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What Can Developing Cities Today Learn From the Urban Past?

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### **ABSTRACT**

The downsides of density, including traffic congestion, contagious disease and crime, were common in Victorian London and classical Rome, just as they are today in Sao Paulo and Lagos. Our urban past provides lessons for developing world cities today. The first lesson, that I highlight, is that political power, not commerce, has long driven the growth of the world's largest cities, and that fact remains true for many developing world mega-cities today. The second lesson is that while market access fundamentally shaped the cities of the past, the power of transport to determine urban fortunes has declined. Transportation infrastructure no longer transforms cities unless it is accompanied by complementary investments, such as education. The third lesson is that infrastructure, such as sewers and roads, functions best when combined with incentives, which can ensure the adoption of sewers and discourage the abuse of highways. The fourth lesson is that the development of many western cities relied on a nexus of property rights for landowners, including the right to build, buy, alienate, mortgage and rent, that are far more limited in many developing world cities. The fifth lesson is that there is a menu of institutions for managing infrastructure, including direct public control, independent public authorities and public private partnerships. Local conditions, especially the level of public capacity, will determine the best choice among those institutions.

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## I. Introduction

Can developing-world cities today learn from the urban history of the West? This essay argues that there are at least five broad lessons from the urban past that remain relevant to the growing cities of South Asia, Africa and Latin America, and there are surely many others. Urbanization today is, of course, different from the past because of new health, transportation and agricultural technologies, and because of cultural and institutional differences. Yet there are core elements of urban governance that are as important today as they were in Rome 2000 years ago.

The first lesson is that politics shapes space, which was certainly true during the time of the Caesars. The urban systems of developing-world countries are often dominated by a single primate city that is typically the national capital. While such dominance may look unusual to twenty-first-century Americans or Germans, it was the norm for much of urban history, during which population followed power. Jakarta's primacy within Indonesia today resembles the primacy of Edo within seventeenth-century Japan or Baghdad within the eight-century Abbasid Caliphate. All cities face negative externalities from crowding, but these are typically offset by positive agglomeration economies, which may be limited in cities that form for largely political reasons.

The second lesson is that while transportation costs have long determined urban fortunes and urban structure, the impact of new transportation technologies has become less important over time. The introduction of urban streetcars and elevated railroads increased the speed of urban commuters more than fivefold and consequently enabled the horizontal expansion of nineteenth-century cities. American suburbs were built around highways (Baum-Snow, 2007), but America's late twentieth-century investments in intra-urban rail appear to have had little impact on either mobility patterns or urban form, probably because they did little to increase travel speeds (Baum-Snow and Kahn 2005).

A third lesson is that incentives have been necessary complements to infrastructure in the fight to reduce the downsides of density. For twenty-five years after the Croton Aqueduct opened, New York City still suffered from Cholera outbreaks because poorer property owners and renters typically didn't pay to connect to the system. These connections were only made after 1866, when Dr. Stephen Smith and the City's Department of Public Health began fining tenement owners who didn't pay for piped water and sewerage. In sub-Saharan Africa today, even when water and sewer-related infrastructure exists (and often it does not), that infrastructure frequently does not reach poorer urbanites. Just as there was in nineteenth-century New York, and for the same reason, there is often a "last-mile problem," which can be solved by giving residents stronger incentives to use the infrastructure. Financial incentives, such as congestion pricing, can also ensure better use of roads by limiting excess traffic.

A fourth lesson is that well-defined property rights played a critical role in past urban transformations. The enforcement of hygiene regulations in nineteenth-century New York was easier because the city government knew who owned the properties. Over the course of that century, all major European and American cities saw a transformation in which land parcels with

one or two-story homes were transformed by deep-pocketed developers who built taller rental properties. A clear system of ownership and limited regulation made it possible for those builders to assemble land, erect large structures and then have confidence that they would be able to earn returns over time from their investment. The private construction often served lower-middle income urbanites, and it is much harder in an environment where property rights are poorly defined and public land use regulation is extensive.

A final lesson is that western cities were built on appropriate—and sometimes inappropriate—institutions as much as they were on bricks, mortar and steel girders. Over the centuries, cities have experimented with private and public provision of services, from street cleaning to transportation. Sometimes privatization has lowered costs while maintaining quality (LaPorta et al. 1998), but in other cases, private companies have expropriated public resources while providing little in return. The proper role for public, private and hybrid institutions depends on the strength of public capacity and the nature of the problems that are being faced. The history of western cities provides many object lessons of institutions gone wrong, although every developing-world city will have to determine which of those lessons apply to its own situation.

Before turning to those lessons, I highlight the institutional similarities and technological differences between developing-world cities today and western cities during the past. To many observers, developing-world cities seem strikingly poor and often poorly governed. Poverty has been the norm throughout human history, and that is true of western cities as well. Corruption and brutality were also normal parts of urban life historically. The striking differences between urban past and present are technological, and they include the car, the Green Revolution, effective medicine and reinforced concrete. After stressing the similarities and differences, I turn to the five lessons and then conclude.

## **II. Similarities and Differences between Poor Cities of the Past and the Present**

The mass urbanization of the poor world is one of the most striking social phenomena of the past 50 years. The Democratic Republic of the Congo has a per capita income of about 580 dollars (about 1,000 dollars if purchasing power parity adjusted) and an urbanization rate that now exceeds 44 percent. More than 14 million people live in Kinshasa alone. The Congo is extreme but not unique. Urbanization rates exceed 50 percent in Nigeria, Ghana Syria, which all have levels of per capita G.D.P. that are below \$2,500 (or between \$5,100 and \$6,200 adjusting for purchasing power parity).<sup>2</sup>

The mass urbanization of the poor world is a uniquely modern phenomenon. There were no cities with more than two million inhabitants and no countries with more than a fifty percent urbanization rate until 1851, when Great Britain crossed both of those thresholds. Yet large

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<sup>2</sup> The non-PPP adjusted figures are from the World Bank. Data for Ghana and Nigeria refer to 2019. Syria's data refers to 2007, but assuredly GDP is lower now after a decade of civil war. PPP-adjusted GDP comes from the Penn World Tables (Feenstra, Inklaar and Timmer, 2015).

cities, defined as having more than 500,000 residents, have existed for millennia, and many of them, including classical Rome, Abbasid Baghdad and Sung Dynasty Kaifeng, have emerged in societies that were poorer than Nigeria or Ghana today. While income estimates for ancient societies are always debatable, per capita output estimates for those time periods are generally well below \$5,000. Even in 1851, the Maddison Project estimate for income in the United Kingdom is less than \$6,000 (Bolt et al. 2018).

Yet even if incomes seem similar, the technological differences between historical periods and today are enormous, and poor world cities are still shaped by rich world technologies. Agriculture is much more efficient than in the past. Transportation is much faster. We have medical treatments for most contagious diseases. These technologies mean that developing-world cities today can grow larger, spread out further, and survive despite limited investment in public hygiene.

Historically, the growth of cities was limited by the need for large numbers of people to work on farms. Rome's population could reach one million 2,000 years ago, only because it was the center of a 50-million-person empire. Grain flooded into the city from Mediterranean breadbaskets like Egypt and Spain. Even in 1522, 68 percent of men in England worked in agriculture (Broadberry et al. 2011).

In some poor countries today, like the Democratic Republic of the Congo, employment remains overwhelmingly agricultural. But the share of agricultural workers can fall dramatically, even in places that remain poor by modern standards. The improvement of crop yields and the mechanization of agriculture means that a small number of people can produce enormous amounts of food, and then ship that food across the planet. In 2002, over 60 percent of Nigeria's workforce were farmers, but only seventeen years later, that share had fallen to 35 percent (World Bank). Nigerians could move rapidly from subsistence agriculture to urban life, because its farms became more productive and because it could import food produced by the highly mechanized agricultural sectors of Brazil and the U.S.

The ability to import food, of course, also relies on the transportation technologies that are quite different than in the past. Cities have always served as hubs of transportation networks, but the networks today are much larger. The ability of these networks to transfer knowledge and goods makes developing-world cities even more economically important than their historical predecessors. The ability of these networks to transfer disease makes them vulnerable to the spread of pandemics, like Covid-19.

Improvements in inter-urban transportation help explain why newer urban systems feature fewer small cities and more urban giants. The European hinterland is dotted with mid-sized cities and towns that served as local markets during an era when transportation was limited to the ox cart, and the barge. Even the poorest countries today have access to trucks, which mean that—despite rutted roads—moving goods is far easier than in Medieval Europe. Just as the new economic geography models predicted (Krugman, 1991), the value of mid-sized agglomerations located within the agricultural hinterland declines as the costs of shipping agricultural goods falls.

The more visible impacts of new transportation technologies can be seen in the internal structure of the city. Historically cities relied on foot travel for humans and animals for the movement of goods. These technologies helped keep cities both dense and compact. Today, packed minibuses enable the commuters of the poor urban world to travel long distances, which allows developing-world cities to sprawl far more than their historic antecedents.

Traffic congestion has troubled cities since Julius Caesar banned wheeled vehicles from Roman streets during daylight hours. But in the era of the streetcar and the subway, traffic congestion became less problematic because public transportation ran on dedicated infrastructure and was managed by a planning agent (private or public) who could internalize crowding externalities. In developing-world cities today, automobiles and minibuses are ubiquitous, uncontrolled and use more space than the pedestrians who crowded the streets of Medieval Paris. Traffic often overwhelms cities like Sao Paulo and Jakarta. The transportation technology revolution has created a particularly severe road management problem, which is likely to need congestion pricing as well as road-building, because new roads encourage more driving (Duranton and Turner, 2011).

Before 1750, cities had limited knowledge of the causes of death and few tools that could slow the spread of contagion. Quarantines, which emerged after 1377, were the only effective technology against the spread of pandemic, and they seemed to work imperfectly against diseases that were spread by insect, such as Yellow Fever, or through infected water, such as Cholera. Over the past 200 years, we have gained knowledge which has produced vaccines and treatments, although the experience of Covid-19 illustrates the profound limits to our knowledge.

In the nineteenth century, public health investments, such as aqueducts and sewers, were the primary means of reducing disease, even before Dr. John Snow discovered the water-borne nature of Cholera in 1854. The alternative to those investments was death. In the twenty-first century, cheap generic antibiotics and simple but effective oral rehydration solutions have radically reduced the health costs of many contagious disease. This change has allowed developing-world cities to grow largely without massive pandemics, but the world may pay a cost if the massive use of antibiotics leads to the spread of antibiotic-resistant superbugs.

Many observers of developing-world cities today are surprised, if not shocked, by institutional weaknesses. But urban corruption in the developing world today seems well in line with the corruption of American cities during the nineteenth century. If anything, the Tweed Ring's looting of New York City during the 1860s still sets a global standard for organized public theft of taxpayer money in a democracy. Nineteenth-century European countries experienced regular coups and revolutions (France), arbitrary autocracies (Russia) and extremely weak states (parts of Italy before unification). The United States descended into a Civil War that produced mortality levels that were comparable to the Rwandan Genocide or the First Congo War.

Nonetheless, there are at least two institutional differences between the urban past and present that seem particularly relevant for urban policy today. First, all the world's largest cities before 1800 were capitals of empires, which meant that their governments were at least initially capable of subduing their near neighbors. Consequently, those imperial cities typically had some public

strength at the center. Second, Anglo-Saxon countries had the stability of the Common Law, which was particularly developed in the area of real estate, primarily because land had been the primary form of wealth throughout history. While some courts were certainly subverted and nineteenth-century legal disputes could stretch on for years, there was at least some capacity to establish and protect ownership of urban property.

There are also vast cultural differences between London in 1750 and Kinshasa in 2020, just as there were between London in 1750 and Constantinople in 1750. The world's cultural variety does matter for urban policy, but since culture is so local, I can write nothing general about it, other than to emphasize the importance of considering local cultural norms before making urban policy. I now turn to the connection between politics and space.

### **III. Lesson # 1: Politics Shapes Space**

Jane Jacobs (1969) fancifully imagined that the first cities emerged along primitive trade routes and both preceded and caused the agricultural revolution. Archeological findings have not been kind to her speculations (Smith, Ur and Feinman, 2014). Cities appear to have clearly come after agriculture. Moreover, the earliest cities were places of power more than trade that resembled Washington, D.C. more than Jacobs' New York.

Smith (2020) cites Tell Brak as the "best candidate" to be the world's first city, and it is a place marked by "ancient grandeur" that is "spread out over nearly a mile." Ur et al. (2011) describe "a complex of buildings including the north-western corner of a monumental structure with two-meter thick walls and a massive basalt threshold" that existed in Tell Brak six thousand years ago. Other archeologists have found mass graves at Tell Brak, with bodies of young and old, men and women, packed together, showing signs of a violent death, perhaps caused by internal, civil conflict (McMahon, 2014).

That first city does show evidence of manufacturing and specialization, just as Adam Smith witnessed in London and Edinburgh six millennia later, but even more, it reveals evidence of an architecture of power and a legacy of violence. Tell Brak's more famous southern neighbor – Uruk – appears to have been even more of an imperial city. Uruk's famous ziggurats probably performed both religious and political functions, possibly including the distribution of grain. Uruk's successors, including Thebes, Babylon, and Memphis, all of which served primarily as political and religious capitals. Mohenjo-daro's hyper-planned uniformity gives the impression of some strong central authority.

Military power played such a primary role in pre-modern cities, such as classical Rome, because cities need to be fed, and the easiest way to get farmers to provide food for urbanites is just to take it at the point of a spear. Poor farmers have only a limited agricultural surplus which limits their willingness to spend on manufactured urban products. Other basic needs, like apparel, were created by agriculturalists themselves. Cities, including Uruk and Tell Brak, had copious artisans and merchants, but much of their output was probably sold to other urbanites.

Political forces drove the rise and decline of capital cities. Rome's population rose to about one million people at the time of the late republic, because the legions had been able to control the grain producing regions of Spain and Egypt, but not to subdue more local unrest. Consequently, Rome's leaders bought the local peace with grain doles, which were provided to hundreds of thousands of people. The city swelled with migrants eager for the public largesse (Ades and Glaeser, 1995). Five hundred and fifty years later, the western Empire was in ruins and the city may have lost ninety-five percent of its population.

The physical structure of imperial cities also reflects political power. Neither Washington, D.C., nor Beijing has the functional designs and high-density levels found in their more commercial counterparts of New York and Shanghai. Instead, these capitals have broad boulevards and impressive central space. Vistas are cultivated, and everywhere the two mightiest governments in the world present themselves in concrete and steel. Astana is an even more extreme example of a political city that is built to impress the power of its leadership on any visitors.

Many developing-world countries have had non-democratic political regimes that distribute rents disproportionately to residents of the capital city. These rents can flow to empowered insiders, such as the friends of Suharto, the value of whose connection to the leader was measured by Fisman (2001). Alternatively, the rents might go to those favored by formal government policies, such as Peronist import substitution embraced which encouraged the industrialization of Buenos Aires. Rents can even occasionally go to poor urbanites, including some of those Romans who received the bread doles. The growth of the capital is checked most in highly constitutional states that put strict limits on the disproportionate distribution of rents to the capital region, but those limits are rarer in the developing world.

Historically, Federalism has provided a check on the dominance of any one city, because political power is then shared across levels of government and across different state capitals. Henderson and Wang (2007) empirically document that Federalism is associated with more dispersed urban systems. The relocation of the Brazilian capital from the former Emperor seat of Rio de Janeiro to Brasilia was called for in its Federalist constitution of 1891. Juscelino Kubitschek finally implemented the move. He had been the governor of a non-coastal state (Minas Gerais). The quasi-federal structure of the Holy Roman Empire also helps explain the proliferation of medium-sized cities in Germany.

While power matters most for the capital cities, power can also complement the commercial activities of non-capital cities. For example, Dantzic and Lubeck successfully led the Hanseatic League in their fight against 15<sup>th</sup> century England, and their victory reaffirmed Hanseatic trading power in northern Europe. Spain's control over the Americas during the 15<sup>th</sup> century benefitted not only Madrid, but also Seville which became a major port for ships crossing the Atlantic. In the same way today, Chinese soft power benefits Shenzhen as well as Beijing.

The first implication of the political roots of many developing world mega-cities is that their size may not reflect any fundamental economic forces. Consequently, the capital may be "too large" relative to any economic optimization because the population has grown because of rent-seeking. Mid-sized cities may be too small because they did not enjoy the same political advantages.



While there is always the possibility that city sizes are not exactly optimal, that possibility is distinctly larger the sizes are determined by political favoritism more than economic productivity.

A second implication is that political change will impact city growth. If the country has a civil war, then the central city's population is likely to swell even further. If a country transitions from dictatorship to democracy, then secondary cities may expand faster, because their entrepreneurs no longer need to be close to power.

A third implication is that government leaders will face the quandary of both wanting to placate the residents of capital cities to reduce unrest, and desiring reduce the further growth of the city, which exacerbate urban problems and make future unrest more dangerous. Consequently, they may seek advice from urban economists about how to make their neighbors unusually happy and unusually sparse. That task can only be achieved with truly effective barriers to mobility, such as those (arguably) enforced during some years by the Soviet passport system. Moreover, even if rural-urban migrants bring negative externalities in the short run, the growing size of the capital can eventually help the transition to a more functional democracy (Glaeser and Steinberg, 2017).

A fourth implication is that the internal structure of the capital is likely to be blessed and cursed with the legacy of power. At its best, a centralizing despot can leave beautiful amenities, such as Louvre or the Colosseum. At its worst, that power can lead to vast empty areas in the center of the city that were once allocated to the monarch or the military. Planning around political uses of space creates extra challenges for urban design.

Finally, the political nature of urbanism in many developing-world cities means that significant urban policy change may often require intervention at the national level. For Americans, changing zoning or bus routes in Washington, D.C., are largely local concern, handled by the District's Zoning Office and Department of Transportation.<sup>3</sup> Even in India, reforming Delhi requires mainly the signoff from the government of the National Capital Territory of Delhi. But in Uganda, change for Kampala becomes a matter of national importance, and little is likely to be achieved without the support of the president. When cities are shaped by national politics, then national politicians take a distinct interest in the shape of the city.

#### **IV. Lesson # 2: Transportation Still Shapes Cities, but less than in the past**

Imperial cities that are fed by their legions need not depend on their economic endowments, but commercial cities must trade and produce to survive. The economic advantages of urban proximity ultimately come from the reduction of transportation costs for goods, people and ideas.

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<sup>3</sup> To be precise, the District runs the D.C. Circulator buses. The express buses are run by the Washington Metropolitan Area Transit Authority, which is responsible to the states of Virginia and Maryland, as well as Washington, D.C.

Consequently, transportation technologies have played an outsized role in determining urban locations, urban fortunes and the internal structure of cities.

The central place theory of Losch (1940) and Christaller (1933) depicted a hierarchy of cities dispersed throughout an agricultural hinterland, trading off the advantages of proximity against the benefits of specialization and scale that come from concentration. Krugman (1991) depicted geographic concentration as a dance between firms' desire to reduce costs of transportation with dispersed agriculturalists and with fellow manufacturing firms. More modern work, such as Heblich, Redding and Sturm (2020), formally estimates the link between transportation networks and the location of economic activity.

Inter-city transportation technologies have long shaped the location and fortunes of cities. Before the coming of the railroads, moving goods by water was far cheaper than moving goods by land, and consequently, water was crucial to the success of cities from Frankfurt to Mumbai to Shanghai. The importance of Bruges – an urban giant of 14<sup>th</sup> century Europe – dimmed after the silting of the Zwiijn, the river which provided the city with access to the North Sea. Every one of the twenty largest American cities in 1900 was on a waterway, from the Chesapeake Bay to the Pacific Ocean. Bleakley and Lin (2015) show that nineteenth-century cities located on the fall lines of rivers, and that those fall lines continue to predict urban density even today.

Intra-city transportation technologies shape the internal structure of the city. Older European cities, including Rome, contain the tangled web of narrow streets that reflect the legacy of our pedestrian past. The advantages of straight roads and grids increased as cities switched to the wheeled transport, such as streetcars and the horse-drawn omnibuses pioneered by Blaise Pascal in 17<sup>th</sup> century Paris. Since cars are a point-to-point transportation technology that requires essentially no walking, they enable the vastly lower density levels that are visible in American cities, like Phoenix, Arizona, that were built during the second half of the twentieth century. American car-based living, in turn, partially reflects low gas taxes and implicitly pro-car policies, such as building and subsidizing the interstate highway system.

Yet just as western history illustrates the importance of transportation technology, that history also suggests that inter-city transportation has become successively less important over time, largely because transportation costs have declined everywhere and become more homogeneous. In 1840, watery access to eastern markets gave Buffalo, Chicago and St. Louis a huge advantage relative to other locations within the American interior. The spread of the U.S. highway system now means that market access is good almost everywhere. The decline of the Rustbelt reflects the reduced importance of older transportation technologies, and the relatively greater importance of non-transportation advantages, such as the pro-business regulations emphasized by Holmes (1998).

The power of intra-city transportation investment also appears to have declined. Streetcars and then highways had a sizable impact on urban form because they radically reduced the cost of commuting to distant suburbs (Baum-Snow, 2007). Conversely, the post-1973 investments in metro systems seem to have done little to impact urban population patterns, because they didn't significantly reduce commute times relative to the car (Baum-Snow and Kahn, 2005). Moreover,

there is little evidence that train access leads to suburban population booms when those suburbs already had fast car commutes into the central city.

The first implication of this history for the developing world is that we should only expect transportation technologies to create major economic changes when those technologies significantly reduce the cost of mobility. In many cases, goods that are shipped to the outside world will come through container ships and airplanes, which are mature technologies. Added investments may do little to increase the ability of goods to reach the outside world. By contrast, Campante and Yamigazawa-Drott (2018) find that exogenous variation in the direct flights that enable the movement of people seems to have a significant impact of urban growth in the developing world.

A second implication is that a transit linkage may not be enough to turn a remote locale into a thriving city. National governments from Egypt to India to China, often hope to alleviate the population pressure on primate cities by building satellites connected by rail or bus rapid transit. Yet the track record of utopian new communities is mixed at best, and recreating the agglomeration economies of a thriving city takes more than a rail stop. Much of America's Eastern Heartland is well connected with highway and rail, and yet there is still plenty of economic dysfunction there (Austin, Glaeser and Summers, 2018). Local economic success requires other assets, like human capital and strong institutions, as well as market access.

A third lesson of western history is that many transportation systems built since 1970 have over-promised and under-delivered, both in terms of direct use and in terms of larger benefits. The case for new investment in the developing world is generally stronger, because of the limited level of current infrastructure, but there is just as much likelihood of bad spending decisions, such as building expensive metro systems with little ability to reach dispersed informal settlements.

The west would have experienced fewer failures if western governments had more assiduously applied rigorous cost-benefit analysis that focus on the direct benefits to the riders and whether those benefits exceed construction and operating costs. Detroit would have never built its under-utilized People Mover Monorail without magical thinking about how that investment would revitalize the central city. Politics has often driven transport investment far more than serious analysis (Glaeser and Ponzetto, 2019).

## **V. Lesson # 3: Cities Need Incentives as well as Infrastructure**

In 1842, New York City opened its Croton Aqueduct, which brought clean water into the city. This engineering achievement did not, however, end New York City's Cholera problem. Somewhat surprisingly, the city would continue to suffer from cholera outbreaks for another 24 years. The persistence of cholera was not a puzzle to Dr. Stephen Smith, who led a team of doctors during the 1860s that trooped through the city and produced the 1865 "Report of the

Council of Hygiene and Public Health of the Citizen's Association of New York Upon the Sanitary Conditions of the City.”

New York City had piped water, but water connections were expensive and tenement owners avoided the expense. Poorer renters lacked both resources and the incentive to internalize the wider health benefits of sanitation. New York City even had about 2,300 hydrants that dispensed free water, but using hydrants requires carrying water significant distances. Consequently, poorer New Yorkers continued to use shallow wells and pit latrines and they continued to die from cholera.

Smith’s report then produced the legislation that created New York City’s Board of Health, and Smith became its first leader. He began a system of inspections and fines that pushed tenement owners to connect to the water system. The Board’s inspection service was independent of the corrupt police force controlled by the Tammany Hall Machine. The doctors who set atop the Board’s leadership seemed to have been reputable men, like Smith, whose preferences (and reputations) kept them from striking corrupt bargains with those property owners who preferred not to pay for clean water.

While there is no clean identification strategy for estimating the impact of the Board so far, the time series data suggest that it was effective. New York never again experienced a major cholera outbreak after 1866. Mortality rates declined dramatically over the late nineteenth century. Cutler and Miller (2005) provide compelling evidence of a tight link between clean water and mortality during those years.

Ashraf, Glaeser and Ponzetto (2016) interpret the episode to mean that there can be substantial numbers of poor people for whom the cost of sanitary infrastructure is above the private benefit but below the social benefit, then water adoption will be too low. Widespread adoption therefore requires either a subsidy or penalty or both. Subsidies create the possibility of waste, since a subsidized water system may end up being quite inefficient. Moreover, subsidizing urban water use will artificially swell the number of urbanites.

Fines creates the possibility of abuse or extortion by the inspectors. Fines may also harm the most vulnerable, and may just be politically impossible in many developing world cities. Imposing regulations on the poor directly is harder politically and logistically than imposing regulations on landlords who rent to the poor, even if the ultimate incidence is the same. Regulating New York was made because it was a city of landlords, not homeowners, and because ownership records were clear. This suggests that the fine system adopted by Smith will be efficient in settings where the judicial system is relatively efficient but where the executive system is wanting.<sup>4</sup>

Many developing-world cities are in roughly the same place that New York was in 1865. Infrastructure has been built, but poor households are expected to pay for connection to that infrastructure. In Lusaka, the setting for the work of Ashraf et al. (2017), the connection fee

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<sup>4</sup> For a broad range of parameter values, the optimal system combines a fine which is small enough to avoid extortion of the innocent with a subsidy.

could be over \$1,000, and that was a substantial fraction of one year's pay. Consequently, poor people continue to use pit latrines and shallow wells, just as they did in New York City. The world has come to describe this situation as a last mile problem.

The direct health consequences of that problem are not as severe as they were in 1865. We now have antibiotics and effective remedies for cholera. Yet Ashraf et al. (2017) still find adverse consequences that follow when water supply is temporarily broken, including both stomach illnesses and respiratory sickness. While the direct impact of clean water on water-borne illness is more important, hand washing depends on water supply. As the emphasis on hand-washing during the early-stages of the Covid-19 pandemic suggests, the ability to wash one's hands can reduce the risk of some air-borne illnesses.

Dr. Stephen Smith's regulations were not the first use of incentives to regulate urban pollution and congestion. In *Aldred's Case*, decided in 1610, an English judge ruled that a man has "no right to maintain a structure upon his own land, which, by reason of disgusting smells, loud or unusual noises, thick smoke, noxious vapors, the jarring of machinery, or the unwarrantable collection of flies, renders the occupancy of adjoining property dangerous, intolerable, or even uncomfortable to its tenants." Consequently, an urban pig farmer could be sued for abatement or damages. Yet while the Tort system may have worked when the source of harm was an immediate and obvious piggery, the harm done by failing to connect to the sewer system is hard to measure. Common Law remedies work poorly when the chain between action and harm is difficult to establish.

With sewers, incentives need to encourage adoption. With roads, incentives need to discourage overuse, which was a point made by Pigou himself. William Vickrey conceived the idea of congestion pricing in New York in the 1950s, but his idea was first implemented by Singapore in 1975. Drivers needed to purchase and then display a paper certificate to enter the city center during peak hours. London's congestion pricing system, implemented in 2003, also followed this model. In 1998, Singapore switched to electronic road pricing, which can more flexibly change prices based on usage over the day. The city-state's roads face relatively little congestion because of the combination of road pricing and high taxes imposed on car buyers.

The implementation of congestion pricing faces the twin challenges of political resistance and enforcement. Singapore's government in 1975 was not particularly susceptible to democratic opposition, and was comfortable imposing strict penalties on its citizens. Hong Kong experimented with electronic road pricing in 1983, but the government ultimately failed to convince the public. In the U.S., tolling new roads is politically feasible, but imposing congestion pricing on formerly free roads seems impossible. The enforcement of congestion pricing in developing world cities is at least as difficult as imposing sanitary regulations on slum dwellers. Rationing systems, such as those which allow only even numbered license plates to drive on particular days, seem easier to enact and enforce if less efficient.

The central lesson of this history for the developing world today is that infrastructure is unlikely to eliminate urban problems on its own. Water pipes will not reduce urban illness if poor families do not connect to those pipes. More roads will not eliminate congestion if those roads generate

more driving, as in Duranton and Turner (2011). Infrastructure requires incentives either to ensure adoption or to discourage overuse. Taxing the poor to induce them to internalize externalities can sometimes improve the quality and length of life for the poor themselves.

The second lesson is that the level of incentives needed depends on the gap between private and social benefit. Households are more willing to pay for water than for sewers. Much of the benefit of clean water goes to the household itself, but if the household can dump its waste on the street, then almost all of the benefit from sewers comes from positive externalities. That difference explains why in some cities, like Manila, revenues from water are used to cross-subsidize waste disposal.

A third lesson is that the appropriate tool for creating incentives depends on local political conditions and institutions. Smith was able to use the state government to bypass the corrupt city government and create his own parallel quasi-judicial authority. In some developing-world countries today, that system might work well, but only if the independent authority has strong leadership that faces incentives of its own. Parastatal enterprises can often provide less accountability and worse service than direct government provision in the developing world today. I will return to these issues in Section VII.

A fourth lesson is that cities often react to urban problems with a considerable lag. New York had grown to more than 800,000 inhabitants by 1860, yet it did not have enough sanitary infrastructure in place to reduce terrible cholera outbreaks. It took decades to build the structure and institutions that made the city safe. We should not expect developing-world cities to solve their problems overnight.

A final lesson is that sometimes we need both to encourage adoption and limit overuse. Smith did not try to make all water free, because that would have eliminated the incentive to conserve a scarce resource. Smith made sure that water users paid a price for water that limited waste, but property owners faced a second price if they didn't adopt the system. Those two prices ensured connection and limited abuse.

## **VI. Lesson # 4: Western Cities were Built on a Nexus of Property Rights**

Dr. Smith's fight to reduce contagion in New York City took advantage of the city's clear records of property ownership. Early in his career, he discovered that over twenty typhus cases came from a single residence on east Twentieth Street. In the legal haze of an informal settlement, it would be almost impossible to find anyone to hold accountable, but in nineteenth century New York, Smith found the wealthy owner of the property by going through the tax records. While the law gave Smith few remedies, the Doctor was able to threaten the owner with public exposure in the New York Evening Post and the owner acquiesced to Smith's demands (Glaeser and Cutler, 2021).

Today, we cannot know how many prominent and wealthy Indians exercise some control over unsanitary homes in the slums of Mumbai, because property rights are too murky. That

murkiness makes it difficult to impose either Pigouvian incentives or property taxes. The residents of poor areas cannot use their property as leverage to finance entrepreneurship (DeSoto, 2000). Land cannot be easily sold or assembled, and that means that slums may persist in prime urban areas and investors are unable to upgrade structures.

The development of western cities, especially in the nineteenth century, involved a physical transformation from low rise, low quality homes to high rise, durable structures. That transformation, in turn, rested on a system of property rights that had been developed over a millennium. As land was the primary source of wealth in the pre-modern world, the rights associated with ownership of land were a primary focus of litigation and judicial rulings for centuries (Pollock and Maitland, 1898).

Ownership of land is traditionally associated with a bundle of rights (Ellickson, 1993), including the right to occupy, develop, and alienate permanently or temporarily, which includes the right to sell, rent and mortgage. These rights are rarely unlimited. Since *Aldred's Case*, English Common law has limited the right to occupancy, so that owners may not house pigs that harm the neighborhood. Most of the world's jurisdictions have land use controls that limit the right to build. The right to rent is limited by rent control laws, and other regulations about tenants' rights.

In the nineteenth century, the prevailing model of urban development did, however, depend on relatively robust rights to occupy, build, sell and rent. Building the towers that define western city centers first required land assembly, which meant purchasing land from small landholders, and then construction. The builders then typically rented their units: more than 95 percent of New Yorkers were renters in 1890. The willingness to build also depended on the *ex post* security of property rights, since the bankers would have been unwilling to lend to developers without the right to take buildings in the event of default.

A variant of this model also enabled East Asian urbanization. Real estate played a disproportionate role in the Asian financial crisis of 1997, largely because real estate makes better collateral than factories. A bank can more easily resell an ordinary class A office building than it can operate a failed garment business. As real estate is a particularly fungible asset, it is particularly important to banking sectors early in the development process. Consequently, bank failures often revolve around real estate (Glaeser, 2017). The Chinese model includes an unusual combination of limited property rights (the government technically owns all land) with implicit public subsidies of new development through a combination of eminent domain and public lending.

By contrast, neither property rights nor subsidized construction occur in the informal settlements of Africa and India. In these communities, poorer residents typically have some sense of security against expropriation, but they have little ability to sell, rent or develop. Even when governments engage in widespread titling programs, the residents of poorer communities often fail to maintain these titles, presumably because they contain few extra rights that deliver value (Galiani and Schargrodsky, 2016).

The history of the West suggests that it will be necessary to build many more large structures if decent living space is going to be provided for middle income urbanites in the developing world.

Developing-world cities do have large buildings but they are typically limited to commercial structures, luxury housing and government edifices. Western history suggests that large scale construction requires a robust bundle of property rights associated with land ownership.

In the West, residential units were typically rented not sold, which means that they can be allocated to people who have little ability to borrow on their own. Renting also reduces some mobility costs, which is attractive for transient urban populations. Yet rental contracts are difficult in places with strict rent control. India, for example, have some of the strongest rent control rules in the world, but these bind only in the formal housing sector. Consequently, there are two parallel housing markets that coexist in cities like Mumbai: a high-end and quite expensive market, where units are owner-occupied, and an informal market, where renting is common and structures involve little investment. Western cities created a middle range of rented housing only because landlords could adjust rents and evict tenants that didn't pay.

The historic development of western cities was also easier because there were relatively few limits on the size and nature of structures that could be built. While Dr. Stephen Smith, and his followers, imposed basic sanitary laws on tenements, there were no functional restrictions on the height of New York City buildings until the Zoning Ordinance of 1916.<sup>5</sup> Yet since 1968, Indian cities have faced draconian land use controls based on the British Town and Country Planning Act (Bertaud, 2011). If the right to build is limited to a floor-area ratio of 1.33 or less, then it is difficult to erect large amounts of usable space on a small amount of land.

Western history is also replete with examples where robust property rights and enthusiastic speculation combine to create urban real estate bubbles (Glaeser, 2017). These bubbles typically lead to new construction, like the 1920s skyscraper boom in New York that produced the Empire State and Chrysler Buildings (Nicholas and Scherbina, 2013). Those bubbles can also lead to financial wreckage, and widespread vacancy.<sup>6</sup> That lesson suggests that if property rights are strong enough to permit massive amounts of urban building, then bank regulators ought to expect at least the possibility of bank over-lending.

The final lesson is that robust property rights can sometimes stymie urban development, and there is at least a theoretical case for eminent. Land assembly can be defeated by the holdout problem in which a small landholder waits to sell and then demands all of the surplus from the development. The expectation of that problem then prevents new development in the first place. Eminent domain, which gives the government the right to seize private property, is the typical legal solution for this problem. The massive transportation projects that Robert Moses built in New York would have been impossible without eminent domain. Yet the allegations of wanton neighborhood destruction levelled against Moses by Caro (1973) and others reminds us that these powers can be abused.

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<sup>5</sup> Even that ordinance did not restrict heights, but instead required buildings to become narrower as they rose from the ground, which created the ziggurat structure that is common in older New York City skyscrapers.

<sup>6</sup> Empire State was long referred to as the Empty State Building.



## VII. Lesson # 5: Urban Services Need Appropriate Institutions

Historically, there are four common institutional arrangements for providing a road or a bridge or a water system. First, the service can be provided directly by an entity that is part of the executive branch of government and controlled by its leadership (direct public provision). Second the service can be provided by a public entity that is independent of local government, with leadership that is typically appointed by a higher level of government (indirectly public authority). Third, the service can be delivered by a private for-profit company, which is either paid by the public sector or by user fees or both. Fourth, a non-profit company can deliver the service.

Nineteenth-century London was the capital of a world empire and the Thames flows right past the Houses of Parliament. The city's water quality mattered to the mighty. Benjamin Disraeli himself, then Chancellor of the Exchequer, made the case in the House of Commons for better sewers declaring the Thames "which has hitherto been associated with the noblest feats of our commerce and the most beautiful passages of our poetry, has really become a Stygian pool, reeking with ineffable and intolerable horrors" (Glaeser and Cutler, 2021).

Unsurprisingly, London's Commission of Sewers was created directly by an act of Parliament, and its Commissioners were directly appointed by the Queen. Yet, in 1855 Parliament also established an elected Metropolitan Board of Works that would straddle 36 districts within greater London. Royal appointees still held veto power, and there was little progress until the Great Stink of 1858 that brought forth Disraeli's speech. Eighteen days after the speech, parliament passed the "Metropolis Local Management Amendment Act," which directly settled key areas of engineering dispute (e.g. sewage could not enter the Thames within the borders of the metropolis) and provided abundant ability to borrow. The direct engagement of an effective national government enabled the construction of London's sewers under Joseph Bazalgette, just as it enabled Baron Hausman to build the sewers of Paris.

Before New York City built the Croton Aqueduct, the city attempted to solve its water problem using a subsidized private water provider: the Manhattan Water Company. While Philadelphia had opted for a public water works system, Aaron Burr and Alexander Hamilton convinced the city legislature that a subsidized private company would provide a cheaper alternative. The key subsidy slipped into the enabling legislation was that the Manhattan Water Company could also engage in banking, which was a valuable privilege since the city had only one other legal bank.

With the benefit of modern incentive theory, it is easy to predict that this company will do far more banking (which was highly profitable) than water provision (which was not). Over time, the Bank of the Manhattan Water Company evolved into the Chase Manhattan Bank and then into J.P. Morgan Chase. For the last two centuries, it has been a major part of New York City's financial establishment, but it did little to solve New York City's clean water problem.

When New York turned instead to building the Croton Aqueduct, it chose an independent public authority: the Croton Aqueduct Commission. This commission was public, but largely independent of the city's government. The aqueduct commission was led by distinguished New

Yorkers and beholden to the State Government. The Erie Canal Commission followed a similar model. In the twentieth century, the Port Authority of New York and New Jersey and the Triboro Bridge Authority provide other examples of independent public authorities that manage infrastructure.

Private provision also proved problematic for New York City's street cleaning. During the Tweed regime, New York City paid private street cleaners to remove the abundant waste that accreted from abundant animal traffic. Public procurement is a primary means through which public wealth can be plundered. Apparently, the payment to the street cleaners was split between the private company and the city machine's political leaders. As part of this corrupt bargain, the street cleaners faced little pressure to actually do any street cleaning. New York streets only got cleaned up when the city government directly – and not through any independent authority – took responsibility for the streets and handed that responsibility over to public servants, who had a reputation to lose.

Hart, Shleifer and Vishny (1997) present the core model of the “proper scope of government”, in which private-sector provision differs from public provision mainly because of the strength of incentives. Private providers of roads or prisons or airport security will keep costs down, but lower costs may also lead to lower quality. When maintaining quality is more important than cutting costs, then the weak incentives of public providers provide more social surplus.

While assuredly that advantage of public provision is real, both urban history and the contemporary work of Engel, Fischer and Galetovic (2014) point to an even more important disadvantage of public private partnerships: the subversion of the state. When the public sector is paying a private actor to perform a public service, then the private actor has a strong incentive to bribe the government to increase payments. Reduced quality may well go along with that corrupt bargain. The work of Engel et al. (2014) finds that while private infrastructure provision has worked moderately well in Chile, which has strong public capacity and limited corruption, the track record in sub-Saharan Africa is far worse.

During an energy crisis early in 1992, Philippine President Fidel Ramos signed deals with independent energy producers, who proved capable of swiftly increasing the country's power supply. Manila's public water system could only supply “an average of 16 hours of water per day to two-thirds of its coverage population,” and its “efficiency as measured by non-revenue water (NRW) and number of staff per 1000 connections was the lowest among major Asian cities” (Wu and Malaluan, 2008). As private companies had been able to deliver more power, it seemed logical to turn see privatization as a solution for the city's lack of water.

With the help of World Bank consultants, the Philippines produced “a privatization and bidding process that was hailed internationally as a significant improvement over previous similar deals” (Esquerra, 2003). Manila was split into two zones with two different operators, and “the company that won the east zone offered to run the concession by charging a price that was only 26.39 percent of existing rates.” Maynilad won the west zone by charging a price that was 57

percent of current prices.<sup>7</sup> At this point, the situations seemed to be a model of how competition between private providers could lower costs for the public at large.

But Esquerra (2003) notes that there is a “joke” that concessionaires only get serious “on Day 1 after a contract is won” when “they would sit to lay down plans to renegotiate the contract.” At the auction stage, the process is inherently competitive, but after that point, the process turns into a bilateral negotiation between the water companies and the government. The water companies claimed that their currency losses during the Asian Financial Crisis was a *force majeure* event, and that they should be allowed to raise their rates and delay service improvements. The government agreed.

Maynilad was the more problematic entity. It had less equity, and consequently often on the edge of bankruptcy, which helped it bargain with the government. Wu and Mamaluan (2008) note that “because related-party transactions were shielded from competitive bidding, Maynilad incurred exorbitant costs,” and that “non-personnel operating costs actually increased dramatically while its financial woes were worsening.”<sup>8</sup> Profit-seeking private entities who deal with the public sector have strong incentives to subvert the system through renegotiation, bribery, and risk-taking when the public takes the downside risk.

Engel et al. (2014) also emphasize that private provision does solve any financing problem on its own. If a piece of infrastructure generates revenues that can be used to attract private developers, then those revenues can also be used to pay for public development. The case for private development hinges on the value of incentives. If a private developer receives revenues only by ongoing usage over time, then there is a strong incentive to maintain the infrastructure. An independent public authority that was funded by toll revenues could face similar incentives, but those incentives would be weakened if the public entity was funded with general tax revenues, rather than user fees, or if the public entity knows that it can count on a bailout.

Non-profit entities, such as the turnpike trusts that managed road infrastructure in eighteenth-century England or non-profit hospitals today, provide another institutional model. It is difficult to imagine that a non-profit could potentially raise the vast resources need to build urban infrastructure in the twenty-first century, but non-profits provide a number of smaller interventions throughout the urban world, from water purification to education. Non-profits are particularly plausible when there are philanthropic dollars or hours that can be channeled.

Non-profit enterprises also have weaker incentives than their for-profit competitors, but they are independent from government and typically face more competitive pressure. Glaeser and Shleifer (2001) argue that non-profits can help ensure higher quality for customers and fairer treatment of employees, such as the doctors who work for not-for-profit hospitals. Donors have little interest in giving money to for-profits, since that money will typically flow purely to their shareholders, or governments, since donations will presumably just crowd out taxes. Non-profits face a non-

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<sup>7</sup> The well-connected Lopez and Ayala families were central players in the two winning bids, just as they had been in the earlier power privatization.

<sup>8</sup> Overpaying for inputs is attractive either if the fees are based on costs or if the payments essentially shield corporate assets from recovery during bankruptcy proceedings.

distribution constraint, which means that new donations cannot just leave the entity and so charitable gifts can change their budget set and their behavior. The non-distribution constraint therefore gives non-profits an edge in activities that are funded by the altruistic impulses of others.

Independent public authorities have the advantage of being free from some regulations which may bind the rest of the public sector, such as limitations on incentives or salaries or dismissing workers. Independent authorities can sometimes serve to do an end run around failed local institutions, such as New York's political machine. Yet the track record of parastatal firms in the developing world is decidedly mixed. At their worst, these institutions provide even less accountability than a directly controlled public entity because elected leaders can hide behind appointed officials.

The broadest lesson from this urban history is that there is no one right answer for institutional design. In the twentieth century, the switch from public to private service provision in many cities seems to have brought lower costs with little loss in quality (Lopes-De-Silanes et al., 1997). In the nineteenth century, it was the switch to public provision that increased quality and cut costs. Institutions must respect local conditions, and sometimes, just changing the institutional arrangement – in any direction – can eliminate cozily corrupt relationships.

A second lesson is that private provision is extremely dangerous with low levels of public capacity. If a private company is given an opportunity to provide a public service in exchange for a public subsidy, then that company has a strong incentive to subvert the government to reduce the expected level of service and increase the level of subsidy. The first requirement before turning to private providers is to increase the strength of public evaluation capacity, with agents who can investigate and stop corruption, and with independent assessors of costs and quality.

A third lesson is that private provision is most plausible in settings that closely resemble a standard market, such as transportation, and least plausible in settings that resemble public good provision. If users are expected to pay for most of the cost of a service, then presumably a private provider can be found without the need for public subsidy. The need to attract users means that the government will not have to enforce a quality standard. The largest risk may be that the private firm will subvert the government to receive the free use of other public assets. Nineteenth century streetcar companies routinely corrupted American city government to receive lengthy land leases (sometimes lasting for several centuries) at a nominal price.

A fourth lesson is that independent public authorities work well only in limited settings. Ideally, the authority will have a leader – like Robert Moses – with an international reputation to maintain. If the leader is a plausible candidate to run a major private corporation, then she is much less likely to become a pawn for the local political bosses. Independent authorities also work best when they have clearly delineated missions, like building the Croton Aqueduct, which make it easier for their leadership to be judged. In the late twentieth century, the Port Authority of New York and New Jersey morphed into a vast empire with responsibilities ranging from John F. Kennedy Airport to the rebuilding of the Twin Towers after the September 11 bombing.

This vast proliferation of functions would tax any management team, especially a team that labors under political and governmental limitations.

A final lesson is that change happens most quickly with empowered leaders, who are isolated from public discontent, but that isolation can also lead to significant abuse. It is vital to create organizations that hit the right balance between accountability and authority. While Moses perhaps had too much authority, the stasis of American urban infrastructure since 1970 suggests that accountability may have overwhelmed authority (Altshuler and Luberoff, 2004). If the cities of the developing world are going to grow and change, they will need institutional designs that empower, but hopefully do so with enough checks to limit corruption and malfeasance.

## **VIII. Conclusion**

All cities must deal with the downsides of density, including traffic congestion, contagious disease and crime. All cities must deliver usable space for residents and businesses. As massive migration expands the cities of the developing world, these challenges can seem unmanageable. Yet the history of western cities reminds us that they were once places of horrendous disease and terrible living conditions. They too once suffered from corruption and dictatorship. The cities of the developing world should not try to imitate the cities of the west, but they should learn from their past successes and failures.

This essay emphasized five ways in which the urban past still resonates today. Political power determined the growth of places like Rome and Edo. Political power still shapes the fortunes of Lagos and Delhi. Great political capitals typically benefit from favoritism, which then encourages more in-migration, but they also can suffer from the trappings of grandeur, which can limit agglomeration and mobility.

Transportation technology played a critical role in the growth of commercial cities in the past, but transportation-related advantages have become steadily less important over time as the world has become flatter. The declining importance of transportation technologies does not argue against transportation-related investments, but it does suggest the importance of rigorous cost-benefit analysis and the value of complementary investments, such as education.

The third lesson is that the infrastructure becomes more efficient when it is combined with incentives. Road traffic can come to a standstill without congestion pricing. The last mile problem can limit the sanitary value of water mains unless households are nudged into connecting with the system.

A fourth lesson is that property rights played a central role in the physical construction of western cities. Cities like New York and London did not grow through slow infill of small property holders. Instead, large scale developers borrowed vast sums to purchase land and build. Their borrowing was then repaid with revenues from renting apartments and offices. That

process requires a nexus of property rights, including the right to buy, build, rent and mortgage property. These rights are typically absent in most of the world's informal settlements.

A final lesson concerns the institutions that must make the city livable. Some sort of operating entity must provide clean water and sewers and street cleaning. That entity can be an independent public entity or a private provider or fully contained within the public sector. History does not suggest that there is one universal answer. Private providers can cut costs, but they have a disturbing tendency to subvert their public-sector overseers. Local conditions must determine the right institution.

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