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Developing a Common Narrative on Urban Accessibility:

A Fiscal/Finance Perspective

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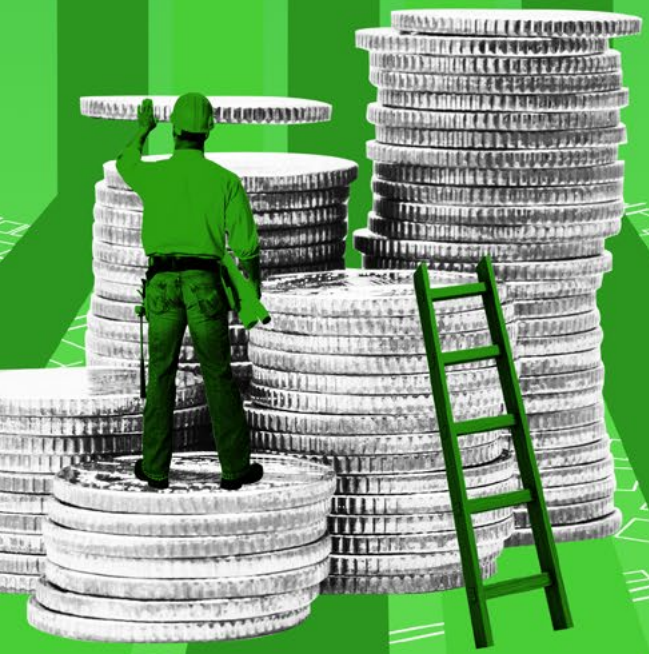

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Executive summary

In today's urbanizing world, facilitating intra-city travel deserves priority because it affects factor productivity, employment, livability, and overall welfare. Achieving the desirably inclusive level of urban accessibility—defined as the ability of a local transportation system to connect people with key destinations—calls for a coordinated approach to planning and implementing land use, managing demand, and building multimodal transport infrastructure.

Developed and developing countries have been struggling to improve urban access. The former are challenged by the need to replace and upgrade legacy infrastructure, modify entrenched land use patterns, and accommodate the needs of aging populations. The latter need to come to grips with rapid and frequently chaotic urbanization that is running far ahead of developmental capabilities. Perhaps most notably, though, both need to employ novel solutions for mobilizing financing and arranging the funding for infrastructure in order to close existing gaps and to accommodate the growth in demand.

In short, cities need to better respond to urban access concerns, and funding and finance play a key role. The way urban leaders finance and fund transportation services is a major determinant of how well residents can connect to economic opportunities.

Urban transport infrastructure tends to be "lumpy" in its ownership and financing. Much of it is financed by transfers, grants, and low-interest loans from the central government. How much tends to vary from place to place, but, for most growing cities, it is never enough. Fiscal arrangements between cities and higher-level governments assign certain expenditure responsibilities to municipalities along with revenue. As the taxes (property, income, sales), fees, and charges assigned to municipal governments rarely generate enough revenue, municipal governments have sought to capture some of the value created by infrastructure spending through a variety of impact and betterment fees.

Some of the larger, better-managed cities with broader economic bases supplement fiscal resources through borrowing from banks and by floating bonds—generally with the approval of the central government. As this too does not always cover the shortfall, cities seek financing from the private sector and enter into a variety of public-private partnerships (PPPs). These have become increasingly popular, as growth of fiscal resources has stagnated while demand for urban access has continued its upward ascent. PPPs, especially for long-lived transport projects, can be problematic, and renegotiation is not uncommon. Nevertheless, cities in all countries are persevering. Once they learn the ropes of bidding, monitoring, regulating, and pricing, some of the difficulties are likely to ease.

Needless to say, improving urban access calls for effective governance. Good leadership—combined with improving governance structures and meritocratic staffing—certainly helps, but achieving and sustaining good governance in the vertical and horizontal domains can be a considerable undertaking for countries at all levels of development. While governance will remain a priority, it is unclear that mediocre albeit adequate governance necessarily holds back the economic performance of cities so long as they can muster the private entrepreneurial energies and the private sector can finance investment in productive assets.

Looking ahead, funding and financing access will remain a key concern of policymakers. Cities' ability to improve urban access for their residents and firms will depend upon how well they balance economic growth with their changing urban form. Globally, the risk is that urbanization will become increasingly bimodal, with successful cities attracting

talent, resources, and technological investments that reinforce their lead over the rest, while cities that are geographically disadvantaged, were late starters, have poor governance, or are hobbled by the decline of a major industry will be left behind. Urban leaders must determine where their cities are located on this continuum, and deploy financial and fiscal tools within their own unique urban and economic context to build a more accessible urban environment.

Introduction

The urbanization of industrialized economies has peaked, and Latin America is not far behind. During the next 35 years, then, Asia and Africa will be largely responsible for the increase in the global urbanization rate from 54 percent in 2015 to 66 percent or more in 2050.[2] Urban economic activity accounts for as much as 80 percent of the growth in global gross domestic product (GDP), and three-quarters of this is generated by 468 cities.[3] Whether a city provides an environment where businesses can flourish, where job opportunities are varied and plentiful, and where the majority can enjoy decent living standards depends in large part on the productive activities attracted to the city and the ease of urban access to jobs, services, and amenities.

As the economic center of gravity of cities shifts from manufacturing to services and as increasingly populous cities keep sprawling outward, these urban regions face major challenges. Sustaining economic growth and an adequate revenue base is one; creating employment for a workforce that is aging in developed countries and youthful in developing ones is a second; taking full advantage of technological changes to enhance productivity and to cope with issues raised by climate change is a third; and ensuring, with the help of regulations governing land use and the provision of housing, that city dwellers from all income groups can efficiently and affordably get to where they want to go, be it the place of work or a shopping mall, is a fourth.

The demand for urban access is steadily increasing and becoming more complex.

The purpose of this paper is to understand how demand for access is evolving in cities and how they can fund the needed infrastructure and services in the face of the local, national, and global challenges that are on the horizon. It examines how cities tackle the funding of urban access and how they might use current and other means to ensure an adequate supply of services into the future. For most cities, a large slice of this funding comes from higher-level governments through fiscal sharing arrangements, some from locally raised taxes and fees, and some from financial markets and private investors. Many cities, especially the smaller and medium-sized ones, struggle to cover their expenditures, and the search is always on for additional sources of financing.

The paper is structured as follows: Sections 1 and 2 explore some of the overarching spatial and economic challenges cities must consider as they develop new ways to fund and finance urban access. Section 3 delves into the issue of fiscal decentralization, sharing of funding responsibilities between national and subnational governments, and efforts by cities to enlarge the fiscal take. Section 4 explores the scope for financing urban access from public and private sources, while Section 5 focuses on the problem of governance and organizational capabilities that frequently hinder the rational and sustainable development of urban access across metropolitan regions. The paper ends by briefly touching upon some of the factors that could influence decision making during the coming decades and identifies a few topics that deserve to be further investigated.

1. How urban areas and demand for access evolve

Before one can focus on the sources of funding and financing to enhance accessibility, it is essential

to understand the different ways the spatial and demographic identities of cities are evolving and the resulting implications for access. Normally, this is not the focus of the fiscal economist nor the financial specialist, but it is a critical input for determining the scope and scale of investments. Just as accessibility has not been a major element in urban land use and transport practice—see the related entries from Christo Venter, Gilles Duranton, and Erick Guerra—so also accessibility is not addressed in traditional cost-benefit analyses for transport projects, especially the accessibility needs of low-income households.[4]

What is needed is a framework for fiscal and finance professionals to understand how urban form drives demand for access. There have been various models to represent the spatial evolution of cities around the world, ranging from the monocentric central business district-oriented configuration, as in Barcelona, to the multicentric hub-oriented model, as in Atlanta, and to polycentric ones, as in Randstad, each giving rise to different demands for access.[5] Shlomo Angel, in his analysis of commuting patterns in U.S. cities, offers a more comprehensive set of possible access-related outcomes, including a "Maximum Disorder" model, in which households and jobs are randomly distributed, and a "Mosaic of Live-Work Communities" model, in which homes and jobs are located in close proximity.[6] He concludes that no single model suffices, but that cities arrive at a "Constrained Dispersal" model that combines elements of each of these models to varying degrees.

Looking across the world, it is easy to see the imprint of each of these models. Expanding cities in middle- and low-income countries are tending away from a monocentric spatial frame toward a multipolar structure.[7] As sprawl is leading to a decline in density, accessibility is becoming even more reliant on private autos, jeepneys, matatus, tuk tuks, and motorbikes. Across metro areas in North America and Europe, outward growth continues while the older urban core frequently retains its concentration of jobs and other economic activity. Each year between 1990 and 2000, the density of urban settlements fell by 2 percent, and a persistence of this trend through 2030 could lead to as much as a threefold increase in the area encompassed by cities.

Outward sprawl and the emergence of multipolar metropolitan forms have implications for how individuals choose to travel, and in some instances the forms themselves can intensify the tendency for urban regions to spread. City and suburban dwellers rely on the automobile in higher numbers each year, with about 1 billion passenger cars in use globally.[8] These mobility choices make it easier for individuals and firms to move to the periphery, leading to even more sprawl, which often steers public investment into road infrastructure.[9] Many communities use formal and informal regulations to create barriers to dense development and promote greenspace in between, stretching distances only further.[10] Depending on how housing is distributed and how commuting patterns are affected (i.e., whether people live closer to their place of work), individuals may not necessarily see the duration of their trips increased by the outward creep of cities, but there can be little doubt that greater spatial mismatch between people and places is likely to worsen aggregate access and increase demand for private vehicles.

What these models are not speaking to, though, are the implications for access by low-income households. Equitable access—or access to destinations that works for people of all incomes—is desirable in any productive urban economy.

Here the statistics worldwide indicate a troubling trend. Spatial segregation is increasing as industrialized countries, in particular the United States, experience the gentrification of a number of leading cities such as New York, San Francisco, Boston, and Washington and the suburbanization of low-income households.[11] In developing country cities like Nairobi and Rio de

Janeiro, informal settlements are growing both on the peri-urban fringe and in core areas.[12] As land use patterns can jeopardize access to jobs and services, public transport services to such communities are limited and/or unaffordable, and there is increased dependence on informal means or non-motorized travel.

The question, then, is to what extent can these trends be changed through land use/zoning and pricing policies, and what are the implications for accessibility?[13] Can urbanization (in high- as well as middle-income countries at least) do a U-turn with empowered mayors and planners who are able to use eminent domain, land readjustment, zoning, and social policies aggressively to prioritize urban compactness, densification, and more low-cost housing closer to high-demand areas?[14]

How rapidly could change occur, and are there instances of such accessibility-enhancing changes made possible by interventions at the local level? Can pricing strategies such as road user/congestion/area access fees, auctioning of car ownership rights (a la Singapore), and high fuel surcharges alter demand and modal share without jeopardizing accessibility for all? Does the experience of London, Stockholm, and Singapore suggest that their methods should be adopted by other cities, and are there potential downsides of inner-city congestion pricing for land use outside the perimeter?

Experience has shown that the "idyllic," resource-conserving, and efficient compact city is a distant prospect in most places, although rapidly urbanizing developing economies such as China and India may offer greater scope for reorienting the trajectory of new and growing cities. The demand trends identified by this discussion and the legacy issues around location and the built-up areas of metropolitan regions underscore the persistent needs for substantial funding for transport infrastructure and services and the importance of increasing the attention of policymakers and practitioners on the issues of accessibility.

2. Where urban form and economic health meet

Efficient and inclusive urban access depends upon the coordinated planning of transportation and land use so that residents can more easily access a range of different destinations. When access is limited—especially due to spatial disconnect—demand for new infrastructure and real estate development to improve access will heighten the demands on transportation and land use planners to finance new construction or expand transportation services. In short, increasing access typically comes with a price tag. The policy issue of consequence is whether often hard-to-measure accessibility gains justify their related expenditures.

This is where urban economists and the professionals concerned with funding and finance can contribute an important perspective to the equation. Addressing access deficiencies is not just a matter of building more housing or boosting transit services. A healthy local economy—tradable industries that create new value and the supporting industries that grow around them and together generate jobs—is a necessary condition because without it a city cannot raise the financial and fiscal resources to pay for those improvements.

It scarcely bears repeating that economic growth is the principal determinant of demand and that large and growing metropolitan regions are better positioned in terms of resources to meet the demand for access. They are advantaged in a number of ways. First, size can be a source of scale economies for industry, and it facilitates startup activity because new firms have a ready-made local market. Second, larger cities tend to be more industrially diverse, which results in greater resilience in the face of business fluctuations. Third, large cities have deeper pools of skilled workers that better match jobs with skills; this kind of labor market flexibility benefits existing and emerging firms. Fourth, on average, larger cities tend to be more fruitful sources of innovation in part because

of industrial diversity, in part also because they tend to host some of the leading national universities and research institutions. Fifth, larger cities tend to be more internationally connected and outward-oriented, and to benefit from learning through trading and from external competition. Taken together, these factors can make the large urban centers more productive, more dynamic, and fiscally more self-sufficient—although this is by no means a given, and the quality of governance and the stickiness of the urban environment for industry influences the degree to which large cities become a thriving Ahmedabad or a struggling Kinshasa.

The process of agglomeration, or the economic benefits from people and firms locating near one another, advantages large urban centers. Coordinating land use and transportation planning is a key to fully realizing the benefits from urban agglomeration, but planning is not the only factor. A dynamic business climate of entrepreneurship, productive investment, and the effective harnessing of technological opportunities also matters, while the range and depth of workforce skills is an important source of agglomeration economies.[15] Where densification is accompanied by an increase in economic activity and by productivity gains from agglomeration, tax revenues, fares, tolls, and betterment levies could most likely cover expenditures on public transport.

Of course, there is an economic developmental loop at play. While growth supported by productivity gains and externalities arising from agglomeration economies can create the fiscal base and financing capacity to pay for access improvements, economic growth itself tends to attract more people and generally increase the spatial demands on an urban area. This may be best seen in global cities like Los Angeles, Shanghai, Mumbai, Istanbul, and Bangkok.[16] These growing economies can in principle more easily mobilize the resources to pursue major transportation infrastructure and housing upgrades to accommodate more people and businesses, both within the core and on the periphery, but the scale of their investment needs is enormous.[17] In contrast, urban areas in developed or developing countries with stagnating or shrinking economies may struggle to cover their infrastructure expenditures. Given that the requirements frequently run ahead of local funding capacities, financing is a perennial concern for both types of cities.

Yet in the pursuit of urban agglomeration and growth overall, urban leaders must carefully weigh the benefits of investment in transport infrastructure. According to a review by Venables, Laird, and Overman, macro-level research indicates that increasing transport investment by 10 percent can raise GDP by 1 percent. But the studies conducted offer:

> …little guidance about the level of transport investment needed in an economy and no guidance about choice between transport projects. [Studies of individual projects] generally find positive effects of large transport projects on measures of economic performance such as local area employment or GDP although effects of smaller projects are harder to tease out. For example, regeneration effects of local transit schemes are mixed. All of these studies struggle to provide convincing evidence on the extent to which positive effects felt locally are additional, and not just the consequence of activity relocating. [18]

Ed Glaeser is also skeptical regarding the economic benefits to be derived from investment in urban infrastructure.[19] Looking at the United States' federal program, he is of the view that too much is channeled into declining areas and that the money invested in roads and their maintenance in order to reduce travel

time does little to spur local economic performance. He notes that there is no evidence to suggest that Japan's marvelous train systems have raised local or national growth rates, but they have added to the nation's "crushing public debt burden," which now exceeds 230 percent of GDP. As a result, policymakers and other practitioners face tough decisions when it comes to guiding future investments; simply neglecting infrastructure funding and finance needs will only hasten the downward spiral of cities, but investment in costly, long-lived infrastructure is unlikely to spur the economy unless it addresses a clearly perceived need and is underpinned by other demand management and sectoral policies.[20]

From a fiscal and finance perspective there is a difference in what kind of city typology is most appropriate. For the urban and transport planners, categorizing cities by their spatial characteristics is of primary concern. Are we dealing with a monocentric, polycentric, multipolar, or chaotic spatial trend? For the fiscal and finance professionals, this categorization is important to determine scale and scope of funding needs. But of equivalent importance is the categorization of cities in terms of economic growth that would determine the relative ability to raise revenues and financing to provide investments and services. How should a country or a multilateral development bank allocate funding and financing across different types of cities? This remains an open question. Categorizing cities according to size or rates of population growth and allocating resources to the largest and fastest-growing ones might not be the most efficient way of using scarce financing. Channeling financing to cities that are achieving high rates of economic growth might bolster performance but would surely not be the most inclusive way of providing access. Likewise, ranking cities with respect to governance and administrative capabilities and revenue effort could single out the ones that could put money to better use, but the cities high on the scale of economic performance are not necessarily the best governed. Typologies help tidy things up, but whether or not a pigeonholing of cities would make planning and resource allocation for the purposes of accessibility easier is uncertain and worth further thought.

3. Fiscal decentralization and local revenue generation

Addressing the issue of accessibility traditionally has not been a major focus of fiscal and finance experts.[21] Just as there have been very limited efforts to incorporate accessibility into economic and financial assessments of specific investments, there has been even more limited discussion of how different instruments for funding and financing enhance accessibility or not. The following two sections are presented as a way of beginning a dialogue, which is essential to pursuing accessibility objectives and incorporating the funding and finance concerns into that conversation. The approach in this discussion is from the broader fiscal perspective, rather than a focus on the financing of a specific project, as a way to emphasize the need to look at how urban plans are funded and financed overall.

As the last two sections set forth, spatial organization and economic health are key variables to determining the accessibility needs and the financial capacity to respond. Assuming that land use changes for most cities can only be effective at the margins, and that the access needs caused by spatial mismatch must be addressed through appropriate transport infrastructure and services, the fiscal and finance discussion around accessibility quickly turns to transport funding and finance.[22]

One significant gap in the worldwide discussion of transport access is the lack of any credible estimate of the financial needs for urban investment and urban transport investment in particular. Estimates by the multilateral development banks (MDBs) and independent researchers suggest that infrastructure

services (urban and non-urban) are in short supply worldwide. For example, Bhattacharya et al. estimate that the world needs $90 trillion in infrastructure investment through 2030 to satisfy unmet and new demand—or about $5-6 trillion per annum, double the amount invested currently and amounting to between 6 percent and 8 percent of GDP.[23] Investment in transport, which was $1.2 trillion in 2012, would need to increase twofold or more.[24] This level of spending would make large claims on public budgets that currently provide between 50 percent and 80 percent of infrastructure investment, and it would necessitate much greater involvement of private and institutional investors and the MDBs. How much of this spending should close the infrastructure gaps in cities, however, is difficult to quantify and has been generally ignored by infrastructure financing studies. But because more than one-half of the world's population is now living in urban areas and three-fourths of GDP is derived from urban activities, it can be safely assumed that the urban share will be large.

Pricing and cost recovery. Pricing policies contribute to the efficient utilization of transport services as well as to covering the financial costs of operations and investment. They can persuade people to take advantage of public transport rather than rely on private cars (with a mix of fuel taxes, parking charges, road congestion charges, and others). Ideally, prices should reflect marginal social costs (and not just marginal private costs) that factor in externalities such as noise and pollution that motorists inflict on others. In practice, transport charges rarely adhere to this rule. Ultimately, policymakers face a complex set of conflicting objectives in setting prices, whether it be public transport fares or road taxation.

At the core of the pricing discussion is finding the critical balance over who pays. Should the users pay and at what level? Should local taxpayers pay because of the broader city benefits? Should there be a cross-subsidy between different users of one mode or between users of different modes? In the interests of enhancing accessibility for low-income households who live in peri-urban areas, municipal transport agencies responsible for public transport services often opt for flat rates or rates that are tapered so as to favor longer journeys. Subsidizing the poor, however, has historically been criticized, as most approaches have either failed to serve the targeted population, have tended to benefit the non-targeted population, or have led to inefficient services. New technology offers new approaches, such as the *Sistema Nacional de Selección de Beneficiarios* (SISBEN) in Bogota, that may ultimately resolve the historic problems.[25] However, pricing and user fees/taxes face steep political challenges despite cogent economic arguments.[26]

Fiscal assignments. Local revenues from fares and taxes typically fall short of filling transportation funding gaps, forcing local governments to look to the central government to allocate bulk tax revenue to subnational entities.[27] National revenue effort determines the pool of fiscal resources, while the rules governing sharing define how much is allocated to lower-level governments and the share retained by the center. This can serve to correct vertical (between different levels of government) and horizontal (among subnational governments) imbalances between revenues and expenditures and advance national objectives, including social distributional objectives. It is also a means whereby the state apportions responsibilities for a variety of tasks across governments based on the nature of the task and on administrative capabilities. The degree of fiscal decentralization varies considerably, being higher in larger (federal) countries, but there are instances of fairly decentralized small countries as well (Belgium).

Services with significant spatial spillovers are usually the responsibility of higher-level governments; those with few spillovers that depend upon knowledge of local preferences and customization based upon detailed local information are assigned to municipal

governments. Furthermore, these entities should have the capacity to carry out their functions and be assigned the revenues to do so.[28] Revenue assignments give local authorities control over tax instruments so that they can mobilize some of the resources needed to discharge the assigned functions.

Tax authorities assigned to city governments can include sales and property/real estate taxes, municipal income and business taxes, a local surcharge on the personal income tax, and others.[29] Additional revenue is derived from charges for public services (e.g., transport, trash collection, fire, education, and police) and a variety of fees and taxes levied on transactions. Many local governments also benefit from the sale or leasing of land that lies within their jurisdiction on the periphery of cities.[30] As discussed above, additional revenues accrue from a variety of user fees and congestion charges that on balance might be a fairer way of funding infrastructure because they require actual users to pay for the upkeep of infrastructure and the social costs of congestion. Glaeser maintains that a reliance on general tax revenues also "removes the discipline that comes when projects need to pay for themselves."[31]

The U.N. Habitat III report maintains that fiscal and administrative decentralization has been on the rise since 1990.[32] Although fiscal decentralization is increasing, the results to date in terms of resource mobilization, governance, efficiency gains, and improved services are decidedly mixed.[33] The reasons are varied. In some countries, the reluctance of central agencies to devolve responsibilities and assignments have compromised the effectiveness of decentralization. In others, the inability of the central government to rigorously evaluate projects and monitor the performance of grants leads to poor results.[34] Furthermore, decentralization is more likely to thrive when an open institutional environment supportive of civil society promotes competitive political activity, which can compel officials to be more diligent in responding to the needs of local citizens. Such "open access orders"[35] that are conducive to robust political competition are not the norm in most developing countries, a fact that compromises the quality of local government and detracts from tax effort. Decentralization can also impede tax reform, as Brazil, Argentina and India can attest.[36] Competition from neighboring municipalities limits the scope for raising taxes, levies, and infrastructure-related charges because of the risk that a rate or price hike (not matched by a commensurate increase in the perceived quality and volume of services) will drive away businesses and households. A retreat from decentralization appears unlikely, hence the solution lies first in improving the intensity of local participation and access to information so as to raise the level of accountability and responsiveness of public officials.

Value capture. Local governments in developing countries rarely succeed in raising sufficient revenue from land and property taxes,[37] and capturing value from developer-led improvements has been hobbled by problems in calculating appropriate fees. Increasing fiscal stringency, however, in the aftermath of the financial crisis have encouraged local governments to more actively pursue the capture of an increase in land value resulting from public and private investment in infrastructure and services, as well as regulatory changes that promote commercial development and densification. This policy clearly has the potential of capturing access benefits linking land use and transport and is increasingly seen as a desirable means of meeting a portion of the capital and interest costs of public investments in cities such as Mumbai, Bogota, and Cape Town. Tax increment financing (TIF), business improvement districts (BIDs, or an association of property owners authorized to provide services), recycled infrastructure funds, accelerated development zones, and special assessments (e.g., betterment levies, transportation utility fees, and air rights) are among the instruments that are available to local authorities.[38] While instruments such as TIF offer a

means of financing infrastructure through an eventual increase in property taxes, they can fail to generate the anticipated revenues and thereby adversely affect the provision of services; also, the targeting of one district could be at the expense of other neighboring ones. Where land use management is in its infancy, accurate and timely property valuation is problematic, and the imposition and collection of property taxes encounters resistance, citywide taxes on residents' incomes are an alternative.[39]

More extensive use of value capture can be a valuable instrument for local governments, as suggested by Levinson and Istrate[40] and by Fischer and Sclar.[41] But as a first step, local governments must be entrusted with the requisite legal authority to engage in such capture.[42] Furthermore, local agencies responsible for transportation infrastructure and zoning often representing multiple jurisdictions would need to coordinate their activities.

Central governments can encourage such practices by directing more resources to those cities that undertake to utilize value capture. Latin American countries such as Brazil have embraced value capture to fund urban infrastructure, and cities such as Sao Paolo are willing to tolerate the possible gentrification of "upzoned" neighborhoods that can force low-income households to relocate to distant suburbs.[43] In both Hong Kong and Tokyo, local transit agencies finance projects and operations with the help of revenues obtained from residential and commercial co-development adjacent to transport hubs. The arrangement incentivizes transportation and land use coordination by consolidating authority in one place.

It is clear that application of the instrument requires looking beyond the financing of one specific investment and taking a more holistic approach to understand how captured value can best impact accessibility for all segments of the population.

4. Sources of financing

Governments look to public and private financing options to meet the longer-term and lumpy characteristics of capital investment. This is a dynamic field where new approaches and models continue to evolve as developed and developing countries attempt to fill their infrastructure deficits. These options become even more complicated when directed at urban infrastructure and the varying range of decentralization, both functional and fiscal, worldwide. The direct implications for accessibility are in the selection and design of the investments to be financed, and, as discussed above, accessibility is usually not incorporated in evaluations. Prior research has not been directed at the more indirect implications on accessibility of alternative finance options. This is a gap that requires further study.

Cities can augment the resources provided by higher-level governments through a number of ways. This section reviews the three principal options: state-owned specialized financial institutions; bonds, where their issuance is feasible; and public-private partnerships of varying kinds. Given the increasing global attention to PPPs, this section concludes with a discussion of the challenges to be addressed by such initiatives.

State financial entities. Public institutions allow the state to channel long-term credit at below-market interest rates to municipalities of all sizes (sometimes for targeted purposes) and to spread the risk through diversification. The specialized lenders can take the form of municipal development funds or infrastructure banks[44] that pool resources from the central government, the private sector, and international agencies. In addition to supplying capital for lumpy projects, these entities can also assist with appraisal and implementation, thereby overcoming some of the common shortcomings of municipal agencies. For developing countries, multilateral development banks have taken a significant role in such financing

for infrastructure, but they have been more limited in urban transport. As the interest in infrastructure banks has grown, they will face significant scrutiny in how they select and appraise projects. This offers an opportunity to enhance the focus on accessibility in such evaluations and decision making.

Bond financing. A much smaller number of cities finance long-lived urban projects through the issuance of municipal bonds. This is an attractive vehicle appropriate for urban infrastructure, as noted by Liu[45] and widely used in the United States, where such bonds are tax-exempt.[46] However, the development of deep and liquid municipal bond markets has been a slow process in spite of legislative and regulatory initiatives by governments. What many countries lack are credible institutions; unequivocal state support, as governments can be ultimately responsible in case issuers default[47]; a pipeline of credibly bankable projects; reliable local credit rating agencies with access to sound data on municipal finances; and backing from international financial institutions (IFIs). Lenders also seek other safeguards such as tailoring of their terms to match the project's life profile, a commitment by the municipality to repay the loan from the revenues accruing from the project and penalties if payment obligations are not met, and a centrally monitored cap on the debt that a municipality can accumulate. Cities with strong economies plus creditworthiness underpinned by credible financial management capabilities in a national environment that is conducive to bond financing have been able to tap this source, but most cities have to look elsewhere for supplementary resources. For this latter majority, one option is to enlist the support of a state agency that then pools the debt of several municipalities and lowers costs. In the U.S. municipal bond market banks permit such pooling, while in Canada the provincial finance authorities borrow on behalf of municipalities, as do autonomous agencies in Europe. Pooling can lead municipalities to coordinate their infrastructure planning, but this approach to mobilizing finance also means that each individual unit has less flexibility in allocating resources.

Public-private partnership. Although private financing is costlier, many city governments have no choice but to seek private partners. Currently, institutional investors are managing assets valued at $100 trillion globally—$43 trillion in the United States—and low yields are driving insurers and fund managers to search for better returns. If cities can come up with bankable projects[48] to improve urban access, in principle private financing should be forthcoming.

Partnerships with private firms can take a number of forms.[49] There is full privatization of an entity such as rail services, which transfers responsibility for capital spending and upkeep to the buyer. This is strictly not a partnership. There are other arrangements where the government retains a role as a regulator and/or partner. For example, private investors can undertake a (bundled)[50] greenfield operation that entails the building and operation of a public asset. A second form of (bundled) involvement is the concession whereby the private firm enters into a long-term contract to operate and maintain a facility.[51] A third form is the brownfield contract to operate and maintain an existing facility.

By involving the private sector, city authorities are able to mobilize additional resources and harness the technical, managerial, and organizational skills of private firms.[52] This can boost efficiency and quality of services,[53] especially when private providers are engaged in a contestable activity and face competition.[54] It also draws in equity capital, which can leverage debt financing.[55] To mitigate the risks that can deter private investors, to increase the liquidity of investments, and to partially offset the higher costs of private capital, governments have adopted a number

of credit enhancement, guarantee, and leveraging tools. Leipziger and Lefevre note that:

> Insurance and loan guarantees[56] can serve to insulate investors from payment default; swaps, derivatives, local currency loans, liquidity facilities, and special lines of credit can insulate against macroeconomic fluctuations; and concessional financing can allow low carbon transport investments to compete financially with traditional modes[57]. Non-financial guarantees, such as minimum revenue agreements, are also common for urban transport projects.[58]

Lastly, PPPs can offer a way to promote innovative solutions to urban transport issues.

Over 139 countries have turned to PPPs, with middle- and low-income countries mobilizing $111.6 billion in 2015. A fifth or more of all infrastructure (electricity and transport, in that order) in developing countries is now being funded by private investors, many in partnerships with both governments and IFIs. Between 2000 and 2015, members of the European Union entered into almost 2,000 PPPs valued at 270 billion euros, 70 percent of which was expended on infrastructure projects, with road projects in the lead.[59] The United Kingdom, which is the birthplace of the new vintage PPP, was far in the lead, with 45 percent of all PPPs contracted, close to 900 in total.

Infrastructure building: problems and solutions. Financing for infrastructure that supports urban access can be especially problematic for a number of reasons. The construction period can be lengthy, subject to delays, and cost overruns, some arising from corruption, are not uncommon. Predicting risks and demand over the long lifecycle of these projects is difficult, hence they are more likely to be involved in disputes and to be renegotiated. Risks tend to bunch in the earlier construction phase and are a major cause of cost overruns. For example, of the 258 projects reviewed by Flyvbjerg, nine out of 10 had cost overruns, ranging from 45 percent for railway projects to 20 percent for roads.[60] Too often they are underestimated and the returns exaggerated. Cost-benefit analyses, particularly of major projects, are notoriously untrustworthy.[61] Urban transport projects are also costly, and private firms prefer to finance them via an off-balance-sheet project company (an SPV), a stratagem that raises the transaction cost by as much as twofold. Recouping the higher expenses, including the upfront costs, and making a profit while juggling physical constraints and the imperatives of access becomes harder because the project design may not permit a maximization of land value capture when it is required to service the needs of low-income households. And since many urban transport projects cannot easily recoup operating expenses, firms must negotiate a subsidy with the government and ensure that it is maintained through the duration of the project.[62]

PPPs are more likely to yield results that are closer to expectations in high- and upper-middle-income countries. Those have larger markets, macro stability, sound enabling environments, and the public-sector expertise to regulate and monitor projects undertaken in partnership with private providers. In low-income countries, the weaknesses of the legal framework and dispute settlement mechanisms, a paucity of local financing, a lack of well-defined project selection criteria, and relatively opaque bidding procedures inhibit the use of PPPs. For example, only about two-thirds of the World Bank Group's partnership operations in lower-middle- and low-income countries have been deemed a success during the early years of operation, and in virtually all of these cases it was not possible to determine whether the benefits from these projects trickled down to the poor, what were the longer-term fiscal implications, and what contingent liabilities arose from the operation of the infrastructure created.

Following an initial burst of activity, PPPs in India have slowed because of rising costs, poor quality of construction, and overleveraging. Even in Latin America, where PPPs have had a better track record, 42 percent of all concessions entered into during 1985-2000 had to be renegotiated; for transportation-related concessions the share was 55 percent, with operators usually taking the lead in demanding that the contracts be renegotiated.[63] Of the 21 transportation PPPs in the United States examined by Engels et al. for the period 1991-2010, six were renegotiated, with the new terms generally favoring the operator.[64] A report by the U.S. Congressional Budget Office in 2015 that reviewed 14 completed highway projects found that of the eight in operation for more than five years, "half had declared bankruptcy or experienced public buyout of private partners" because actual toll revenues were less than the projected amounts.[65] The attempt by urban governments in Nigeria to harness PPPs for the purposes of providing low-income housing has also fallen short of expectations, with most of the housing actually constructed catering to those in middle- and upper-income brackets.[66]

By all accounts, PPPs are here to stay, and governments are going to become more reliant on private-sector financing. Hence, it is vital that the accumulating lessons be systematically analyzed and put to good use in order to obtain the best results in terms of completion, efficient performance from ongoing PPPs, and quality outcomes.[67] A PPP investment management index along the lines constructed by Dabla-Norris et al. for public investment would be a useful tool for ranking and comparing infrastructure-related PPPs in selected countries.[68]

As with any other infrastructure development activity, a clear government strategy, commitment to utilizing PPPs (a domestic champion agency can be an asset), and capacity to engage in prior due diligence is a necessary starting point. Whether it is transport or housing or water or energy or any other type of infrastructure, institutional preparedness is a necessary precondition. Moreover, the costs of writing and tendering bids for complex projects are high and governance issues are rife. Many infrastructure contracts raise knotty contractual issues because enumerating all contingencies is never easy; they are difficult to monitor, and close monitoring is essential because of the incentives for opportunistic behavior; and in the event that they have to be renegotiated, the cumbersomeness of legal systems can lead to lengthy disputes that increase costs, result in the abandonment of the project, or force the public sector to take over from the private provider.[69] Last but not least, few private firms are ready to take on the costs of bidding for government contracts, and so competition is limited and the door open to collusive behavior not easily tackled through the design of auctions.

Monitoring projects during the implementation phase and regulating them thereafter—where such regulation is needed because certain infrastructures are natural monopolies—also demands expertise to work effectively with the vendor and to penalize infringement of contractual agreements. As Guasch et al. observe, renegotiation is correlated with insufficient institutional capacity.[70] It can lead governments to accept aggressively low bids and exaggerated revenue forecasts that pave the way to opportunistic renegotiation by the contractor. And institutional weaknesses are also responsible for the corruption that besets infrastructure contracts.

At the outset, urban governments need a clear view of urban access issues and options when negotiating PPPs. Political economy issues and stakeholder concerns need to be identified and suitably resolved. Incorporating accessibility concerns—whether by reducing fares or varying the levels of service for target populations—requires careful crafting of contracts and clarity designating the responsibilities and accountabilities between the private sector and the government.

Taking into account the options outlined in the sections above, cities face serious and complex challenges in establishing the right mix of pricing, funding, and financing policies. This paper is focused primarily on accessibility objectives, but meeting a wide range of objectives that require tradeoffs between efficiency, equity, and environmental sustainability—not to mention revenue generation—will require looking beyond financing of individual investments. The lack of a framework for assessing alternative sources in terms of accessibility has hampered policymakers.

Larger cities with growing economies, strong political links to the center, and demonstrated administrative capabilities will undoubtedly have an easier time obtaining resources through fiscal channels, by floating bonds, and by enlisting the participation of the private sector. It is the smaller cities and those with shrinking or stagnating economies that will face the toughest challenges. Raising local taxes, fees, and user charges for transport services is an option that can only be employed sparingly because it risks driving out businesses and well-heeled residents—and possibly penalizing low-income earners. Financing from the private sector or from financial markets is also unlikely to be forthcoming. For these markets, central and provincial governments are often left as the sole providers of financing and funding for infrastructure. This confronts the latter governments with hard choices: despite the political and social imperatives demanding attention to a city's interests, how much of the province's scarce resources should be shared with cities that may never become self-supporting?

Many of the issues relating to financing and funding highlight the importance of urban governance and organizational capacity examined in the next section.

5. Better governance for urban access

Governance failings often seem to lie at the root of many urban problems, particularly insufficient access. The weaknesses of governance are more pronounced in developing countries, but in both developed and developing countries they are exacerbated by urban sprawl that is creating multijurisdictional metropolitan regions. In fact, polycentricity and multipolarity have further highlighted problems that to a greater or lesser degree bedevil cities everywhere. These include institutional, administrative, organizational, and managerial shortcomings that are a cause of urban planning deficiencies; the lack of interagency and interjurisdictional coordination; the capture of agencies by political interests; the poor quality and motivation of public officials; the low productivity of public enterprises; and the frequently noted problems with the contracting, monitoring, and implementation of municipal projects.

It is not only developing nations that suffer from governance failures. Peter Schuck offers a deeply depressing indictment of the United States, which resonates with the many complaints that are voiced around the world about the performance of urban governments.[71] He maintains that the cause of U.S. policy failures is structural and arises from "a deeply entrenched policy process, a political culture, a perverse official incentive system, individual or collective irrationality, inadequate information, rigidity and inertia, lack of credibility, mismanagement, market dynamics, the inherent limits of law, implementation problems and a weak bureaucratic system." To a greater or lesser degree, these flaws are the bane of municipal and higher-level governments everywhere. As Richard Stren puts it, "Show me a large metropolitan area almost anywhere in the world—in both the industrialized north and the developing areas of Africa, Asia and Latin America—and I can almost guarantee that I can show you a governance system that operates both ineffectively and inequitably. If the growth of huge metropolitan areas in the world looks like an immutable force, then the structures of governance we have erected to respond to the problems of these areas look like Godzilla."[72]

The situation might appear desperate because many metropolitan areas with fixed jurisdictional boundaries and changing economic areas are struggling with fragmented services, unequal access, and spillovers. But in most cases, the situation is not yet critical. The contributors to Ruble et al. provide many chinks of light,[73] and while better governance could improve urban economic growth and access, there is little evidence suggesting that substandard governance necessarily holds back cities with an abundance of entrepreneurship.[74] Growth and urban accessibility may not be as inclusive as is desirable, but in time growth does improve the living standards of the majority. According to the new Habitat III report "Access to Services," cities such as Dhaka, Phnom Penh, and Bangkok, while not notable for the quality of governance and the provision of urban access, are thriving nonetheless. It is cities lacking in economic dynamism and potential and saddled with weak governance that are trapped.

Every city with a governance issue that impedes urban access and adversely affects other services is mired in its own version of misaligned and poorly functioning, multilevel governance. This has become more acute as cities have grown and straddle several jurisdictions. Metropolitan regions tend to be interdependent in many respects and subject to jurisdictional externalities. Thus, policymaking that addresses the myriad economic, social, environmental, and administrative issues requires an effective structure of vertical (multilevel) governance that provides direction with regard to broad urban strategy but also monitors the design and implementation of policies in areas of national (or province-wide) concern. Interdependencies and externalities also demand a horizontal structure of governance that enables a coordinated and unified approach to the planning and financing of infrastructure, and that takes account of fiscal disparities and uneven access to services among jurisdictions and income groups. Horizontal governance is rendered more complex in federations where a metro region crosses a number of provincial boundaries. For example, the National Capital Region in India crosses the boundaries of four states, and the Chicago-Naperville-Joliet metropolitan statistical area includes portions of Illinois, Wisconsin, and Indiana.

Cross-country experience suggests that a desirable governance structure needs to take account of (1) the advantages to be derived from coordinating services and scale economies that are of special relevance for transport infrastructures; (2) intra-regional developmental and fiscal disparities; (3) institutional design that maximizes transparency, accountability, and the responsiveness of governing bodies to the needs of all segments of the metropolitan population; and (4) the tension between the top-down and bottom-up elements of governance and the need to delineate legal/regulatory functions, responsibilities, and fiscal assignments between the center and the metropolitan authorities—with room for these to evolve over time. Examples of governance institutions that mediate region-wide interests include regional development agencies, e.g., for the Dehli and Dhaka metro regions, Vancouver, and Manila; metro-level councils, as in U.S. cities; and committees such as the Verband der Region Stuttgart, the Metro City Council of Bologna, and the Dar es Salaam City Council.

Better leadership that also partially insulates decision making from political pressures—and identity politics—can be a major step to addressing metropolitan access and other issues.[75] The research of Bloom et al. suggests that, as with firms and schools, good management can enhance the working of local administrations.[76] Effective managers need staff with skills, and the ability to attract and remunerate talent is part and parcel of any effort to upgrade municipal governance.

Brazilian experience suggests that cities can achieve greater accountability and a more inclusive provision of services through participatory budgeting (PB). This approach, pioneered by Porto Alegre and adopted

by other cities, informs policymakers regarding the needs of citizens by directly soliciting their views. It also increases the degree of oversight exercised by the voting public, non-governmental organizations, and other watchdog bodies over politicians, the spending of municipal resources, and the quality of services provided. Faguet observes, "Municipalities adopting PB increased spending on health and sanitation significantly more than those that did not—by between 20 percent and 30 percent. This was in line with the preferences consistently expressed in PB meetings."[77]

Too often planning and upgrading urban access is hampered by the multiplicity of agencies that are involved, which makes coordination a nightmare. Having fewer cooks can expedite decision making as well as the implementation and delivery of services. Close consultation with private stakeholders and potential financiers is also a necessity given the increasing role of private capital. Seeking their input and building trust in the interests of long-term relationships is more of a priority than ever in light of the trends in urbanization and the need to build prosperous and equitable cities.

6. A glance toward the horizon

Judicious use of the finance and fiscal techniques available to urban governments and their peers are an essential part of designing, building, and governing urban areas with ideal access levels. Yet how governments employ those techniques must be sensitive to the sometimes rapid evolution of technological, demographic, and environmental factors that affect economies from the local to the global level. These disruptive forces—in the Schumpeterian sense—are of critical import for how regions plan for accessibility.

Notwithstanding Robert Gordon's pessimism regarding the pace and content of recent and future technological change,[78] the prospects for technology-driven advances in urban access are of immediate—and likely the most significant—consequence. Due to the enormous range of new hardware and software being released every year, urban design and demand for physical space could all change dramatically in the coming decades. As a result, urban leaders should consider how infrastructure investment and the supply and pricing of transportation services might need to respond.

Personal and industrial telecommunications is one such area. The ease of telecommuting (facilitated by investment in and pricing of broadband services), flexible working arrangements, and the spread of contracted self-employment (the gig economy) can lessen the need to travel, especially during peak hours.[79] As online transacting like e-commerce, digital banking, telemedicine (e.g., M-Pesa and Afya Poa in Kenya), and digital education spread, many more face-to-face transactions could become redundant.[80] The real estate effects like lower demand for fixed retail and higher demand for urban freight are already being felt in countries with high levels of digital penetration and will only rise in places with subpar telecommunications infrastructure today. Yet it is still widely unknown how these developments may impact people's demand for access.

These same telecommunications advances have begun to unlock new travel models. The rise of shared vehicle and digital ride-hailing services and quasi/fully autonomous (electric) vehicles could be game changers for the supply of access and demand from metropolitan residents.[81] Already today, digital applications enable individuals to select a route and means of conveyance that minimize costs and time spent traveling.[82] Yet for all the surging popularity of these mobility enhancements in developed and developing countries, there is still great uncertainty over how they will affect spatial demand, especially around housing. It is easy to imagine a future where just as many individuals choose to live in denser urban areas and exploit shared mobility as choose to live

even further from activity centers and travel blissfully in their private, autonomous vehicles. But these demands will be tempered by major public policy decisions, especially around carbon pricing. How these patterns emerge—and how services are priced to support equitable access for all populations—will have enormous effects on the neighborhoods people choose to live in and the funding available to build connections between them. Little research has gone into pricing this transition, because change is coming thick and fast and the implications for access are difficult to discern.

Many information technology and auto companies are in the race to perfect and roll out the new technologies. Whether these technologies are widely adopted will depend on their evolution, operationalization, and utility (and downsides); on the resistance that they arouse from those whose sunk capital and livelihoods will be affected; and on the cost and dislocation that will be caused in trying to retrofit the new technologies into the cities that are saddled with the accumulated construction of the past, some of it very long lived. Most importantly, the adoption of new technologies, including the infrastructure and software that contribute to the greening of urban transport, will be predicated on the availability of patient capital and a long-term policy perspective.[83] None of this is easy to foresee. In particular, the potential supply of capital will depend upon the health of the global economy, national rates of saving, government policies, and the willingness of private investors to pour vast amounts into assets with lengthy payback periods. All these raise questions for which no ready answers exist at this point.[84]

Demographically, the age profile of the urban population also affects demand—and more data and research on this would be valuable. Older people are generally more homebound: they prefer to travel shorter distances and to make greater use of suitable public transport or taxi services. In developed and some developing countries, where populations are aging rapidly, the demand for convenient public transport is likely to rise. A nascent preference of the wealthy young households in industrialized countries is to live in inner cities and participate in the gig economy—and avoid the expense of car ownership and utilize public transport or non-motorized means of conveyance. If this patterns spreads to an entire generation, it could lead to a re-densification (and gentrification) of the core cites—where density has declined—and a further easing of the demand for conventional private auto and road-based urban access.[85] In this scenario, larger cities with growing economies could have an easier time meeting the demand for public transport; smaller cities with declining populations and weaker economies will have an uphill task. But much like the technology example, more continuous study is needed to better project these trends and how they may impact the funding of future transportation infrastructure.

Finally, all global urban areas should be focused intently on how to minimize their carbon footprint while managing the adverse effects already present due to climate change. Current models suggest that urban compactness—coupled with advanced technology deployments—may be the most sustainable route forward, but this kind of change can be difficult in the face of legacy built environment structures and limited financing capacity. Minimizing the carbon footprint would also require national and subnational governments to deploy land use regulations and taxes to minimize sprawl, promote mixed-use densification, build low cost housing closer to the foci of economic activity, curb the use of the private automobile, and accelerate the shift to (fully) autonomous vehicles, including those providing public transport services.[86] The measures introduced would be a lucrative source of financing for desirable infrastructures, but they require deep political alignment that is a major shift from the political dysfunction cities face today.

Conclusion

Political instability, governmental dysfunction, stagnating median wages, and high total indebtedness are generating strong headwinds in a number of developed and developing economies. Aging is beginning to erode aggregate growth prospects in the developed nations and will soon begin affecting some of the middle-income countries. In Africa, South Asia, and the Middle East, opportunities through rising populations are tempered by limited economic opportunity in rural areas, government instability, and a continued deficit in entrepreneurial activity relative to their developed peers. In other words, the conditions that would channel greater investment into urban infrastructure and services are not present today.

Yet even in the face of major economic headwinds, urban populations will continue to demand greater access to local destinations. That is, in every urban area across the planet, fiscal and finance techniques are of critical import to how governments and their private-sector peers build and maintain the transportation systems to meet that demand.

What should be clear from this paper's discussion is that we do not yet have a framework from which to assess how alternative modes of funding and financing enhance or constrain accessibility for each segment of a city's population. Moving forward, governments would be well-served to understand the broad sources of funding and how those sources can be utilized to advance shared goals around maximizing access. Doing so will require financial professionals to employ new data and performance measures behind their investment decisions and a more coordinated approach to governance alongside their transportation and urban management peers. Considering the economic challenges in the forefront today, it is time to launch that new approach.

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Endnotes

1 The author is chief economist of the Growth Dialogue, George Washington University, Washington DC.

2 United Nations, *World Urbanization Prospects* (New York, 2014).

3 Graham Floater and Philipp Rode et al., "Cities and the New Climate Economy," Working Paper No. 1 (London: London School of Economics, New Climate Economy, 2014); David Gartner, "Leveraging Cities" (Washington: Brookings Institution, 2015).

4 Fol and Gallez (2014).

5 Bertaud, Alain, "Clearing the Air in Atlanta: Transit and Smart Growth or Conventional Economics? (2003).

6 Angel and Blei (2015).

7 The growth of cities into urban regions can proceed from a monocentric structure to one that sprawls outward in widening concentric circles depending upon geography, with densities decreasing in the outer reaches. A polycentric structure integrates various nearby smaller cities within commuting distance to the core through the development of connecting transport infrastructure. A polycentric structure can morph into a multipolar structure comprising the core city and the networked sub-centers, with a densification of the areas in between.

8 In 2015 there were about 1 billion passenger cars in use globally, and annual sales of passenger cars and light trucks equaled 80 million. Passenger cars alone consumed 18 million barrels of oil per day, somewhat under a fifth of the 97 million barrels of oil equivalent produced in 2015 ("Pressure on the Pump," *Financial Times*, Aug. 31, 2016, https://www.ft.com/content/31d68af8-6e0a-11e6-9ac1-1055824ca907).

9 Efforts to rein in auto dependency through investment in public transport and curbs on the purchase and use of cars may have slowed the spread of car ownership (e.g., in Singapore and West European countries), but has not arrested or reversed it. Washington, Curitiba, Sao Paolo, Prague, Cape Town, Lahore, Beijing, and many other cities are all locked in a vicious spiral where the evolving shape of cities plus the attraction of owning vehicles leads to the acquisition of cars that in turn further distorts urban form and urban access.

10 Keenlyside et al. (2009) discuss how nesting of cities in a polycentric urban region leads to green unbuilt spaces in between, while Hyde (2016) discusses how stubborn holdouts create barriers to the creation of land parcels that can promote densification.

11 Kneebone and Berube (2013). As the reviews by Florida (2015) and Zuk et al. (2015) show, the picture is decidedly mixed even in the United States, with displacement of low-income households not a given. See also Freeman (2005).

12 U.N. Habitat World Cities Report (2016) discusses various informal settlement trends in developing countries.

13 Shertzer, Twinam, and Walsh (2016) emphasize the role of zoning in the distribution of economic activity in metro regions in the United States.

14 Benjamin Barber (2013) claims that mayors vested with authority are the ones who can tackle urban problems and put cities on the path to sustainable growth; and through a World Parliament of Mayors, help share best practices and provide cities with a voice in global affairs.

15 As noted by Scott and Storper (2014), agglomeration widens avenues for sharing services and benefiting from linkages; matching providers with buyers; and learning from dense flows of heterogeneous information. Overman and Puga (2010) analyze the advantages of labor market pooling and their contribution to agglomeration economies.

16 For example, on Mumbai, see Clark and Moonen (2014).

17 For example, Los Angeles passed Measure R in 2009, and Measure M is set for a vote at the time of this writing; see https://www.metro.net/projects/measurer/ and http://theplan.metro.net/, respectively. Paris is undertaking an enormous, costly regional transit expansion known as Grand Paris Express; see http://www.theatlantic.com/magazine/archive/2016/03/tying-paris-back-together/426870/.

18 Anthony Venables, James Laird, and Henry Overman, "Transport Investment and Economic Performance: Implications for Project Appraisal" (London: U.K. Department for Transport, 2014); see also Henckel and McKibbin (2010). The high returns estimated by David Aschauer in 1989 have not been replicated. A review of the evidence from Asia by Straub and Terada-Hagiwara (2010) fails to establish a clear link between infrastructure investment broadly defined and productivity and growth.

19 Edward L. Glaeser, "If You Build It…" *City Journal,* Summer (2016).

20 There are uplifting stories of rust belt cities in the United States and Europe that have found a new economic life after a near-death experience—such as Providence, R.I.; Pittsburgh; and Akron, Ohio in the United States and Manchester, Leipzig and Oulu in Europe—but such cases are few, and leveraging high tech (as proposed by Porter and Heppelman 2014) is unlikely to create the number and kind of jobs that the manufacturing industries they are displacing once did. See van Agtmael and Bakker (2016).

21 The topics discussed in this section and the next are examined in detail by the contributors to Bahl, Linn, and Wetzel (2013).

22 This is not to minimize, however, the importance of looking at land use policies in terms of overall efficiency measures and related cost savings

23 Amar Bhattacharya, Mattia Romani, and Nick Stern, "Infrastructure for Development: Meeting the Challenge" (London: London School of Economics, 2012).

24 There is a wide variance in estimates of the desirable level of expenditure on infrastructure in developing countries, ranging from 1 percent of GDP per annum to 5 percent and as high as 6.5 percent; see Kharas, Chandy, and Hermias (2010); Kim (2016); and Estache (2010). Ferrari et al. (2016), citing the IHS Global Construction Index, state that through 2020 the demand for infrastructure from developed and emerging economies will average $4.2 trillion per annum—almost two-thirds of which will be from emerging markets.

25 Rodriguez et al. (2015) examine targeted transit subsidies for Bogota's urban poor (see http://pubdocs.worldbank.org/en/865911454354497451/20160112-TRB-Bogota-Pro-Poor-Targeted-Subsidy-FINAL-for-Publication-00000003.pdf).

26 Kenneth Gwilliam, "Moving to Access: Transport Pricing and Accessibility," Draft (Washington: Brookings Institution, 2016).

27 OECD countries devoted an average of 3.1 percent of GDP to infrastructure as against 3.3 percent in the United States during 2006-2011. Spending on road, rail, and inland waterway infrastructure averaged close to 1 percent of GDP in the OECD countries and 0.6 percent in North America (see http://www.worldhighways.com/sections/general/news/oecd-countries-invest-average-1-gdp-on-road-rail-infrastructure/).

28 Research reported by Sow and Razafimahefa (2015) finds that revenue and expenditure assignment plus capability are needed to achieve efficient services delivery outcomes.

29 Property/real estate taxes are the principal sources of local revenue for municipalities in Canada, the United States, Australia, and the United Kingdom (Slack 2014). While this is an important tax, rates and collection can vary widely. Even in the United States rates vary from 3.88 percent in Bridgeport, Conn. to 0.30 in Honolulu. Municipalities that raise very little tax revenue from property taxes either rely more on income and sales taxes and/or provide fewer services (Lincoln Institute 2016).

30 This practice is widely prevalent in China, where taxes collected by local governments fall well short of their assigned expenditures, compelling local governments to raise additional financing by purchasing land from farmers at low agricultural use prices and selling or leasing it at higher prices to developers, and applying for bank loans (involving a variety of financing platforms). This approach to balancing the books is unsustainable, and rising indebtedness, especially since 2010, is a cause of concern (Wu 2016; Lu and Sun 2013).

31 Glaeser (2016).

32 See http://unhabitat.org/habitat-iii-resources/. Dziobek, Mangas, and Kufa (2011) find little evidence of a definite trend based on government finance statistics collected by the International Monetary Fund. In fact, Garret and Rodin (2003) maintain that globalization has led to an increase in fiscal centralization.

33 For example, a cross-country analysis by Rodriguez-Pose and Kroijer (2009) of Central and East European countries shows that the decentralization appears to have a negative effect on growth. Where some cities do better is when they have substantial fiscal autonomy. This is supported by the findings of Yushkov (2015) for Russia and by Gemmel, Kneller, and Sanz (2013) for the OECD countries. Good performance is predicated on cities receiving revenue assignments commensurate with their expenditure responsibilities.

34 Australia has sought to overcome this by setting up an independent body to oversee transfers.

35 A term popularized by Douglas North and Barry Weingast (http://elibrary.worldbank.org/doi/abs/10.1596/1813-9450-4359).

36 Vito Tanzi, "Pitfalls on the Road to Fiscal Decentralization," Working Paper No. 19 (Washington: Carnegie Endowment, 2001).

37 Not just developing but also some of the developed countries such as Germany have encountered difficulties; see Slack and Bird (2015).

38 First suggested by John Stuart Mill in 1848 and introduced in the United Kingdom in 1909, betterment levies were difficult to implement and morphed into community benefit contracts with developers to provide infrastructures. More recently, the U.K. has turned to community infrastructure levies, and France has imposed special taxes to defray the development of new towns. Walters (2014) provides a balanced overview.

39 Issues pertaining to value capture are examined at length in Ingram and Hong (2012).

40 David M. Levinson and Emilia Istrate, "Access for Value: Financing Transportation Through Value Capture" (Washington: Brookings Institution, 2011).

41 Fischer and Sclar (2016).

42 Sclar notes: "A good location creates value for a landlord, for example, who benefits, and employers who can more easily recruit a workforce. Users who are beneficiaries should pay" (http://blogs.ei.columbia.edu/2016/04/19/how-to-rethink-urban-transit-and-pay-for-it-too/).

43 Serva (2014) explains the working of value capture techniques in Sao Paolo. After the city identifies a redevelopment zone, it auctions bonds to developers that allow them to construct buildings that exceed the height restrictions imposed by zoning regulations. The money raised through the auctions is then invested in infrastructure and housing in the same development zone.

44 One example is the Infrastructure Development Finance Company in India.

45 Zhi Liu, "Towards Sustainable Urban Transport Finance Mechanisms," Traffic in Towns: The Next Fifty Years (2015).

46 Tax credit bonds are taxable, but bond issuers and buyers directly receive tax credits. This is a lure for foreign investors who are not tax exempt.

47 This gives rise to moral hazard issues and can encourage municipalities to borrow in excess. Governments have therefore sought to make municipal borrowers responsible for their debt, which is feasible in a very limited number of cases.

48 Macomber (2016) maintains that finance is not the binding constraint, it is the shortage of bankable projects.

49 PPPs have a long history, however, it was the straitened public finances of the U.K. that sparked a revival of PPPs in 1986. The Channel Fixed Link, a concession agreement with the Channel Tunnel Group to finance, build, and operate a rail link between the U.K. and France, signaled the start of a new wave; see https://www.ppiaf.org/sites/ppiaf.org/files/documents/toolkits/highwaystoolkit/6/pdf-version/1-21.pdf.

50 Trebilcock and Rosenstock (2015) state that bundling induces a contractor to factor in longer-term costs into the earlier design and construction phases and also to avoid cost overruns and to temper appraisal optimism.

51 Concessions are commonly utilized in Latin America, while greenfield contracts are the preferred mode in East Asia.

52 PPPs also allow governments to shift spending on infrastructure off the balance sheet and, where these apply, to sidestep budgetary limits imposed by the center.

53 Private providers invariably do a better job than state-owned enterprises.

54 James Alm, "Financing Urban Infrastructure: Knowns, Unknowns, and a Way Forward," *Journal of Economic Surveys* 29, no. 2 (2015): 230-62.

55 This assumes that private investors are willing to put enough skin in the game and not depend excessively on loans from public infrastructure banks—as in India.

56 For example, MIGA offers guarantees against political risk as does the UK Treasury.

57 The use of low interest subordinated loans from governments is a fairly common practice as are standby contingent credits from governments or MDBs.

58 Benoit Lefevre, David Leipziger, and Matthew Raifman, "The Trillion Dollar Question: Tracking Public and Private Investment in Transport," (Washington: World Resources Institute, 2014).

59 Mirco Tomasi, "Public Private Partnerships in Member States" (Brussels: European Union, 2016).

60 Bent Flyvbjerg, "Truth and Lies About Megaprojects," Inaugural Speech for Professorship and Chair at Faculty of Technology, Policy, and Management, Delft University of Technology, September 1, 2007, and with M.S. Holm and S.L. Buhl, *Journal of the American Planning Association* 68, no. 3 (2002): 279-95.

61 Bent Flyvbjerg, "Survival of the Un-fittest: Why the Worst Infrastructure Gets Built—and What We Can Do About It," *Oxford Review of Economic Policy* 25, no. 3 (2009): 344–67.

62 Leipziger and Lefevre (2015). Urban bus systems generally need to be subsidized, as they are in Bangkok and Kolkata.

63 Luis Guasch, Daniel Benitez, Irene Portabales, and Lincoln Flor, "The Renegotiation of PPP Contracts: An Overview of Its Recent Evolution in Latin America (Paris: Organization for Economic Cooperation and Development, 2014).

64 Eduardo Engels, R.D. Fischer, and A. Galetovic, *The Economics of Public Private Partnerships: A Basic Guide* (Cambridge, England: Cambridge University Press, 2014).

65 *Wall Street Journal,* December 1, 2016, http://www.wsj.com/articles/numbers-dont-add-up-for-trumps-trillion-dollar-building-plan-1480538796.

66 Eziyi Offia Ibem, "The Contribution of PPPs to Improving Accessibility of Low-Income Earners to Housing in Southern Nigeria," *Journal of Housing and the Built Environment* 26 (2011): 201-17.

67 Engels et al. (2014) are critical of PPPs, claiming that over the long term PPPs are apparently not augmenting the resources at the disposal of the public sector and not leading to improvements in the efficiency and quality of services.

68 E. Dabla-Norris, J. Brumby, A. Kyobe, Z. Mills, and C. Papageorgiou, "Investing in Public Investment: An Index of Public Investment Efficiency," Staff Working Paper 11/37 (Washington: International Monetary Fund, 2011).

69 Ruerd Ruben, "Public-Private Partnerships in developing countries," Institute of Development Policy and Management, 2013, https://www.oecd.org/dac/evaluation/IOBstudy378publicprivatepartnershipsindevelopingcountries.pdf.

70 Guasch et al. (2014).

71 Peter Schuck, *Why Government Fails So Often* (Princeton, N.J.: Princeton University Press, 2014), p. 372.

72 Richard Stren, "Introduction," in Ruble, Blai et al., eds., "Urban Governance Around the World" (Washington: Woodrow Wilson International Center, 2011).

73 Blai Ruble et al., "Urban Governance Around the World" (Washington: Woodrow Wilson International Center, 2011).

74 A recent survey of the literature on urban governance by Jones, Clench, and Harris (2014, 6) states: "The available literature does not permit firm conclusions to be drawn about the nature of key governance challenges and lessons and the political economy factors that are most important for delivering services in urban areas.... Another crucial weakness is the low number of studies that attempt to make systematic links between governance and the effectiveness of services delivery." In other words, there is a lot of noise out there but precious little signal.

75 As Akerlof and Kranton (2011) have indicated, this can be a cause of political polarization and policy gridlock apparent in countries as disparate as Kenya and the United States.

76 Nicholas Bloom et al., "Management Practices Across Firms and Countries," Working Paper No. 17850 (Cambridge, Mass: National Bureau of Economic Research, 2012).

77 Jean-Paul Faguet, "Decentralization and Governance," *World Development* 53, no. 1 (2014): 9.

78 Robert J. Gordon, *The Rise and Fall of American Growth* (Princeton, N.J.: Princeton University Press, 2016).

79 For some activities, working from home could increase productivity. See Bloom et al. (2014) on Chinese call center workers.

80 See https://www.theguardian.com/sustainable-business/2016/may/10/how-kenyans-are-embracing-mobile-technology-to-access-healthcare; http://ihub.co.ke/blogs/21974.

81 These would reinforce disincentives to using private cars arising from tolls and parking fees, which will be easier to impose and collect with the Internet of Things infrastructure.

82 Helsinki will be among the first to introduce this scheme in 2017; see *The Economist* (2016), http://www.economist.com/news/international/21707952-combining-old-and-new-ways-getting-around-will-transform-transportand-cities-too-it.

83 A smart urban transport system increasingly reliant on electric vehicles and the Internet of Things will come with improved traffic management, better travel information, and advances in road use pricing (Sentence 2009).

84 Among the government policies that will be consequential, revenue effort and fiscal discipline will be uppermost. Revenue effort is especially low in some of the African and South Asian countries.

85 For many workers this involves self-employment and multiple part-time occupations, some of which could entail additional travel.

86 On a pilot basis the experimentation with driverless vehicles has already commenced in Singapore and Pittsburgh. If it succeeds, the consequences for access are likely to be momentous (see Claudel and Ratti 2015). The potential of the transport revolution now in the offing is discussed by Atkinson (2014). See also the comment by John Zimmer, co-founder of Lyft (https://medium.com/@johnzimmer/the-third-transportation-revolution-27860f05fa91#.ugy4bph67).

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Brookings gratefully acknowledges the support for the Moving to Access Initiative provided by the Volvo Research and Educational Foundations. The author has no additional disclosures relevant for this publication.

Brookings recognizes that the value it provides is in its absolute commitment to quality, independence, and impact. Activities supported by its donors reflect this commitment.

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