



# Bamako

THE TIME TO ACT IS NOW!

An Engine of Growth and Service Delivery

URBAN SECTOR REVIEW

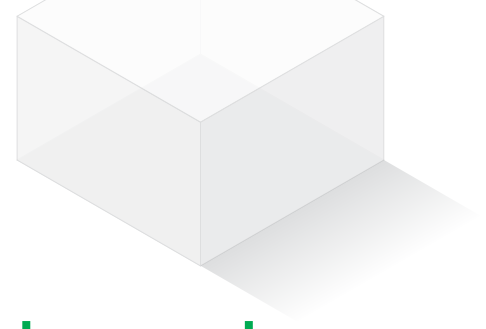




# **THE TIME TO ACT IS NOW!** **Bamako**

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# Acknowledgements

The Bamako Urban Sector Review was prepared by a team led by Megha Mukim (Senior Economist), and consisting of Christian Eghoff (Urban Specialist), Paolo Avner (Economist), Harris Selod (Senior Economist), Alex ChUNET (Consultant), Caroline Plançon (Consultant on Land policy), Tristan Reed (Economist), Alexandr Trubetskoy (consultant) and Zie Ibrahima Coulibaly (Senior Infrastructure Specialist).

This report was conceptualized, researched and drafted in collaboration with officials and experts from the Ministry of Housing and Urban Planning, the Ministry of Local Governments, the District of Bamako and Communes within in the geographic area of the District of Bamako. The team is incredibly grateful to the National Institute of Statistics (INSTAT) in Mali for the provision of data, including census and geographical, to the Cellule de Préfiguration de l'Agence Urbaine de Bamako (CPAUB) for sharing studies insights, and, together with La Direction de la Régulation de la Circulation et des Transports Urbains (DRCTU) for providing the Sotrama network. The team also greatly appreciates the continued guidance and feedback received from representatives of sector agencies and organizations who contributed as members of the Review Technical Committee.

The team gratefully acknowledges the peer reviews and inputs from these World Bank Group colleagues: Andrea Liverani (Program Leader), Shomik Raj Mehndiratta (Practice Manager) and Ellen Hamilton (Lead Urban Specialist), Sylvie Debomy (Lead Urban Specialist), Peter Ellis (Lead Urban Economist), Johannes Hoogeveen (Lead Economist), Boubacar Sidiki Walbani (Senior Operations Officer), Andre Marie Taptue (Economist), Alice Duhaut (Economist), Alexandre Laure (Senior Private Sector Specialist), Cheick Omar Tidiane Diallo (Transport Specialist), Yu Lu (Takashi Riku) (Research Assistant) and Olivier Beguy (Senior Economist).

Senior management of the Urban Global Practice and the Country Unit provided guidance and strong support throughout the research, including Meskerem Brhane (Practice Manager), Somik Lall (Lead Economist), Soukeyna Kane (Country Director) and Michel Rogy (Program Leader).

The team would like to acknowledge gratefully the Department for International Development/UK AID for helping finance this study through their program on urbanization and spatial development.

Connie Kok Shun (Senior Program Assistant), Aoua Sow Toure (Program Assistant) and Aissata Diop Diallo (Program Assistant) provided administrative assistance. The design of the report is credited to Francis Gagnon.







# Introduction and Summary

**Cities have many advantages.** They allow workers to be closer to jobs, increasing opportunities and fueling productivity. They bring people together physically, facilitating the exchange of ideas and bringing about innovations. High densities make it cheaper to provide services efficiently and equitably. As such, many of the benefits of urban life – productivity and livability – are associated with proximity within the city. Fragmented urban development, thus, makes cities less productive and less livable.

**Many of Mali's development challenges have a spatial dimension – with Bamako at its core.** Bamako and the neighboring commune of Koulikoro were the only net recipients of migrants (as reported by the 2009 Household Census<sup>1</sup>), while the regions of Ségou, Mopti, Tombouctou and Gao were the largest net contributors of migrants<sup>2</sup>. While pull factors (such as access to jobs and services) matter for movement from rural to urban areas, push factors such as poor living conditions, weather, limited economic opportunities and insecurity were also particularly important in Mali. Bamako also has potential to be a regional hub in West Africa – recent analysis conducted for a regional report on urbanization in the Sahel region<sup>3</sup> found that inland capitals (Bamako, Ouagadougou and Niamey) would be the biggest gainers from investments to relieve present transportation bottlenecks across West Africa. In fact, of all West African cities, Bamako shows the highest potential for a hub for market access both regionally and globally.

**While Mali's rate of urbanization has risen above 40% in the last years, its GDP per capita (US\$1971 PPP, constant 2011 USD) remains at a far lower level compared to other developing countries with similar urbanization levels.** Mali's annual urbanization rate at 4.9% per annum exceeds by far the overall population growth rate of 2.9% per annum. Currently 41% urbanized, the country is expected to cross the 48% urbanization mark by 2030<sup>4</sup>. However, urbanization has not been associated with commensurate increases in GDP, especially compared to Asian developing countries – see Figure 1. Besides, in the last decade, urbanization has been accompanied by deindustrialization – man-

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1 RGPH -Recensement Général de la Population et de l'Habitat (du Mali)

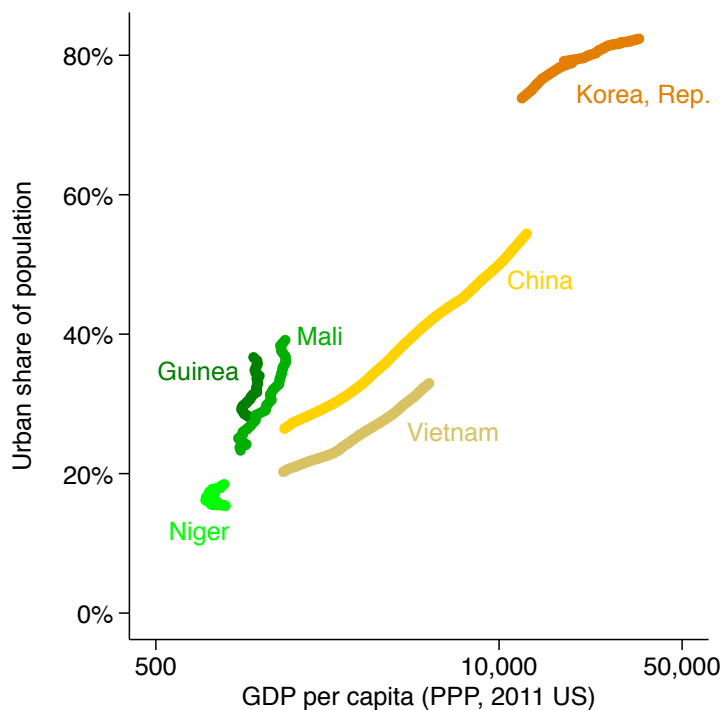
2 World Bank (2015) The Geography of Poverty in Mali.

3 World Bank (2018) *forthcoming* Unlocking Productivity and Livability – A Tale of 3 West African Cities.

4 World Resources Institute Data

ufacturing is now only 18% of national GDP, down from 28% in 2006<sup>5</sup>. This implies that the country has low levels of wealth, fiscal resource, service delivery, and that institutions and systems remain weak – see *Greening Africa's Cities* (2017). Regarding Bamako, the population of the district capital city has more than doubled over the 2000-2015 period, and the pressure on the city is expected to grow in the future.

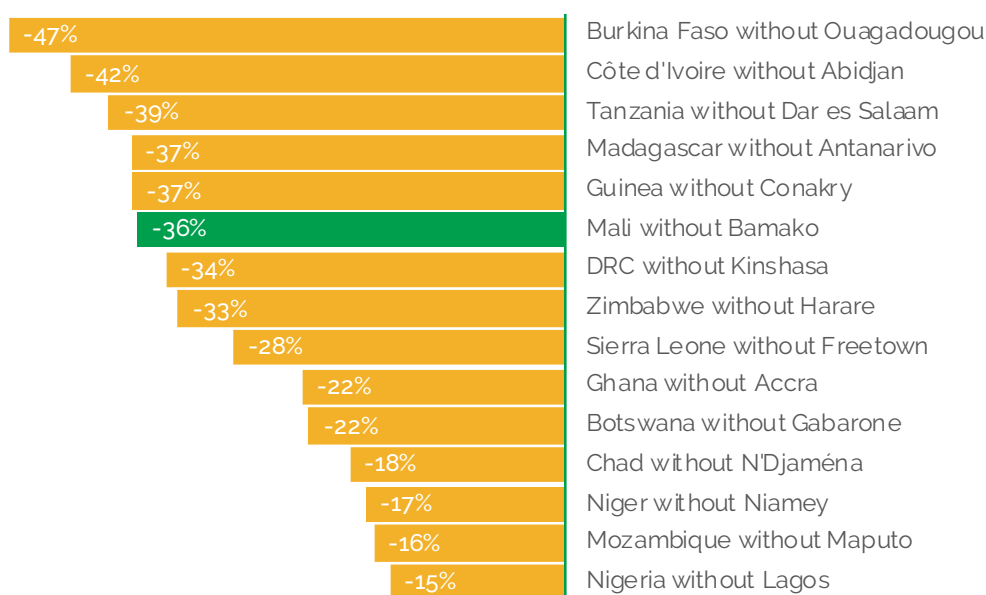
*Figure 1. Change in GDP depending on urbanization, per country*



Source: Henderson, V. and Nigmatulina, D. (2016). *The Fabric of African Cities: How to Think about Density and Land Use*. Draft, April 20, London School of Economics.

**This study focuses on Bamako, the capital of Mali, that dominates the country's urban landscape.** A central premise of policy-making in cities is that the flexibility, practicality, and focus of local governments make them ideal players to understand and respond to the needs of their citizens. Indeed, cities mostly aim their problem-solving at local conditions. In Mali, the economic importance of the capital city cannot be understated – it is the nerve center of the national economy<sup>6</sup>. If the capital, Bamako, was to be removed, Mali would lose 36% of GDP - see Figure 2. Thus, reforms and investments aimed at tackling urban development challenges in the capital will have knock-on effects on national economic development.

*Figure 2. Reduction in gross GDP if the capital city was removed (% of GDP)*



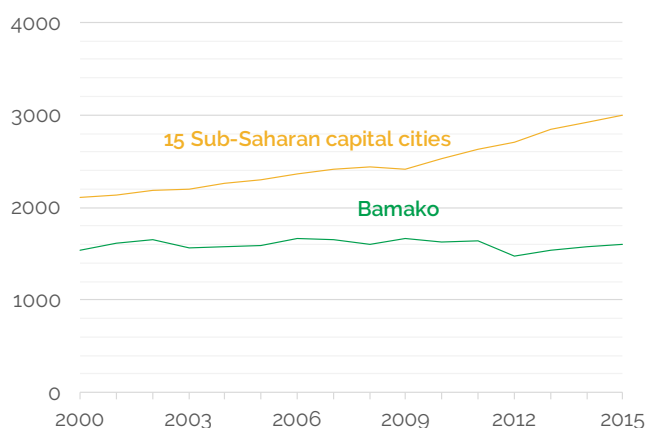
Source: Oxford Economics

### **Yet Bamako is neither an engine of growth, nor of service delivery.**

Despite Bamako's importance to the national economy, Bamako is failing to make progress on increasing its competitiveness over time, or delivering on urban services for its citizens. Labor productivity, calculated by gross value added per capita, is low and has remained stagnant in the last 15 or so years, compared to the average for 15 cities in Sub-Saharan Africa (see Figure 3). Even more troubling is that urban service delivery in Mali (indicated by an index combining quality of access to water, electricity and sanitation) also continues to lag the Sub-Saharan average, and is not showing signs of catching up - see Figure 4. Thus, Bamako, and by extension, Mali, is failing to reap the benefits usually associated with urban growth.

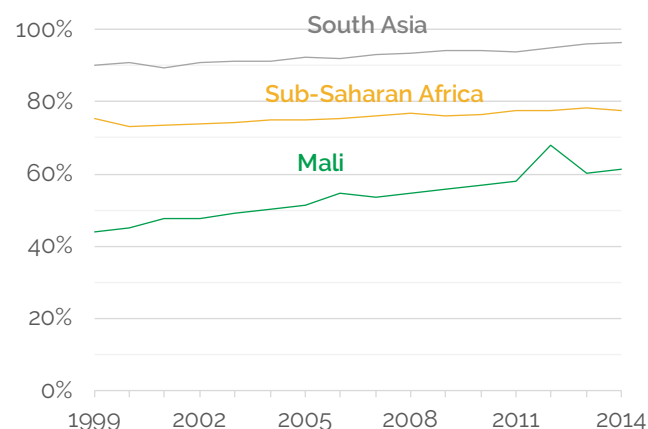
<sup>6</sup> In fact, the primacy of Bamako in Mali's urban hierarchy has remained fairly stable over the last 30 years.

Figure 3. Trend in Competitiveness (GVA per worker)



Source: Oxford Economics. Comparator cities: Abidjan, Accra, Antananarivo, Bamako, Conakry, Dar Es Salaam, Freetown, Gabarone, Harare, Kinshasa, Lagos, Maputo, N'Djaména, Niamey, Ouagadougou

Figure 4. Trend in access to public services in urban areas



Source: World Development Indicators

**Urban development in Bamako has been fragmented, providing an important explanation of the failure to realize the advantages associated with city growth.** Much of new urban construction in Bamako has taken place far from existing urban concentrations, exacerbating the challenges of urban accessibility and access to services. The high level of urban fragmentation is fettering both - productivity, by preventing opportunities for matching people and jobs - and livability, by driving up the costs of urban infrastructure and service delivery.

## Summary of recommendations

**To become an engine of growth and services delivery the focus should be on how Bamako is built and organized spatially.** Bamako is grappling with inefficient land markets which have resulted in haphazard urban development, leading to investments in buildings and infrastructure away from the urban centers. Insufficient investments in cost-effective network infrastructures, including transport and public services, has further exacerbated urban accessibility. Underlying these drivers, urban planning institutions at the local level are also weak, and urban governments struggle with small mandates and limited control over revenues for development expenditures.

**To unleash Bamako's potential, a balanced approach to reforming institutions, putting the right policies in place and investing in infrastructures and attention to implementation will be needed.** The main recommendations from the study are summarized below:

- ***Coordinate land use and connective infrastructure:*** Public land and properties could be used to promote investments, which would help encourage denser economic infrastructure investments within the city. An inventory of public holdings – land, administrative buildings and infrastructure, would be a first step to help set the tone to enable the development of efficient land and property markets. In parallel, efforts should also be made to implement the new legal frameworks put in place to ensure better land tenure and management, for instance, through the installation of local land commissions to help tackle uncontrolled land conversion taking place in peri-urban areas. To better connect people to opportunities, investments should be made in upgrading road quality and better managing public spaces. And finally, digital technologies should be leveraged to work with communities to better monitor and track accessibility changes.
- ***Finance and manage better public service delivery:*** To meet the growing needs for investments in public infrastructure, systems should be developed to increase the sources of own-source fiscal and other revenues at the local level, through mechanisms such as increasing tariffs and taxes and national government transfers. At the same time, there should be a focus on reducing inefficiencies in the system – for instance, in the case of solid waste management, better placement of landfills and more opportunities for composting would significantly impact public revenues. And lastly, contractual arrangements can be organized better to maximize the incentives for public and private service delivery providers to increase access while recovering costs.
- ***Invest in urban institutions:*** Since much of current and future urban growth will spill-over to neighboring communes, systems and incentives for inter-jurisdictional coordination on planning for investments in infrastructure and service provision will be paramount. At the same time, institutional responsibilities across jurisdictions and between national and local levels need to be better clarified, and capabilities to implement the local administrative remit be reinforced. Citizen engagement and private sector can and should be leveraged as a crucial element of addressing urban infrastructure financing and governance, including using data and technology.

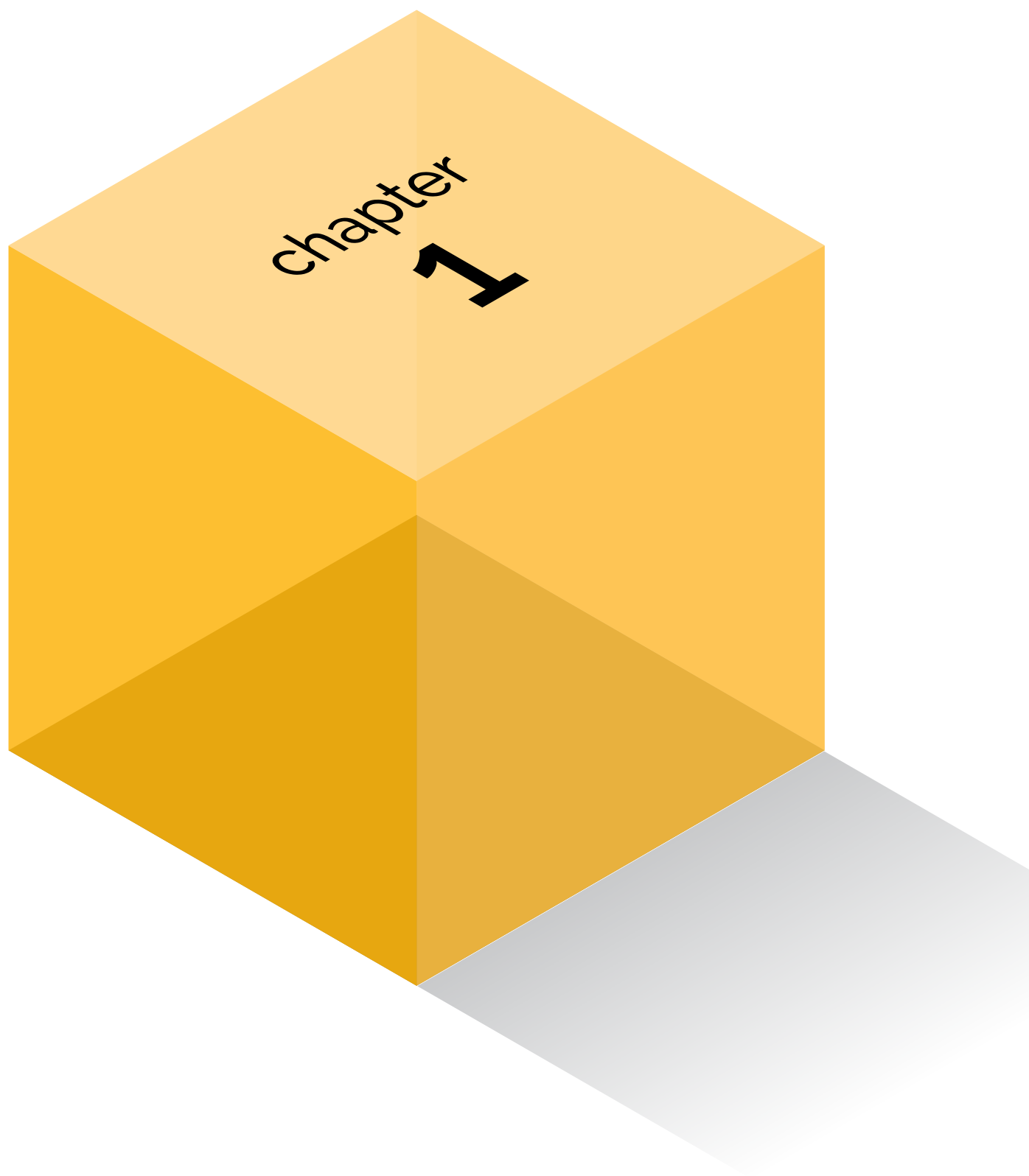
	Reform Institutions	Modify Policies	Invest & Implement
<b>Coordinate Land Use and Connective Infrastructure</b>	Inventory public land, buildings and infrastructure	Manage public spaces better, including road rehabilitation and maintenance	Implement new legal frameworks, for instance, through the installation of local land commissions
<b>Finance and manage better public service delivery</b>	Develop systems to increase its own-source fiscal and other revenues, such as through increasing tariffs, taxes, and national government transfers	Reduce inefficiencies in the system, for instance in the case of SWM building a landfill closer to the city and composting 50% of the organic waste within the city	Organize better contractual arrangements, to maximize incentives for increasing access and cost recovery
<b>Invest in Urban Institutions – Think outside the Box</b>	Develop systems and incentives for inter-jurisdictional coordination on planning for infrastructure investments and service provision	Clarify institutional responsibilities and reinforce capabilities at the local level	Leverage citizen engagement and competitive markets as a crucial element of addressing urban infrastructure financing and governance, including using digital technologies

## What to Prioritize?

NOW	SOON	LATER
<p>Inventory public land, buildings and infrastructure</p> <p>Review past performance of structuring PPPs in solid waste and identify future investments, including feasibility of constructing a new landfill, nearer to the city</p> <p>Make commuting data publicly available to inform public and private decision makers, including passengers</p>	<p>Assess investment needs and identify of potential sources of investment funds, including for own-source revenue and private capital mobilization</p> <p>Finance catalytic activities, including those to crowd-in private sector ideas</p> <p>Invest in urban mobility systems and road construction &amp; rehabilitation</p>	<p>Implement new legal frameworks for land, for instance, through the installation of local land commissions</p> <p>Operationalize a metropolitan management and coordinating entity</p> <p>Invest in building local government capabilities for urban planning and inter-jurisdictional coordination</p>

**Given the small public purse and several competing and unmet demands, smart urban innovations and solutions could also arise from bottom-up actions.** New technologies could be leveraged to give citizens more opportunities to have a say in the functioning of their communities. Beyond investments in heavy infrastructure, if the right platforms can be developed, citizens can be empowered to transform the city space. This report also demonstrates how a variety of data could be used for urban innovations: opportunistic data, which is collected for one purpose and then used for another (*such as data owned by cellphone companies and then used to understand urban mobility*); purpose-sensed data, which is collected using cheap and ubiquitous sensors that can be deployed in public spaces (*for instance, to better understand land and building use*); and user-generated data, which comes from engaging people through social media platforms or crowdsourcing (*for instance, through Open Street Map communities to track urban infrastructure investments and use*). The Government can play a fundamental role in fostering innovation, using open platforms but also through establishing synergies with the various actors that can make a city smart, such as businesses, innovation hubs and research centers. Bamako already supports accelerators, and can scale up investments in a bottom-up, innovative ecosystem to engage citizens in finding solutions to its urban challenges.

**The window for coordinated investments in urban infrastructure is narrow.** Owing to its post-colonial legacy, Bamako is less chaotic in its urban planning, compared to its East African counterparts. This provides it with an opportunity to make early investments in connective infrastructure, closely synchronized with land-use planning. Bamako's District Government will need to build coalitions with its neighboring communes, regional development agencies and with the national government, while finding ways to expand its sources of revenues. Urban investments are long lived and path dependent. The time to act is now.







# Bamako is **not** an engine of growth or service delivery

**Bamako dominates the urban and economic landscape in Mali, but it is not an engine of growth or of service delivery.** Bamako's economy remains dominated by small firms, that mainly operate in non-tradable sectors, and which lack scale and specialization. Informal employment is prominent. Even though the city attracts the most qualified migrants from the country, the lack of skilled labor remains a constraint to firms. Bamako is also not a very livable city. Although access to public services has improved somewhat, access to important services, such as water and waste collection, lags Sub-Saharan African cities. Traffic congestion also poses a big burden on livability.

**Much of these outcomes are related to Bamako's fragmented spatial form.** Historically most urban development took place on the left bank of the city, although new growth has been on the right bank – and adequate investments in infrastructure and service delivery have failed to keep up. While jobs are concentrated in or next to the city center, residential density is distributed across the city. Given the lack of urban accessibility, this has resulted in a spatial mismatch. Indeed, accessibility in Bamako has been doubly penalized – making it more expensive and inefficient to provide urban services equitably across the city, and placing a greater burden on peripheral households in terms of urban mobility. Accessibility is limited owing to a combination of a fragmented urban area where jobs and people are far from one another, but also exacerbated by poor quality of the connective infrastructure, including an insufficient coverage of public transport.

## Bamako is not very competitive

**Jobs in Bamako are concentrated in non-tradable sector** – repair and retail account for around 1/3<sup>rd</sup> of total employment. According to the 2009 census, only 16% of workers are employed in manufacturing and construction. Public administration and other non-tradable services (transport, education, domestic work) account for the remainder. Indeed, location quotients<sup>7</sup> illustrate that Bamako is specializing in mostly non-tradeable service sectors such as real estate, domestic workers, hotels and restaurants and retail. This is worrying since global<sup>8</sup> and Africa-specific regional<sup>9</sup> research reiterates the importance of tradeable sectors in driving urban economic competitiveness. In Bamako, it seems like a large proportion of the workforce are employed in local activities, which have limited scope for growth and job creation as they are held back by their production structures and by the size of the local market.

The two business registries considered in this study, 2012 and 2015, include respectively 5,786 and 8,808 firms for the Bamako urban area. The registries include all formal firms. Compared to the census, mining and banking services are



### Business Registry (2012, 2015)

The two business registries considered in this study, 2012 and 2015, include respectively 5,786 and 8,808 firms for the Bamako urban area. The registries include all formal firms. Compared to the census, mining and banking services are somewhat overrepresented within the registries. However, if the top 5% of firms are excluded, the decomposition is much more similar. Since the data was geo-referenced at the neighborhood level, it feeds into the spatial analysis of economic activity. The data is somewhat limited, and only allows computation of the total number of firms and the total wage bill per neighborhood. However, two caveats are worth mentioning upfront.

First, there is considerable increase in the number of entries between 2012 and 2015 which might be owing to differences in methodologies used and the geographical coverage, affecting any inter-temporal analysis. Second, the wage bill is reported at the level of the firm (and not the plant). The top 5% of firms with the biggest wage bills were dropped from the analysis, as these would run the greatest risk of reporting firm (and not plant) level data. In addition, large mining, extractive and security firms were dropped from the analysis, since it can be safely assumed that a large proportion of their operations take place outside of the city.

7 A location quotient (LQ) is an analytical statistic that measures a region's industrial specialization relative to a larger geographic unit (usually the nation). A LQ is computed as an industry's share of a regional total for some economic statistic (earnings, GDP by metropolitan area, employment, etc.) divided by the industry's share of the national total for the same statistic.

8 Competitive Cities for Jobs and Growth (2015), World Bank.

9 Opening Doors to the World (2017), World Bank

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**A caveat to this analysis is the prominence of informal employment in Bamako.** About 68% of the employed population works within the informal sector both in Bamako and other urban areas. Besides, there is a strong effect of income and education as only 34.6% of workers with secondary education and 55.7% of workers of the fifth quintile work for an informal company at national level<sup>10</sup>. Considering that the business register datasets analyzed only include formal firms, there is an inherent bias to the analysis. However, considering the importance of the formal sector and the higher productivity of formal companies, the analysis remains highly relevant to the assessment of Bamako's economic activity.

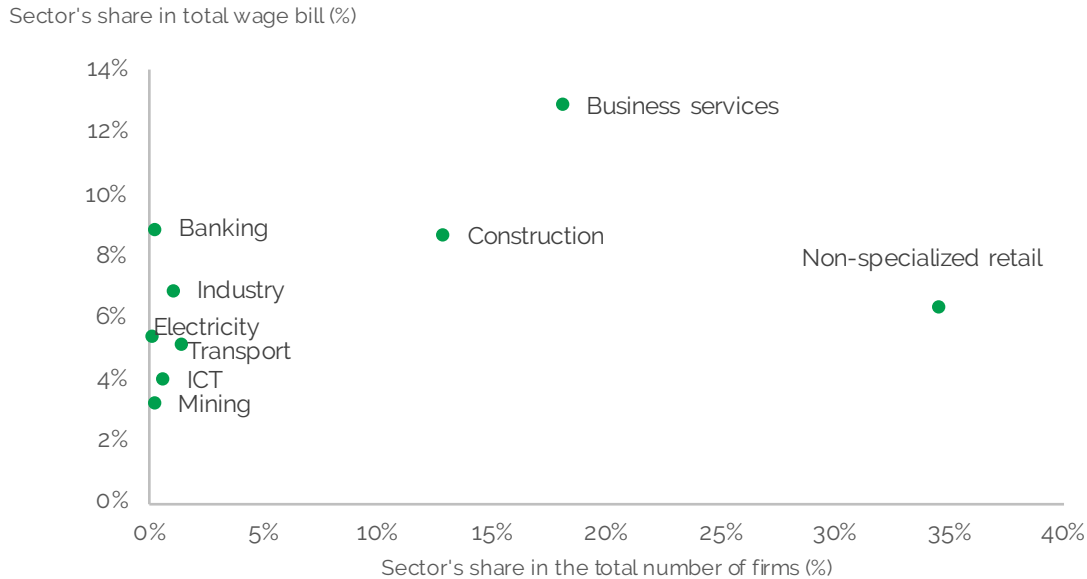
**Bamako's economy consists of predominantly small firms.** For instance, sectors such as business support services and retail in non-specialized shops, make up more than half of the total number of firms, and yet account for less than 20% of the total aggregated payroll – see Figure 5. Industrial sectors firms - plastic, steel and chemicals production – also represent a non-trivial proportion (7%) of total payroll while only around 1% of total firms. Research from other urban, developing country, contexts<sup>11</sup> suggest that sustained job creation over time is created by medium and large enterprises. In fact, since much of job creation by small firms is usually volatile (with job destruction often matching job creation) and of much lower quality – the predominance of small firms in Bamako is worrying.

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<sup>10</sup> EMOP (2014), Enquête Modulaire et Permanente auprès des ménages

<sup>11</sup> See Rijkers, B et al (2014) "Which firms create the most jobs in developing countries? Evidence from Tunisia," *Labour Economics*, Elsevier, vol. 31(C), pages 84-102; and see Mukim, M (2016) "How do Cities in Ethiopia create Jobs?", World Bank Research Working Paper #7866.

Figure 5. Share in total number of firms and total wage bill per sector



Source: Business Registry 2015

**Bamako attracts some of the most qualified migrants, and yet the lack of skilled labor is one of the most important constraints faced by firms in the city.** According to the 2009 Census, 79 percent of internal migrants with a tertiary education end up in Bamako; by contrast only 55 percent of migrants with no education go to Bamako. And yet, according to WBG enterprise surveys, while only 11.3% of firms considered the lack of skilled labor to be a major constraint in 2010, 37% designated it as a major or very severe constraint in 2016. Employers in the formal and the informal sector complain of difficulties in finding individuals with the rights skills, including basic technical skills. One of the main determinants of skilled labour scarcity is low enrolment rate in primary and secondary education. More than 70% of individuals between 15 and 25 were out of school in 2010, with very limited qualifications and skills for employability which leads them to generally low productivity jobs in the agricultural or service sector (over 90% of all jobs)<sup>12</sup>.

**Access and usage of information and communications technology in Bamako also remains limited – in terms of extent and quality of coverage – limiting opportunities for digital innovation.** While there has been a significant increase in access to internet over the last years reaching 11% in 2016, a huge gap remains with the rest of Sub-Saharan Africa for which average access is at 20%. Internet penetration in Bamako has historically been one of the lowest in West Africa as only 9.5% of households had access to internet in 2013 which can be linked to high cost and poor infrastructure. While 9 in 10 adults in the city had access to a mobile phone in their household, usage rarely goes beyond texting and phone calls<sup>13</sup>. It is also worth noting that personal mobile phone ownership is systematically higher among men (88.6%) compared to women (70.7%), and higher

<sup>12</sup> World Bank (2014), Skills development and youth employment project, Education Central and West Africa Department

<sup>13</sup> Gallup (2013), Media use in Bamako, Mali

among individuals with secondary education (91.6%) compared to non-educated people (74.3%).

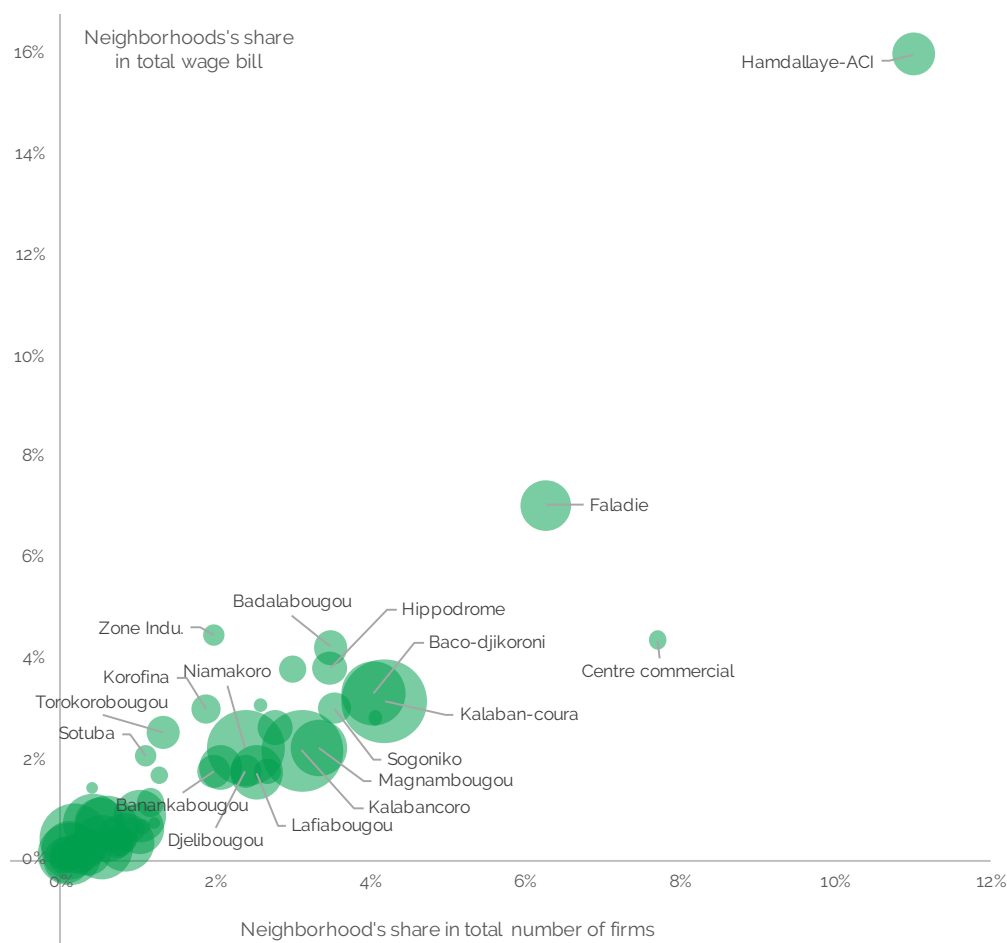
**Economic activity is highly concentrated in a few neighborhoods.**

Figure 6 presents the distribution of wages and the distribution of firms across neighborhoods in Bamako. Hamdallaye ACI, which is not displayed, accounts for about 12% of firms and 18% of total wages paid. In general places that host more firms also account for a larger share of the wages paid. The Centre Commercial is an exception, which clearly seems to host far more, possibly smaller firms, which account for a small share of the wage bill. The mirror exception is the industrial zone, which hosts far fewer firms (mostly in chemical, steel and plastic production), but accounts for more than its fair share of wages.

**Bamako needs far more firms with scale and the right specialization.**

Although political instability and inadequate access to finance have been highlighted as big impediments by firms, almost half of firms identify transportation as an issue (twice the proportion compared to other Sub-Saharan countries) and around 41% identify access to labor as a constraint. This requires the right 'habitat' for firms, and goes far beyond the national regulatory environment.

*Figure 6. Distribution of Firms and Wages (without Hamdallaye-ACI)*



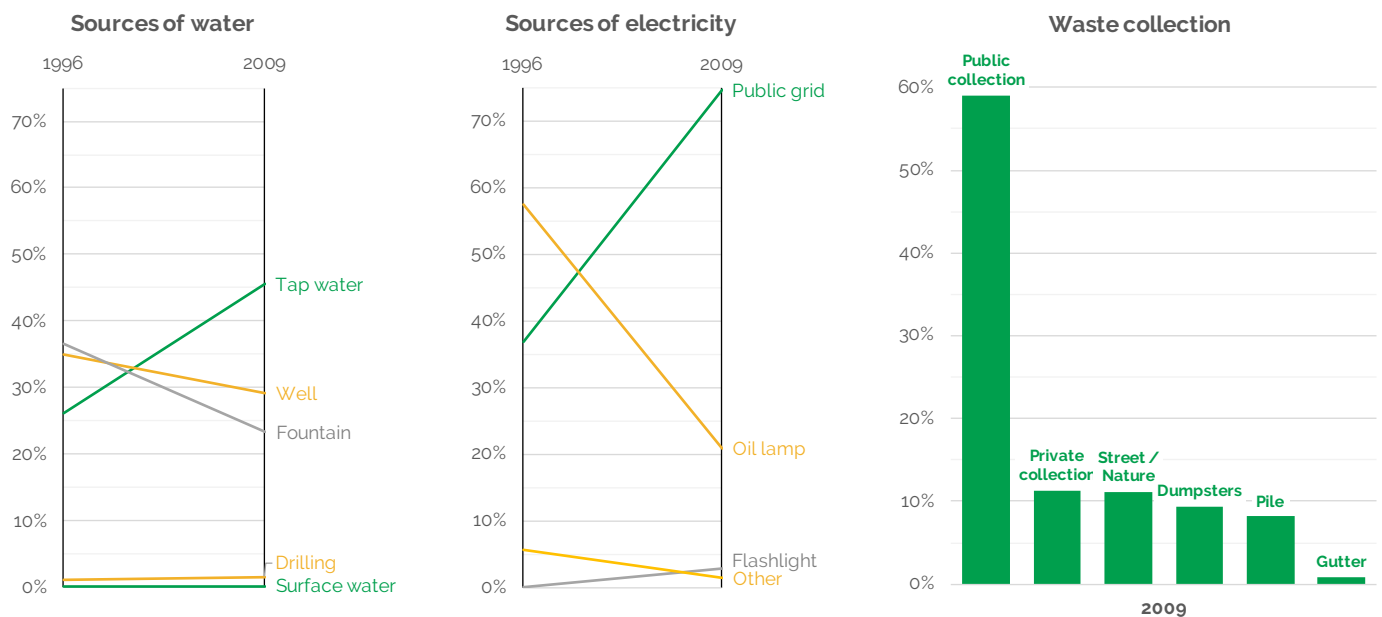
Note: Bubble Size: Neighborhood Population (Global Human Settlement Layer, GHSL, 2015)

Source: Business Registry 2015, GHSL 2015

## ... and much improvement is needed to make it livable

**Access to public services has improved between 1996 and 2009, however some services, such as access to tap water, remain limited – see Figure 7.** While only 36% of households were connected to the electrical grid in 1996, almost 75% benefitted of the service in 2009. Similarly, access to tap water jumped from 25% to 45% on the same period, which however remains relatively low. Finally, while waste management was not considered in the 1996 census, the 2009 figures display a relatively high collection rate with 70% of households served either by public or private companies<sup>14</sup>. Although collection rates are high, proper disposal lags – this will be discussed in detail in later chapters.

Figure 7. Services decomposition



Source: RGPH 2009, 1996

<sup>14</sup> Data on solid waste collection used here for consistency. More recent estimates put the level of household collection at 40 to 70 percent depending on neighborhood, see chapter 3.



## A special focus on solid waste management

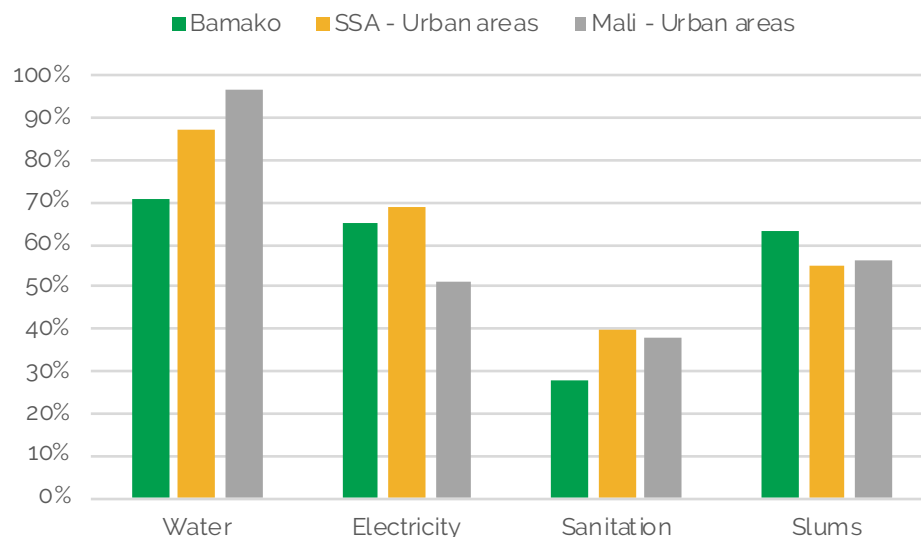
This study will place a special spotlight on solid waste in Bamako. This is for many reasons. Solid waste is an important environmental and health concern and studies have shown that inadequate municipal solid waste management can impact negatively on GDP. For example, economic losses resulting from inadequate provision of solid waste services have been estimated at 0.83 percent of GDP in Burkina Faso and 0.5 percent of GDP in Morocco. Focusing on solid waste management is thus justified from an economic growth perspective. Furthermore, while according to the 2009 census Bamako fares relatively well in terms of

collection rates compared to regional benchmarks (Ouagadougou at 47 percent, Greater Monrovia at 41 percent, Senegal (country) at 55 percent), the absence of a sanitary landfill and the very low collection rates in the Greater Bamako area (20 percent in the surrounding Region of Koulikoro) is an additional reason to a focus on this service in the present report. Solid waste management also exemplifies some of the coordination failures related to urban planning and service delivery in the Greater Bamako area and is one of the few municipal services essentially delivered by local government.

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- 15 World Bank (2017). Burkina Faso. BF-Improving Solid Waste Service Delivery. Report No: ACS22298. Washington DC: World Bank.
  - 16 World Bank (2009), 'Municipal Solid Waste Sector Development Policy Loan', Program Document, P104937, Washington DC: World Bank.
  - 17 World Bank (2017). 'Cheesemanburg Landfill and Urban Sanitation Project', Project Appraisal Document, P159961, Washington DC: World Bank.
  - 18 World Bank (2017). 'Senegal Municipal Solid Waste Management Project', Project Information Document/Integrated Safeguards Data Sheet, P161477, Washington DC: World Bank.

**Access to urban services in Bamako lags average access in urban areas in Sub-Saharan African countries.** While, 87% of households benefit from improved access to water in Sub-Saharan Africa, it is the case of only 71% of households in Bamako. Similarly, only 28% of households have access to improved sanitation compared to 40% in SSA – see Figure 8. Access to electricity compares reasonably well, although this also lags somewhat. These gaps can also be embodied by the higher share of slums in Bamako (63%) compared to the average urban areas of the region (55%)<sup>19</sup>.

*Figure 8. Access to services in Bamako, Malian urban areas and Sub-Saharan urban areas (% of population)*



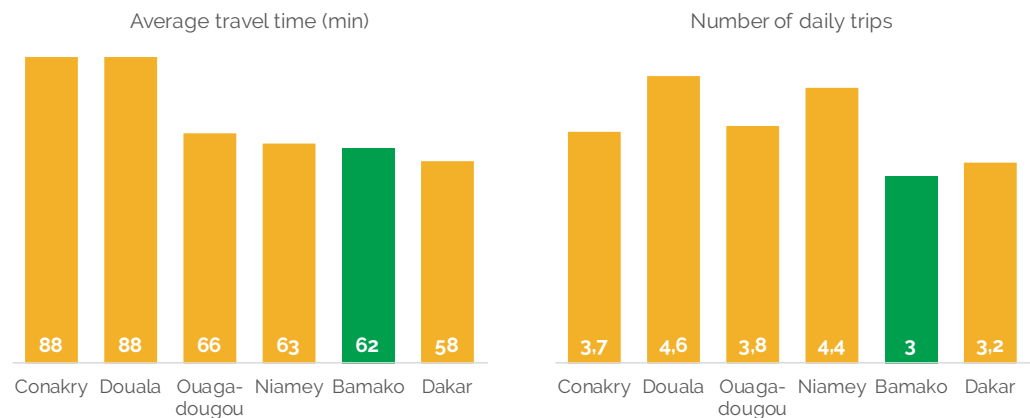
Source: UN Habitat and RGPH 2009

<sup>19</sup> While the estimates for the Sub-Saharan African regions are based on the UN Habitat definition, the estimate for Bamako is based only on housing quality



**Traffic congestion is also a huge burden on liveability.** The physical form of Bamako is prone to congestion - there has been exponential growth on *Rive Droite*, and yet, most of the administrations, the higher education establishments, the industrial zone and the main markets remain concentrated on the *Rive Gauche*, near the city centre. Much of this disconnect is owing to the legacy of urban development, wherein new growth has been on the right bank. The increased congestion in Bamako seems to be associated with lower overall mobility rather than longer commutes. While the average daily travel time in Bamako is 62 minutes, which aligns with international norms<sup>20</sup>, the number of daily trips per person is one of the lowest in the region with only 3 trips a day – see Figure 9. Besides, 53% of residents surveyed had either not travelled at all or only by walking on the previous day compared to only 38% in Douala, 43% in Ouagadougou<sup>21</sup>. The spatial range of trips in Bamako also seems somewhat geographically limited. In Bamako, more than half of trips (53%) are either intra-district or restricted to close neighbouring districts. Considering the prominence of walking in transport modes, short trips are symptomatic of poverty and traffic congestion in African cities. For example, trips within the same district or neighbouring districts represent 57% of the total in Niamey, 66% in Conakry and 52% in Douala. This points to spatial fragmentation within the city, which is associated with low mobility but higher levels of congestion.

Figure 9. Time spent per day and number of trips per person



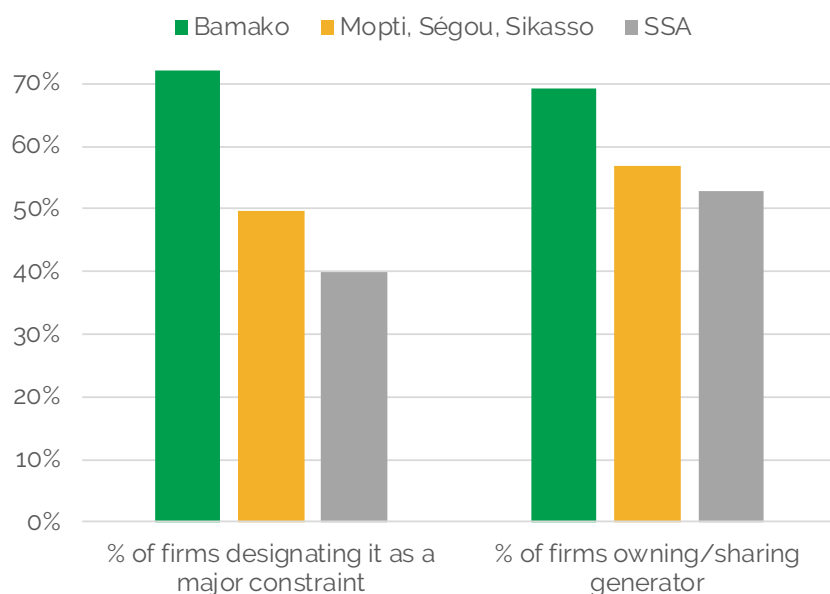
Source: Lourdes Diaz, O., Plat, D., Pochet, P. (2013). The puzzle of mobility and access to the city in Sub-Saharan Africa. *Journal of Transport Geography*, Elsevier

<sup>20</sup> Schafer, A. & Victor, D.G. (2000). The future mobility of the world population. *Transportation Research A* 34 (3), 171-205.

<sup>21</sup> Lourdes Diaz, O., Plat, D., Pochet, P. (2013). The puzzle of mobility and access to the city in Sub-Saharan Africa. *Journal of Transport Geography*, Elsevier.

**Access to electricity in Bamako constitutes an important obstacle to firms' activity** – see Figure 10. Approximately 68% of firms in Mali complain about electricity being a major constraint to their activity, compared to a Sub-Saharan average around 40%. This is an even greater constraint for firms in Bamako (72% of firms designate it as major constraint) than in Mopti, Ségou and Sikasso (49% of firms). In fact, the percentage of firms identifying energy as a major constraint in the capital has doubled between 2010 and 2016. To cope, almost 70% of firms rely on an either a shared or private generator<sup>22</sup>. The main drivers of this situation are the important urban expansion of Bamako, which would need large investments to connect new areas to the grid, exacerbated by the weakness of the electrical network and production, fueled by the financial state of Energie du Mali. The company suffers from high levels of indebtedness due to low tariffs, a shift towards thermal generation and a deficit in installed capacity<sup>23</sup>.

*Figure 10. Percentage of firms designating electricity as a major constraint, experiencing electrical outages and owning/sharing a generator*



Source : Enterprise Survey 2016

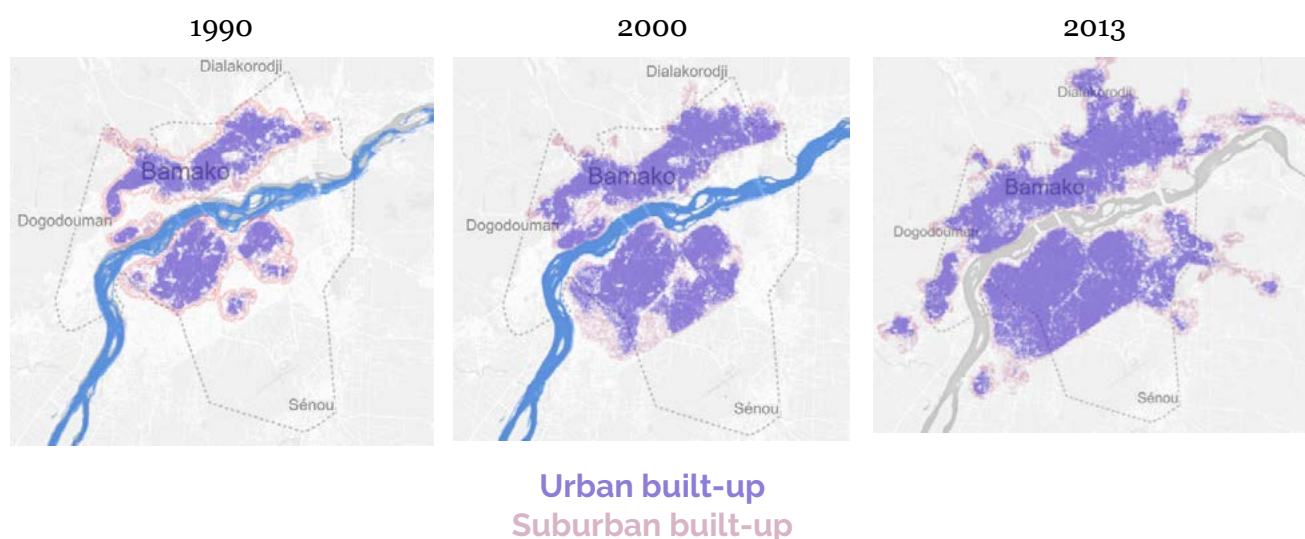
<sup>22</sup> Enterprise Survey 2010 and 2016

<sup>23</sup> African Development Bank (2015). Renewable Energy in Africa: Mali Country Profile

## Bamako's urban development has been fragmented

The population of Bamako has grown exponentially in the last 40 years and is almost equitably distributed between the *Rive Gauche* and the *Rive Droite* – see Figure 11. Jumping from under 500 thousand inhabitants in 1990, to more than a million in 2000, the population is estimated at approximately 3.3 million today<sup>24</sup>. This translated in the urban expansion of the city which grew on both sides of the river Niger and in every direction (except for the south, limited by the exclusion airport area). The population is divided almost equitably between the *Rive Gauche* and the *Rive Droite* which represent respectively 54% and 46% of the population.

Figure 11. Urban expansion of Bamako in the last 30 years

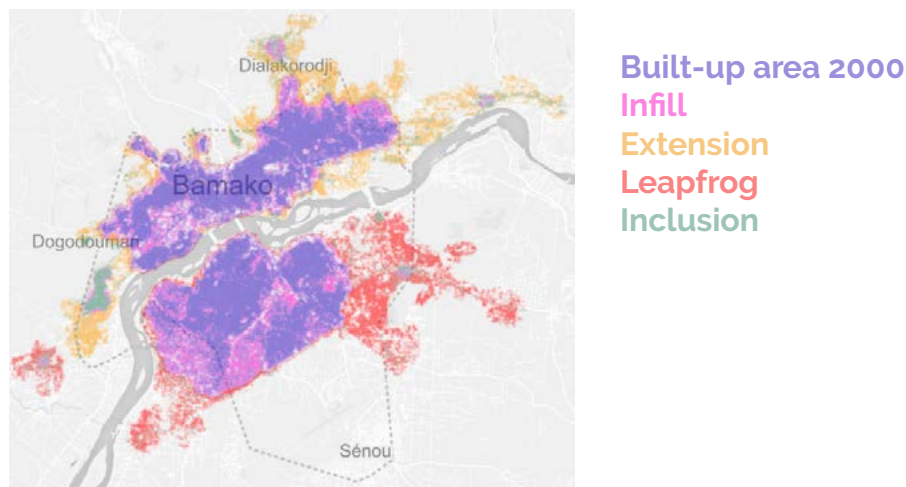


Source: Atlas of urban expansion, UNHABITAT-NYU, 2017

<sup>24</sup> Global Human Settlement Layer 1990, 2000 and 2015

**The nature of the urban expansion differs between the two city banks** – see Figure 12. In the last two decades or so, the urban expansion on the *Rive Gauche* consisted mainly in extension of the already existing urban built-up areas. However, the urban expansion occurring on the *Rive Droite* has consisted mainly in leapfrog development, i.e. spatially discontinued urban expansion. Expansion refers to new construction at the edge of the consolidated urban area, leapfrog refers to parcels of newly built land that do not border on existing development, and infill refers to construction on unbuilt parcels surrounded by existing development. Inclusion refers to urban built-up areas that were previously leapfrog development, but are now within the urban extent.

*Figure 12. Nature of added areas since 2000*



Source: Atlas of urban expansion, UNHABITAT-NYU, 2017

**Population density in Bamako averages 8,200 inhabitants per square kilometer – but this masks huge differences and fragmentation across neighborhoods.** For one thing, population density on the *Rive Droite* is around 9,100 inhabitants per square kilometers which is significantly higher than the *Rive Gauche* with approximately 7,400 inhabitants per square kilometer. However, population density is very unequally distributed across the two banks – see Figure 13. Population density also declines, slowly but steadily, with distance from the center of the city – denoted by the location of the *Grand Marché* – see Figure 14. Concerning the Grand Bamako area, two urban centers stand out, Koulikoro and Kati<sup>25</sup>, which densities are respectively around 5,750 and 2,900 inhabitants per square kilometer.

Figure 13. Surveyed population density per 250 meters squares

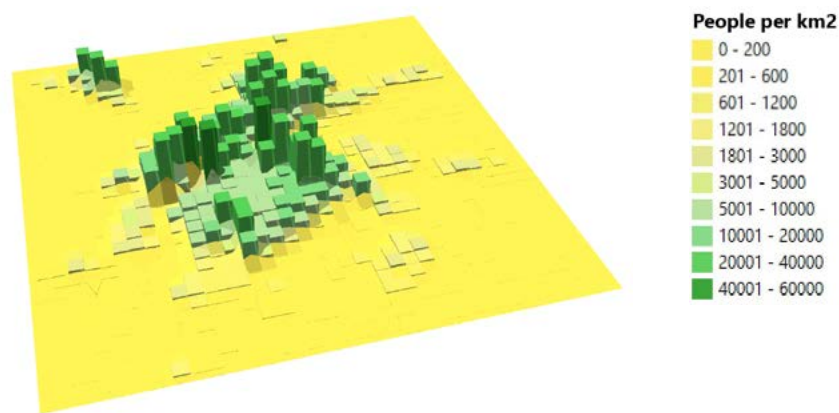
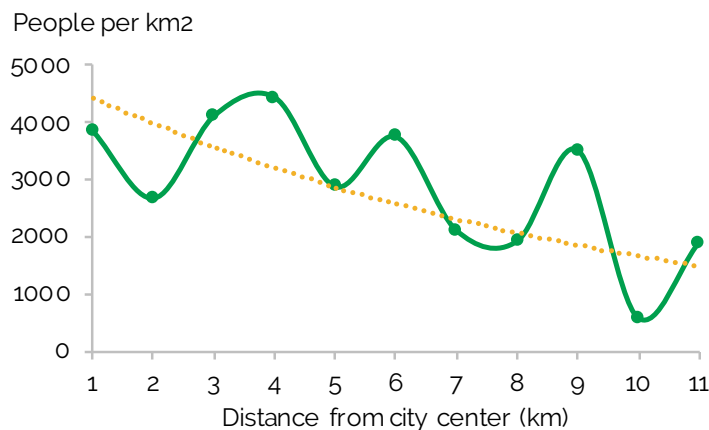


Figure 14. Population density gradient



Source: Landsan 2012 and GHSL 2015

<sup>25</sup> Kati, being located in the close north-west suburb of Bamako, is considered as being part of the Bamako urban area although it constitutes a separated administrative division.



## Geographical coverage of the analysis

The study uses two different geographical levels for analysis – for the District of Bamako, and for the commune. The first, i.e. the District-level includes the urban area covered by the District (shown by yellow in Figure A) and the suburban areas (shown in green). This neighborhood level allows an analysis of the build-up area of Bamako, which spills into neighboring communes. The analysis at commune level was focused on 25 communes that are part of the Greater Bamako area (see list below) and located in the circles of Kati, Koulikoro and the district of Bamako (the latter circled in black in Figure B). While the “Greater Bamako” area is often considered to be the area associated with the administrative circle of Kati thereby including relative isolated areas and excluding closer areas from the Koulikoro circle, the definition used here focused on areas that are functionally linked to the Bamako district through economic corridors (primary roads).

Communes included: *Baguineda, Mountougoula, Tiele, Dogodouman, Kalabancoro, Mande, Mor-*

*ibabougou, N’Gbacoro, Sangarebougou, Diago, Dialakorodji, Dio-Gare, Doubabougou, Kambila, Kati Commune, Safo, Ouelessebougou, Bougoula, Dialakoroba, Sanakoroba, Bancoumana, Siby, Koulikoro Commune, Mequetan, Tienfala*

**The communes of Kati and Koulikoro, part of the Greater Bamako area, do not seem to have become strong relays to Bamako’s development.** Kati and Koulikoro are respectively around 35 minutes and 100 minutes from Bamako’s city centre. Both have experienced a population growth between 1.5% to 2% per year on the 2000-2015 period which is relatively low compared to the district of Bamako (6.2%). Besides, housing quality remains significantly worse in Kati and Koulikoro with, for example, under 20% of households having good quality roofs compared to more than 33% in Bamako (results being similar for floor and wall quality). Regarding tenure, the proportion of households with land titles is approximately the same across the three areas.

Figure A. Urban area of Bamako

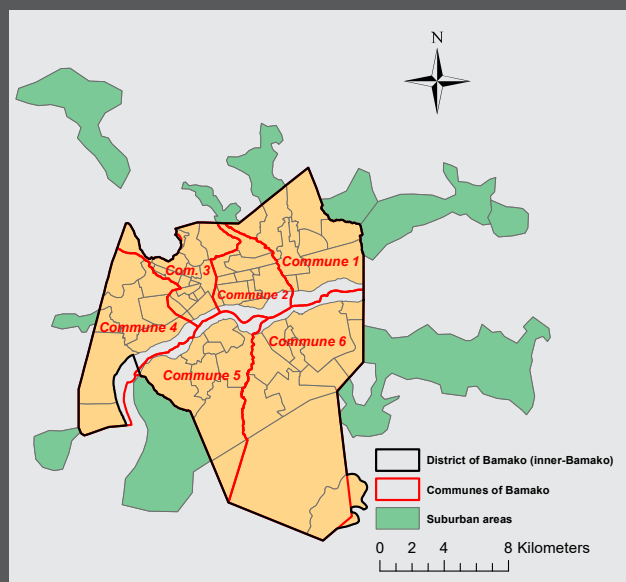
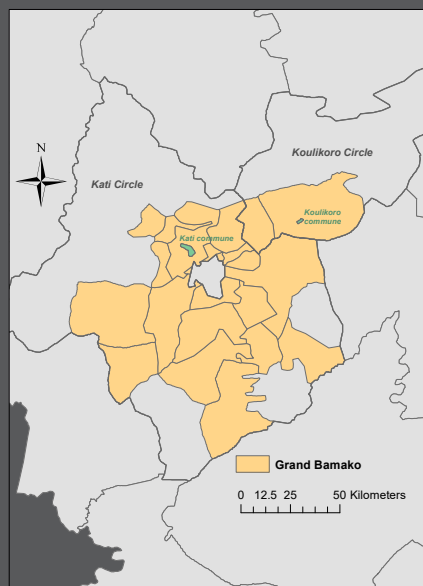


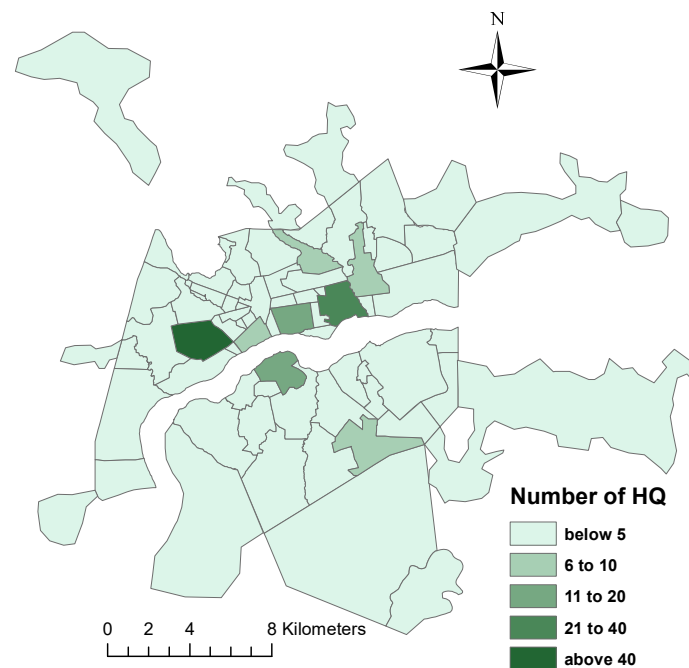
Figure B. Greater or Grand Bamako



## People are not close to jobs or services

**Firms in Bamako are concentrated in or next to the city center.** Of the 7,511 companies registered in the 2015 business registry for the urban area of Bamako, 66% are located on the *Rive Gauche* (down from 73% in the 2012 business registry). This divide is due to a very high concentration of firms in the center of the city, around the neighborhood Centre Commercial which displays a density of around 344 companies per square kilometer. The spatial analysis at neighborhood level confirms this pattern (see Figure 15), highlighting 12 neighborhoods with a density higher than 100 companies per square kilometers.

Figure 15. Number of HQ per neighborhood



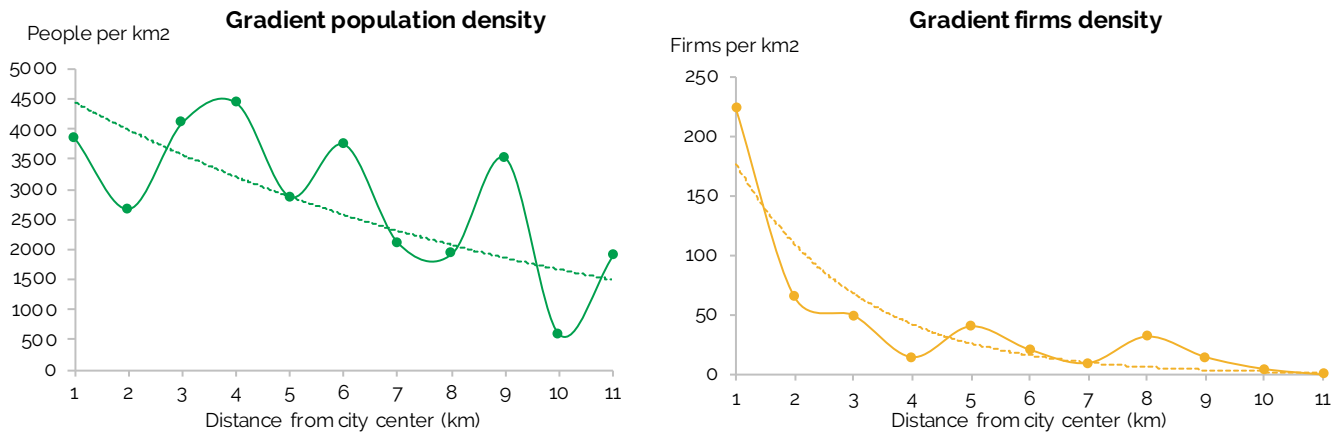
Source: 2015 Business Registry

**Comparing gradients of firm density and population density confirms the divergence between a very high concentration of firms in the center of the city and a more equally distributed population, which produces a spatial mismatch – see Figure 16.** The “Grand Marché” (main market) of Bamako was used as the central point for this analysis. While population density decreases progressively when distance to the center increases, job density decreases dramatically in the first four kilometers. The calculation of company headquarters<sup>26</sup> in the city also seems to indicate concentration in a few neighborhoods, almost all of which are on the *Rive Gauche*.

<sup>26</sup> Proxied by firms accounting for the top 5% of the wage bill.



Figure 16. Gradient of firm and population density



Source: 2015 Business registry and 2009 Census

**Bamako is an unequal city – access to urban services, such as water, electricity and waste varies widely.** Only 42% of the urban population has access to water, and access is also distributed unequally across the city. Neighborhoods with good demographic characteristics – such as better education levels and better housing quality – also benefit from good access to water (i.e. Hamdallaye, Badalabougou, Hippodrome, Korofina Nord). In addition, only 20% of the population has access to drinkable water in the suburban areas cities of the close suburb and 16% in the communes of the Greater Bamako. While 70% of the urban metropolitan area have direct access to electricity, the access to this service remains very much concentrated in the center of Bamako on the *Rive Gauche*. Access to electricity diminishes drastically when analyzing the suburban areas (39%) and the communes of the Grand Bamako (27%). Similarly, for waste, while 70% of households are served by either public or private waste collection in the inner-Bamako area, only 31% of households in the suburban areas and 19% in the communes of the Greater Bamako are served. It is important to note that even in the central neighborhoods, for instance those close to the Grand Marché, waste collection remains patchy.

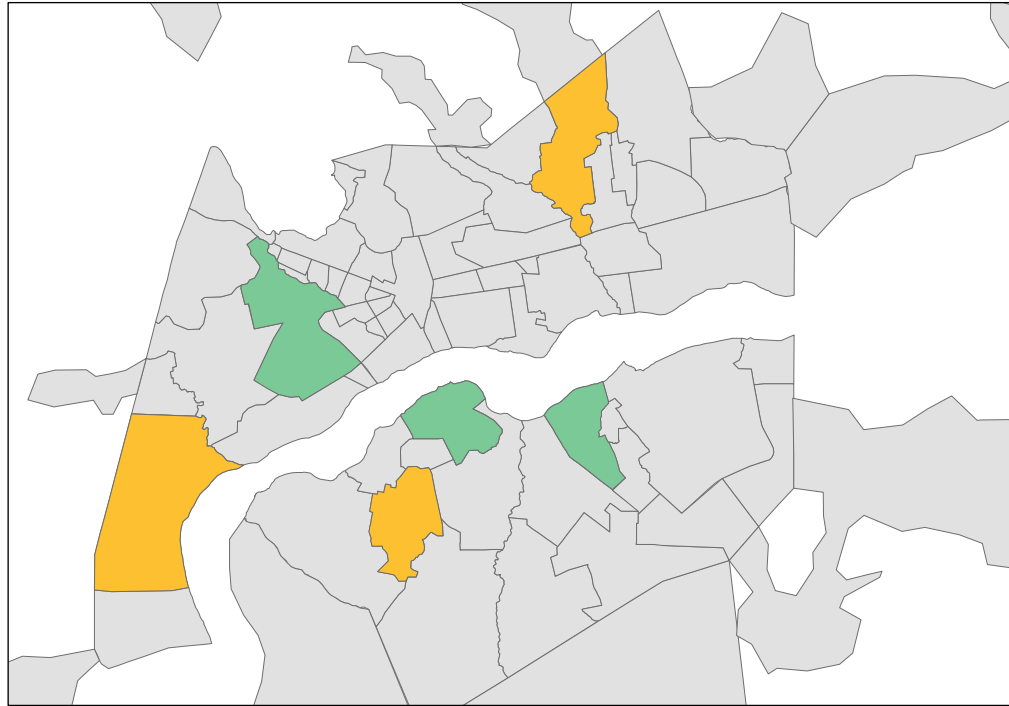
**Peripheral areas are doubly penalized – they seem to be more highly exposed to tenure insecurity and have lower quality housing.** This is particularly true for areas in the North of the city, where the topography is steeper. On average 26% of households in the urban metropolitan area are affected by high tenure insecurity<sup>27</sup>. Mapping tenure insecurity at neighborhood level reveals that levels rise as one moves from inner Bamako (21%) to close suburbs (39%) to the Grand Bamako area (43%). The spatial patterns of housing quality are like the ones of tenure insecurity – low housing quality<sup>28</sup> is concentrated in peripheral areas, particularly on the *Rive Gauche*. Again, the share of households with low housing quality increases as one moves further away from the city center. Combining information on land tenure and housing quality points towards some of the most advantaged areas (Badalibougou, Hamdallaye, and Magnambougou – highlighted in blue) and most disadvantaged areas (Banconi, Sébénikoro, and Sabalibougou – highlighted in red) areas within the cities – see Figure 17.

<sup>27</sup> Tenure insecurity is calculated as the share of households which are not tenants and who live in a property without owning land rights.

<sup>28</sup> Housing quality is calculated as an average of two variables: roof and floor quality.



Figure 17. Most advantaged (green) and least advantaged (yellow) neighborhoods



Source: 2009 Census

**The socio-economic divide is directly related to fragmented form of the city.** Contrary to common perception, the socio-economic divide in Bamako is more complicated than a simple *Rive Gauche* – *Rive Droite* divide. Indeed, the *Rive Gauche* does score lower than the *Rive Droite* in terms of housing quality and land tenure, but it also benefits from somewhat better access to basic public services – water, electricity and waste collection. In fact, the low scores of the *Rive Gauche* are very much due to the peripheral neighborhoods in the north (a product of urban extension along the edge of the city) which score especially low in terms of land and housing. The low scores for accessibility of public services for the *Rive Droite*, on the other hand, seem to be related to the prominence of leap-frog urban development. In addition, there is a strong divide between the urban area of Bamako and the surrounding communes (except for Kati and Koulikoro urban centers), with the latter lagging on all socio-economic outcomes.

## And low connectivity exacerbates lack of access...

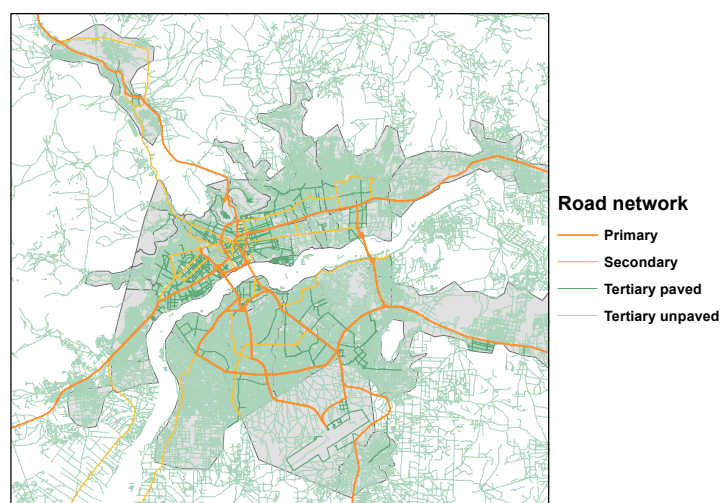
**Road infrastructure in Bamako is relatively well spread but lacks quality due to insufficient paving.** The coverage of arterial roads in Bamako is relatively good, with 80% of the population within walking distance of an arterial road (compared to 68% in Accra, 90% in Addis Ababa and 86% in Kampala)<sup>6</sup> – see Figure 18. The average road width in Bamako is 6.5 meters, which is slightly above average compared to the main Sub-Saharan African cities (6.1 meters)<sup>29</sup>. However, paved road density in Bamako lags other cities in Africa – see Table 1 below.

Table 1. Road density in Bamako and 6 other comparator cities

City	Length of road network	Share of paved roads	Paved road density (km per km <sup>2</sup> )
Accra	1.899	50%	2.8
Douala	1.800	25%	2.4
Conakry	815	32%	2.3
Abidjan	2.042	59%	2.1
<b>Bamako</b>	<b>836</b>	<b>24%</b>	<b>0.8</b>
Ouagadougou	1.827	11%	0.4
Kigali	984	12%	0.2

Source: Kumar and Barrett (2008)

Figure 18. Road network of Bamako



Source: Open Street Map Data

29 Atlas of Urban Expansion (2016), Bamako Mali, UN-Habitat, NYU, Lincoln Institute of Land Policy

**What constrains accessibility is how the road infrastructure is being used** – see Figure 19. In Bamako, roughly 9% of trips are made using a car and 17% using buses. More than half the trips in the city (57%) are made by walking – suggesting a somewhat limited geographical range of movement and thus limited access to the opportunities and services that the city can offer. In many cases this is because they cannot afford any means of motorized transport on a regular basis. While walking to work is good way to commute it also has consequences on how many jobs and services can be reached in each time frame when mode choices are constrained. Assuming a person walks for one hour, they would be able to reach opportunities that lie within a 28-square kilometer radius (assuming a generous 3km/hour speed along a straight line). For instance, in 2015, this would cover only 10% of the urban area of Bamako – see Box 4.



## Computing accessibility

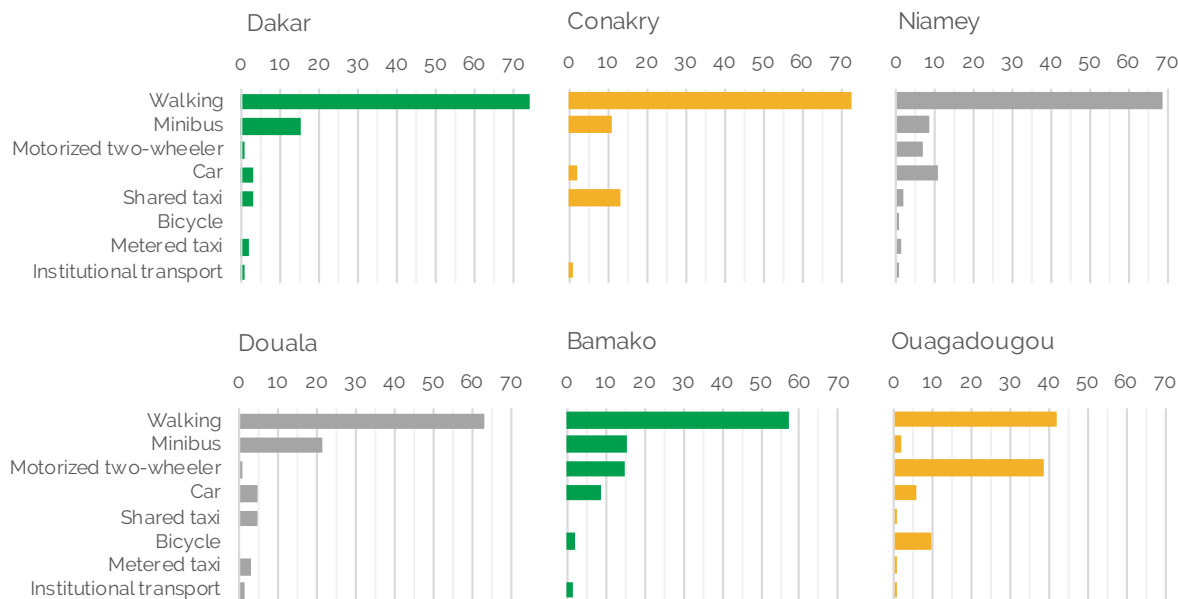
Accessibility across Bamako is computed by accounting for the road infrastructure (network and road type), different modes of transportation (pedestrian, car and public transport), times of the

day and corresponding speeds. The analysis covers the inner and outer Bamako road network, i.e. beyond the administrative boundaries of the city.

### *Speeds for network analysis (km/h)*

	Car	Car rush hour	SOTRAMA	SOTRAMA rush hour	Pedestrian
Primary	60	30	42	21	3
Secondary	40	16	28	11.2	3
Tertiary paved	35	14	24.5	9.8	3
Tertiary unpaved	25	10	17.5	7	3

Figure 19. Decomposition of transport modes as share of total trips per city (%)



Sources: Olvera et al (2012), Godard (2011)<sup>30</sup>

**Public transport services are lacking - in many ways.** The SOTRAMA network, which is composed of privately-owned buses traveling on different routes, covers most of the city. However, according to customers the quality of the service is poor in terms of frequency, speed and comfort. There are no designated stops, and frequency of the service is unpredictable with often lengthy wait times (up to an hour for certain lines). Reflecting the density of economic activity within the city, SOTRAMA densities are higher on the *Rive Gauche* (more than 10 kms per square kilometer) – see Figure 20.

Figure 20. SOTRAMA network and associated Kernel density



Source: Urban agency of Bamako

<sup>30</sup> Olvera, L., Plat, D. and Pochet, P. (2012). *Mobilité et accès à la ville en Afrique Subsaharienne*. Godard, X. (2011b). *Sustainable urban mobility in “Francophone” Sub-Saharan Africa*, regional study prepared for the Global Report on Human Settlements 2013

## ...to public services

**The three existing hospitals in Bamako are concentrated on the *Rive Gauche* which results in relatively low accessibility for many parts of the city** – Figure 21. Only 16% of the urban population can access hospitals within a 30-minute trip using public transport during rush hours – 53% during normal hours. Comparing this to accessibility using cars provides some sense of the inequality of access within Bamako – 76% of car users can reach hospitals within 30 minutes during rush hours (99% during normal hours).

**Peripheral areas have lower accessibility to social infrastructures and, to a lesser extent, to markets** – see Figure 22. Other health infrastructures (which include clinics, doctors, attention points but exclude traditional medicine and drugstores) can be assessed by 81% of the urban population within a 30-minute walk; 84% considering public transport during rush hours. The accessibility of primary schooling and secondary education is very high with 89% and 84% of the urban population living within a 30 minutes' walk respectively. 67% of the urban population lives within a 30-minute walking distance of a market; 83% by public transport even during rush hours. What is noticeable is that peripheral areas to the north of the city and the urban centers in suburban areas suffer from the lowest levels of accessibility.

Figure 21. Hospitals accessibility across transport modes

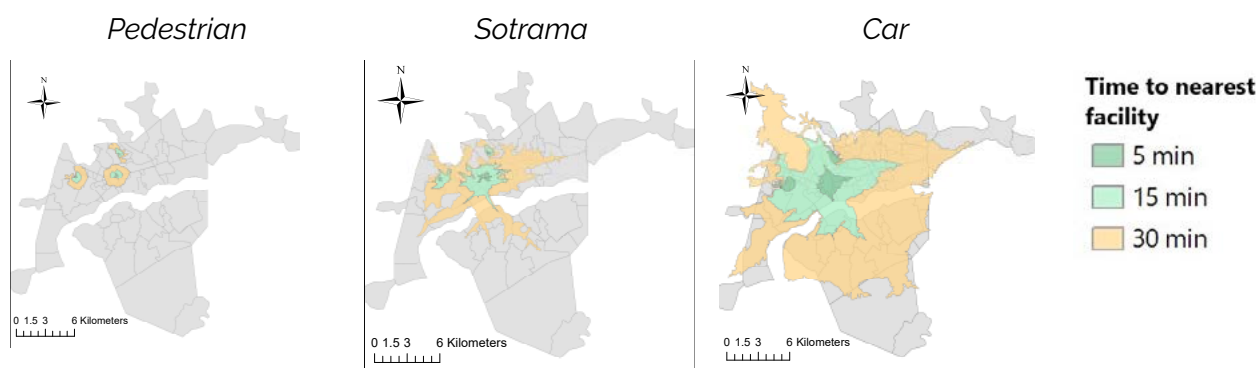
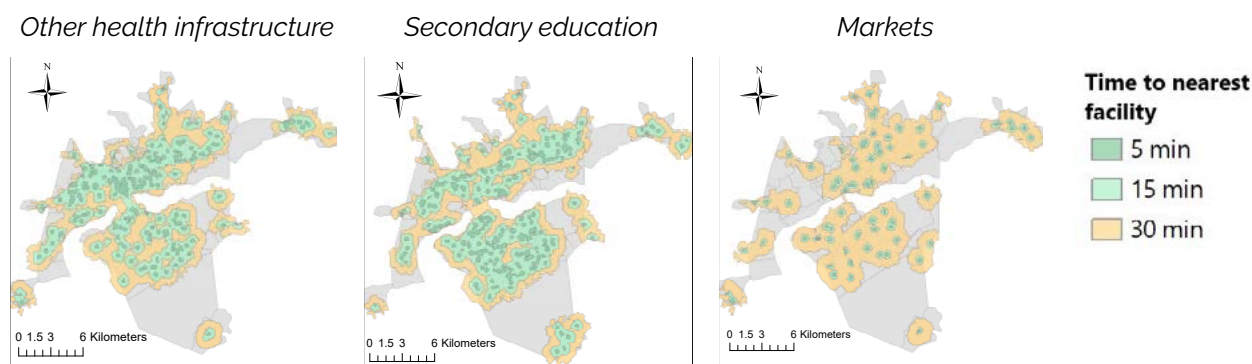


Figure 22. Primary and secondary education infrastructure accessibility for pedestrians

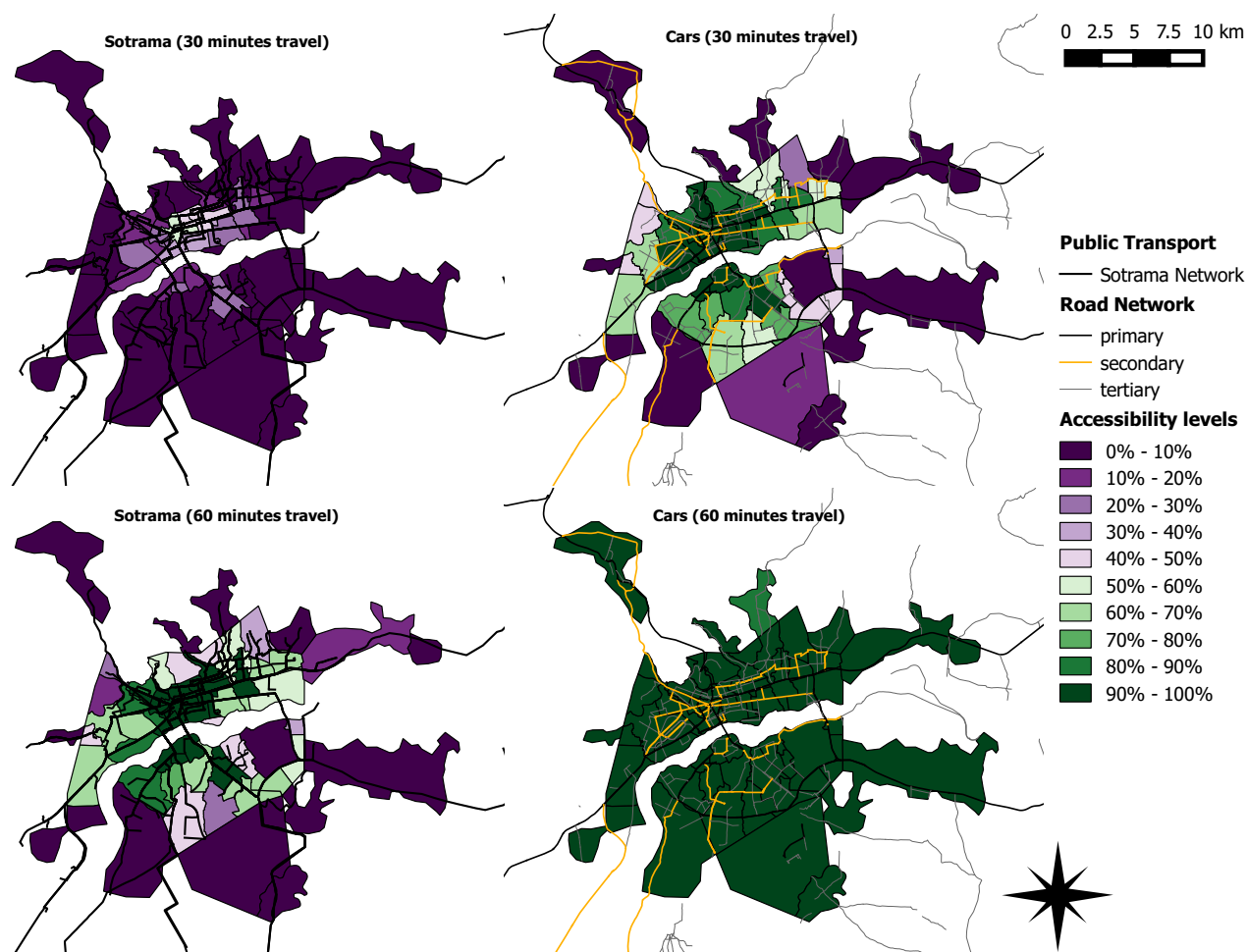


Source: Education infrastructure GIS data (Juliette Coulibaly)

## ....and to jobs

**Public transport services do not help ameliorate the spatial mismatch between people and jobs.** Labor market accessibility is assessed at the neighborhood level by examining the share of jobs which can be accessed within a given time frame using various transport modes (Sotrama and cars<sup>31</sup>). More central neighborhoods have the best accessibility - they are located closer to jobs and they benefit from a denser road and Sotrama network – see Figure 23. Conversely, since population density extends far beyond the central city, neighborhoods located further away fare worse on all counts – they have lower road and Sotrama densities. Exacerbating inequality, public transport users suffer from much lower accessibility than private transport users (cars<sup>32</sup>).

*Figure 23. Share of accessible jobs using Sotramas (left) and cars (right) for various time thresholds (30 and 60 minutes) during peak hour*



<sup>31</sup> Accessibility metrics will also be computed for pedestrian travel.

<sup>32</sup> On average accessibility levels will resemble those provided for Sotramas as equipment rates in Mali are low: 12 vehicles per 1000 inhabitants which can be compared to the world average of 182 and an average for Africa of 42.



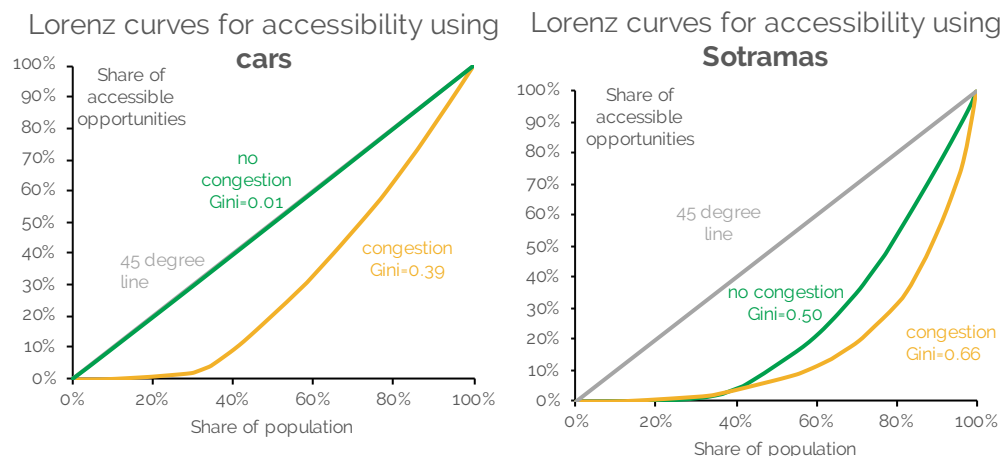
**Congestion on the network seems to be a large determinant of how quickly people can reach potential employment opportunities.** Table 2 summarizes the share of jobs accessible on average within the urban area for various travel modes, time thresholds and time of day. Within 30 minutes, without congestion, Sotrama users can reach 41% of all jobs on average while the figure drops to 11% during peak hour. Thus, while road infrastructure quality in Bamako has room for improvement, big effects on labor market accessibility could be attained simply by finding ways to increase average public transport network speeds, and reducing congestion during peak hours.

*Table 2. Average accessibility levels to employment opportunities at the urban area's level*

Time	Sotrama		Cars	
	peak hour	off-peak	peak hour	off-peak
30 mins	6.4%	26.5%	49.5%	99.2%
45 mins	22.9%	60.9%	82.8%	100%
60 mins	45.1%	83.8%	98.6%	100%

**The costs of congestion are borne unequally, with those using public transport bearing a much heavier burden.** While car users can access most infrastructure and jobs within the city no matter where they live, location matters hugely for Sotrama users as they depend entirely on public transport for accessibility (see Figure 24). The costs of mobility, and of congestion on the network, are thus borne by poorer residents, especially those living in more peripheral areas. Besides, when accounting for congestion, the GINI coefficient jumps from 0.50 to 0.66 – implying a huge increase in inequitable access. This increase is mainly driven by the fact that congestion lowers the accessibility levels of the people that live far from jobs (or broadly, the city center) while people living close to jobs are less affected. Figure 24 displays the Lorenz curves and the associated Gini coefficient for cars (left) and Sotramas (right) for peak and off-peak travel.

*Figure 24. Lorenz curve for accessibility for car users (left) and Sotrama users (right) for peak and off-peak travel within 30 min travel*



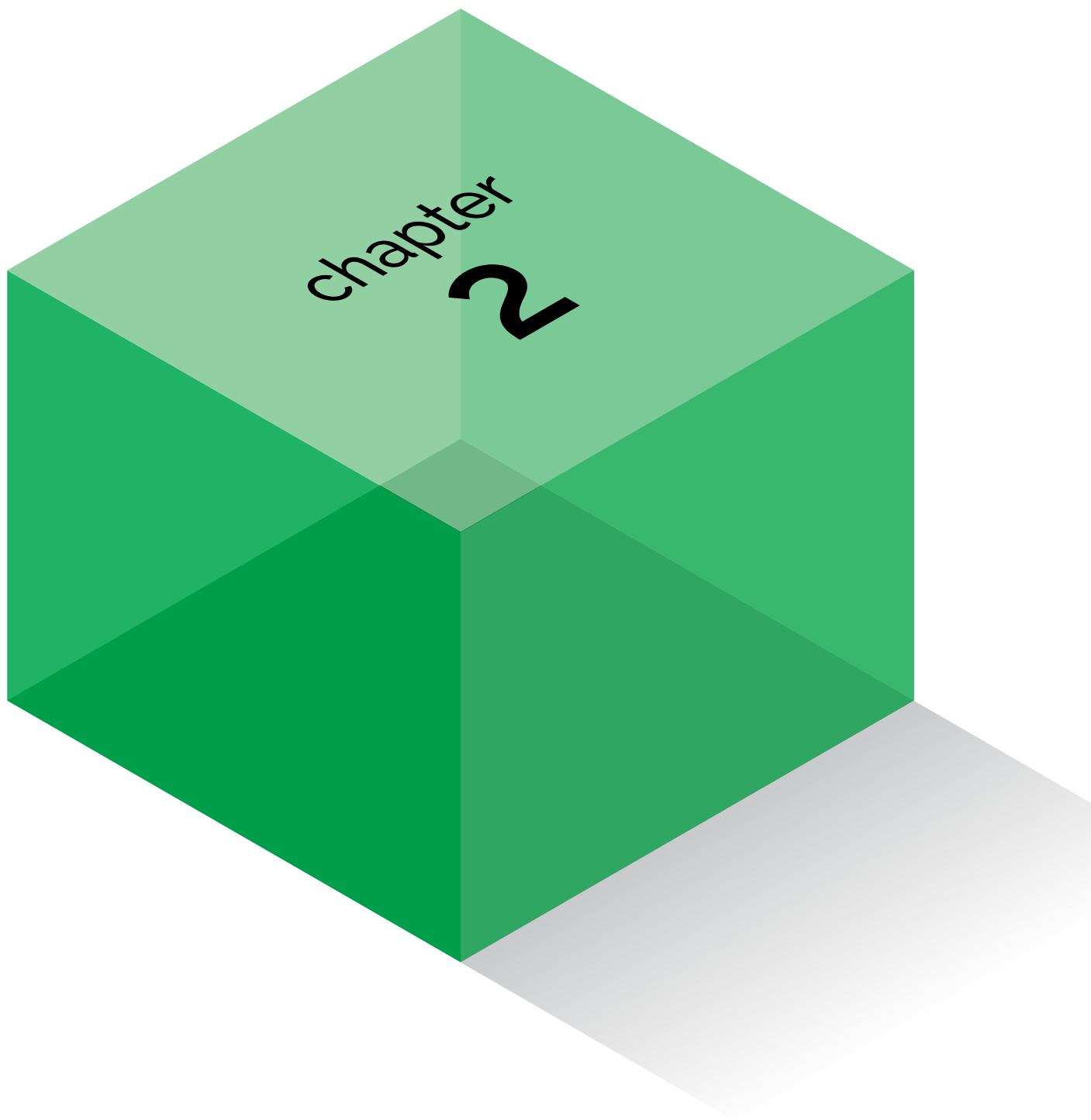
**Congestion has spatially differential effects on accessibility between car and Sotrama users.** Congestion reduces accessibility for car users *who live away from the center* – this is logical, since they have longer distances to travel. However, the loss in accessibility owing to congestion is higher for Sotrama users *who live closer to the center of the city*. This is because Sotrama users who live on the outskirts of the city already have very low accessibility to the city center – and so congestion on the network doesn’t lead to very much more loss of accessibility<sup>33</sup>. However, if the time threshold of travel is increased to an hour or more, then Sotrama users in all parts of the city are equally affected by congestion on the network.

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<sup>33</sup> Calculations and associated maps for different time thresholds, available on request.









# What factors underlie Bamako's challenges?

**Bamako isn't reaching its potential owing to inefficient working of land markets, low accessibility even with a reasonable road network, and lack of resources for much-needed investments in service delivery.** This chapter examines the underlying drivers of the trends identified in the first chapter. Inefficiencies relating to land – access, markets, rights and planning – are a significant deterrent to productive investments within the city, leading to less opportunities for infill development and exacerbating urban fragmentation. At the same time, urban accessibility within Bamako is limited - not because of the lack of road infrastructure - but rather owing to its fragmented urban form, poor quality of the road infrastructure, an insufficient coverage of public transport, the natural bottleneck that the Niger river poses and competition for public space – including road and sidewalk. And lastly, service delivery in Bamako is hindered not only by lack of resources, but also by institutional fragmentation and lack of metropolitan coordination. Local governments lack capabilities, including fiscal, to develop and implement urban plans and invest in urban infrastructure, which in turn, has contributed to ineffective spatial management of the Bamako metropolitan area.

## Inefficient land markets deter productive investments

**Dysfunction in land markets is a significant deterrent to productive investment in cities**, affecting not just the patterns of land-use and building volumes, but also limiting the ability of local governments to capture the value of land (for instance, through taxation) for economic development investments. In many developing countries, weak property right systems and poor land governance contribute to making access to land costly and insecure. This in turn undermines the willingness of other actors to invest in the city's future growth leading to cities that lack urban planning and suffer the consequences of urban sprawl. Because the urban land market in Mali operates under such conditions, it is failing to provide the enabling environment to sustain productive urbanization, likely exerting a significant toll on the economy. These conditions also prevent local governments to potentially capture the value of land (for instance through taxation) to fund economic development investments.

**The land tenure system in the Greater Bamako area<sup>34</sup> is characterized by several layers of complexity, which deter efficient and equitable urban development.** Under the current system, different land tenure regimes (referred to as legal pluralism<sup>35</sup>) co-exist, beset by poor governance in the management of land at all levels of government, leading to a largely uncoordinated pattern of land-use and land-tenure transformation that has accompanied urban population growth and urban spatial expansion. Since the population of Bamako is expected to expand steadily in the coming decades (at a rate of 5.4 percent annually reaching 6 million residents in 2030 for the Bamako District alone, see Ville de Bamako, 2012)<sup>36</sup>, the pressure on urban land will continue to grow. Currently, agricultural land at the outskirts of the city are being transformed into residential plots at a massive scale (Durand-Lasserve et al., 2015)<sup>37</sup>, within the unequitable context of weak property rights and unplanned development.

**The most visible implication of these multiple layers in the legal framework is the coexistence of various land tenure situations.** The typology of tenure situations includes the following categories: customary possession of land, non-customary possession of land (often for plots purchased from a customary possessor and held with a certificate of sale), occupation of a plot with

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34 We define the Greater Bamako area as the area comprising the District of Bamako and the peri-urban area and rural hinterland in surrounding communes, up to about 80 km away from the city center.

35 Legal pluralism is a typical feature of West African countries which experienced a succession of land regimes that were established through the pre-colonial area, the colonial period, the post-independence socialist transition, and following the market liberalization phase over the past two or three decades. The changes in both political and economic orientations that took place over time added cumulative layers to the legal and regulatory framework that governs land while never completely abolishing the previous system in place.

36 Ville de Bamako. 2012. Bamako 2030: Croissance et Développement – Imaginer des Stratégies Urbaines pour un Avenir Maîtrisé et Partagé.

37 Durand-Lasserve, A., M. Durand-Lasserve and H. Selod. 2015. Land Delivery Systems in West African Cities. The Example of Bamako, Mali, Washington D.C.: The World Bank and Agence Française de Développement, 133 pages

an administrative document, occupation of a plot with a use right (*concession*), and ownership with a title (*titre foncier*/title deed). These different tenure situations are encountered throughout the Greater Bamako Area, with *concessions* and ownership titles mostly in the urban core, and customary land or land purchased from customary owners mostly in the peri-urban area or the rural hinterland (a large part of the Greater Bamako area, beyond the 6 communes of the District is agricultural land). The classification and the conversion of rural land to urban land relies not only on different legal provisions more or less clear and effectively implemented regarding land use planning and decentralization legal framework<sup>38</sup> but also on actual stakeholder practices. For the latter, the conversion of rural land to urban land involves a variety of mechanisms, including direct purchase of private parties to customary holders, followed or not by formalization, or subdivision schemes at the initiative of prefects or mayors. A wide variety of situations is encountered during these processes which involve different degrees of legality and are often informal even when at the initiative of official stakeholders. For instance, subdivision by a mayor is not legal if the land was not previously registered in the name of the state and transferred to the commune. Service provision is almost never considered. All things else equal, these different tenure situations command different levels of tenure security and transferability and ease of formalization and thus command different prices. The ownership title is generally the most secure, but is the most expensive way of holding land<sup>39</sup> and perhaps may have proven not be the most suitable way of securing the land rights for a clear majority of households residing in the Greater Bamako Area, especially beyond the boundaries of the District<sup>40</sup>.

**Plots of land can be obtained through allocation processes outside land markets or through market transactions.** The specific tenure on a plot of land reflects the way the plot was obtained, but it can also be transformed over time. Allocation processes outside land markets can take the form of customary allocations by village chiefs without involving any monetary payment in accordance with customary rules (which still occurs in the peri-urban area and the rural hinterland) or public attributions of use rights (*concessions*) by local or central authorities at non-market prices. As for market transactions, they may be formal or informal, depending on the tenure of the plot, the legality of the transaction, and whether the transaction is registered<sup>41</sup>. Tenure can also be transformed by following a sequence of land tenure formalization steps whereby it is possible to move up the ladder of formality and tenure security towards a use right or an ownership title<sup>42</sup>. Very often, however, the formalization process is never completed. The tenure situation of a plot, thus reflects where the current owner or occupant decided

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38 Land use planning at the Cercle and Region levels and distinction between Communes rurales and communes Urbaines. The definition of these categories and the delimitation of each Commune is not identified from a legal point of view.

39 According to observers of the land market in the Bamako area and a study of land prices (Durand-Lasserve and Selod, 2015), a plot with an ownership title could cost three to six times more than a plot with similar characteristics but no title (see Durand-Lasserve et al., 2015).

40 Only 150,000 ownership titles have been issued in Bamako since 1932.

41 At the city fringe, where the city expands, there is a growing market for land sold by customary possessors and for plots held with an administrative document. Those markets can be viewed as informal in the sense that such transactions are not authorized in the law, although, to some extent, they are tolerated or even encouraged. The formal market strictly speaking is that of land held with an ownership title.

42 For a detailed description of these sequences, see the description of land delivery channels in Durand-Lasserve et al. (2015).

to stop along the chain of formalization. For instance, a very common form of land tenure in the peri-urban area is the *bulletin*, an administrative document which is obtained before a *concession* can be delivered. Although *bulletins* do not provide a legal property right per se,<sup>43</sup> households keep them as if they were property rights and trade them subsequently on the informal segment of the market<sup>44</sup>.

**In practice, land in the peri-urban area and in the hinterland of Bamako is often obtained through the purchase of land directly from customary possessors without any legal document.** However, this does allow for the possibility to directly sell on the informal market or, in a minority of cases, to formalize it and then to trade it on the formal market. These purchases of customary land accompany the massive ongoing process of transformation of agricultural land into residential plots that occurs as the city expands. In the zones adjacent to the District of Bamako, land can also be obtained through land subdivision schemes or *lotissements* initiated by various stakeholders (see below, more details on the lack of urban planning and the practice of *lotissements*) with or without a use right. In the core urban area, which corresponds to zones that were developed several decades ago, an overwhelming majority of plots were obtained under concessions (i.e. through public allocation from the State), or for a minority of them, through formal real estate development (and are then usually held with an ownership title). Possessors of title deeds may have purchased the land directly from a real estate developer, or on the secondary market, or may have upgraded a use right to a title deed.

**The market for formal land is limited, and serves mainly high-income households.** One of the most striking features of the land system in Bamako is the small size of the formal land market with title deeds. It is also the result of several factors that limit the supply of formal land, driving up its price. The growth of the formal land market is indeed hindered by the lengthy and costly formalization processes that involve many stakeholders who capture rents at each step, which ends up deterring users from fully formalizing all the way to the ownership title.<sup>45</sup> The formalization of land is also complicated by the difficulty of land adjudication given the diversity and complexity land tenure situations and the risk of conflicting claims (see the below paragraph on conflicts). Finally, the small size of the formal land market also reflects the scarcity of developments by private property development companies and housing cooperatives (who are confronted to a scarcity of land that can be formally transferred to them by authorities) and the

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43 Bulletins are not property rights but could be used as proof of legitimacy.

44 For a household, not pursuing the formalization process beyond the bulletin stage has the advantage of not having to pay the fees that would be required to obtain a concession. Although this is not legal, bulletins are often issued with the recipient's name left blank to facilitate transactions: the buyer can then later continue the formalization process by writing his or her own name on the bulletin.

45 Measuring the costs of formalization is difficult given the many procedures and direct and indirect costs involved. For instance, Durand-Lasserve et al. (2015) describe a process of formalization of customary land involving payments in kind to surveyors and civil servants whereby the original customary possessors are left with a titled property (title deed) on ten percent of the land they originally owned under the customary regime. This is the example where the largest costs are borne. For the buyer of customary land who establishes an ownership title, it is not unrealistic to assume that the total costs that will be paid will be in the same range of magnitude as the value initially paid to the customary owner. It should be noted however, that the value of the land considerably increases with formalization in a factor of two to six according to Durand-Lasserve et al. (2015). For other, but other examples of formalization costs, see Djiré (2007).

narrowness of home ownership programs (known as *logements sociaux*; see the below section on housing)<sup>46</sup>.

**For most households, given the limited supply, access to land under formal tenure is either unaffordable or unattainable** (due to the lack of social connections required to navigate the land administration). Most household lack the social connections needed to navigate the land administration, or lack information on property rights<sup>47</sup>. Low and middle-income households, thus, access land for housing, invest in savings, or seek capital gains almost exclusively through informal land markets. This occurs at the cost of tenure insecurity and at high prices both in the formal segment and the informal segment (given that the majority of low and middle-income households compete with a minority of wealthy buyers who have the economic means and social connections to purchase informal plots and the option to later formalize them for resale on the formal segment of the market)<sup>48</sup>.

**Instead of coordinated urban planning, Bamako is built through a process uncoordinated and often unauthorized *lotissements* – leading to urban fragmentation.** By far, the most common type of land development intervention in the Greater Bamako Area is the *lotissement*. In theory, a *lotissement* is “the subdivision of a single piece of bare land into plots with appropriate provision of infrastructure and collective facilities to host the buildings to be erected by the future occupants<sup>49</sup>”. Since 2002, the law stipulates that *lotissements* are to be carried out by *communes* and require the prior allocation of land from the state’s private domain to the *commune*. In such “authorized *lotissements*”, plots are allocated to beneficiaries with a *concession* that can later be transformed into an ownership title. In a large majority of cases, however, the practice is very different from the theory. For ownership of the land title, the commune is required to have a planning scheme approved. Since most communes do not have such a planning scheme in place, they engage in *lotissements* without a land title transferred to them by the State, or on customary land. As a matter of fact, *lotissements* continue to be initiated by a variety of stakeholders (not only the communes but other levels of central government despite the devolution of *lotissements* to *communes*). The word has also become a catchall term that refers to a wide range of land subdivisions, including at the initiative of customary landholders themselves, with the help of surveyors. Some forms are legal/authorized, but most are illegal/unauthorized<sup>50</sup> in some way. Because the majority of *lotissements* is believed to

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46 Employees of public organizations and private companies may gain access to land through membership in cooperatives. Cooperatives were originally set up by trade unions and by professional associations but are now also popular with private companies and Malians abroad, who may join together to buy land. They obtain can obtain land from the State and then subdivide if for its members or purchase customary land without title and then obtain an ownership title.

47 Many households are poorly informed about their own tenure situations and the rights conferred by tenure upgrading. There is also a common misunderstanding among the population that administrative documents are property rights or that use rights are ownership rights.

48 Other factors contributing to high prices include demographic pressure and speculation (there is a strong demand to purchase land plots at the periphery of the city in anticipation of urban expansion).

49 See Decree No. 05-115 of March 9, 2005. Infrastructure and collective facilities are specified as “roads, drains/sewers, water supply, electricity and telephone.”

50 Illegal private constructions occur on the banks of the Niger river in spite of the land being unsuitable for construction and in the public domain of the State (and thus not transferable to private parties).

be unauthorized, this also adds to the confusion surrounding land tenure in the Greater Bamako Area.

**The system of *Lotissements* hinders land-use planning, leading to unplanned and spatially-fragmented urban expansion.** *Lotissements* occur in all rural communes in the peri-urban areas of the Greater Bamako, and can be quite lucrative. For authorities that engage in *lotissements*, the underlying motivation is often to generate revenues from these lucrative interventions, rather than to use *lotissements* to implement predetermined urban plans<sup>51</sup>. In fact, there is no coordinated planning of *lotissements* at the scale of the urban area, which makes their implementation inconsistent with larger schemes of development of serviced land and with access to public services. Because of this, there is no control over the way the city expands and infrastructure and services are often very limited or not provided at all. This generates immediate environmental costs and results in haphazard patterns of land use development that can potentially hinder the functioning of the city and make the future provision of services very costly. Unauthorized *lotissements* further threaten the poor's access to public services as many informal neighborhoods face difficulties to be connected to public services due to unplanned development and impediments to formalizing informally subdivided land. Informal tenure also prevents the possibility of implementing any form land taxation, which would be needed to fund infrastructure for urban expansion.

**The pervasiveness of land conflicts in Mali are symptomatic of the dysfunctions in the land market, placing a major constraint on the urban development of the Bamako area.** Newspaper articles about land conflicts are very common in the Malian press. It is estimated that around 80 percent of court cases in Mali involve land tenure issues<sup>52</sup>. In the Greater Bamako Area, land disputes are also very common and can result in the destruction of housing and evictions. Conflicts can involve many different aspects, which makes establishing a typology difficult (see Durand-Lasserve et al., 2015). Although they can overlap, three broad categories can be distinguished: (1) conflicts in the peri-urban area stemming from the *vagueness regarding the scope and recognition of customary rights*, which creates problems when the land is transferred and/or other claims emerge for the same piece of land; (2) conflicts in the Greater Bamako area stemming from the *implementation of lotissements when ownership of the underlying land is unclear*; and (3) conflicts related to the *allocation and transfer of land by the State and local authorities* to individuals, property development companies and housing cooperatives. What all three categories have in common is the lack of clarity on property rights and enforcement of these rights, which often stems from the weakness of the State to establish and guarantee rights<sup>53</sup>. They also have social consequences in that the weakest stakeholders (customary possessors and low-income households) have limited access to information and weak social and political networks and limited financial means through which they can access secure land. And economic consequences, through efficiency losses as insecurity deters investments and prevents markets from functioning properly and having land put to its best use.

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<sup>51</sup> For some mayors, *lotissements* are the only way they can generate revenues to fund investments.

<sup>52</sup> République du Mali, 2009. « Actes de la rentrée judiciaire. » Bulletin d'information de la Cour suprême du Mali, No. 10, Bamako.

<sup>53</sup> This leads to problems of multiple claims, and sometimes even the issuance of multiples rights on the same plot.



**Bamako has had past success in the provision of serviced and titled land, and the development of land and housing development by the State – but demand now far outstrips supply.** Formal land and housing development in the Greater Bamako Area dates back to 1992 with the creation of a parastatal land development agency, the ACI (*Agence de Cession Immobilière*). The ACI channels serviced and titled land to the market and has been instrumental in developing central parts of Bamako, including the high-standing residential and business neighborhood ACI 2000. A small number of land and property development companies exist with an opportunity to carry out operations in public-private partnerships for social housing and the provision of formal housing. However, supply of housing remains very limited in the face of the enormous needs in the Greater Bamako Area. Most real estate developers face difficulties securing titled land from authorities. Their activities are also limited by the narrowness of the middle-class, the low and irregular income of households, the complex procedures and restrictive standards constraining norms for planning, construction, and development, and the weakness of the housing finance system.

**Attempts by the State to provide social housing suffer from lack of adequate urban planning.** Responding to the difficulties faced by the middle class to access affordable and secure housing (i.e., those who have relatively high incomes but cannot directly afford to obtain titled land), the Malian government has engaged over the past two decades in a policy of “social housing”, which aims at helping households to access property ownership. The social housing program is usually carried out in connection with a public-private partnership, with the state providing a property development company with land and subsidizing household purchases. So far, it has provided a relatively small number of dwelling units (a few thousand units) at a subsidized price on lease-to-purchase arrangements or bank loans. The schemes seem to have failed to integrate properly new developments into the urban fabric: the new social housing developments, which are located on the edges of the city’s built area, frequently lack collective facilities, forcing residents to travel long distances to go to school or to the market or fetch water from the nearest water point. As part of the “social housing” policy, the government of Mali has also experimented with a pilot for the construction of vertical buildings and denser neighborhoods (known as the “*80 logements*” in the Faladié neighborhood of the N’Tjiba commune, constructed in 1990). This is a form of collective ownership as the ten buildings were built on a single land title. The experience, however, has led to difficulties of cohabitation with the deterioration of common parts over time.

## Urban accessibility is hampered by inefficient land use and transport

**Cities are often referred to as centers of opportunity because they reduce the economic distance between workers, employers, buyers and sellers.** This density reduces economic distance, decreases the unit cost of supplying infrastructure such as transport networks, allows ideas to circulate, grow and mature, and promotes economic specialization whereby people can focus on what they do best or enjoy the most (Glaeser and Kahn 2004; Ciccone and Hall 1996). These advantages of cities explain why urban residents are generally more productive than workers outside urban areas, what economists commonly call agglomeration economies which stem from proximity and exchanges (Duranton and Puga 2004; Rosenthal and Strange 2004).

**Integrated labor markets also produce more inclusive cities, avoiding the disconnection of entire neighborhoods of urban areas from the rest of the local economy.** When accessibility is good, cities can become integrated labor markets, that provide opportunities to residents allowing them to choose jobs from larger pools, hence leading to increased welfare (Bertaud 2014). Integrated labor markets exist when it is possible for an individual to reach a large share of the employment opportunities within a city at a reasonable cost or within a reasonable time-frame. Large and integrated labor markets, by increasing the number and the diversity of employers and job seekers, allow for an appropriate match that makes the best of their respective skills and aspirations. Empirical evidence suggests that the benefits of large and integrated labor markets are not simply a theoretical argument but that accessibility, measured as the number of opportunities an individual can access within a given amount of time, matters for productivity and well-being in cities.

**But cities are not always associated with high levels of employment accessibility.** Although cities concentrate on a restricted area of land large numbers of households and employment opportunities, this simple geographic proximity does not imply that all households have an equal or even good access to jobs. In Mexico for example, urban sprawl, massive population decentralization into single use residential and peripheral settlements together with uncoordinated urban growth has widened the distance between jobs and housing, undermining Mexican cities' ability to match skills to jobs. In Mexico City low-income households living in the peri-urban areas can spend an additional four hours commuting per week compared to low-income families residing in more central areas (Kim and Zangerling 2016).

**Low accessibility levels, carry negative consequences for productivity and well-being in cities.** Low accessibility leads to fragmented labor markets where matching takes place at a local level only. Jobs located outside high-density economic clusters tend to be scarcer, more informal and lower paying. Low accessibility levels also force households to locate closer to jobs. The excess housing costs in these locations can be unaffordable for some households, which can be forced to compromise on living conditions by settling in informal areas, thus fueling the phenomenon of central slums found for example in many African cities (Antos,

Lozano-Gracia, and Lall 2016). Such an outcomes has been documented in Nairobi where most slum dwellers have jobs and comparatively high levels of education relative to those living in formal housing, yet their living conditions remain basic (Gulyani, Talukdar, and Jack 2010).

**Interventions aiming at coordinating the land use and transport simultaneously reduce the disconnect between residential areas and employment opportunities** through efficient planning while enabling for affordable and time scarce connections. Reductions in transportation costs have been found to have positive impacts on the employment prospects of the youth in Ethiopia (Franklin 2015) and in France (Le Gallo, L'Horty, and Petit 2017) while land use interventions also carry the potential to increase employment accessibility (Avner and Lall 2016; Quirós and Mehndiratta 2015). Conversely, inadequate urban policies can foster disconnection within urban areas. The massive sprawl and low-density housing development in Mexican cities was partly the result of the housing policy reform of 2000.

**Bamako's accessibility is driven by two main drivers – the use of land and the efficiency of transport.** The intensity of land-use underlies the urban layout of the city and the level of density, which provide more opportunities for interaction and for better access to services. At the same time, the efficiency of the transportation network connects people with jobs and services, including by reducing congestion. This section will thus outline how these two factors affect accessibility within Bamako. Given lack of micro and geo-coded data on past land use and transportation, the analysis will showcase impact through simulations for future growth.

### ***Changing Land Use***

**The objective of the model is to understand the consequences of the spatial distribution of people and jobs on levels of accessibility.** Bamako is a fast growing, sprawling urban area with low population densities. Thus, on average people must travel longer distances to reach the same number of jobs than compared to in denser cities. Achieving more compact urban forms cannot take place overnight, as cities display inertia and path dependence through the considerable amount of sunk capital already invested in structures and infrastructures. To account for this inertia, the model assumes that Bamako's city structure can only change at the rate of its population growth, i.e. current city dwellers will remain where they live today but newcomers can decide where to settle in the urban area. Counterfactual scenarios are run for the year 2030 with the following demographic and spatial scenarios:

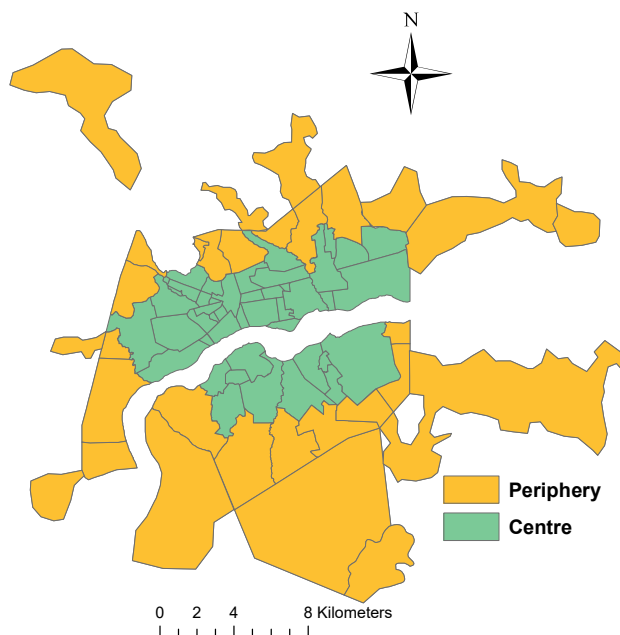
- **3 Demographic Scenarios:** The rate of urban population growth could be low, normal or high. The normal growth scenario assumes a similar rate of growth as the one Bamako experienced from 1990 to 2015 – i.e. 5.26% annually. The high and low growth scenarios assume annual demographic growth rates of 6.3% and 4.2% respectively (20% higher and lower than the past growth rate respectively) – see Table 3 for details.

Table 3. Demographic scenarios for Bamako from 2015 to 2030

	High popula- tion scenario	Normal popula- tion scenario	Low popula- tion scenario
Annual population growth rate (%)	6.3%	5.26%	4.2%
Population in 2030	8,007,000	6,898,000	5,934,000

- **3 Spatial Scenarios:** Different scenarios for the spatial distribution of people and jobs are also considered. These include: a baseline scenario, a peripheral scenario and a densification scenario. The baseline scenario assumes that jobs will continue to be distributed spatially as they are in 2015 and that population will be added to each neighborhood in proportion to its share of total population in 2015. The peripheral scenario assumes that jobs and people will be drawn to peripheral neighborhoods in priority. Jobs in the periphery will be 1.5 times higher than they were in 2015 and those in the central neighborhoods 50% lower. And new urban dwellers will settle in the periphery in larger numbers than in the center. Finally, the densification scenario supposes the opposite trends to the peripheral scenarios with jobs and people densification in the central neighborhoods of the city. The central and peripheral neighborhoods considered for these exercises are depicted in Figure 25.

Figure 25. Central and peripheral scenarios considered



### Changing density patterns in Bamako has a big impact on accessibility.

The consequences of these demographic and spatial scenarios are depicted below. When averaged over the entire urban area of Bamako, and assuming normal population growth rates, the densification scenario provides significant gains in terms of accessibility – approximately 50% of jobs will be accessible compared to 42.8% in the baseline and 36.2% under the peripheral scenario – see Figure 26 and 27. Put differently, without densification employment accessibility is lower by 7.2 percentage points and further growth in the peripheral areas would further reduce accessibility by 6.6%. Thus, fragmentation and low densities in Bamako have probably exerted a large cost in terms of matching people with jobs and consequently for opportunities for increased productivity. And higher future population growth rates would exacerbate these costs.

*Figure 26. Difference in share of accessible jobs using the Sotrama network at peak-hour between the densification and peripheral scenarios.*

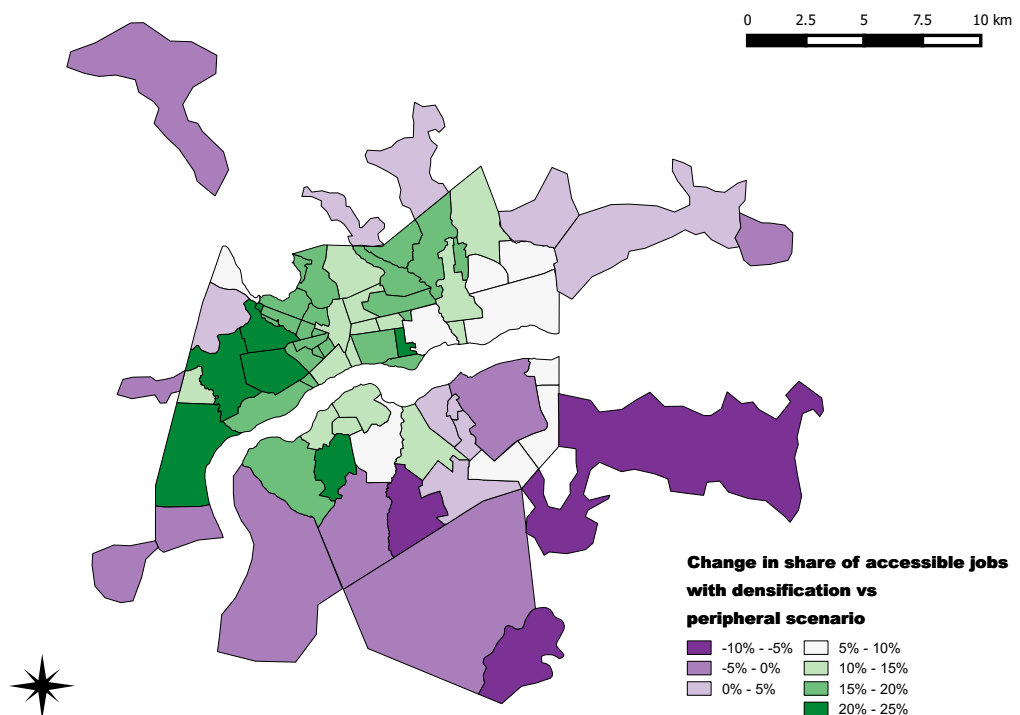
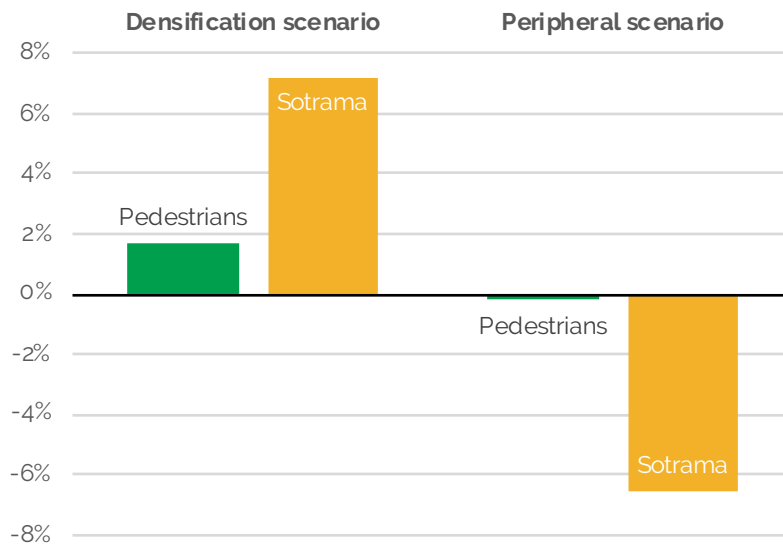


Figure 27. Change in average share of accessible jobs within a 60-minute peak-hour commute by Sotrama and foot depending on the land use scenarios in comparison to the baseline

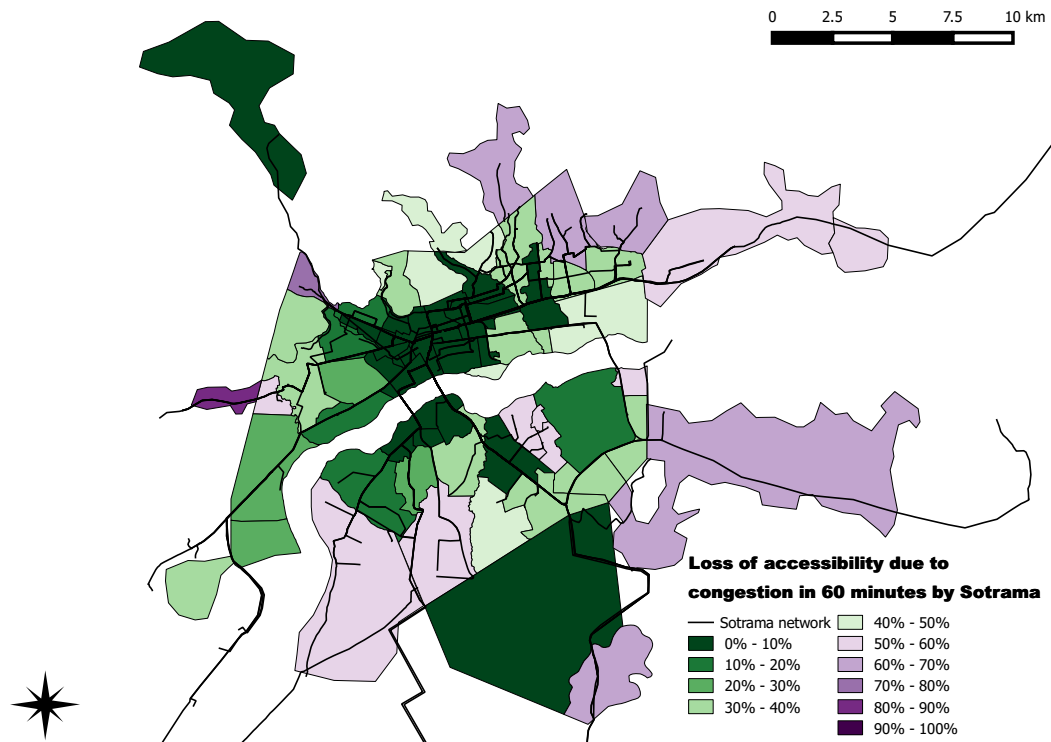


### Changing Transport

**Changes in the speed of the transport network is another important driver of accessibility in Bamako.** Congestion in Bamako is high, in part, because of the natural bottlenecks created by the river Niger, owing to which only three bridges can channel the flow of commuters mainly coming from the *Rive Droite* of the river to the *Rive Gauche* in the morning. Freight transport also contributes to the congestion in Bamako and to the rapid depreciation of roads. Bamako is not only a main destination for products from Dakar, Conakry or Lomé, it is also a transit point. This means that because of the lack of ring roads, Bamako's limited urban transport network not only supports the freight destined to its markets but also the goods travel destined to other West African cities. Finally, whereas the density of roads in Bamako is within or above regional averages, lack of road paving considerably reduces travel speeds, forcing people off the secondary and tertiary networks and on to the main arteries and adding to congestion levels in the process. If the congestion in Bamako could be eliminated completely and travelers could commute at speed limits instead of congested speeds<sup>54</sup>, an additional 38% of jobs within the city would be accessible within one hour by the Sotrama network – see Figure 28. While ensuring free flow speeds at all times and on all road links is not a realistic scenario, it never the less demonstrates the importance of travel speeds as a driver of accessibility.

<sup>54</sup> This results hinges on the assumptions that are made about speeds on the transport network and are provided as a means of showing the costs of congestion only.

*Figure 28. Loss of accessibility using the Sotrama network within one hour of travel because of congestion.*



**Given the spatial layout of the Sotrama network, individual segments matter differently for overall accessibility.** Simulations that increase speeds by 30% on six Sotrama corridors (see Figure 29) provide orders of magnitude of the impact on accessibility across different corridors. As expected, an increase in speed across all corridors simultaneously would have the largest impact on accessibility, with a 12% difference compared to no changes – see Figure 30. Individually, the Sogoniko corridor seems to have the largest impact with a 4.3% difference in accessibility levels compared to the counterfactual - see Figure 29. The importance of transport speeds across corridors is also different spatially – for instance, higher speeds on the Kati corridor would have limited impacts for the accessibility level in Bamako overall, but high impacts for certain parts of the city.

Figure 29. Sotrama corridor priorities for intervention (left) and accessibility gains assuming a 30% speed increase on all six corridors simultaneously (right).

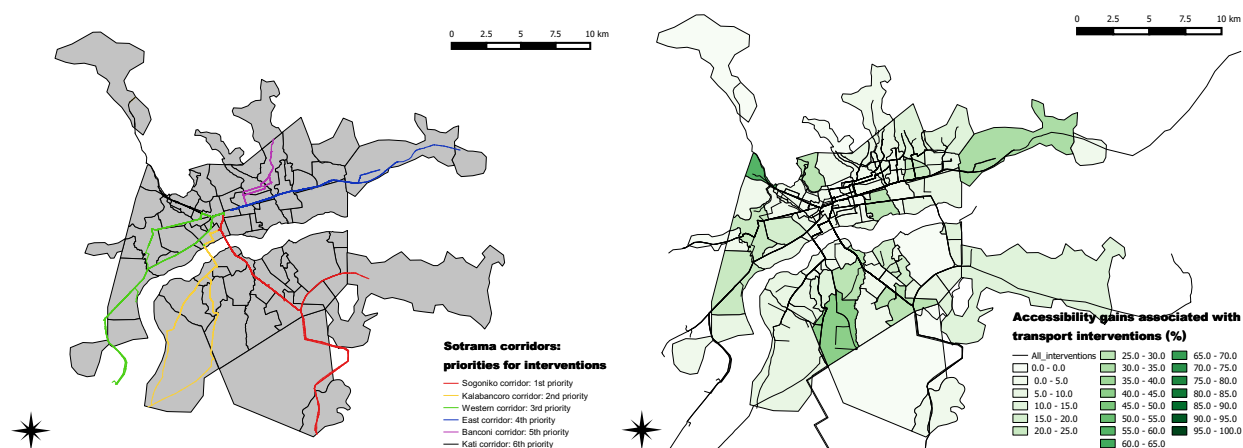
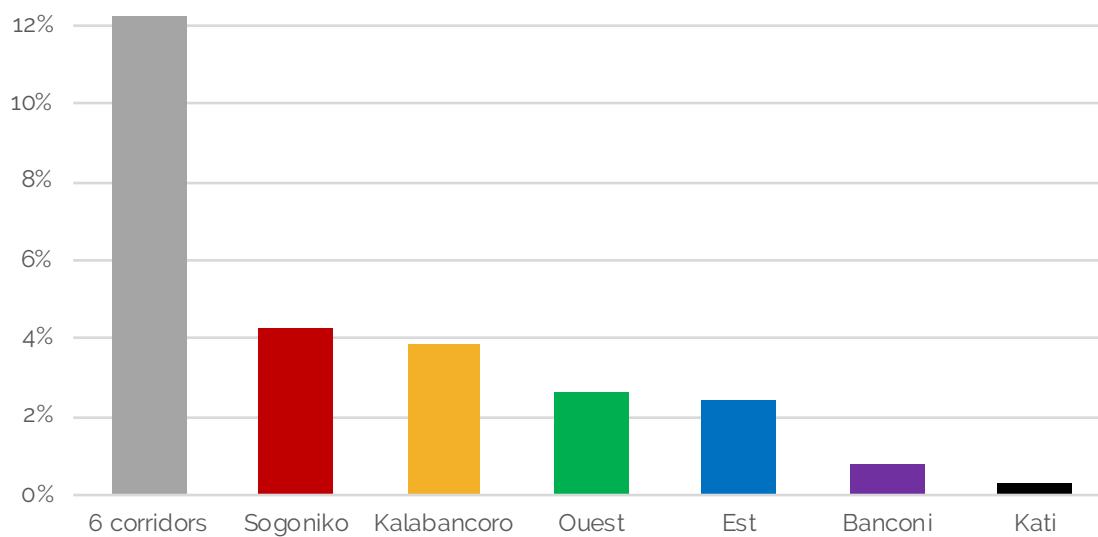


Figure 30. Gains in average share of jobs accessible within a 60-commute by Sotrama with interventions to increase speeds on select Sotrama corridors





## Institutional fragmentation and lack of investments hinder service delivery

**This section analyses aspects of institutional structure and metropolitan coordination that have repercussions on service delivery in the greater Bamako region.** The District of Bamako is part of the Bamako metropolitan region, and is becoming integrated with the cities of Kati and Koulikoro into a multi-city agglomeration marked by fragmented governance structures. This entails specific governance and coordination challenges at the metropolitan level for provision of infrastructure and basic services. Solid waste services, which are an important environmental and health concern (identified by stakeholders in the public and private sector and civil society representatives) is discussed as a special case. Solid waste management (SWM) also exemplifies some of the coordination failures related to urban planning in the Bamako metropolitan area.

**The administrative landscape in Mali is characterized by institutional fragmentation and a complex relationship among deconcentrated and decentralized units of government.** Mali has 771 local government units, consisting of 703 municipalities, 49 circles, 18 regions (of which 10 effectively established following a 2012 reorganization), and the District of Bamako. The regions and circles are deconcentrated administrative units of central government (*circonscriptions administratives*), while also being local government units (*collectivités territoriales*) with elected governing bodies. The District of Bamako has a governing council elected by direct suffrage and is under oversight by the Ministry of Local Government<sup>55</sup>, while the District is also composed of six local governments (*communes*) and an additional 29 local governments compose the greater Bamako metropolitan region.

**Overlaps in competencies bestowed upon local governments by legislation makes responsibility for delivery of services unclear.** The local government law<sup>56</sup> provides limited clarity on horizontal and vertical repartition of competencies. According to the local government law and the law on specific arrangements for Bamako, the delivery of a large array of services, e.g. water, energy, health, education, and environmental protection are attributed to regions, circles, the District of Bamako and communes. In the case of roads and cleanliness, this is also the case, but only “if management has been transferred”. The transfer is to be approved by the Council of Ministers and this has not yet happened for these services, which is much more advanced in the education and health sectors, with a clearer hierarchy of services. The absence of formal transfer creates a legal limbo in which *de jure* and *de facto* responsibilities are not clearly attributed. Since no local government can exercise control over another local government according to law this creates a situation which obstructs coordination of planning within the administrative boundary of the District of Bamako for services such as drainage and solid waste management.

55 Loi N°2017-051 du 2 oct. 2017 portant code des collectivités territoriales (local government law).

56 Loi N°053 du 2 oct. 2017 portant statut particulier du district de Bamako (the Bamako law).

**Lack of clarity from legislation is further compounded by sector and provider overlaps.** National, parastatal and city-level agencies are involved in infrastructure investments and services provision, with overlapping and unclear regulatory scope and responsibilities. Central government ministries plan and implement by sector, but there is no coordinated plan for development of the urban space and no planning of services in urban extension areas. Also, utility companies deliver services formally under the jurisdiction of local governments by law (water and electricity), but as local authorities do not have a seat on the governing bodies or play any formal role in planning for services the lines of accountability are unclear and complicate all aspects of service delivery from planning over implementation to enforcement.

**The superposition of layers of decentralized authorities (the District and six communes) and support structures without clearly defined and implemented functional mandates constrains coordination and integrated urban planning.** According to the Bamako law the District is responsible for its *schéma d'aménagement*, while the local government law ascribes to the communes responsibility for elaborating a *schema d'aménagement territorial*, consistent with that of the *cercle*. On the other hand, the urban planning law bestows upon the communes the responsibility for elaborating urban reference plans. The regional development agencies (*Agences de Développement Régional*) are partly independent support structures under the MCT that provide reimbursable technical assistance to local governments in the areas of planning and service delivery. In addition, the District of Bamako also has its own *Cellule de Préconfiguration de l'Agence d'Urbanisme de Bamako*, which launches planning initiatives for the District and has made some progress in getting surrounding communes to sign up to more formalized arrangements for collaboration to plan the Bamako metropolitan area. Parallel attempts are being made by the surrounding communes to organize in an inter-communal collaboration and develop a vision of proximity to Bamako, focused on solid waste management and spatial management. However, none of the coordination attempts have so far come to fruition in terms of actual coordination of service delivery.

**Decentralization has not so far resulted in ability to develop urban plans by local governments.** Mali's decentralization process, including for planning, takes its impetus from the 1992 constitution. Although -as described above- the responsibility for elaborating and implementing urban plans has in principle been decentralized, it remains largely the function of the central government. This situation reflects international trends, with gradual decentralization of planning responsibility since the mid-1990s.<sup>57</sup> As in many other developing countries in the process of decentralization, devolution of responsibilities is subject to interpretation and in the case of Mali neither the fiscal or human capacity is present to support implementation of legislators' intentions. While the government yearly funds on average two urban plans for major cities, no local government has the financial resources to elaborate urban plans.

**Urban plans and planning institutions are ineffective and are not managing the spatial development of the Bamako metropolitan area.**

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<sup>57</sup> Somik Vinay Lall, J. Vernon Henderson and Anthony J. Venables: *Africa's Cities. Opening Doors to the World*. World Bank Group, Washington DC, 2017

The total number of accredited urban planners in Mali is about 20<sup>58</sup>, or 0.13 per 100,000 capita. This is very low, even compared to an average ratio of 0.97 planners for every 100,000 people in selected African countries.<sup>59</sup> The last approved urban structure plan for Bamako dates back to 1995, and although it contains some considerations of trunk infrastructure in the metropolitan area, it is completely surpassed by development and expansion of the city in the meantime. A 2005 revision was elaborated to integrate parts of the surrounding area into the District but was never approved, since the institutional stakeholders could not agree on the boundaries of the District. A further attempt was made by the District in 2014 to recruit a planning agency (on external funding) to update the structure plan but floundered due to disagreement between the government and the District of Bamako over planning authority.

**The District of Bamako and six communes of the District have urban planning departments, and the District has developed a plan to address some identified shortcomings.** The ‘Vision 2030’ includes investments to, among others, densify the commercial center of the city, minimize heavy transport and unloading in the city through construction of dry ports, and rebalance the development of the city through moving some institutions and commercial activities to the right bank of the Niger River. The ‘Vision 2030’ constitutes a good starting point for developing an urban structure plan, but the legal and regulatory foundation for any investments to reshape the city are not in place in the absence of an approved and enforceable plan. In the absence of such a plan and institutional capacity to assure its implementation, the city is peri-urbanizing through unauthorized *lotissements* to which the local government authorities and technical services participate (see section on land markets in Chapter 2) and densities remain lower than optimal in the absence of a land market and taxation of undeveloped land in the city center.

**The cost of fragmentation is not directly quantifiable but is likely high.** The literature is not unanimous on the effects of fragmentation, there is some evidence that fragmentation has a negative effect on productivity in OECD countries while countries in Latin America and the Caribbean could conversely benefit from fragmentation.<sup>60</sup> In the case of Bamako, with 7 administrative units in the

58 According to Diarra Sissoko, the President of the Malian Association of Urban Planners, interviewed November 22, 2017.

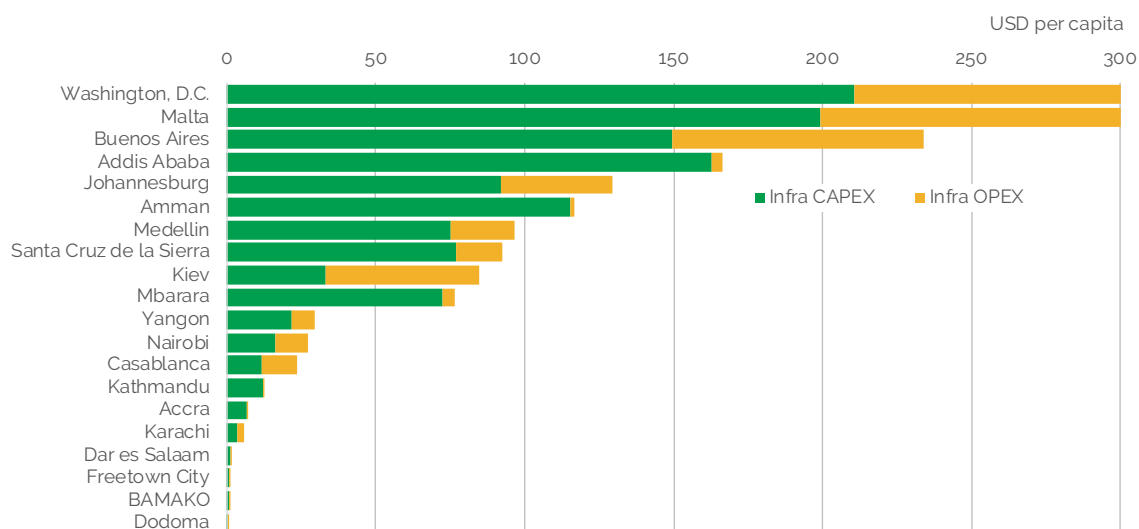
59 Authors’ calculations based on the number of planners in 12 African countries in: The State of Planning in Africa. African Planning Association and UN-Habitat, 2014.

60 See e.g. Ferreyra, M., Roberts, M., Gracia, N., Cadavid, P. and Selod, H. (2017). Falling Short. Cities and Productivity in Latin America and the Caribbean. They find that LAC metropolitan areas are likely being affected negatively by their levels of fragmentation. With on average 9.39 administrative units per metropolitan area, this level is detrimental to productivity. The study finds no evidence that presence of a governance body at the metropolitan level mitigates the negative effects of fragmentation (but the study does not include measures of efficacy of such governance structure). Ahrend et al (2017) also find that cities with fragmented governance structures tend to have lower levels of productivity (10 percent increase in the number of municipalities leads to 0.6 percent lower productivity). But to the contrary they find that the negative effects are mitigated by almost half by the existence of a governance body at the metropolitan. See Ahrend, R., Farchy, E., Kaplanis, I. and Lembcke, A. (2017). What makes cities more productive? Evidence from five OECD countries on the role of urban governance. Journal of Regional Science, Vol. 00, No 0, 2017 pp 1-26. Bartolini (2015) also finds that municipal fragmentation within a given country has a negative impact on per capita GDP growth and that for a given level of municipal fragmentation overlapping of function is more severe in urban regions (where people are likely to commute over municipal boundaries) than rural regions. See Bartolini, D. (2015). Municipal Fragmentation and Economic Performance of OECD TL2 Regions. OECD Regional Development Working Papers, 2015/02, OECD Publishing, Paris.

District of Bamako and 31 local governments making up the Greater Bamako area, the qualitative analysis supports that fragmentation causes problems of coordination between the metropolitan center and the surrounding local governments (and with public utility companies) regarding service delivery.

**There is also no capacity to invest by Bamako local governments and hence the government is in principle the main funder of infrastructure in the capital.** The combined identifiable infrastructure expenditure (operating and capital expenditure) by the seven local governments in Bamako (the District and six communes) was \$0.72 per capita in 2016.<sup>61</sup> Figure 31 provides a comparison of this figure to other capitals and Figure 32 provides a comparison by income tier. Budgets typically contain high proportion of emoluments (62 percent on average) and only 4.6 percent of budgets go towards investments. Indeed, the recent increase in overall local government revenues in Bamako appears to have been driven by dramatic hikes in the size of earmarked conditional transfers, largely intended to cover the costs of running devolved services (such as education and health). These functions (or “competences”) have been devolved as part of a wider national policy of shifting sector responsibilities from central to sub-national government. As such, these conditional transfers do not represent a significant increase in the quantum of resources available for local investments; recipient local governments do not have much latitude to decide on the use of these transfers. The District of Bamako has benefited from a substantial increase in transfers over the past years, up from \$10.7 million in 2015 to \$40.2 million in 2016, bringing total revenue to \$50.4 million but this is however also not reflected in increased investments. Own-source revenues remain largely unexploited and e.g. the local and regional development tax that is dedicated to service provision and infrastructure is, at \$166,000 collected, very far from the potential of about \$13 million. Thus, the government funds service delivery directly, although according to law this falls under the purview of local governments.

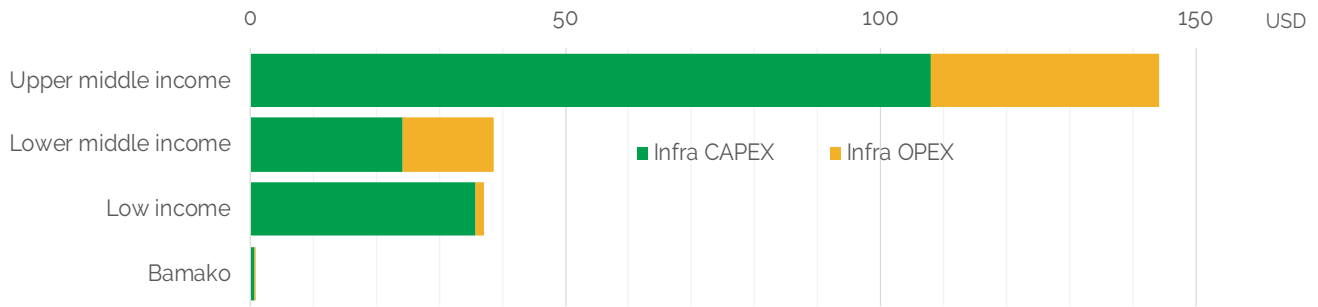
*Figure 31. Infrastructure investments by Bamako and comparators (2016)*



Source: From Yu Lu: City-level capital and operational expenditures for infrastructure, benchmarking for Bamako (2017).

<sup>61</sup> Analysis of latest available budget data for this report: Budget execution reports for 2016 for the District and communes, except Commune I for which budget execution for 2015 was used.

Figure 32. Infrastructure investments by Bamako compared to income levels (2016)



Source: From Yu Lu: City-level capital and operational expenditures for infrastructure, benchmarking for Bamako (2017).

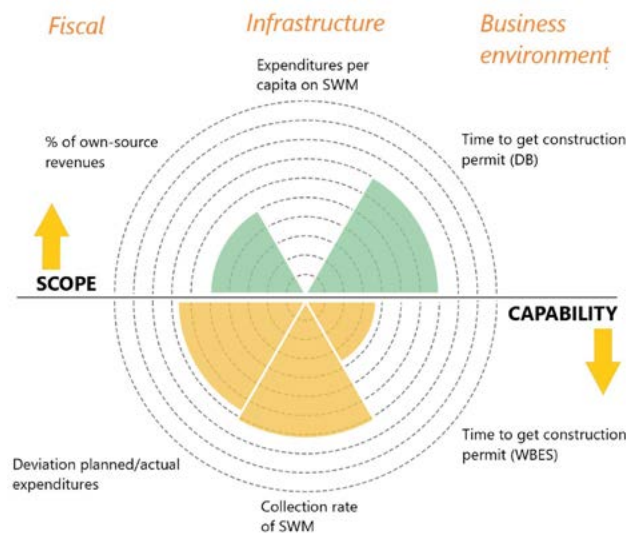
**Bamako's scope and capability seem somewhat mismatched – with neither being very high.** Urban governance structures are the outcome of specific historical and political circumstances. Not only does the administrative scope or remit of Bamako matter, but also its capabilities to implement its remit, given access to resources – fiscal and technical. It seems that Bamako lacks financial resources and technical capabilities, to varying degrees, to tackle urban planning for the delivery of urban infrastructure and services (see Figure 33 and accompanying box). The total number of urban planners in Mali is 20, or 0.13 per 100,000 people (compared to 0.97 across Africa)<sup>62</sup>. The city scope and capability radar graph shows that Bamako's fiscal scope (*above the line*) and its capability (*below the line*) is reasonably well matched – neither is very high. However, the city has no control over its waste management function<sup>63</sup>

- this will be discussed in detail below. There is also a big disconnect in terms of business environment, wherein the Doing Business measure regarding construction permits (mainly a *de jure* measure) lags far behind actual time to get a construction permit (i.e. *de facto*) measured by Enterprise Survey data from Bamako.

62 Authors' calculations based on: The State of Planning in Africa. African Planning Association and UN-Habitat, 2014.

63 The absence of revenue in the local governments' budgets reflect the funding structure of SWM services: households pay directly to small collection companies (*groupements d'intérêt économique*) and the government funds the collection contract with a private company (Ozone) directly. The District of Bamako stopped budgeting expenditure for the Roads and sanitation agency separately as of the 2016 budget, after signing the Ozone contract in on September 29, 2015.

Figure 33. City Scope and Capabilities (Bamako)



**The City Scope & Capabilities radar graph** outlines how policy reforms and interventions at the city level are channeled through a city government's operational **scope** and **capability** – i.e., the powers at the government's disposal, and, the ability to effectively and efficiently carry out those powers. It includes 6 variables, which consider city scope and capabilities in terms of 3 different dimensions: fiscal, infrastructure, business environment. The limits of the graph on each variable are given by the lowest and highest scores among 8 African cities – Bamako, Niamey, Conakry, Lagos, Kammala, Addis and Johannesburg.

**The scope for Bamako – as a sub-national “city” government – to shape, finance and determine urban outcomes is limited by several factors.** Firstly, decision-making in Bamako is highly fragmented. The central government is a major player in what happens in the national capital; central government may not always share the same vision as local government. In addition, Bamako includes two legally autonomous local government tiers (District and communes), neither of which can impose decisions on the other; and there is clearly a good deal of overlap in the functional mandates of each tier, in practice if not in theory. Moreover, different local governments are governed by different political parties, making it more difficult to make common decisions. Lastly, Bamako (for better or worse) is the focus of Mali's voice-empowered socio-political elites, a further complication in any already fragmented decision-making framework. Secondly, Bamako's local governments (like all other local governments in the country) are faced with a growing set of functional mandates as the central government devolves sector functions to the sub-national level. Rapid sector devolution, partly driven by symmetric regionalization and secessionist “safeguards”, is probably swamping sub-national capacities in a variety of ways and, in Bamako, may well be constraining local officials' ability to focus on and address urban development challenges.

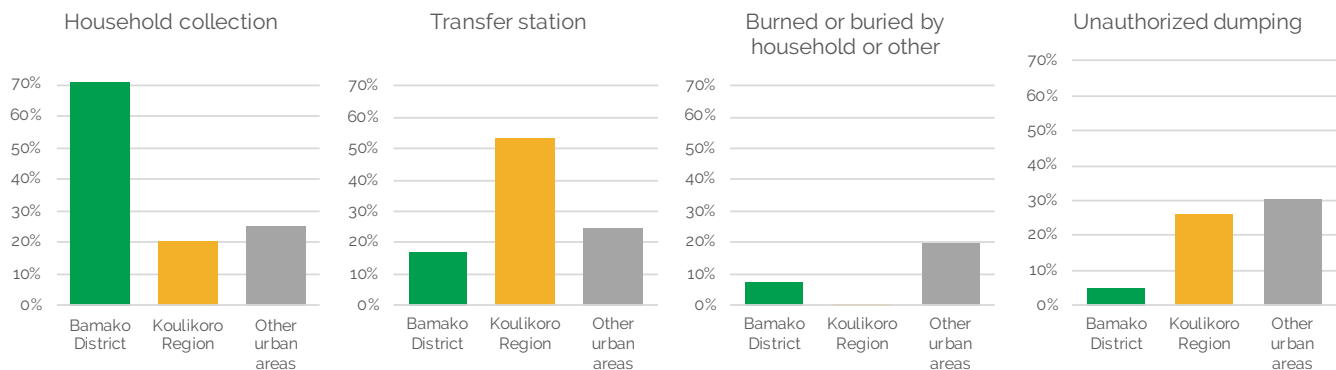
## Special Spotlight on Solid Waste Management

**Reflecting the coordination failures of planning and service provision, there is substantial lack of clarity of responsibilities for provision of solid waste management services, and a substantial funding gap.** The District of Bamako and communes are responsible for provision of solid waste management services, but in reality, the government carries the majority of funding responsibility, and the six communes of the District play a limited role as regulators and supervisors of primary collection agents. The identified investments in solid waste management in the seven local government's budgets are \$0.03 per capita. The absence of revenue in the local governments' budgets reflect the funding structure of SWM services: households pay directly to small collection companies (*groupements d'intérêt économique* – GIEs) and the government funds the collection contract with a private company (Ozone) directly. The District of Bamako stopped budgeting expenditure for the Roads and sanitation agency (*Direction des Services Urbains de Voirie et d'Assainissement* – DSUVA) separately as of the 2016 budget, after signing the Ozone contract in on September 29, 2015. Unregulated consumption of land and means that there are no land reserves within the District boundaries to construct SWM infrastructure, including transfer stations, leading to inefficiencies in the collection chain. The problem largely overflows the boundaries of the District, as until recently there was no engineered landfill to dump waste. Hence, the majority of waste is dumped in surrounding local government circumscriptions (and the District of Bamako is in fact benefiting from free ridership for disposal while negative spillovers are borne by the surrounding communes), or in an unsanitary landfill located centrally in the city of Bamako.

**About 71% of households in Bamako subscribe to private waste collection services by some estimates.** As shown in Figure 34, this share is substantially larger than other urban areas outside the Koulikoro region, where this percentage is 25%. Urban areas of the Koulikoro region have slightly lower subscription rates, at 20%, indicating room for improvement within the region. While limited data is available for cross-country benchmarking, Bhada-Tata and Hoornweg (2012) report collection rates (by weight) of 77% for Zinder, Niger and 76% for Conakry, Guinea, both measured in 2007. If one assumes a constant weight generation per household, and that “*dépotoire public*” counts as collection, then Bamako preforms fairly well relative to these benchmark, with 88% of waste collected. Although the collection frequency might be high, in reality the majority of waste gets dumped on open land in the surrounding communes. The collection rates in the Koulikoro Region, within which the District of Bamako is located are very low, at 20%, and would benefit from a coordinated approach to collection and disposal.



Figure 34. Bamako has substantially more developed waste collection services than the rest of the country



SOURCE: World Bank staff calculations using the Enquête Agricole de conjoncture intégrée aux conditions de vie des ménages (LSMS), 2014.

**The scope of the Maire du District du Bamako to improve the quality of solid waste management services is primarily defined by contracts between the city and private firms.** As is common globally and across Africa, the district of Bamako has fully outsourced solid waste collection, with pre-collection being completed by approximately 180 GIEs that collect waste and fees directly from households under 3 to 5 year contracts with the communes that give them monopolies over a set of land plots (referred to as concessions, that include groups of on average 2.1 households) within a specific neighborhood (*quartier*). The transport of waste from the GIE's transfer depots, collection from large producers, disposal, as well as street sweeping, has been contracted to Ozone, an international firm that signed a convention with the city in 2014 giving it this responsibility (see *Maire du District de Bamako et Ozone*, 2014). The city can therefore only affect quality of services by using sanctions available within existing contracts with the private sector, for instance penalties for underperformance.<sup>64</sup> In the longer term, it has the opportunity to revise contracts, as it is doing currently with Ozone and the GIEs, through in this case, it appears that the national government, via the Prime Minister's office and also the *Ministre de la Décentralisation et de la Fiscalité Locale* exerts substantial *de facto* control over the negotiation process. For more detail see ARTELIA (2015).

<sup>64</sup> Penalties available under the current convention are difficult to enforce, though this is recognized by the authorities and the convention is currently being renegotiated. For instance, the 2014 convention allows the city to apply a fine, as described in Article 56, for « secteur non collecté, non balayé (4 heures après signalement par le délégant) » at the rate FCFA/jour 300,000 to the share of sectors plausibly not cleaned by Ozone. The phrase « 4 heures après signalement par le délégant » in the convention indicates that sanctions can only be enforced if the Mayor of Bamako notifies Ozone immediately when a sector is not cleaned. This implies that for the sanctions in a contract to work, the city must (i) have a daily flow of information on whether Ozone is completing its tasks, and (ii) a way to transmit that information readily to Ozone. Future contract negotiations should consider methods of establishing these flows of information. In principal, the GIE could play an important role in supporting such a system, providing DSUVA with regular information on whether Ozone has picked up waste from specified areas, such as transfer depots. If poor performance is reported, Ozone could be sanctioned. In principal, such sanctions could be enforced under the existing contract.



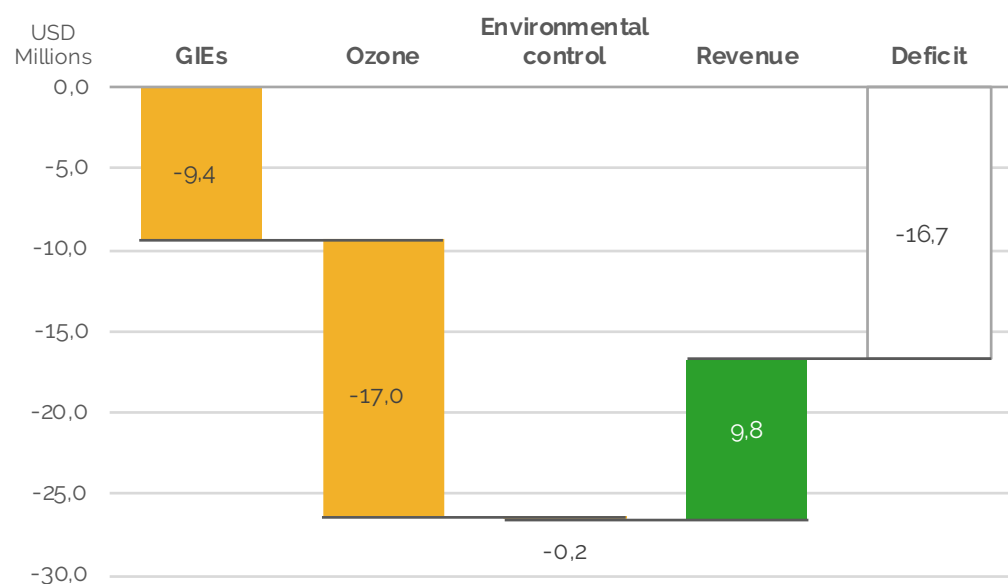
**The only areas of direct formal government participation in the system are in the function of environmental regulation, specifically with regards the control of unauthorized dumpsites (*dépôts anarchiques*).** These activities are carried out simultaneously by the *Brigade Urbaine de Protection de l'Environnement (BUPE)*, a commune funded agency, and two parallel decentralized agencies of the MAEDD, the *Direction Régionale de l'Assainissement et du Contrôle des Pollutions et Nuisances du District de Bamako (DRACPN-BD)*, at the district level, and *Service de l'Assainissement et du Contrôle des Pollutions et des Nuisances (SACPN)*, at the commune level.

**The scope of the Maire du District du Bamako to improve the quality of disposal is limited by its ability to plan and develop projects in collaboration with the surrounding communes outside the district.** Though local governments are de jure responsible for environmental protection and cleanliness, the key activity and often most substantial investment in disposal, construction and operation of landfills, is carried out by the national agency *Direction Nationale de l'Assainissement et du Contrôle des Pollutions et Nuisances (DNACPN)* within the *Ministère de l'assainissement, de l'environnement et du développement durable (MAEDD)*. To exemplify this, the Noumoubougou sanitary landfill for the District of Bamako, was constructed by the government without prior consultation with the District authorities. If the city is to assert more control over the quality of disposal in the future, it will have to find ways to plan, finance and build projects on its own. In doing so, there are potential economies of scale from working with surrounding communes to develop projects requiring waste at scale, such as for instance, biogas or landfill gas electricity generation facilities, though the technical requirements of these facilities are such that they would need to be developed as greenfield projects.

**The capabilities to tackle the challenges associated with SWM seem limited and are constrained by institutional overlaps and land issues.** The District does have some planning and service delivery capacity through the Road and Sanitation Unit but the multitude of stakeholders involved in solid waste management exemplifies the limited intra-jurisdictional coordination, central government infringement on local government prerogatives, and lack of control over land use. The landfill was constructed by the central government, based on a 2003 solid waste strategy, but ownership has not been transferred to the District. Some minor problems to render the landfill operational are being sought solved by the MAEDD, but so far unsuccessfully, and in the meantime the District does not dispose of the landfill that is an integral part of the contract with the private collection operator. In addition, the landfill is located 35 kilometers from the city, which increases the transport of solid waste. While the 2003 solid waste strategy identified a second site for a landfill in Dialakorobougou outside the District limits, to serve communes V and VI of the city (*Rive Droite*), issues of land ownership were left unresolved. No land has been reserved for a second landfill in the vicinity of the city on the right bank of the Niger River, which could contribute to reducing transport cost and through traffic in the center of the city. In several cases land reserved for transfer stations in the solid waste sector plan has been attributed to private owners or is being slowly but steadily encroached upon. This means that the window of opportunity to invest in infrastructure to improve efficiency of the collection chain is quickly closing.

**Under current contractual arrangements and revenue mobilization plans, the District of Bamako faces an estimated \$16.7 million annual operating deficit, shown in Figure 35.**<sup>65</sup> This estimate of total cost of the system includes \$9.4 million for pre-collection, borne by GIEs, largely for labor and fuel costs, \$17 million for the Ozone contract (this was the amount invoiced for 2016), and \$200,000 for a fully funded environmental control program involving 48 agents with motorcycles, enough for 8 per commune. The estimated revenues rely on the current proposal of a FCFA 3,000/concession/month tariff, and an 80% collection rate. This graph makes clear that even with very high rates of collection, the proposed tariff will not come close to covering the costs of the system. Indeed, it will only cover those costs of the GIEs activity, which they currently cover by collecting tariffs ranging between FCFA 1,000-5,000/concession/month themselves. This deficit is expected to accumulate over time, making revenue mobilization a top priority. The district currently has FCFA 11.7 billion in arrears to Ozone, and communes are also understood to have arrears of an unknown size to the GIEs.

*Figure 35. Under current plans, Bamako's solid waste management system faces a US\$ 16.6 annual operating deficit*



SOURCE: World Bank staff calculations. Estimated total cost includes labor, fuel, materials and depreciation of vehicles used in waste collection and transport but does not include costs associated with management of the landfill or transfer depots. The \$9.4 million GIE bill is extrapolated from the business model of a single GIE, provided by Le Collectif des Groupements Intervenant dans l'Assainissement au Mali (COGIAM), assuming a 90% subscription rate. This calculation therefore assumes a fully functioning system, given that subscription rates, or the share of concessions procuring service from the GIEs, currently range from just 40-70% depending on quartier. The \$17

<sup>65</sup> Expenses associated with private contracting of waste management services can run out of control, and lead to failure of contracts. For instance, in 2014 Nouakchott, Mauritania cancelled a 7-year contract with the international Pizzorno Environment Group, after the cost exploded. In 2013, the bill had reached FCFA 10 billion annually, similar to that of Bamako with Ozone, despite the fact that Nouakchott has approximately 1/3 the population. Under an arrangement with the national government, the Urban Community of Nouakchott (CUN) had to cover FCFA 2 billion (20%) from its own resources, with 80% coming from the government. Given the small revenue base available, the city and national government cancelled the contract.

million Ozone bill is equivalent to the FCFA 9 billion in invoices submitted by Ozone during 2016. The \$100,000 BUPE bill is estimated assuming 24 officers, each with a motorcycle, and 2 managers. The proposed revenue stream assumes a 3,000 FCFA/concession/month fee, an 80% collection rate and 182,789 concessions, as reported by the *2014 Annuaire Statistique du District de Bamako*.

**Performance of private contractors under the current system has been far from perfect.** Subscription rates by GIEs range between 40-70% per commune, suggesting household collection rates within that range. Ozone is also not meeting its obligation: estimates by DSUVA indicate that in 2016, just 76.62% of the waste quantities targeted in 2014 Ozone convention had been collected. This number was lower for street sweeping, where just 68.82% of kilometers of street have been swept.

**The primary concern from the perspective of environmental regulation is the control of “*dépôts anarchique*,” or unauthorized dumpsites, of which there are approximately 5-7 per commune at any given time.** The agencies responsible for this task, namely BUPE, DRACPN-BD, and SACPN lack staff and key resources, such as vehicles and GPS equipment that would be helpful in more tightly controlling these sites. Evacuation of unauthorized dumpsites not effectively controlled by these agencies cost the Maire du District de Bamako at least FCFA 222.5 million (~\$416,000) in 2016, at a rate of FCFA 5,000 per cubic meter (DSUVA, 2016).<sup>66</sup> An investment of 48 motorcycles (at FCFA 2 million each) and GPS devices (at \$50 each) to support 8 control agents across all 6 districts, would cost only ~\$180,000, which would be easily justified by the savings generated if it could reduce the volume of unauthorized dumping by 50%. Annual operating costs of an upgraded control system are estimated to be approximately \$200,000 a year, less than 1% of total operating costs. Intangible benefits from a cleaner city, depending on how they are valued, are likely to be substantially greater.

**Solid waste management needs are substantially greater in the Koulikoro region than in the District of Bamako, especially when recent urban growth is taken in to account.** Figure 36 provides an estimate of daily waste generation in the Koulikoro region. 36% of waste generation occurs outside of the district, and so there is therefore potential to achieve economies of scale by combining solid waste management operations of the regional government and the District du Bamako. These include primarily economies in: (i) procurement of equipment (i.e. trucks, transfer station containers), (ii) management of contractors that deliver transportation services.

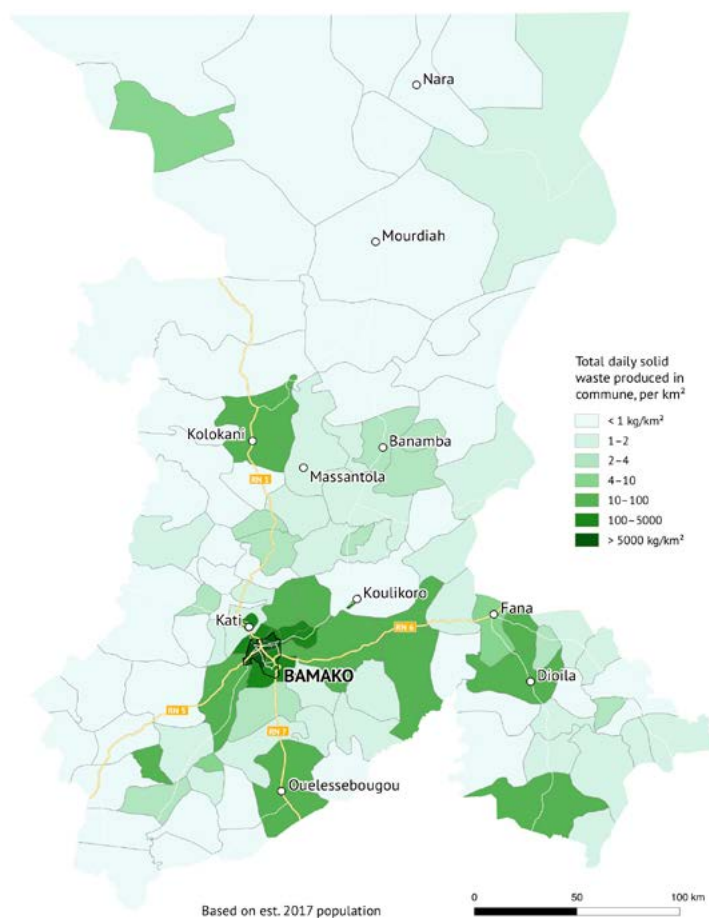
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<sup>66</sup> This number includes the evacuation of 44,503 m<sup>3</sup> from 21 unauthorized dumpsites in communes I, II, VI and V reported by the Direction Des Services Urbains De Voirie et D’assainissement (DSUVA) for September 5, 2016.

Figure 36. 36% of waste produced in the Koulikoro region is produced outside of Bamako district

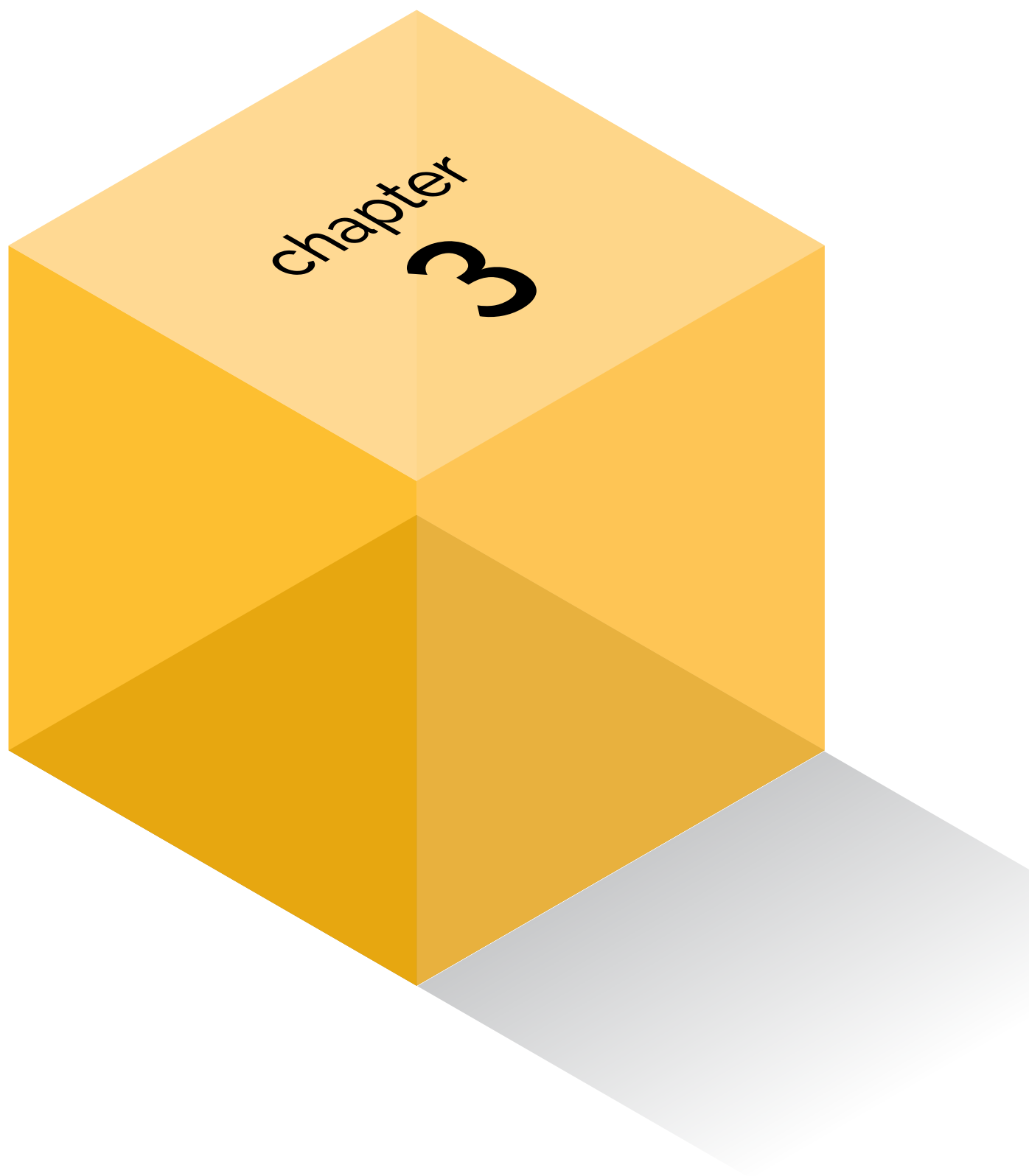
#### Bamako and Koulikoro

Solid waste generated in one day (kg/km<sup>2</sup>), Case 2



SOURCE: World Bank staff calculations based on the 1998 and 2009 censuses. The forecast assumes that urban waste production is 0.58kg/day/capita (equal to the daily generation implied by waste generation targets and populations listed in Table 1 of the Convention with Ozone); that rural production is 0.1 kg/day/capita; and that population growth since 2009 in urban areas has been 5.08% per annum and in rural areas 1.75%, consistent with United Nations forecasts. The forecast classifies as urban all communes with population growth rates higher than 5% p.a. between 1998-2009 in the census, or with population more than 50,000 in 2009. This results in a 33% higher forecast than projections made using the current urban/rural classification used by the Ministère de l'Administration Territoriale de la Décentralisation et de la Réforme de l'Etat.







# How to unleash Bamako's potential?

**To unleash Bamako's potential, a balanced approach to reforming institutions, putting the right policies in place and investing in infrastructures and attention to implementation will be needed.** This section highlights steps taken by policy makers in Mali to address Bamako's challenges, but also brings in practical examples from other resource-constrained and often low-capability urban environments. Given the competing demands on the public purse, the chapter also demonstrates how technologies, community-based and private-sector based approaches can be used effectively to provide many solutions to urban issues in the city. The main recommendations are summarized below:

- ***Coordinate land use and connective infrastructure:*** Public land and properties could be used to promote investments, which would help encourage denser economic infrastructure investments within the city. An inventory of public holdings – land, administrative buildings and infrastructure, would be a first step to help set the tone to enable the development of efficient land and property markets. In parallel, efforts should also be made to implement the new legal frameworks put in place to ensure better land tenure and management, for instance, through the installation of local land commissions to help tackle uncontrolled land conversion taking place in peri-urban areas. To better connect people to opportunities, investments should be made in upgrading road quality and better managing public spaces. And finally, digital technologies should be leveraged to work with communities to better monitor and track accessibility changes.
- ***Finance and manage better public service delivery:*** To meet the growing needs for investments in public infrastructure, systems should be developed to increase the sources of own-source fiscal and other revenues at

the local level, through mechanisms such as increasing tariffs and taxes and national government transfers. At the same time, there should be a focus on reducing inefficiencies in the system – for instance, in the case of solid waste management, better placement of landfills and more opportunities for composting would significantly impact public revenues. And lastly, contractual arrangements can be organized better to maximize the incentives for public and private service delivery providers to increase access while recovering costs.

- **Invest in urban institutions:** Since much of current and future urban growth will spill-over to neighboring communes, systems and incentives for inter-jurisdictional coordination on planning for investments in infrastructure and service provision will be paramount. At the same time, institutional responsibilities across jurisdictions and between national and local levels need to be better clarified, and capabilities to implement the local administrative remit be reinforced. Citizen engagement and private sector can and should be leveraged as a crucial element of addressing urban infrastructure financing and governance, including using data and technology.

	Reform Institutions	Modify Policies	Invest & Implement
<b>Coordinate Land Use and Connective Infrastructure</b>	Inventory public land, buildings and infrastructure	Manage public spaces better, including road rehabilitation and maintenance	Implement new legal frameworks, for instance, through the installation of local land commissions
<b>Finance and manage better public service delivery</b>	Develop systems to increase its own-source fiscal and other revenues, such as through increasing tariffs, taxes, and national government transfers	Reduce inefficiencies in the system, for instance in the case of SWM building a landfill closer to the city and composting 50% of the organic waste within the city	Organize better contractual arrangements, to maximize incentives for increasing access and cost recovery
<b>Invest in Urban Institutions – Think outside the Box</b>	Develop systems and incentives for inter-jurisdictional coordination on planning for infrastructure investments and service provision	Clarify institutional responsibilities and reinforce capabilities at the local level	Leverage citizen engagement and competitive markets as a crucial element of addressing urban infrastructure financing and governance, including using digital technologies



## Coordinate land-use with connective infrastructure

**To help defragment Bamako, and to lay the foundations for a more compact city in the future, coordination between land use and connectivity will be critical.** Accessibility between people and jobs, and for more efficient service delivery, is a function not just of where people and employment opportunities locate, but also the ease of connectivity between them. Thus, policy makers must use both levers to influence the spatial form of Bamako in the future. This will require not only well-functioning land markets, on the one hand, but also planning for connective reforms and investments on the other.

**Public land and properties can and should be used to promote investments, including in economic infrastructure, which would also help generate revenues to government in a transparent way.** Real estate and asset management is a powerful tool in the city's arsenal, which can also set the tone to enable the development of efficient land and property markets. The first step would be to do an inventory of public property holdings – land, administrative buildings and infrastructure – which usually constitute the lion's share of local public wealth<sup>67</sup>. Government property holdings are often very large, and can directly impact the urban economy and the urban spatial form – for instance, an inventory of public property holdings revealed that the city of Warsaw, Poland (with a population of 1.7 million, similar to Bamako) held 11,312 government buildings and facilities and 10,000 shops of more than 1 million m<sup>2</sup>. An inventory of public land would also help identify pockets of land within the city where it would be possible to crowd in commercially-viable infill development by the private sector. And proper asset management can also result in huge public revenues and savings opportunities. An example from Kuwait City illustrates the magnitude of forgone revenues. Kuwait City leased nearly 600 hectares of land to citizens at low fixed rates – land which was immediately sub-leased informally to small entrepreneurs, with the rental revenues foregone by the city equivalent to about 1.5% of GDP, annually<sup>68</sup>. Such savings, could in turn, be used for much-needed investments in infrastructure assets for service delivery. A recent Public Investment Management<sup>69</sup> report by the IMF inventories assets for the central government, and could be used as a basis for a sub-national, Bamako-specific, assessment.

**The current focus on undertaking land reforms, aimed at better land tenure security and land management, is laudable and should be scaled.** Until recently, a main principle in Mali has been that land without a title is presumed to belong to the State. This remains a key principle - both the recent Rural Land Act (enacted in April 2017) and the State Land and Land Act under reform include provisions that could strengthen the recognition of land rights (including land use rights, particularly for agricultural lands), the process to improve

67 Capital assets can account for 66% (Los Angeles, USA), to 69% (Cape Town, South Africa) to 94% (Warsaw, Poland) of total assets (i.e. capital and financial). See Peterson, G. and Kaganova, O. (2010) 'Integrating Land Financing into Subnational Fiscal Management', World Bank Working Paper #5409.

68 World Bank (2003) Land and Real Estate in Kuwait: Market Analysis and Policy Implications

69 IMF (2017) Evaluation de la gestion des Investissements publics, Rapport d'Assistance Technique.

land tenure security, and land management. The reform of the legal and institutional framework that governs rural and urban land tenure aims to secure land rights while ensuring that land administrations are improved, and that revenues from land ownership and State property are mobilized. Three ongoing processes need to be kept in mind in the attempt to improve the land sector in the Bamako area: (i) the Rural Land Act which will apply to part of the greater Bamako, (ii) the State land and Land law reform (the State has a central role in urban areas to register and manage land), and (iii) the process of cadaster building which started in six communes in the Bamako District<sup>70</sup>. With these ongoing land reform processes, an important challenge for the Greater Bamako Area will be to clarify the scope of each law, i.e. identify where each will be implementable and how they will be coordinated. However, building a land cadaster, with the accompanying geographical information and legal frameworks, is a longer-term objective. The use of advances in digital technologies could be used to make progress on registration processes (see Box 5 below).

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<sup>70</sup> The enactment of the Rural Land Act, the adoption of the application decree (including the operationalization of rural local land commission), the amendment of the State land and Land Act, and the cadaster building process are included in a budget support of the World Bank.



## Using Blockchain to administer and manage land

Blockchain technology has the potential to revolutionize the way records or value, such as a land plot, are stored and transferred. Blockchain, as the name suggests, is a “chain of blocks”, where each block represents a record. This record could represent an asset like a land plot, an identity, or even a cryptocurrency. Blockchain is useful since it is – decentralized (processing takes place on several “nodes” or computers connected to the blockchain network decreases the transaction processing time and possibly, cost<sup>71</sup>), distributed (the data is spread across different nodes, increasing transparency and reliability and improving disaster recovery) and an immutable ledger (blocks are connected through a complex mathematical formula that is cryptographically secure, making it almost impossible to change a record in the past).

**Evidence from pilots indicates that blockchain can help to register land titles and transactions in a tamper-proof way.** This can be seen in the cases of the Bitfury pilot in Georgia<sup>72</sup> and the Consensus pilot with the Dubai Land Department<sup>73</sup> which register land titles and transactions respectively on a private blockchain. Blockchain can be very useful in low governance environments as time-stamped, tamper-proof transactions can be stored on a blockchain. This

could be used as a pilot to increase trust and transparency. The simplest application would be virtual notarization on a public blockchain accessible to all on the network. Instead of requiring a notary to certify previous ownership while transferring an asset, the blockchain can process the virtual notarization at a lower cost. While the public blockchain is more transparent and tamper-proof, a private blockchain pilot can also be useful if it comes with a stamp of approval of the government that would uphold the legality of transactions on the blockchain platform.

**However, blockchain requires certain “off-chain” conditions to function well.** For a blockchain-based solution for land administration to work effectively, accurate, digitized records are required<sup>74</sup>. This is what is behind the success of BenBen, a private company, in Ghana, that uses surveying and mapping techniques to obtain accurate field information before digitizing it on their platform. Once accurate, digital information is available, it is used for transactions<sup>75</sup>, which in turn has helped galvanize the use of land in commercial markets. It should be noted, however, that leapfrogging technology has much potential but only if major underlying legal problems are properly addressed.

71 The Internet of Value-Exchange, Deloitte Report: <https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/Innovation/deloitte-uk-internet-of-value-exchange.pdf>

72 The First Government To Secure Land Titles On The Bitcoin Blockchain Expands Project: <https://www.forbes.com/sites/laurashin/2017/02/07/the-first-government-to-secure-land-titles-on-the-bitcoin-blockchain-expands-project/#4feddb424ded>

73 Blockchain Virtual GovHack video: <https://www.youtube.com/watch?v=-yoWGwzKaxI>

74 Other constraints to be considered include the privacy of data, capacity related to understanding blockchain advantages and disadvantages, data storage, the recognition of customary ownership, and the legal recognition of transactions done on the blockchain.

75 World Bank Interview with BenBen team (April 2017).

**To ensure more sustainable urban development, certain additional land reforms should be undertaken in Bamako.** An important first step is the implementation of the new legal frameworks, already put in place. The installation of local land commissions in the Kati Cercle and the Koulikoro region, for instance, would help tackle uncontrolled land conversion taking place in peri-urban areas, which are still managed under rural rules for the most part. These local bodies could also help monitor and prevent unauthorized *lotissements*. A systematic inventory of public land should also include the validation of titles established in the name of the State. Improvements can be made in the methodology for the validation and conversion of existing precarious titles as well as for the prevention/resolution of land conflicts in urban areas – see an example of how this was done in Benin. For the Greater Bamako Area, the process will need to assess and make efficient use of the body of land information that already exists in the form of registries, plans and inventories at the local level (communes). Additionally, the new provisions will need to include a method and timeline for dealing with the accumulated inconsistencies in these records.



### The conversion of use rights to ownership rights (Benin)

In Benin, permits to occupy (*permis d'habiter*), albeit insecure, had become the key document to have for households wishing to access urban property. In the 2000s, 20 communes began piloting a large program of conversion to ownership titles based on the idea that the numerous urban permits to occupy that were initially considered transitional and temporary had become de facto permanent. Many of these permits to occupy are old and constitute the only documentation that bona fide occupants hold as evidence of their rights. Thus, in 2001, the Government in Benin initiated an operation to convert these permits

into title deeds. Although the program (supported by the Millennium Challenge Corporation) did not achieve the desired results and was much slower than anticipated in moving towards its target<sup>76</sup>, its implementation provided the following lessons: (i) the original idea of strengthening the rights of permit holders was sound; and (ii) this was an extremely ambitious exercise given the legal situation at the outset<sup>77</sup>, resulting in a lengthy and expensive process. Although measures have been taken to improve the timeframe and correct errors, many cases are still waiting to be processed.

<sup>76</sup> In 2009, the initial target of 30,000 title deeds was revised to 15,000 in view of the number of applications that were collected. In February 2016, 6,810 title deeds had been signed since the start of operations, and 4,016 title deeds collected by beneficiaries.

<sup>77</sup> It is not possible to describe here all the legal and procedural difficulties encountered under the Benin program. Note however that the main issues revolve around the legal and technical irregularities relating to parcel description; insufficient funding from the national budget, difficulties mobilizing support and senior staff in the administration; lengthy consultations on technical aspects of the procedure among stakeholders; basic errors in certain technical parceling documents;

**The link between land, taxation and urban infrastructure should also be strengthened.** Confusion over land rights confuses management of local land, making it difficult to use land to generate local resources for local governments. As in Box 6, Benin has tried to avoid the difficulties of setting up a legal cadaster, by relying on the presumption of ownership and occupant behavior. With the help of various donors including the World Bank, Benin also put in place urban land registers – a system for collecting and managing information about land parcels. It generates a map showing the location and addresses of parcels in the city and can be used to establish the tax base for urban areas. The database includes the identity of owners or tenants who are liable to pay taxes (land and non-land) and the characteristics of registered parcels. Although its primary objective was fiscal, the database is also supposed to facilitate land and urban management and provide a planning tool for local authorities (*communes*). The approach, however, faced various difficulties at the implementation stage given the lack of ownership and interest from the main stakeholders, especially the commune mayors.

**Better urban planning will also help remove barriers to private real-estate development.** Improving the land tenure system will be a prerequisite to ensure a more balanced development of the Greater Bamako Area. This, however, will not be sufficient and it will be important to support the coordination of the different authorities involved in the preparation and validation of urban plans. Given the large fraction of the city that will continue to grow informally, it will be important to have plans that will lay out the future grid of public infrastructure and ensure that urban expansion occurs in way that is consistent with these plans and that funding to support these investments is available (possibly through land taxation). Under an improved land tenure system and improved planning, an important focus will be to identify and have a due process to make land available for formal development consistently with plans for infrastructure provision and spatial urban development, and consistently with good principles of compensation of prior use of the land. The role of the private sector in the provision of affordable housing could also be expanded by reducing the barriers that hinder its development, especially through the stimulation of long-term finance.

**Better management of land will need to be integrated with reforms and investments relating to the transport system to ensure accessibility.** These can take many forms and do not necessarily require costly investments. Better managing public space can go a long way in increasing speeds as congestion stems in a large part from competing uses of constrained space for circulation. This encompasses several interventions aimed at preserving dedicated space for specific uses: i) sidewalks for pedestrians, ii) space for street vendors so they do not encroach on roads, iii) a parking management strategy to avoid parked vehicles from occupying street space, iv) segregated lanes for two-wheelers and as far as possible v) segregated lanes for collective transport buses couple with the creation of bus stops for Sotramas and other collective transport vehicles. In addition, road maintenance to fix potholes can also reduce localized bottlenecks, and rehabilitation or upgrading of the secondary roads network, through paving, could

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the lack of a reliable information system at the communal level and failure to change names in registers held by certain town halls; the fact that some of the plans and registers sent by certain town halls were unusable; at the end of the process, constraints associated with the formalities that beneficiaries had to complete to collect title deeds; and despite efforts to verify the data, the fact that some of the physical characteristics of parcels (boundaries, location) were still incorrect when the deeds were collected.

help reduce the traffic on the primary network and increase average speeds. While the road network coverage is within or above the regional average, lack of paving on the secondary and tertiary road links considerably reduces travel speeds, adds to overall congestion and isolates neighborhoods that are distant from main arteries from access to opportunities. Finally, setting-up and enforcing a functioning traffic management system would also greatly improve urban mobility.

**A focus for policymakers in Bamako, should be on improving the walking experience of people.** With such a large share of the urban population travelling on foot to reach services and opportunities (57% of the trips are made by foot in Bamako), it is indispensable to make sure they are safe. This implies a focus on better managing public space, including making sure that sidewalks exist and are not used for parked vehicles, thereby forcing pedestrians to slalom between obstacles.

**Bamako needs a strategy to deal with the travel of goods which competes for the limited road space and increases congestion in the city.** Recent decisions have limited the circulation of lorries to evening hours to limit the congestion in the city center and around the main markets. This has provided some relief in terms of daytime congestion but is no panacea as the immobilization of trucks and lorries remains costly. A more permanent solution might involve a combination of a ring road to bypass the city center and of logistic hubs or dry ports in the periphery of the urban area so that only goods destined for Bamako's markets need to be transported through the city.

**Understanding the failure of large bus companies in Bamako and the operation model of the Sotramas as a pre-condition for potential collective transport supply reforms.** Large buses have the potential to reduce congestion and be more efficient on main arteries of the urban area where demand is concentrated compared to Sotramas. That is because larger buses, when full, occupy less road space and consume less fuel per passenger. Sotramas could complement the large buses by acting as feeder buses or by serving areas that have lower demand density. However, Bamako has a long history of introducing large buses going back to 1960 (Tababus, Bamabus, Diarra Transport) but all these experiences have failed. It is important to understand the reason for these failures and in parallel to understand the reasons for the resilience of the Sotramas in Bamako's mobility landscape. This stocktaking would shed light on whether there exists a potential for larger buses to circulate on the main arteries of the urban area and what the conditions for success are. In fact, using digital platforms, motorcycle taxis have the potential to transform the 'last mile' experience for commuters in Bamako – see Box 7.



## Motorcycle taxis - a safe, convenient and affordable alternative to Bamako's existing transport options

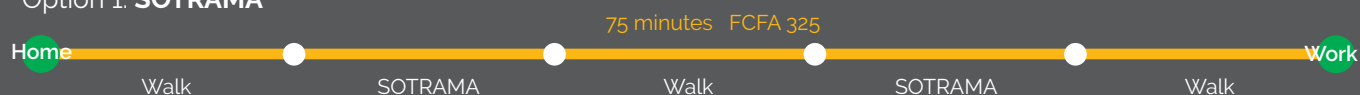
As Bamako's population grows and its suburbs swell into the surrounding hinterland, the city's road network is coming under increased pressure, especially when it comes to the public transport and the estimated 600,000 daily commuters. Regular taxis are too expensive for the average commuter and the main alternative, SOTRAMA or vans for public transport, are uncomfortable and slow. Considering the rising popularity of motorcycle taxis in many African cities facing the same urban mobility problem, CFAO Motors, Toyota's African subsidiary, decided to conduct a market analysis to see if a motorcycle taxi service was feasible in Bamako. After months of field studies, the company concluded that there was large market potential for a safe, convenient and affordable alternative to the existing transport options. The WBG helped

bring together this multinational corporation and Mali's nascent tech sector and startup ecosystem, by organizing a hackathon. The result was Teliman, an on-demand transport mobile app startup, which has raised \$1 million from CFAO and local angel investors to date. By combining old and new business models, Teliman and CFAO are hoping to both secure a supply of trained and professional drivers and stimulate demand via a convenient app, high-quality service and easy mobile payments. In April 2018, Teliman will launch its first 20 drivers, using them as a prototype to show that the model is profitable and safe, not only to customers but also to potential drivers. By December, a fleet of as many as 250 drivers could be on the road, with another 1,250 planned by the end of 2019.

*Value for money using Teliman in Bamako: 5 times faster than Sotrama and 4 times cheaper than taxis*

*Moussa lives in the Badalabougou area. Every day, he makes a six kilometers trip, usually at rush hours to get to work at Orabank HQ, in ACI 2000.*

### Option 1: **SOTRAMA**



### Option 2: **Taxi**



### Option 3: **Teliman**



**Bamako also has an opportunity to utilize digital technologies to work with its communities to better monitor and track accessibility challenges.** The absence of reliable statistics on urban transport is often a big constraint in low-income cities, and Bamako is no different. Without such monitoring and tracking exercises, the formulation of urban planning and transportation policies and considerably hindered. Travel surveys<sup>78</sup> are the traditional way of understanding mobility patterns in urban areas – but they can be expensive and time consuming to conduct frequently as they require the hiring of large teams of surveyors. Recent technological advances are beginning to make some headway on collecting useful information at a fraction of the cost. For instance, using anonymized information associated with the usage of mobile phones (referred to as Call Detail Records) sheds light on the location of jobs and people in the urban area, and even travel times. Other initiatives have focused on understanding the supply of collective transport for example for para-transit which is often not well understood<sup>79</sup>. Mapping these routes and collecting travel times and fares in the form of a publicly available and standard format<sup>80</sup> can provide critical information on those urban areas which are under-serviced. Finally, new smartphone applications can register the quality of roads with precise coordinates that can help identify the most pressing needs in terms of road maintenance.

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78 Travel surveys usually record origins and destinations of the travelers, frequencies of trips, transport modes, travel times and spending.

79 See The Digital Matatus project for example: [http://www.digitalmatatus.com/intro\\_lite.html](http://www.digitalmatatus.com/intro_lite.html)

80 Over recent years many formal transit agencies (and in some cases informal operators) have adopted the General Transit Feed Specification that defines a common format for public transportation schedules. This common format allows for rapid assessment and comparison of transit networks across cities.





## Using mobile phone data to understand mobility patterns – learning from Haiti

**Working in data scarce environments often requires more innovative sources of data and information.** To understand accessibility challenges information on the location of jobs in relation to that of people is needed. In Haiti, however, the latest census was carried out in 2003 and there was no business registry. To breach this data gap a World Bank team turned to cell phones. It partnered with Digicel – the largest cellphone provider in Haiti, and with Flowminder, – an NGO with vast experience on cell phone data analysis for development purposes, thus with multiple stakeholders, alongside government, to handle highly sensitive data. The rich set of information provided by individuals as they use their cell phones, combined with machine learning techniques, allowed the team to get a sense of where people live and where they work, key information for city planning.

**Cell phone data allowed extracting information on where people lived and where they worked.** Using the Call Details Records (CDR) over a 3-month period, the first step is to understand people’s “meaningful locations”, that is locations that structure the ordinary day of the cell phone user. The approximate location of a user at the time of a call can be ascertained based on the cell phone tower that she is connected to. When calls are placed from a given location (or

locations close to each other) repeatedly over a 3-month period, this location is deemed to be “meaningful”. The second step of the analysis is to determine whether these locations correspond to “home” or work “locations”, the two places where people are likely to spend most of their time. To label the locations as “home” or “work”, a scoring criterion is employed based on the time of day and the day of the week at which calls are placed. The underlying assumption is that most people spend much of their morning and evening hours at home and some time over the weekend. Conversely, they are likely to spend a larger part of their weekday daytime at work.

**Understanding flows within the city allowed for better urban planning, including for natural disasters.** By getting a sense of where people live and where they work, the World Bank team could understand flows of people within the city’s network. This was combined with information on natural hazards, such as flooding, to identify the most critical links in the transport network – those that if affected by a natural disaster would impede access to jobs. Thus, starting from a situation of data scarcity, mobile phone data shed light on the location of the main job centers in the city, on the most common trips, and the most critical links of the transport network, when flooding risks are taken into account.

## Finance and manage better public service delivery

**Capital and operational investments in Bamako's urban infrastructure lag far behind those in other low-income cities and countries.** Mali will need to contend with 400,000 people migrating each year to urban areas. Beyond land and housing, these people will require access to basic urban services, notable among these is waste collection and disposal. As highlighted earlier, given the rates of urban population growth in Bamako and its neighboring areas, the generation of solid waste in the Greater Bamako area is expected to grow exponentially.

**The contractual arrangements for managing solid waste are somewhat muddled and provide weak incentives for efficiency.** The contracts with Ozone and the GIEs are currently under renegotiation, with the process led by the Government and the District of Bamako. Two key issues are at the center of the discussion: (i) how should annual tariff revenue be collected, and ii) what should be the formal business relationship between Ozone and the GIEs? Under the current system, all revenue is collected by GIEs directly from households, and GIEs operate independently of Ozone. Under the new system, it is proposed that a FCFA 3,000/concession/month tariff will be collected by 165 collection workers who currently collect the FCFA 3,000/year/adult local development tax for the district. These funds will then be remitted to Ozone, which will in turn will pay the GIEs, either as employees or sub-contractors. However, under this system, the proposed tariff will only cover the operational costs of the GIE, and very little of the costs required to pay Ozone – leaving a US\$ 16.6 million deficit. The new system would not address the existing operational deficit. It would also add multiple intermediaries between the GIEs and their customers, potentially threatening the economic viability of the GIEs themselves, and thus the entire pre-collection system.<sup>81</sup>

**This section will outline strategies to simultaneously mobilize resources and reduce inefficiencies in the sector, and for better contractual management, aimed at improving service delivery.** Although the focus is on the solid waste management sector, many of the recommendations and learnings also pertain to other sectors such as water, sanitation and others.

### *How to mobilize more revenues for investments?*

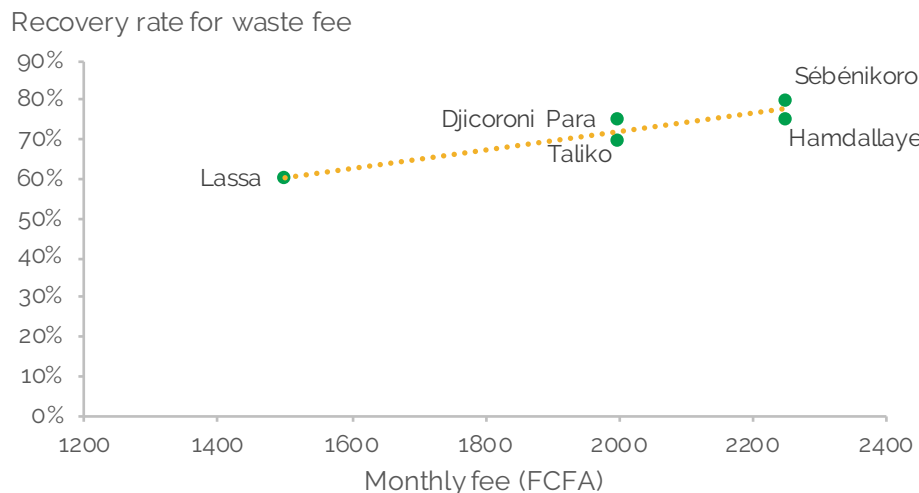
**Bamako must develop systems to increase its own-source fiscal and other revenues.** These could be to better finance recurrent costs to serve a growing city, but also to be able to pay for development outlays to invest in the future. In the case of solid waste management, there are three possible ways for the city to mobilize additional revenues – some involve tinkering at the margins, while others will require large scale reforms.

- *Increase tariffs:* The tariff for waste collection should be increased from 3,000 FCFA/plot/month to 3,000/household/month. Since there are an average of

<sup>81</sup> This is for two reasons: (i) Ozone may delay payments to GIEs, to cover missed payments from the city, and (ii) GIEs will no longer be paid by those who directly observe quality of service, and so have reduced incentives to perform.

2.1 households per plot (see DRPSIAP/DB, 2014)<sup>82</sup>, this would more than halve the operating deficit, generating an additional US\$ 10.5 million in revenue, and reducing the deficit to just US\$ 6.2 million annually. There is evidence (Arterlia 2015)<sup>83</sup> that willingness and ability to pay among many households may be even higher - some households currently pay 5,000 monthly, and anecdotally some GIEs report collecting as much as FCFA 10,000 monthly per plot from larger waste producing households. Figure 37 shows current tariffs and recovery rates reported by GIEs<sup>84</sup> for five neighborhoods in Commune IV. If all households had the same willingness to pay, one would expect this curve to slope downwards. Instead, it slopes upwards, as households in Sébénikoro and Hamdallaye are both willing and likely to pay more. Thus, to maximize revenues, any new tariff regime should continue the differential-pricing business model employed by the GIEs. In addition, a system in which GIEs are empowered to charge based on weight (for instance by requiring that disposal only take place with authorized bags) would also help standardize such a business model across households.

Figure 37. Higher tariffs do not necessarily imply lower recovery rates



Source: Coordination des Partenaires intervenant dans l'Assainissement (CPAC) en Commune IV

- **Tax Plastic:** There is evidence indicating that taxes on importers and producers of plastic to cover waste management costs can be an effective policy. Under conservative assumptions, a value tax at 5 FCFA/plastic bag could yield an additional US\$ 1.7 million in revenue, reducing the deficit to US\$ 4.5 million<sup>85</sup>. Such initiatives have been successful in Morocco (under the label of ecotax),

<sup>82</sup> Direction Régionale de la planification de la statistique et de l'informatique de l'aménagement du territoire et de la population du district de Bamako (DRPSIAP/DB), (2014) « Annuaire Statistique du District de Bamako : Année 2014 ». The increase in revenue would come from billing per household rather than per plot. As there are more than two households per plot, the revenue would potentially increase correspondingly.

<sup>83</sup> ARTELIA (2015), « Étude des aspects organisationnel, institutionnel et tarifaire liés à l'assainissement urbain : Diagnostic Institutionnel et Organisationnel Volet Stratégie De Gestion Des Déchets Solides de Bamako »

<sup>84</sup> Small collection companies - *groupements d'intérêt économique*.

<sup>85</sup> This calculation assumes 500,000 bags/day consumption. According to UNCTAD data, Mali imported \$74.5 million in plastic and articles thereof in 2014. A 5% tax on this would yield a greater

where a special account was established to ring-fence revenue after collection by customs. Other West African countries have instituted or are establishing similar measures (e.g. Senegal, Benin) and the cost-benefit and social acceptability should be explored further for Mali.

- *National Government Transfers:* Another option would be for the national government to provide an annual transfer to the city to cover the remaining deficit. Such a scheme has been established successfully in Tunisia, where the government has established a dedicated fund which pays cities based on the quality of performance. Establishing such a system would require further expansion of the city's capabilities to monitor waste collection quality (i.e. collection rates) and the extent of enforcement of unauthorized dumpsites. Given political economy concerns associated with raising tariffs at the household level, a standing government transfer may be required to cover costs in the near term.

### *How to reduce inefficiencies in the system?*

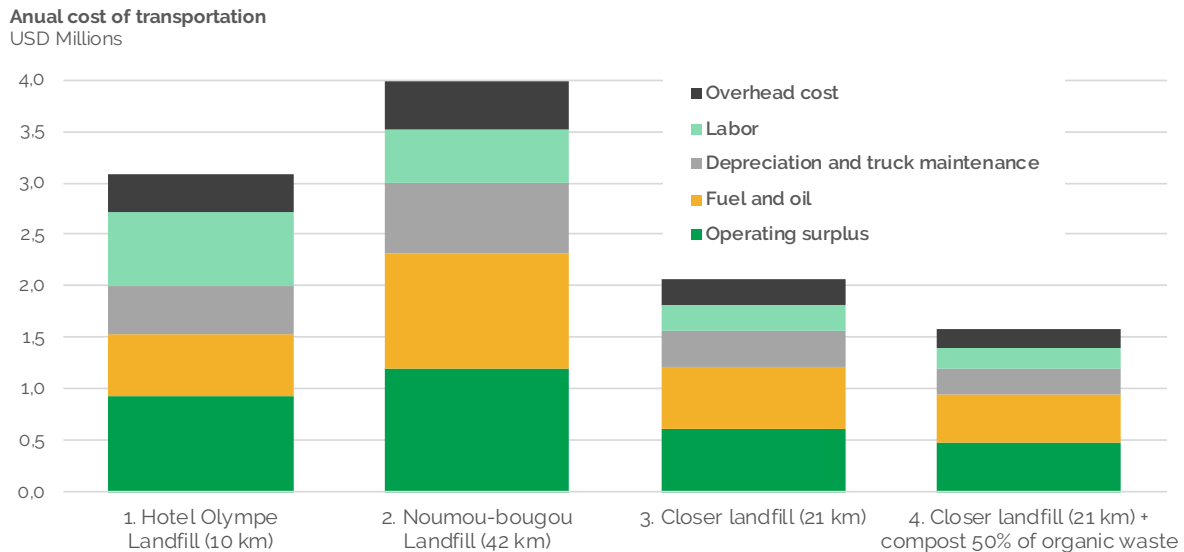
**Bamako should also focus on the efficiency and opportunity costs of local government expenditures.** Although a focus on increasing revenues is important, local governments can also focus on better management of their expenditures. Thus, an alternative approach to reduce the operating deficit is to reduce costs. While the best options available achieve only small savings relative to the overall deficit, the low investment costs associated with them suggest that they are likely still positive net-present value investments and should be considered. Two options are most promising:

- *Study feasibility of constructing a new landfill, nearer to the city:* A substantial share of the total costs (US\$ 3.1 million, or 18%) borne by Ozone – the firm currently contracted to collect waste in Bamako – are estimated to cover the fuel, labor, maintenance, depreciation and overhead associated with transporting waste from transfer depots to the final dumpsite, currently the *Hôtel Olympe* site within the city. These costs are high in part because of a lack economy of scale, as Ozone uses smaller capacity trucks (i.e. 7 m<sup>3</sup>). Given that the alternative site – the *Noumoubougou* landfill – is quite far (42 km) from the city, and even assuming larger trucks can be used (say, 24 m<sup>3</sup>) to achieve more economies of scale, it is expected that transport costs will increase to US\$ 4 million once the site is in use. This difference is observed when comparing Options #1 and #2 (see Figure 38) which shows a breakdown of transport costs under different scenarios. Building a landfill nearer to the city in the identified site in Dialakorobougou, shown under Option #3, at just 21 km away, or half the distance, could reduce costs relative to Option #2 by US\$ 1.9 million annually. With the costs of a sanitary landfill approaching US\$ 8-9 million, this implies a pay-back period on such an investment of just 5 years when valuing the savings in transport costs alone. Such a payback period means such an investment would have positive net-present value, even at a 20% discount rate. From an environmental perspective, opening an additional landfill would also allow to definitively close the active (*Hôtel Olympe*) and closed (*Doumanzana*) non-sanitary landfills within the District and this option should be studied more closely.

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amount, \$3.7 million, but would also be difficult to justify since not all articles of plastic are disposed of as consumer waste.

Figure 38. Annual costs are expected to increase by \$900,000 if Noumoubougou is used (Scenario 2), whereas the use of a nearer landfill and a composting program to reduce waste volume could reduce costs relative to scenario 2 by \$2.4 million



SOURCE: World Bank staff calculations. Overhead is assumed to be 20% of depreciation, fuel and labor costs, and the profit margin is assumed to be 30%. Labor costs are higher under Scenario 1 because smaller capacity trucks are assumed to be used for disposal within the city. Ozone currently has fewer than 5 working trucks with capacity of 24 m<sup>3</sup> that are assumed to be used for transport in scenarios 2-4.

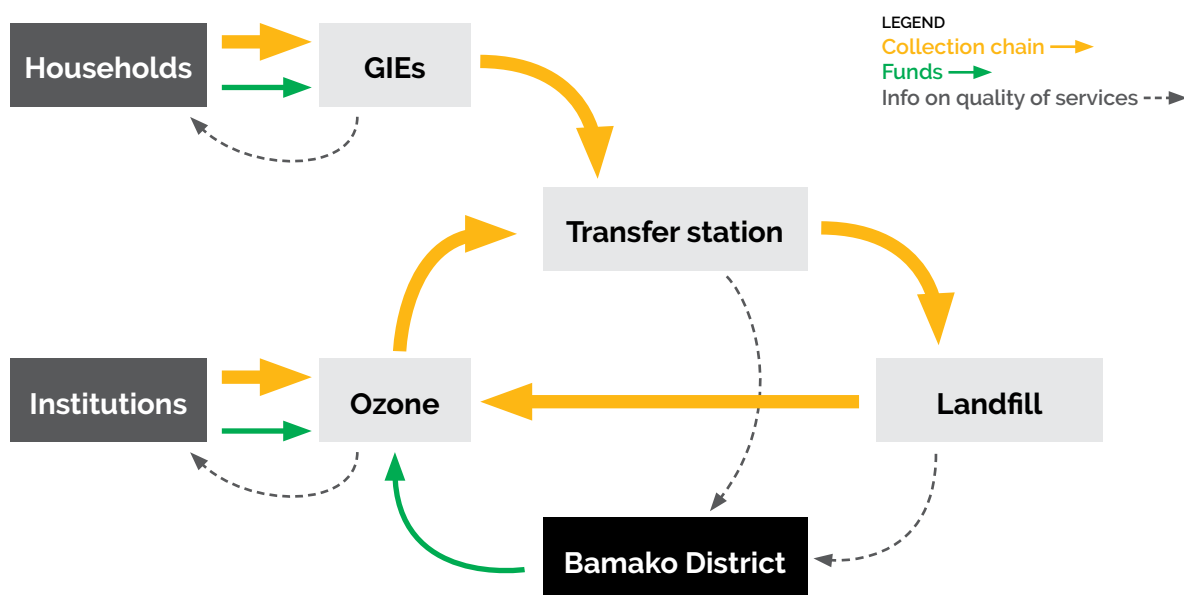
- Compost 50% of organic waste within the city:** While recent waste composition data is not available for Bamako, according to Bhada-Tata and Hoornweg (2012), typically 50% of waste in Sahelian countries, and indeed across Africa, is biodegradable. A scheme to compost 50% of organic waste within the city would reduce the volume of waste shipped to landfills by 25%. As shown in Option #4, this would reduce annual transportation costs to \$1.6 million, saving \$0.5 million annual relative to Option #3. Given these savings, investment in a city-wide composting program should be explored. Commune VI currently operates a small-scale composting operation led by a GIE that sources organic waste from ~100 plots, mixes it with animal manure at a 50/50 ratio, and then sells on the compost to horticulturalists in the city. Initial reports suggest that to fully equip the operation would include investing in a crusher to grind the compost, rehabilitating storage space and a covered work area, and adding piped water, a crucial input into the process. This would probably amount to an investment of approximately FCFA 10,000,000 (~US\$ 19,000) per operation, which is not large given the savings from reduced transportation costs. It is likely, however, that some operational subsidy will be required on an on-going basis to sustain the business. Managers in Commune VI reported that they currently rely on the unpaid labor of approximately 20 women for operation. To pay them wages (which @ FCFA 70,000/month would equal ~US\$ 31,000 annually) does not appear possible under current margins, which are very thin. Such a subsidy, however, would still be small relative to the savings from

reduced transportation costs. Further benefits from increased female employment will also increase returns.

### *How to better organize contractual arrangements?*

**Bamako should consider a contractual arrangement in which operators are paid based on performance, by those who observe their performance directly.** The current contractual arrangement in which GIEs are independent and collect fees directly from households satisfies the theory of contracts<sup>86</sup>. As contractors add more customers, thus increasing the collection rate, they capture any new fees associated with that effort. And households can directly verify the performance of GIEs. Under the new, proposed arrangement, GIEs would be paid directly by Ozone and it is not clear how their performance would be tied to pay, since Ozone has no direct way of measuring whether a GIE collects waste from a given household. Further, under such a system, willingness to pay by households might also fall since the link between payment and service would be less clear.

*Figure 39. Under the ideal contract, operators are paid based on performance, by those who observe their performance directly*



SOURCE: World Bank staff

<sup>86</sup> The theory of contracts underlies two basic principles of an optimal contract: (i) The contractor (i.e. the person doing the work) should be a “residual claimant” on his or her marginal effort. Specifically, this means he or she should receive 100% of the value from any additional effort, so that he or she has a complete incentive to work hard (ii) Performance under the contract should be verifiable by the payer, so that the payer can indeed pay the contractor extra if he or she does works hard. For further detail see Bolton and Dewatripont (2005).

**Figure 39 illustrates an alternative contractual arrangement, which would maximize incentives for collection and payment.** Under such a system, GIEs would continue to collect revenues directly from households. Ozone would collect some revenues from large institutional producers, and be paid directly by the city based on its performance in evacuating transfer depots (which is currently being monitored by DSUVA). Under this system, there would be a clear link between performance and pay for each party. Further investments in performance monitoring capabilities would make such a system more viable. Implementing such a system, however, would require sourcing additional revenue for the city to pay Ozone.

**To collect higher tariffs to cover the operating deficit a license fee model for the GIEs could be considered.** To increase revenue and to allow GIEs to continue to collect fees directly from households so that they are fully incentivized to deliver services, the following scheme should be considered. In exchange for the right to operate and collect fees, GIEs would pay an annual license fee to the district equivalent to 50% of 3,000/plot/month for all households in their quartier<sup>87</sup>. To keep their existing profits, GIEs would need to double collection, raising an estimated US\$ 4.9 million. After paying the fee to the district, all profit from marginal effort would go to the GIE, and households (those who observe the quality of service) would pay for the service. Further, the city would not need to invest additional resources in collecting revenues from households. Such a scheme has been successful in Liberia in raising additional revenue for the city. Designing such a scheme would require careful design of the license fee structure so that GIEs remain economically viable and are able to generate jobs for youth (see Box 9 on the experience in Conakry).

**To further incentivize GIE participation, in exchange for the license, the government could also develop funding mechanisms for GIEs seeking to improve their equipment.** Estimates by COGIAM suggest that 112 GIEs need tractors to upgrade their businesses and collect more waste. At FCFA 11.75 million per tractor, this implies a total cost of FCFA 1.3 billion (US\$ 2.5 million), a relatively small amount given the potential for improvement in service delivery. The capital cost associated with guaranteeing loans for this amount from banks would be lower. A guarantee scheme may be preferable to current proposals to capitalize the GIE, which involve Ozone purchasing these tractors and lending or giving them to the GIEs. If the GIEs are full own the tractors, and, through fee collection capture all the marginal value created, they will be best incentivized to maintain the equipment. Currently, however given outstanding arrears currently, Ozone appears unwilling to capitalize the GIEs. Any guarantee (or directly lending) scheme to finance tractors for GIEs would have to be negotiated carefully with the GIEs, to ensure that the license fee charged did not hinder their ability to cover loans to finance tractor purchases.

**An experimental approach could be used to identify which contractual arrangements work best to deliver quality of service and increase revenue collection.** The arguments above rely on economic theory, and the performance of different contractual arrangements may vary in the real world. As the city considers how to move forward with the GIEs and Ozone, it could take an

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<sup>87</sup> This scheme is equivalent to a franchise fee in industrial organization: In order for the right to operate, the franchisee pays a fee to the franchiser, but keeps any additional profit from the business beyond that fee.

experimental approach in which it pilots certain contracts with subsets of GIEs. For instance, 60 GIEs could be selected to continue operations as is, 60 could be selected to operate as employees of Ozone and 60 to operate under a license fee arrangement, as described above. If the GIEs were selected randomly, as in a randomized control trial, performance and revenue collection outcomes could be compared across groups to identify which contract performs the best. Once this is known, the optimal contract could be scaled to the city.





## Building and maintaining a solid waste system – ups and downs in Conakry

**Good SWM results were achieved through long-term engagement and strengthening SMEs.** Guinea has a long history of improving waste collection. The World Bank supported this process through a series of three Urban Development Projects, which laid the foundation for a professional collection service through comprehensive support to urban management and SWM in particular, which included capacity support to SMEs carrying out primary collection and establishment of an SME equipment financing fund, institutional strengthening of the municipal SWM department, construction of transfer stations, upgrading of secondary roads to facilitate access for waste collectors, a large communication campaign, and implementation of a street addressing system which helped keep track of the customer base and collection zones.

**High collection rates through a two-tiered system.** The system allowed a full coverage of the city and 85% of solid waste was disposed at the landfill, a very high rate by regional standards. The overall sanitary conditions and habits of residents improved. Household waste was collected by 35 SMEs (14 led by women) in the 44 collection zones of Conakry that had been identified by using the street-addressing database. The SMEs collected payments from about 115,000 households (a 73% subscription rate). The municipal waste department transferred waste to the landfill by container trucks and the transfer stations were monitored to keep track of performance in each link in the collection chain.

**Creation of a new sector of the urban economy and job generation.** The SWM industry generated about 3,300 jobs and the total annual turnover of the SMEs was about US\$415,000, or about US\$1,000 per SME, at an affordable subscription rate of US\$ 0.375-US\$ 1.15 per month per household. The construction of transfer stations helped to improve profitability for SMEs since it reduced the average distance between households and transfer stations.

**Political crisis and departure from established principles led to decrease in system performance.** The advent of the socio-political crisis experienced by the country between 2009 and 2011 had as a side effect a reduction in the city's capacity to ensure transport of waste from transit stations to the landfill and broke the trust between the SMEs and the customers, since the waste collected was no longer removed regularly from transfer stations. A complete privatization of the collection chain decided by the Government in the aftermath of the crisis was not based on a sound preliminary analysis of the technical and organizational prerequisites, the financing needs, and the incentives for results. Due to the lack of clarity on the organization of the collection chain in the new format the lack of oversight and regulation of the private sector provider, the collection rate decreased to 27 percent by the end of the project.

Sources: World Bank (2007), 'Third Urban Development Project', Project Appraisal Document, PO91297, Washington DC: World Bank.

World Bank (2013), 'Third Urban Development Project', Implementation Completion and Results Report, PO91297, Washington DC: World Bank.

## Invest in Urban Institutions – Think outside the Box

**Adequate capabilities for planning are required for effective provision of services, not least in the expansion areas of the District.** As noted by Lall et al (2017), *“urban planning and land use regulations are central for enhancing urban connectivity, productivity, and livability because of externalities and coordination failures. [...] Well-functioning cities require that economies of scope and complementarities be leveraged in the provision of physical infrastructure”*<sup>88</sup>. While urban local governments in the Greater Bamako Area have (also partly outdated) spatial plans, in the absence of an integrated plan for the metropolitan area, the only plan to guide the development of the District is the Social, Cultural and Economic Development Plan that is mandated for all local governments. This document does however not contain any spatial vision or provisions for land use. No detailed study has been done for land consumption on the fringes of the Bamako urban footprint, but evaluation of larger secondary cities in Mali displaying population trends like Bamako (Kayes and Sikasso) have shown that land set aside for urban extension over the 20-year duration of the urban plan was consumed after 5 years<sup>89</sup>. The challenges associated with land use and urban expansion (outlined earlier) will only be exacerbated by the lack of capacity to plan urban development and provide services in the District and its extension areas in a coordinated manner. The Greater Bamako Area needs an urban structure plan that clearly delineates priority development areas and can serve to align investments to these objectives, e.g. densification in the center and along transport corridors through road paving and specification of areas for provision of water and electricity.

**Institutional responsibilities should be clarified and capabilities at the local level should be reinforced.** In Bamako, there is much room for the mayors of the District and the neighboring communes to better utilize their mandates effectively, given that sub-national government is developing serious teeth<sup>90</sup>. At the same time, institutional mechanisms are needed to clarify responsibilities and to help coordination<sup>91</sup> – between the local governments, and with the national government. There is very little capacity at the local level, which lack resources and staff - the total number of urban planners in Mali is 20, or 0.13 per 100,000 people (compared to 0.97 across Africa)<sup>92</sup>. The District of Bamako and neighboring communes must invest in their capability to address regulatory and investments needs associated with larger development challenges.

88 Somik Vinay Lall, J. Vernon Henderson and Anthony J. Venables: Africa's Cities. Opening Doors to the World. World Bank Group, Washington DC, 2017, p.131.

89 Projet d'Appui aux Communes Urbaines du Mali: 'Evaluation de schéma d'urbanisme de la ville de Kayes et environs', 2014 and Evaluation de schéma d'urbanisme de la ville de Sikasso et environs', 2014.

90 This is owing to regionalization and the drive to devolve public resources to sub-national government, both being part of the political deal made to gain peace in the north.

91 For instance, in the land sector in Mali central authorities continue to initiate lotissements when the law stipulates the mandate falls to the communes.

92 Authors' calculations based on: The State of Planning in Africa. African Planning Association and UN-Habitat, 2014.



## Less is More – strengthening municipal capabilities in La Paz

**In the early 1980s, the capital city of Bolivia, La Paz, was in shambles**—the national fiscal subsidy to the city had collapsed, the city payroll represented 120 percent of local revenues and services were in disarray. The city systems for public works, tax collection, permits and licenses, payments, and procurements were overstaffed, hugely inefficient, and a goldmine of corruption.

**La Paz managed to attract and retain high-quality professionals for better service delivery.** In 1985, with a new administration, the city embarked on a project to modernize and rationalize the city administration, streamline staffing, and reform procurement practices, including by outsourcing public works. Besides providing a timely infusion of investment funding and technical assistance, the project included a novel feature that proved essential to the success of the reforms: a grant component of US\$ 1 million that was used to top-up the salaries of high-quality staff recruited for key positions, while some 40 percent of the existing municipal personnel were let go. The grant permitted this critical step to be initiated, but, after the first year, improvements in fiscal administration, coupled

with the personnel restructuring, permitted the city government to cover the new payroll from its own revenues, without further external assistance.

**The reforms in staffing and remuneration of key positions were accompanied by sweeping changes in systems and procedures** affecting public works (for example, privatization of the city construction company), procurement (cutting down the 26 steps previously required), tax collection (reducing the number of municipal taxes from 126 to 7), and public information (for example, advertising the requirements to obtain a license). For the first time, citizens were asked to be part of an effort to improve the quality of municipal services. These measures had the salutary effect of dramatically drying-up much of the worst corruption affecting the city government.

*Sources: World Bank (2006), *Infrastructure at the Crossroads: lessons from 20 years of World Bank experience*, Washington DC: World Bank, pp. 94-95; using “Municipality of La Paz” Case Study for the Kennedy School of Government, Harvard University, by WBI.*

**Viewed from any perspective, the six communes and the District of Bamako need more financial resources to fund both their regular service delivery mandates as well as some of the growing infrastructure needs of the city.** There are two main sources of revenue available to Bamako’s local governments:

**Increasing own-source revenues (OSRs):** OSRs are either collected by the national tax directorate (on behalf of local governments) and then “shared” or wholly allocated to the District and communes or collected directly by local revenue administrations. In the short term, the scope for improvements in revenue administration is probably greatest with respect to the latter, where the District and communes have more room for maneuver. Here a range of options exist (many of which have been piloted in Mali or elsewhere) to improve revenue ad-

ministration and thus to increase revenues: modernizing tax assessments/censuses by using new technology, introducing better and more comprehensive billing systems, making payments easier. Where revenues are collected by the national tax directorate (or its local offices), the District and communes still have a role to play by assisting in the identification of tax-payers and in tax collection, and – most importantly – in working actively to promote “willingness to pay” (by being as transparent as possible, delivering services, and the like). In the medium term and strategically, own-source revenue arrangements in Mali (and thus Bamako) would clearly benefit from serious reform, as highlighted by numerous technical reviews and assessments. Much of this is well known in Malian policy circles; but to date, reforms have been slow in taking off.



## Improving local government own-source revenues in Mali – what the IMF says and recommends

**Local government own resources are limited.** Their own resources are broken down into extremely diverse categories of revenue (tax and nontax). However, the corollary of that diversity is that revenue levels are very low. On the tax revenue side, there are no less than 21 different taxes and levies ... of which 3 (the business license tax, the local development tax, and the tax on wages and salaries) represent 77.3 percent of the total revenues collected in 2012, while 12 others represent just 3.4 percent of this total. The findings are similar for nontax revenues (revenues from land services and miscellaneous sales). More than 80 percent of nontax revenues collected by the local governments related to 13 categories of revenue in 2012, while 30 other categories represented 1 percent or less of total nontax revenues. This fragmentation is a source of complexity and bureaucracy in the collection of revenues and helps to explain the low productivity of local governments' own resources.

**The local taxation system is cumbersome.** There is some disorganization in the process for the assessment and collection of local taxes and levies. The weaknesses [include] poor management of the tax rolls, insufficient coordination between units, insufficient material, human and

financial resources in the assessment and collection units, contradictory role of elected officials in the collection of local taxes, insufficient motivation of officials, and tax avoidance.

**There is significant room for improvement in local taxation.** The Malian government is considering various areas for improvement [such as]:

### Streamlining taxation:

- Review numerous existing taxes against their revenues and costs, and eliminate unprofitable taxes in order to concentrate on profitable ones (taxes on: business license, local development, and salaries);
- Expand the tax base of the local governments;
- Identify and list new taxpayers;
- Reconsider the base for the regional tax for local development (move from a per capita tax to a property tax in urban areas only);
- Subject to the establishment of reliable property registries, create a property tax.

Source: IMF (2015): *Mali – Implementing Fiscal Decentralization*

**Transfers from the central government:** Grants and transfers from the central government to the District and communes of Bamako are already a significant source of total revenue. However, a good proportion of those transfers appears to be earmarked for specific sectors; the use of those funds is not left open to local discretion. The central government also provides capital grants (in the form of “drawing rights”<sup>93</sup>) to local governments through ANICT (*Agence Nationale d’Investissement des Collectivités Territoriales*), funding for which is largely provided by development partners. In 2016, ANICT made CFA 22.7 billion (roughly US\$ 42.5 million) worth of investment drawing rights available to all local governments in Mali. ANICT, however, is intended to be a nation-wide system, with a mandate to ensure that investment grants are allocated on an equitable (or equalizing) basis across the country. As a result, the combined 2016 drawing rights for the District and communes of Bamako amounted to around US\$ 4.4 million, representing a little over 10% of the total ANICT allocation for investments, even though their combined population makes up around 14% of the country’s total population. ANICT, understandably given its equalization mandate, does not factor in the high cost of urban infrastructure investments nor the wider economic spillovers from infrastructure investments in Bamako. Nonetheless, an adapted “urban” form of ANICT (or a special urban funding window within ANICT) might provide Bamako’s local governments with access to greater levels of investment capital.

**A final issue that merits consideration is the need to encourage more efficient public spending by the District and communes of Bamako.**

As mentioned earlier, the District and communes spend most of their budgets on recurrent items, and especially on payroll costs. Although well beyond the scope of this review, it is more than likely that some of this recurrent spending is either wasteful or un-warranted. The District and communes could be incentivized to review and reduce their recurrent expenditure, by making additional or future investment grants conditional on such actions.

**There is an urgent need to develop systems and incentives for inter-jurisdictional coordination on planning for infrastructure investments and service provision.** Bamako is becoming integrated with Kati and Koulikoro into a multi-city agglomeration, which entails specific governance and coordination challenges at the regional level. Municipal waste, an important by product of an urban lifestyle, is an excellent illustration of the need for inter-jurisdictional coordination. Solid waste management in the Greater Bamako area requires coordination between the district of Bamako and the surrounding communes, which would help generate economies of scale in collection and disposal, including the development of projects such as biogas or landfill gas electricity generation facilities. The lack of clarity of responsibilities has been reflected in the failure to coordinate planning for the provision of this crucial service.

**The multitude of stakeholders make collaboration difficult, but still possible.** There is a history of failure to reduce the institutional overlaps in Mali. The Bank-funded Urban Local Government Support Project was restructured when the expected administrative integration of the District and the six communes, for which legislation was being prepared in 2009, did not take place and

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93 ANICT’s drawing rights are not, strictly speaking, grants. In order to use their drawing rights, local governments must submit investment proposals, which may or may not be accepted by ANICT. In practice, then, Malian local governments often do not use their full drawing rights.

support to the process was no longer relevant. However, both the local government law and the urban planning law allow for horizontal and vertical collaboration across local and national governments. Disparate coordination attempts have been made and the lessons learnt from these experiments could be the precursor to single-purpose districts. To exemplify these problems and show the potential benefits of coordination, the delivery of solid waste management services taken as a case in point.



### **Box 12. Metropolitan Governance Arrangements – from voluntary to consolidated**

**Various institutional approaches have been identified to assure governance of metropolitan regions.** Each have advantages and disadvantages and the historic trajectories are often major determinants of success. When local governments join forces on opportunistic basis this can result in “asymmetrical” arrangements, where service provision is provided or coordinated differently in different sectors, to make jurisdictional spillovers work for a given service. Most forms of collaborative governance arrangements are horizontal, but more vertical arrangements also exist.

**Inter-municipal cooperation mechanisms.** These arrangements may take various temporary forms (committees, working groups) or more permanent networks, associations, and consortiums. Cooperation can concern a specific issue or investment project but more broad-based collaboration is also common. For example, Brazil has a separate legal framework that encourages the formation of local government consortiums, which in some cases can become entities somewhat similar to regional agencies. In the metropolitan area of Los Angeles, USA, the Los Angeles County government, by far the largest, provides a variety of services to the metropolitan area’s numerous small local governments on a contract basis.

**Metropolitan or regional authorities.** These are voluntary organizations where a regional authority is an independent legal entity. Two or more local governments may associate in this way to achieve economies of scale, for example for a transport network or to jointly operate a waste disposal facility. Regional authorities, sometimes established as utility companies, can usually levy user charges for services provided, and/or collect from the member local governments. Metropolitan or regional authorities can also take the form of a metropolitan council of governments and they can be established for planning or advisory purposes only, or for planning as well as service delivery in one or more sectors. The New York Regional Plan Association, established in 1929, is an example of an NGO having had substantial influence as an urban research and advocacy organization. The successes were achieved through a pragmatic and cooperative strategy with other civic groups, government, business and community organizations.

**Second level metropolitan local government.** These arrangements may take the form of a higher-level

metropolitan local governments or regional governments. Such local governments would not necessarily be hierarchically above the other local governments in the area in terms of reporting



relationships, but possibly of equal rank and legal status. For example, the Dar es Salaam metro government has no authority over other local governments, while the mayor of London, elected directly, has substantial authority over the area's lower-level local governments. Experience shows that such institutions will often be weak unless they are supported by the lower-level local governments.

**Consolidated local government.** Annexation or amalgamation can under the right circumstances be effective to achieve efficiency and equity in public service delivery, reducing institutional complexity. A jurisdiction that covers a large portion (or all) of the metropolitan area can facilitate equalization in the area since it would have one tax base. The municipal reforms of South Africa are a case in point. For example, the present Cape Town one-tier municipal government resulted from amalgamation six local governments overlaid by a metropolitan administration and incorporation of other local governments in the metropolitan region to form a single local government covering 2,461 square kilometers. This has facilitated equalization of access to services and spatial and integrated planning at a metropolitan scale to address in a comprehensive manner the planning challenges and inequalities that are the legacy of the apartheid area.

**Factors of successful metropolitan governance:** A number of steps for successful metropolitan governance arrangements have been identified as follows:

- i. Motivate collaboration by identifying concrete metropolitan projects.
- ii. Build metropolitan ownership among key stakeholders.
- iii. Ensure national government support.
- iv. Tailor reliable sources of metropolitan financing.
- v. Design incentives and compensations for metropolitan compromises.
- vi. Implement a long-term process of metropolitan monitoring and evaluation.

It is also important under the various arrangements to clarify and communicate who is responsible for what and to make authority coincide with representation. Finally, finance should follow function, which means that any entity established to coordinate or provide services to a metropolitan area should ideally be represented by, and accountable to, the corresponding entire jurisdiction and receive corresponding resources.

*Substantially based on:* GIZ and UN-Habitat (2015), *Unpacking Metropolitan Governance for Sustainable Development*. Eschborn: GIZ.

*Other sources:* OECD (2015), *The Metropolitan Century: Understanding Urbanisation and its Consequences*, OECD-Publishing, Paris.

World Bank (2014): *Municipal Finances. A Handbook for Local Governments*. Catherine Farvacque-Vitkovic and Mihaly Kopanyi, Editors Washington DC: World Bank.

Regional Plan Association (2017): <http://www.rpa.org/> Accessed November 4, 2017.

Interview with Andrew Borraine, CEO of the South Africa Western Cape Economic Development Partnership. February 26, 2018.

City of Cape Town (2018): <http://www.capetown.gov.za>. Accessed March 5, 2018.

**Stakeholder engagement must be a crucial element of addressing urban infrastructure financing and governance.** Major infrastructure projects are complex and are often disruptive in the construction stage, and often local communities do not wholly understand the nature of infrastructure planning and development. For an example of how to effectively leverage local communities and stakeholders into the process of urban governance – see Box 13.



### Bringing citizens into governance – participatory budgeting in Brazil

**In 1989 the city government of Porto Alegre—a Brazilian metropolis with 1.4 million in habitants—initiated a project of participatory decision-making on the city budget,** with the aim of strengthening participation through the creation of a public space for the expression of citizens' demands. Citizen assemblies in each city district began determining priorities for the use of a part of the city's revenues: 'ordinary citizens' made binding decisions on several areas of governmental action, most notably those affecting the city's new capital investments.

**The planning process depended on citizen participation at each stage.** Once a year, in March, a series of preparatory meetings are held in which municipal officials report on what has been accomplished with the previous year's budget. Then, in April-June, large city assemblies and decentralized neighborhood ones discuss and vote on spending priorities, electing delegates to the Council of the Participatory Budgeting as well as to thematic committees. In July-August, city experts, together with the assemblies' delegates help in translating the demands into projects. The delegates meet and prepare a General Proposal on the Budget and a draft of the Investment Plan that will be discussed with the City Council and then approved. Some decisions are made in conjunction with neighboring communities: for example, when two communities realize that if they both rank a clinic first, and thus gain more funding, they can get a better clinic. Overall, participation increased from less than 1,000 people in 1990 to more than 30,000 in 2002.

**There were several innovations in the actual practice of holding meetings.** For example, to minimize inequalities resulting from differences in speaking ability, short interventions were encouraged rather than formal speech-making. Authority within meetings did not come from education or class, but involved other sorts of social status such as respect within the community, often linked with membership (or even leadership) in various local groups. The concept spread rather cautiously at first, but then expanded rapidly since 1996 and is now adopted by about 180 Brazilian municipalities, as well as some municipalities in Argentina, Uruguay, Peru, Ecuador, Colombia, Bolivia, Mexico, and Chile.

**Several clear benefits were observed.** In Belo Horizonte—which has a special participatory process for its housing programs and land use changes—*land invasions have declined precipitously*. Holding meetings at community level also *allowed more women to participate* since they tend to avoid meetings away from their communities. Likewise, *the cost of attending such meetings is significant for lower income citizens*, in terms of transportation costs and the opportunity cost of time spent. Concomitantly, the location of projects is related to participation, which in turn is related to household income. *In all municipalities, the proportion of investments serving lower income communities has increased.*

*Based on:* della Porta, Donatella & Mario Diani (2006), *Social Movements: an introduction*, 2<sup>nd</sup> ed., Malden, MA: Blackwell, pp. 223-226.

IADB (2005), 'Assessment of Participatory Budgeting in Brazil', Washington DC: Inter-American Development Bank.



**Bamako has an opportunity to leverage digital technologies to give its citizens access to decision-making processes in local governance.**

An exciting development in e-participation tools is the ability to crowdsource, through an online open call for data or proposals for an inquiry or a problem. Planners and citizens can crowdsource information from citizens about plans, policies, the conditions of their neighborhoods and their ideas to address urban problems<sup>94</sup>. Cell phones allow crowdsourcing through SMS or through mobile-accessible social networks. See Box 14 for an example of how simple data platforms, that leverage local communities, can have an impact on better availability and understanding of geospatial data for decision-making.



## Use of Geospatial data in Niger

**Niger has already implemented a Geospatial Information System leveraging community involvement** ([www.risques-niger.org](http://www.risques-niger.org)). The system includes the following features:

A geocatalog referencing and disseminating available data (dissemination is protected by group of users). All data can be displayed on a map.

A geoportal allowing to display several layers of geographical information from national and international sources such as daily rainfall, land use etc.

An offline version also allows users to pre-download data for a specific geographical area to run the analysis offline.

**Concurrently, to ensure with a constant flow of up to date information, different tools leveraging community involvement**

**have been developed.** First, users can update their data in an excel file which is saved in a shared folder. This data is synchronized instantly when the computer is connected to internet. Second, data is collected through smartphones. Users can enter any type of data (i.e. points, polylines, polygons), which is synchronized and integrated automatically through internet. The capacity of national actors in the collection, integration and dissemination of information is also being reinforced. Complementary tools are being implemented such as SMS messaging in case of special event, alerts for rainfall above certain thresholds by distance to points of interest, 3D visualization of areas affected by a flood and so on.

A beta version of the platform for Mali is available at the following address: <http://ml-risk.pigeosolutions.fr>

94 For examples see Silva, Carlos Nunes (2013) Citizen E-Participation in Urban Governance – Crowdsourcing and Collaborative Creativity.

**Bamako can also leverage competitive markets alongside regulation to expand basic services.** To promote entrepreneurship, policy makers need to remove constraints to business development and support light manufacturing sectors in urban centers. Local governments are often in the lead when experimenting with ‘smart solutions’ to crowd in private sector players to help tackle urban challenges. In all three countries, there is a large, untapped potential to pilot projects that could demonstrate intermediate success in using digital technologies to address urban challenges, and which would have potential for scale-up in the future. In cases, where urban service provision may be limited in the short-term by resources and capacity, local governments could facilitate crowding in of private sector firms to provide ideas and solutions – see Box 15.<sup>95</sup>



### Creating Markets for Service Delivery – example of sewerage

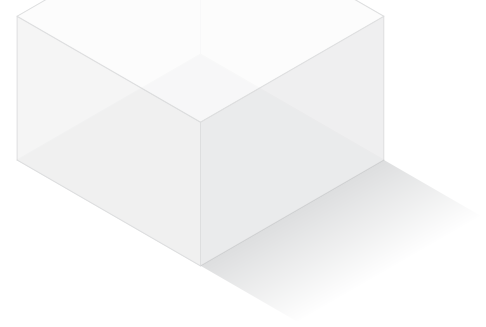
**Social enterprises in many, low-income, cities and countries can serve poor households, sometimes also through off-grid solutions.** Millions of people at the bottom of the pyramid live in communities that are not connected to the sewerage system. Most of them use pit latrines or engage in open defecation. To address the problem, dozens of social enterprises have devised innovative toilets that require no water. These low-cost in-home or community units represent a huge improvement over unimproved sanitation and create jobs for people who install and service them. Serviced toilets are compact toilet units that can be used in homes and communities without access to centralized sewerage systems. Clients usually pay for using the toilets but do not own them. The company that owns the toilets empties them, treats the waste and converts it into fertilizer or fuel.

**The business model usually involves a mix of private companies, NGOs, local entrepreneurs, and, often local government agencies.** Under a typical serviced toilet model, the enterprise supplies and installs the toilet and evacuates and often processes the waste. For community toilets, local franchisees or operators usually service the toilets, keep them clean, collect fees, and sell other services at the toilet site. Ecotact in Kenya, for example, operates “toilet malls”, which also serve as retail outlets for necessities such as prepaid mobile cards, snacks, and shoe cleaning services. Sanergy (a firm in Kenya serving low-income communities) supplies prefabricated toilets and evacuates and processes waste. An NGO operates the toilet network, provides training, and supports more than 300 local entrepreneurs, who earn steady incomes from their business. Local municipalities are usually involved in waste management to dispose of the waste at local plants.

<sup>95</sup> Esper, Heather, Ted London, and Yaquta Kanchwala. 2013 Improved Sanitation and Its Impact on Children: An Exploration of Sanergy. William Davidson Institute, University of Michigan, Ann Arbor, MI.







# Conclusion

**Given its importance to Mali, and its potential to become an inland hub in the West Africa region, Bamako has much to gain from becoming a productive and livable city.** But currently it is far from that potential. If the urban form of the city continues to grow in an unplanned, spatially fragmented way, Bamako and its citizens will be locked into economically and socially unproductive urbanization. The Government has a rare opportunity for smart new policies to transform Bamako into a platform for productivity and livability, and into a city that works for its people.

**The window for coordinated investments in urban infrastructure is narrow.** Urbanization is critically dependent upon good public policies. Owing to its post-colonial legacy, Bamako is less chaotic in its urban planning, compared to its East African counterparts. This provides it with an opportunity to make early investments in connective infrastructure, closely synchronized with land-use planning. Bamako's District Government will need to build coalitions with its neighboring communes, regional development agencies and with the national government, while finding ways to expand its sources of revenues. Urban investments are long lived and path dependent. The time to act is now.



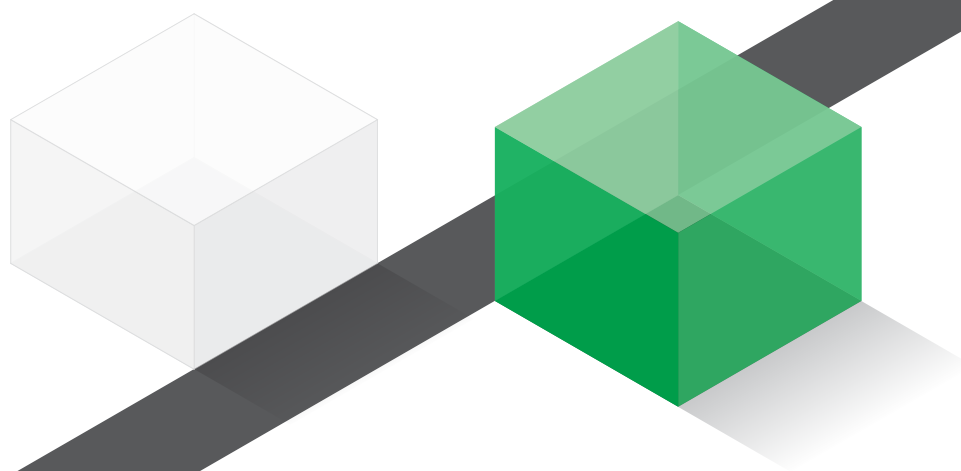


# BAMAKO

## An Engine of Growth and Service Delivery

Bamako, the capital of Mali, dominates the country's urban and economic landscape – it is the nerve center of the national economy. Bamako has much to gain from becoming a productive and livable city. But currently it is far from that potential. The city is neither an engine of growth, nor of service delivery. Its urban development has been fragmented, fettering both - productivity, by preventing opportunities for matching people and jobs - and livability, by driving up the costs of urban infrastructure and service delivery. If the urban form of the city continues to grow in an unplanned, spatially fragmented way, Bamako and its citizens will be locked into economically and socially unproductive urbanization. Tackling urban development challenges in the capital will have knock-on effects on Mali's economic development.

This report argues for a focus on how Bamako is built and organized spatially. A balanced approach will be required – to reforming institutions, putting the right policies in place and investing in infrastructure – along with attention to implementation. The window for coordinated investments in urban infrastructure is narrow. Bamako has an opportunity to use urban planning to make early investments in connective infrastructure, closely synchronized with land-use planning. Local and national government leaders will need to build coalitions with Bamako's neighboring communes, regional development agencies and with the national stakeholders, while finding ways to expand its sources of revenues. Urban investments are long lived and path dependent. With projected population growth, many of the current 2.5 million residents will live to see the population surpass 13 million by 2050. **The time to act is now.**



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