Accommodating an Urban Species

Patrick Lamson-Hall

ABSTRACT

More than 50% of the world's population lives in cities, a number which is predicted to rise to 70% in a few decades. Cities are growing faster than they have ever grown before, and they are doing so in the context of staggering inequality and the depletion of large amounts of environmental capital. If cities are to be livable, equitable, and efficient, realistic and adequate preparations will have to be made for this growth. An acceptable urban development strategy must be simple and cheap, and focused on improving mobility and housing affordability without interfering with market mechanisms. The only reasonable response to rapid urbanisation is to prepare the ground and plan for urban expansion.

Patrick Lamson-Hall is a Research Scholar at the NYU Stern Urbanisation Project. He completed a Masters degree in Urban Planning at the NYU Wagner School of Public Service in 2013; and a Bachelor's degree from Portland State University in 2011. He is the Monitoring Coordinator of the Ethiopia Urban Expansion Initiative, and the NYU Representative at the India Urban Expansion Observatory, at the Mahatma Education Society, New Panvel, India. His research interests include urbanisation in the developing world, development economics, and historical urbanisation.

✉ plamsonh@stern.nyu.edu

An Increasingly Urban World

As of the year 2008, more than half of the people in the world now live in cities. We are now an urban species. In the next few decades, nearly 7 out of every 10 people will live in cities.

This idea, which appeared so shocking back in 2008, has now become rote, boring, and trite. And yet, for all the repetition, very little has been done to prepare cities for the implication of this message. For some time now, the population in cities has been expanding much more rapidly than the population in rural areas, and that this trend is actually accelerating.

Cities are now growing faster than they have ever grown before, and they are doing so in the context of staggering inequality and the depletion of large amounts of environmental capital. If the enormous investments in cities are not channeled correctly - if cities don't plan for growth - the consequences will be chaotic.

This essay attempts to provide a perspective on urban growth that is based on the NYU Stern Urbanisation Project[1], founded in 2012. The project seeks to harness the growth of cities to speed up global progress. It does so through two initiatives: Urban Expansion and Charter Cities. The Urban Expansion initiative works with cities to make room for their inevitable expansion. The initiative has a "stakes-in-the-ground" orientation - a focus on real and tangible results in rapidly growing cities. We work with municipal officials and their colleagues at the regional and national level to make realistic long-term preparations for urban expansion.

Sao Paulo is Parched

The city of Sao Paolo in Brazil grew from a population of 2.2 million in 1950 to 11.3 million in 2011 - a ten-fold increase. It boasts the 3rd highest rate of economic growth in the world. The New York Times[2] has reported that Sao Paolo in the face of a massive water shortage, is considering a rationing plan that would provide households with running water for just two days out of every seven - with water that isn't even potable.

Figure 1: Sao Paulo in 1950[3] (left) and in 2014[4] (right) [Sources: Life Magazine and David Bank]

Some would take this as evidence of the general unsustainability of cities, but Sao Paolo is not Machu Picchu or Angkor Wat. Sao Paolo can pump water from 2000 meters underground, build enormous aqueducts, or engage in the costly miracle of desalination in order to slake their thirst. If the crops fail in Brazil, people do not have to starve in Sao Paolo. If the government of Sao Paolo can't solve the drought, people can move to Rio, or Curitiba, or a dozen other cities. In short, Sao Paolo and other modern cities are much less vulnerable than cities were in the past. And yet, Sao Paolo is almost out of water.

The problem is not caused by a lack of technology or a lack of resources, and the problem is also not caused by *too much* growth, as many people believe. Cities facing the negative consequences of the expansion of their populations and extents– whether from traffic congestion, inequality, or shortages of civic goods such as water, sanitation, and education - are struggling because they failed to prepare for the coming millions.

The first water system in Sao Paolo was established in the 1880s. It was expanded in 1906 with the completion of two dams on the Upper Tiete River. It was expanded again between the 1920s and the 1950s, a period in which the city quadrupled in population. Between 1950 and 1970 Sao Paolo again tripled in population. The Brazilian economy was expanding rapidly, and rural residents were moving to cities to join in that growth, and to make better lives for themselves and their families. At the same time, new health and sanitation measures increased the survival rate among children, resulting in a population boom.

Thirsty People -
A Legacy of Disorderly Growth

Sao Paolo grew in its floodplains, in a disorderly manner, without formal permission and without a long-term plan. By the early 1970s, the headwaters of the rivers that supplied Sao Paolo were being threatened by urban expansion, and slums ringed the reservoirs. The response of the state environmental agency, CETESB, was to pass a law prohibiting residential development in 53% of the Sao Paolo metropolitan area.

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On the surface, this seems like a good idea - part of the purpose of planning is to protect environmentally sensitive areas. But the strategy for doing so has to be rooted in a realistic understanding of the expansion of cities. The planners in Sao Paolo thought that their ban would stop the city from growing. In fact, Sao Paolo added an additional 5.3 million people over the next 40 years - almost doubling in population, and more than doubling in area.

Wishful thinking on the part of planners meant that no meaningful preparations were made for this growth. With planning, the growth could have been directed away from reservoirs and headwaters, and into less environmentally
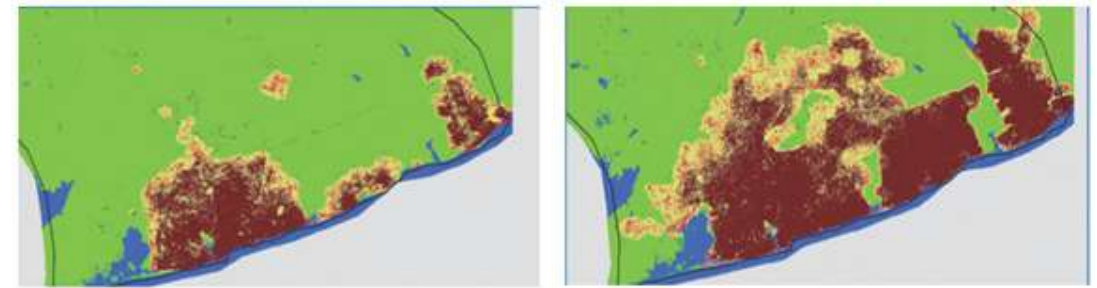

Figure 2: Accra, Ghana in 1985 (left), and 2000 (right). Built-up area in red. [Source: Angel et al. (2012)]

sensitive areas. There are many places where this has happened, including Mumbai, where the mangrove swamps have wisely been preserved. Instead, the city expanded with no significant protections, and without the transportation system necessary to permit decongestion. Water sources became polluted, new sources were not developed, and today the largest city in Brazil is parched.

India's Urban Population is Growing Rapidly

According to preliminary results from the NYU Stern Urbanisation Project's 'Monitoring Global Urban Expansion' program, in 2010 there were 405 cities in India with populations of greater than 100,000. The total population in these cities was 113,200,000. On an average, these cities are growing at 2.2% per year, and the rate of growth is increasing. This means that by 2040, India's urban population will have doubled. In 75 of these cities, the average rate of growth is over 3% per year, meaning a doubling of population will happen by 2030.

Further, 23 of these cities are growing at rates that will double their population in 15 years or less. Are cities in India making plans for this kind of expansion? What would those plans even look like? These are the questions that need a serious attention.

Urban Densities are Falling

Dr. Shlomo Angel in his book, *Planet of Cities*[5] points one way forward. The book builds on the work presented in *Atlas of Urban Expansion*[6]. The most important point in this body of research is that city population densities are falling. This means that cities that are adding population are going to take up progressively more land than they have in the past. When planners prepare their cities for growth, they have to take this into account.

Accra, Ghana provides a useful example **(Figure 2).** Between 1985 and 2000, the population of the city increased by 50%, but the area of the city increased by 153%. The reason for this is simple. Cities generate enormous

Figure 3: The Lower East Side of Manhattan in 1898[7] (left) and in 2010[8] (right)
[Source: Library of Congress and Wikimedia Commons]

Figure 4: Expansion Plan for Queens, New York, 1898.
[Source: Risse (1900)[9]]

wealth (New York and Los Angeles alone have a higher GDP than the entire nation of India), and when people become wealthier they consume more of everything, including land. Planners must take this into account when preparing land for future growth.

They also have to remember that *population density is a market outcome, not a design outcome.* Population density emerges as a result of how much income people have available to spend on living space. Regulations can have an impact on population density, but the usual impact of regulation is to force densities to be artificially low - there is no evidence for the success of policies that are intended to raise population density.

Often, planners believe that they can control density in a given area. But a historical analysis shows that it's quite normal for density to change radically over the lifetime of a city, even without massive replacement of the building stock. In New York City's Lower East Side, the population density in 1910 was approximately 450 persons/hectare. Today, the density is about half that - 200 person/hectare. And yet, the buildings today are exactly the same buildings that existed in 1910 - indeed, the neighbourhood is regarded as historically important for that very reason **(Figure 3)**.

The cause of the drop in density was twofold. First, the development of a rapid, cheap, citywide transportation system (the subway) opened up new land for development, while allowing people to commute from any part of the city. This was only possible because the land was planned before it was occupied, creating rights-of-ways for the sensible siting of major infrastructure and green spaces **(Figure 4)**. The second factor in the de-densification of Manhattan was a steady rise in incomes in the 20th century, which made it possible for the many people living in the Lower East Side to purchase and rent the new homes being built in the outer parts of the city. Planning alone was not enough to de-densify the Lower East Side. Rather, transportation planning guided market forces that were already in existence, to achieve a desirable outcome.

The role of planning in the market was not limited to the creation of a transportation network. As the network was extending the commuting range of New York City residents, planners were preparing land for the construction of new homes and businesses. This consisted of laying out a grid of major arterial roads, and the parcelisation and release of lands for development on the urban periphery. The results? Housing in New York remained affordable for three generations.

A Simple Plan for Urban Expansion
The beauty of the expansion plans for New York plan lied in their simplicity. At root, the planners did not seek to control how people lived, at what densities, in what sort of housing, or where they lived. They simply created adequate space for them to live in, and provided means for them to travel there. As one cynical architect put it, planners are people who put colors on maps. The kernel of truth in this is that for a plan to be relevant, it has to have an impact on the ground, and having an impact on the ground is much more important than drawing an impressive master plan that specifies every detail.

Action Program for Growth
The NYU Stern Urbanisation Project offers up a four-step municipal action program for cities that are interested in planning for their urban growth:
1) Accurate Maps and Population Projections
2) Expansion of Administrative Boundaries
3) A Network of Arterial Roads
4) A System of Large Public Open Spaces

Accurate maps are necessary so that cities can anticipate how much growth will take place, both in terms of population and in terms of area.

The administrative area has to be expanded to include all the areas where growth will have to occur. A modern example is Beijing **(Figure 5)**,
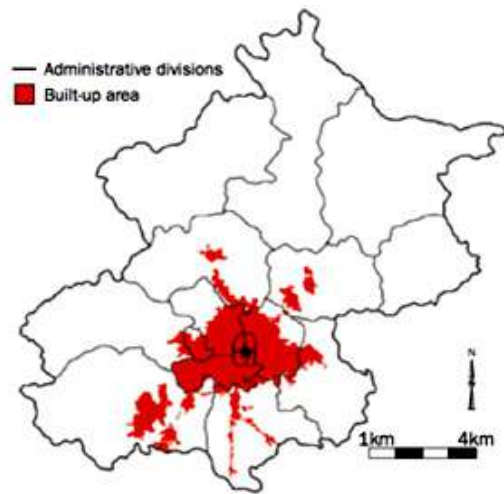
Figure 5: The administrative area of Beijing, China was almost 9 -times its built-up area in 2000. [Source: Angel et al. (2012)]
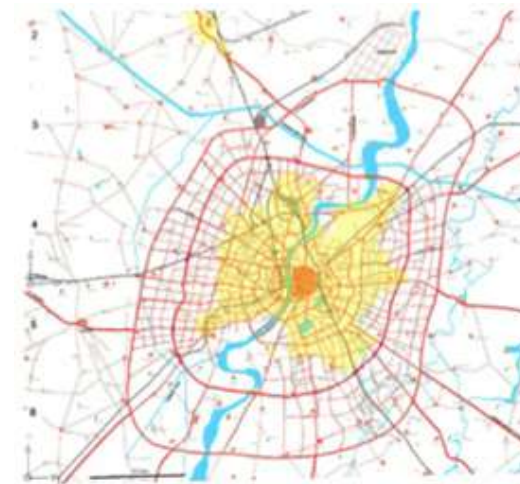

Figure 6: The arterial road grid in the 2011 development plan for Ahmedabad, India, allows for orderly urban expansion. [Source: AUDA- Ahmedabad Urban Development Authority]

which has an administrative area equal to 9-times its built up area. Historical examples include Barcelona, which increased its area 9-fold with Cerda's Ensanche plan, and New York City, which increased its area 7-fold in 1811 and another 9-fold in 1898. There is a principle at work here - only a small minority of cities grow very large, but if a city does grow very large, it's critical that the growth be orderly.

A network of arterial roads is essential, as mentioned previously. More precisely, it is critical for cities to obtain the land on which to build these roads before development reaches an area. These rights-of-ways will be an order of magnitude cheaper if they are purchased while the land is still rural, and they can continue in their current use until development reaches the area. The rights of ways would ideally be around 30 meters wide – wide enough to carry public transportation and trunk infrastructure, and they should be spaced approximately one-kilometer apart. One kilometer spacing ensures that no resident is more than a 15-

minute walk from a bus, train, or streetcar.

Finally, cities should take control of the land for a system of large public open spaces, to protect environmentally sensitive areas such as bodies of water and hillsides. This should happen in coordination with the network of arterial roads. The roads should direct growth away from the sensitive areas, so that cities don't have to spend exorbitant sums protecting them. These spaces can be developed into parks as growth begins to approach their fringes, creating valuable civic spaces, for example, the case of Toronto in Canada **(Figure 7).**

When we think about what it means to accommodate an urban species, and to make room for our urban expansion, these four ideas are a good place to start.

Two Places Making Room – Ethiopia and Colombia

The NYU Stern Urbanisation Project is currently implementing this four-point program on the
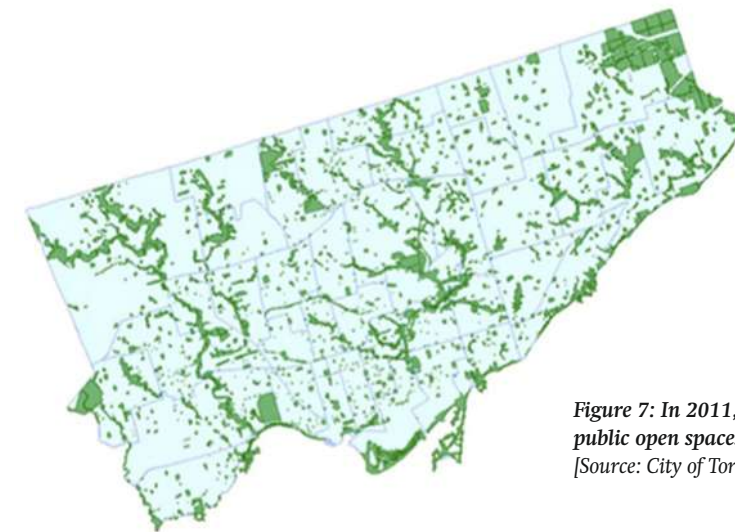
Figure 7: In 2011, Toronto, Canada, had a hierarchy of public open spaces that constituted 11 percent of its area. [Source: City of Toronto (2012)[10]]

ground in Colombia and Ethiopia, through its Urban Expansion Initiatives.

Four cities in Ethiopia – Bahir Dar, Mekele, Hawassa, and Adama - started planning for urban expansion in 2013. With assistance from the national Ministry of Urban Development and Construction and the Civil Service University, the cities have created up-to-date

maps, expanded their boundaries, surveyed a network of arterial roads, and created a phased budget to purchase the land for the roads over the next five years. In Valledupar, Colombia, work is underway to begin securing the land for the network of large public open spaces. Already, the arterial grid plan for the city directs growth away from the most valuable agricultural land, and away from the river.

Expansion is Inevitable

In these Ethiopian and Colombian cities, planners and mayors are committed to taking real action on the ground, quickly, in order to take advantage of the benefits of urban expansion, while minimising the downsides. In the 21st century, we're building the cities that we will have to live with for perhaps several hundred years. In cities where growth is orderly, the consequences of urbanisation can be dramatic and positive – higher incomes, longer lifespans, greater education, more gender equality, and a cleaner environment.

In cities where growth is disorderly, where progress in planning is not made, and where the priorities of cities leaders are on protecting the property rights and lifestyle concerns of the existing citizens, rather than planning for the coming millions, the consequences can be quite chaotic. As we have seen in Latin America, cities that failed to plan for their growth in the 1950s, when the continent had roughly the same proportion of urban residents as India does now, faced illegal expansion, social disorder, and, ultimately, shortages of critical basic goods such as water.

Make Room for Urban Expansion

Ultimately, the lesson is clear – it is neither feasible nor desirable to prevent people from moving to cities. It is neither feasible nor desirable to control the densities at which people live, the types of homes they live in, or where those homes are located. The only reasonable response to rapid urbanisation is to be an excellent host to the future residents of the city, by making room for urban expansion. ∎

Notes:

[1] More details about the NYU Stern Urbanisation Project can be found here: http://www.stern.nyu.edu/experience-stern/about/departments-centers-initiatives/centers-of-research/urbanization-project/project-overview

[2] Simon Romero,Taps Start to Run Dry in Brazil's Largest City, New York Times, February 16, 2015.

[3] Dmitri Kessel. São Paulo, 1947. Life Magazine.

[4] David Bank. Sao Paulo, View from Edificio Italia, 2010.

[5] Shlomo Angel, Planet of Cities, Cambridge, Massachusetts: Lincoln Institute of Land Policy, 2012.

[6] Shlomo Angel, Jason Parent, Daniel Civco, and Alejandro Blei, Atlas of Urban Expansion, Massachusetts: Lincoln Institute of Land Policy, 2010.

[7] "Mulberry Street, New York City,"1898. Library of Congress Prints and Photographs Division Washington, D.C. http://www.loc.gov/pictures/resource/det.4a31829/?co=det'

[8] Wikimedia Commons. Lower East Side, uploaded by Russavia. 2011.

[9] A. L. Risse, General Map of the city of New York, Topographical Bureau, Board of Public Improvements, New York.

[10] City of Toronto, Parks, Forestry and Recreation: Vision, Mission, Values, services, 2012.