 ■ Medium
 ■ Low
 ■ Highest rank in each indicator

Continued from page 12

but one with clear causes. While it reached the top 10 in six indicators, Tokyo ranked 12th in ease of doing business; eight places from the bottom in the key variable of demographics and livability (with a correspondingly low score in life satisfaction); and six places from the bottom in cost and sustainability—unusual results for one of the leading cities in the world with extraordinary human capital.

Berlin ranked immediately above

Tokyo in this year's study and is reinventing itself—or, more accurately, reintegrating itself into the international economy—for the second time since it became the capital of Imperial Germany in 1871 and burgeoned in size and population in the first decades of the 20th century.

The fall of the Berlin Wall in 1989, the city's reunification and its reinstatement as the political center of a united Germany have restored Berlin to the mainstream of European and global history. It looks like it intends to stay there, certainly as a creative center—and not just in the arts but in IT, life sciences, and services (see page 64 interview with René Gurka of Berlin Partner).

Returning to overall messages in the findings, it may be telling going forward that New York ranks 14th in demographics and livability, with low scores in quality of living and commute time. Weakness in these areas may be a future threat not only for New York

but for cities such as Paris and London. Both these cities complete the top three, respectively, in lifestyle assets; but they do not perform nearly as well in demographics and livability. (Paris does best, tied for eighth; but London comes in at a tie for 17th.) Meantime, Stockholm, Sydney, Toronto and San Francisco lead the category.

Results in health, safety and security

may expose another significant risk going forward in terms of any city's success. In our heat map analysis this year, a highly positive correlation arises between health, safety and security and intellectual capital and innovation (see page 26). Clearly, the people who constitute a city's intellectual capital, and are its leading innovators, need to feel healthy, safe and secure in their working and personal surroundings in order to put down roots and prosper.

Taking a step back, high or low overall scores are only guideposts. One pragmatic policy implication of the study is that a broadly positive quality of life may serve as a foundation of both a resilient economy and lasting global success.

While none of our beta cities are world economic powerhouses, they perform very well overall. This is important at a time of urban growth when residents are looking for more than just a place to work but also a place to live, build families and invest in the future. The cities that perform well in *Cities of Opportunity* are those that reflect that balance.

While none of our beta cities are world economic powerhouses, they perform very well. This is important at a time of urban growth when residents are looking for more than just a place to work but also a place to live, build families and invest in the future.

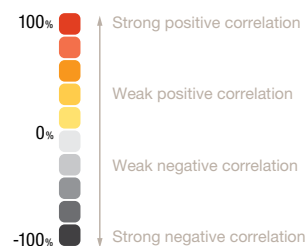
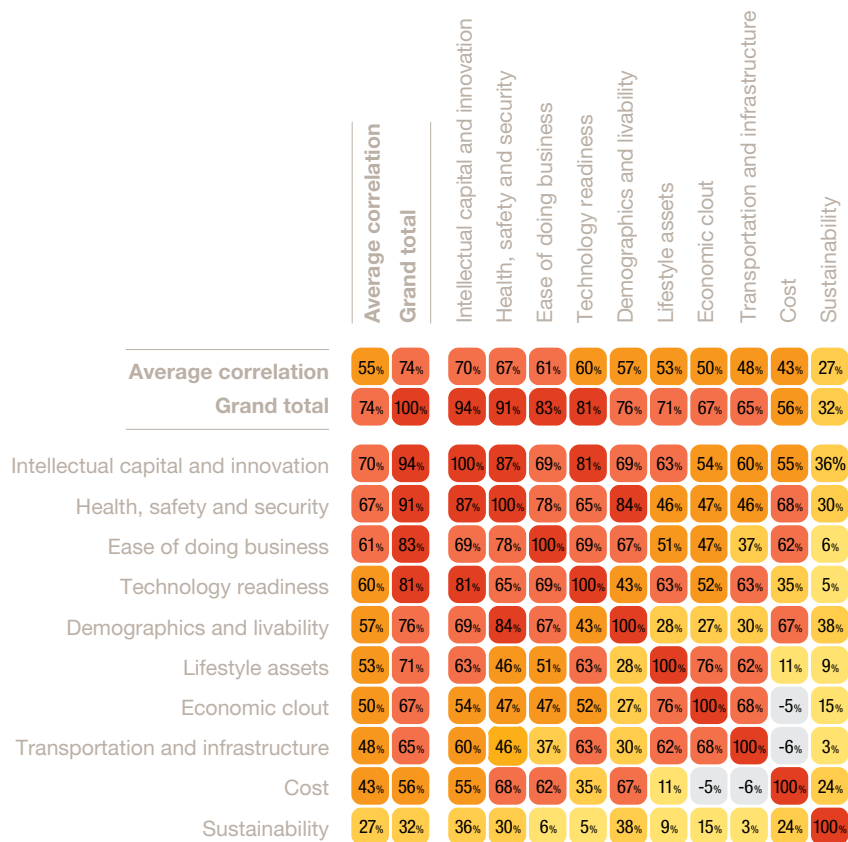




Grande Arche de la Défense, Paris.

Practical correlates:

The patterns of a successful city reflect the people who work toward success



Correlation analysis adds a fascinating aspect of our study in which the data create their own patterns, on a kind of random walk that leads to new, and often unexpected and counterintuitive, conclusions that challenge some theories and confirm others.

What stuck out in the heat map of our 10 indicators this year was the strong positive correlation between intellectual capital and innovation and health, safety and security.

Simply stated, the most globally competitive cities are almost always those in which the men and women who generate a city's intellectual resources are offered professional and personal surroundings that can reasonably ensure their health and safety. Put another way, a city's creators and innovators—those who design and devise its products (whether buildings, financial instruments, media or works of art) and set its trends—actually choose where they want to live.

This illustrates a broader competitive landscape. The five indicators that correlate very positively among themselves lie in the “north-

west” corner. In addition to the two discussed above, they include ease of doing business, technology readiness, and demographics and livability. What is noteworthy about this cluster is that only ease of doing business is a “hard” economic or financial measure. The other four are more properly social, educational or technological indicators—not the conventional stuff of economic analysis.

Most of those hard economic indicators—economic clout, transportation and infrastructure, and cost—lie in the bottom half of the map. Interestingly, cost, the “hardest” and bluntest economic measure of all, shows weak negative correlations with economic clout, as well as with transportation and infrastructure.

This is a striking illustration of the transformation of modern metropolitan economies, now based and dependent on education, science and technology rather than on traditional industry. Moreover, to sustain success, cities today must continually attract and retain highly educated, technologically adept and digitally connected knowledge workers who increasingly make up the core of their human capital and whose definition of quality of life is exacting and not easily compromised.

This extremely positive correlation of social and educational variables in our study is borne out by our large heat map, which includes all 66 variables (see www.pwc.com/

cities). Of the top 10—those, in other words, most positively correlated with each other—three are social (end-of-life care, housing and quality of living); two involve intellectual capital and innovation (literacy and enrollment and intellectual property protection); one is technological (digital economy score); one is political (political environment) and as relevant to personal freedom as to prudent investment; and only three are economic (workforce management risk, entrepreneurial environment and business trip index).

That, in the end, is the new urban terrain. Intellectual capital and innovation has the highest average positive correlation with every other indicator. Health, safety and security has the second highest. And the two are more positively correlated to each other than is the case with any other indicators.

According to the data, therefore, the successful modern urban economy is reliant on, if not yet solely the product of, intelligence and social well-being—a methodological conclusion that seems not so much to challenge any theory as to confirm common sense.

Simply stated, the most globally competitive cities are almost always those in which the men and women who generate a city’s intellectual resources are offered professional and personal surroundings that can reasonably ensure their health and safety.

Indicator rankings at a glance

The maps below show city rankings in each of the study’s 10 overall indicators. A brief key to the 66 variables is available on pages 79-82. Interactive tools and detailed listings of definitions and source documents used to develop *Cities of Opportunity* are offered at www.pwc.com/cities.

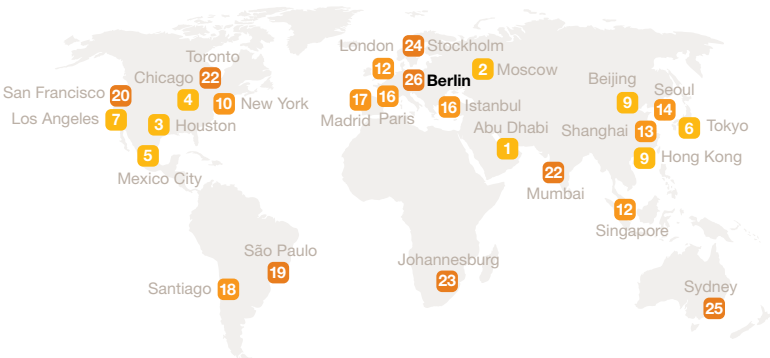
Intellectual capital and innovation
page 26



Health, safety and security
page 45



Sustainability
page 46



Cost
page 62



Demographics and livability
page 66



Technology readiness
page 29



Transportation and infrastructure
page 34



Economic clout
page 54



Ease of doing business
page 60



Lifestyle assets
page 70

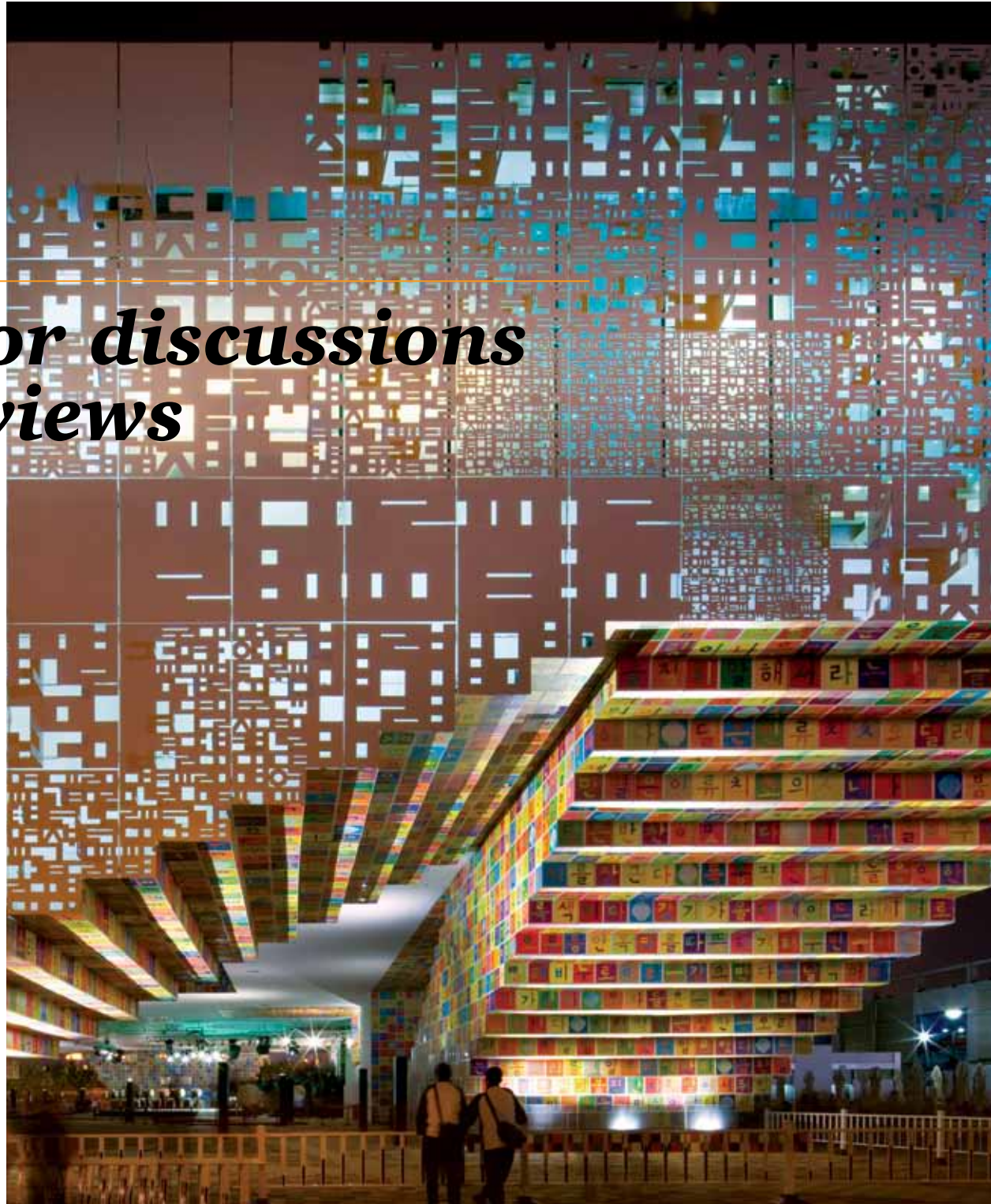


Map Key

- High
- Medium
- Low

The 26 cities are sorted from the best to the worst performing, with each receiving a score ranging from 26 for best to 1 for worst. In ties, cities are assigned the same score.

Indicator discussions & interviews



The Korean Pavilion at Shanghai's 2010 Expo.

As we dig our way out of the Great Recession, we shouldn't just replicate the old, consumer-driven economy. We need to build the next economy. The key is for metropolitan areas to develop economic plans tailored to their own strengths.

Judith Rodin

The quantitative research is represented by 10 indicator categories that include 66 individual data variables. The makeup of the indicators also mirrors the study's hypothesis: Cities with well-rounded economies and forward-looking policies and actions over the long run will prove best for businesses and residents.

In addition to this quantitative research, discussions with leading authorities and examination of various issues add insight into the numbers.

Rem Koolhaas, architect, writer and Harvard professor, has worked in many of our 26 cities. A discussion with him covers modern-city issues from density to globalization to the particular beauties and tragedies of individual places.

Intellectual capital and innovation has been expanded to nine variables this year, and Stockholm and Toronto perform consistently well. Translating education theory into classroom reality is a paradox we investigate.

Technology readiness focuses purely on hardware, and New York, Seoul and Stockholm come out on top. **Judith Rodin**, president of the Rockefeller Foundation and formerly the University of Pennsylvania, offers her own extraordinary range of insight from education to infrastructure and migration.

Transportation and infrastructure lays a physical cornerstone enabling much else in every city to work. Paris, Chicago and New York perform best. The changing ideal and reality of what a cityscape should and does look like bears discussion of its own.

Klaus Baur and **Guenther Krug** of Bombardier detail the sustainable and efficient edge offered by intra- and intercity rail travel.

Health, safety and security plumbs the vital signs of city life, and, again, Stockholm and Toronto emerge in best shape.

Sustainability raises a finger in the wind to find Berlin, Sydney and Stockholm performing best but four developing cities joining the top 10. Planning for sustainability takes the first step toward results, and we examine how Johannesburg, Mexico City, Shanghai, Abu Dhabi and New York are handling it. **Kerry Zhou** of Goldwind Technologies discusses the inroads renewable energy is making into the urban energy mix in China and worldwide.

Economic clout is earned over time and changes little this year. London, Paris and New York continue at the head. The top 10 are divided evenly between five North American and European cities and five Asian cities. **Mortimer Zuckerman** brings a broad perspective in discussing the economics landscape as a major developer, publisher and former Harvard professor.

Ease of doing business is expanded this year, but the top four—Hong Kong, Singapore, New York and London—change places minimally.

Cost finds five North American cities on top. But Berlin is right below. And **René Gurka** of Berlin Partner tells what the reunified city is doing to turn its many cultural advantages into an economic plus.

Demographics and livability looks at socioeconomic well-being and finds this complex quality best offered in Stockholm, Sydney, Toronto and San Francisco. The pain of commuting merits a detour of its own to compare traffic policies.

Lifestyle assets follows the urban bliss toward New York, Paris and London. And we examine the cobweb of issues encircling historic preservation as rage for the new looks in the rearview mirror to find vintage chic. In the end, the gaze of **Leif Edvinsson**, who pioneered the study of intellectual capital, is firmly fixed on future “cities of mindware.”

See videocasts with architect Rem Koolhaas as well as Vítor Knijnik, creative head of Y&R Energy in São Paulo, hear podcasts with Mortimer Zuckerman and read the full interviews condensed here on the web at www.pwc.com/cities. The web also offers interactive tools to customize heat maps and model your own city based on all 26 cities and 66 variables, as well as detailed background on sources and definitions.

Rem Koolhaas muses on changing cities

... and on his own quest to reinvent them in a way that serves the public good



Few people have thought as profoundly about cities as Dutch architect, author and Harvard School of Design professor Rem Koolhaas, head of the Office of Metropolitan Architecture in Rotterdam. In books such as *Delirious New York* and *S,M,L,XL*, he has redefined attitudes toward urban architecture. But Koolhaas, winner of the coveted Pritzker Architecture Prize in 2000, is no mere theorist: His iconic buildings include Seattle's Central Library and Beijing's dazzling CCTV tower. Here, Koolhaas discusses the startling transformation of cities such as Beijing and Dubai, the wonders of Berlin and how New York lost its creative mojo.

How is the nature of cities changing?

There's been an enormous influx from the countryside to urban conditions, which has led to an enormous scale of city building, particularly in Asia. Cities are becoming so ubiquitous, they've ceased to be able to be defined as single entities with a single character. They're now almost always so big that they've fallen apart into fragments. Almost every new city has dense parts, empty parts, low parts, high parts. Only in cities that are old can you actually talk about character. If you look at Dubai or anything in the Pearl River Delta, we see vastly greater freedoms applied to the notion

of what a city is. So my role is, to some extent, mediating between an old and new conception of the city.

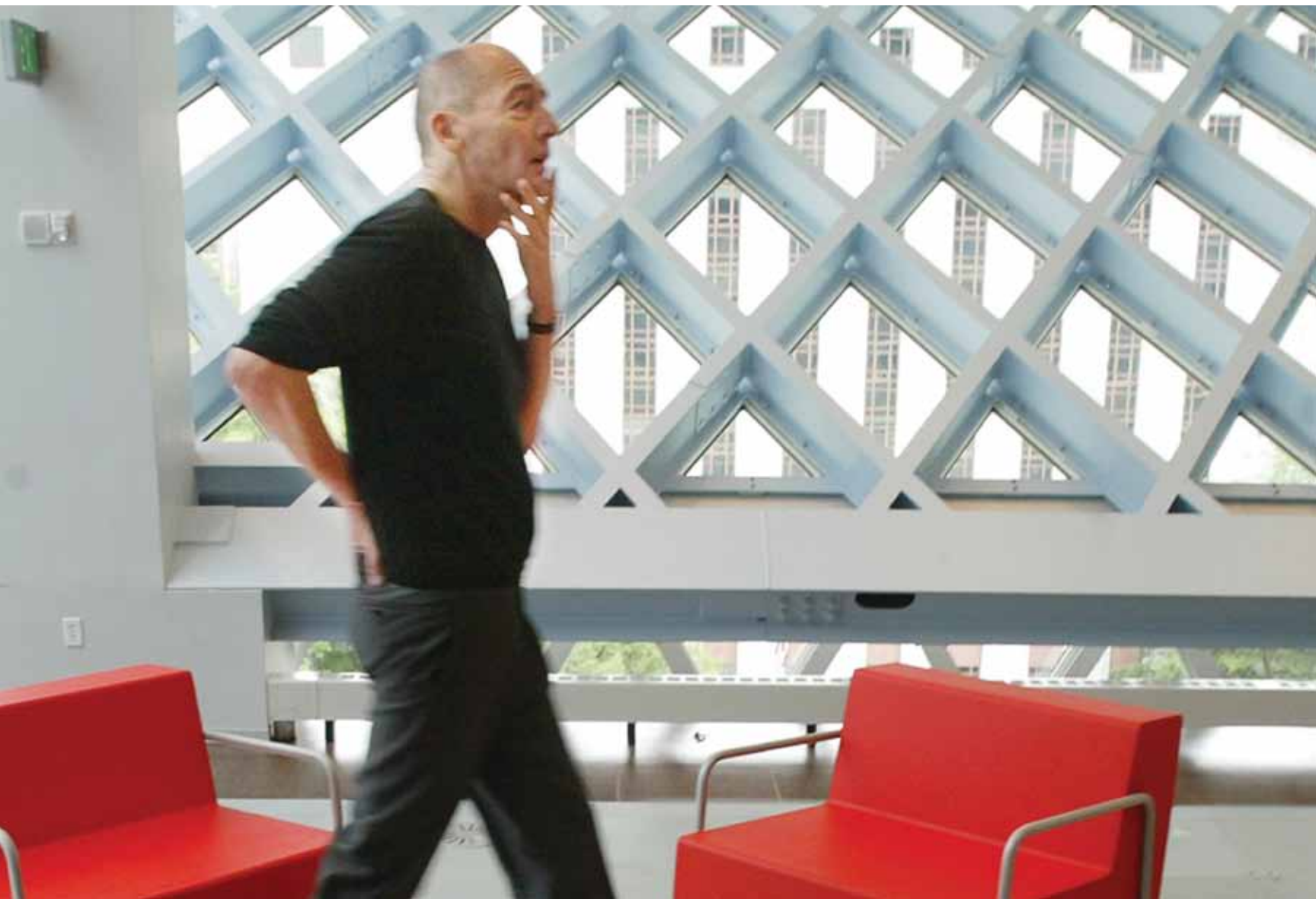
Were new cities like Shenzhen designed with any model in mind?

No. The problem is that urbanization in America and Europe flattened around 1900, and urbanization in Asia started taking off in a really harsh way maybe in the '70s. If you look at all the manifestos written about urbanism by Europeans like Le Corbusier, it basically ends in 1930. Previously, when we were urbanizing, we thought about cities and how they should be.

When a lot of these new cities were being built, we stopped thinking. It happened in a fallow period—a strange, in-between state. Trying to develop models for urbanization is in itself very valid because, at this point, the city is defined by a Western default—the obvious skyscraper or the obvious city block, the obvious curtain wall, put together in an obvious way.

Is there an optimal density for a city?

No. Within the current condition, the city will neither be dense nor not-dense. It'll have density but in parcels and in locations. That's why I'm so fascinated by



Koolhaas strides across the Seattle Central Library, recently called his “masterpiece” by *The Financial Times*: “It is a building of Dantean ambition, a spiraling journey through words toward the light, a new conception of what uncommercial public space can be.”

the image of Shenzhen where you see the biggest intersection of the city 400 meters from a rice field. You’ll have the same thing everywhere. That’s the irony in the 21st century. The skyscraper is combined with the hovel. You can have a skyscraper anywhere, even in a desert.

Does this create aesthetic problems?

You can see it either as an aesthetic crisis or new aesthetic conditions. I was just in Dubai. There was this skyscraper there. It’s maybe absurd. It’s maybe unsustainable. Nevertheless, I have a sense of exhilaration and awe because it’s so extreme

and exactly because it’s not surrounded by anything like it. It’s so stunningly present that I cannot deny there’s an excitement in it.

What about Berlin, where you built the Netherlands Embassy in 2003?

It’s a fantastic city. When I was in architecture school, the idea that a city could be divided and accommodate two completely opposite political systems fascinated me. I studied the Berlin Wall, which was the interface between those two systems—and, on the two sides, represented those systems in a pure, almost propagandistic way. The beauty of Berlin is that it’s the stage of

Cities are becoming so ubiquitous, they’ve ceased to be able to be defined as single entities with a single character. They’re now almost always so big that they’ve fallen apart into fragments.

a number of very radical transformations, and it wears the traces of those transformations in a very poetic way—but there's still a real substance that was always there. That's what makes it such a wonderful city. Also, frankly, the fact that it had a rich part and a poor part, and you still feel that opposition—that it's not luxurious in its entire center like Paris.

Does New York still hold a special place in your heart?

Yes. It was the site of an unbelievable explosion of creativity. But in the past 30 years, I've seen little of that same creativity in terms of being inventive or critical or demanding. The real difficulty of New York is that, in these 30 years, the quality of buildings has become so unbelievably low; there's so little newness that it now acts like a bulk of mediocrity that almost prevents you from appreciating the city's initial genius or initial ingenuity.

Chicago is interesting as it had a fire, was rebuilt by planners and architects, and is now a pleasure to walk around, to see.

Very much. Chicago has always had a discourse about planning and has results that are recognizable as planning. Perhaps in New York you have that, too, but the beauty and tragedy of New York was that the first gesture was so overwhelmingly genius and powerful that everything after that never had the same impact or status. In Chicago, they continued to think about the city in a more creative way, perhaps because the beginning was not so overwhelming. The result is that it's a very impressive, beautiful city.

You were asked to consider designing the new World Trade Center, but chose to focus on CCTV's headquarters in Beijing. Why?

I felt more engaged with the issue of trying to imagine China, of trying to participate in an effort of drastic renewal, rather than

being involved in an effort of consolidation. China is unbelievably interesting because it needs thinking about what it's going to be and wants to be. And with the building itself—a project for Chinese Central Television—it would be interesting to think of a media company, what it represents, what its relationship with the public can be, how open or closed it can be. So it represented a number of challenges that were good for me to think about. Plus I thought the World Trade Center buildings were so superb. I liked them so much that the idea of trying to even imagine something different on that site seemed impossible.

How does the car fit into today's cities?

Certain cities accommodate cars quite well. If cars become more sustainable, that will remain quite a persistent model because it gives flexibility that's almost unimaginable through any other device. But in existing cities, it's much more problematic. In many

European cities, you have a weakened public transport, weakened infrastructure of trains and almost pervasive car use. They could have avoided a lot of this if the public sector had been enhanced. The result is a nightmare of the lack of public initiative.

You once wrote that “globalization astronomically expands the realm of possibility for better or worse.” Where does globalization stand today?

We're very clearly in a period of waning enthusiasm for it. With the economic crisis, you see it on every level. So we have an ironic situation where we live in a period of globalization, yet every single nation wants to be more itself. I find this very noticeable in our clients. For the first time, Chinese projects have to be Chinese; Arab projects, Arabic; Dutch projects, Dutch. We're losing internationalism as a positive thing. You also see it in a lack of generosity toward travelers, toward immigrants.

The beauty of Berlin is that it's the stage of a number of very radical transformations, and it wears the traces of those transformations in a very poetic way ...

... The beauty and tragedy of New York was that the first gesture was so overwhelmingly genius and powerful that everything after that never had the same impact or status. In Chicago, they continued to think about the city in a more creative way.

Your own perspective is unusually international. How were you shaped by being Dutch, moving to Indonesia, then returning to Rotterdam?

I went to an Indonesian school so I knew from an early age what it is to be among different people. It gave me a versatility and an anthropological interest in how other people live and what's important to them. That hugely informs everything we do.

What changes are occurring in rural areas as people move to cities?

It's breathtaking how completely transformed the countryside is. I've seen robotized tractors now working in Swiss alpine mead-

ows. You see Thai maids looking after the children of people who live two weeks a year in transformed barns. It's at least as radical and probably as artificial as what's happening in the city.

What's your favorite city to visit?

It's extremely difficult to say. I visit cities for different reasons. I looked at your list, and there's almost not a single city on it that I don't, in many ways, like. I love Rome. I love Istanbul. I love Damascus: It's amazing, and it's particularly amazing—and maybe all these cities have some of that quality—that every period is still there as if it didn't pass. That richness is irresistible there. But I also like entirely new things, like Shenzhen and Dubai.

If you were obliged to remain in just one city, which would you choose?

There was a period when I felt Paris would be a wonderful place to find some stability, but I really can't say.

There's a sense of playfulness throughout your work. Is architecture a form of play and fun for you?

That's a really good question because I'm always surprised

nobody gets our sense of play or humor because I'm having huge, huge fun. The irony and sadness for me is that the architecture profession is so humorless even though it's a crucial part of thinking: irony, sarcasm—these modes are crucial to approach something from every different direction. And they're very important for me personally. So I'm happy you asked it and very happy that you actually see it.

Video excerpts of this condensed conversation are available at www.pwc.com/cities, as is a full-length version of the entire, much longer discussion.

"China is unbelievably interesting because it needs thinking about what it's going to be and wants to be" Koolhaas says, and "trying to imagine" that led him to design Beijing's CCTV tower.



Intellectual capital and innovation: Developing the ‘mindware’ that will build future cities

Of all the indicators, this is the one that has undergone the most profound enhancements this year. As virtually all observers, both academic and in business, consider intellectual capital, and the innovation that springs from it, to be the engine of both social and economic development, it is important to design as robust an assessment of it as possible.

The fact that Stockholm ranks first, by a significant margin, is both striking and unsurprising. Unsurprising because as our interview with the “father” of the concept of intellectual capital, Leif Edvinsson, confirms (see page 76), Swedes are in the vanguard of thinking about this issue; and Sweden is in the forefront of embracing the policies needed to expand and reinforce its own intellectual capital.

What is striking is how thoroughly Stockholm commands the category, however. It ranks first in three variables, second in two, third in one and within the top 10 in two others. Indeed, it (just barely) falls out of the top 10 in only one out of nine variables (albeit an important one), math/science skills attainment. This, by all objective measures, is an impressive performance.

Toronto also excels in this section of the study, ranking second overall and placing in the top 10 in seven of the nine variables. But the United States does particularly well, with five cities in the top 10, New York ranking first overall in terms of the research performance of its universities and San Francisco placing first in the percentage of its population with higher education.

Perhaps even more conspicuous than the cities that made the top 10, however, are the ones that did not, most obviously those in Asia. Only Tokyo managed to break into the highest ranks this year. That left out every other Asian city, including Hong Kong, which fell six places from last year, when a more limited range of measurements was used. At a time when Asia is advancing into the highest levels of the value chain, these results confirm the arduous road ahead of it.

There is one other noticeable result in this year’s findings. The bottom 10 cities represent some of the most dynamic

	Classroom size ¹	Libraries with public access	Math/science skills attainment
26 Stockholm	20	25	16
25 Toronto	25	21	23
24 New York	15	15	12
24 San Francisco	19	18	12
22 Paris	17	16	15
21 Los Angeles	22	11	12
20 Tokyo	9	19	22
20 Sydney	14	26	19
20 Houston	21	12	12
17 Chicago	13	17	12
16 London	12	24	17
15 Berlin	18	20	18
14 Seoul	6	4	24
13 Madrid	24	13	14
12 Singapore	5	5	26
11 Hong Kong	7	9	25
10 Moscow	26	22	7
9 Shanghai	3	8	21
8 Beijing	3	1	21
8 Mexico City	23	23	4
6 Abu Dhabi	16	7	2
5 Santiago	8	10	6
4 São Paulo	11	6	3
3 Johannesburg	4	14	1
2 Mumbai	1	3	13
1 Istanbul	10	2	5

economies of the last decade. Clearly, there are structural issues that these economies confront as they compete in economic (and social) value creation with the top 10 cities in this chart.

At the very least, this proves, once again, that it is extremely difficult to compete with the power of a long-established and globally dominant city whose institutional networks and sophistication were specifically designed to extend and maintain its dominance.

Literacy and enrollment ²	Percent of population with higher education	Research performance of top universities	Percent of gross domestic expenditure on R&D	Intellectual property protection	Entrepreneurial environment	Score
25	24	17	26	26	26	205
24	21	16	14	22	20	186
22	20	26	23	16	25	174
22	26	13	23	16	25	174
23	25	19	15	24	18	172
22	16	22	23	16	25	169
17	22	24	25	17	13	168
26	11	15	16	21	20	168
22	14	23	23	16	25	168
22	18	20	23	16	25	166
16	19	25	13	20	16	162
15	13	14	18	23	10	149
13	15	21	24	9	14	130
14	17	9	10	10	9	120
8	7	10	17	25	16	119
9	8	18	6	19	17	118
12	23	5	9	1	2	107
3	12	8	12	8	8	83
3	10	11	12	8	8	77
6	6	6	2	4	3	77
7	9	1	1	18	13	74
11	3	7	4	6	13	68
10	4	12	8	3	1	58
5	1	3	7	11	5	51
1	5	4	5	5	4	41
4	2	2	3	2	8	38

Each city's score (here 205 to 38) is the sum of its rankings across variables. The city order from 26 to 1 is based on these scores. See maps on pages 18–19 for an overall indicator comparison.

1. Where average class size data were unavailable, pupil-teacher ratios, or the number of students divided by the number of teachers in primary education, were used as substitutes.

2. The World Bank's Knowledge Index (KI) measures a country's ability to generate, adopt and diffuse knowledge. This is an indication of overall potential of knowledge development in a given country. The KI is derived by averaging a country's normalized

performance scores on the key variables in three Knowledge Economy pillars—education and human resources, the innovation system, and information and communication technology (ICT). The variables that comprise education and human resources are adult literacy rate, secondary education enrollment and tertiary education enrollment.

■ High
■ Medium
■ Low

■ Highest rank in each variable

The paradox of education:

Translating educational theory into classroom reality and practical results transcends the ABCs

One of the clearest messages in this year's rankings of intellectual capital and innovation is how complex the issues of educational reform are. We became particularly aware of this after the global attention generated by the publication of the latest Programme for International Student Assessment (PISA) results in early December 2010 (released after compilation of this report), which showed Shanghai's 15-year-olds outperforming every other nation's students in math, science, and reading, in what was reported internationally as a perfect educational trifecta.

It is impossible—and not our intention—to diminish the scope of this achievement by Shanghai's educational authorities. Yet, it would be wise to look at the data in our rankings holistically and analytically before we draw any premature conclusions from the undeniable feat of Shanghai's schoolchildren.

The first dissonant note is struck in the column measuring precisely that attainment in math and science in which Shanghai's youngsters excelled. Stockholm ranks eleventh with a score of 16, which is actually the city's worst ranking in the entire chart. This datapoint in itself causes us to pause. If Stockholm—which ranks first in R&D expenditure, second in literacy and enrollment, and third in population with higher education—misses the top ten altogether in math and science, what does that tell us about the relative importance of that category as a whole in the creation of a dynamic, and dynamically innovative, society?

The fact that Western educators reacted strongly, not only to Shanghai's students' stellar performance on the recent PISA, but to some disappointing results in their own countries, makes clear that math and science skills are important measures of educational progress. However, they are only two among many critical factors that contribute to high achievement. Our research shows that cities like Toronto—which ranks second in the indicator despite not placing first in a single variable—can excel in providing high-quality education and engendering an innovative environment without besting their competitors in any particular performance measure.

Over-reliance on any single measure is also ill-advised. For example, while Mexico City comes in fourth in classroom size, its low ranking in literacy and enrollment and even lower ranking in math and science skills suggest that its small classrooms have not led to significant leaps in learning.

Given the academic support for the relevance of classroom size, this outlier does not undermine the variable's legitimacy. However, it does underscore the value of examining educational performance through several different lenses. Success in one area of education does not necessarily indicate high achievement throughout the educational system. The American cities in our report—which consistently perform well in one or both of our measures of higher education, yet place in the bottom half of cities in math/science skills attainment among secondary students—illustrate this point. Singapore has the



A classroom in Paris.

opposite problem: it outperforms other cities in math/science skills attainment, but has not been able to translate high academic achievement among its youth into a high college completion rate.

Looking beyond the classroom, cities have to find ways to harness intellectual capital for economic growth. Even cities with a wealth of world-class research universities, youth and adults with high educational achievement, and a demonstrated commitment to supporting R&D do not necessarily convert intellectual capital into economic success.

Tokyo's entrepreneurial environment ties for a lack-luster 14th in our report despite the fact that

the city places in the top five in research performance of top universities, percent of population with higher education, math/science skills attainment, and percent of gross domestic expenditure on R&D.

In the end, what makes the data in this chart so challenging is that they do not lend themselves easily to superficial analyses or solutions. But they do help us formulate the questions and perspectives that can lead to a richer analysis of what "education" means, both for the individual and the society at large.

Technology readiness: Honing the right stuff for the digital age

This year's study clearly distinguishes between the tangible and intangible assets a city needs to lead in intellectual capital and innovation and straightforward technological preparedness. Here we focus purely on the software, hardware and bandwidth that are required for economic and academic progress. And correlation analyses of all the data do show an 81% positive correlation between cities with a robust technology backbone and strong intellectual assets. (See page 16 for an indicator heat map and www.pwc.com/cities for a modelling tool.)

Forward thinking nations and the top cities within them have had the resources and foresight to make high-tech plans, put them into action, and attract

big populations of tech-heads and related investors; notably including New York, Seoul, Stockholm, San Francisco, Chicago, Singapore and Hong Kong.

New York, home to more than 10% of the nation's financial technology workers, tops the list overall in technology infrastructure and measures of the city's potential to nurture a high-tech future. Stockholm scores near perfect in every area except software development and design and is the only European city among the top 10 finishers. San Francisco performs lower than might be expected not because creative, high-tech drive is lacking but rather because funding sources are more likely to be found in Silicon Valley than in the city itself.

	Internet access in schools	Broadband quality score	Digital economy score ¹	Software and multi-media development and design ²	Score
26 New York	21	21	25	23	90
25 Seoul	23	26	16	24	89
24 Stockholm	26	25	26	7	84
23 San Francisco	21	21	25	16	83
22 Chicago	21	22	25	12	80
21 Singapore	25	13	20	20	78
20 Hong Kong	24	16	20	17	77
19 Los Angeles	21	15	25	15	76
18 Houston	21	17	25	11	74
18 Tokyo	10	24	14	26	74
16 London	16	12	15	25	68
15 Toronto	22	10	17	10	59
14 Paris	9	19	12	18	58
13 Moscow	5	23	1	22	51
12 Berlin	11	18	13	6	48
11 Shanghai	15	7	4	21	47
11 Sydney	13	11	18	5	47
9 Beijing	15	7	4	19	45
8 Madrid	7	9	11	13	40
7 Istanbul	6	14	5	4	29
6 Santiago	8	8	10	2	28
6 São Paulo	3	5	6	14	28
4 Abu Dhabi	12	2	9	1	24
3 Mexico City	2	4	7	8	21
2 Mumbai	4	3	2	9	18
1 Johannesburg	1	1	8	3	13

Each city's score (here 90 to 13) is the sum of its rankings across variables. The city order from 26 to 1 is based on these scores. See maps on pages 18–19 for an overall indicator comparison.

1. The Economist Intelligence Unit (EIU) renamed this study this year. It previously was titled, "E-readiness." Given the prevalence of Internet-connected consumers, businesses and governments and the indispensable role that digital communications and services now play in most of the world's economies, the EIU believes that the countries included in its study already have achieved at least some degree of e-readiness. The study's new title, the "Digital Economy Rankings," captures the challenge of maximizing the use of ICT that countries face in the years ahead.

2. The index takes into account factors such as: education levels; size and track record of the ICT sector; quality of IT, air, port, road and railway infrastructures; quality of electrical supply; size of labor force; labor productivity; hiring and firing flexibility; labor relations; foreign ownership restrictions; business costs of terrorism; and cost of establishing a business.

■ High
■ Medium
■ Low

■ Highest rank in each variable

Judith Rodin

... uses philanthropy to steer cities in new directions



Judith Rodin is a pioneer. At Yale University, she blazed a trail in behavioral medicine and health psychology. As president of the University of Pennsylvania, she was the first woman to lead an Ivy League institution. Now, as president of the Rockefeller Foundation, she's refocusing this philanthropic giant to address challenges such as massive urbanization and the threat of global warming to cities. Never one to accept the status quo, Rodin speaks here about the urgent need for urban innovation.

As president of the University of Pennsylvania, you tackled the dire urban problems confronting the Philadelphia neighborhood near the campus. Why?

The neighborhood on the western edge of campus was in dreadful shape: crime had soared, and one in five residents lived below the poverty level. We believed we couldn't have a future as a truly great university in a disintegrating community. So we developed a 300,000-square-foot project that included a luxury hotel, public plazas, stores and restaurants along a largely deserted commercial corridor; we acquired scores of run-down homes and apartment buildings, rehabbed them

and sold or rented them; and we partnered with residents, the electricians' union and the electric utility to light the sidewalks of 1,200 neighborhood properties, enabling pedestrians to take back the streets. We found that when you tackle these issues simultaneously, forging alliances with all the stakeholders, urban transformation not only becomes very possible but becomes a lot easier.

At the Rockefeller Foundation, you've also been deeply involved in urban improvement. What makes cities more livable?

We've identified three critical types of infrastructure that make a city livable. The first is its physical infrastructure, which

makes a city attractive and easy to navigate but also relates to its capacity to withstand climate-related shocks and other emergencies. This physical infrastructure includes diversity of transportation options, good housing and access to clean water. Second, livable cities have a strong and resilient economic infrastructure, which means they must be diverse enough economically to withstand financial shocks and innovative enough to seize opportunities. Finally, cities must be sustained by a resilient social infrastructure. When all three of these infrastructures are strong, a city will not only create a better quality of life but also greater economic success.



Judith Rodin was joined in California by then-governor Arnold Schwarzenegger, Michael Bloomberg, New York mayor, and Edward Rendell, governor of Pennsylvania, left to right, in a call for federal action to repair and expand aging US infrastructure.

How key are cities as drivers of national economic growth?

In the US, metropolitan areas are the principal source of growth and innovation. The top 100 metro areas comprise two-thirds of our population but three-quarters of our GDP. As we dig our way out of the Great Recession, we shouldn't just replicate the old, consumer-driven economy. We need to build the next economy. The key is for metropolitan areas to develop economic plans tailored to their own strengths. For example, the Seattle area is known for high-tech industries and environmentalism so it's developing a new industry retrofitting buildings around the world to make them green.

How can public-private partnerships help to produce vital cities?

They're essential in tackling the complex problems of the 21st century. The challenge is to leverage the unique assets of each sector in unison. For example, in New York and many other growing cities globally, lack of affordable housing is a critical issue. To build 30,000 units of affordable housing, New York needed for-profit and not-for-profit developers to assemble land and invest pre-construction dollars. This investment was too high-risk for most commercial lenders. At Rockefeller, we set out to bridge this gap. Our solution was to assemble a group of foundations that put up the first, high-risk

Each year, Americans lose 4.2 billion hours and \$87 billion in productivity and wasted fuel stuck in traffic, and the cost of transportation is the second-highest expenditure for American households. Reforming our transportation system is critical.

tier of capital for new housing projects. This allowed commercial lenders with lower risk tolerance to provide the second tier of debt. That partnership enabled the city to build more than 3,000 units of affordable housing, with the option of thousands more in the pipeline.

So collaboration is crucial?

Yes. For metropolitan economies to succeed, everyone needs to be at the table to design the plan and execute it—government, business leaders, universities, civic leaders and more. Business is a key sector, but a growth plan can't succeed with business alone. We need government to provide investment incentives and set the right policy framework that enables businesses to grow. Universities conduct research and provide innovations that keep businesses competitive, and community colleges train workers. These players, acting in concert, can produce the economic growth and jobs we need.

Many urban workers in developed economies have felt the impact of jobs being outsourced. Are there creative ways of addressing this economic insecurity?

What's needed is a mixture of different approaches—some focused on building export-oriented

markets, others that emphasize developing new local markets. We've forged a partnership with the Brookings Institution to give greater attention to the role of business in US metropolitan regions in building an economy that will be increasingly export oriented and lower-carbon and innovation driven. With the dual purpose of fighting climate change and boosting quality employment in a new, green economy, we're supporting locally focused, market-based solutions that can be replicated elsewhere. For example, we're supporting a coalition of organizations to develop the policy road map for Green Jobs Green NY. This program aims to retrofit 1 million homes throughout New York. A resilient, green economic infrastructure can ensure high-quality jobs and sustainable growth.

How has massive migration toward larger cities intensified urban challenges?

For the first time in history, more people live in urban communities than rural areas, and cities can't cope with this massive migration. The growth of slums is symptomatic of this new reality in which urban expansion is characterized by informality, illegality and unplanned settlements. In nearly all urban areas that will experience dramatic growth, we

find inadequate housing, food and transportation—let alone jobs, schools or health care. And floods, droughts and other perils resulting from climate change only multiply the dangers in these overcrowded areas. To help address such concerns, the Foundation committed \$70 million toward an initiative on building climate change resilience in vulnerable cities in India, Thailand, Indonesia and Vietnam. We've also created a network so that such experiments will teach other countries what works, enabling them to develop plans that can ultimately save billions of dollars and countless lives. We face a choice: Either we watch as billions of people surge into unplanned urban regions—depleting natural resources on which our survival depends, fueling the spread of disease and jeopardizing national security—or we lead by developing innovative, collaborative responses.

What's the Foundation doing to combat the environmental threats facing cities?

We've committed more than \$200 million to shaping innovations that address the interconnected challenges of expanding economic opportunity while adapting to climate change. One of our efforts involves building knowledge

around the planning necessary to create a resilient urban physical infrastructure where it doesn't exist—and, where it does, to identify points where it might buckle under the pressures of global warming and severe weather. For instance, cities must have provisions for temporary shelter in the wake of a natural disaster. So in New York, we sponsored a design competition for Post-Disaster Provisional Housing. We also helped fund the Rising Currents project, in which engineers, architects and urban planners proposed the redesign of New York's shoreline to withstand a rising sea level. The designers developed implementable innovations such as a fingered shoreline that reduces wave velocity and the introduction of porous materials into lower Manhattan's streets to absorb water quickly and release it slowly. We're also working globally through projects like the Asian Cities Climate Change Resilience Network since no growing cities are in greater peril than those in Southeast Asia. This network will chart new approaches for cities everywhere to prepare for local impacts of the global environmental crisis while aggressively courting governments and donors who can apply successful approaches on a wider scale.

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What can be done to improve slums?

Cities often are the first to adopt breakthrough innovations. So we're experimenting through a broad spectrum of urban innovators, including Slumdweller International Kenya, a network of community-based housing organizations that's developing housing for Nairobi's urban poor. We're assisting their outreach to global funders like the World Bank and to the Kenyan government, local universities and think tanks. The idea is that they can solicit funding internationally but deploy it to capitalize solutions from local communities. We've learned that urban development is more effective if poor communities are involved as partners, not only as beneficiaries.

What must be done to improve urban transportation?

Each year, Americans lose 4.2 billion hours and \$87 billion in productivity and wasted fuel stuck in traffic, and the cost of transportation is the second-highest expenditure for American households. Reforming our transportation system is critical. We're engaging civic leaders, grass-roots groups and system insiders who embrace a new transportation paradigm that promotes a low-carbon, transit-supportive policy.

Why does the Foundation earmark funds for cultural innovation in New York?

We helped fund a report about the role of the creative sector in New York's economy, and it firmly established the link between a

vibrant arts sector and strong neighborhoods. It also affirmed that creativity is New York's most precious natural resource. So this is all grounded in our conviction that the arts are essential for the lifeblood of a great city.

Which are your favorite cities to visit?

I love all cities that are walkable, well-lit, teeming with energy day

and night, and architecturally exciting and that have great local cuisines.

What do you like most about the cities where you've lived?

New York has all the characteristics I just described. I also love Philadelphia for its history and ineffable spunkiness; New Haven for its New England charm and spirit; Miami for its Latin influence and pulsating energy.

This interview has been condensed for publication in the report. To read all full-length interviews, please visit our website: www.pwc.com/cities.

Judith Rodin in her Rockefeller Foundation offices.



Transportation and infrastructure: Good connections remain at the nexus of strong cities

Nothing is more fundamental to a city's definition than its built environment. Yet long before the Internet, people knew that it takes more than bricks and mortar to make a community: it's the connections—the individual, social and economic networks—that transform a thriving city into a global center and, more rarely, a metropolis of historic resonance.

It is no accident, therefore, that one of the most culturally evocative icons of each of the top four cities in this category (in ascending order) is its respective transport system: San Francisco's cable cars, New York's subway, Chicago's 'L' and Paris' Métro—a particularly apt example of municipal infrastructure becoming a part of, and reinforcing, a city's cultural identity. (Although it is now mostly tourists who ride them, cable cars remain emblematic of San Francisco's robust transit network.)

Still, an iconic rapid transit system does not ensure optimal performance in this category. Moscow has one of the most celebrated metros in the world—and does very well in cost and coverage of mass transit—but just misses the top half of cities here. (If nothing else, traffic above ground should ideally, flow as well as traffic below the surface; Moscow, however, is less effective in dealing with its traffic congestion than most cities and is tied for last in the number of licensed taxis.)

On the other hand, Sydney, not known for mass transit, scores highest in miles of track, while Stockholm scores second in coverage, just below Paris. Unsurprisingly, Stockholm also is tied with Singapore at the very top for alleviating traffic congestion, as both cities are famous, each in its own way, for their commitment to sustainable urban development—which, in this case, means congestion charges and, in Singapore at least, severe constraints on vehicle ownership (see page 68).

While Mexico City's metro system is the largest in Latin America, it has been operating for only 40 years and, so, cannot compete with longer established systems either in terms of coverage or extent of track. Nonetheless, the Mexican capital leads the rankings in keeping

	Mass transit coverage ¹	Miles of mass transit track	Cost of public transport ²
26 Paris	26	19	10
25 Chicago	20	21	8
24 New York	24	22	8
23 San Francisco	23	23	12
22 Madrid	17	18	17
21 Tokyo	13	12	11
20 London	14	16	2
20 Hong Kong	15	15	24
18 Seoul	19	13	23
17 Mexico City	10	9	26
17 Stockholm	25	24	4
15 Beijing	8	7	25
14 Sydney	12	26	1
13 Moscow	21	17	21
12 Shanghai	9	11	15
12 Toronto	16	20	3
10 Singapore	11	10	13
9 Berlin	22	25	5
8 Abu Dhabi	2	2	19
7 Istanbul	4	4	20
6 Los Angeles	7	14	14
5 Houston	3	3	18
4 Santiago	5	8	22
3 Mumbai	18	6	6
3 São Paulo	6	5	16
1 Johannesburg	2	2	9

down the cost of mass transit and also is first in licensed taxis, which are widely considered part of public transport (because of the low fares) and, therefore, used to supplement the city's transportation needs.

Cost of public transport, it should be noted, shows the strongest negative correlation with measures such as housing, quality of living or literacy and enrollment of all variables in this year's report. In fact, it moves in the opposite direction from them, tending to fall as they rise, which suggests that a rela-

tively higher cost of transport is acceptable if the system provides access and convenience to citizens. (See discussion of indicator correlations on pages 18-19 and customizable heat maps for the 66 variables on www.pwc.com/cities.)

New York leads in aircraft movements, followed by Chicago, London, Paris and San Francisco. What is interesting about these rankings is that Paris, Chicago, New York and San Francisco also are, in that order, the leading cities in this indicator.

Continues on page 40

Airport to CBD access ³	Licensed taxis	Traffic congestion ⁴	Aircraft movements	Incoming/Outgoing passenger flows	Skyscraper construction activity ⁵	Score
22	24	18	23	23	3	168
22	11	18	25	22	12	159
10	7	12	26	25	24	158
22	8	24	22	16	6	156
24	19	18	16	17	8	154
15	17	18	21	24	21	152
18	15	18	24	26	16	149
22	12	18	10	15	18	149
12	23	9	12	14	20	145
14	26	2	14	8	25	134
16	22	26	4	4	9	134
26	18	2	20	21	6	133
24	6	24	9	10	17	129
17	2	9	17	13	11	128
12	14	12	19	19	16	127
8	9	21	15	9	26	127
13	20	26	8	12	13	126
8	10	24	7	6	6	113
6	25	21	2	3	24	104
9	5	9	13	11	24	99
5	3	9	18	20	3	93
4	4	21	11	18	10	92
3	21	12	1	2	8	82
3	16	4	6	1	20	80
3	13	9	5	7	16	80
25	2	4	3	5	3	55

Each city's score (here 168 to 55) is the sum of its rankings across variables. The city order from 26 to 1 is based on these scores. See maps on pages 18–19 for an overall indicator comparison.

1. Kilometers of mass transit track for every 100 square kilometers of developed and developable land area.

2. Cost of public transport data refers to the cost for the longest mass transit rail trip within the city boundaries. However, bus trips are used for cities without rail systems.

3. 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 in terms of international passenger traffic. Cities with direct rail links are preferred to those with express bus services. Cities with rail links with fewer transfers are ranked higher than those with more.

4. The traffic congestion variable is taken from the 2009 Mercer Quality of Life Reports and adjusted using two additional sources. This reflects not only traffic congestion but also the modernity, reliability and efficiency of public transport—measures of a city's active management of the issue.

5. A skyscraper is defined as any building 12 stories or greater in height.

■ High
 ■ Medium
 ■ Low
 ■ Highest rank in each variable

The city-suburban conundrum:

With all politics local, how can regions avoid getting lost in the sauce?

While the suburbs may never ignite the imagination in quite the dramatic way cities have—from *Berlin Alexanderplatz* to *Last Exit to Brooklyn*, “Metropolis” to “Slumdog Millionaire”, Carl Sandburg to Karl Marx—it is clear that cities no longer are the lodestars of socioeconomic activity they once were. Modern urban thinking has to embrace the regions into which big cities are interwoven in order to be effective.

In order to craft regional policies, the first step is understanding what exactly constitutes a region. This seemingly straightforward task is complicated by the fact that metropolitan regions are measured differently around the world. The US and Canada focus on commuting ties in determining regional boundaries.¹ Mexico weighs planning and political considerations, among others.² Australia accounts for transport patterns, telephone traffic, retail shopping, fresh goods marketing, provincial newspaper circulation and radio coverage when drawing regional boundaries for cities in New South Wales, where Sydney is located.³

Policymakers interested in stimulating regional development also must contend with the reality that metropolitan regions often are informal groupings of various administratively separate localities. These are often larger than any individual cities but smaller than states or provinces.⁴ The technical director of the São Paulo State Metropolitan Planning Public Company noted in late 2006 that dealing with metropolitan problems is significantly hampered by the absence of formal regional governments in Brazil, especially due to difficulties securing funding for infrastructure projects that extend beyond local borders.⁵ These problems are not isolated to emerging economies. In New York City, a plan to add another tunnel

into Manhattan hit a speed bump when the state governor in New Jersey across the river decided the project was not affordable.

Intraregional competition adds another difficult dimension to the puzzle. A comparative study of greater Beijing and Berlin-Brandenburg that was presented at an international conference of planning professionals in 2008 pointed out that even in the capital region of China, a nation with more central planning than most, Beijing competes fiercely

Modern urban thinking has to embrace the regions into which big cities are interwoven in order to be effective.

But how can regional urbanism be managed in a world with overlapping jurisdictions; competing needs; and incomplete, inconsistent measurements? *Cities of Opportunity* found it nearly impossible to recreate our core cities study at the regional level. The analogous data do not exist. However, our research did reveal some useful insights into challenges and opportunities for the world’s key urban regions.

1. “OMB Bulletin No. 10-02: Update of Statistical Area Definitions and Guidance on Their Uses,” United States Office of Management and Budget, December 1, 2009, accessed January 10, 2011, <http://www.whitehouse.gov/sites/default/files/omb/assets/bulletins/b10-02.pdf>; and “Information on Standard Geographical Classification (SGC) 2006,” Statistics Canada, last modified August 18, 2008, <http://www.statcan.gc.ca/subjects-sujets/standard-norme/sgc-cgt/2006/2006-intro-fin-eng.htm>.

2. “Delimitación de las Zonas Metropolitanas de México 2005,” Secretariat of Social Development, National Population Council, and National Institute for Statistics, Geography, and Informatics, November 2007, accessed January 10, 2011, http://www.conapo.gob.mx/publicaciones/dzm2005/zm_2005.pdf.

3. Brian Pink, “Australian Standard Geographical Classification (ASGC),” Australian Bureau of Statistics, July 2010, accessed January 10, 2011, [http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/0001EA65CA16C1B9CA25779F00179316/\\$File/12160_july%202010.pdf](http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/0001EA65CA16C1B9CA25779F00179316/$File/12160_july%202010.pdf).

4. Rui Antonio Rodrigues Ramos and Antônio Nelson Rodrigues da Silva, “A Data-Driven Approach for the Definition of Metropolitan Regions,” University of Minho Institutional Repository, accessed on January 10, 2011, <http://repositorium.sdum.uminho.pt/bitstream/1822/2320/1/1c2.pdf>.

5. Eloisa Rolim, Technical Director, São Paulo State Metropolitan Planning Public Company, “Metropolitan Regions in Brazil: A Model of Shared Management,” November 29, 2006, obtained via the World Bank, accessed January 10, 2011, http://info.worldbank.org/etools/docs/library/238536/13_Summary_Sao_Paulo.pdf.



Chicagoland sprawls for miles beyond the heart of the city and its municipal borders and into two neighboring states.

with nearby municipalities.⁶ For regions that cross over mid-level administrative divisions, the problem goes a step further. An October 2010 report from the Center for American Progress highlighted several ways that state-oriented policymaking can run counter to regional economic and social needs in the 44 metropolitan statistical areas in the US that cross over state boundaries, which include the regions surrounding New York City and Chicago.⁷ In the end, intraregional competition can make policymaking and funding for regional projects a free-for-all with unpredictable outcomes.

However, solutions are bubbling up as awareness of the critical importance of a regional focus broadens. The officials and policy advisors from 50 metropolitan areas across Europe that comprise the Network of European Metropolitan Regions and Areas (METREX) have backed the notion that metropolitan areas are now the level at which many urban objectives can be realized

most effectively.⁸ As a result of this heightened focus on regions, more policymakers are embracing regional governmental models.

Some areas have taken the most straightforward approach to regional governance: creating an administrative division that includes both the city center and its surroundings. Mumbai was a pioneer in this regard, having merged its suburbs into the municipality over the course of the 1950s.⁹ However, this is by no means the only structural arrangement that is conducive to metropolitan development. The Organisation for Economic Cooperation and Development (OECD) contends that there is no optimal regional governance strategy and instead advocates that each metropolitan area develops its own responses tailored to specific regional challenges.¹⁰

Other cities have combined some but not all of their governmental functions with satellite localities. Berlin joined with neighboring Brandenburg to create the Joint

Spatial Planning Department (JSPD), thereby carving out a specific policy area for joint management while otherwise remaining independent.¹¹ JSPD does not replace but is interwoven into both local governments.¹² JSPD has facilitated cooperation between Berlin and Brandenburg on crucial regional projects such as laying the groundwork for the new Berlin-Brandenburg International airport in Schönefeld, on the southeastern outskirts of Berlin.¹³

The private sector is getting in on the act as well, thanks to the increasing realization that the problems and solutions of cities and regions will not be crafted unilaterally. The European Union's "Joining Forces" study underscored the importance of local and regional authorities actively seeking opportunities to involve the private sector in metropolitan governance.¹⁴ Businesses also have taken the initiative to get involved in regional development on their own. For example, the Ford Foundation's "Metropolitan

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Sydney harbor.

Opportunity” grant-making program has launched a \$200 million, five-year campaign to promote economic growth in US metropolitan areas by integrating housing, transportation and land use policies.¹⁵

So what should all of the players in regional development be working toward? A World Bank-commissioned study of regions in the Yangtze Basin found that effective metropolitan management requires satisfying the demand for housing and buildings; constructing and maintaining affordable, safe and reliable transport, water, telecommunications and utilities infrastructures; ensuring that firms locate in the region and have access to supply chains and output markets for their products after doing so; and minimizing any economic disadvantages associated with regionalization for individual cities within the region.¹⁶ These principles have international appeal. METREX has laid out a similar set of key issues that affect the competitiveness and cohesion of European urbanized areas

and additionally has stressed the need for strategies that promote sustainability and the integration of infrastructure and services.¹⁷

In the end, modern urban thinking can only be effective if it is framed in terms of cohesive urban regions. And here John Updike, who celebrated the passions of the suburbs but rooted for his local city team, the Boston Red Sox, may be setting the right tone for the future.

6. Yan Tang and Jingquan Xu, “Regional Governance of the Capital Metropolitan Region: A Comparative Study of Berlin-Brandenburg and Beijing” (paper presented at the 44th annual congress of the International Society of City and Regional Planners, 2008), accessed January 10, 2011, http://www.isocarp.net/Data/case_studies/1242.pdf.

7. Brian A. Sponsler, Gregory S. Kienzl and Alexis J. Wesaw, “Easy Come, EZ-GO: A Federal Role in Removing Jurisdictional Impediments to College Education,” Center for American Progress, October 2010, obtained via the Institute for Higher Education Policy, accessed January 10, 2011, http://www.ihep.org/assets/files/publications/a-f/Report_Easy_Come_EZ-GO.pdf.

8. “METREX Brochure: Making a Metropolitan Contribution,” The Network of European Metropolitan Regions and Areas, accessed January 10, 2011, http://www.eurometrex.org/Docs/About/EN_Brochure.pdf.

9. “Evolution of the Corporation,” Municipal Corporation of Greater Mumbai, accessed January 11, 2011, <http://www.mcgm.gov.in/irj/portal/anonymous/qlhismilestone>.

10. Lamia Kamal-Chaoui, “Metropolitan Governance in OECD Countries,” OECD Territorial Reviews and Governance Division, accessed January 10, 2011, <http://www.oecd.org/dataoecd/59/40/6100078.pdf>.

11. “About Joint Spatial Planning,” Berlin-Brandenburg Joint Spatial Planning Department, last modified January 2011, <http://gl.berlin-brandenburg.de/ueber/index.en.html>. See also Tang and Xu, “Regional Governance of the Capital Metropolitan Region.”

12. Ibid.

13. Tang and Xu, “Regional Governance of the Capital Metropolitan Region.” See also “About Joint Spatial Planning” and “Airport BBI,” Berlin Airports, accessed January 11, 2011, <http://www.berlin-airport.de/EN/UeberUns/index.html>.

14. “Joining Forces: Final Outputs - Fact Sheet,” European Union URBACT Program, May 2010, accessed January 11, 2011, http://urbact.eu/fileadmin/Projects/Joining_Forces/documents_media/JoiningForces-FinalOutput-May2010.pdf.

15. “Helping America’s Metropolitan Regions Build Prosperity and Expand Innovation,” Ford Foundation, May 18, 2010, accessed January 11, 2011, <http://www.fordfoundation.org/issues/metropolitan-opportunity/promoting-metropolitan-land-use-innovation/news?id=375>.

16. “Context: What Is a Metropolitan Region? Why Do They Matter? What Is ‘Effective Metropolitan Management’? or What Performance Should We Be Aiming For?” (presentation prepared by Chreod Group, Inc. for the World Bank, May 24, 2007), obtained via the World Bank, accessed January 11, 2011, <http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1180031098365/Leman.pdf>.

17. “METREX Impressions: The First Ten Years 1996 – 2006,” The Network of European Metropolitan Regions and Areas, 2006, accessed January 11, 2011, http://www.eurometrex.org/Docs/About/EN_METREX_Impressions.pdf.



Continued from page 34

This variable appears to confirm what most people understand

intuitively: World-class infrastructure plays an important part in bestowing world-class status to a city. (Although it also should be said that *maintaining* world-class status demands continually upgrading one's infrastructure—and airport facilities, in particular—especially when so many cities in Asia and Latin America are competing with the established cities of Europe and North America for global prominence.)

Just as one would expect given their mature global presence, London, New York, Paris and Chicago also are among the top five cities in incoming/outgoing passenger flows, with Tokyo joining the group here (in lieu of San Francisco). Nonetheless, Beijing and Johannesburg are on top of the rankings in airport to CBD access. In taking the lead in this variable, Beijing and Johannesburg confirm that newer cities—or, as in the Chinese capital's case, cities with a more recent return to global prominence—can leapfrog ahead of more established cities to put in place the infrastructure that will ensure future success. Finally, another city that has also recently entered the global arena with great confidence and effect, Toronto, leads in skyscraper construction activity.

In closing, it is difficult to avoid one last observation: By the signs of this indicator at least, while the FIFA World Cup™ held in South Africa last year certainly expedited essential infrastructural projects in Johannesburg (Phase 1 of the Gautrain Rapid Rail Link to the airport and, even more important, the Rea Vaya Bus Rapid Transit System), the city still has much to do to improve the daily lives of its citizens.

The sky above, the streets below: One size does not fit all when it comes to cityscapes

It has been quite a while in the popular imagination since the thought of a skyline conjured up the image of the “apparent juncture of earth and sky, an outline ... against the background of the sky.”¹ Most of us associate skylines with the dramatic contours of cities like Hong Kong and New York. But the fact that Paris led the transportation and infrastructure category this year, although it fell near the bottom in skyscraper construction, prompts the question: What type of skyline defines a city today?

The answer is not made any easier by the city leading the rankings in skyscraper construction, Toronto. Even as its business district has sprouted with skyscrapers, its residential

neighborhoods have contributed to consistently putting Toronto toward the top of our study on measures of demographics and livability, including a first-place finish in the quality of living variable this year. More than a center of global business and finance alone, Toronto is a community in which people want to live and expect to lead rich and meaningful lives.

What is clear is that all human communities, but particularly cities, which are the most complex, require multiple systems of connectivity. Just getting around efficiently, comfortably and safely—to work, to the theater, to a stadium, to a café or restaurant—is a fundamental act of

1. <http://www.merriam-webster.com/dictionary/skyline>.



Aerial view overlooking Wanchai, Hong Kong.



Stockholm, a busy regional hub with a low-density lifestyle.

cohesion and connection in the urban experience. High density is thoroughly debilitating when it leads to isolation and a feeling of entrapment (as all urban planners learned following the experience on both sides of the Atlantic with public housing in the fifties and sixties).

The reason why many European (and other) cities have opted to restrict skyscraper construction in the heart of their historic centers is because the phrase “human scale” has an undeniable resonance to most people. On the other hand, New York proved a long time ago that humans have an extraordinary capacity to define for themselves what is a comfortable scale for modern life.

Residing in a Manhattan high-rise does not preclude being extremely connected, not only to your neighborhood but to an entire

world of other neighborhoods. On the contrary, living in a low-rise city such as Paris, Berlin, Madrid or Stockholm does not necessarily lead to enhanced connections between people if there are not other, more important bonds to bring them together. Under the circumstances, a “skyline,” and the values ascribed to it, seems to be less relevant to the urban experience than the more flexible notion of a “cityscape.”

No one would argue that Hong Kong’s skyline is not impressive; or that the extraordinary skyscraper construction throughout Asia’s major cities has not created skylines of considerable verve and cultural presence; or that a massive spire rising out of a Middle Eastern desert is not exhilarating. But the view of San Francisco Bay from any number of spots on Pacific Heights is breathtaking. Much less open but equally

stunning views can be had in any direction, up or down the canals, throughout Amsterdam’s Nine Streets.

And is there a more magnificent, more historically awe-inspiring vista in any city than that of the Golden Horn, whether one finds oneself on Istanbul’s Asian or European shores? Finally, and most famously, having been reproduced in countless movies (and certainly destined to be endlessly reproduced on postcards), is the vista up or down the Seine from the Pont des Arts. It may have become a tourist cliché by now, but it remains, year in and year out, a genuinely spectacular cityscape.

If nothing else, a cityscape reveals more about a city’s sense of itself—and perhaps even of a communal aesthetic and an openness to diverse, evolving possibilities of

what a city may be—than a skyline does, which probably is why both admirers of Jane Jacobs and Rem Koolhaas agree on the term. Put another way, a skyline is a quantitative measurement that becomes significant only when it is transformed, as New York’s was in the early decades of the previous century, into a shared emblem of sophistication, imagination, sociability, ambition, and promise. The cityscape of tomorrow will surely come in different sizes.

Sustainable mobility goes back to the future

... as Klaus Baur and Guenther Krug explain why railways make so much sense for the planet and its cities



With cities and surrounding metropolitan beltways choking on auto traffic and fumes, it appears a 200-year-old solution is charting a sensible, safe track ahead. Intra- and intercity rail transport is discussed here by Klaus Baur, chairman of Bombardier Transportation Germany, and Guenther Krug, a member of the Berlin Parliament and the Council of Europe as well as a senior advisor to Bombardier. Speaking in Berlin at the world's largest rail technology fair, InnoTrans, Baur and Krug also discuss Berlin's renaissance.

What advances are occurring now in transportation that will change life in cities and the metropolitan beltways around them?

KB: We see more congestion due to the use of cars, resulting in pollution and other negative effects. The solution is public transportation, and that comes in a variety of modes—trams for smaller cities or smaller numbers of passengers; the metro for moving a lot of people quickly within a city; and commuter or regional rail links for connecting big cities with their outer regions.

Why are trains the wave of the future now?

KB: They can transport huge numbers of people, using very

limited space and little impact on the environment. In the past, it was very important to have your own car, to be in your own space. Now in cities, there is an emphasis on clean, efficient, comfortable transportation. In many European cities, where mass transit had been a bit neglected, it now has become efficient and comfortable.

How do you see the mix changing among cars, bicycles, buses, trains and trams?

KB: I think that we will have more park-and-ride and less car traffic in the cities. We will have more of a combination of walking and bicycle riding.

What should a developed city do to become more environmentally friendly and to have more efficient transportation?

KB: It's important that people actually live in the city. And it's a problem if the suburbs are for the poorest people and the city center only for business. A city must be alive, not just during the workday but also during the day and night. But to attract people to live in cities, you need to have clean air, and you need green areas and recreation opportunities. And you need mobility.

GK: Yes. Managing the right mix of business and living areas in the city center is a major challenge. It's important for businesses



Klaus Baur, left, and Guenther Krug stand against the ZEFIRO—the train that will drive China's high-speed rail network toward what Bombardier calls "the fastest way to save the planet."

themselves to think about managing the mix of business and living areas in the city center.

How is development different in fast-growing cities in Asia, for instance?

KB: In China, you see a lot of metro systems being built. India also is starting to make progress on this. But in other areas in Asia with megacities, it is going very slowly because it's expensive. As an industry, we have to develop systems that are more affordable.

Many say the world soon will be one large metropolitan beltway. What needs to be done about intercity transportation?

KB: You have to connect the transport systems very well. If

there is an airport, you have to have connections from the metros or commuter trains directly to the airport. We have some examples in Germany, like Frankfurt, where a high-speed train goes directly to the airport, and commuter trains also stop there. You can easily get to the airport even from outlying cities. And since intercity connections go from city center to city center, they are faster than planes for distances between cities of up to 650 kilometers because you save the long trip to the airports and the pre-boarding time.

Where else can you make those kinds of airport connections?

KB: In London, they have a very well-connected airport, and in

In the past, it was very important to have your own car, to be in your own space. Now in cities, there is an emphasis on clean, efficient, comfortable transportation. In many European cities, where mass transit had been a bit neglected, it now has become efficient and comfortable.

Klaus Baur

It's a big challenge to build a multi-cultural society. As we say, we give a lot to immigrants, but we also ask for a lot. Giving and taking, that's the process political leaders have to organize.

Guenther Krug

France, there's Charles de Gaulle. Also in Berlin, there's a new airport being built just south of town in Schönefeld, and it includes a rail station. You will have an intercity line and regional and commuter connections.

GK: The new Berlin airport, opening in 2012, will have high-speed and commuter rail service. That means every 15 minutes, you'll have a connection to the city center via two routes. But a recent discussion in the Parliament was not about the good connections we will have but about the noise from the much higher number of planes taking off and landing

So the protest is about the planes?

KB: Yes, but there is a similar discussion about trains, both passenger and freight. In many rail systems, walls are built along the tracks. Noise control is very important so that people accept trains, or planes or any mode of transport.

Is the renaissance of trains today more a shift in awareness than a change in technology?

GK: There is clearly a shift in a awareness in Europe driven by the recognition of the environmental friendliness of rail travel. Rail causes only 1% of all CO² emissions of the transport sector compared with 74% caused by road transport. That, together with rising fuel prices, makes people rethink.

It's very important not only that you have no accidents but that people feel safe. Take the metro

in Berlin, for example, where you can walk through the whole train. There are no doors between cars. So if you feel uncomfortable or alone, you can walk to the front part of the train, where the driver is.

Do we need a consciousness change where government, business and citizens realize that trains should be a greater priority than highways?

KB: Very often, the political people say, "yes, we need trains," but there still is an emphasis on roads. So it's a mixture. The priorities are slowly changing.

GK: Financially, a good city transport system cannot be paid for solely by the citizens. In Berlin, subsidies go to the BVG [Berlin Transport Services]. Local government must make keeping prices low a priority. If you don't subsidize the tickets and they are too expensive, people say "No, I'll take my car."

If you were the mayor of a crowded developing city, São Paulo, for example, what would you do about transportation?

KB: Find the financing to build metros and commuter train system, either underground or elevated. Rail transit is absolutely essential as a backbone of transport and economic development.

In America, it's hard to get high-speed rail because everybody wants their stop, say every 20 miles, and a fast train can't keep making stops. Is that a problem elsewhere?

GK: We have this same discussion in Germany because we have different states, and each has its

capital, and each state wants its capital in the high-speed network.

KB: The solution is very fast regional and commuter transport feeding into the high-speed stops in order not to slow down the very high-speed system. Real high-speed trains run as fast as 350 kilometers per hour, take around 20 kilometers to accelerate to full speed and around 10 kilometers to come to a halt from full speed.

So it's an issue with the connections?

GK: Yes, that's what we need to have. We need fast trains from point to point, but, then, on the end points, we need a good connection to the metro or other feeder lines.

Can such connections ever be established in the US?

KB: Well, the US is larger and the distances are longer. But, still, there are routes where you can get to your destination within two or three hours, and that is attractive.

Berlin is brimming with energy and optimism. What explains Berlin's vitality?

GK: It's a melting pot of different systems, different cultures. After

the wall came down, there was tremendous development. I have been living in Berlin since '65. I knew the Berlin with the wall, I know the Berlin without the wall, and now I see this mixture of ideas, of people coming from west and east, north and south. And then you have special industries. Berlin is a center of creativity, with more than 100,000 employed in IT, film and a lot of media.

Many cities today are seeing tremendous immigration. What is Berlin doing to help absorb people from around the world?

GK: This is a big challenge for the city's political leaders, who must work to integrate hundreds of thousands of people coming from other countries. On the one hand, it's a very big plus—198 languages are spoken in Berlin. On the other hand, it is a huge task for politicians to organize education, equal opportunity and integration to help understand and live with different cultures and traditions.

It is a big challenge to form a multi-cultural society. As we say, we give a lot—but we also ask for a lot—from immigrants. Giving and taking, that's the process political leaders have to organize.

This interview has been condensed for publication in the report. To read all full-length interviews, please visit our website: www.pwc.com/cities.

Health, safety and security: Taking the pulse of city life— and death

Cities divide neatly here between those enjoying long-term stability and relative affluence and those still striving to either get ahead or establish a new, resilient fabric of life for themselves. Top cities Stockholm, Toronto, Chicago and San Francisco perform very well across a range of measures; lower ones are similarly consistent—though in the inverse direction—across the variables. Correlation analyses (see page 16) show a strong positive relationship between cities with robust scores in health, safety and security and other good traits like intellectual capital and innovation and demographics and livability (87% and 84%, respectively)—essentially showing “healthy cities” also tend to have good quality of life and productive energy.

To gauge the relative health, safety and security of a city, we measured personal risks, including crime, as well as the physical safety and number of hospitals a city offers to residents and visitors. Quality and availability of healthcare at various stages of life also are factored in.

Based on national data, Tokyo tops the list of health system performance when life expectancy is compared with the cost of healthcare per person. However, Japan pales next to the UK’s access to caregivers and palliatives when end-of-life care is measured by a wide range of variables (not factoring in a society’s traditional family care for the elderly and dying). It is worth noting that delivery of healthcare through national plans add a variable into the subtext of this equation.

	Hospitals	Health system performance ¹	End-of-life care ²	Crime	Political environment	Score
26 Stockholm	24	24	16	23	26	113
25 Toronto	20	22	23	23	24	112
24 Chicago	26	15	23	23	20	107
23 San Francisco	23	15	23	23	20	104
23 Sydney	17	17	25	23	22	104
21 Houston	22	15	23	23	20	103
20 Berlin	12	21	24	16	25	98
19 Singapore	16	25	15	26	15	97
18 New York	19	15	23	16	20	93
17 Tokyo	6	26	13	23	23	91
16 London	15	18	26	16	15	90
15 Los Angeles	21	15	23	10	20	89
14 Abu Dhabi	25	19	9	26	7	86
13 Paris	10	20	17	16	22	85
12 Madrid	13	23	12	16	15	79
11 Hong Kong	4	10	14	26	12	66
10 Seoul	5	16	10	16	11	58
9 Johannesburg	18	1	11	4	8	42
8 Mexico City	14	6	6	4	11	41
7 Beijing	9	10	5	10	3	37
7 Shanghai	8	10	5	10	4	37
5 Santiago	1	5	3	10	11	30
4 Istanbul	2	7	8	5	3	25
4 Mumbai	11	2	1	6	5	25
2 São Paulo	7	4	3	1	6	21
1 Moscow	3	3	7	4	1	18

Each city’s score (here 113 to 18) is the sum of its rankings across variables. The city order from 26 to 1 is based on these scores. See maps on pages 18–19 for an overall indicator comparison.

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

2. The end-of-life care variable measures the provision of care for its citizens at the end of their lives using data across four areas, including basic healthcare environment, availability, cost and quality of care.

■ High
■ Medium
■ Low

■ Highest rank in each variable

Sustainability: A reordering reflects policy, action and the challenges of comparison

Measuring, and judging, sustainable development is a complicated process, requiring continual reassessment. This year, we refined our data and analysis regarding sustainability by eliminating one variable (green cities) from last year's study, transferring another (green space as a percent of city area) to a different indicator discussion (lifestyle assets), adding renewable energy consumption and further clarifying our definitions by changing the air quality variable to air pollution so it is clear what we are measuring.

Some surprises emerged, although the very top rankings have changed relatively little, with cities known for their active environmental policies performing best.

Berlin is first this year, as compared with third-place Frankfurt (which Germany's capital replaced) last year. Sydney ranks second this year, as it did in 2009. Stockholm now is ranked third, although it ranked first last year. It is only in fourth place that we see the first of several noteworthy shifts.

Johannesburg now ranks fourth, having moved up six places from last year, and does extremely well in three out of the four variables. Moreover, Mumbai now is tied with Toronto for fifth, having moved up an astounding 15 slots from last year, when it was second from the bottom (and Toronto

Continues on page 49

	Recycled waste	Renewable energy consumption	Air pollution	City carbon footprint	Score
26 Berlin	23	15	24	24	86
25 Sydney	17	16	24	26	83
24 Stockholm	13	22	26	20	81
23 Johannesburg	8	23	24	23	78
22 Mumbai	20	26	6	19	71
22 Toronto	24	14	26	7	71
20 San Francisco	25	12	24	8	69
19 São Paulo	4	25	13	25	67
18 Santiago	9	24	6	22	61
17 Madrid	5	13	24	16	58
16 Istanbul	2	19	24	12	57
16 Paris	7	18	16	16	57
14 Seoul	26	7	13	10	56
13 Shanghai	21	21	9	3	54
12 London	13	6	16	17	52
12 Singapore	16	1	24	11	52
10 New York	14	12	10	13	49
9 Beijing	18	21	6	2	47
9 Hong Kong	23	4	6	14	47
7 Los Angeles	16	12	9	9	46
6 Tokyo	6	5	16	18	45
5 Mexico City	4	17	1	21	43
4 Chicago	11	12	13	6	42
3 Houston	10	12	9	4	35
2 Moscow	19	3	6	5	33
1 Abu Dhabi	1	2	24	1	28

Each city's score (here 86 to 28) is the sum of its rankings across variables. The city order from 26 to 1 is based on these scores. See maps on pages 18–19 for an overall indicator comparison.

■ High
 ■ Medium
 ■ Low

Better cities, better lives

Planning for sustainability takes the first, big step toward results

Half of the world's population currently lives in cities, a proportion that will rise to 70% in less than 40 years.¹ As cities now account for roughly 60% to 80% of global greenhouse gas emissions,² their combined action is critical to the world's response to climate change. That explains why so many cities have mobilized to take the lead, not only in reducing the effects of climate change but in creating genuinely sustainable patterns of economic growth and human development.

Cities possess a defining characteristic—density.

Urbanization plays the profound ecological function of concentrating populations in extremely restricted geographical areas. Consequently, when cities decide to undertake widespread, long-term planning initiatives, they do so on behalf of enormous numbers.

And as the planet's urbanization increases, so does the responsibility of policymakers in cities. Mayors, councilors and urban authorities worldwide have recognized the need to channel the demographic force of their fellow citizens into a transformative redefinition of sustainable development.³

Transnational organizations such as the C40 group, ICLEI and the World Mayors Council on Climate Change are creating a critical mass around joint sustainability efforts.⁴ Although no two cities are identical, climate change has forced common challenges on most cities: decreasing greenhouse emissions, advancing renewable energy use, enhancing green spaces, modernizing and expanding mass transit systems, improving air and water quality, and reducing waste.



Solar panels on Marina Barrage building in Singapore.

What binds all cities together is a common need

to abandon older models of growth based mostly on industrial output without regard to the quality of daily life. And here it is important to stress the central point that often is lost in discussing sustainable development: namely, that even if climate change were not an issue, virtually all the other factors defining viable growth remain so.⁵

Water and energy consumption, resource extraction, polluted air and contaminated water, traffic congestion, mounting waste from increasing (and increasingly affluent) populations: All of these issues would exist even without climate change. Models of development based on the Industrial

Revolution are growing obsolete today. Cities throughout the world are not merely looking for a different framework of growth. They are planning for it and preparing its blueprints.

What follows is a representative sampling of the plans that have been assembled in some of the 26 cities in this year's study so as to present an overview of the current issues and difficulties faced by cities and the solutions they are developing.

As might be expected, many mature economies—from Sydney and Singapore to Berlin, Toronto and San Francisco—have issued comprehensive and ambitious plans for sustainable growth. Nor will it surprise anyone that

cities in the developing world—Istanbul, São Paulo, Mumbai, Beijing—face infrastructural and, especially, resource constraints that cities like Stockholm or Chicago need not worry about. Still, we were impressed with the commitment precisely of those cities in emerging economies to move forward with plans for sustainable growth despite the daunting challenges they face in providing their citizens with the most basic services, such as electricity or potable water. Clearly, the mayors and councilors of these cities understand the linkage between fundamental development and sustainable growth: Providing potable water today does not guarantee that the wells will not run dry tomorrow.

Johannesburg illustrates

how progress can be made in a city that is not only part of the developing world but faces deeply rooted social and economic challenges.⁶ *Joburg 2030*, Johannesburg's plan, is fundamentally different in purpose from, say, New York City's proposal. Johannesburg struggles with enormous barriers to normal growth such as high crime, poor public health (including an HIV/AIDS crisis) and inadequate infrastructure. As a result, its plan points to two fundamental criteria for sustainable development: increased economic growth and improved quality of life.⁷

Specific strategies cover crime, labor skills and investment in telecommunications, utilities and transport.⁸ Transportation planning is being determined by the pragmatic assumption of an economically dynamic city in which higher incomes will result in both more private cars and greater reliance on public transport, which, in turn, will require

more planning, and building, of transportation infrastructure.

Mexico City's mayor, Marcelo Ebrard, has not only made climate change a priority but has issued a far-reaching, 15-year *Green Plan (Plan Verde)*. He was named chair of the World Mayors Council on Climate Change in 2009 and awarded the Council's World Mayor Prize in 2010 for his outstanding leadership on climate and other issues.⁹ It may not be coincidental that Mayor Ebrard produced Mexico City's environmental blueprint. He is a graduate of the *École Nationale d'Administration*, the famous training ground of French government and business leaders, in which planning is considered the foundation of all policymaking.

The *Green Plan* has received international recognition. The Clinton Global Initiative pledged \$200 million to help Mexico City meet its greenhouse gas emission targets, while Metrobus, the city's bus rapid transit system, was

honored by Harvard's Kennedy School of Government with an environmental prize.¹⁰ Meanwhile, the city's environmental conditions are improving. While ozone levels were above national standards more than 92% of the year in 1990, the duration of ozone-laden days now has fallen to approximately 50%, and other pollutants also are declining.¹¹

Abu Dhabi is located in one of the harshest environments on the planet.¹² Moreover, it is the capital of the United Arab Emirates, the country with the second highest per capita carbon emissions in the world. Its explosive growth as a business and financial center has led to predictable problems, from traffic congestion to waste recycling. All indications are that rapid population growth will continue in the next two decades.

The city's answer is *Plan Abu Dhabi 2030*, which integrates economic, social and cultural criteria into all development decisions. Abu Dhabi clearly expects

that its second-mover advantage will allow it to learn from the experiences of others and develop a comprehensive growth plan to avoid their mistakes. While *Plan 2030* is still in its inception, the hope is that it will be a prototype for comparably growing cities.

Since 2000, Shanghai has

issued continuous three-year environmental plans focused on reducing air and river pollution, improving waste treatment and fostering greener construction, among other actions.¹³ Over the last 10 years, it also has decreased its dependence on coal, cutting the proportion of coal used as a primary energy source to 51.3% in 2007 from 65% in 2000.¹⁴ Last, in order to relieve traffic congestion, Shanghai was the first city in China to implement a monthly auction system for a fixed number of licenses to own and operate private vehicles. This policy has been in place since 1986.



Finally, New York City's *PlaNYC 2030*, a comprehensive planning and development strategy created in 2007 under Mayor Michael Bloomberg to meet the city's projected increase in population by 2030, integrates many aspects of sustainable growth. But what makes *PlaNYC 2030* a robust statement of intentions is its requirement of annual, legally mandated progress reports, making it a forceful instrument of urban sustainability policy in a mature city.

The plan includes 127 initiatives in areas such as energy, housing, open space, climate change, transportation and water, with specific targets for each, including monitoring and evaluation requirements. The entire plan itself is required by law to be revised every four years.

Accomplishments already have been realized. In 2009, the city required buildings of a certain size to perform lighting upgrades and benchmark their energy

use, among other regulations, in order to lower emissions (80% of which come from the city's building stock). Another success concerned brownfields. Last year, New York became the first city in the nation to create a municipally run program to accelerate site cleanup, create jobs and reclaim industrial spaces.

However, some of the city's initiatives have failed because of political resistance at higher levels of government. For instance, legislation requiring taxis to meet more stringent emissions standards than those set by the federal government was rejected in federal court after being challenged by the taxi industry. The US Supreme Court recently declined to hear the city's appeal. San Francisco managed to pass a similar bill only because it had the industry's support from the start. And congestion pricing stalled in the New York State legislature over what was seen as an elitist tax to enter the heart of the city (see pages 34-35).

Politics being the art of the possible, however, temporary failure doesn't preclude ultimate success. That is why environmental sustainability—which, because of the required changes in lifestyle, quickly becomes social transformation—demands planning to ensure that everyone understands why they are being asked to change their lives and shoulder additional financial burdens. The good news is that from Johannesburg to New York City, the mayors who have produced the most dynamic and effective sustainability plans have done so through maximum engagement with their fellow citizens so that, in the end, when change is achieved, it proves to be permanent.

1. See the United Nations Population Database, 2009. For the calculation regarding 2050, see Kamal-Chaoui, Lamia and Alexis Robert (eds.), *Competitive Cities and Climate Change*, OECD Regional Development Working Papers N° 2, 2009, OECD publishing, p. 22, © OECD.

2. *Competitive Cities*, p. 9.

3. *Ibid.*, p. 78.

4. Municipalities also have come together on national and regional levels, such as the

Nottingham Declaration group in Great Britain and the EU's EUCO2 80/50 Project and Covenant of Mayors.

5. One consequence of climate change that is particularly pernicious for cities, however, is rising sea levels. Access to the sea is part and parcel of the history of human trade and cultural exchange, and most of the world's great cities are located in coastal areas (or, like Paris or Beijing, in riparian zones not far from major seacoasts). Indeed, the first global review of urban settlements found that 58% of Europe's largest cities (metropolitan areas of more than 5 million) and 80% of the largest cities in North America were located in Low Elevation Coastal Zones (LECZ), less than 10 meters above sea level. Australia was even more threatened by rising sea levels, as 100% of its urban areas of at least half a million people lay in LECZs. See Table 5 in Gordon McGranahan, Deborah Balk and Bridget Anderson, "The rising tide: assessing the risks of climate change and human settlements in low elevation coastal zones," *Environment and Urbanization*, Vol. 19, No. 1, April 2007, p. 30, International Institute for Environment and Development.

6. See <http://www.joburg-archive.co.za/2002/2030-shortversion.pdf>.

7. *Ibid.*

8. <http://www.joburg-archive.co.za/2002/2030-strategy.pdf>.

9. <http://www.worldmayorscouncil.org/>.

10. http://www.mexicocityexperience.com/green_living/.

11. <http://www.citymayors.com/environment/mexico-green-plan.html>.

12. To name an obvious difficulty, its desert terrain contains few natural freshwater resources.

13. <http://www.echinacities.com/shanghai/city-in-pulse/shanghai-invests-3-of-annual-gdp-to-promote-environmental.html>.

14. http://www.unep.org/pdf/SHANGHAI_REPORT_FullReport.pdf.



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was fourth from the top). In fact, Mumbai now ranks first in renewable energy consumption.

More generally, three significant patterns occur in this year's study. First, four cities from the developing world—São Paulo and Santiago joining Johannesburg and Mumbai—now are in the top 10 (as opposed to only one last year). Second, three major Western cities (Paris, London and New York) have fallen out of the top 10, partly because of the change in variables this year.

Finally, with the singular exception of San Francisco, which remains in the forefront of urban sustainability, the four largest cities in the US fall to the bottom 10 of this ranking (with Chicago and Houston squeezed in between Mexico City and Moscow). Unfortunately, American cities, to a real degree, are victims of gridlock on the national level when it comes to environmental policy. Nonetheless, they must, sooner or later, confront the issue of sustainability more effectively if they are to maintain their global pre-eminence in perception and fact.

Shanghai joined more than 100 other Chinese cities to promote "no car day," permitting only taxis downtown and encouraging residents to take mass transit, bike or walk to fight pollution.

Lighting the world's cities with green power

... is the mission of Kerry Zhou and China's Goldwind Technologies



Goldwind Science & Technology Co. is a Xinjiang-based trailblazer in the world of renewable energy. Founded in 1998, it has become a leading manufacturer of wind turbines, with operations in Europe, Asia, Australia and the Americas. In addition to designing cutting-edge turbines, Goldwind does everything from operating wind farms to developing smart-grid solutions that can make cities more energy efficient. Kerry Zhou, Goldwind's director of strategy and planning, speaks here about the challenges of powering cities with green energy and about how to make this environmental dream an economic reality.

How far is China from the dream of powering its cities with green energy?

China still relies on coal-fired power generation, and renewables, excluding hydro, account for only 1%-2% of the total energy mix. It's projected that wind power will account for 11% of China's total power capacity by 2020, rising to 20% by 2030. This still is relatively low compared with a country like Denmark.

Which Chinese cities will drive this trend toward renewable energy?

Megacities like Beijing and Shanghai should take the lead in applying new, green technologies. That's partly because they suffer

the most from the consequences of environmental pollution and partly because they're more financially capable. Industry-intensive cities like these also are more likely to act because their demand for power is high, which incentivizes them to take action.

What needs to happen to make the vision of green-powered cities a reality?

First, the government needs to provide stronger support for green power—for example, by giving mandatory access to the grid and higher subsidies so the green power sector can grow quicker while lowering its cost to a level comparable with that of conventional power. Second, companies



A worker walks between wind energy generators at a Goldwind factory in Urumqi, China.

need to further improve their technologies to meet the requirements and standards of grid companies. It's important, too, that green power should include natural gas, although it's not a renewable energy. Beijing has been investing heavily in natural gas in-bound transport to replace coal as the primary source of energy for power generation.

How similar are the energy policy challenges facing governments in China and the US?

Both governments support the growth of green power generation and consumption. China's government may be more forceful—for example, setting quotas for the use of renewables and requiring

mandatory access to the grid.

In contrast, the US government could offer only some preferential taxes to incentivize companies. Also, in the US, land is privately owned, and each state has its own land-use policies, making it difficult to launch a new program. In China, the government is in a very strong position and can do nearly anything it wishes. Politically, it's much harder in the US, where the rising power of the Republicans is not a blessing for the wind-power sector.

What other countries are leading the way in stimulating renewable energy?

Denmark, Germany and Spain are doing better than most countries.

Megacities like Beijing and Shanghai should take the lead in applying new, green technologies. That's partly because they suffer the most from the consequences of environmental pollution and partly because they're more financially capable.

Is there a danger that prolonged global economic problems will make wind power less attractive than cheaper forms of energy like oil or coal?

This view has certainly applied to the US. The American wind-power market shrank by more than 40% in 2010 from the previous year, and it's not expected to recover over the next two years to the level of development it had reached in 2009. But while the financial crisis has dealt a severe blow to America's wind-power industry, the opposite is true in China. In the future, as China undergoes a structural transformation and moves toward becoming a low-carbon economy, it will need to find new jobs for workers from conventional industries. In my view, the wind-power sector can absorb many laid-off workers from these conventional industries while also reducing emissions of CO² and meeting the nation's rising demand for energy. So I'm very positive about the next 30 years.

You've said before that the potential of the wind-power industry is much larger than anyone can imagine. How fast is it currently growing in China?

China's wind-power industry experienced explosive growth over the past two years, thanks largely to a government stimulus package and huge energy demand from the real estate and construction sectors. In 2009, the wind-power sector expanded more than 100%, and the growth rate for this year will be more moderate and stabilized due to a large single-year volume that reached more than 13 gigawatts in 2009. There now are nearly 300,000 people working along the value chain of wind power, a sector that barely existed in China five years ago.

What sources of energy do you see powering the world's big cities in 20 to 30 years?

It largely depends on the natural resources that exist in each country. Natural gas will play a key role in Russia; coal and natural gas will dominate in Brazil; coal in China; coal and hydropower in

the US. The impact of renewables largely will depend on government policies. In China, the government target is to increase renewables to 15% of the energy mix by 2020, but this could even reach 20% if China resolves its challenges more effectively.

Do you expect urban transportation to change radically around the world with the rise of renewable power and electric cars?

The US is expected to take the lead in riding this wave. Cities like Los Angeles, San Francisco and New York are actively pursuing opportunities in technologies like offshore wind farms, electric cars and renewable application technologies. We're seeing many venture capitalists getting actively involved in these new business areas. Some European countries also are getting very active in R&D. But past experience would suggest these new technologies are more likely to be commercialized first in the US. In China, big cities like Beijing and Shanghai will be the leaders. I would not be surprised to see advancement in renewable application technology in these cities.

Will smaller cities see technological advances too?

Yes, we're already seeing the emergence in smaller cities of many new utility projects such as independent, intelligent mini-grids in local communities. Goldwind actually is exploring the idea of using our own wind mini-grid to power our offices and factories.

Chinese cities like Chongqing are working to develop intelligent grids and integrated power management. How critical is this kind of technology?

Smart grids are an important vehicle in making renewable energy competitive, enhancing its acceptability and its access to the grid.

Goldwind now is a turnkey provider of wind services and a wind farm owner around the world, not just a manufacturer. Why adopt this strategy?

As the market matures and moves into a period where growth is slower, equipment manufacturing no longer will be in high demand. So we should start preparing

Cities like Los Angeles, San Francisco and New York are actively pursuing opportunities in technologies like offshore wind farms and electric cars. We're seeing many venture capitalists getting actively involved in these new business areas.



ourselves by expanding our value-added services. Instead of only manufacturing, we'll provide manufacturing plus wind farm services plus grid-access solutions. Currently, we have a wind farm services company that provides turnkey services for everything customers need to build a wind farm plant. We also have a wind power investment company that's endeavoring to become an independent power producer in many provinces.

Goldwind is globalizing rapidly, setting up wind farms, manufacturing and other ventures everywhere from the US to Cuba, Germany to Central Europe, Africa to Australia. How do you select the best places to invest?

We're trying to have a balanced business portfolio. The American and European markets continue to be our focus, but we're also actively exploring the emerging markets of Eastern Europe, Africa, the Middle East, Southeast Asia and Central Asia. Whenever possible, we'll leverage our rich experience in China to achieve growth in these other markets.

Why did Goldwind choose Beijing for its headquarters?

Mainly because of its central location to access our domestic operations, as well as quick and easy access to the worldwide marketplace.

What makes Beijing an attractive place to work for you?

There are lots of key factors. It's China's political capital, it has an advanced economy, it has a deep pool of talent and a strong R&D capability, its influence radiates out to neighboring Chinese provinces and it has influence at a global level.

Why choose Chicago as the headquarters for Goldwind USA?

America's midwestern states attach more importance to the development of the wind-farm industry. Geographically, these states are closer to our customers. They also receive more support from state governments, and they have strong research capabilities. The reason we chose Chicago itself is mainly due to the scale of its economy, strong industrial capability, excellent universities and R&D, as well as convenient transportation.

Which is your favorite city in the world?

I like San Francisco the most. It's a beautiful natural setting, it's not very big and it has a great climate. It's a city, but it also gives you easy access to the countryside and the ocean.

At its headquarters, Goldwind offers employees everything from soccer games to climbing walls to music lessons. Culturally, would the company be at home in Silicon Valley?

There are lots of differences. Companies in Silicon Valley are mainly technology driven, with few having practical experiences. Goldwind, by and large, is an industrial enterprise, although people here dress casually at work, engage in many recreational activities, and talk in an open and democratic way. This unique corporate culture derives from the experiences of our com-

pany's founders, most of whom studied or worked in Germany and Denmark. I don't think we should compare ourselves with Silicon Valley companies: There still are areas where we need to develop our culture further—for example, encouraging more innovations among our staff.

What challenges lie ahead for Goldwind?

Goldwind has to work hard to improve its technology further, reduce its costs, increase its competitiveness and contribute to the development of green power. We have a social duty to promote sustainability and economic growth by using the Earth's resources responsibly. That's why, when the company was founded, we made a commitment to help safeguard these natural resources for generations to come, "preserving white clouds and blue skies for the future."

This interview has been condensed for publication in the report. To read all full-length interviews, please visit our website: www.pwc.com/cities.

Turbines at the Da Ban Cheng wind farm in Xinjiang, China.



Economic clout: Reaching the high ground carries its own momentum but no guarantees

London, Paris and New York finished on top again this year, exactly the same as last year—a telling result since all three cities are the financial centers of countries that have been much more affected by the global financial crisis than other developed economies or even several developing ones. The lesson that emerges is that economic strength, having been “earned over time,” cannot be dissipated by one financial crisis, no matter how deep or debilitating.

Indeed, the top 10 cities this year all are long-established urban centers of political or commercial consequence (or both) rooted in hundreds or even thousands of years of history. Paris’ record as an administrative capital goes back a millennium, while that of Beijing—which has climbed this year to the ninth rank—can be traced back 2,000 years.

Economic clout has a great deal to do with staying power, which, consequently, is what “economic stability” undoubtedly comes down to in the end. This is not to say that cities do not rise and fall: Over recent centuries, plenty of European cities (from Venice and Genoa to Amsterdam and Vienna to Manchester and Glasgow) have proved that economic power is as difficult to maintain as it is to achieve. Still, longevity allows a city to build the economic institutions, and networks, that will enrich it and, therefore, extend its financial weight and credibility way beyond its borders.

Accordingly, with the exception of Abu Dhabi (best known for its pearl trade prior to its discovery of oil in 1958), every city in our report goes back at least to the turn of the 20th century as a significant urban presence. Even some of the cities in the lower half of our ranking—from Mexico City to Mumbai and Istanbul to Moscow—know what it means to have once been imperial centers, which is to say that they know what it takes to lead.

As a result, Moscow does relatively well in the number of Global 500 headquarters and its attraction of FDI. Mumbai, too, contains as many Global 500 headquarters as Moscow (or Houston or Madrid) and even manages to outpace New York in both categories of FDI. Both Moscow and Mumbai, however, have currency issues (inflation, in particular) and relatively undeveloped financial and business sectors.

	Number of Global 500 headquarters	Financial and business services employment	Domestic market capitalization ¹
26 London	22	26	19
25 Paris	24	24	20
24 New York	23	18	22
23 Hong Kong	15	13	17
22 Madrid	19	25	15
21 Singapore	11	16	6
20 Toronto	20	21	16
19 Shanghai	15	7	18
18 Beijing	25	15	0
18 Tokyo	26	4	21
16 Sydney	11	12	11
15 Stockholm	13	23	9
14 Chicago	11	20	1
14 San Francisco	11	22	0
12 Berlin	6	19	12
12 Houston	19	9	0
10 Seoul	21	17	10
9 Moscow	19	6	7
9 Mumbai	19	1	13
7 Los Angeles	6	11	0
6 São Paulo	13	3	14
5 Abu Dhabi	3	2	2
4 Istanbul	6	5	4
3 Johannesburg	3	14	8
2 Mexico City	11	8	5
1 Santiago	3	10	3

In the end, the most interesting aspects of this year’s results might be the prospective trends they signal. Three factors are unusually suggestive of future developments. First, although the top four cities were European or North American last year, only the top three were this year. Hong Kong replaced Toronto in the fourth spot and, even more important in this year of currency crises, came in first in a measure of its inflation rate. Moreover, all five Asian cities continue to sit within the top 10 spots in this indicator.

In regard to currencies, the apparent currency strength on which so many European cities depended last year surely will have been

tested this year, following the euro’s serial crises. This is especially the case for Madrid—ranked fifth this year, aided also by its strong financial services workforce—which might see its advantages slip because of the continuing turmoil in the European Union (EU).

Finally, appearances notwithstanding, the top three cities in this category prove that economic clout and cultural influence are not two sides of the same coin. Quite the opposite, a city’s cultural influence only really becomes dominant when it is backed by economic power. It is a lesson learned by Berlin, Mumbai and Istanbul—three cities lauded during the last few years for their cultural vibrancy.

Level of shareholder protection ²	Inflation ³	Strength of currency (SDRs per currency unit)	Attracting FDI: Number of greenfield projects	Attracting FDI: Capital investment	Score
18	11	26	25	23	170
9	24	25	21	19	166
24	25	22	16	13	163
25	26	10	22	21	149
6	20	25	18	16	144
26	17	15	24	25	140
24	24	17	9	8	139
6	11	10	26	26	119
6	11	10	23	24	114
16	7	3	19	18	114
12	15	16	15	15	107
12	15	11	10	10	103
24	17	22	4	2	101
24	19	22	2	1	101
6	12	25	8	12	100
24	21	22	1	4	100
9	8	1	12	11	89
6	3	5	20	22	88
15	1	4	18	17	88
24	13	22	5	3	84
9	5	13	14	9	80
1	18	12	13	20	71
12	2	14	11	14	68
18	5	7	6	6	67
15	7	6	7	7	66
15	24	2	3	5	65

Each city's score (here 170 to 65) is the sum of its rankings across variables. The city order from 26 to 1 is based on these scores. See maps on pages 18–19 for an overall indicator comparison.

1. Total number of issued shares of domestic companies multiplied by their respective prices at a given time. This figure reflects the comprehensive value of the market at that time in millions of USD. Cities with no stock exchange receive a score of 0. The remaining cities are ranked and assigned a score from 22 (reflecting the reduced number of cities in the ranking) to 1.

2. The level of shareholder protection index is the average of "transparency of transactions," "liability for self-dealing" and "shareholders' ability to sue officers and directors for misconduct."

3. Ranking according to how far a country deviates from a +2% inflation rate, with inflation that is closer to +2% being favored over inflation or deflation that is further from this rate. A +2% inflation rate is used as the benchmark because it is widely regarded as a target or healthy inflation rate by large international banks. A country's inflation rate is based on a projection of how much its Consumer Price Index, which measures the rise in prices of goods and services, is expected to rise during the course of 2010. US cities were further differentiated using regional data.

■ High
■ Medium
■ Low

■ Highest rank in each variable

Mortimer Zuckerman gauges

... the present and future of cities from his perspective as a real estate developer, publisher and former professor



Mortimer Zuckerman.

As one of the most prominent property developers in the US, Mortimer Zuckerman honed a sharp focus on what makes cities decline or prosper. Zuckerman co-founded Boston Properties in that city, then broadened to real estate ventures in New York and other cities. He also owns *US News & World Report* and the *New York Daily News* and served as an associate professor at Harvard Business School. Here, he shares his views on politics, immigration, public employee obligations and the media—and offers special praise for the meritocracy that defines New York.

What do you see as critical to the well-being of a city such as New York?

Cities expand or contract on the basis of their economies first. That's often what has led to the formation of cities. New York did not just happen by accident. New York is a remarkable city for all kinds of historical reasons. It certainly is the center of this country's media, it is the center of this country's financial world, it is the center of this country's world of theater and it has one of the most wonderful combinations of people.

What makes New York City great is that it welcomes talent.

It rewards talent, it celebrates talent, it nurtures talent, it encourages talent and, therefore, it attracts talent. This city is not about buildings. It is the closest thing to a meritocracy, in my judgment, that exists in this country. And people of extraordinary talent get attracted to it because talent likes to be with talent, and it spreads through everything.

What pitfalls should New York be aware of looking to the future?

New York suffers from everything that every other city and state suffers from, from the national government side. There are many things that can be done only by government, and we have

the most ridiculous and corrupt government at all levels. I mean, the state government is just a fiasco beyond imagination. And that was the reason why the *Daily News* was the only major newspaper to endorse Mike Bloomberg the first time he ran [for mayor], because I knew he is very talented and a great manager. But every city suffers from that deficiency, to some degree.

We are held terribly hostage by the public service unions. The problem now is that the people who pay the pensions and the healthcare benefits for the public service workers, never mind their salaries—that's the public.

What makes New York City great is that it welcomes talent. It rewards talent, it celebrates talent ... It is the closest thing to a meritocracy that exists in this country.

Is it just a New York problem?

No, it's every one. I mean, we now have a new privileged elite, and they're called the public service workers. They work fewer hours, they have longer vacations, they have bigger pensions and their average income is probably—total, including the benefits—30% to 40% above the average incomes of the private sector workers. That's not sustainable. The Obama administration, by giving the public service workers unbelievable amounts of support without asking for anything in return, did the wrong thing.

What can the public sector learn from the private sector?

The private sector also is vulnerable to this. When times were good, everybody was willing to go along. And then when things turned down, which they certainly have, how do you get out of these obligations? How do you manage these obligations? How do you fund these obligations? [Former California Governor Arnold] Schwarzenegger wrote an op ed piece in *The Wall Street Journal*. He said California is now paying \$6 billion a year for retirement benefits, and it's going up by 15% a year. It's unsustainable.

We have costs that are unsustainable. There's no money for any of this. And we could break the whole system by providing what-

ever the public sector wants and put all the money into the union contracts and retirement benefits, but that's crazy.

What would you see cities like New York in the US, and the world as much as it applies, doing to generate jobs?

One, the process of gaining city approvals of all kinds has to be streamlined. Two is cities have got to manage their tax rates, their real estate tax rates, and there have to be programs to create incentives for people to build. Third, cities have to understand what their strengths are, and they've got to nurture those strengths. Fourth, the one thing that I think is absolutely critical for almost every city is the public transportation. I'll add to that public education.

You witness it at all levels. The federal government's a disaster, the state government's a disaster, with rare exceptions the city governments and local governments are disastrous, and I don't know how you change that. We are susceptible to elections that are based on how much money people can raise rather than how good they are.

What about technology?

We've lost in this country 5.6 million manufacturing jobs in the first decade of this century. We have a comparative advantage in

terms of technology and people who understand technology, and we've just got to nurture that.

You talked about immigration.

There is something called an H-1B visa. In the year 2000, we had 195,000 H-1B visas; in the year 2001, after the dot.com bubble burst, a group of people who worked on this new technology called the web managed to get the federal government to reduce the number of H-1B visas from 195,000 to 65,000. We still are at 65,000. I spoke with this administration about it. Intellectual power or technical power, call it what you will, is more important than financial power. We are sending these people out—these are people who we educate here—we send them to other countries and companies that compete with us. This is insane.

One of the great strengths of America is its ability to integrate immigrants. We've done it for our entire history. The most talented people who have come from countries like Canada and Australia, there are offices all around the world trying to attract these people, and we're sending them away. It's insane. And it's done for the crassest of political reasons. Fifty percent of the graduate degrees in the hard sciences go to these foreign students, and we send them away.

Is the balance of power and governance that cities control correct?

That's the way our politics work. We still have representative government. However, certainly at the state level, we have to understand what is it that draws people to New York. And our representatives in Washington cannot allow the financial industry to be hammered for short-term political gains, when it is the absolute core of the economies of this city and this state. But politics get played in the worst kinds of ways. I don't know how you deal with it. The Executive Branch may make a decision, but then you have God knows how many local political issues that mix it up. We can't afford it any longer. We just can't.

There are some things that only governments can do. If you're talking about a subway system, that can only be done by the government. The same thing is true of education. Now, if you can find a way to privatize it, good luck, but, so far, that is beyond the scope of the private world. Not entirely. But my recommendation is if we want to do something about the economy, we have to have a national infrastructure bank, which Felix Rohatyn has recommended. It's an independent thing. It should not be done on the basis of political, shall we say, patronage and earmarked—it should be done on the basis

of rational planning. And they should be large-scale projects, and we should toll them so that the users pay for them because nobody wants to charge taxes.

Do you think Northern Europe or even China does all this better than us in terms of planning?

Certainly China, on one level, has a much more strategic view of what its interests are, but, on the other hand, they don't have any opposition. The government makes a decision, and they implement it. When China was in trouble, they put in a massive infrastructure program, they took the economy out of the doldrums when the exports collapsed. We haven't been able to do anything that makes sense. The stimulus program that we had was a joke. It wasn't large enough; it was misdirected. It didn't create job multipliers; it just basically patronized the public service unions primarily because of the constituency of Obama. Now it's way too late.

John Jacob Astor famously said, "Buy on the fringes and wait." With the great expansion of cities, are there still fringes today?

Of course there are. There are always fringes. And the fringes

may go up, not out. Look, there are many cities that do not want to have high-rise buildings. But then if that's the case and there's pressure, it goes out horizontally. It's either going to go vertically or horizontally, and there are opportunities in both.

Are there projects you do because they're the right things to do as a developer interested in the future of the city, not just to make money?

That's right. For example, there was a competition to build this 103-story building that is going to basically replace what was there prior to the World Trade Center, and that's going to be a landmark building. And for me to have had the opportunity to be a part of that, it's not an economic judgment. I can afford to do something for aesthetic reasons and public service reasons, and that was my approach.

How do you balance that—making money, capitalism, versus public spiritedness?

This has been the approach that I've taken forever. I have been in a position to take a longer-term view than most people in terms of their approach to business, and

I've always taken that. And in that sense, if you take a longer-term view, there's a quality, not just a quantity, to what you do. I don't need short-term profits; I want long-term values. And if you do that, you can really be sensitive to the aesthetic quality and to the construction quality of what we do. Everything we do is for the longer-term.

And that was a decision, a business and personal decision, you made?

From day one. And, frankly, in my judgment, it's worked better than any other alternative in purely business terms.

What should cities do to foster collaboration among various stakeholders?

It's political leadership. Bloomberg can do it here because he wasn't somebody who came up through the political system, but he came in with a more idealistic view of what could be done, and, frankly, somebody who could afford to do whatever he has to do. It wasn't dependent on financial contributions. But you need that kind of leadership, and somehow or other we've got to value it enough to support it.

That's the biggest problem we have now because people have been looking at public office and feel that it denigrates you rather than enhances you. I've never felt that way.

Speaking as a media owner, how important is credible information to a community?

You know the answer to that question. It's critical, in fact. And it's like everything else—media shapes the public dialogue. Now there are going to be people in the media who are going to go for short-term gains. I hope I don't do that. Not that you have to ignore it, but if you have values that you want to somehow or other transmit, whether it's on the editorial page or in the quality of your journalism, it's really critical for the quality of the public dialogue to have quality media.

Many of the great newspapers have been owned by families—the Sulzbergers, the Bingham or the Chandlers. As those families give up control and corporations take over, will it mean the end of public-spirited journalism in big cities?

No, I don't think it's the end of it at all. I'm not sure corporations

We now have a new privileged elite, and they're called the public service workers. They work fewer hours, they have longer vacations, they have bigger pensions and their average income—total, including benefits—is probably 30% to 40% above the average incomes of the private sector workers. That's not sustainable.



A view of the GM Building in New York, one of many skyscrapers in the US owned or developed by Boston Properties.

can really do a good job in running a multifaceted media company, and we've seen that. Look what happened to the Tribune Company. It got in trouble because it was overleveraged.

You invested in presses for *The Daily News*. Clearly, you still think newsprint is not a dead medium?

I don't think it is. But I'm not saying it was entirely an economic decision.

You're from Montreal, and you've done business in Boston. How does New York stack up?

Major league difference. New York is to my mind the best example of how American business can work because it is a meritocracy. There are many cities where you have a tribal, shall we say,

configuration, and if you're not a part of one tribe or you are part of another tribe, you know, you face all kinds of opposition. The United States, in general, is more of a meritocracy than any other country. Where the United States suffers is not from its private sector but from its public sector.

It's an open city, it's an open country, it's an immigrant country—that's what immigrant countries are all about. That's why America attracted so many people.

Is New York in our lifetimes the center of the world today, like ancient Rome once was?

To the extent any city is, I would say it still is New York. No city is the center of the world, however.

But to the extent that you have a global center, the number one city in terms of its reach around the world still is New York.

What is your favorite city to visit for pleasure?

I love London, and I love Rome—London because it's a civilized city and Rome because the Italians are the warmest, most open, most life-enhancing people you could want to spend time with.

What city do you live in, and if there were one thing you were going to do to improve it, what would it be?

I live in Manhattan. And if there's one thing I could do to improve it—which is difficult—I would improve New York City's education system at all levels. The entire public education system really needs it. And the resistance to that, of course, comes from teachers. That's the sad fact of it.

To hear podcasts of the discussion with Zuckerman, as well as read a full-length version of this and other interviews, please visit our website: www.pwc.com/cities.

Ease of doing business:

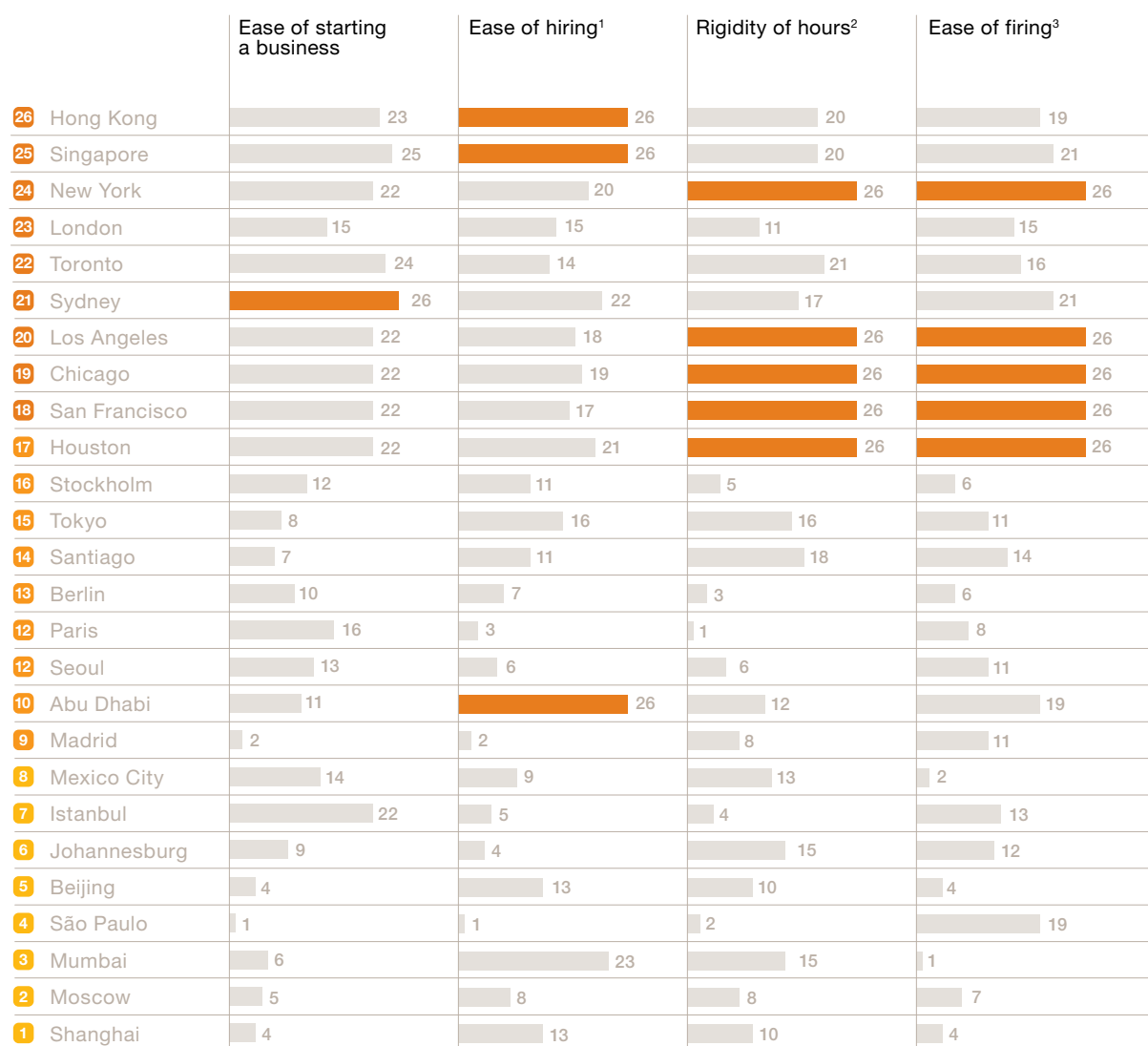
The open city trumps geography and culture

Among the most significant changes in this year's research is the addition of three variables to this indicator: ease of starting a business, operational risk climate, and workforce management risk. These changes, however, have not appreciably altered the general terrain of the world's business-friendly landscape.

The leaders—Hong Kong, Singapore, New York and London—just played musical chairs in the four top spots. It would be a mistake, however, to see this jockeying for the top positions by the same players as a case of advantages accruing to already advantaged cities.

There is another, more valuable, lesson to be drawn here; namely, it is not geography, a specific cultural profile or historical experience that matters in the end when it comes to business investment. What does matter, as the variables in this category indicate, is a combination of flexible labor policies, openness to the rest of the world, and the ease of starting and maintaining an enterprise (which embraces the stability of a city's fiscal and regulatory environment).

American cities continue to lead the rankings this year in degree of employer flexibility to create work schedules and ease of firing. Indeed, were it not for the severe visa



Each city's score (here 191 to 54) is the sum of its rankings across variables. The city order from 26 to 1 is based on these scores. See maps on pages 18–19 for an overall indicator comparison.

High
Medium
Low

1. The ease of hiring index measures whether fixed term contracts are prohibited for permanent tasks, the maximum cumulative duration of fixed term contracts and the ratio of the minimum wage for a trainee or first time employee to the average value added per worker. An economy is assigned a score of 1 if fixed term contracts are prohibited for permanent tasks and a score of 0 if they can be used for any task. A score of 1 is assigned if the maximum cumulative

duration of fixed term contracts is less than 3 years; 0.5 if it is 3 years or more but less than 5 years; and 0 if fixed term contracts can last 5 years or more. Finally, a score of 1 is assigned if the ratio of the minimum wage to the average value added per worker is 0.75 or more; 0.67 for a ratio of 0.50 or more but less than 0.75; 0.33 for a ratio of 0.25 or more but less than 0.50; and 0 for a ratio of less than 0.25. Averaging the scores and scaling the result to 100 give a final index. Higher values indicate more rigid regulation.

requirements of the United States, they would arguably dominate this category. As it is, the five American cities here are all in the top 10.

The relative improvement of the continental European cities is a notable change from last year. Paris fell to the bottom five of last year's rankings but finishes in the middle this year. Berlin is just above Paris this year, although Frankfurt was just below the French capital last year, three places from the bottom. Stockholm continues to prove its global competitiveness by placing in the top half of the rankings.

Toronto, however, is the city that continues to impress, ranking fifth this year in a larger

field, up one place from last year. It also is among the top three in the new variables, including first in workforce management risk. If it improved its standings in hiring and firing, as well as visa requirements and flexibility (which are national restrictions), Toronto would be among the easiest cities in the world in which to do business.

Sydney also rises conspicuously in this year's rankings, moving up five places from last year's report to just barely behind Toronto. Sydney also comes in first in the new category of ease of starting a business and ranks high in both ease of hiring and firing. Again, however, Australia's visa policies impair Sydney's abilities to compete at the very

highest level in ease of doing business—which, in this case, is particularly noticeable given that Sydney should be a prime competitor in Asia to Hong Kong and Singapore.

What is most striking in the end about the top cities in this ranking is how important open access to the world is to achieving the very top spot. Indeed, it is ironic that Hong Kong (about which there was some fear regarding its business environment after its return to Chinese sovereignty) now ranks second in ease of entry, as it did last year, and first in flexibility of visa travel—up from third last year.

Ease of entry: Number of countries with visa waiver ⁴	Flexibility of visa travel ⁵	Foreign embassies or consulates	Operational risk climate	Workforce management risk	Score
25	26	10	24	18	191
26	4	16	26	24	188
9	11	21	18	25	178
23	25	25	13	24	166
12	15	11	24	26	163
11	13	12	22	18	162
9	11	8	18	21	159
9	11	5	18	20	156
9	11	7	18	18	154
9	11	4	18	15	152
20	23	19	25	22	143
16	19	23	12	19	140
22	24	14	19	9	138
19	21	22	20	13	121
13	16	26	22	14	119
24	23	17	9	10	119
10	4	13	10	12	117
18	20	18	12	11	102
15	18	15	8	3	97
17	15	9	3	2	90
21	13	1	7	5	87
3	4	25	5	8	76
14	17	7	7	6	74
3	5	2	2	4	61
4	6	20	1	1	60
3	4	4	5	7	54

2. The rigidity of hours index has five components: (i) whether night work is unrestricted; (ii) whether weekend work is unrestricted; (iii) whether the workweek can consist of 5.5 days; (iv) whether the workweek can extend to 50 hours or more (including overtime) for 2 months a year to respond to a seasonal increase in production; and (v) whether paid annual vacation is 21 working days or fewer. For each of these questions, if the answer is no, the economy is assigned a score of 1; otherwise, a score of 0 is assigned. Averaging the scores and scaling the result to 100 give a final index. Higher values indicate more rigid regulation.

3. The ease of firing index has eight components: (i) whether redundancy is disallowed as a basis for terminating workers; (ii) whether the employer needs to notify a third party (such as a government

agency) to terminate one redundant worker; (iii) whether the employer needs to notify a third party to terminate a group of 25 redundant workers; (iv) whether the employer needs approval from a third party to terminate one redundant worker; (v) whether the employer needs approval from a third party to terminate a group of 25 redundant workers; (vi) whether the law requires the employer to reassign or retrain a worker before making the worker redundant; (vii) whether priority rules apply for redundancies; and (viii) whether priority rules apply for reemployment. For the first question, an answer of yes for workers of any income level gives a score of 10 and means that the rest of the questions do not apply. An answer of yes to question (iv) gives a score of 2. For every other question, if the answer is yes, a score of 1 is assigned; otherwise, a score of

0 is given. Questions (i) and (iv), as the most restrictive regulations, have greater weight in the construction of the index. Averaging the scores and scaling the result to 100 give a final index. Higher values indicate more rigid regulation.

4. Count of visa exemption only includes tourist and business visits.

5. *Ibid.*

Cost: Post-recession, the rich get cheaper

Two things truly are remarkable about the five lowest cost cities in this year's rankings. First, none is from a developing country. Second, they are all in North America. Last year, by contrast, Johannesburg was ranked first in this indicator, and Santiago tied for fourth. This year, Johannesburg and Santiago are tied for eighth, which make them the only non-Western cities in the top 10. Last year, there were five non-Western cities—including Seoul, Dubai and Mexico City—among the top 10 rankings.

As was the case last year, however, this indicator confirms the potential of smaller cities,

or cities that are not among the long-established global financial capitals, to compete in attracting investment. The four top cities in this ranking—led by Houston by a significant margin, followed by Los Angeles, Chicago, and San Francisco—are surprisingly affordable places to do business. The issue now for these cost-competitive cities is to maintain their advantages.

This year's rankings also challenge the traditional perspective on the cost-competitiveness of mature cities. Eight of the top 10 cities come from the developed world (with Stockholm jumping five places from last

	Total tax rate	Cost of business occupancy	Cost of living	Purchasing power ¹	Business trip index ²	Score
26 Houston	19	25	24	25	23	116
25 Los Angeles	15	24	16	24	22	101
24 Chicago	18	21	21	21	18	99
23 San Francisco	13	22	22	23	16	96
22 Toronto	17	13	19	19	26	94
21 Berlin	14	20	17	20	20	91
20 Sydney	11	16	10	26	24	87
19 Johannesburg	22	26	25	10	3	86
19 Santiago	24	23	23	6	10	86
17 Stockholm	8	11	19	16	25	79
16 New York	12	17	12	23	13	77
15 Abu Dhabi	26	9	14	13	8	70
14 Singapore	23	14	4	7	16	64
13 Madrid	6	12	15	15	14	62
12 Hong Kong	25	1	3	12	19	60
11 London	20	2	8	18	11	59
10 Mexico City	9	19	26	2	2	58
9 Seoul	21	10	5	9	12	57
8 Paris	2	6	8	14	21	51
7 Istanbul	16	8	13	5	4	46
6 Tokyo	7	3	1	17	17	45
5 Shanghai	5	15	11	4	6	41
4 Beijing	5	18	6	3	7	39
3 Moscow	10	5	2	11	9	37
2 São Paulo	1	7	9	8	5	30
1 Mumbai	3	4	20	1	1	29

Each city's score (here 116 to 29) is the sum of its rankings across variables. The city order from 26 to 1 is based on these scores. See maps on pages 18–19 for an overall indicator comparison.

1. Domestic purchasing power is measured by an index of net hourly pay (where New York = 100), including rent prices. Net hourly income is divided by the cost of the entire basket of commodities including rent. The basket of goods relates to 122 commodities.

2. Weighted index of the cost of a business trip to a city, including measures such as taxi cab rates, lunch prices, and quality of entertainment and infrastructure. The business travel index comprises the following five categories: stability, healthcare, culture and environment, infrastructure and cost.

High
Medium
Low

Highest rank in each variable

year to reach the 10th rank this year). The notion, therefore, that North America, Europe and Australia are doomed to be perennially uncompetitive on costs might have to be re-examined—as PwC’s 2011 annual CEO Survey recently showed. Chief executives now rank the US and Germany among the top five countries for sourcing along with China, India and Brazil, competing favorably on a combination of cost, quality and innovation (see www.pwc.com/ceosurvey).

Nonetheless, the developing world maintains considerable benefits. Johannesburg remains first in cost of business occupancy and continues to do very well in cost of living and total

tax rate. What most affected its ranking this year was the transfer of the business trip index to this indicator. Moreover, Mexico City ranks first (that is, most affordable) in cost of living (coming up from second last year), while Abu Dhabi has the lowest tax rate (as Dubai had last year). The problem for every city in the developing world is to translate these and other advantages to benefits for their citizens. One key measure, however, points to a relative lack of success on that count.

Sydney ranks first in its citizens’ purchasing power, followed by Houston and Los Angeles. Counterintuitively, perhaps, for those who have lived or visited there, San Francisco and

New York tie for fourth. At the very bottom of the rankings comes Mumbai, followed (in ascending order) by Mexico City, Beijing, Shanghai and Istanbul.

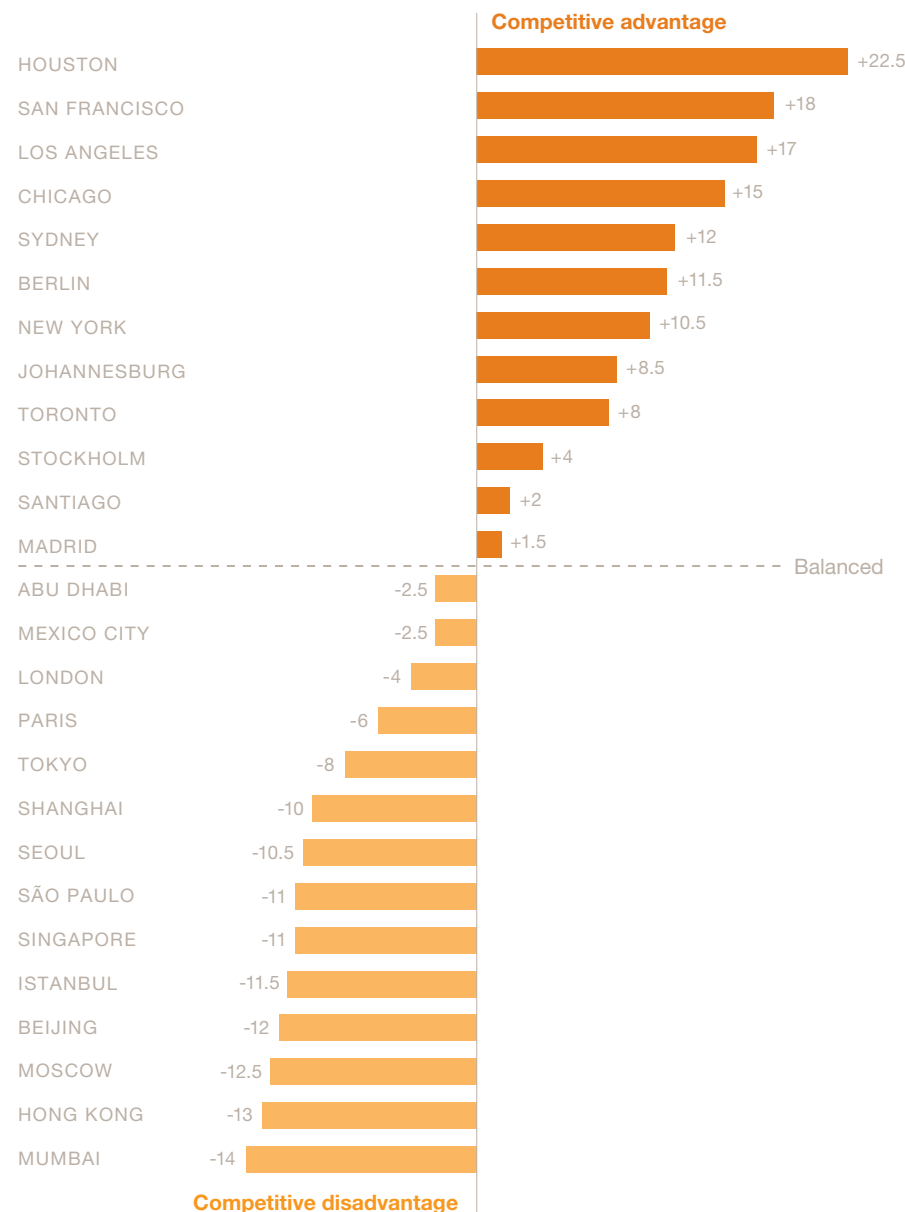
Of course, as we noted last year, purchasing power is greatly enhanced by high salaries, which are concentrated in the major cities of the advanced economies. Also, the 122 Western goods and services that compose the basket of goods measured by this variable might skew the results to the disadvantage of the cities of the developing world. Still, the rankings show that good salaries are not so much an impediment to as a confirmation of a city’s overall competitiveness.

Confirming the pattern: Western lifestyles are (usually) cheaper in the West

Once again, this year’s study confirms—even more so than last year’s—that Western lifestyles are decidedly expensive in the East (and South); they also are unavoidable given the realities of transnational business. Last year, five out of seven cities with a competitive advantage in costs were from the mature economies; this year, 10 out of 12 are.

Each city’s relative cost was calculated based on cost of business occupancy and cost of living as compared with purchasing power. Costs of business occupancy feed directly into operating costs. The cost of living affects the wages needed to attract the best workforce. Purchasing power serves here as a proxy for productivity, or, broadly, the production of goods and services.

We determined each city’s average costs by creating a factor of costs of living and business occupancy weighted in inverse proportion to purchasing power. The resulting ranking gauges general levels according to basic economic theory; that is, a city in a rich country with high purchasing power should be more costly on a relative scale. Divergences from what might be expected determine competitiveness.



René Gurka sees Berlin

... as “the place to be” for media, life sciences, clean industries and services as the once-divided city re-establishes itself as a business center



René Gurka of Berlin Partner.

Energy, art and good quality of life make Berlin today a magnet for creative people. But the city also faces a challenge in turning itself back into a business center after a traumatic history of war, division and dislocation. René Gurka, managing director of Berlin Partner, a civic organization devoted to the economic development and marketing of Berlin, is busy tackling that challenge. Gurka himself brings global perspective to the job after spending six years helping German businesses put down roots in San Francisco and Atlanta.

What are you doing to re-establish Berlin as a world capital in business and finance?

First of all, even before the Wall came down 20 years ago, for the 45 years before that, we were not a business center anymore. After the Second World War, Berlin's business time was over. Siemens was founded in Berlin; Deutsche Bank was founded in Berlin. Both of those companies moved immediately. And they never came back with their headquarters. So when, 20 years ago, the Wall came down and 12 years ago the German government moved to Berlin, we were in a very special situation. The economic environment was down. Production had

lost 100,000 people in the nineties because all of the factories were heavily subsidized during the Cold War. ... So after the Wall came down, the money in the West went, and the other companies were closed because you could not sell their product.

What did the city do to change the situation?

They ... began to develop a very clear strategy. They sat down in 2001 and said, “Okay, we're down to nothing; we have a very bad income situation so let's see what is left.” They said, “First, we have a great creative scene in Berlin. We have artists, we have galleries, we have little IT companies.”

Then they looked around and saw there is a biotechnology scene. And they realized life sciences is big in Berlin. “Let's concentrate on that.” The next thought was, “What's left of industry?” They saw that traffic, railway and energy is our most common industry. And then they thought of the service industry, because we're the capital of the country, and lots of ministries will come here. ... So the service industry will probably do well.

That way, the city defined four clusters and chose to work in them and not get distracted. After almost 10 years of this new cluster strategy, in the last five years, we saw an increase of

It's very easy if you're an international company to locate a business in Berlin. ... More and more, we're trying to be an alternative location to London for foreign companies coming to Europe.

more than 10% of new jobs ... which is amazing. Boom cities like Atlanta and cities in Asia had figures like that.

These are all highly skilled jobs you're talking about.

Yes, exactly. Out of the bad nineties that we had, we still have a very high unemployment rate, around 14%. Now we're creating jobs, and everything is going well. More and more, people are willing to drive every day from Brandenburg into Berlin. And then we have a lot of young people who want to be in Berlin because Berlin is hip. So the interest is still higher than the availability of open jobs here.

What explains the fact that Berlin has seen such a great influx of people with skills?

I think the biggest reason is space, and all types of space. There is space for people to be creative. There's enough space to come with different religions, different ideas, different sexuality. Everything is possible in Berlin, and everybody finds his little niche of whatever he's looking for.

Where does Berlin Partner come in?

We were founded five years ago. We came from different agencies: a traditional economic development agency, a traditional foreign trade agency and a city marketing association. When we were founded, it was as a public-private partnership between the industrial and business community of Berlin and the public sector. Today, the foreign direct investment rate in Berlin is one of the three highest in Germany.

How does that stack up within the EU?

Germany overall is the highest, behind the UK. But, actually, we're trying to get a piece of the UK cake. Because we in Berlin now think it's very easy, if you're an international company or have an English-speaking management team, to locate a business in Berlin because most people speak English. We have a very international environment now ... More and more, we're trying to be an alternative location to London for foreign companies coming to Europe ... If you're comparing costs, you would not believe how cheap Berlin is in comparison with London, Paris, New York and all the other cities. ... It's not just cheap. You get value. That attracts the creative class.

Is the history of art and culture in Berlin a draw?

The younger people coming here are thinking about the "now" and saying it's the coolest city. ... The mindset is different here. We are a little bit Stockholm, we're a little bit San Francisco, we're a little bit Manhattan. Now, 20 years after the fall of the Wall, we are realizing we are not like other cities. We don't even want to be like another city. We want to be Berlin.

Now we have the highest rate of new companies being founded in Germany. All this comes together now. And it took 10 years. I would always say about Berlin it was a very ill patient. After the Wall came down, Berlin went into intensive care. Now, the patient actually has healed. The patient is out of the hospital, and it'll take

time, but the patient is getting better and better every day.

In a sense, the crisis also was an opportunity. You can't start from nothing in London, New York or Paris.

Absolutely. And consider, 50% of the people in Berlin have been exchanged in the last 20 years. Fifty percent of the 3.5 million Berliners are new Berliners, either by birth or having moved here.

What is your vision for the future of Berlin?

From an economic development perspective, we want enough growth and enough jobs created so that the 3.5 million people living here have a good and easy life and can find enough work to finance their life. On the other hand, I am convinced that we will not be very successful in relocating companies from within Germany. Siemens is not going to come back. Deutsche Bank is not going to come back. But we have a chance for international companies. And when I view us as a mini-Silicon Valley, I think we have the chance to create big stock companies that will make it

into the index in the next 10-15 years because all the potential is in Berlin.

What struggles is the city confronting in achieving cohesion between immigrants and native Germans?

There has been an intensive discussion about that. ... I would say that the people living in Berlin today are trying to live a new lifestyle. We're trying to connect the dots. Nobody's going to close his eyes and say, "it's not my problem." Last week, I was in a meeting with the ambassador of South Korea and the ambassador of North Korea. What do you think goes through their minds, sitting in a city like Berlin, that was a separated city? They must say, "Hey, what are we doing?"

Final thoughts?

Quentin Tarantino came and lived for six months when "Inglourious Basterds" was being filmed in Berlin. A guy like that comes to town, and he says, "It's so cool. I'll stay here." The brain drain is a big issue today—smart people going away. But Berlin, surprisingly, is a city where smart people are coming back.

This interview has been condensed for publication in the report. To read all full-length interviews, please visit our website: www.pwc.com/cities.

Demographics and livability: The key to happiness unlocks a Pandora's Box of questions

What defines socioeconomic well-being—that happy state where people are satisfied and productive, businesses are busy and making money? On the personal side, various studies offer differing keys to happiness: not smoking, being educated, exercising, enjoying good health, living in warm climates, living on islands and, of course, having more money. The list goes on. Perhaps most persuasively, it might be argued, people are most satisfied when they like what they have at the moment, not what they might have in the future. But the restless energy and pursuit of progress that builds great cities takes a bit of a different twist.

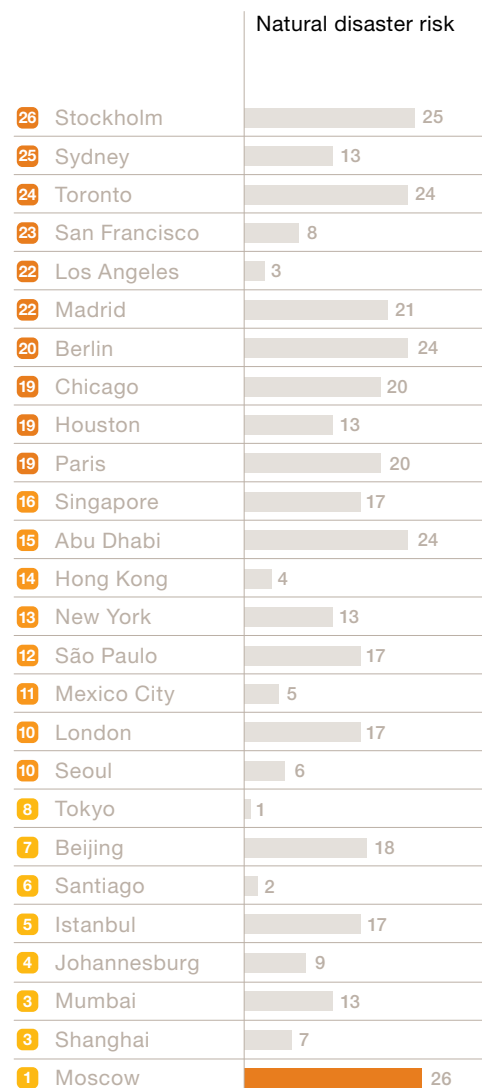
In gauging demographics and livability, *Cities of Opportunity* considers a potpourri of ingredients: the size of a city's working age population and speed of its workers' commutes, housing stock, quality of living and life satisfaction, heat and humidity, and the risk of natural disaster.

We find top-tier cities that balance healthy demographics and livability are sometimes a bit off the beaten path of the world's "alpha" cities. Stockholm moves from ninth to first this year, while Sydney and Toronto again finish toward the top, taking second and third, respectively. These are joined by a kindred city spirit in San Francisco, which is new to the study. A history of city planning and action also seems to characterize those cities that do well here. Chicago, Paris, Singapore, Berlin, each in its own way, have shown a commitment to planning and finish in the top half.

If anything, housing offers one of the best keys to socioeconomic happiness in our study. Tracking the interrelated movement of all variables in *Cities of Opportunity* shows that available, affordable, good quality housing correlates very closely with other traits perceived to be positive such as good end-of-life care, healthy entrepreneurial and political environments, and a robust digital economy. (See discussion of indicator correlations on page 16 and customizable heat maps for the 66 variables on www.pwc.com/cities.)

While our data do not show which comes first, the chicken or the egg, housing or good economy, it does show that they tend to occur concurrently. The weather can be good or bad, the commute a pleasure or a pain, the city predicted to fall into the sea, but good housing seems a prerequisite if a city is to achieve healthy socioeconomic balance. At the end of the day, it appears, happiness is where the home is in terms of holistic urban well-being.

And, paradoxically, despite all the attention paid to the daily weather forecasts, thermal comfort has a weakly negative correlation with the traits often associated with a vibrant society like robust housing, entrepreneurship and digital economy. For instance, São Paulo, our most temperate city, still faces challenges in terms of building its economy and quality of life, but frigid Stockholm and Toronto are among our strongest cities.



Thermal comfort ¹	Working age population	Housing	Commute time ²	Quality of living	Life satisfaction ³	Score
5	14	22	22	24	25	137
24	10	26	11	25	25	134
7	19	24	7	26	26	133
19	23	22	19	15	25	131
25	13	22	20	16	25	124
17	8	22	21	18	17	124
10	3	24	26	21	14	122
7	15	22	8	19	25	116
9	6	22	24	17	25	116
16	20	13	13	23	11	116
13	22	26	9	15	11	113
3	26	10	25	8	14	110
16	24	13	16	20	14	107
11	11	22	3	12	25	97
26	5	7	15	5	17	92
23	18	5	18	3	18	90
12	2	22	2	13	15	83
8	25	10	17	11	6	83
14	7	22	6	22	9	81
3	21	7	14	7	8	78
20	12	3	23	10	6	76
18	17	5	12	2	3	74
22	16	13	5	5	1	71
21	9	1	1	1	3	49
4	4	10	10	6	8	49
1	1	2	4	9	4	47

Each city's score (here 137 to 47) is the sum of its rankings across variables. The city order from 26 to 1 is based on these scores. See maps on pages 18–19 for an overall indicator comparison.

1. Measure of the average deviation from optimal room temperature (72 degrees Fahrenheit). January and July heat indices were calculated for each city using an online tool that integrates average temperature and average morning relative humidity during each month. A final thermal comfort score was derived by first taking the difference between a city's heat index for each month and optimal room temperature and then averaging the absolute values of these differences.

2. Average commute time for workers commuting into or within the city.

3. Based on an international survey of country populations in response to the question, "All things considered, how satisfied are you with your life as a whole these days?"

■ High
■ Medium
■ Low

■ Highest rank in each variable

Are we there yet?

On the slow lane to congestion management

Everyone who has ever lived, or worked, in a major metropolitan area knows the psychic costs of traffic congestion. Unfortunately, there are substantial economic and social consequences as well.

These were quantified several years ago by the Partnership for New York City.¹ It found that congestion in the greater New York City region added approximately \$1.9 billion to the costs of doing business, led to \$4.6 billion in unrealized business revenue, and cost some \$5 billion to \$6.5 billion in lost time and productivity, as well as an estimated \$2 billion in wasted fuel and other vehicle operating costs. In total, the increasing problem of traffic congestion costs the New York City regional economy more than \$13 billion a year, resulting in the loss of as many as 52,000 jobs annually.

And, obviously, these negative effects are in addition to the environmental damage caused by uncontrolled traffic congestion. Clearly, decreased congestion fundamentally improves most aspects of urban life. The problem lies in getting from here to there—from plainly unsustainable levels of urban gridlock to more viable patterns of urban transport, not only of human beings but of the goods and services that keep a city functioning.

Many factors will constitute a final mix of policies to that end, from HOV lanes in the highways leading to city centers, to enhanced mass transit, to urban densification, to energy policy, to technological developments

in the design of automobiles themselves (electric cars and hybrids, most obviously). One policy that has increasingly attracted municipal authorities and planners throughout the world is congestion pricing since it tackles the problem directly—that is, through economics and the price mechanism.

Singapore led the world in congestion pricing

in 1975. In 1998, electronic pricing was extended to all roads leading into the central business district, as well as to expressways and heavily used arterial roads. The new system has helped to tweak road-usage patterns. Peak traffic has eased and spread into off-peak hours, while average speeds for major thoroughfares have remained constant despite increased traffic volumes over the years.

It is important to note, however, that Singapore decided 20 years ago to reinforce congestion pricing with policies that severely limited car ownership—including the requirement that anyone wishing to buy a new car in Singapore must bid on and win a “certificate of entitlement” through a monthly auction. The costs of these certificates have become so high that it almost is prohibitive for many residents to own a car in Singapore. As a result, per capita car ownership stands at about 122 per 1,000 (as opposed to 780 per 1,000 in the US, for example).

Europe’s experience also is generally positive. Stockholm introduced a congestion fee in 2007 for cars entering and leaving the inner city during business hours. Three years later, traffic had declined by approximately 20%, and traffic jams in and

Pricing policies make a small dent in the pileup of inner city traffic problems as Stockholm eases the pain, London regains some and Singapore takes a slightly different turn.



Cars entering London's congestion charging zone.

around the center had decreased by 30%. (A recent “commuter pain” study showed that Stockholm’s citizens suffer the least grief of any commuters in 20 major cities of the world.)²

In London, authorities introduced a congestion charge in 2003 and extended it between 2007 and 2010, although in January 2011, the “western extension” area was removed from the charging scheme. In the central congestion charging zone, according to the latest traffic monitoring report, there continues to be a 16% decrease in all vehicles entering the zone when compared with pre-charging traffic levels.³

As streets and roads are traditionally considered a public good, congestion charges represent new

costs to users. A critical factor in introducing them, therefore, is not only governmental resolve—as elections are a risk to officials wanting to implement such policies—but freedom of action. Mayor Michael Bloomberg’s approach to traffic congestion in New York, to give an obvious example, was not even put to a vote in the state assembly. (In Sweden, by contrast, the national government was allied with city authorities in moving Stockholm’s plan forward.)

In any case, congestion management requires regional solutions. In fact, it demands input from every level of government, including national leadership—which is the common lesson to be learned from both Singapore and Stockholm.

1. *Growth or Gridlock? The Economic Case for Traffic Relief and Transit Improvement for a Greater New York*, Partnership for New York City, December 2006.

2. *IBM Global Commuter Pain Study Reveals Traffic Crisis in Key International Cities*, IBM, June 2010.

3. *Central London Congestion Charging Sixth Annual Impacts Monitoring Report*, 2008. <http://www.tfl.gov.uk/assets/downloads/sixth-annual-impacts-monitoring-report-2008-07.pdf>.

Lifestyle assets:

Following your urban bliss, from green to neon to basic black

The greatest changes in this section this year have to do with the definition of the indicator itself, which now tries to capture more of a city's actual character and its real cultural gravity in the wider world. We also have added and deleted some variables and changed the definition of a very important one. In so doing, we have sought to further clarify, and enrich, the information conveyed.

First, for the changes: We deleted top global fashion capitals and top 100 restaurants and moved the business trip index to the cost indicator. We also have moved green space as a percent of city area from sustainability to here because, increasingly, a green quality of life is seen as an aesthetic and cultural good, as well as an environmental one.

Most important of all, we have tried to quantify a city's actual cultural impact with the new variable, cultural vibrancy, which represents a much more robust aggregation of data.

We have added two new measures to our former entertainment variable to gauge cultural vibrancy: the number of museums (with an online presence) within each city and that city's "zeitgeist." The former is a concrete, and self-evident, gauge of a city's specific cultural identity; the latter speaks to current cultural influence and linkages that can't be captured by the number of a city's museums or the quality of its restaurants. Finally, because of the increasing significance of sport in the modern world—not to mention the importance of one or more teams to a city's self-definition—we have made sport and leisure activities an independent variable, freeing it from its previous incorporation in entertainment.

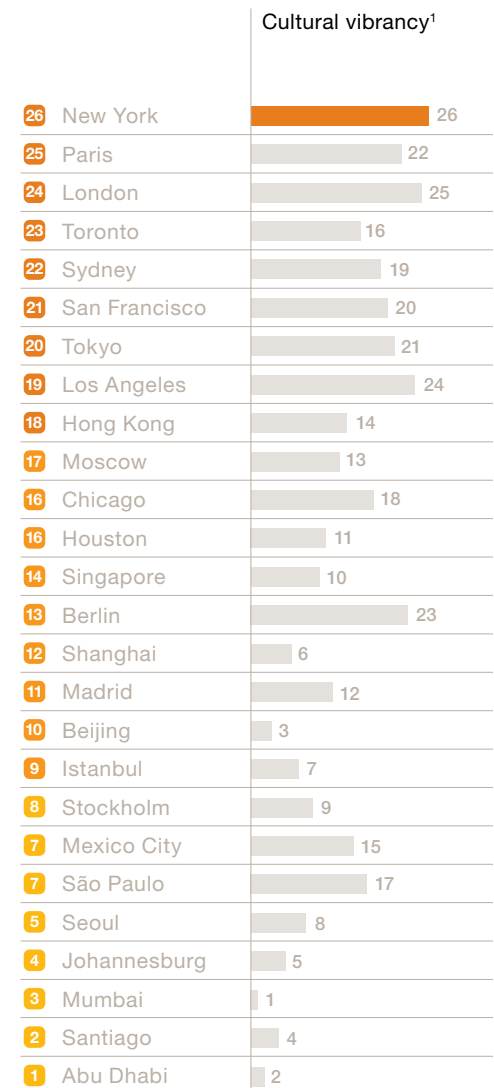
Now for the rankings: It is in this category, yet again, that a great city proves to be more than the sum of its parts, more than just an array of steel, concrete and madding crowds.

Great cities remain so, in large part, because they are the ongoing laboratories of human interaction and of the art and culture produced by this enduring exchange. For several years, New York, Paris and London have unsurprisingly ranked at or near the very top. This year, however, because of our changes, Hong Kong drops to ninth from third last year. It is joined by Tokyo as the only other Asian city among the top 10, as Singapore also has dropped seven places this year.

Asian cities lead in other variables, however. Beijing is ranked first in hotel rooms, while Hong Kong remains at the very top in the impact of its skyline. Still, while nine cities are tied for first in sport and leisure activities, none of them are Asian.

Stockholm, true to its reputation for environmental leadership, scores highest in green space. Moscow scores second. Russia's capital mostly does well in lifestyle assets and just makes the top 10.

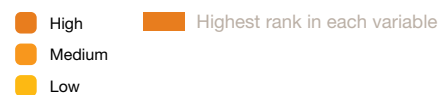
Finally, it is telling that, whereas Frankfurt scored fourth from the bottom in our 2010 report, Berlin scores in the middle of the pack this year, at the very top of the second half of the rankings—and fourth in cultural vibrancy. Berlin is generally recognized as having become one of the liveliest cities in Europe since German unification (see interviews with René Gurka and Rem Koolhaas, on pages 64 and 24, respectively) and a magnet for younger people especially. São Paulo also makes it into the top 10 in cultural vibrancy as the global media buzz intensifies around its fashion, nightlife and energy. There is something to be said for "zeitgeist," after all.



Sport and leisure activities	Green space as a percent of city area	Skyline impact	Hotel rooms	International tourists	Score
26	22	25	23	25	147
26	23	9	22	23	125
26	14	7	25	26	123
26	17	19	13	20	111
26	24	15	12	9	105
26	21	12	11	14	104
12	10	24	24	12	103
26	13	13	8	18	102
12	7	26	16	22	97
6	25	16	18	17	95
26	15	22	9	4	94
26	20	17	19	1	94
17	8	21	10	24	90
17	18	2	15	13	88
6	11	23	21	19	86
17	16	6	17	16	84
2	19	18	26	15	83
12	4	8	20	21	72
17	26	1	8	7	68
12	12	10	5	11	65
12	3	14	14	5	65
6	6	20	6	10	56
17	9	5	1	6	43
2	5	11	3	8	30
12	1	3	2	2	24
6	2	4	4	3	21

Each city's score (here 147 to 21) is the sum of its rankings across variables. The city order from 26 to 1 is based on these scores. See maps on pages 18–19 for an overall indicator comparison.

1. Weighted combination of city rankings based on: the quality and variety of restaurants, theatrical and musical performances, and cinemas within each city; which cities recently have defined the "zeitgeist," or the spirit of the times; and the number of museums with online presence within each city. The "zeitgeist" rankings take into account cultural, social and economic considerations.



Past perfect?

Cities walk a fine line between welcoming progress and preserving historic structures and ways of life

During a recent month, an unscientific sampling of the morning newspapers in New York uncovered stories on saving the traditional hanoks of Seoul, courtyard communities similar to the hutongs of China; preserving the ruins of ancient Babylon; relocating the planned glass-and-steel Gazprom tower in St. Petersburg to maintain harmony in the city's historic heart; protecting one of the few idyllic ponds left in New York City's Bronx from nearby development; and restoring a longer stretch of Manhattan's High Line, an obsolete, raised freight

line recently transformed into a park through community support.

Perhaps most telling is a small town drama unfolding in the heart of Brooklyn, until 1898 a city of its own. Long known in America as a place that welcomes a good fight, downtown Brooklyn residents, businesses and preservationists are battling over a plan to create a historic district amid 20 or so commercial buildings dating from the turn of the 20th century.¹

Opponents argue the buildings being saved are nothing special. "It looks like downtown Detroit," one resident commented. Businesses fear development and commerce will dry up with historic designation. Property owners worry landmark status will bring costly maintenance requirements. Preservationists, on the other side, argue distinguished architecture deserves to be protected.

Preservation is taking off

worldwide: Twelve percent of the world's surface now is preserved, and a vast amount of new area awaits heritage certification, according to a study done by AMO, the research arm of the Office of Metropolitan Architecture (OMA), for last summer's Venice Biennale at which Rem Koolhaas was awarded the Golden Lion for lifetime achievement.² While Europe accounted for the bulk of preservation a century ago, the pendulum now is swinging the other way, according to the

research. Certification of today's planned heritage sites will even out the spread of preservation across the continents. (*Cities of Opportunity* considered measuring and comparing urban preservation efforts, but it quickly became apparent that differences among cultures and economic conditions would make city comparisons unwieldy, inaccurate or impossible.)

OMA*AMO's work also shows the time interval is shrinking between construction of a building and its historic designation. And, ironically, heritage status attracts waves of tourists who, in turn, jeopardize the integrity of what was just preserved.

What's going on here? The past is hot in the present. And why do we care so much about it? In the simplest of senses, progress clearly demands change. It's the mantra of modern business, "change is good" and heart of homey wisdom, "You can't make an omelette without breaking some eggs."

But perhaps a better question should be asked to explain the immediacy of preservation today: What is authentic? And why do we care about that? The hunger for the real often lies at the center of preservation debates if the surface is scratched deeply enough. In the age of virtual life, authenticity offers a natural antidote to impersonal personal communications; consumer goods that are the stuff of dreams (even with obsolescence-



In its heyday in the mid-20th century, the High Line hauled goods above Manhattan's industrial heart directly into factories and warehouses, avoiding congestion in the streets below.

“Redevelopment destroyed not only social networks but also took away the particular identity...a place had for centuries” van Oers says.



After the trains stopped in 1980 and before it became a park in 2009, the High Line welcomed weeds, refuse and rust. Demolition appeared the next step.

Joel Sternfeld, *Fallen Billboard*, November 2000 Courtesy of the artist and Luhning Augustine, New York.

guaranteed); throwaway culture that makes “15 minutes of fame” seem like an eternity; political correctness and hyperbole that drown out the simple and direct; and preoccupation with process that eclipses the focus on actual results. (Not that all believe preservation, per se, assures authenticity. Some contend the zeal to preserve not only risks exceeding the value of what we’re saving but creates a middle-of-the road limbo; more faux than old or new, quashing imagination and innovation along the way.)

According to Ron van Oers, head of UNESCO’s World Heritage Cities Programme³, careful choreography is required to make the delicate balance of interests work at a time when the entire approach to preservation demands rethinking. Van Oers is optimistic. He currently is drafting new UNESCO guidelines that seek to make conservation a natural strategy for sustainable

development. He envisions a more organic and collaborative model than the modernist era of engineering neighborhoods in and out of existence based on distant ideas rather than on local needs; of developers bankrolling change at the expense of communities; of architects manufacturing instant landmarks; or of preservationists fighting to protect historic structures without equal care for surrounding ways of life.

“Society has become so complex with so many stakeholders, each having their particular view and settled values, that the traditional, purely technical way of doing preservation is not cutting it anymore,” van Oers explains. “The discussion is pretty similar all over the world,” from the hutongs of Shanghai, to the favelas of São Paulo, to 19th century neighborhoods in lower Manhattan, to Paris, Rome, Liverpool and Manchester.

“What we have seen in the last decades of the 20th century was that redevelopment destroyed not only social networks but also took away the particular identity and feeling, the atmosphere that a place had for perhaps centuries. Now planners, decision makers and conservationists are trying to identify those elements that should be retained so that either building stock can be renewed or careful surgical interventions in the built environment can maintain the sense of place and identity.”

Van Oers draws an analogy to selective forestry where timber is preserved to provide a continuing habitat. “Instead of clearcutting and razing to build something completely new and then put people back in, in a sort of numbers game, the aim now also is to maintain social networks when preserving urban heritage sites. No matter what forces created a heritage, local

communities are its living custodians; they embody it. Community participation ultimately makes the difference between preservation’s success and failure. Heritage conservation has to be matched to serve local needs, not only preservation itself.

“Otherwise expenses will fall on city authorities ... Social networks take care of each other. Uprooted

1. Joseph De Avila, *The Wall Street Journal*, December 15, 2010, “Save Brooklyn? Fuhgeddaboutit”.

2. CRONOCAOS, OMA*AMO, Venice Biennale 2010 exhibit. From the introduction: “OMA and AMO has been obsessed, from the beginning, with the past. Our initial idea for this exhibition was to focus on 26 projects that have not been presented before as a body of work concerned with time and history. ... We show the documentary debris of these efforts. But 2010 is the perfect intersection of two tendencies that will have so-far unauthorized implications for architecture: the ambition of the global taskforce of ‘preservation’ to rescue larger and larger territories of the planet, and the—corresponding?—global rage to eliminate the evidence of the postwar period of architecture as a social project. In the second room, we show the wrenching simultaneity of preservation and destruction that is destroying in any sense of a linear evolution of time. The two rooms together document our period of acute CRONOCAOS.”

3. See World Heritage papers 27, *Managing Historic Cities*, September, 2010, for a compilation of essays by van Oers and others on urban preservation, <http://whc.unesco.org>.



Today, community support has restored the High Line as a popular park crowded with local residents and tourists who stroll above the now trendy neighborhood near the Hudson River.

“The world needs a new system mediating between preservation and development,” Koolhaas writes. “We have never theorized a way to keep not only the physical substance, but, as in a time machine, also the life that came with it.”

communities and families provide automatically more problems for city authorities whether it's in health or productivity or economic cost.”

Koolhaas interjects other considerations, citing “ambiguities and contradictions”: “How can the preserved “stay alive and yet evolve?” How can political correctness be stopped from allowing “the past to become the only plan for the future?”

Ultimately, Koolhaas writes in CRONOCAOS at the Venice Biennale, “The world needs a new system mediating between preservation and development ... We have never theorized a way to keep not only the physical substance but, as in a time machine, also the life that came with it ... Pre-emptive mediocrity has become our dominant expression of respect for history... It has become impossible to date large sections of urban production; a low-grade unintended ‘timelessness’ is our contribution to the march of civilization.”

In his current restoration for the four buildings that make up The Hermitage, Koolhaas approaches preservation with as little intervention as possible, allowing the past to speak for itself. “We want to create a greater complexity but maybe also greater transparency regarding what happened there ... This is where the tsars lived; it's also where the Russian Revolution broke out. So let's see whether we

can make the experience of this building reveal more about the period.” (See full interview with Rem Koolhaas as well as video at www.pwc.com/cities.)

All in all, urban preservation seems to be navigating its way between a rock and a hard place on a number of nettlesome issues: Maintain the old, sometimes without discerning prudently between gems and junk. Stay away from projects that challenge imagination, aesthetics and functionality. Settle somewhere in the middle for plasticized paeans to the past; cityscapes congealed like mummified kings, neither fully alive nor fully dead. And justify investing energy and resources in historic preservation when budgets are challenged in the present, sometimes in providing adequate water, decent housing and healthcare.

However, 400 years later, the debate between two notable city thinkers, Descartes and Spinoza, over which deserves pride of place, mind or body, still appears to be playing out as developers,

planners, city officials and neighborhoods try to define the right approach to preservation. Which comes first, people or structures; mind or body?⁴ Each side has strong points.

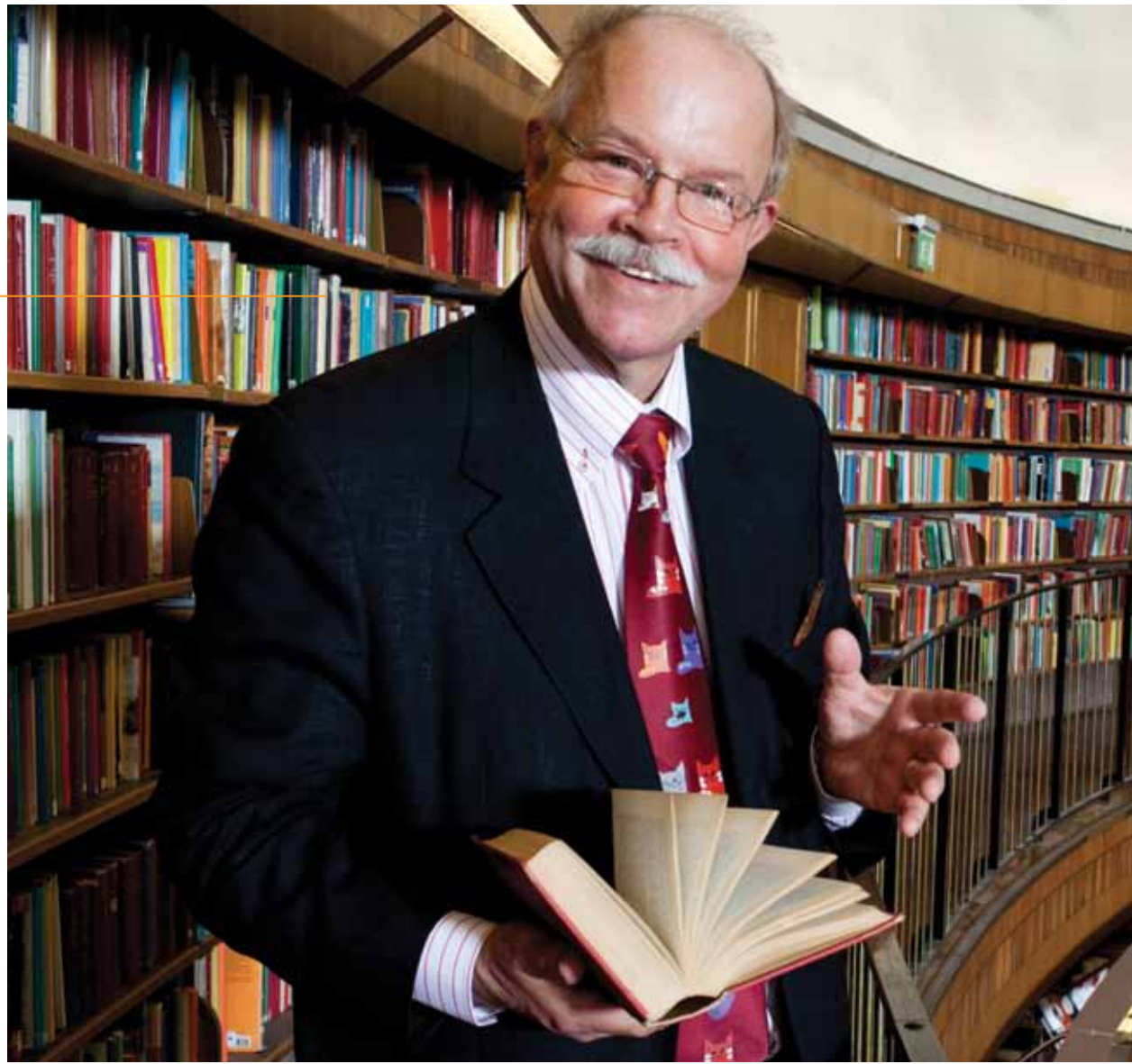
Resolving the issues—like determining whether the devil or angel lies in the details—will depend on the energy, tenacity and humanity applied to the problems. Mean-time, the promise of the city continues to inspire dreams and plans. And the energy and intelligence to build the future comes from the people who put down the roots that build a heritage worth saving.

4. After moving to Golden Age Amsterdam in 1629 to get away from the distractions of Paris, Rene Descartes, champion of the life of the mind, wrote: “Amidst this great mass of busy people who are more concerned with their own affairs than curious about those of others, I have been able to lead a life as solitary and withdrawn as if I were in the most remote desert, while lacking none of the comforts found in the most populous cities.” [The Philosophical Writings of Descartes, Cambridge University Press, 1985]. Benedictus Spinoza would be born in Amsterdam three years after Descartes' arrival. Spinoza was soon to be excommunicated from the city's Jewish community for his freethinking ideas that included naturalistic views on God and a belief that bodily emotions and rational behavior were causally intertwined. This differed from Descartes, “Cogito, ergo sum or “I think, therefore I am.” One way or the other, the debate continues today.

Please see www.pwc.com/cities for videocasts of our discussion with Rem Koolhaas and a full-length transcript.

The future unfolds for Leif Edvinsson

... on a course “from cities of hardware to cities of mindware”



As a professor at Lund University and Hong Kong Polytechnic University as well as the first chief knowledge officer at the insurer Skandia, Leif Edvinsson pioneered understanding of the dynamics of intellectual capital in modern companies and communities—work that led the British Brain Trust to name him “brain of the year.” Here, Edvinsson discusses intellectual capital in various contexts, the successes and challenges of particular cities and the “neural planning” that can help cities prepare for a knowledge-centered economy.

Do you see the physical quality of life in a city related to the quality of intellectual capital?

Absolutely. That’s why this might be the way we progress: from cities of hardware to cities of mindware. But that is the quality dimension. This year’s Monocle rankings of the most livable cities in the world were Munich at number one; number two, Copenhagen; and number three, Zurich. All small cities with easy access. You can bike around, and it’s easy to build relationships in such cities.

How do you envision the intelligent city of the future? What will it look like? What will its government, thinkers, business and social leaders be doing in areas like intellectual capital, and related areas, to assure continuing socioeconomic well-being?

I think there are at least three dimensions to this question, which is a challenging one. The long-term, visionary perspective is that the future city, 25 years down the road, will be like a brain, in which urban planning becomes brain or neural planning for the city. And we will be looking at how to create synapses between brains by creating special

mind zones instead of shopping centers. So as the shopping center is replaced by mind zones, the second dimension will require upgrading the skill of urban planners to the levels of neuroscience.

Another dimension is a focus on drawing the maps of urban value creation to determine where value creation takes place in cities. It used to be the harbor. It used to be the industrial areas. It used to be the offices. In the city of the future, it probably will be the networks, which will not be captured in traditional statistics. So you need to develop the social and city intelligence to create maps to see where value creation is taking place.



Leif Edvinsson in the rotunda of the Stockholm Public Library, a city landmark known for Gunnar Asplund's design and the nation's first open shelf library.

How would you describe these mind zones? What are they?

A mind zone is a kind of open space—an arena, or Ba, as Ikujiro Nonaka calls it—where the traditional square is replaced with a kind of quality-of-life meeting space. The closest illustration we have today is the knowledge café. But in Toronto, as well as here in Scandinavia, because of the climate during the winter, we need a kind of built-in meeting space but still open. A kind of open innovation system, where people go in—you don't know who you'll meet, but you'll probably enjoy being there. It's like going to the Starbucks of tomorrow.

And how do you see a planner's skills combining with neuroscience?

We know today, for example, from a discovery made during the nineties in Italy by Giacomo Rizzolatti that when you sit next to a person in a Starbucks, your neurons jump from your brain to that of the person next to you in a process called “mirror neurons.” It used to be called a “meeting of minds.” But now you actually can measure this with technical devices, which means you can visualize it.

We have to start thinking about the city as a cell—a stem cell, with tremendous potential. But also one that you can kill by not giving it energy, by not cultivating relationships. That's why relational capital is so important for the nourishment and growth of intellectual capital.

Shenzhen's experience confirms that you have to prototype because that reduces the risk level for urban planners: You run a little prototype, which might fail or be successful and then gradually scale up the successful part. Shenzhen had about 30,000 people in 1979 and over 9 million today, as well as a number of major universities.

What recommendations would you give to city governments and city policymakers or to businesses or universities operating in cities? What should they be doing, or thinking about, to help move us in the right direction?

Three steps: Number one is, start asking some good questions about the social intelligence of a city. Observe the signals. The second is, draw a new type of urban map, one based not on houses and streets and flow of water but flow of knowledge—which probably will lead to urban planning that focuses on the in-between spaces.

What's an in-between space?

What's in between buildings. What's in between floors. What's in between people. It's like a photographic negative in which you more or less see the non-tangible dimension.

Finally, the third step is to build and visualize the city as a mind or brain. Consequently, you need to have neuroscientists come and work in urban-planning units.

Has that occurred anywhere?

A little bit, in a city called Solna, here in Sweden, where PwC ran a sustainable city development project two years ago. But the most tangible example of what I'm talking about so far is the city of Helsingborg, which has inaugurated a project called H+, "H"

for Helsingborg. One of the three architectural firms finally chosen by the city to work on the project, White arkitekter AB, in whose team I participated, actually calls its proposal "Mindzone"—which is about developing an urban mind zone, as I described it above, instead of a shopping center.

Looking at how cities in different parts of the world should be building long-term intellectual assets and nurturing knowledge workers, what do you think a mature city in the US or the EU should be doing? Or is that too obvious a question?

It's probably the most complex one. One of the most appealing cases I know of is Shenzhen, which, as you know, is the formerly little city north of Hong Kong that was selected by Deng Xiaoping in 1979 as the prototype for transforming China from communist to capitalist. Its experience confirms that you have to prototype because that reduces the risk level for urban planners: You run a little prototype, which might fail or be successful and then gradually scale up the successful part. Shenzhen had about 30,000 people in 1979 but has more than 9 million today, as well as a number of major universities. Now it's being integrated with Hong Kong into an innovation zone. So the recommendation probably is to prototype a knowledge zone or innovation zone or urban-enterprise zone.

The other family of cities we should mention comprises the teeming emerging cities in Asia, Africa and Latin America. It seems as if there's a tremendous tension between the hope and the challenge. What would you do to build intellectual capital in Mumbai, Johannesburg and other cities in the developing world?

Brain import, localizing structural capital and commercializing it into markets that are both near and far away. For example, today, China is buying a lot of land in Africa as well as leasing land in Mexico for food production. That will have an impact on the trade of food between Africa and China, and it will also upgrade the quality of food production in Africa.

In *Economic Possibilities for Our Grandchildren*, written in 1930, Keynes envisioned that, 100 years later, the economic challenges of sustaining life would be solved, and our new challenge would be to become creative, to use our time constructively for ourselves and others. Do you think that, through advancing wisdom and intelligent use of science and technology, we can ever graduate to that? Where life is no longer a battle for survival?

To some extent, I think the intellectual-capital nations are there already. If you take ordinary Swedes, they work perhaps 30 years during their lifetime—which is about 85 years. In other words, they already spend close to 65% of their lifetime on something other than a job. So, perhaps, we are witnessing this creative, quality-of-life existence already.

This interview has been condensed for publication in the report. To read all full-length interviews, please visit our website: www.pwc.com/cities.

Key to the variables

Air pollution

Measurement of the quality of a city's air based on the degree of pollution from sources such as vehicles and power plants.

Aircraft movements

Count of air traffic movements at each of the major airports servicing a city, including civil international and domestic passenger, cargo and non-revenue flights but excluding military flights.

Airport to CBD access

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 in terms of international passenger traffic. Cities are separated into categories according to whether a direct rail link exists between the city center and the airport—if so, the number of transfers required, and if not, whether there is a public express bus route to the airport. Cities with direct rail links are preferred to those with express bus services. Cities with rail links with fewer transfers are ranked higher than those with more. Cities are ranked against other cities in the same category according to the cost of a single one-way, adult weekday trip and the length of the trip, with each factor weighted equally.

Attracting FDI: Capital investment

Total value of greenfield (new job-creating) capital investment activities in USD in a city that are funded by foreign direct investment. Data cover the period from January 2003 through May 2010.

Attracting FDI: Number of greenfield projects

Number of greenfield (new job-creating) projects in a city that are funded by foreign direct investment. Data cover the period from January 2003 through May 2010.

Broadband quality score

Measurement of the quality of a broadband connection in a given country. The Broadband Quality Study is an index that is calculated based on the normalized values of three key

performance parameter categories: download throughput, upload throughput and latency. A formula weights each category according to the quality requirements of a set of popular current and probable future broadband applications.

Business trip index

Weighted index of the cost of a business trip to a city, including measures such as taxi cab rates, lunch prices, and quality of entertainment and infrastructure. The business travel index comprises the following five categories: stability, healthcare, culture and environment, infrastructure and cost.

City carbon footprint

Annual amount of CO₂ emissions in metric tons divided by the city population. Supplemental national reports on data and policies on greenhouse gas emissions were used when city-level data were not available.

Classroom size

Number of students enrolled in public primary education programs divided by the number of classes in these programs. Primary education programs usually begin at ages five to seven and last four to six years. Primary education is counted as the equivalent of kindergarten through grade 5 in the US education system wherever possible.

Commute time

Assessment of the average commute time for workers commuting into or within a city across all modes of transport, measured in minutes.

Cost of business occupancy

Annual gross rent divided by square feet of Class A office space. Gross rent includes lease rates, property taxes, maintenance and management costs.

Cost of living

Measure of the comparative cost of more than 200 items in each city. Counted items include housing, transport, food, clothing, household goods and entertainment.

Cost of public transport

Cost of the longest mass transit rail trip within a city's boundaries. The cost of a bus trip is used in the cities where there are no rail systems.

Crime

Amount of reported crimes in a city such as petty and property crimes, violent crimes and street crimes.

Cultural vibrancy

Weighted combination of city rankings based on: the quality and variety of restaurants, theatrical and musical performances, and cinemas within each city; which cities recently have defined the "zeitgeist," or the spirit of the times; and the number of museums with online presence within each city. The "zeitgeist" rankings take into account cultural, social and economic considerations.

Digital economy score*

Assessment of the quality of a country's information and communications technology (ICT) infrastructure and the ability of its consumers, businesses and governments to use ICT to their benefit.

Domestic market capitalization

Total number of issued shares of domestic companies listed at a city's stock exchange(s) multiplied by their respective prices at a given time. This figure reflects the comprehensive value of the market at that time in millions of USD.

Ease of entry: Number of countries with visa waiver*

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

Ease of firing

Ranking based on notification and approval requirements for termination of a redundant worker or a group of redundant workers, obligation to reassign or retrain, and priority rules for redundancy and re-employment.

Ease of hiring

Ranking based on restrictions and regulations employers must follow when taking on new staff.

Ease of starting a business

Assessment of the bureaucratic and legal hurdles an entrepreneur must overcome to incorporate and register a new firm. Accounts for the number of procedures required to register a firm; the amount of time in days required to register a firm; the cost (as a percentage of per capita income) of official fees and fees for legally mandated legal or professional services; and the minimum amount of capital (as a percentage of per capita income) that an entrepreneur must deposit in a bank or with a notary before registration and up to three months following incorporation.

End-of-life care*

Ranking of countries according to their provision of end-of-life care. The Quality of Death Index scores countries across four categories: Basic End-of-Life Healthcare Environment; Availability of End-of-Life Care; Cost of End-of-Life Care; and Quality of End-of-Life Care. These indicator categories are composed of 27 variables, including quantitative, qualitative and “status” (whether or not something is the case) data. The indicator data are aggregated, normalized, and weighted to create the total index score.

Entrepreneurial environment*

Measurement of the entrepreneurial attitudes, entrepreneurial activity and entrepreneurial aspirations in a country. The Global Entrepreneurship Index integrates 31 variables, including quantitative and qualitative measures and individual-level data.

Financial and business services employment

Proportion of employees working in businesses located within a city in the financial and business services sectors to the total employed workforce in the city. Where industry data were disaggregated, the equivalents of “finance and insurance” and “real estate and rental and leasing” were included in financial services; and the equivalents of “professional and technical services” and “management of companies and enterprises” were included in business services.

Flexibility of visa travel*

Ranking based on the number of visa waivers available for tourist or business visits and the length of time for which the visa waiver is granted. Ranking is based on the number of those countries that can stay for at least 90 days, excluding those countries whose residents can enter only without a visa if they have a biometric, diplomatic or official passport.

Foreign embassies or consulates

Number of countries that are represented by a consulate or embassy in each city.

Green space as a percent of city area

Proportion of a city’s land area designated as 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.

Health system performance*

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

Hospitals

Ratio of all hospitals within each city accessible to international visitors to every 100,000 members of the total population.

Hotel rooms

Count of all hotel rooms within each city.

Housing

Measure of availability, diversity, cost and quality of housing, household appliances and furniture, as well as household maintenance and repair.

Incoming/Outgoing passenger flows

Total number of incoming and outgoing passengers, including originating, terminating, transfer and transit passengers in each of the major airports servicing a city. Transfer and transit passengers are counted twice. Transit

passengers are defined as air travelers coming from different ports of departure who stay at the airport for brief periods, usually one hour, with the intention of proceeding to their first port of destination (includes sea, air and other transport hubs).

Inflation

Ranking according to how far a country deviates from a +2% inflation rate, with inflation that is closer to +2% being favored over inflation or deflation that is further from this rate. A +2% inflation rate is used as the benchmark because it is widely regarded as a target or healthy inflation rate by large international banks. A country’s inflation rate is based on a projection of how much its Consumer Price Index, which measures the rise in prices of goods and services, is expected to rise during the course of 2010.

Intellectual property protection*

Leading business executives’ responses to the question in the World Economic Forum’s Executive Opinion Survey 2010 that asks, “How would you rate intellectual property protection, including anti-counterfeiting measures, in your country? (1=very weak; 7=very strong).” The survey covers a random sample of large and small companies in the agricultural, manufacturing, non-manufacturing, and service sectors.

International tourists

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

Internet access in schools*

Leading business executives’ responses to the question in the World Economic Forum’s Executive Opinion Survey 2010 that asks, “How would you rate the level of access to the Internet in schools in your country? (1=very limited; 7=extensive).” The survey covers a random sample of large and small companies in the agriculture, manufacturing, non-manufacturing, and service sectors.

Level of shareholder protection

Measurement of the strength of minority shareholder protection against misuse of corporate assets by directors for their personal

gain. The Strength of the Investor Protection Index is the average of indices that measure “transparency of transactions,” “liability for self-dealing” and “shareholders’ ability to sue officers and directors for misconduct.”

Libraries with public access

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

Licensed taxis

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

Life satisfaction*

Average score in robust international surveys of country populations in response to the question, “All things considered, how satisfied are you with your life as a whole these days?” The (Un)Happy Planet Index 2.0 predominantly drew its data from the 2006 Gallup World Poll, with the 2000 and 2005 World Values Surveys being used to fill in values for countries excluded from the Gallup survey. Responses are scored on a numeric scale from 0 to 10, where 0 is dissatisfied and 10 is satisfied.

Literacy and enrollment*

Measurement of a country’s ability to generate, adopt and diffuse knowledge. The World Bank’s Knowledge Index is derived by averaging a country’s normalized performance scores on variables in three categories—education and human resources, the innovation system, and information and communications technology. The variables that compose education and human resources are adult literacy rate, secondary education enrollment and tertiary education enrollment.

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 green space and governmentally protected natural areas from total land area.

Math/Science skills attainment*

Top performers’ combined mean scores on the math and science components of an Organisation for Economic Co-operation and

Development (OECD) assessment of 15 year-olds’ academic preparedness. Top performers are defined as those students who achieved in the top two proficiency levels (Level 5 and Level 6) on the math and science portions of the test. Comparable examinations are used wherever possible to place cities not included in the OECD assessment.

Miles of mass transit track

Total miles of metro, tram and light rail track within a city divided by the total population and then multiplied by 100,000. Includes monorail and commuter rail that run within a city if they operate as metros in the city.

Natural disaster risk

Risk of natural disasters occurring in or near a city. Counted hazards include hurricanes, droughts, earthquakes, floods, landslides and volcanic eruptions.

Number of Global 500 headquarters

Number of Global 500 headquarters located in each city.

Operational risk climate*

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

Percent of gross domestic expenditure on R&D*

Total gross domestic expenditure on research and development in 2007 as a percentage of the gross domestic product.

Percent 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.

Political environment

Measure of a nation’s relationship with foreign countries, internal stability, law enforcement, limitations on personal freedom and media censorship.

Purchasing power

Measure of the comparative relationship between prices and earnings calculated by dividing net hourly income by the cost of a basket of 122 goods and services, including rent.

Quality of living

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

Recycled waste

Percentage of municipal solid waste diverted from the waste stream to be recycled.

Renewable energy consumption*

Percentage of total energy consumption in a nation that comes from renewable sources. Renewable energy sources include geothermal, solar thermal, solar voltaics, hydro, wind, and combustible renewable sources and waste (composed of solid biomass, liquid biomass, biogas, industrial waste and municipal waste). Non-renewable sources include coal and peat, crude oil, petroleum products, gas and nuclear.

Research performance of top universities

Sum of the scaled scores of a city’s universities that are included in the rankings of top performing research universities in the world. Scaled scores are based on the number of articles published, number of citations to published work and the quantity of highly cited papers. The scoring accounts for social sciences papers but not humanities papers.

The rankings favor large universities, universities with medical schools, and universities that focus predominantly on the “hard sciences” rather than social sciences and humanities.

Rigidity of hours

Ranking based on the flexibility in scheduling of nonstandard work hours and annual paid leave for a business.

Skyline impact

Measure of the visual impact of completed high-rise buildings on their skylines, accounting for the height and the breadth of a skyline. Cities are given scores based on the number of buildings located within them that are above 90 meters tall, with taller buildings receiving more points than smaller ones.

Skyscraper construction activity

Count of skyscraper construction projects in each city under way as of September 26, 2010. A skyscraper is defined as any building 12 stories or greater in height.

Software and multimedia development and design

Combined score for each city in *fDi* magazine's Best Cities for Software Development and Best Cities for Multi-Media Design Centres indices. Both indices weight a city's performance 70% based on the quality of the location and 30% based on the cost of the location. The software design index is based on an assessment of 120 quality competitiveness indicators. These indicators include availability and track record in ICT, availability of specialized-skills professionals such as scientists and engineers, access to

venture capital, R&D capabilities, software exports, quality of ICT infrastructure and specialization in software development. The multimedia design centre rankings are based on an assessment of 120 quality competitiveness indicators, including the size of the location's leisure and entertainment sector, its specialization and track record, information technology infrastructure, quality of life and skills availability.

Sport and leisure activities

The quality and variety of sport and leisure activities within each city.

Strength of currency (SDRs per currency unit)*

Currency value of the Special Drawing Right, or the SDR per currency unit. The currency value is determined by summing the values of a basket of major currencies (USD, euro, Japanese yen and pound sterling) in USD based on market exchange rates and the amount that can be bought by a given currency unit.

Thermal comfort

Measure of the average deviation from optimal room temperature (72 degrees Fahrenheit) in a city. January and July heat indices were calculated for each city using an online tool that integrates average temperature and average morning relative humidity during each month. A final thermal comfort score was derived by first taking the difference between a city's heat index for each month and optimal room temperature and then averaging the absolute values of these differences.

Total tax rate

Total amount of taxes and any mandatory contributions required by local, state and national law payable by a business as a percent of its profit. Does not include employer contributions to healthcare coverage.

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.

Workforce management risk

Ranking based on staffing risk in each city associated with recruitment, employment, restructuring, retirement and retrenchment. Risk was assessed based on 25 factors grouped into five indicator areas: demographic risks associated with labor supply, the economy and the society; risks related to governmental policies that help or hinder the management of people; education risk factors associated with finding qualified professionals in a given city; talent development risk factors related to the quality and availability of recruiting and training resources; and risks associated with employment practices. A lower score indicates a lower degree of overall staffing risk.

Working age population

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

*Country level data.

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