

Is there such a thing as spontaneous smart growth?

Smart growth and spatial planning in developing countries. Evidence from Lima, Peru

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1. Introduction

Among the most significant challenges of planning the sustainable future of cities is how to organise their growth in a structured way, in order to discourage urban sprawl and inefficient ways of land use. This challenge is especially pronounced in developing countries, whose cities are growing rapidly and, in most cases, in an unplanned way. Efficient land use has to be steered by the coordinated actions of urban plans and interventions, legal norms and regulations, incentives and institutions. It is now widely recognised that the expansion of cities should not only be outwards in the so-called greenfields, but it should include interventions in the established city, in terms of development of brownfields and upgrading existing informal settlements.

Lima, the capital of Peru, is one of this cities which has grown rapidly and in an unplanned way and, as such, is affected by great urban challenges. Lima expanded hugely during a period of high demographic growth and industrial expansion (mid-1950s - late 1970s), in a process which transformed the country from an eminently rural into an eminently urban country in few decades. This transformed the city's structure into one characterized by a centre-periphery pattern, which at the same time represents a clear social and spatial divide between the 'formal' and 'informal' parts of the city.

Since the 1990s changing political, demographic, social and economic issues have drastically transformed the urban scene. New housing policies, positive national economic trends, increased availability of credits and a high housing demand have led to a construction boom. Important urban trends have been modified: instead of the typical pattern of development through one-family houses, the new homes are now apartments in multi-storey buildings; and instead of suburban homes, the preferred locations have been the central areas of the city, which are growing vertically in a process that has been called a 'return to the centre'.

The strong intensification of land use occurring in Lima has been hardly envisioned in the current urban policies, and as such it may be considered as 'spontaneous' or unplanned as the informal settlement of lower-income population groups in the periphery. The first question that arises is: up to what extent are the urban processes occurring in Lima enabling a smart/sustainable type of metropolitan growth? The main objective of this paper is to provide a brief examination of the particularities of spatial planning in Lima and the consequences for the city's structure and functioning, identifying trends toward smart growth. The ultimate goal of smart growth/planning is the reconciliation of the needs for economic growth and social and environmental challenges through more efficient planning. In this study, the notion of smart growth/ smart planning will be analysed in terms of policies and trends in three main aspects: spatial planning, housing policies, and transportation planning.

The following sections deal with planning smarter cities and regions in developing countries and in Latin American countries, respectively. Section 4 goes deeper into the circumstances of spatial planning in Lima. Housing and transport trends toward smart growth are the focus of section 5. The last section presents the conclusions.

2. Planning smarter cities and regions in developing countries

Due to demographic and environmental considerations, striving for a smart, sustainable and inclusive in cities of developing countries, future has become a global imperative. Pearlman (2011) distinguishes the most significant transformations as those which are turning the world population from:

- Rural to Urban
- North to South
- Formal to informal
- Small cities to Megacities

Indeed, a major demographic transformation is taking place in countries of the Global South, moving large proportion of population to urban centres. “91 percent of the total growth in the urban population between 2010 and 2030 will be in urbanizing countries, of which 74 percent will be in the minority-urban category (e.g., India, China, and most of Southeast Asia) and 17 percent in the majority-urban category. Only 9 percent of the projected growth in the urban population will be in urbanized countries.” (Angel et al., 2011, p. 52).

Accelerated urbanisation in developing regions has developed in such an unplanned fashion that it has resulted in a concentration of urban troubles, such as informal urban sprawl, slums, overcrowding, traffic congestion, and the lack of basic services for large proportion of urban dwellers. If developing cities develop according to the same urban models of the western world, four times the ecological footprint of the earth will be required (Suzuki et al., 2009). City authorities are caught between the social and economic imperatives and the environmental ones to reduce carbon emissions and the global footprint. Their efforts to deal with the latter are highly constrained by lack of capital, resources and planning (Romero, 2007).

In this context, the notion of smart development is similar as the notion of sustainable development: a balanced type of development which supports economic, social and environmental concerns. This should be implemented through a strategic planning interventions which support economic growth, addresses community needs, and preserves the environment. Without efficient and coordinated planning efforts, smart developments seem unlikely to develop. To tackle the planning deficiencies of cities in developing countries, the World Bank launched an initiative in 2009: Eco² cities (Suzuki et al, 2009), which refers to the Economic and Ecological imperatives for global urbanisation. Four planning principles are underlined: (1) a city based approach; (2) collaborative design and decision making; (3) a one system approach; and (4) investment for sustainability and resiliency.

Although the literature about the relationship between urban patterns and sustainability issues is largely inconclusive about the most sustainable urban form, two main approaches can be distinguished for development countries to deal with these issues. One that is centred on density and land intensification issues, such as the compact city approach described by Jenks and Burgess (2000). UN Habitat’s approach is also favourable to this approach, advocating “A regional system of multiple, compact, interactive satellite cities linked by strategically-located transit lines reduces resource

consumption and emissions while preserving an overall land mosaic in which ecological systems can interlink and thrive.” (UN Habitat, 2011, p. 3). The polycentric model of small compact cities UN Habitat advocates (shown in Figure 2) has very clear city and metropolitan area development limits, is criss-crossed by multiple infrastructural networks. This model is in stark contrast with the realities of most North American and developing countries’ metropolises, illustrated in Figure 3.

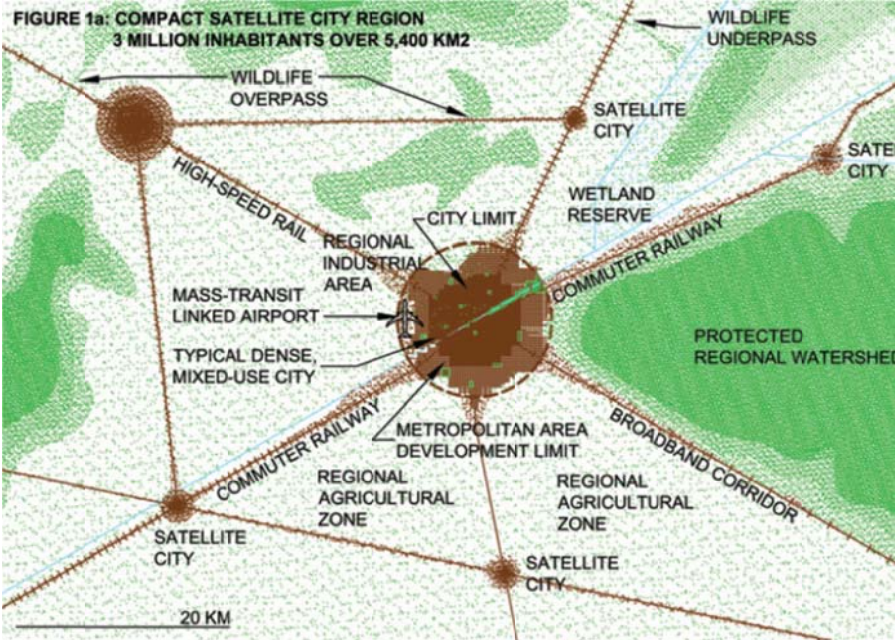


Figure 2. Model of a compact satellite city region (Source: UN Habitat, 2011).

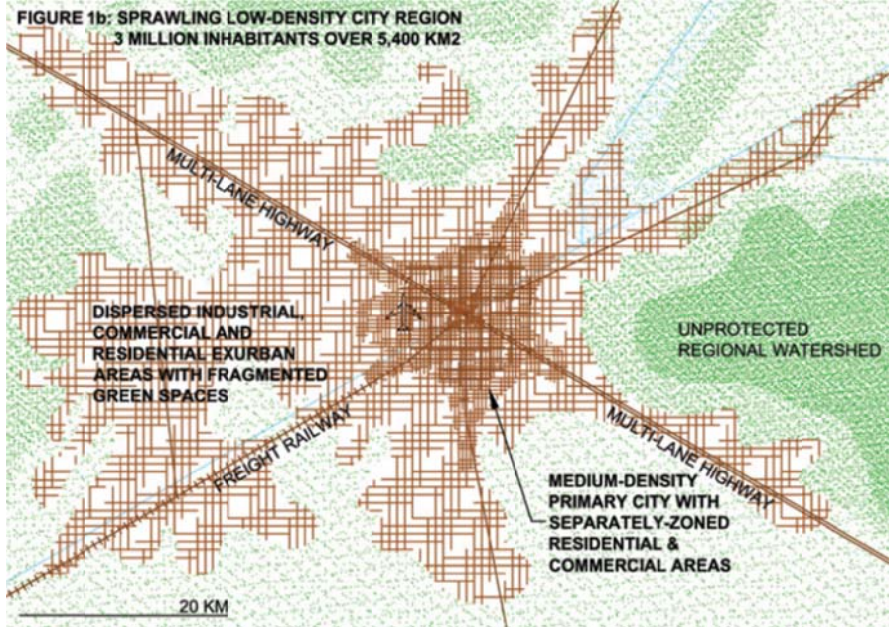


Figure 3. Sprawling low density city region (Source: UN Habitat, 2011).

Another approach advocated by the Lincoln Institute of Land Policy argues against the use of containment policies in developing cities (Angel et al, 2011), as the UN Habitat model recommends. Containment policies became a commonly used planning instrument after the London Greenbelt Act of 1938. Angel et al. (2011) argue that containment may function in advanced economies but is

detrimental in rapidly growing cities, as it has been the case in South Korea, for example. Instead, they propose a new development paradigm with four key elements: (1) realistic projections of urban land needs; (2) generous metropolitan limits; (3) selective protection of open space; and (4) a proper spacing of arterial roads to support public transit.

After studying the case of African cities, Arku (2009) has recommended six strategies for smart growth: (1) a firm government commitment to urban growth management; (2) compact urban development; (3) a comprehensive physical planning package; (4) the creation of a broad-based executive agency; (5) the provision of varied housing choices; and (6) infill development.

3. Planning policies and horizontal expansion in Latin America

If for the developing world, the 21st century is the century of urbanisation, for the Latin American region, it was the 20th century the one who saw a notable shift in the living situation of most of its inhabitants. In 1900 Latin America one out of four inhabitants lived in urban centres of more than 2000 people, while at the end of the century three out of four were living in cities. This has made Latin America the most urbanised region of the developing world and the second highest after North America. Figure 4 shows the evolution the proportion of urban population by world region, illustrating Latin America’s explosive demographic growth during the last half of the 20th century.

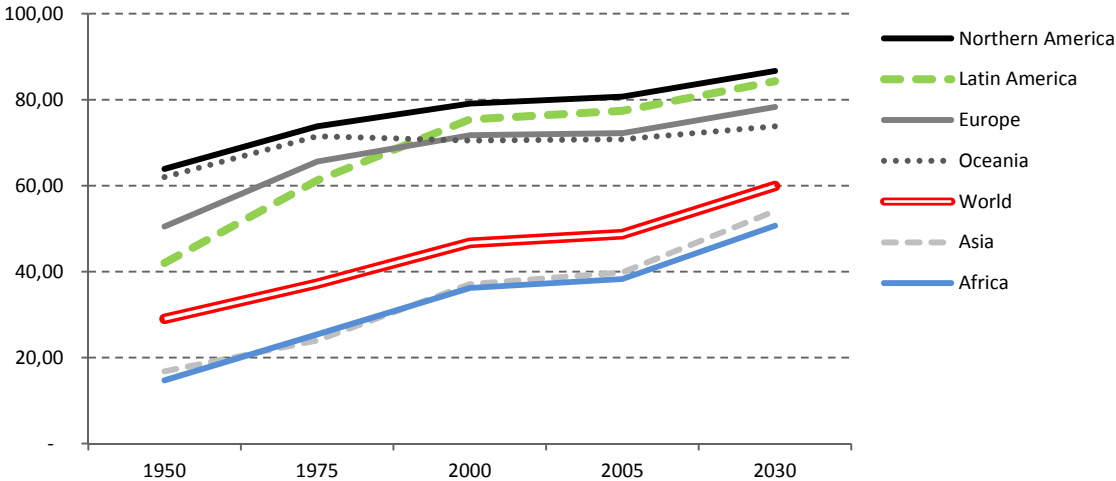


Figure 4. Percentage of urban population by world region, 1950-2030 (Source: Fernandez-Maldonado, 2010).

In front of such an explosive rate of urbanisation, central and municipal governments have been very much unable to regulate and guide land development, or to provide housing, employment, urban infrastructures and services for the huge amount of rural migrants settling in the cities. Migrants eventually managed to get land, housing and employment in informal ways, generally invading peripheral or unsuitable land and building vast squatter settlements. The results have been massive informal urban sprawl, together with growing urban poverty and informality. Spatially, the result was a “clear-cut spatial differentiation between the rich (city centre) and poor (urban periphery)” (Verkoren a al., 2009), in what has been called the polarized city (Bosdorf and Hidalgo, 2010). A great proportion of the self-built neighbourhoods that settles in the 1960s and 1970s – the period of faster

expansion – has consolidated and has been provided of urban services and property titles, but the “informal city” continues growing in many cases.

During the 1990s, a new wave of horizontal expansion was observed (De Mattos, 2002). This time the spatial transformations have not been driven by demographic processes, but linked to the economic and cultural pressures coming from globalizing processes. The construction and improvement of motorways and rings in the periphery have greatly contributed to the expansion of the cities. The peripheries, which before were the exclusive domain of informal neighbourhoods, had a huge transformation due to the emergence of gated communities, and the construction of housing projects for the middle classes and social-housing projects for lower-income groups. Furthermore, a significant proportion of jobs and service activities also moved outwards, and shopping malls were built for different sectors of the population at the intersections of transport networks. New industrial areas also appeared in the periphery, some of them in the form of formal clusters, but also as informal production clusters (Verkoren et al., 2009). This new urban pattern has been called the fragmented city or agglomeration (Bosdorf and Hidalgo, 2010). Figure 5 illustrates the schemes of the evolution of the Latin American city from the compact colonial city until the current fragmented agglomeration.

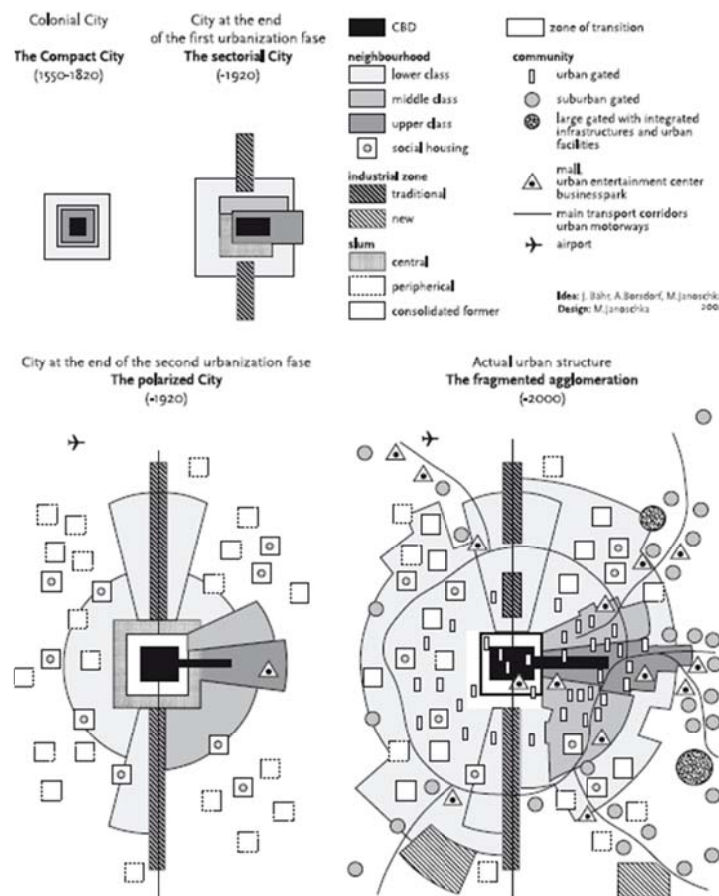


Figure 5. Evolution of the urban structure of the Latin American city (Source: Bosdorf and Hidalgo, 2010)

The last two waves of growth have meant a substantial horizontal expansion in the form of urban sprawl, which is basically the result of weak planning and development control rather than a deliberate strategy. This horizontal growth has brought about serious environmental and

management problems: “the way that cities have grown by swallowing up neighbouring towns outside their jurisdiction has created difficulties in making decisions on investment and regulation. It has also caused tensions between mayors and governors who frequently compete with each other using tax incentives and other regulatory tools to shift business from one town to another. This destabilizes the long-term financial stability and governance of these large cities.” (Cadena et al., 2011, p. 30). However, comparing with North American cities, there are several differences that make the pattern of urban sprawl less striking in urban Latin America.

1. Average metropolitan population densities are much higher in Latin America, although wide variations between cities are seen. The largest cities tend to be more compact: Santiago has around 6,500 inh./km²; Monterrey almost 6,000, Buenos Aires about 3,300; Lima about 3,000; São Paulo and Mexico City have both approximately 2,400 inh./km². As a comparison, New York, one of the more densely populated cities in the US, has about 1,000 inh./km² (Cadena et al., 2011).
2. Private car ownership is much lower in Latin America. Due to the socio-economic conditions, only a fraction of the urban population can afford to buy and maintain a private car. Economic conditions have improved greatly in the latest years, and this has led to an increase in private car ownership and in turn, of urban congestion, but the proportion of private automobility is still much lower than in the US. Therefore, public transport is how most people move to their daily mobility. In Mexico City, approximately 80% of the 30 million daily trips in 2000 was performed by collective transportation modes, with private cars (including taxis) making up for the remaining 20%. In Lima, 77.3% of the 12.1 million daily trips was made using public transportation in 2004; 22.7% by private cars (including taxis) (Verkoren at al., 2009).
3. Monofunctional areas are more the exception than the rule in Latin America. Zoning laws have been much less restrictive and, especially, the laissez-faire policies have produced a great deal of urban informality, by which important arteries become change residential into commercial uses without much local authorities interference.
4. Urban space is much more important in Latin American than in North American cities. Latin Americans have a tradition to meet outside the home. Plazas with street furniture as benches are also part of the local urbanism tradition, what promotes walkability. A great deal of daily purchases still occurs in markets that are access by foot, in contrast with the conditions of retail in the US, which is unthinkable without the car.

On the other hand, since the rates of population growth are reaching demographic maturity, Latin American cities do not find themselves in the situation in which Asian and African cities develop in terms of horizontal expansion. Figure 6 shows the fastest growing large cities in the emerging economies, they all belong to the Asian and African regions, but no Latin American city is among them.

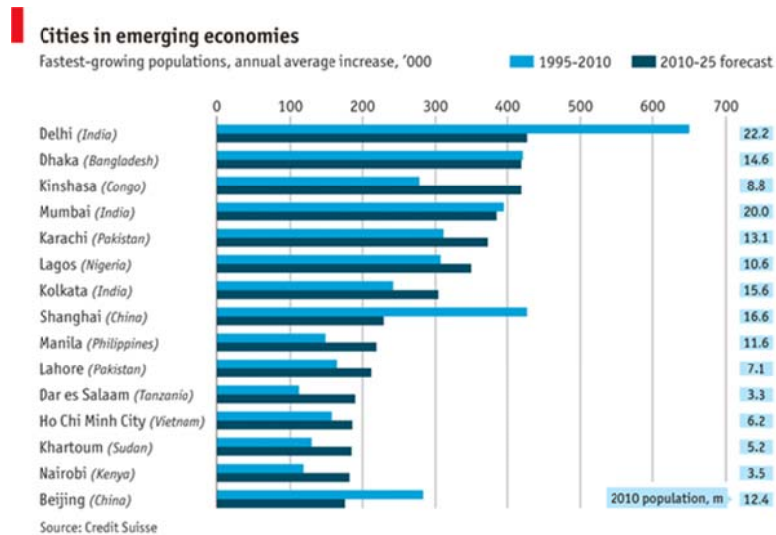


Figure 6. Annual average increase of the fastest growing cities' populations in emerging economies (Source: The Economist, 2012)

In spite of the slower rates of growth and lower levels of urban sprawl, the fate of the Latin American cities far from easy. Deficient planning is frequently mentioned as one of their main problems. De Mattos (1987) mentions three issues of Latin American urban planning in the 1980s: economic reductionism, formalism and “utopian voluntarism”, by which planners tended to set their own ideology above the one of the decision-makers. This resulted in an ineffective planning system, centralised in planning agencies isolated from other public offices and agencies, and with a clear separation between plan elaboration and implementation. The state had the leading role formulating and implementing development plans. This traditional conception of planning was spread by the UN's Economic Commission for Latin America and the Caribbean (ECLAC) since the 1960s, which sent planning consultants to different countries of Latin America and run several schools and courses to educate planners.

Despite the lack of effectiveness, these traditional planning systems were perpetuated by local bureaucracies and educational and job training institutions. “The rational, technocratic planning model, master or comprehensive planning and zoning have been common approaches to planning in LAC that have not been adjusted much in decades, except for exceptional cases.” (Irazábal, 2008: p. 52). Unsurprisingly, during the rapid urbanisation process of the second half of the 20th century, planners were unable to face the urban challenges, which eventually led to housing shortages, congestion, pollution, insecurity and socio-spatial segregation in the largest cities. “Urban planning in LAC has often been thwarted by changes in governing bodies, lack of constituency involvement, financial constraints, natural disasters and other challenges, resulting in failed implementation of plans.” (Irazábal, 2008: 22).

Indeed, Latin American large cities are world known by their pressing problems. In a recent article, The Economist (2011) characterizes Latin American cities by their problems of traffic congestion, housing shortages, pollution and the lack of urban planning. “Along with land use, transport is the biggest headache facing city authorities. Vehicle ownership is likely to expand by 4% a year over the next 15 years, further clogging the streets.” (Economist, 2011, w/p).

Despite their reputation, Latin American cities have produced significant urban innovations that have been exported to other cities in the region but also to developed economies. Santiago's policy of

housing through subsidies to the demand, Porto Alegre’s participative budgeting, Bogota’s process of civic renaissance and Curitiba’s transit oriented development have proved to work successfully in other realities too.

The case of Curitiba, the capital city of the state of Parana in Brazil, is the most salient example for the city to grow in a smart and sustainable way. In a period in which most Latin American cities were growing rapidly and in an unplanned way, Curitiba managed to not only plan but to implement a type of development backboned by transportation networks – by which the city grew from 361,000 inhabitants in 1960 to 1,797,000 in 2007 – which has been praised and followed by many cities around the world. “Curitiba has implemented innovative, imaginative and practical solutions that demonstrate resource constraints are no barrier to sustainable ecological and economic urban planning and development” (Suzuki et al., 2010, p. 3). Curitiba’s approach to sustainable development balances the social, economic, and environmental aspects by means of integrating the plans and policies regarding land use, public transportation, and street network (see Figure 7).

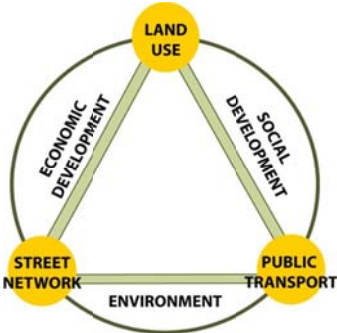


Figure 7. Policy integration in Curitiba (Source: Suzuki et al., 2010)

Indeed, the city has implemented several innovative approaches in the field of urban planning and growth management, and is especially known for its land use planning integrated with transportation planning, which became the origin of TOD (transit oriented development). To avoid urban sprawl, Curitiba directed urban growth linearly along strategic axes, along which the city encouraged high-density commercial and residential development along the lines of a mass transit system, and according to its integrated master plan and land use management vision. Its ‘Bus Rapid Transit’ system, an affordable but innovative bus system that takes the role of a metro, is at the kern of its innovative transportation policy, but initiatives regarding green area enhancement and flood control, and solid waste management are also urban innovations made in Curitiba. Figure 8 shows the main elements of the “Trinary road system” with the different densities and uses allowed.

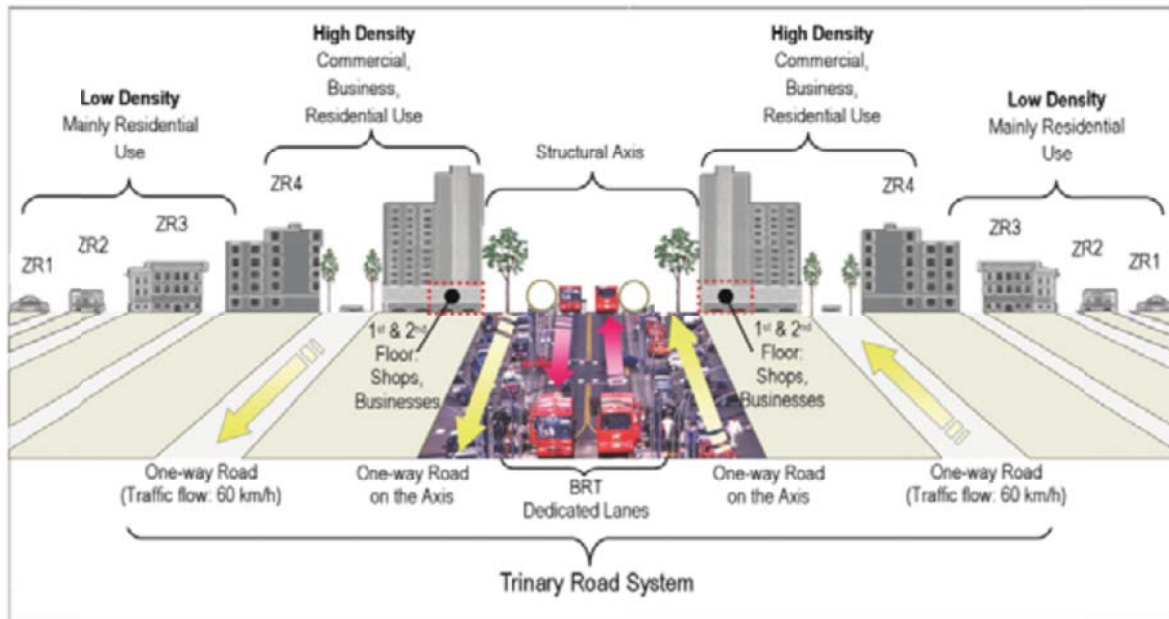


Figure 8. The Trinary Road System of Curitiba (Source: Suzuki et al., 2010)

Many Latin American cities have used the lessons of the Curitiba model of sustainable urban planning for their own development. Indeed, the idea of revitalizing the city centre by filling it up with new housing is becoming increasingly popular in the large Latin American cities, among others, due to the problems associated with long commuter trips for low-income population groups. But integrating land development and public transportation is easier in cities that are expanding and not so much in cities that are already suffering from sprawl and grow slowly. Despite this constraint, Curitiba's BRT system has been implemented in several cities of the region, from which the most successful example is the TransMilenio of Bogotá. That Curitiba is a class apart from other Latin American cities is widely recognised, as it shows in most comparative examinations and benchmark studies. The Economist Intelligence Unit (2010) assessed by an international panel of experts, carried out a study to assess the environmental performance of 17 of Latin America's major cities, and developed a Green City Index with seven criteria: (1) energy and CO2; (2) land use and buildings; (3) transport; (4) waste; (5) water; (6) air quality; and (7) environmental governance. Table 2 gives the results of this study, showing the leading position of Curitiba well above the regional average.

well below average	below average	average	above average	well above average
Guadalajara Lima	Buenos Aires Montevideo	Medellín Mexico City Monterrey Porto Alegre Puebla Quito Santiago	Belo Horizonte Bogotá Brasília Rio de Janeiro São Paulo	Curitiba

Figure 8. Assessment of environmental performance of 17 of Latin America's major cities (Source: The Economist Intelligence Unit, 2010)

It becomes clear that a good environmental performance is very much related to good governance practices in general. To compare the overall performance of the eight largest Latin American cities against the McKinsey Institute elaborated a benchmark study – using a benchmark defined as the average of Helsinki, New York, Singapore, and Toronto – with four criteria: (1) economic performance; (2) social conditions; (3) sustainable resource use; and (4) finance and governance (Cadena et al., 2011). The report concludes that Latin American cities perform poorly against international benchmarks and that despite a reasonable economic performance, "... their institutional, social and environmental support structures have not kept up with their expanding populations." (see Figure 9).

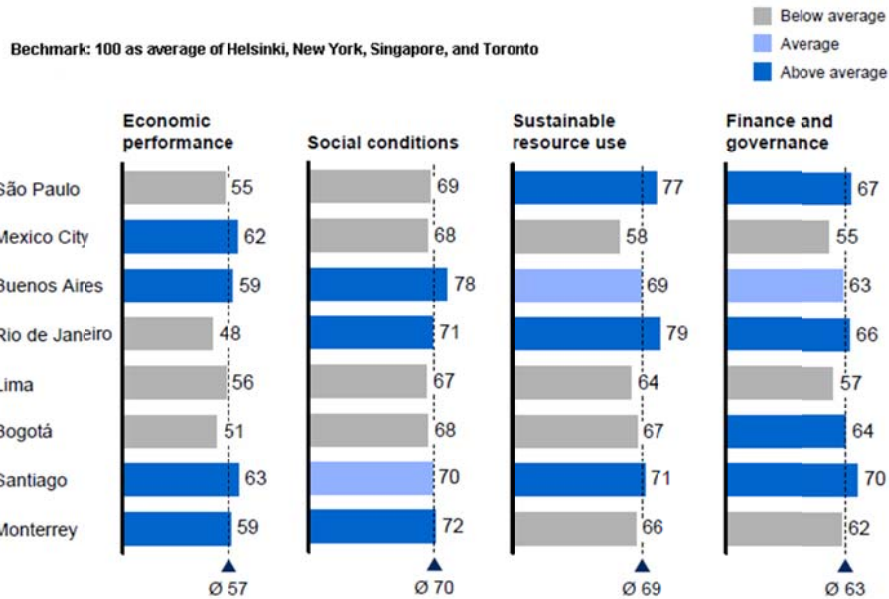


Figure 9. Performance of the eight top Latin American cities (Source: Cadena et al., 2011).

4. Spatial planning policies in Lima

The previous section has shown how Lima – the fifth largest Latin American city in terms of population – performs well beyond average in terms of environmental performance according to the Green City Index (The Economist Intelligence Unit, 2010). It is also the worst of the eight cities evaluated in terms of overall planning performance (Cadena et al., 2011), and the only one which is below the regional average in all four benchmark criteria. This section will focus on Lima’s issues regarding the role of spatial planning.

Lima ranks well below the average of large Latin American cities in criteria related to land use, a conclusion that has been drawn after examining its below-average population density, its extremely low number square metres of green spaces per person, its severe housing shortage and the lack of land use policies for curtailing the environmental impacts of urban development (The Economist Intelligence Unit, 2010). This evaluation concurs with the empirical evidence gathered in Lima: the city does not have a well-established land use policy, and sectoral housing and urban transport policies are not coordinated with the local governments.

Indeed, one of the most remarkable urban development transformations of the recent years, the housing boom and process of “return to the centre” (see section 6.1), has been the result of a sectoral policy without any links with the planning of the development of the whole city. The most

frequently mentioned metropolitan planning challenges in Lima is the huge existing fragmentation in terms of political decision-making, which leads to a management conundrum. Lima and its port, Callao are two different (provincial) municipalities conforming a vast conurbation, which in spite of their common problems have not managed to coordinate future plans for the development of their shared metropolitan area. Lima has 42 district administrations, plus one for the province, while Callao has 8 more districts and one provincial administration which in total make up for 51 government bodies. "... the (district) government is quite absurd: 42 pieces of a puzzle that no one knows how to assemble and that do not mean much. Districts mean very little, no one knows what the members of the council do, they do not represent tangible territories, and their competences and responsibilities are completely lost in space." (Interview to Augusto Ortiz de Zevallos in Paredes, 2006, p. 64).

Besides, there is a prevalent confusion in the identification of the competences at every level of government (national, regional and local), evident in important urban sectors as transport and housing (García, 2009), whose policies and regulations have a great impact in the spatial expansion and functioning of the city. What finally occurs is that the national level takes the lead and implements sectoral policies and programmes without consulting the lower government levels. For example, "the Ministry of Housing has exercised pressure on local governments to allow many building permits for projects subsidised by the Mivivienda Fund, without the existence of previous studies or even against the same municipality's urban plans." (Riofrío, 2010, p.76). Similar impositions have also occurred in the transport sector, where the former president García took the lead to develop the urban metro (see section 6.2).

Riofrío (2010) comments that there is a tradition of presidents that act as mayors of Lima that dates back to the 19th century and is explained by the Peruvian centralism. But the imposition of national decision-making over city plans became worse since 1990. "In Lima, for instance, it can be argued that the city's fate has been primarily led by national policies, following the alienation of the municipal districts' autonomy by the Fujimori administration in 1990. While the districts regained their autonomy after Alejandro Toledo's election in 2001, the ten previous years of uncoordinated spatial policies and nonexistent metropolitan agenda have frustrated urban planning and become engraved onto the city's territorial organization." (Crot, 2006, p.244).

As in many other Latin American cities, the Peruvian planning system is very formalistic and normative, and exhibits high implementation problems. Local governments pass many legal norms, ordinances and strict building codes, but there is very little concrete results of the achievement of the proposed aims and objectives (García, 2009). City authorities do not have enough capacity to control the observance of the local regulations. Ploger (2010) provides an example of this, describing the case of ordinance 690, passed by the metropolitan council in 2004 to respond to the Peruvian ombudsman's requests regarding the spread of gates and barriers obstructing the free access to public streets in Lima, that emerged during the 1990s. "The ordinance has however been implemented very slowly by the district authorities. Only a few consolidated districts have made serious efforts to enforce the legal guidelines, while the informal status quo persists elsewhere." (Ploger, 2010, p.42).

These problems are associated to the institutional weakness and the features of planning in the Peruvian context. The former has been abundantly debated at local level and is widely considered as the product of an incomplete process of nation building. A World Bank report (2001) that deals with

the institutional roots of poor governance in Peru mentions, among other issues, the institutional disorder created by a confusing administrative structure that weakens transparency and accountability, incoherent policy-making, weak checks and balances on the central government, and even weaker checks and balances on the local government. These processes were deepened by “the progressive decomposition of Peruvian democratic institutions (occurred) between the presidential inauguration of Alberto Fujimori in July 1990 and the announcement of his leave on 16 September 2000.” (Crot, 2002).

Admittedly, there have been great improvements in terms of institutional capacity since 2001, but many of these problems are still part of the local culture and as such are difficult to eradicate. The weaknesses and low legitimacy of Peruvian institutions help to explain important urban issues, such as the widespread process of informal appropriation of peripheral land by lower-income groups, as well as the negligible influence of planning on guiding and regulating urban growth (Ploger, 2010).

The particularities of the local spatial planning culture is, as in most other Hispanic American countries, highly to the Spanish tradition of spatial planning (the so-called Urbanism tradition). This has been characterised as having “a narrow scope in terms of methods of intervention through zoning instruments, design codes, building control and development projects... Private actions tend to dominate. There is recognition of the relationship between physical environmental change and wider societal objectives. The model has a strong bias to design and professional solutions with only limited mechanisms for citizen involvement and managing conflicts.” (Duhr et al., 2010, p. 182). Because of this difference between aim and outcomes, it is considered an immature kind of spatial planning.

Another important challenge of planning Lima’s future refers to the limitations of its public finances. Metropolitan Lima’s annual metropolitan budget was about US\$ 100 per inhabitant (in 2010), an amount which included with the budgets of the metropolitan and all local (district) governments. As a comparison, Medellin has five times and Bogota ten times that amount per inhabitant. While in the two latter more than 80% of the budget is addressed to investments, in Lima, due to the huge administrative personnel of so many districts, the investment budget is only 30% of the total budget (Fernández-Dávila, 2010). Despite the reduced budget, mayors have been generally almost exclusively concerned with the realization of public works. The disregard of long term planning in favour of short term interventions is evidently linked to political opportunism, because mayors have generally tried to use the mayor’s post as a trampoline to the presidency of the country. Concerns for strategies for future growth have been neglected, as many other important urban issues that do not clearly belong to the realm of the four year period of the mayor.

With these serious limitations, it becomes clear that the problems of spatial planning in Lima are not so much of a technical but of a political-administrative nature (Fernández-Dávila, 2010). A report assessing the economic losses due to the lack of urban planning in Peru (Sociedad de Urbanistas del Perú, 2011) states that only 3% of municipalities in Peru has a valid Urban Development Plan, and 30% of them have never elaborated one, even if it is mandated by law. “The few existing Urban Plans are not used by city authorities due to their excessive technicalities, or the weak appropriation of the plans by the local civil society” (Sociedad de Urbanistas del Perú, 2011, p. 3).

Even in the capital city there is no valid Metropolitan Plan for its development. The previous plan – the so-called PLAN MET – was elaborated at the end of the 1980s and was valid up to 2010. PLAN MET ended during the last mayor administration without minimally achieving its goals (García, 2006).

Former mayor Luis Castaneda (2006-2011) focused his government almost exclusively on the construction of roads and transport works, some of which improved traffic flow, but since they were built in an uncoordinated with other sectors and local governments, they also produced many urban conflicts. His administration was hardly interested in local economic development or human development issues, up to the extent that knowing that the Metropolitan Plan would expire in 2010, it made no provision to update it (DESCO, 2012).

This verifies that “The state – central government and municipalities alike – has in practice abandoned its role of planning and guiding urban expansion.” (Ramírez Corzo and Riofrío, 2006, p.54). The absence of a sound regulatory framework for land use planning is more a rule than an exception in Latin American cities, as the examples of Buenos Aires (Crot, 2006) or Mexican cities (Azuela, 2002) have shown. What is singular in Lima, however, is the negligence of (former) city authorities toward metropolitan planning, as suggested by the absence of metropolitan planning to guide the overall urban development.

In November 2011, however, the new mayor has appointed a commission chaired by an expert in governance with the mission to elaborate a new plan for 2012-2025, the so-called Plan Regional de Desarrollo Concertado (Participative Regional Development Plan) which is now in the making and is expected to be ready in October 2012. As its name states, the plan is being elaborated in consultation with different organisations of the civil society, which gather around topics in each of the main zones of Lima: Lima Centro, Lima Norte, Lima Sur, Lima Este and Callao. The consultations have already begun. One of the ten thematic groups discusses Urban Growth, Housing and Urban Services. This group will work during six months to identify a shared and strategic vision for urban growth, housing and services by means of 56 Dialogue Meetings (Mesas de Dialogo) in districts, four inter-district events, surveys and focus groups (Municipalidad de Lima, 2012).

5. Trends toward smart developments?

To identify trends toward smart development we will focus on two sectors: housing and transportation. In the absence of proper land use planning and explicit land policies, as in the case of Lima, the successive housing policies have functioned as land (use) policies (Riofrío, 1991). On the other hand, public transport is one of the main structuring elements of urban development. In Lima, these two sectors have undergone deep reforms and intense transformations during recent years. The next subsections describe the main trends toward smart developments in these sectors.

6.3 Housing policies and trends

Lima’s huge horizontal expansion – illustrated in Figure 10 in the 1910-2000 period – has been the result of decades of laissez-faire housing policies at national level and nonexistent land use policies at local level. City authorities have been unable to guide the two mechanisms of land development: the ‘formal’ development process led by the real estate market, mainly based on land speculation; and the ‘informal’ process of urbanization of the periphery by the collective and organised action of the poor, which became mainstream in the 1960s. The permissive political attitude, the long history of land invasions and government reallocations, and the easy attainment of property security have institutionalized land invasions as the way by which the poor get access to land and housing in Lima (Fernández-Maldonado, 2007). This has produced an enormous strain in the internal structure and urban functioning of the city, in which socio-spatial segregation has become a typical feature. It has produced a city of low density that is difficult to manage and extremely expensive to provide with

adequate services. Currently, Lima has an estimated 300 inhab./ha², which is a low density compared with the average of 450 inhab./ha² of the 18 largest cities in Latin America (The Economist Intelligence Unit, 2010), because the one-family house pattern has been the typical way of expansion for all segments of society, through formal or informal processes.

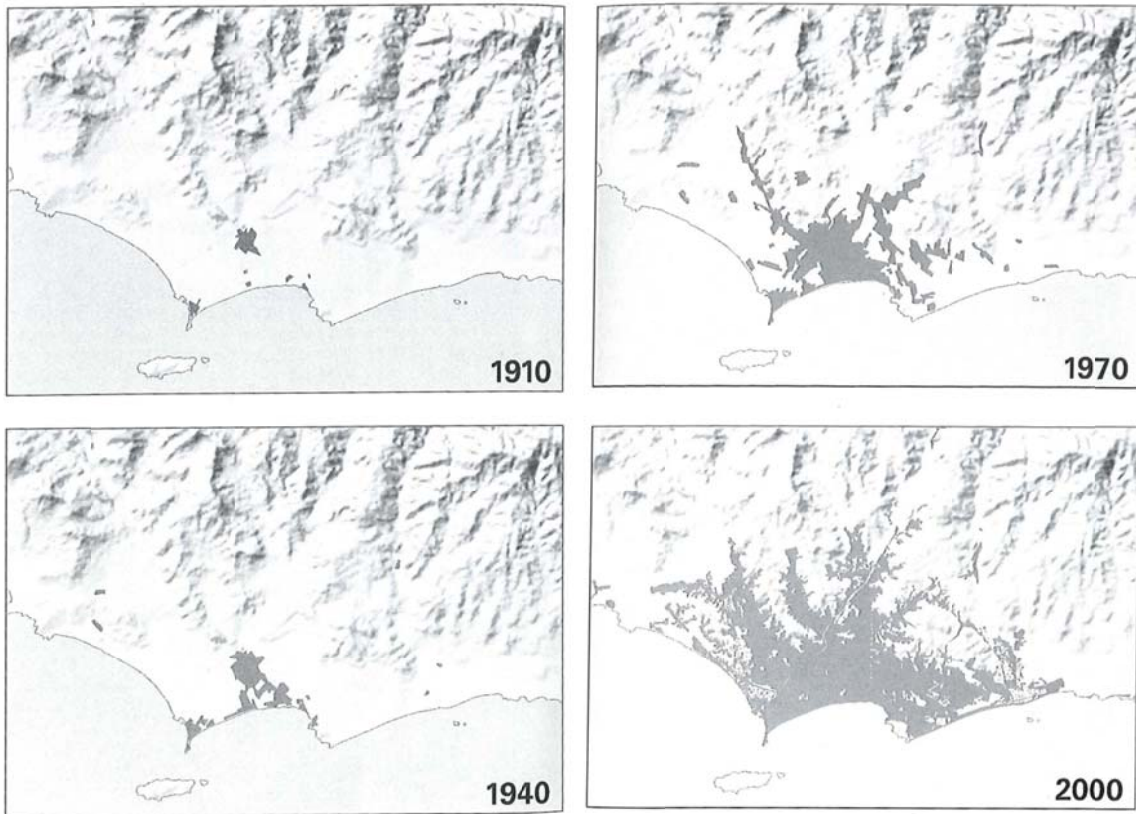


Figure 10. Evolution of Lima during the 20th century (Source: Hays-Mitchell and Godfrey, 2005)

As in other large Latin American cities, Lima's rate of growth diminished greatly after the 1970s, although in a lesser extent than in other countries. However, demographic processes have also led to a very high demand of housing, since there is a vast number of young people at the age of forming new households. This, mainly unsatisfied demand, has resulted in the continuous occupation of land in the outskirts.

Lima is currently object of a remarkable construction boom, triggered by housing policies that began to be implemented during the Toledo administration (2001-2006). These have followed the recommendations of international agencies, and are strongly oriented toward mechanisms to finance the acquisition of new homes. To implement the policies the government launched a National Housing Plan (PNV) for 2003-2007, establishing different programmes to promote the construction of affordable new homes for different socio-economic sectors. Direct housing subsidies were created – the Bono Familiar Habitacional (Housing Family Subsidy) – to support the demand of lower-income groups (Fernández-Maldonado & Bredenoord, 2010). This was happening in a favourable economic context. After many years of crisis and recession, Peru's economy began to grow rapidly after 2001 and its average rate of growth (as percentage of the GDP) has been more than 4%, and since 2005, 2% more than the average of Latin American countries. Poverty rates began to decline moderately, and somewhat more rapidly during Garcia administration (2006-2011).

These processes – economic growth, clear housing policies and programmes, increased availability of credits, and available funds for subsidies – gave an unquestionable impulse to the housing construction activities, in the context of the contained demand. In turn, this contributed to the dynamism of the whole construction sector. The construction sector is now one of the pillars of the economy, whose growth increased the availability of public and private resources. A virtuous economic circle was created through the housing policies.

The number of new homes built through these policies is still low in relation to the huge housing deficit, and has mainly targeted middle-income groups (Fernández-Maldonado & Bredenoord, 2010). However, the process has produced a “rebound effect” and become a catalyser of overall building activities, pushing downward the property prices and allowing the redirection of private construction capital to income segments previously considered unprofitable. Calderón (2009a) mentions as main effects of these policies: (a) an increased housing supply; (b) the reduction of property prices; (c) the growth of mortgage market; and (d) the 'repopulation' of central Lima as an additional residential space of the middle class.

The housing construction boom has led to the densification of Lima's central areas, in view of the increasing scarcity of accessible urban land (see section 6). The subsidised housing projects were initially located in the traditional middle-class districts in central Lima. Later, the locations changed towards more peripheral areas or working-class central districts due to the higher costs of land. In front of the new housing possibilities, the traditional middle class has kept its preference for central areas while the emerging middle class stays in the periphery or ventures into older central areas, working class districts or even old industrial areas and military terrains (Fernández-Maldonado and Bredenoord, 2010). In a city with a horizontal pattern of urban growth – by the way of one-family houses in an own piece of land – these trends toward densification seem very auspicious. Instead of suburban homes, 98 per cent of new homes are apartments in central areas (Vera, 2009) and the need to lower the housing costs has made land consumption moderate. This change of mind-set towards multi-family housing is a step in the right direction for sustainability.

However, there are also heavy local criticisms to this housing policy. Some authors argue that this new housing policy was not designed to meet lower-income groups housing needs, but had a broader economic logic, as the core of an economic programme addressed to support the financial and construction sectors, which were still suffering from the 1998 economic crisis. Supporting the construction industry was considered a tool to reduce unemployment and to reactivate the local economy. The fact that the policy was designed in close consultation with the CONFIEP (Peruvian Federation of Entrepreneurs) and CAPECO (Peruvian Chamber of Construction), who represent the large construction firms, and not with the metropolitan and local authorities, who have jurisdiction over the territory and have to deal with building and land use permits, gives a strong suggestion that it is indeed more and economic than a housing policy.

Through CONFIEP and CAPECO, the private sector made several demands to guarantee enough profitability for the construction sector, and lesser risks for the financial sector. In the need to activate the whole economy, many of these demands were met and building standards were relaxed to allow a reduction in the production costs of the new homes (Calderón, 2009b) in 'acceptable' (central) areas of the city. The government also waived the payment of the General Sales Tax (VAT) for homes of up to US\$ 30,000 (at the time around 18 percent) in 2001.

A first question that arises is: does this process of “return to the centre” constitutes a fundamental shift in the usual distribution of residential construction? In a highly segregated city as Lima, we have to pay attention to two processes of urban development: formal and informal. For the former, data from the last two population censuses (2005 and 2007) confirm that the new social housing programmes have promoted the re-population of central areas, especially those of the traditional middle-class. In 2005, 15 of the 21 central districts of Lima had lost population, while the whole central area lost population in absolute terms. But in 2007 there was a recovery of the population loss in 13 districts. Thanks to the new projects, central districts of Modern Lima recovered 84% of its population. In contrast, working-class central districts had only recovered 22.5% of the previous losses (Calderón, 2009a). This might have changed due to the recent trends of location of new projects, in peripheral or working class district.

To measure the more silent but not less important informal growth, on the other hand, local empirical studies have been useful. They show that the trends of informal development have drastically changed in the last decades, due to the scarcity of land. The locations of recently-formed informal neighbourhoods are not any more flat lands or with a low slope, but steep hills and dangerous places which will be almost impossible to provide with urban services (Ramírez-Corzo and Riofrío, 2006). The localisation of these recently-built areas can be seen in an official map of the Metropolitan Municipality (Figure 11) which illustrates Lima’s growth evolution. The areas occupied by recent developments (2004-2010) are showed in dark red, and their location confirm what is argued in the empirical studies. Except from (formal) developments at the north part of Lima, most of them constitute piecemeal developments locate uphill from the existing hills occupied by informal neighbourhoods. This shows that the recent trends toward densification have not greatly modified the usual pattern of land consumption in Lima. On the contrary, the same figure shows that in the 2004-2010 (six-year) period, approximately the same land has been occupied than during the 1995-2004 (nine-year) period (shown in pink).

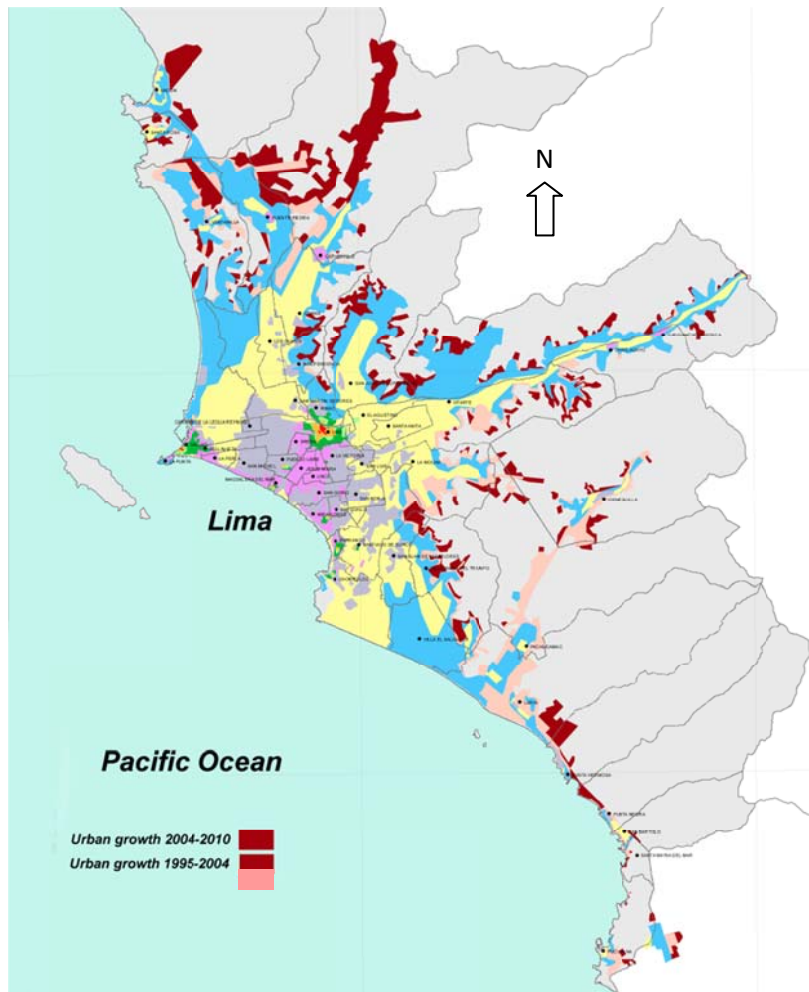


Figure 11. Urban evolution of Lima 1995-2010 (Source: Municipalidad de Lima, 2011)

If the densification of central areas does not represent a fundamental shift in the usual pattern of land development, the next question to answer is: how sustainable is the process of densification of central areas in terms of public space? The answer is also disappointing. The unplanned vertical expansion has produced an evident deficit of public spaces, which acquires a higher importance due to the higher densities and the smaller areas of the new homes (Riofrío, 2010). Representatives of the professional association of architects have argued that, under the justification of supporting local investors, the state's approach to urban growth has been the deregulation of urban practices, instead of regulating and organising the densification process (Sota, 2011). Riofrío (2010) comments that the housing policy has copied the defects but not the virtues of the Chilean housing model: it constitutes a simple housing delivery scheme without attention to the surrounding urban space, without creating a city. Indeed, the exclusively commercial character and lack of urbanity of the new projects is widely discussed in the media by architects and urban professionals.

Since the densification of central areas has occurred without enough control from the local authorities, it is increasingly producing conflicts among the residents. Zoning and building codes are not always followed or are later arranged through fines or "administrative silence", and developers build 12 storey building where there should be 8, or plan less parking places than the norm (Sota, 2011), what increases congestion at street level. Only 27.6% of residents considers that the new buildings follow the building codes and norms, and 42.1% considers that local governments have not realised a proper supervision of the works (Lima Cómo Vamos, 2011). Better-off districts have been

more efficient in controlling the densification process, modifying their regulations to demand stricter measures in criteria such as the number of parking places and square metres per apartment. But in general, the densification of central areas has developed according to the rules of a completely free market: the higher profits possible for the developers, without attention to issues of general welfare.

The housing boom resulting from the housing policies has produced a strong intensification of land use in central areas, but this process is not sustainable since “the business of densification” is ending in central districts and the large construction firms have not found a way to extend it to low-income areas (Riofrío, 2010), which are the ones who are more in need of affordable housing. Without solving this issue, there is no possibility of sustainable growth.

6.2 Transport policies and trends

One of the most excruciating urban problems of Metropolitan Lima is the chaos and congestion in the roads. 90% of residents of Lima describe the traffic as chaotic, disorderly or congested (Municipalidad de Lima, 2012). Remarkably, chaos and congestion are not the fruit of a high level of use of private car mobility, but a consequence of the messy situation of the public transport system. Peru has a relatively small vehicle stock compared to other countries in the region and very small compared to developed countries: 49 vehicles per 1000 inhabitants in 2006, but which has been increasing in the last years. In 1990 there were 400,000 vehicles circulating in Lima, in 2006 there were 900,000 and in 2010 more than one million (Protzel, 2011), from which the public transport fleet is over-represented. Until July 2010, Lima was the only Latin American capital city that did not count with an organised system for massive public transport. The fleet consisted of small old units – with an average age of 18 years, among the oldest among Latin American cities – that circulated along and congested routes.

Public transportation was in a state of collapse at the end of the 1980s. The fleet consisted on few, very old, and hugely crowded transport units. In 1991, the government of Fujimori privatised and deregulated the transport system. In the context of the difficult economic situation, the government renounced to even attempt to have a transport policy (Protzel, 2011) and the sector was completely left in the hands of individual operators: Decree 651 of July 1991 declared free access to all routes urban and interurban transport. The lack of planning produced a system whose only goal is to minimise costs and maximise benefits, without taking into account the quality of the service. Formal enterprises could hardly compete in this distorted market (Barbero, 2006). In 2008, 80% of public transport was in the hands of the informal sector (Defensoría del Pueblo, 2008).

To tackle the low number of units, the government allowed importing (cheap) second-hand vehicles for public transportation. These measures were launched in a moment of high unemployment due to the radical reduction of the public sector. To work as driver of public transport became the main way to avoid unemployment for thousands of people. Lima gradually lost its few units of massive transport – articulated buses – and acquired a disproportionately large number of smaller units (Villalobos and Torres, 2006). The 1991 reform eventually transformed the public transportation system from an overcrowded and insufficient system into a system characterised by oversupply, chaotic routing, informality and low quality services. Users experience very long trips, low levels of comfort, high levels of air and noise pollution, irresponsible behaviour of drivers, little respect to traffic regulations, low levels of security and many accidents. More than 80% of fatal accidents in Metropolitan Lima are responsibility of public transport units (Defensoría del Pueblo, 2008). Figure

12 shows the lengths of daily trips in Lima, where more than 40% of trips are between one and two hours long.

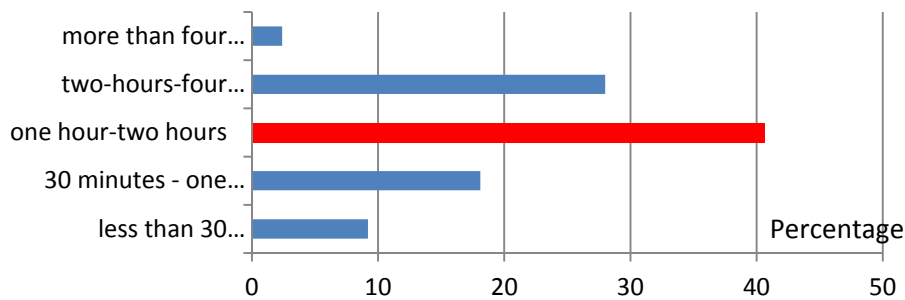


Figure 12. Length of daily trips in Lima (Source: Municipalidad de Lima, 2012)

In 1999 public transportation was declared in state of emergency due to its critical situation. The *Comité de Transporte Metropolitano* (TRANSMET) (Metropolitan Transport Committee) was established with the mission of coordinating between four different agencies involved in public transport. Still, few things changed during several years. Nine ‘profitable’ roads bore 78% of the total public transportation fleet, which made them very congested (Villalobos and Torres, 2006). Routes were not only saturated but also very long and winding, because the operators saved money paying for only one route. This, in combination with high unemployment and no regulation, led to the oversupply of public transportation. There are approximately 31,000 units of collective transport in Lima (2012), while it is estimated that only 16,500 are needed (Municipalidad de Lima, 2012). Oversupply results in a great competition for passengers which “substantially contributes to traffic chaos, accidents and environmental pollution.” (Barbero, 2006, p.276).

At the same time, there are in Lima 250,000 taxis that increase the congestion of the roads (Protzel, 2011), while 100,000 are considered enough for the current demand. Taxis and motor-taxis (approximately 45,000) – also work in the informal sector, with its characteristic low prices but also low quality services. Only 20% of taxis are registered and authorized to provide the service (Villalobos and Torres, 2006) and they have no meters and the tariffs are the product of negotiation between driver and passenger.

In view of the huge problems, the government commanded the elaboration of an Urban Transport Master Plan for Metropolitan Lima. This was elaborated in 2005 (and financed) by the Japanese Cooperation Agency (JICA), which had to carry out a survey with 35,000 households in Metropolitan Lima to prepare an informed diagnosis, in view of the widespread informal practices. The survey calculated that of the 12 million daily trips in Metropolitan Lima, 9.37 million (77.3%) were done by public transportation. The plan recommended a massive transport system, the management of demand and the improvement of the road network. Despite that the plan was approved, very little changed in the daily transport of most people in Lima. On the other hand, a series of civil society initiatives emerged with the goal of paying attention to transport issues, as *Fundación Transitemos* – a large group of professionals gathered to “tackle the chaos” of the local transport – *Luz Ambar* – an NGO specialised in transport issues – *Lima Cómo Vamos* – a citizen observatory dedicated to measure urban indicators established following *Bogotá Cómo Vamos* observatory, among others. These have greatly contributed to raise awareness to the importance of this topic in terms of quality of life.

In 2008, the National Ombudsman published a report entitled *Urban transport in Metropolitan Lima: in defence of life*, especially addressed to the metropolitan authorities (Defensoría del Pueblo, 2008). The report presented a clear diagnosis of the state of public transport in Lima. It highlighted the importance of planning the urban transport service mentioning that in spite that the metropolitan municipality had passed Decree 054-93, approving a plan regulating the organization of the routes of urban transport services in Lima, urban transport kept on showing lack of planning, organization and regulation. The report concluded that “Urban transport in Lima is an activity that takes place in very risky and precarious conditions for its citizens, and constitutes a significant source of environmental pollution. This seriously undermines the fundamental rights to life; to personal integrity; to health; to receive good quality services; and to have a suitable environment.” (Defensoría del Pueblo, 2008, p.175).

In July 2010, the first route of the Metropolitano was finally inaugurated after many delays in the construction process and an increase of the costs from US\$ 190 to about US\$ 300 million. This is a Bus Rapid Transit scheme, inspired in the TransMilenio model from Bogotá. Implemented by Protransporte, the Metropolitano is a public-private project, in which the municipality provides the infrastructure and the private sector the equipment. This first corridor connects Lima North and Lima South, covering 16 districts and benefiting nearly one million users per day. Other five routes are planned for the coming years.

The second project for massive public transport is Lima’s urban train, lately called Metro de Lima. The urban train was a “personal” project of former president Garcia during his first administration (1985-1990). Its construction began in 1986, as an elevated viaduct along a route that was never completed due to serious technical and economic problems, in the context of the deepening of the economic and political crises at the end of the 1980s. In 2009, during the second Garcia administration (2006-2011), the Ministry of Transport decided to complete the line, extending its route to downtown Lima, with 16 stations and passing through 9 districts. In December 2010, the government approved the basic network of the Metro de Lima, which will consist of 5 lines. The existing Line 1 is a viaduct but most others will be underground.

The new metropolitan authorities, inaugurated in January 2011, are clearly putting a special emphasis in tackling the transit problems by organising an integrated transport system that will be implemented in four years (see Figure 13) (Municipalidad de Lima, 2012). The Metropolitan Municipality’s strategy consists of six steps:

- (1) Prohibition to increase the public transport fleet (Ordinance 1538);
- (2) Establishment of the Bus Patron (Ordinance 1338), long buses that can transport up to 240 persons, which reduce air and noise pollution, and are accessible for handicapped or visually impaired people;
- (3) Definition of the transport corridors of the Integrated Transport System (see Figure 12);
- (4) Organization Plan for main congested roads. Currently there are about 40 transport enterprises working per route, which should turn into only four by means of consortia or tenders.
- (5) Chatarreo Programme to eliminate 4000 old public transport units in 2012 (Ordinance 1538); and
- (6) New Transport Regulations (Ordinance 1599 of April 2012).

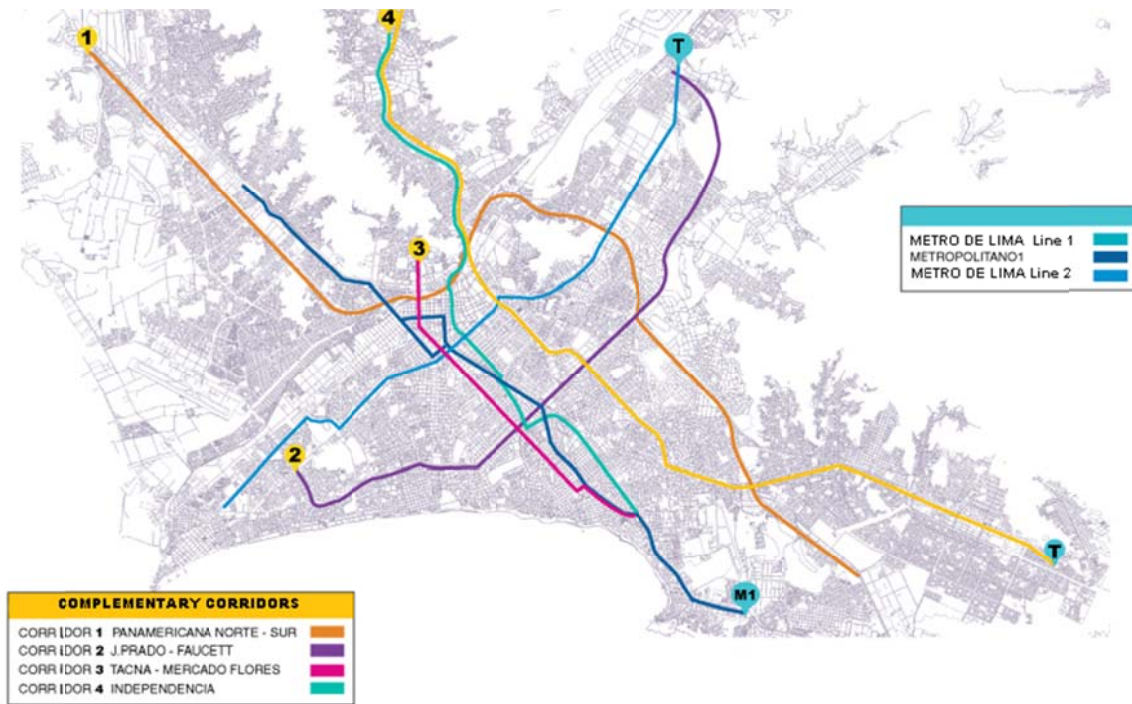


Figure 13. Transport corridors of the Integrated Transport System (Source: Municipalidad de Lima, 2012)

These steps represent an evident progress from the previous unsustainable situation. The functioning of these two mass transit systems has definitively improved the transport conditions of many people, but many more measures and interventions are needed to complement these systems such as improved sidewalks, bicycle paths, and other connecting transport options. Besides, the public opinion is still unhappy due to the congestion problems produced by the chaotic situation of the rest of the public transport.

The Municipality recognises that an efficient public transport system is essential for productivity and competitiveness, as well as an important factor of social inclusion and is working in the right direction. If the plan is implemented it will have positive consequences for the environment, the economy, the quality of life of residents of Lima and even for the legitimacy of the metropolitan government. But currently it is still a work in progress and as such, may have to face many constraints from powerful stakeholders that resist to let their long-acquired privileges.

On the other hand, Metropolitan Lima is much more extended than what is shown in the usual map of the Province of Lima. It also includes old and new settlements that have developed along the north and south Panamerican highway, and toward the east along the Central highway. Ortiz de Zavallos (2012) describes the recently-formed informal settlements along the south Panamerican highway as a “serpentine conurbation” without quality, order, system or balance, product of illegal land developments and without an urban character. This asks for the need to envision the future of the transport system with high-speed train lines at a higher level. A train system may offer the only alternative to articulate this unstructured territory.

6. Smart developments in Lima?

The previous sections have examined up to what extent are the recent urban processes enabling a smart/sustainable type of metropolitan growth in Lima. The results are not completely negative, but

still unsatisfactory in all of the three aspects addressed. Spatial planning processes in Metropolitan Lima are framed within a formalistic and normative planning system, with many norms and ordinances but significant implementation problems. These serious deficiencies are accompanied by great political and administrative fragmentation, the imposition of national level decisions over the other levels of government; weakness and low legitimacy of institutions and limitations of the public finances. As a result of these problems, there has been a neglect of metropolitan planning since 1990, which has produced the absence of a long-term vision for the development of the metropolis and an attitude to carry out opportunistic short-term projects to get fast political dividends. The absence of regulatory framework for land use planning has produced a city that grows without control. On the other hand, the new metropolitan government installed in 2011 seems eager to correct many of these serious troubles, but to reverse 20 years of nonexistent spatial planning seems an immense task. The participative character of the regional development plan in the making is an auspicious development and a step in the right direction, but it still has to pass the test of implementation.

In the absence of metropolitan growth policies, national housing policies have been traditionally the drivers of urban growth in Lima. Since 2003, the city has experienced an acute intensification of real-estate led urban development that has produced a great urban change, rapidly densifying its central districts. The trends of social housing delivery – attending mainly the demand of middle income groups – suggest that it is, as local researchers claim, more an economic than a housing policy. The (housing) construction sector is the darling of the national government, which has become an important pillar of the national economy. The apparently sustainable intensification of land use is only occurring in formal Lima, while poor households continue with the usual practices of informally occupying peripheral land. The unplanned character of the densification process is also bringing about serious conflicts and problems of urban space.

The urban transport sector has greatly suffered from the lack of long term visions for the city development. The lack of a system for massive transport during two decades has produced huge economic losses, as well as environmental degradation and a diminished quality of life. The sector was in such a chaotic and disorganized situation since its liberalization in July 1991, that many civil society initiatives emerged to demand solutions from the government. After many years of studies, plans, implementation problems and construction delays two new systems have recently begun to function: the Metropolitan BRT system and the urban metro. They constitute a first step toward a more sustainable development, but the planned implementation of an integrated system for massive transit is still in its infancy. The metropolitan government is currently attempting to reorganize transit in Lima, with some positive results. Long-term visions for the articulation of Lima the outer areas of the metropolis outside the Province of Lima, however, are desirable but still not very much discussed in view of the urgent short-term problems.

Although masked by the current economic bonanza of part of the city, Lima has serious internal problems that demand proper attention: high housing demand, huge congestion and chaos in the roads, high levels of air pollution, lack of green areas, uncontrolled expansion, socio-spatial segregation, etc. The urgent character of the problems in a context of weak governance has produced the neglect of long-term visions and of the use of strategic spatial planning as a tool to achieve these visions. This brief examination has shown that there are some improvements in terms of sustainability in each of the three aspects addressed: there is an auspicious new regional and participative planning in the making; there is a densification process going on in central areas of Lima

that could improve if it was regulated; and the process of organisation of transit in Metropolitan Lima has just begun. But compared to its Latin American “sisters”, Lima is far behind in terms of sustainable initiatives. There are many interesting plans, good ideas and people willing to improve Lima’s urban situation. But all this is still far from the actual capacity to harmonise the different economic, environmental and socio-cultural assets of all important stakeholders involved in urban development for the sake of a smarter, more sustainable and inclusive city. Lima has much homework to do in terms of governance to catch up with other Latin American cities.

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