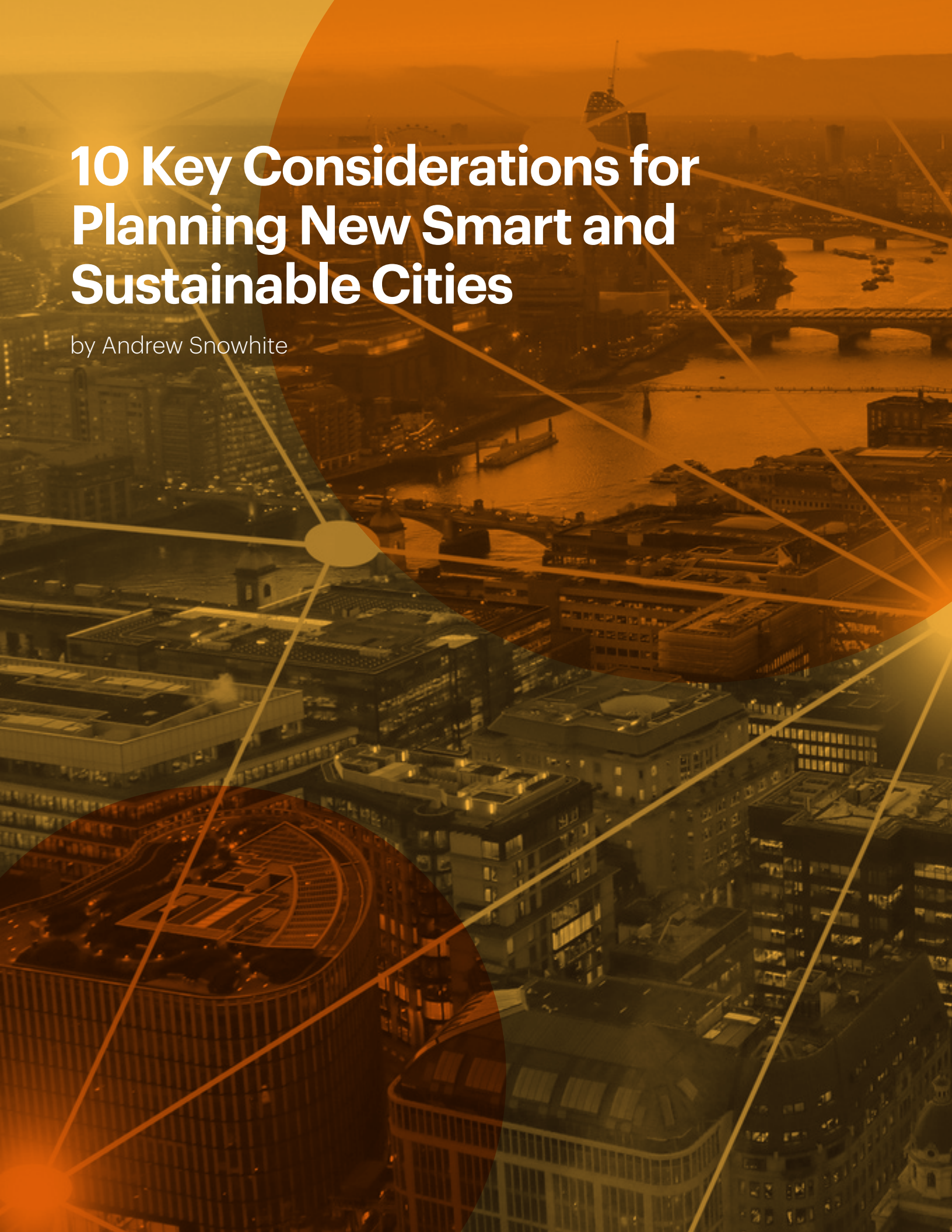

10 Key Considerations for Planning New Smart and Sustainable Cities

by Andrew Snowhite

As populations increase exponentially across the planet, there are two approaches to meet the demands of billions of new urbanites. The first is to modernize and expand current cities and infrastructure. The second is to build new cities from the ground up. Each method presents its own set of challenges and opportunities and both currently are being implemented, but not fast enough, especially large-scale greenfield developments. While serving as Chief Innovation Officer at Gale International, I was fortunate to work on our marquee development, Songdo, South Korea and also explored dozens of other real estate projects around the world. This experience provided me with deep insight into greenfield urban developments, the future of smart and sustainable cities, and how difficult it is to plan, build and operate cities of the future.

THE URGENT NEED FOR NEW URBANIZATION

By most estimates, the world will welcome at least two billion new urbanites by 2050. This will increase the percentage of people worldwide that live in urban areas to almost 70%. The effects will be profound, impacting every aspect of society and our planet. Our cities currently face major challenges and it is staggering to consider how we will welcome and integrate these new citizens into productive, healthy and vibrant urban areas.

Of this population boom, almost 90% of the growth will occur in Asia and Africa, with three countries, China, India and Nigeria, combining for almost a billion new urbanites. Already the United Nations identifies 33 megacities (cities with at least ten million residents), 27 of which are located in the less developed "global south"[1]. Regardless of location, all of these megacities struggle to serve their current residents and to plan for future growth.

In the next decade, at least ten more cities will expand into megacities.

1 United Nations, Department of Economic and Social Affairs, Population Division (2018). The World's Cities in 2018—Data Booklet (ST/ESA/ SER.A/417). https://www.un.org/en/events/citiesday/assets/pdf/the_worlds_cities_in_2018_data_booklet.pdf

And growth won't be concentrated simply to the megacities and megalopolises. By 2030, the UN projects that 28% of people worldwide will reside in cities with populations over one million.

Many cities are actually much larger than the parameters used by the United Nations might indicate. Measurement of urban populations is sometimes limited to the city proper, while other times it may include an entire metropolitan region, which can include millions more people (a "megalopolis"). For example, within the city limits of Seoul, South Korea live almost ten million residents, but the larger Seoul megalopolis is about 25 million people. Due both to sheer size and to multiple layers of governmental and regulatory structures with jurisdiction over a region, the challenges faced by a megalopolis are amplified well beyond those faced by a city proper (especially for a megacity).

In addition to the general population boom and migration waves that are occurring, the planet's inhabitants are aging rapidly. The United Nations estimates that by 2030, people over the age of 60 will outnumber those under nine years old, and that by 2050, there will be more people over the age of 60 than adolescents and youth between the ages of 10-24 years.[2] This means that not only will cities need to accept more people, but also that they will need to be designed and operated to accommodate an aging population that will require new health and mobility solutions for large groups of people who have transferred out of the workforce.

In order to accommodate this increased population and shift in demographics, dozens, if not hundreds, of new cities and urban areas need to be quickly designed and built. Some may need to be megacities, while others may house hundreds of thousands or only tens of thousands of residents. No matter the size, history has shown that creating successful new urban areas of any magnitude requires considerable time, money and multi-stakeholder commitment.

SONGDO: A PIONEERING CASE STUDY

Songdo is a fascinating case study. Songdo was the brainchild of the Korean and Incheon City governments. It was executed in partnership with New York's Gale International as the master developer. In less than twenty years, in the midst of a massive global economic downturn, a new city rose from the sea and is now home to hundreds of thousands of people and over a thousand businesses. Songdo has hosted global sporting events. It houses multiple universities and is the site for billion-dollar innovation facilities. It has the highest concentration of green certified buildings in the world and is the location of the Green Climate Fund's Secretariat.

Songdo is not the only new city project undertaken in the last few decades, but it is arguably the most successful. It provides a wonderful case study for best practices, as well as an opportunity to explore and to learn from what could have been done differently.

Through my work with Songdo and other new city projects, I have identified the following key elements for consideration when planning and developing new urban environments. These can be utilized by all stakeholders, from governments and private developers to financers and regulators to planners, architects, engineers and citizen groups.

10 KEY CONSIDERATIONS

1. Purpose & Positioning

Every new city should begin by defining a clear purpose for why it is needed and how it will be positioned. This needs to be informed by market factors and feasibility studies. Often governments or developers decide they want to have a specific type of new city, such as an "innovation city" or "entertainment city," without doing adequate research to determine if that is in fact the positioning required to meet market demand (both economic and human needs). To be

2 United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Ageing 2015 - Highlights (ST/ESA/SER.A/368). https://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2015_Highlights.pdf

successful, the market must drive the process. Leaders and planners should make decisions based on market data that identifies and supports the project both in terms of economic viability and needs of the people and businesses that will inhabit it. Most importantly, greenfield cities should be planned and built for tomorrow and decades into the future. Simply building a massive new urban development neither ensures it will be populated nor its economic success.

2. Visionary Leadership

There are a myriad of reasons why creating new cities is challenging. They take years of coordination, massive human and financial capital resources, and political will. Visionary leadership is required in the early stages to define a city's purpose and to launch the planning process. It is also needed throughout the construction and into operations to ensure the development is done according to plan. Korea and Incheon City provided the initial vision for Songdo, but the passion and tenacity of Gale International Chairman & CEO, Stan Gale were foundational elements of Songdo's growth and success. Importantly, Gale recognized the need to engage world-class subject matter experts and built a core team of firms that each provided best-in-class expertise and aligned with a key element of the Songdo city plan. Among these firms, KPF led the masterplanning and design process; ARUP provided engineering expertise; Cisco served as the smart city partner (a cornerstone of its Smart+Connected Communities initiative); and Nicklaus Design was responsible for the anchor sporting and business amenity the Jack Nicklaus Golf Club of Korea.

3. Location

A new city's location is fundamental and is a key element in informing its purpose, its inherent benefits and its anticipated challenges. Key factors that need to be determined upfront include how energy, water and transport will connect in and out of the city, and how the associated current and future costs will be met. Songdo's strategic location was key to its positioning. It is less than a half hour drive to Incheon International Airport and within a three-hour flight of a third of the world's population. And while located within Incheon City and the Incheon Free Economic Zone, it is also directly a part of and connected to the Seoul megalopolis.

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4. Regulations & Rule of Law

In order to sell a project's vision to attract businesses, residents, and, importantly, investors, a clear and enforceable regulatory framework needs to be established and implemented upfront. This includes how the new city will operate within existing federal and regional governmental structures and any special regulations (e.g. tax, data ownership, etc.) that will be adopted to help facilitate investment, development and ongoing operations. During the Songdo planning process, an international hospital was included as a key asset of the masterplan both to fulfill the positioning as a global city and meet the expectations of potential foreign tenants. Potential partners were identified, however, local regulations were not adjusted to allow for the approval and addition of an international hospital partner, and to date it has not been built. As with any ambitious, multi-billion dollar project, clear legal and regulatory structures are essential to attracting investment, especially foreign investment. This has inspired some countries and municipalities to create entirely new autonomous zones, such as the Estonian Free Trade Zones, the Astana International Financial Center and the Zones for Employment and Economic Development ("ZEDE") system in Honduras.

5. Financing

Financing is always one of the greatest challenges to any large-scale real estate project. In the case of development of a new city, the planning process alone requires tens of millions of startup dollars. Base infrastructure can cost hundreds of millions, if not billions, of dollars. Songdo's success was predicated on the Korean and Incheon City governments' massive investment in infrastructure, from land reclamation to smart technology infrastructure to the 21km Incheon Bridge. Financing needs to be planned for and addressed throughout each phase of a project and may require a mix of public and private funds along with development aid.

6. Resiliency & Sustainability

New cities need to be resilient and sustainable. Current and future climate change consequences must be addressed at every stage of development of a new city, along with other challenges such as pollution, habitat loss and a host of security issues (ranging from food to digital to diseases). In Songdo, Incheon City built and maintains the "U-City" platform, which tracks city-wide services including traffic, weather, waste, safety and disaster management. It also has the highest concentration of green buildings in the world due to an early commitment to utilize the U.S. Green Building Council's LEED green building certification. It is home to the first LEED certified exhibit hall in Asia and the first LEED certified school and hotel in Korea. The Songdo International Business District, with 40% open space including a beautiful central park, was designed to be walkable and incorporates a variety of innovative technologies such as an underground pneumatic trash system. Energy is derived from multiple sources, from an LNG-powered combined cycle power plant that also powers a district heating and cooling system, to rooftop solar and tidal power. In 2012 Songdo was named the headquarters for the Green Climate Fund and now also houses offices for numerous international environmental and social organizations. Early focus on sustainability was the right decision not only from the perspective of liveability and the environment, but also from the perspective of attracting businesses.

7. Design and Infrastructure Planning

New cities require planners to utilize current market data while looking well into the future. From mobility to open spaces to buildings, the masterplan and its required infrastructure dictate how and when all development will occur. It is imperative that the planning aligns with the project's positioning and purpose as well as with its financial and resiliency goals. A District Urban Plan ("DUP") was created and adopted in Songdo that permitted key zoning elements upfront in order to facilitate near and long-term construction. Furthermore, as the world faces unforeseen challenges, like the novel COVID-19 virus, city planners need to expand their design thinking to facilitate disaster and major disruption response and relief.

8. Phasing & Activation

A phasing and activation strategy allows a new city to grow in a manner that creates critical mass and economic viability. Songdo was phased in a manner that concentrated initial construction to its urban core and "quality of life" foundations. The first assets built at Songdo were a beautiful Central Park with a canal and open space and an adjacent convention center and hotel—all to support the initial residential and commercial space. Activating these assets simultaneously provided a concentrated area of activity and a "pulse" for the project. The Jack Nicklaus Golf Club of Korea was an early asset that brought important businesspeople and decision makers to Songdo, while creating buzz around global sporting events (in 2015 it hosted the Presidents Cup, the first time this event was held in Asia). For reasons ranging from the global economy to local politics to challenges with business partnerships, Songdo's DUP and phasing plans did not all come to fruition. For example, initial construction phases resulted in the establishment of many key infrastructure and building assets, especially around the Central Park urban core. However, over time, some plots of land have been developed out of alignment with the DUP. These structures don't fit the overall "future city" design and feel of Songdo. However, they do not necessarily indicate a failure. Rather, Songdo became somewhat of a victim of its own success. It became such a popular residential destination that some local

developers (including Gale's Korean partner) opted to focus heavily on off-plan traditional residential offerings, which are a solid business proposition in Korea as all buildings are pre-sold before they are constructed.

9. "Smart"

If you ask a hundred people what the term "smart city" means, you will receive a hundred different answers. Manufacturers look at it through a product placement lens, a utility focuses on grid modernizations and transmission and tech companies dream of advances tied to 5G and future connectivity revolutions. More so, what is considered "smart" in one country may be a futuristic dream in another. For example, it is challenging for a government to think about autonomous flying vehicles when they are not yet able to provide clean water or reliable power to their residents. "Smart" needs to be defined broadly in the context of planning new cities and tailored to each location and city's purpose. It is a holistic definition that encompasses a broad range of best practices. Through my experiences in Songdo and working on various other new city projects around the world, I define a "smart city" as: In the case of Songdo, it might be defined as an urban area that is planning for and integrating flexible new technologies and methodologies to create a more connected, sustainable and resilient community that spurs innovation and increases the quality of life of its citizens.

10. Livability & Inclusion

Perhaps the most complicated challenge of planning and developing new cities is creating places where people want to live and where they will thrive. Our great cities typically grow over decades if not centuries; however, we don't have that luxury of time going forward. The needs of residents, workers and visitors must be at the core of all planning and placemaking decisions. As we have learned from the "ghost cities" phenomenon, especially those in China, simply building a place doesn't guarantee people will want to live there. All aspects of the human experience need to be accounted for, covering the diverse spectrum of who we are as people, from age to gender to ethnicity to ability to social class and well beyond.

LOOKING FORWARD

The considerations highlighted above barely scratch the surface - an entire article or book could be written about each. The challenges of planning and developing new smart and sustainable cities are immense, but given global population and urbanization trends, it is a necessary process that will require partnership across disciplines and stakeholders. Time is running short so let's get started!

Andrew Snowhite focuses on the intersection of urbanization, sustainability, experiences, and storytelling. Through his firm, Snowhite Strategies, and as a Senior Advisor to NewCities, he provides strategic advice, connections, and management services globally to a variety of organizations and initiatives. Andrew was the Chief Innovation Officer at Gale International, the master developer of the Korean smart city Songdo, and led America's participation at Expo 2012, Yeosu South Korea and Expo 2017 Astana Kazakhstan. More recently he advised the Kingdom of Saudi Arabia on numerous "gigaprojects" including NEOM. He has served as an OpenGrounds Fellow at the University of Virginia and as a member of Samsung Electronics' Corporate Citizenship Advisory Council. Andrew received a degree in Environmental Science from the University of Virginia where he was a National Science Scholar.