THE NEW CHALLENGES FOR BRAZILIAN CITIES:

Considerations for the Urban "Artist"

By Jerry MacArthur Hultin, July 2020

The opportunity of crisis.

Until the onset of the global pandemic caused by COVID-19, cities in general, and mega-cities especially, were seen as the key to productivity and growth. A simple way to demonstrate this fact was to note that, while 70% of the world's population lives and works in urban areas, this 70% produces 80% of the world's gross domestic product (GDP)[1]. We were certain that density of population, concentration of resources, and high-levels of social interaction -- the things that a big city offers and make cities special -- were the elixir that attracted talent, multiplied their creativity and delivered productivity gains that suburban or rural life could not match. This productivity bump was evident well before cities strived to be smart, but as competition grew between cities to attract and retain the best talent, becoming a smart city became an important new competitive advantage. The view was smart cities improved a city's quality of life by producing

[1] For a more detailed and scientific look at the advantages of cities, see the work of Geoffrey West. As Irving Wladawsky-Berger recently wrote in the Wall Street Journal *(How Covid-19 May Transform Urban Life, July 3, 2020):*

"Dr. West and his collaborators analyzed an extensive body of data about cities around the world to explore the scaling relations between population and a wide range of infrastructure and socioeconomic measures. They discovered that the measurable infrastructure of cities--the lengths of roadways and electrical lines, energy consumption, the number of gas stations--scale sublinearly, with a scaling factor of .85. That means that cities enjoy a 15% benefit in economies of scale. If the population of a city doubles, its infrastructure needs to only increase by a factor of 1.85. This 15% benefit was true for cities of any size across the world as well as for any measurable infrastructure.

"The results also scale with population, but instead of following a sublinear .85 scaling factor, socioeconomic attributes scale exponentially, with a superlinear factor of 1.15. That means that if you double the population of a city, there will be a roughly 15% increase in productivity, wages, entertainment and educational institutions, and so on. The exponential scaling of these positive socioeconomic measures makes cities even more attractive to talented people which in turn reinforces their appeal, leading to network effects and the rise of superstars cities."

operating efficiencies, economic growth, innovation, and most of all, attracting and retaining talent.

As promising as smart cities seem to be, cities have been surprisingly slow to become radically smart. Starting in 2010, initially, cities approached smart technology as a cottage-industry supported by an array of smart city consultants and suppliers promoting individual technologies to individual cities around the world. Each city designed its own data and connectivity infrastructure. Advances were incremental and tactical, usually based on a specific technology -- smart street light, wireless water meters, data-rich command centers, smart power grids, and traffic management systems were common -- and seldom were the people of the city asked whether they benefited from this technological wizardry. During the last five years, around 2015, a greater emphasis on engaging residents in defining the benefits of smart cities has shifted the smart city conversation.[2] Smart City 2.0 is a step forward but the underlying fragmentation of smart city visions and strategies persists. Furthermore, the smart city conversation seldom deals with the fundamental transformation proffered by automation and artificial intelligence. This was why many of us called for a new vision and strategy for cities, indeed for the whole economy, that would take advantage of the benefits of AI and automation as they fundamentally changed the way we produce goods and services, and thus even more fundamentally transformed our view of work and how we earn income. This more dramatic and transformative vision and strategy for cities I call Smart City 3.0[3].

All three versions of the Smart City, whether Version 1.0, 2.0 or 3.0, are premised on the widely-shared view that cities -- especially large, dense cities -- were the most productive, creative, and rewarding places for people to work, play and live. While there

[2] I had a hand in this "powered by people" shift as chair of Barcelona's smart city global advisory board in 2015 and as a co-founder with Raj Pannu of Smart Cities New York starting in 2017.
[3] André Corrêa d'Almeida, editor, *Smarter NYC: How City Agencies Innovate* (2018), see my concluding chapter, https://cup.columbia.edu/book/smarter-new-york-city/9780231183758

were whispers that massive, concentrated cities were losing their charm[4], or that ubiquitous connectivity would allow smart and creative people to live wherever they chose, these forces were not strong enough to overcome the raw, exciting, captivating capacity of dense, big cities to thrive.

Then in late 2019, a spark from urban China launched a fundamental reframing of the benefits of concentration, density, mass-transit, and social proximity. Cities became risky, dangerous, and seemingly empty, as residents were locked-down within their homes, or, if they had resources, fled to more distant locales[5]. Connectivity became a savior for all those who worked with ideas and data, whether a teacher, broker, banker, administrator or advisor. But connectivity offered little to those where social interaction or physical work was involved. Tourism, restaurants, hotels, office real estate, "bricks and mortar" retail, air travel, mass-transit, sports, and theaters all collapsed in weeks.

In less than four turbulent months (I am writing in late-July 2020), the benefits and utility of large cities came into doubt. Foremost of these cities to collapse is my home town for the past twenty years, New York City. New York's dependence on mass-transit, its crowded narrow sidewalks and streets, its large open offices, and its small, cramped apartments multiplied the exposure to the coronavirus, and soon offices were empty, subways were vacant, restaurants shuttered, retail stores boarded up, and angry people marched in the streets. The rich and almost wealthy fled the city, while the middle-class and poor were locked-down, hospitals overflowed, and impoverishment, disease and death fell disproportionately on the old and people of color and caste.

In the past half year, we have learned that for many endeavors, such as consulting, schools and colleges, store-front retail, and investment banking, virtual is surprisingly capable if not perfect. For some endeavors, like streaming video or a political

[4] Richard Florida, *The Urban Crisis* (2017)
[5] The federal post office reported in July 202 that 1 million of New Yorks' 8 million residents requested an address change in the past three months.

convention, there are satisfactory substitutes that often lack many of the charms of real events, but will suffice until COVID immunity is ubiquitous.

But to many endeavors, like tourism, mass-transit, air travel, expositions, child-care, sports events, big weddings, movie-making, or nights at bars and restaurants, there is barely a virtual counterpart.

Many believe that NYC will never return to its former self, so its leaders are searching for the “new normal” that will generate a vibrant, economically viable city, but with new characteristics. Conversations about the way cities can be more resilient, more sustainable and economically vital, more innovatively creative and more equitable and just are being held in many cities around the world.

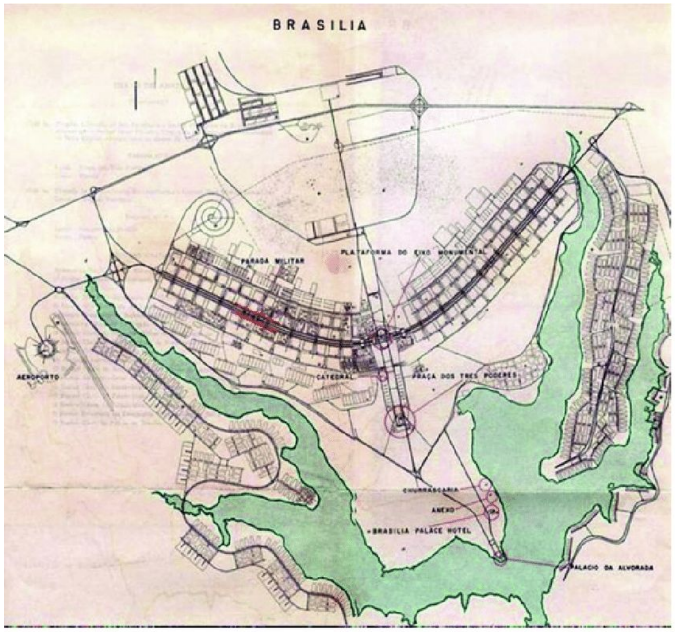
Three urban canvases

There are three big options for urban transformation: change the city itself, build new cities (and let the old cities wither away), or extend the central city into a new relationship with the surrounding peri-urban and rural regions. These three options are like different urban canvases upon which the “urban artist” -- urban planners, advisors, builders, operators, financiers, and citizens -- has the opportunity to paint.

The New, Empty Canvas

If you wanted to design and build a totally new city, using the best of today's insights, experience and technology – and who of us doesn't dream of such an assignment – you might pause to reflect and wonder why it has been so hard a skill to master, why so many of our planned cities have taken so long to attain a patina of culture and vitality, and why these planned cities evolve so differently than their conceivors’ original conceptions.

None of the easily recognized planned cities -- for instance, Brasilia, Washington DC, Chandigarh, Masdar, or Songdo[6] -- have had an easy quick path to success, and each is far different today than when its founders and architects put pen to paper to design its original plan. Why is this?



The Original Plan for Brasilia[7]

[6]According to Wikipedia, there are over 700 planned cities and communities in the world. https://en.wikipedia.org/wiki/List_of_planned_cities

[7] Plano Piloto-Brasilia

Brasilia Today[8]

One might consider words attributed to Senator Daniel Patrick Moynihan, “If you want to build a great city, create a great university and wait 200 years.”[9] Or consider the benefits of scale: Geoffrey West in his book *Scale* found “the bigger the city, the greater the social activity, the more opportunities there are, the higher the wages, the more diversity there is, the greater the access to good restaurants, concerts, museums and educational facilities, and the greater the sense of buzz, excitement, and engagement.[10] ” If cities need to be huge to erupt into the productive, creative, fun and vitality we love, how does one start at zero citizens and create an exciting city in one, two or even ten and twenty years?

Perhaps one does not need to wait all of Moynihan’s two centuries, but most planned cities have required decades to reach the critical size that Geoffrey West postulates is needed for urban buzz to take hold. How painful and suboptimal are those decades,

[8] Wikipedia, Brasilia from ISS
[9] The Journal of Economic History, p 574. Review of *Building Ivory Tower: Universities and Metropolitan Development in the Twentieth Century*.
[10] Geoffrey West, *Space: The Universal Law of Growth, Innovation, Sustainability and the Pace of Life in Organisms, Cities, Economies and Companies* (2017)

even centuries, of embryonic, evolving urban growth? Few founders or funders of new cities with tolerate two decades, let alone two hundred years of festering, floundering growth before the payback -- a great city -- finally arrives

And finally, one might reflect on the myriad of cities lost in the sands of time -- Chan Chan, Peru; Chakokia, Illinois; Memphis, Egypt; or Antioch, Greece to name a few -- once powerful centers of commerce, influence or enlightenment, now buried or nearly forgotten. What were they missing that they lost their appeal? Something more powerful than their role as a city swept these successful cities off their pedestals as their residents perished for lack of resources, were killed by invaders or pestilence, or moved on to new locations, new designs, and new times.

Could it be that after one hundred years of leading the world, New York City, will lose its essence, its easy connectivity, as subways no longer are a viable way to commute? Will other cities with more open systems of buses, cars and bicycles attract the most creative, industrious souls away from NYC?

Cities of the 19th century approached a similar existential cliff when density, local water supplies, and modest sewage systems, erupted into cholera epidemics that mystified even the brightest scientists and raised serious questions about the viability of living in a major city.

Technology, underpinned by science and data, often comes to the rescue in the modern world -- as it did for cholera in London and other large cities of the 19th century -- but forces larger than science and technology, like sea rise, climate change, political ambition, and the rise of new empires, may doom many cities no matter how well conceived or naturally productive. These forces are so strong they become, in Richard Pascale's words, "precursors to death."

Can one as a designer of new cities anticipate such forces and, even if foreseen, can we afford the cost of building to forestall calamities that may never happen (such as a comet strike), or not arise as expected (as a pandemic that does not tell of its arrival until one is already infected)? The more creative the mind of the urban "artist", the more perils imagined, the more solutions needed, the more costly the city, the more likely the transformation plan is shelved and replaced by a less ambitious, more modest revamping of the city.

So city building -- whether conceived on a napkin in a coffee cafe, or on an easel in the loft of an architectural team, or bargained in the smoky backrooms of political and financial titans -- is not a walk in the park. Faced with the challenges of building new cities, one comes to prize an assignment to re-imagine and transform an exisity city, a quest New York City is about to embark on as it tries to reinvent itself post COVID-19.

The Old, Built Canvas

Existing large cities are ripe for transformation as congestion, contagion, climate change, crime and other calamities drain away energy vitality, mobility and fun and leave its citizens -- especially its poorest -- trapped in pollution, traffic, and poverty, while the rich fly above the congestion and calamity in Uber helicopters, ala Mexico City, New York City, and other sprawling mega-cities around the world.

But if creating new cities is hard because one starts from zero, transforming existing cities is equally hard for different reasons, the major one being the city already exists. Its infrastructure of streets, sewers, power utilities, buildings and homes are a major impediment to change. This alone is daunting but a city's political power structure, its vested interests, and its existing communities form an additional wall of inertia that also resists change, for good reasons and bad.

The options for change are so confined by this inertia that one hankers for catastrophe to break the bonds of what exists and unleash transformational change. War, pestilence, economic collapse, and political revolution open the door for deeper change, but even with such opportunities the existing infrastructure places a heavy hand on what one can do. This puts a premium on imagination and technology. Imagination because it is needed to see opportunity within the remaining assets, like imaging Hudson yards in New York City by building on top of an ancient railyard, or designing Zaryadye Park on the vacant grounds of the derelict 3000 room Rossiya Hotel[11], or offering streets currently laden with cars to walkers, scooters, and bikes.

Technology is needed to insert itself within the infrastructure, to convert cars to electricity or incandescent street lights to LEDs or water and gas meters to wireless, or streets to bicycle thoroughfares sans cars, or government paper mills converting to online process to issue permits. The technologies of connectivity were slowly beginning to reshape work, education, healthcare, food, entertainment and sports when today's global pandemic seemed to push everything forward in weeks not years. For many, especially the middle class and rich, this has been an awakening to the possibility of living and working away from the central city and retreating to less expensive, more expansive housing in the outer reaches of the city, the suburbs, and even the rural and remote.

With this revelation and exodus, cities are now under new pressure to demonstrate and augment their benefits. How can cities support creativity, mobility, and social intercourse in ways that surpass the peri-urban or suburban life-style? The solutions that make cities attractive in the past are insufficient to meet these challenges, yet the existing infrastructure gives little room for radical transformation.

The In-Between Canvas

[11] https://www.nytimes.com/2018/08/10/arts/design/zaryadye-park-moscow.html

If new cities are hard to grow and old cities hard to transform, then where can one look to meet the needs and deliver the good life you and I believe people require to be creative, productive, healthy and happy.

One is drawn to the edges of cities, the peri-urban[12], where land is cheaper, infrastructure modest, power less entrenched, and populations less dense. The peri-urban is close enough to the city to use its assets, taste its wares and enjoy its pleasures, but open enough to offer bike paths and walking trails, parks and ponds, housing with room for home offices, and yet sufficiently concentrated to sustain local commerce and entertainment.

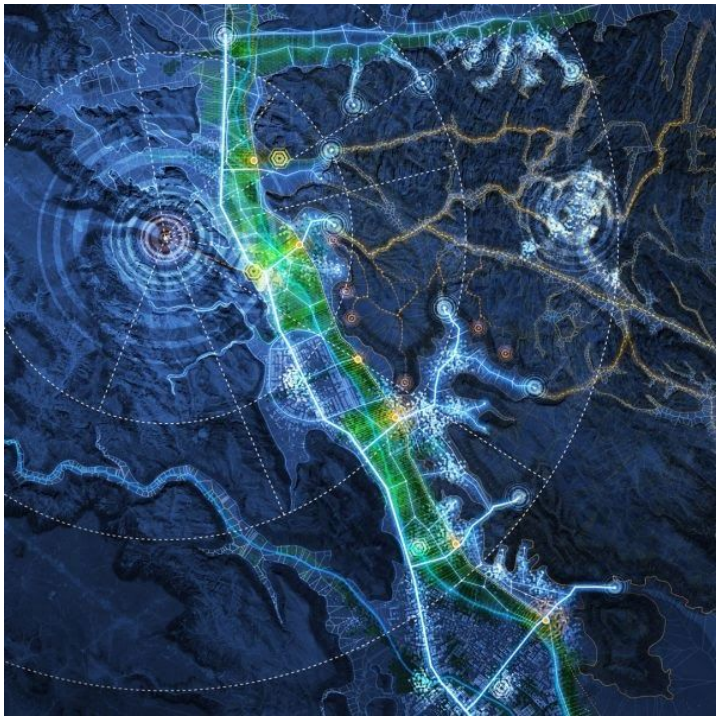
[13]

[12] Wikipedia: “Peri-urban … can be described as the *landscape interface between town and country*, or also as the *rural—urban transition zone* where urban and rural uses mix and often clash.” INSEE and https://en.wikipedia.org/wiki/Peri-urbanisation

[13] Expressions of Urban – Peri-Urban – Rural Relationships: Metropolitan Region of Styria https://rural-urban.eu/publications/expressions-urban-–-peri-urban-–-rural-relationships-metropolitan-region-styria

This expansion beyond the confines of the original city can be extended to surrounding cities that are connected to each other in transportation and electronic networks to create what Alfonso Vergas[14] calls Territorial Diamonds:

> "[P]olycentric systems of cities as "Urban Ecosystems of Innovation" and more importantly as 'Territorial Diamonds'. In design terms, Territorial Diamonds can be conceived and constituted by "Points" – Cities as nodes; "Lines"- Links as communication and mobility networks; "Surfaces" – as built up areas and rural spaces. The Territorial Diamonds are in the powerful position to harness such common assets by setting up close cooperation between all its constituent parts which will also benefit individually from synergic actions.[15]"



Territorial Diamonds[16]

[14] For more on Vegara's views on regional development, see https://www.mascontext.com/tag/alfonso-vegara/
[15] Designing the Territories of the Future. https://www.fmetropoli.org/en/cities-lab/territorial-diamonds/
[16] Designing the Territories of the Future. https://www.fmetropoli.org/en/cities-lab/territorial-diamonds/

The challenges of change

Most of us will not be asked to design and build a new city, far from other cities, on open ground. Those who do accept this challenge will need a strong ego to convince skeptics that their urban vision will succeed coupled with sufficient humility to see their vision grow awkwardly into something different than their imagination foretold. A heavy dose of density, mobility, social intercourse and awe will increase the likelihood of seeing their ambitions evolve into a vibrant city that matches or exceeds what is delivered by the current crop of cities that dot the world.

Some of us will be asked to imagine and build the peri-urban, where the proximity of the densely populated central city boosts growth, and the openness of the land gives room to offer amenities that central cities seldom provide.

But most of us will be asked to transform the existing city, where wealth, power and production are concentrated. Our ingenuity will be at a premium as we face the existing infrastructure and the entrenched power structure, as we respond to the desires and needs of those who call their city home, and as we seek the financial resources to pay for such change. This is not an easy equation to solve.

All three urban canvases have their advantages and limitations for the urban artist who imagines the future of cities and those who are responsible for building urban transformation. These competitive pluses and minuses of each option give you and me the freedom to pursue any one of the three with the understanding that none of the three is a perfect platform upon which to design and deliver the transformed city.

The rules of change

All three urban canvases are shaped, perhaps controlled, by a set of overarching rules or principles which must be recognized and obeyed by the urban artist and developer.

These overarching rules and principles are the subject of discussion and debate by all of us who study and research the advancement of cities. You have read the theories and pronouncements of many, I am sure, like the older generation including Le Corbusier, Frank Lloyd Wright, Robert Moses and Jane Adams, and a fresh crop of urban commentators such as Richard Florida[17], Greg Clark[18], Geoffrey West[19], Anthony Townsend[20], Jonathan Rose[21], Charles Montgomery[22], Mike Barlow and Cornelia Levy-Bencheton[23], Bruce Katz and Jennifer Bradley[24], Alan Ehrenhalt[25], The Urban Age Project[26], Architecture for Humanity[27], and many others.

Being a New Yorker for over two decades, I've come to appreciate the successes and failures of modern transformation of NYC from the disparate approaches of Robert Moses, Jane Adams, and Michael Bloomberg. One student of cities, Alex Garvin, has refined his lifetime of changing cities into a set of "considerations" one should employ in conceiving and executing urban transformation. Garvin, in his comprehensive study of American cities, called *The American City, What Works, What Doesn't*, cites six "ingredients of success"[28] which offer a base line upon which to shape your dreams for transforming new, old, or peri-urban cities.

First, the market. Often ignored by the most visionary of urban thinkers, the market is both an impediment and a boost to urban transformation. The brightest of urban leaders find a way to "unlock" the power of the market and let it lead the transformation.

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[17] Richard Florida, *The Rise of the Creative Class* (2004)
[18] Greg Clark, *Global Cities: A Short History* (2016)
[19] Geoffrey West, *Space,The Universal Laws of Growth, Innovation Sustainability and the Pace of Life in Organisms, Cities, Economies and Companies* (2017)
[20] Anthony M. Townsend, *Smart Cities : Big Data Civic Hackers and the Quest for a New Utopia* (2013)
[21] Jonathan Rose, *The Well-Tempered City* (2016)
[22] Charles Montgomery, *Happy City: Transforming Our Lives Through Urban Design* (2013)
[23] Mike Barlow and Cornelia Levy-Bencheton, *Smart Cities, Smart Future: Showcasing Tomorrow* (2019)
[24] Bruce Katz and Jennifer Bradley, *The Metropolitan Revolution: How Cities andMetros Are Fixing Our Broken and Fragile Economy* (2013)
[25] Alan Ehrenhalt, *The Great Inversion and the Future of the American City* (2012)
[26] The Urban Age Project (Ricky Burdett and Phillipp Rode), *The Endless City* (2006),
[27] Architecture for Humanity (Cameron Sinclair and Kate Stohr), *Design Like You Give a Damn* (2002)
[28] Alexander Garvin, *The American City: What Works, What Doesn't (2002),* pages 538 to 542.

Michael Bloomberg did this at least three times during his twelve year run as mayor of NYC. First, up-zoning, where additional development rights were legislated so that owners of property could increase the height and size of buildings in NYC. This led to the flourishing of downtown Brooklyn, Long Island City in Queens, downtown and midtown Manhattan. Second, financing a $2 billion subway extension on the west side of Manhattan that opened a flood of private capital to build Hudson Yards on top of an existing railyard. And third, offering a derelict slice of Roosevelt Island to the winner of a global competition for a new science and technology university in NYC. The winner received access to the land in return for a commitment to invest in building and operating a new technological university on what once was an under-performing psychiatric hospital. Some estimate the competition's winner, Cornell Tech, will bring nearly $2 billion of fresh capital into NYC as it builds its new campus over the next thirty years.

But the market is not always your friend, and often does not provide such substantial leverage. As Garvin notes, "Asserting a 'need' does not mean that people will desire it enough to pay the price. Nor does portraying a 'better' city mean that the electorate will support it.[29]"

Second, location. We all know that cities of the past were the product of location, whether situated on an important river, a well-protected harbor, or a thoroughfare of commerce. Geography often has been destiny, as Tim Marshall and others have noted [30], and location still shapes opportunity and growth. Such traditional geographic assets are becoming less important as technology -- ubiquitous connectivity, urban farming, and air-conditioning -- offers high-quality living in places with fewer natural reasons for their existence. Las Vegas in the United States and Dubai in the United Arab Emirates are two examples that defy their geography and generate compelling reasons to exist by using technology, design and money to attract wealth and generate income.

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[29] Alexander Garvin, *The American City, What Works, What Doesn't* (2002) p. 542
[30] Tim Marshall, *Prisoners of Geography, Ten Maps that Tell Everything About the World* (2016)

Third, design. A close cousin of location, design must reckon with location and the market. It must feature the geography and existing amenities in a way that urban residents are excited and awed. One sees this in NYC's new Brooklyn Bridge Park which converted obsolete warehouses and piers to a green vantage point to watch the Manhattan skyline light up each night. In Moscow, creative landscaping in Zarardye Park has generated drama and surprise, with a cantilevered glass promenade over the Moscow River turning the river, Red Square and Saint Basil's Cathedral into dramatic backdrops for thousands of tourists to admire themselves in stylish selfies.

[31]

Fortunately, the best of modern design has abandoned the formalistic plans of the 19th and 20th centuries where the beauty of the project existed on the drawing table, and once built, could only be seen from an inaccessible vantage point a few hundred feet above the project. Thus we have moved from mathematical and formulaic designs such

[31] R&K Essentials: Zaryadye Park, https://roadsandkingdoms.com/travel-guide/moscow/rk-essentials-zaryadye-park/

L'Enfants' layout of Washington, D.C.[32] and proposals such as shown in the figure included here, to designs that view the project at the ground-level, through the eyes of the pedestrians who walk, work, and live within the project. Whimsy, short-cuts, surprise, and variety add life and vitality to urban life, as the crooked streets of older cities around the world have shown.

Fourth, financing. Many a project has faltered because there were insufficient funds to build it. More and more, a combination of public and private financing is necessary to create transformational projects. To be attractive enough to justify both public and private financing, the urban designer must offer both public and private benefit, so parks, affordable housing, improved transportation, new schools, or special facilities for healthcare are essential to justify the public investment, and extra opportunity for gain, such as taller buildings or tax subsidies, must be included to attract private sector capital.

[32] For a well-researched and interesting understanding of L'Enfants' mathematical and land-planning concept for Washington, D.C. see Will Selman, *L'Enfant's sacred design for Washington DC,* published in Published Square (2018), https://www.cnu.org/publicsquare/2018/02/21/l'enfant's-sacred-design-washington-dc

Fifth, entrepreneurship. By entrepreneurship, Garvin does not mean the kind we think of today -- the young, inventive person sitting in an incubator or garage and creating a new product or service -- but rather the ingenuity and drive that takes a transformational urban design and propels it into the public consciousness. Brashness and over-sized ego is sometimes sufficient, but more compelling is a plan which benefits many sectors of society so that set-backs and resistance to change are overcome by the almost spontaneous public support of the transformation.

Sixth, time. As Steve Jobs said, "If you really look closely, most overnight successes took a long time.[33]" Time is your friend if you can accept that major transformation is not quick, indeed it may take generations. As Garvin notes, quoting Daniel Burnham, a comprehensive plan can only "be executed by degrees, as the growth of the community demands and as its financial ability allows."[34] Indeed, Garvin notes great plans are often short on detail, so that future leaders can craft specific projects to match the evolving desires and resources of the community.

Smart City 3.0: Artificial Intelligence, Autonomy and the Future of Work in Cities

We are focused on the coronavirus pandemic these days as it eats our jobs, stifles education, deflates real estate, and collapses social intercourse, but soon a new force of change will begin to alter society, the economy and cities. This is the force of artificial intelligence and automation. This AI "pandemic" will put us to the test as we grapple with how to educate our citizens for this new era, generate taxes when many citizens have neither job nor income, and provide creative opportunities for millions of people who are free to do what humans, not robots, do best which is create, care, complain, carouse, and consort. This leads to the rise of Smart City 3.0.

Smart Cities 3.0's assignment is to deliver what robots and humans both need. This is an even more daunting challenge than delivering Smart Cities 1.0 and 2.0. If we expect

[33] See https://www.azquotes.com/quote/492771
[34] Alexander Garvin, *The American City: What Works, What Doesn't (2002),* p 542.

success in delivering Smart Cities 3.0 in the coming decade, you and I will need to be even more adventurous and ambitious to break through the inertia and restraints one faces in transforming cities, yet practical enough to listen to Alex Garvin's six "ingredients for success".

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