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### Book section

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# Infrastructures of Equality Versus Inequality

Ricky Burdett

When planning infrastructure at a large scale it can be easy to lose sight of its effects upon the individuals who actually use it, as well as its capacity to act as a multiplier of social equity. Joining up the dots between the data, density and development, Ricky Burdett explains how policy choices have emboldened infrastructure's social impact in Bogotá and London—and could do so elsewhere.

There is a tendency to be negative when it comes to talking about infrastructure. Though I had originally titled my essay “Infrastructures of Inequality,” I would like instead to take a positive approach and focus on infrastructure’s capacity to foster social integration. When one thinks of the negative aspects that are often associated with infrastructure, one should not forget that there is a flip side. Whereas infrastructural systems always benefit those who have access to them, one could also invest in infrastructure in order to improve existing conditions and modes of operation—to do things better and with better results. This is what we should be most interested in learning.

Exploring the physical and political impacts of infrastructure on urban life necessitates a different way of thinking about design as a form of political action in order to effectively solve the problem of using economic means in a positive, inclusive, and equitable way. To pursue such an agenda requires a twofold perspective—on the one hand, a big-picture approach vis-à-vis infrastructure and, on the other, the particular view of affected individuals on the ground.

One of the most important things in contemporary discourses concerning infrastructure is that academics and practitioners have broadened their view, not exclusively addressing sewers, transportation systems, water distribution networks, or social institutions as isolated components, but asking how they actually *inter-connect*. This shift of perspective is particularly important when looking at those parts of the world that are currently urbanizing at an unprecedented rate, requiring more and more investment in infrastructure in the years to come. Statistics back this up. When it comes to urbanization, the cities that are growing faster—*much* faster than those we typically think of in China or Latin America—are metropolitan regions such as those of Nairobi, Lagos, Kinshasa, Kabul, and Addis Ababa. These agglomerations, at least today, are located in regions of the world with societies marked by relatively low levels of income and energy consumption. What are the appropriate models to follow and what are their consequences when trying to

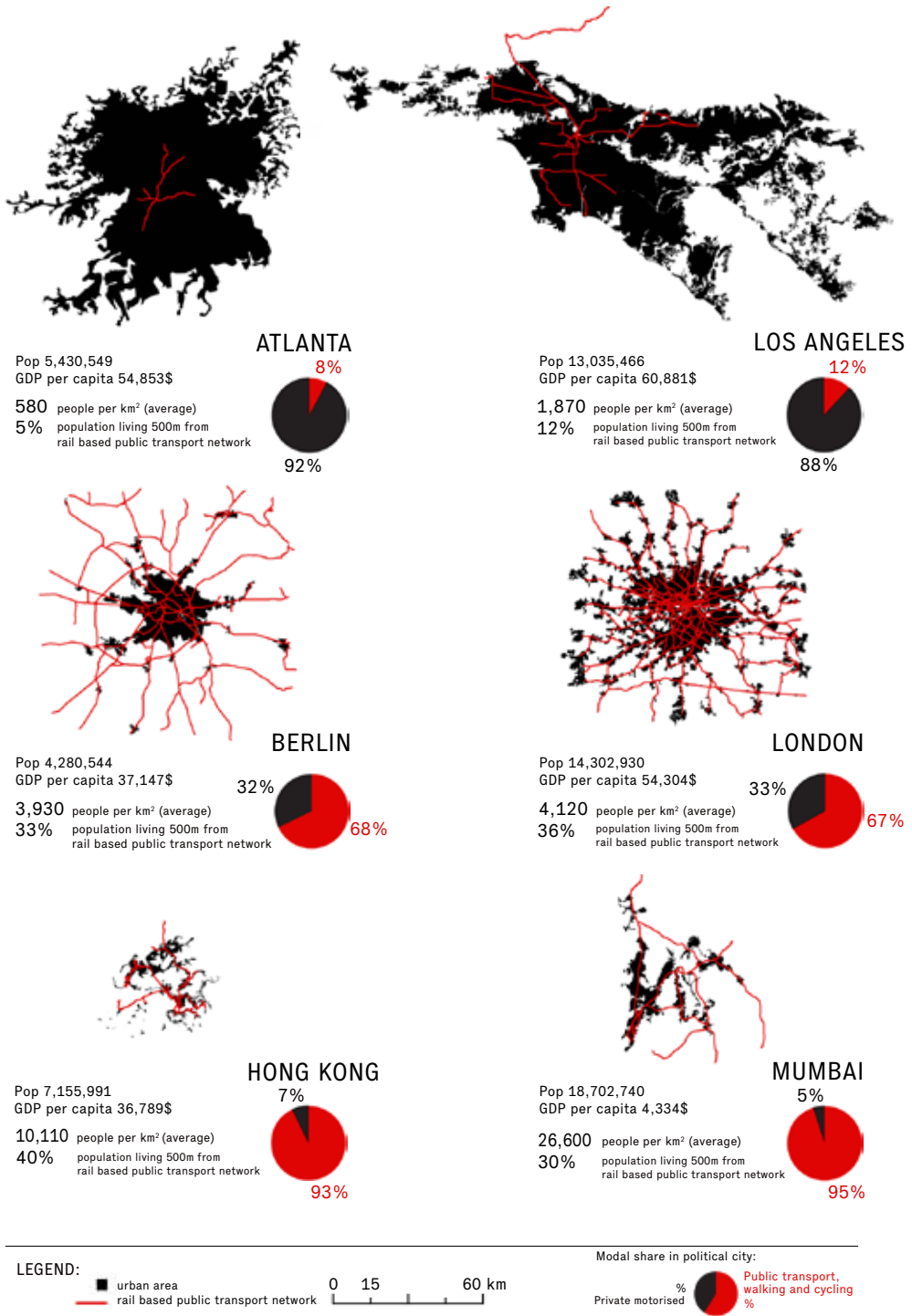
address such challenges? Beyond the very visible problem of a lack of “big infrastructure,” there is also a range of less discernible sociopolitical issues, most explicitly revealed by the fact that large portions of populations in places such as these are living in slum conditions. While the term “slum” per se is a problematic one, it nonetheless stands for a lack, not only of infrastructure as it’s normally understood, but most importantly a lack of infrastructure fostering common well-being—a lack of schools, housing, medical clinics, communal institutions, and so on, not to mention a lack of the transportation network connecting them.



Fig. 1: Infrastructure has a profound effect on the lives of the increasing number of urban dwellers across the globe, as evidenced by the success of the *ciclovías* in Bogotá, which have not only reduced commuting times and pollution levels, but have also positively affected the quality of life of individuals and families.

When talking about infrastructure at such a large scale, one must acknowledge its effects on social agency

in general and individuals in particular—for example, a father taking his two children to school on his bicycle in Bogotá. As straightforward as this example might be, it nevertheless points to the role that infrastructure can play when trying to improve social conditions. Important in this discussion is the relationship between infrastructure and social equity. One way of measuring social equity is access to education. It is a well-accepted fact that if children do not get education early on in life, in a safe environment and in close proximity to their home, they lose out on the benefits that a society might be able to offer. Discussing transport as a means to access education is a proxy for talking about social integration. If one takes education levels of the population in different parts of the city, the quality of education utterly correlates with the availability of and accessibility to transit facilities, whether a subway, bus rapid transit system, or bicycle network. In other words, the better the infrastructure, the higher the educational levels. It is fundamental to remember that decisions made about whether to invest in one form of public transport over another have an impact on the way our children and grandchildren are educated. The critical relationships between those different aspects have been understood by successive mayors of Bogotá, who introduced a bus transit system as well as a network of bicycle paths in their city, placing bus stops close to bicycle lanes, which can be used by parents to take their children to school. Infrastructure in this case positively affects



**Fig. 2:** While Atlanta and Berlin have roughly the same population size, their urban footprint varies by a factor of seven. A third of all Berliners live 500 meters from a rail-based public transit network, while the number drops to 5 percent in Atlanta.

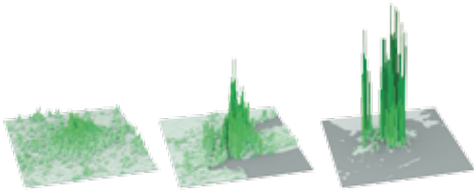
people's living conditions. Bogotá's transport policies have furthermore taken the locations of public schools into account, the result being that the city now has the highest literacy rate in Latin America. Consider the effect such projects might have on parents who spend four or five hours commuting a day in order to reach their places of work and secure their family's livelihood. Being denied accessibility, in other words, adversely affects populations. This is by no means a perfect example, but it clearly demonstrates a way of dealing with infrastructure at the macro level in order to foster social change at the micro level.

We must understand how to deal with infrastructure at both scales. The broad discussion on sustainability is concerned with how to increase human well-being, but also with how to reduce the energy footprint per person. At the heart of this discussion is the relationship between physical form, infrastructure, and sustainability. Societies have to decide on how to bring these components into a fruitful and positive relationship. Choices are to be made. It is a public-policy choice, but it is also a choice of how much one should allow the market to dictate policy. In cities such as Detroit or Los Angeles, for example, the tram systems that were built early on were removed decades ago, turning the car into the primary mode of transportation and thus foregrounding the role of a particular branch of industry. Now both cities are spending a tremendous amount of money to reintroduce public transport systems. By the same

token, the effects of such choices can explicitly be discerned when comparing cities like Atlanta and Berlin (Fig. 2). Both have a population of roughly five million people, but the difference in size of their physical footprint when compared is vast. Given this difference, one should not be surprised that more than 90 percent of Atlanta's population use cars to get to work or school, while one-third of Berlin's population live 500 meters away from rail-based public transport stations.

Similar observations can be made when comparing London, New York, and Hong Kong in view of the relationship between physical form and infrastructure efficiency. London has had a costly investment in sophisticated transit for over 150 years; New York has the same population as London but double the density, with a high-priced and a well-maintained transit system; and Hong Kong is incredibly dense and has a highly efficient public transit system. In London, with nearly one million people commuting into the center each day, a rather extensive system of transport infrastructure is needed to allow the city to function. In New York City, despite having taller buildings and people living even closer together, more people come into the center on a daily basis. In Hong Kong, with an even greater density of residents as well as workplaces, people live not only closer together, in thirty to forty-story buildings, but their relative travel distance to work is also less. What does all this have to do with the theme of infrastructure space? The relationship between physical density

and infrastructure has a lot to do with these interwoven facets of well-being, infrastructure efficiency, and energy footprint. Considering the effects of the physical model of Hong Kong, with a high density of residents and a high density of work, just above 90 percent of its population use public transport to get to work. Why? Because it is the quickest and most efficient way to move within the city, the average commuting time being less than fifteen minutes.

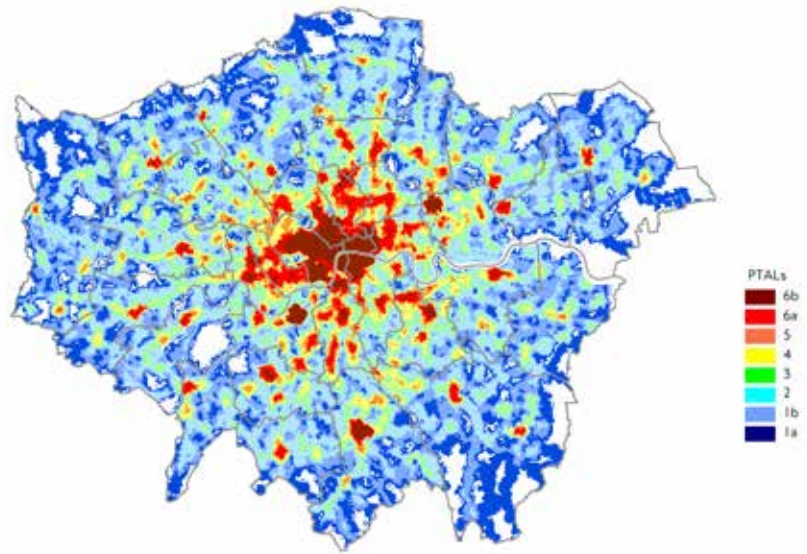


**Fig. 3:** London, New York, Hong Kong. The level of urban density determines the efficiency of complex metropolitan systems that require investment in infrastructure to create more sustainable cities.

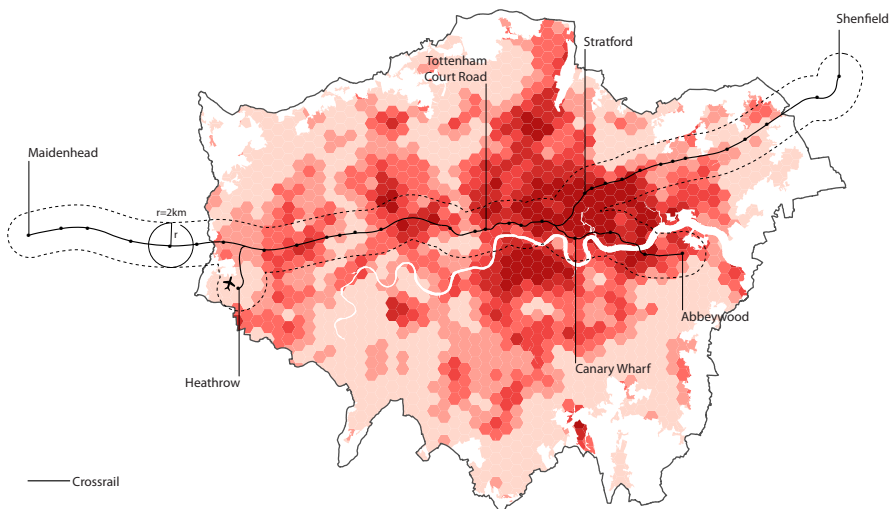
London, at the opposite end of the spectrum, is a widely dispersed, relatively low-density city, with many clusters around its edges that are all very well connected. Unlike most Western cities or cities of the Global North, London has faced an increase in population over the last ten to fifteen years, currently bringing it to its historical high, potentially reaching ten million inhabitants by 2035. London is not at all a perfect city; it suffers

from divisions, it is expensive, and it has fundamental social problems that are physically translated in the reality of the city. The street confrontations that took place in 2011 are evidence of these underlying problems, which in turn are reflected in statistics and maps. London's Public Transport Accessibility Map, for example, shows a well-connected center, reachable in less than an hour when using public transport (the purple area on the map, fig. 4). The city's suburbs, on the other hand, have a deficiency of access, with commuting times into the center of over two hours. Taking into account that public transport accessibility level (PTAL) maps can be drawn for every city, the question that must be addressed is what to deduce from particular relationships between urban form and public infrastructure accessibility, not only at an abstract level, but most importantly in terms of the social impact of infrastructure on the ground.

Another statistical map of London highlights the relationship between social equity and infrastructure accessibility (Fig. 5). The areas in dark red are the most deprived of London—districts with higher rates of teenage pregnancies, unemployment, and lower life expectancy. As the map shows, East London is more deprived than other parts of the city, while those living in the suburbs are quite affluent and better educated. To state the argument otherwise, if a man born today in West London takes the Jubilee Line to the Olympic site in East London, his life expectancy will be reduced by one year at every tube stop. This is not



**Fig. 4:** The Public Transport Accessibility Map of London shows the areas that can be accessed in less than an hour using public transit (in red and purple), demonstrating an imbalance in provisions between west and east and between the center and the periphery. The Crossrail high-speed transportation line is set to improve connectivity across London, linking currently deprived areas in the east of the city to the rest of the metropolitan region, which includes its job market and public services.



**Fig. 5:** The 2012 Summer Olympics in London has provided an opportunity to rebalance London's unequal distribution of social disadvantage, creating new jobs and improving life chances in the eastern boroughs that have suffered from decades of underinvestment in infrastructure and services.



just a condition; it is a problem that could be resolved through planning, investment, and infrastructure. Compared to the previous map depicting the inequality of access to public transport, one can argue that infrastructure planning has been biased in favor of the western parts of the city. Trying to remedy the situation, the policies of two London mayors and several governments have very simply been to spread the quality of the center—the purple area on the map—to other parts of the city. The result has been major investment in public transport. One particular case concerns the Crossrail

project, a high-speed-tunnel rail route that goes all the way from Heathrow Airport in West London to the county of Essex, east of the city. The project has substantial public support, and will cost approximately \$25 billion. It is already regarded as being so successful in bringing jobs and providing opportunities, that a Crossrail 2 project is being planned for 2030, going from the northeast to the southwest of London. Other infrastructure projects have been equally successful, effectively connecting parts of the city in an orbital way, which has seen much new housing and development.

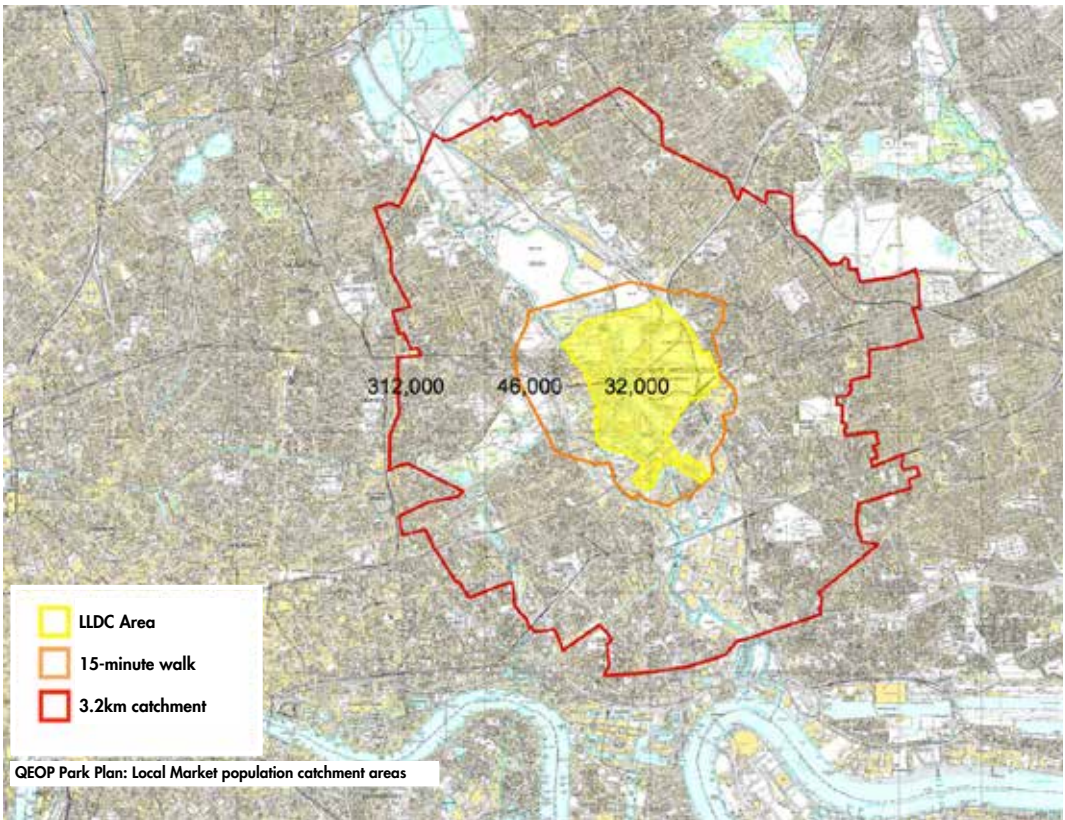


Fig. 6: Map showing the catchment of the Queen Elizabeth Olympic Park in 2016, for a local population of 312,000 people.



As far as East London is concerned, one must consider such large projects as Canary Wharf and the site of 2012 Summer Olympics. Canary Wharf, though heavily criticized when it was being built during the 1990s, has contributed to the creation of 100,000 new jobs in London. What is interesting are the synergies created between the Crossrail line and Canary Wharf, demonstrating how infrastructure and planning can come together. Sites on which nothing happened for years were suddenly developed, with 8,000 new residencies planned, of which 25 percent are affordable. More recently, the Olympic development was a project underpinned by the ambition of integrating a neglected part of the city into London's fabric, both physically and socially. The political language that was used during the planning phase was concerned with the notion of convergence, for which infrastructure would play an important role—fostering equity being a central objective of the undertaking. The master plan has since evolved, encompassing housing as well as sports facilities open to the public, such as a velodrome and Zaha Hadid's swimming pool, which was used by one million people in its first year. Many new bridges and connections have been built. There are parks and cultural institutions, like the Victoria and Albert Museum, the Smithsonian, and others venues coming to the area. Thirty thousand new jobs were created over the last decade. All in all, the economy of East London has changed dramatically. Its five boroughs—also known as the Olympic boroughs,

and considered some of the poorest in London—have significantly improved. Statistics show that the boroughs of Hackney and Newham, which in 2010 were the sixth and fourteenth most deprived areas in the United Kingdom, have now shifted position to the fiftieth and 104th, respectively. This is tangible evidence that infrastructure, not by itself but rather when planned in concurrence with other elements like schools, health, investment in social welfare, and affordable housing, can be a positive force for both growth and social integration.

Image Sources:

Fig. 1: Urban Age/LSE Cities.

Fig. 2: LSE Cities, NEC Paper 03 Accessibility in Cities: Transport and Urban Form (London: London School of Economics and Political Science, 2014).

Fig. 3: Residential density, London; Urban Age/LSE Cities [LSECiti.es/u25691340](https://LSECiti.es/u25691340); Residential density, New York City; Urban Age/LSE Cities [LSECiti.es/u159812b4](https://LSECiti.es/u159812b4); Residential density, Hong Kong; Urban Age/LSE Cities [LSECiti.es/u52351432](https://LSECiti.es/u52351432).

Fig. 4: Source: TfL Planning, Strategic Analysis.

Fig. 5: Urban Age/LSE Cities, Transport and social equity: London, Crossrail; [LSECiti.es/u33181391](https://LSECiti.es/u33181391).

Fig. 6: London Legacy Development Corporation, 2011.