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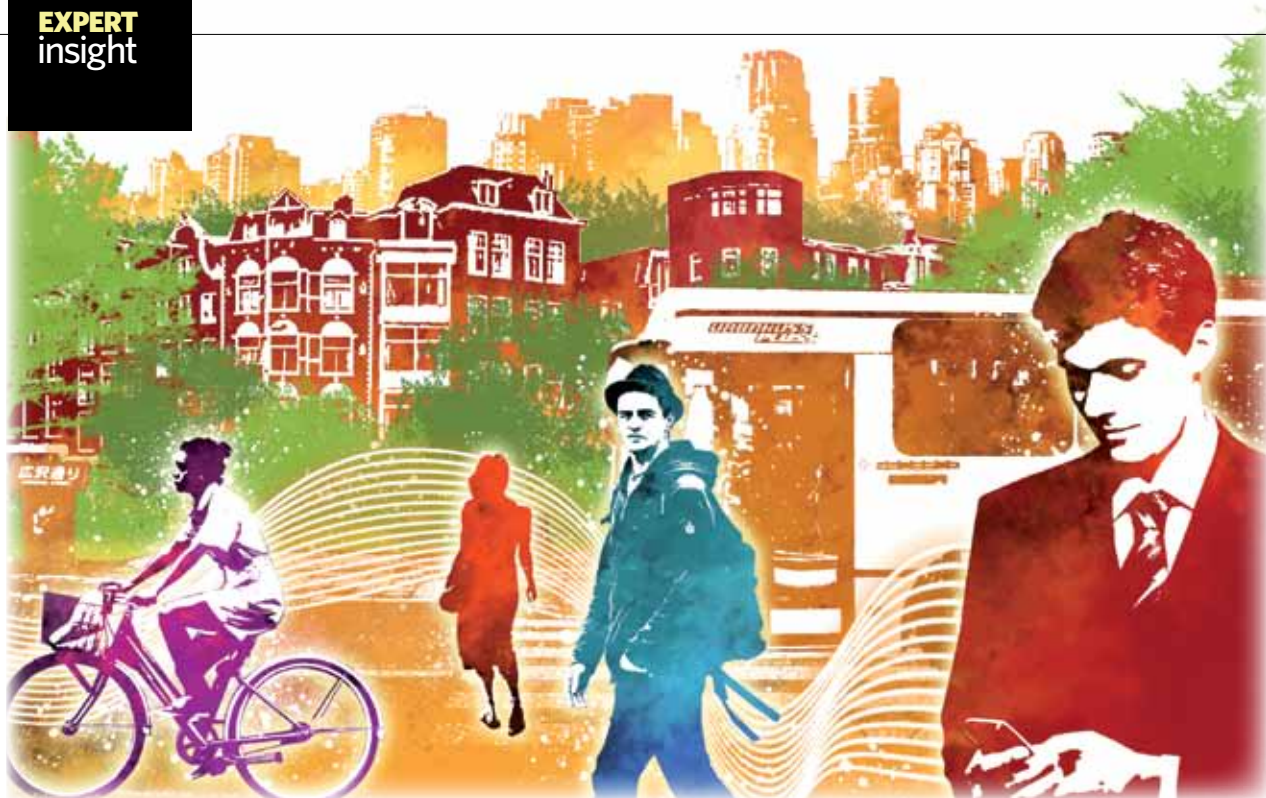


Illustration by OSCAR GIMÉNEZ

OPPORTUNITIES FOR URBAN DEVELOPMENT

Smart Cities, Sustainable Progress

By JUAN M. BARRIONUEVO, PASCUAL BERRONE and JOAN E. RICART

In the wake of the devastating floods and mudslides that hit Rio de Janeiro in April 2010, the city resolved to develop a \$14 million intelligent operations center equipped with the latest technology in disaster management and response. It can control the city's traffic flow and public transit systems, and handle power outages. Its alert system includes mobile, e-mail and instant messaging services, to provide residents and emergency services with real-time status reports.

Rio de Janeiro is one of a growing number of metropolises using new technology and intelligent resources to streamline their everyday operations and improve the quality of life for their citizens.

These so-called smart cities offer huge opportunities for businesses to partner with

public authorities, who are eager to tap the private sector's expertise in systems design and strategic management.

At IESE's Center for Globalization and Strategy, we have been studying various urban development models around the world. This article highlights some of our early findings and the key implications for public and private sectors alike regarding the future development of smart cities.

What Is a Smart City?

Being a smart city means using all available technology and resources in an intelligent and coordinated manner to develop urban centers that are at once integrated, habitable and sustainable.

Drawing on the urban development model of the IESE Cities in Motion project, we have

identified five types of capital that contribute toward a city's intelligence:

- economic (GDP, sector strength, international transactions, foreign investment);
- human (talent, innovation, creativity, education);
- social (traditions, habits, religions, families);
- environmental (energy policies, waste and water management, landscape);
- institutional (civic engagement, administrative authority, elections).

These are the lifeblood of the modern urban system, and can be nurtured through strategies targeting *innovation, social cohesion, sustainability and connectivity*. See **Exhibit 1**.

Failure to adapt to the new urban reality could be disastrous for cities facing unprecedented demographic, economic, social and environmental pressures.

The United Nations has predicted that the world's urban population will grow by 75 percent by 2050. This mass migration to the cities will increase the number of densely populated areas, further complicating urban mobility and putting even greater strain on public services.

The McKinsey Global Institute concurs, pointing out that, with up to 65 percent of global GDP growth soon to be concentrated in the world's 600 largest cities, associated problems such as income inequality, mass unemployment, illiteracy, social conflict and ghettos will be exacerbated.

Such rapid urbanization also has an environmental impact. While cities occupy a mere 2 percent of the planet, they already account for 60 percent to 80 percent of energy consumption, and 75 percent of carbon dioxide emissions. Increased traffic, pollution, waste and energy costs will no doubt continue to present a growing threat to human health and sustainability.

Sustainable Ecosystems

Against such a backdrop, the major challenge for urban authorities is to build cities that can function as habitable and sustainable ecosystems. The cities that are able to pull this off will almost certainly lead the way in attracting investment, talent, tourism and employment opportunities.

The smart city concept covers a broad cross-section of strategies and measures designed to enhance the quality of urban life, the provision and management of public services, and long-term sustainability.

After all, a city's vitality and reputation depend on a whole host of factors, including communications technology, disaster and waste management, access to clean drinking water, green areas, public transportation, health, education and public safety.

The key, therefore, to developing smart cities is to integrate all of these components in one holistic vision, thereby boosting management efficiencies – an area in which the private sector has much to contribute.

For newly built business hubs like Songdo in South Korea, designing such a tightly integrated system is relatively easy, as there are virtually no limits – beyond the usual financial restraints – to what urban planners can dream up. Conversely, the transformation of conventional cities presents far greater challenges.

Most smart projects that have emerged in recent years focus primarily on information and communications technology (ICT) and sustainability, which is understandable, given the scope and scale of the business opportunities on offer. According to the consulting firm IDC, the income generated by ICT used in smart city projects may hit \$57 billion by 2014.

Nevertheless, we must not forget that ICT is only a means to an end – which is ultimately to measurably improve people's quality of life.

■ EXECUTIVE SUMMARY

With urbanization on the rise

globally, failure to adapt to the new urban reality could be disastrous for cities facing unprecedented demographic, economic, social and environmental challenges. Development models are needed to transform such challenges into opportunities.

The authors outline the strategic planning methodologies needed to create smart cities – sustainable, innovative, connected and socially cohesive places that enhance the quality of urban life. And when it comes to transforming cities, the private sector has plenty to contribute.

Progress By Planning

With the global urban space expected to grow exponentially in the coming decades, cities will need to streamline their strategic and scenario-planning processes. Only then will they be able to think up new ways to innovate, and identify opportunities and priorities for future development.

This means developing a flexible, participatory process with a defined goal: to design a sustainable action plan that gives uniqueness and visibility to the metropolis.

But just as two companies will have different recipes for success, each city must forge its own development model that tackles, in a systematic way, the unique set of challenges and opportunities that it faces – all of which presupposes a veritable sea change in the way city authorities operate.

Amazingly, many cities still employ urban planning methods that fail to monitor whether goals are actually being met or not.

Indeed, most cities don't do strategic planning at all. Instead, they tend to deal with issues as and when they arise, rather than adopting an integrated, holistic approach. They remain fixated on taking an industrial approach to urban planning, rooted in a bygone reality. Furthermore, they constantly run up against brick walls erected by government bodies, which are more interested in protecting their own power bases.

Large cities must take a longer view, make greater use of innovation to improve the efficiency and sustainability of their services, improve communications and engage local residents in their projects.

To do that, cities need to develop smart governance systems that take all these factors into account. Only by doing so will they become

sustainable places, with long-term strategic projects developed in partnership with the private sector and local citizens.

When drawing up a long-term strategy, the city must take into account the full spectrum of its constituent elements. We propose a three-step process, beginning by diagnosing the situation, then developing a strategic plan and finally taking action. See **Exhibit 2**.

Analyze the Key Areas

ICT has opened up whole new dimensions to urban development. However, as we already mentioned, there is more to smart cities than just ICT.

City authorities must try to take into account *all* the various factors that create value and bring success to the city, both at the local and international level. This diagnosis should be based on a thorough analysis of the following factors, including but not limited to technology.

ECONOMICS. This encompasses all the factors that contribute toward a city's economic development, including local development frameworks, transition plans, business strategies, formation of industrial clusters, and the presence of innovation and entrepreneurship.

In the strategic plan drawn up for the economic development of the South Korean industrial center of Suwon, the new economy was given prominence. By extending finance to SMEs specializing in IT, biotechnology and nanotechnology, the city's authorities created an economic landscape in which two out of every three companies now operate in high tech.

A similar approach has enabled Eindhoven to establish itself as the Netherlands' technological capital. The city decided to stake its future on R&D and innovation. Since then, leading companies from a broad range of sectors – automotive, design, food and nutrition, technology and medicine – have flocked there. This boost to the local economy has yielded a steady stream of new projects.

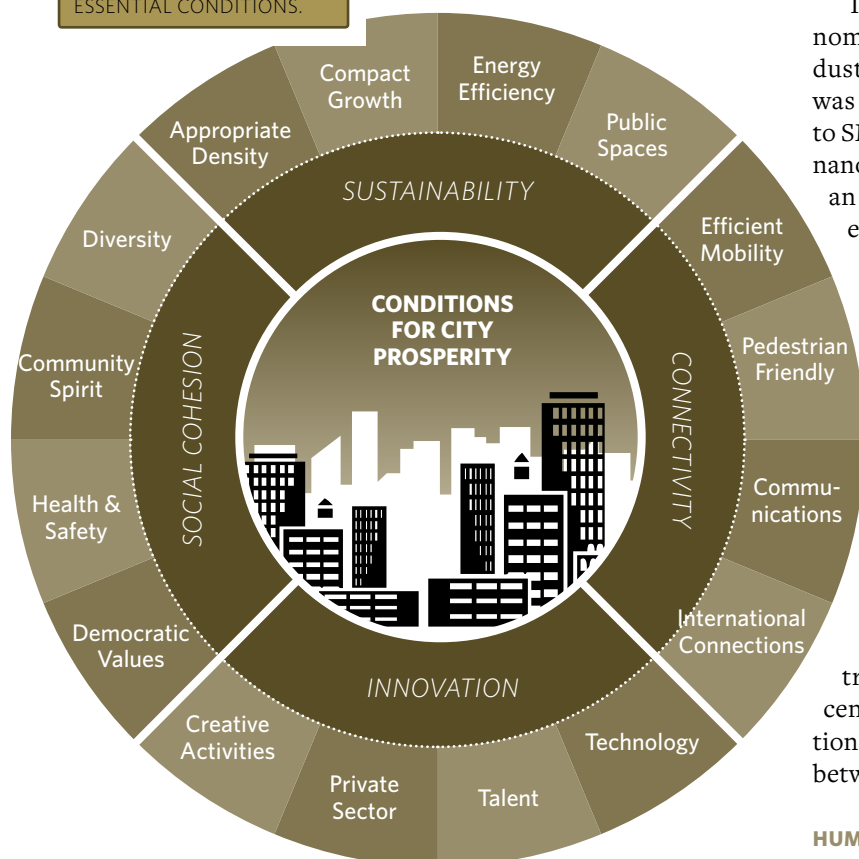
Countless similar examples demonstrate that urban development in the 21st century can stimulate recovery and revitalization, thanks largely to the partnerships formed between the public and private sectors.

HUMAN RESOURCES. The main objective of any

The Path to Prosperity

EXHIBIT 1

A GOOD MODEL FOR URBAN DEVELOPMENT SHOULD PROVIDE THESE ESSENTIAL CONDITIONS.



city is to enhance its human capital. As such, it must attract and retain talent, as well as raise local education standards, and promote creativity and research.

Take the example of Vancouver. Following the University of British Columbia's decision to promote biotech research, the city has become a hotbed of highly specialized biotech companies, attracting a steady influx of qualified labor from overseas.

To retain that talent, many of the companies in the sector have established flexible work policies, and they offer attractive perks and incentives to high-value staff.

In a similar vein, Suwon has strengthened its competitiveness by investing more than 350 million euros in improving educational infrastructure and specialized courses.

ENVIRONMENT. With increasingly scarce resources and ongoing environmental degradation, cities can no longer afford to ignore the issue of environmental sustainability. In fact, by tackling pollution, managing water efficiently, and supporting green buildings and alternative energy, cities can become cleaner, more pleasant places to live, while at the same time drastically reducing their energy bills.

Yokohama, Japan, is a case in point. Its commitment to renewable energy and conservation has made it a pioneer in the field, helping to reduce carbon dioxide emissions and dependence on fossil fuels.

The authorities in Moncton, Canada, have unveiled a sweeping green city project, which, among other things, aims to encourage greater use of public transport and bicycles, and more recycling. It has installed LED traffic lights throughout the city, and provides electric cars for city services. In addition, it has imposed tighter controls on irrigation water and launched tree-planting campaigns.

In Europe, the Spanish city of Málaga has launched an ambitious effort to become an eco-efficient city, aiming to reduce carbon dioxide emissions by more than 6,000 tons per year, and shifting toward renewables.

SOCIAL COHESION. Improving a city's social environment requires extensive research and action in areas such as immigration, community development, elder care, health care and public safety.

One interesting case is the health-care scheme launched by Copenhagen city authorities, which gives doctors instant access to patient records, thereby reducing the percentage of medical errors and raising the levels of user satisfaction.

In the United States, Chicago has implemented an ambitious public-safety plan. A system of widespread video surveillance and license-plate recognition technology has led to substantial improvements, including in emergency response times across the city.

URBAN PLANNING. To make their spaces more livable, many cities are launching local master plans focused on the design of green areas and public spaces. They usually include a firm commitment to smart growth.

Most importantly, new urban planning methods should focus on creating compact, well-connected cities, with easily accessible public services.

Although this is more easily done when smart cities are built from scratch, there are many initiatives to revitalize neglected areas of existing cities, as in the case of 22@Barcelona.

Backed by a public investment of 180 million euros, this project in Spain's second city is among the most ambitious urban transformation projects to be launched in Europe.

A former industrial area has been regenerated through the construction of 4,000 new

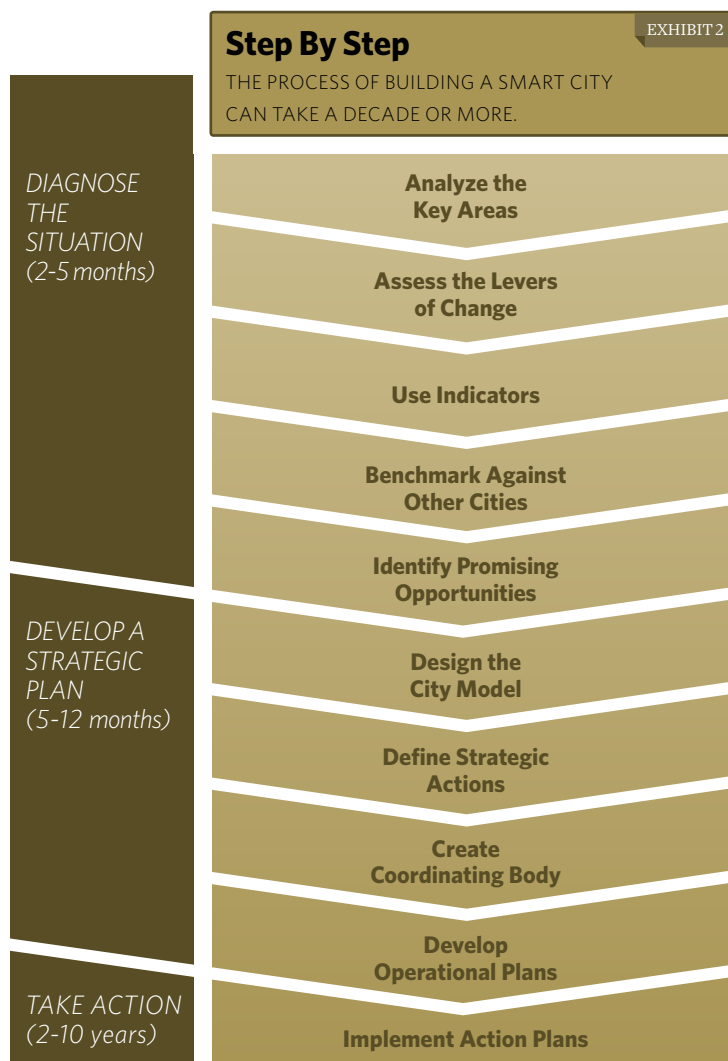
■ ABOUT THE AUTHORS

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Joan E. Ricart is director of the Strategic Management Department and holder of the Carl Schroeder Chair of Strategic Management at IESE. Besides serving as the vice president of the Iberoamerican Academy of Management, he was the founding president of the European Academy of Management and also presided over the Strategic Management Society. His areas of interest include the design and economics of organizations, corporate governance and sustainable development.



homes, along with parks and facilities. Since the year 2000, the zone has attracted 4,500 companies, many in tech-related industries. To date, the scheme has helped create more than 56,000 new jobs.

GOVERNANCE & CIVIC PARTICIPATION. Citizens are the main focal point for responding to the challenges facing cities. As such, consideration should be given to levels of participation, the ability of authorities to engage business leaders and local residents, and the implementation of electronic government, or e-government, plans.

One of the pioneers in this area is Singapore. Since the '80s, Singapore has supported numerous initiatives to facilitate communication and collaboration among government, civic and business institutions. Today, the city's e-government offerings are among the most advanced in the world. Its citizens now have access to more than 1,600 online services via mobile devices.

Singapore's experience reveals an essential truth about smart cities: Bureaucracy must be minimized, and most procedures can be conducted electronically.

Another notable project is Change by Us NYC, a platform promoted by New York City to encourage neighbors to share ideas and then create work teams to put those ideas into action. Participants are provided with tools and resources to access public services and contact the relevant associations for implementing their plans.

PUBLIC MANAGEMENT. Many cities are trying to improve the efficiency of local government institutions, focusing in particular on the design of new organizational and management models. This area presents major opportunities for the private sector, whose experience of optimizing efficiencies is invaluable.

Take the example of England's second city, Birmingham, whose city council has entrusted the management and maintenance of local roads, sidewalks, bridges, lighting and green areas to a consortium of private companies. This represents good business not only for companies but also for the city, which stands to save several million pounds each year.

TECHNOLOGY. While cities do not live on technology alone, ICT is an essential driver of a community's economic and social development. As such, cities around the globe should be – and many are – seeking to harness the benefits of the latest generation of ICT.

Take the Chinese metropolis of Chengdu, which is in the process of adopting fiber optics and other technology to control traffic, police, firefighters and ambulances from a large operations center. In addition, Internet access will soon be available from any point in the city.

South Korea's Songdo will likewise soon have integrated all its information systems for buildings, hospitals, transport and businesses.

In South Africa, Johannesburg is teaming up with a technology company to build a broadband network that will provide high-speed services to businesses and local residents by the first quarter of 2013.

This is not to say that ICT is the exclusive domain of major metropolises. Consider the case of the satellite town of Sant Cugat del Vallès, located just outside Barcelona, which has fitted one of its streets with a network of sensors that enables the council to manage a

Making it easier for people to access public services will be among the major urban challenges of the future – especially given the coming explosion in urban populations.

whole range of services remotely, including traffic, parking, waste management, trash receptacles, environmental control, lighting and Wi-Fi.

MOBILITY & TRANSPORTATION. Making it easier for people to get around town and access public services will be among the major urban challenges of the future – especially given the coming explosion in urban populations.

Fortunately, many cities are already on the front foot. Curitiba, Brazil, for example, has introduced an intelligent, integrated transportation system to improve mobility, for which a fleet of 2,160 buses has already been assigned. The city's main hubs are served by high-capacity, high-speed, high-frequency buses, complemented by other lines operating between neighborhoods, along loop routes and other conventional lines. The city has also built 120 kilometers of bike lanes.

On the other side of the globe, Singapore authorities are working on a pilot project to determine the most effective and useful technology for facilitating urban mobility. The city has already installed a system of traffic sensors that allows authorities to predict traffic jams up to one hour in advance.

INTERNATIONAL PRESENCE. Given the intensity and scope of competition between international metropolises, big cities looking to prosper must first achieve a prominent place on the world map. Building international presence means attracting tourism and foreign investment, which, in turn, requires bold initiatives to boost the city's overseas representation and global positioning.

Take the example of Barcelona, which has developed a Strategic Tourism Plan with a series of activities until 2015. The ultimate goal of the plan is to increase the city's attractiveness and to position it internationally, particularly among high-quality tourism segments.

To achieve that, the city council is working alongside the Barcelona Chamber of Commerce to organize public-awareness campaigns, exhibitions and forums.

In many ways, Barcelona is following the

example already set by Vancouver, whose long-held strategic commitment to sustainable tourism has established the city as an international role model.

For the past two decades, the local government has been working closely with companies to improve sustainability and support energy conservation programs, through associations like the Oceans Blue Foundation, BC Hydro and Ethos.

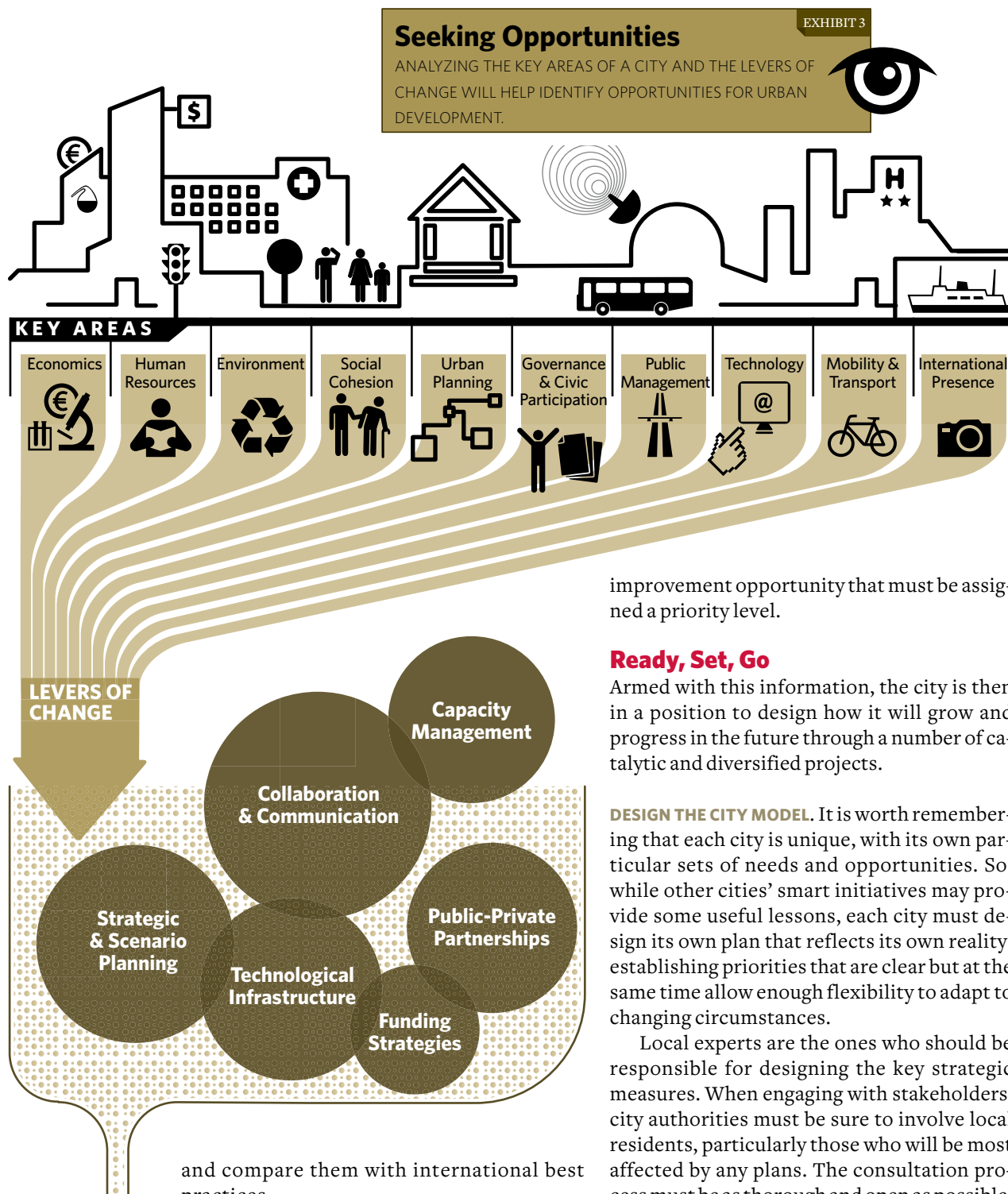
Diagnose the Situation

Through the analysis of these key areas, the city begins to understand its current situation, and to see how mature it is in relation to *innovation, social cohesion, sustainability and connectivity*. But that is only part of the equation: Before executing action plans and achieving the goals defined, the city also needs to diagnose its competitive situation and strategic position along several other fronts.

ASSESS THE LEVERS OF CHANGE. City authorities need to review the main levers that will drive the city's progress. These are: strategic and scenario planning; collaboration and communication; public-private partnerships; funding strategies; capacity management; and technological infrastructure. See **Exhibit 3**.

As part of this process, authorities will have to decide how plans are to be drawn up and implemented, making sure that different scenarios are being considered. They will have to identify ways of improving communication with local citizens, as well as how to get local actors on board. They must devise strategies for drawing in private-sector support and involvement, and spell out how such partnerships will benefit the city. Above all, they need to develop ways of delivering greater value to citizens, which, among other things, may involve identifying which technology is needed to improve the city's infrastructure.

BENCHMARK AGAINST OTHER CITIES. The next step is to develop a set of indicators to identify your city's strengths and weaknesses,



improvement opportunity that must be assigned a priority level.

Ready, Set, Go

Armed with this information, the city is then in a position to design how it will grow and progress in the future through a number of catalytic and diversified projects.

DESIGN THE CITY MODEL. It is worth remembering that each city is unique, with its own particular sets of needs and opportunities. So, while other cities' smart initiatives may provide some useful lessons, each city must design its own plan that reflects its own reality, establishing priorities that are clear but at the same time allow enough flexibility to adapt to changing circumstances.

Local experts are the ones who should be responsible for designing the key strategic measures. When engaging with stakeholders, city authorities must be sure to involve local residents, particularly those who will be most affected by any plans. The consultation process must be as thorough and open as possible. This requires seeking out and genuinely listening to local stakeholders' ideas and opinions, no matter how unpopular they may be.

DEFINE STRATEGIC ACTIONS & DEVELOP OPERATIONAL PLANS. Although smart-city planning should always have a long-term vision, short-term projects will also play their part.

As with any corporate governance, municipal authorities must know how to strike the

and compare them with international best practices.

Appropriate indicators need to be established for each of the previously mentioned key areas. This should involve the active participation of key stakeholders. Economic indicators, for example, may include GDP, exports and foreign investment per capita. In this way, cities can begin to chart their progress and identify ways of further enhancing their position.

Each key area should have an indicator, an international benchmark and a particular

Private companies are ideal for leading and developing projects, in collaboration with universities and other public institutions, thanks to their project management and technical know-how.

right balance and meet the needs of different stakeholders.

In addition, they must diversify their urban policies as much as possible. No city – nor any business – should put all its eggs in one basket, especially in today's hyper-competitive world.

The process of defining catalytic projects – that is, projects that rapidly speed up the development process – should include a timetable with specific goals, tools, resources and responsibilities covering the primary objectives, as well as giving a detailed description of the tasks involved.

In this phase, a supervisory body should also be established for coordinating, monitoring and adapting the various plans.

IMPLEMENT ACTION PLANS. Finally, all the planning needs to be put into action. This could take anywhere between two and 10 years, depending on how ambitious the smart-city project is. During this phase, flexibility is paramount: Planners must be ready to adapt strategies, and even final objectives, to reflect shifting, on-the-ground realities.

A Fully Networked Ecosystem

It cannot be overstated that every contribution matters in this process, which is why stakeholders must be invited to participate at every step of the way. A networked ecosystem should develop among all stakeholders, including civic organizations, public bodies, government institutions, top universities, business experts and research centers.

Working with this networked ecosystem has certain advantages: It makes it possible to identify the needs of the city and its residents, set common goals, establish regular communication between different actors, increase learning opportunities, improve transparency and implement more flexible public policies. As an OECD report has stated, this ensures that local policies are focused on those who matter: local citizens.

Private companies are ideal for leading and developing projects in collaboration with

universities and other public institutions, thanks to their project management and technical know-how.

These public-private partnerships can result in significant savings to the public purse. But the benefits go both ways: The private sector can gain greater government cooperation, a better understanding of local needs, raised international visibility and, consequently, access to new business opportunities and talent.

The human factor remains crucial to urban development. Without a participatory, intelligent and proactive society, any strategy is doomed to failure, regardless of how well-intentioned it may be.

Beyond technological and economic development, it is the citizens who hold the key to turning smart cities into wise cities. That is the goal that every large city should be pursuing: for its inhabitants and leaders alike to lend their talent in support of its progress, in the broadest sense of the term. □

■ TO KNOW MORE

This article is based on early research by **IESE Cities in Motion Strategies**, an initiative of IESE's Center for Globalization and Strategy. This platform connects experts and private companies with city administrations all around the world, with the goal of stimulating innovative thinking and encouraging the private sector to play a major role in developing smarter governments and better opportunities for citizens.

■ Find out more at www.iese.edu/globalcenter