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Meeting the challenges of China's growing cities

China's cities are booming. Intelligent policies could make the good effects prevail over the bad ones.

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China's dramatic economic growth is intensifying the challenges of urban policy. Mass migration to the cities is leading to urban sprawl, the loss of arable land, and spiraling demand for energy and natural resources, as well as contributing to the challenge of providing social services. It's time for policy makers to rethink their approach to these problems and to the direction that urbanization has taken so far.

About 600 million Chinese now live in cities, yet that represents only 45 percent of the population, compared with more than 80 percent in the United States, so China's cities are likely to grow considerably. New research by the McKinsey Global Institute projects that by 2025 China's cities will add 325 million more people, including about 230 million migrants. Following the current trend, the country's urban population will reach 926 million by 2025 and top 1 billion by 2030.[1]

Rapid urbanization will contribute to GDP growth but also carries serious challenges. By our estimates, demand for energy in urban areas will more than double, and demand for water will increase by 70 to 100 percent. Providing health care and education to new migrants will severely strain municipal finances. Depending on the shape urbanization takes—more

[1] The full report, *Preparing for China's urban billion,* is available free of charge online at mckinsey.com/mgi.

concentrated or more dispersed—7 to 20 percent of the country's arable land could be lost. Urban sprawl, massive slums, pollution, and traffic gridlock are some of the problems cities around the world confront when infrastructure and municipal services fail to keep pace with the influx of people. Decisions that China's officials make today will determine whether its cities struggle to cope with growth (as in Mexico City, Mumbai, and São Paulo) or emerge as world-class metropolises on par with London, New York, and Tokyo.

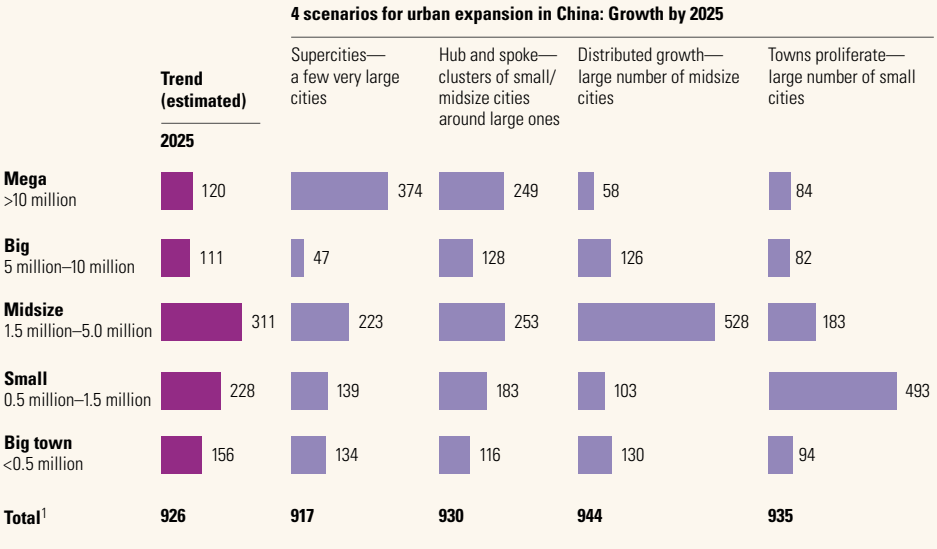
We examined the impact of four scenarios for China's coming urban expansion in areas such as labor, resource management, and municipal finance. The scenarios depict, respectively, future urban growth characterized above all by the emergence of a small number of supercities with populations of 20 million or more, by hub-and-spoke clusters of small and midsize cities growing around the largest one, by the distributed growth of a large number of midsize cities, and, finally, by an even larger number of small ones. Played out through 2025, each scenario produced a starkly different urban pattern for China (Exhibit 1).

Our analysis shows that the concentrated-growth scenarios—the supercity and hub-and-spoke models—would have the greatest overall benefit in

EXHIBIT 1

How will China's cities grow?

Population by city size, millions (2025 estimated)



[1]Totals vary because of differences in migration, as well as expansion and annexation by cities, among other factors; figures may not sum to totals, because of rounding.

Source: McKinsey Global Institute analysis

terms of GDP growth and overall efficiency of the urban system, although they could also lead to more intense congestion and localized water shortages. Concentrated growth requires a deliberate shift from current trends, but compared with dispersed scenarios, by 2025 it could increase per capita GDP by up to 20 percent, raise energy efficiency by about 20 percent, and minimize the loss of arable land.

While central authorities can't easily force urbanization in this direction, initiatives in land policy, infrastructure planning, and municipal finance would encourage it. Under any plausible scenario, municipal leaders should also concentrate on productivity policies that help mitigate the problems caused by rapid urbanization.

Urbanization's future

China's economic growth and rapid urbanization have gone hand in hand. From 1990 to 2007,[2] the country's urban population more than doubled, growing to 601 million, from 254 million. During the same period, real GDP grew almost tenfold, to $2.18 trillion (15.26 trillion renminbi), from $224 billion (1.57 trillion renminbi). Private investment focused on the cities, and the expansion of the middle class has been largely an urban phenomenon.[3] The near doubling of city populations by 2025 will have huge implications for urban life.

The shift ahead

From 1990 to 2007, China's cities grew primarily by incorporating neighboring land and their resident populations: cities added more people through expansion (131 million, by our estimates) than through migration from rural areas (113 million). Often, they financed their infrastructure improvements, increased services, and other costs linked to growth by purchasing newly incorporated farmland and selling it for development at much higher prices. Although this practice prompted social tensions among farmers who felt unfairly treated, it is probably one of the main reasons there are few slums in Chinese cities—this source of funding allowed local governments to provide and maintain roads, utilities, and housing in pace with their swelling populations.

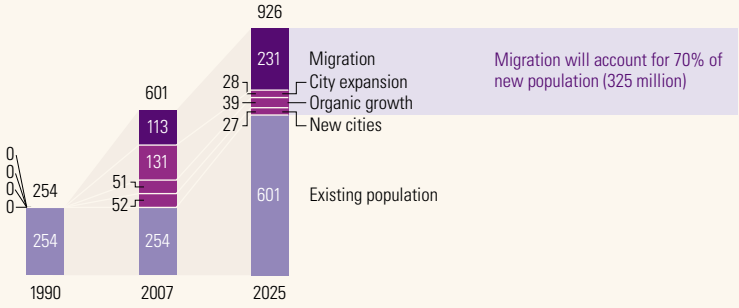
Our model shows that under current trends, migration will play a much larger role, accounting for about 70 percent of the new urban residents over the next two decades (Exhibit 2). Two factors will promote this change. First, many cities are running out of room to expand as they begin to abut other jurisdictional boundaries or land unsuited for urban development.

[2] The 2007 population figures used throughout this article are estimates based on our China urbanization model.
[3] See Diana Farrell, Ulrich A. Gersch, and Elizabeth Stephenson, "The value of China's emerging middle class," *The McKinsey Quarterly*, 2006 special edition: Serving the new Chinese consumer, pp. 60–9.

EXHIBIT 2

Moving to the city

Sources of increase in urban population, millions of people



Source: McKinsey Global Institute analysis

In addition, the central government has made it harder for cities to expand in the old way because national leaders are concerned that too much arable land is being lost, that land speculation is leading to inflation, and that social tensions could continue.

The loss of the financial benefits of land sales and the shift to growth through migration will strain city budgets. Unlike residents incorporated into a city on annexed land, migrants arrive almost empty handed and require greater effort to assimilate. Under the country's *hukou* (or resident registration) system, most migrants aren't immediately eligible for full social services. Yet as the proportion of migrants increases, the government will feel pressure to offer them more benefits, particularly health care and education. Indeed, the government recently made benefits for migrants a stated part of its urbanization policy.

Current trends point to a dispersed urbanization pattern, with midsize cities (those with populations from 1.5 million to 5 million) absorbing most of the new urban residents. About 40 percent of the overall urban expansion will take place in these cities. Their total population, we estimate, will almost double, going from 169 million in 2007 to 311 million in 2025—about one-third of China's urban population (Exhibit 3). Meanwhile, the number of midsize cities in China will grow to 115, from 73. Their importance to the economy is going to expand as well: they will account for some 34 percent of total GDP, up from 29 percent in 2007.

Although dispersed urbanization is the overall trend, megacities (those with populations of more than ten million) will continue to grow rapidly; by 2025 they will have 13 percent of China's urbanites. Over the next two

decades, six cities—Chengdu, Chongqing, Guangzhou, Shenzhen, Tianjin, and Wuhan—will probably surpass ten million people and take their place with Beijing and Shanghai among China's megacities. The number of inhabitants in these cities will rise almost fourfold, from 34 million in 2007 to 120 million in 2025, while their contribution to GDP will more than double, to 24 percent, from 11.

The implications of urbanization

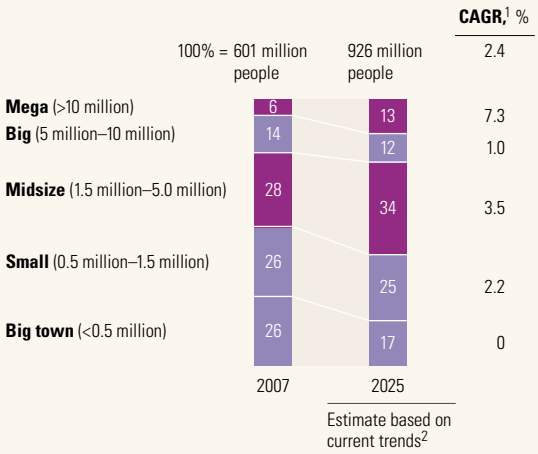
The change wrought by urbanization on this scale will be spectacular. China will have to build 900 to 1,100 gigawatts of power production capacity by 2025 to meet the energy demand of its cities. During this period, it will also have to pave five billion square meters of road, lay 28,000 kilometers of commuter rail, and erect 20,000 to 50,000 skyscrapers (for about 40 billion square meters of new floor space). These are just a few of the visible manifestations of continued urbanization. There are other challenges as well, similar to those that other countries have confronted as their people migrated from farms.

Land. Pressure on land will increase, raising concerns about the country's food security and threatening further urban sprawl. Residents and businesses will demand more intense development of arable land, and even the current pace of loss will quickly bring the country's stock of it below 120 million hectares—the government's targeted minimum for 2010.

EXHIBIT 3

A dispersed urbanization

Distribution of China's population by city size, %



[1] Compound annual growth rate.
[2] Figures may not sum to 100%, because of rounding.

Source: McKinsey Global Institute analysis

Energy, water, and pollution. The demand for resources will double and pollution will increase. Energy demand will reach 123 to 142 quadrillion British thermal units (QBTUs), from 60 quadrillion. While agriculture will continue to consume more water than cities do, meeting urban needs will be hugely challenging. Already almost 60 percent of China's river water is below international potable standards, and current trends would lead to a fivefold increase in the water pollution produced by midsize and smaller cities. Air pollution, already critical in China's major cities, could worsen if not properly tackled with focused city-level initiatives.

Budgets. Rapid expansion will strain the budgets of many cities, especially small and midsize ones. Some cities already run deficits as high as 16 percent of GDP before transfers from the central government. On average, urban budget deficits are about 4 percent of GDP before such transfers. By 2025, we estimate, China's cities will have to pay out an additional $214 billion (1.5 trillion renminbi) annually to extend public services to migrants. In addition, they must finance infrastructure improvements, though as a percentage of urban GDP, this form of spending will grow only slightly. All but the largest cities could buckle under these budget pressures.

Talent. Cities, especially the smaller ones, will face intense pressure to attract and build an educated workforce and to create appropriate jobs for it. Attracting such workers diversifies the economy and shields cities from the sort of long-term decay that the US Rust Belt experienced during the late 20th century. Although by 2025 China is expected to more than triple the number of university graduates it produces every year, many of these degree holders will lack the skills that top Chinese companies and multinationals demand.[4]

The benefits of concentration

Actions taken today will shape China's urban landscape irreversibly and affect the lives of vast numbers of people for years far beyond the scope of this study. Our interviews, models, and analysis show that a plan pushing China toward a more concentrated approach to urban development—the supercity or hub-and-spoke scenarios—delivers the optimal trade-off between the benefits and burdens of urbanization.[5] Such a policy, however, would require a deliberate shift from the current development pattern: disproportionate growth in midsize urban areas.

[4] See Diana Farrell and Andrew J. Grant, "China's looming talent shortage," *The McKinsey Quarterly*, 2005 Number 4, pp. 70–9.

[5] Our conclusions are valid for China, given its recent development experience, political and cultural setting, and economic history. The optimal approach for other countries could be quite different.

In China, unlike many other countries, the largest cities—especially Shanghai—have performed better than smaller ones since the 1990s. We find no indication that this pattern will change. Apart from the natural efficiencies created by scale, large Chinese cities have the advantage of municipal leaders who are seasoned administrators promoted within the political system after running smaller cities, provinces, and even ministries. Upward movement has been based largely on achievement, particularly the promotion of GDP growth, and the best administrators have been channeled to the biggest cities.

Size also brings intrinsic advantages. Drawn by the superior infrastructure of China's largest cities and their sizable market, multinationals have flocked to these urban centers, introducing more intense competition, new technologies and business practices, and higher-value-added jobs. Over the past 15 years, these cities have therefore attracted the lion's share of foreign direct investment. Since Chinese companies there face greater competition at all levels, they must constantly improve their performance and can more easily create economies of scale because of the huge market at their doorstep. By 2025, these and other factors would drive GDP per capita about 20 percent higher under a concentrated approach to urbanization than under other scenarios. A dispersed approach—the distributed growth and small-city scenarios—would dilute these effects considerably.

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What's more, city governments finance education in China, and the largest cities can afford the best quality. Twenty-eight of the country's top 40 universities are in the six biggest cities—18 in Beijing and Shanghai alone. The quality of education would improve as these institutions continued to flourish. Their graduates, other educated Chinese, and foreign talent are attracted to the brand-name employers and amenities of these cities; in Shanghai, for example, about a quarter of the workforce has a college education. While some small and midsize cities could develop excellent universities or provide attractive lifestyle amenities, a great many more would be starved for talent under the dispersed scenarios, since there would be more of these cities in the first place.

Concentrated approaches also create the greatest energy efficiencies; under the supercity scenario, for example, Chinese cities would use energy

18 percent more efficiently than they would under the distributed-growth scenario. For starters, the types of industries that settle in the largest cities tend to be more energy efficient—services and electronics rather than steel and textile mills, say. In addition, people there tend to live and work in smaller spaces, which require less energy for heating and lighting, and energy-saving initiatives (such as insulation) are easier to implement in a smaller number of bigger buildings than in a larger number of smaller ones.

To be sure, environmental concerns present a mixed picture and represent the greatest drawback of the concentrated approaches to urbanization. On the one hand, more farmland would be preserved. Water pollution would

Under city control

The leaders of China's cities will have to cope with growth in any plausible vision of the future. In our study, we weighed the trade-offs they would have to make under the four urbanization scenarios. Regardless of the path the country follows, our work shows that municipal leaders can fashion agendas focused on increased urban productivity and reap substantial benefits from them. Some cities, such as Wuhan, are already piloting programs of this kind.

If urban productivity measures were deployed throughout the country, overall public-spending requirements would fall by $214 billion (1.5 trillion renminbi) a year by 2025. Water pollution would be halved and air pollution emissions cut by about a third. Savings to the private sector, mainly through reduced resource consumption, would come to about $143 billion (1 trillion renminbi). These measures fall in four general categories.

Dense development. Cities should grow up rather than out, since higher-density development is more energy efficient and fosters greater productivity. Zoning tools such as floor-area-ratio regulations, which control floor space permitted on a given plot of land, are an effective way to guide dense development toward transportation hubs.

Demand management. While continuing to build a supply infrastructure, cities ought to begin managing demand for resources. Building codes could mandate energy-efficient structures, and water tariffs might encourage conservation by charging higher rates for higher use. Spread across a city of millions, water-efficient showers and toilets would bring huge benefits.

Skills-based growth. High-value-added jobs are more productive and less polluting. Cities should therefore invest in educating their workforce and, more specifically, in raising the quality of their university graduates. One effective measure would be to shift the performance metrics used at institutions of higher learning from enrollment numbers to the employment rates of graduates. Cities must also enact measures to encourage degree holders to stay in town after graduation; for example, they could develop internship programs with local employers and improve amenities for recreation, entertainment, culture, and health care.

Public-sector productivity. Greater efficiency in the public sector would provide almost two-thirds of the public-spending reductions we identified. City governments around the world are tackling productivity deficiencies, and China's cities should join this trend. In health care, for example, they could push for the greater use of primary-care facilities and for incentives that would encourage hospitals to improve their operations. Greater control by city managers over capital projects could also deliver quick results.

be mitigated, too, since China's largest cities, which come under greater pressure from residents who tend to be wealthier and more demanding and from the central government, have enforced wastewater-treatment measures relatively strictly.

On the other hand, wealthier people use more water, and the concentrated approaches would further exacerbate China's water supply problems. While air pollution will remain a concern in any case, peak-hour pollution in the biggest cities would be worse in the concentrated scenarios, even though in the country as a whole, emissions would be lower. (Nitrogen oxides emitted from automobiles will be the main source of pollution in the largest cities.) Traffic congestion, which could cripple many urban areas, would also be a more serious problem; by 2025, traffic in Shanghai could be three times the city's road capacity, even considering planned improvements. That kind of congestion could hamper a city's overall productivity by reducing available working hours.

Making change happen

Urban-development decisions in China are mostly decentralized: municipal governments collect taxes and make many decisions, such as granting industry subsidies and retail licenses, that have a direct economic impact. These local decisions have a strong and irreversible effect on the quality of Chinese urban life (see sidebar, "Under city control"). The central government, however, can guide local actions, set common standards, monitor enforcement by cities, and exert a degree of negative control by blocking local actions and disciplining lower-level officials. In fact, central policy makers have many tools to move the country away from the current trend of dispersed urbanization and toward a more concentrated approach.

Central officials have already tightened the quota for land that can be developed for urban use, but violations are rampant. Officials could step up enforcement by dedicating more manpower to it and making oversight more transparent so that they could spot and correct violations before offending projects are too far along. Removing jurisdiction in these matters from local courts, whose judges are appointed by local officials, would be another substantial step toward stricter enforcement.

The central authorities could also encourage infrastructure investments that focus on supercities or hub-and-spoke clusters. Today, highway grids, road systems, and rail networks are being planned to connect the entire country. While this is an appropriate long-term goal, projects that encourage growth and productivity in larger cities and their hubs could receive a higher priority. Capital projects such as refineries, ports, and large universities could be placed strategically to spur the growth of the largest cities.

Social policies can have the same effect. Smaller cities have used migrant workers, who are often ineligible for full city services, as cheap labor to drive expansion. National standards for health care and education for all cities, regardless of size, could load smaller ones with financial burdens that might discourage their unbridled growth.

The central government could flex its political muscle as well. The metrics used to judge the performance of mayors could be changed to include not only their cities' GDP growth but also collaboration with other regional officials and the promotion of efficient energy policies. Redesigning the incentive system in this way would discourage growth-at-all-costs attitudes and reward mayors who help their country achieve its goals more productively. Further, the central government could grant more autonomy to megacities (as it did recently for Chongqing, in central China), freeing them from one layer of budgetary approval and from provincial agendas that might conflict with optimal urban development. Today, all cities except Beijing, Chongqing, Shanghai, and Tianjin come under the authority of provincial governments.

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Massive urbanization is coming to China. In little more than two decades, two-thirds of all Chinese—one billion people—will probably be living in cities. National and local officials must take steps now to ensure that this unprecedented transformation unfolds as smoothly as possible. Encouraging the development of China's largest cities would generate the greatest benefits and the least harm for the country. Q

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