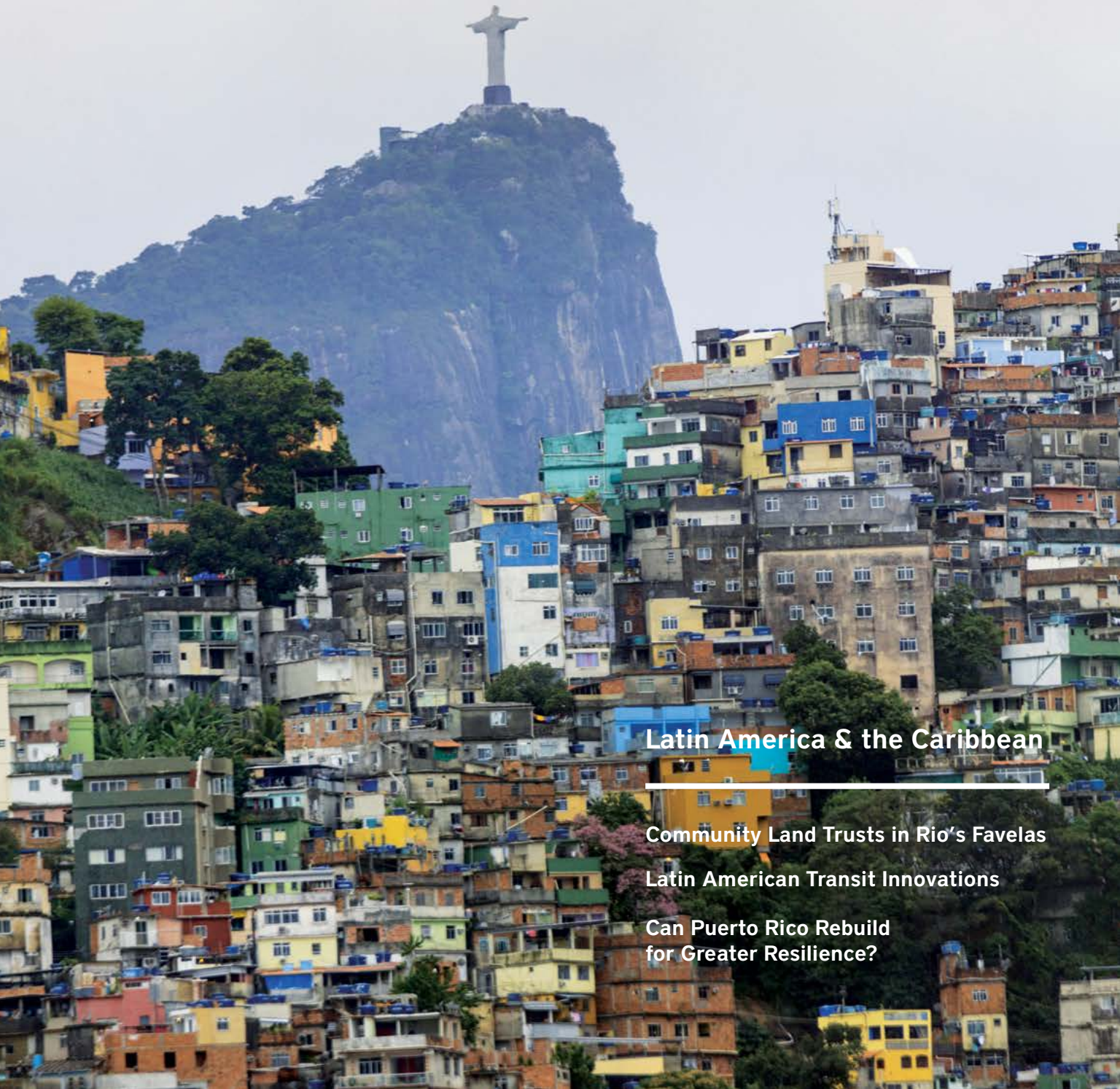


# Land Lines

QUARTERLY MAGAZINE OF THE LINCOLN INSTITUTE OF LAND POLICY

JULY 2018



## Latin America & the Caribbean

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Community Land Trusts in Rio's Favelas

Latin American Transit Innovations

Can Puerto Rico Rebuild  
for Greater Resilience?

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is an independent, nonpartisan organization whose mission is to help solve global economic, social, and environmental challenges to improve the quality of life through creative approaches to the use, taxation, and stewardship of land. As a private operating foundation whose origins date to 1946, the Lincoln Institute seeks to inform public dialogue and decisions about land policy through research, training, and effective communication. By bringing together scholars, practitioners, public officials, policy makers, journalists, and involved citizens, the Lincoln Institute integrates theory and practice and provides a forum for multidisciplinary perspectives on public policy concerning land, both in the United States and internationally.

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Rio de Janeiro's Rocinha favela frames Mount Corcovado. Credit: Robert Harding Picture Library



MESSAGE FROM THE PRESIDENT GEORGE W. McCARTHY

## Land Policy Demands Collaboration

### SPECIALIZATION IS A HALLMARK OF MODERN SOCIETY.

It also contributes to systemic risk and periodic crises. But it's possible to mitigate, and in some cases reverse, the negative impacts of this basic organizing reality by marshalling diverse skills toward shared goals. When it comes to pressing and complex matters of land policy, conservation, and climate change, specialists, working collaboratively, can blunt the excesses and failures of specialization.

How did we get here?

In 1776, Adam Smith hypothesized in his canonical capitalist text, *The Wealth of Nations*, that the relative success of any national economy was a direct result of its ability to increase productivity through the division of labor. Smith famously noted the effects of breaking the pin-making process into 18 distinct tasks, from pulling and cutting wire to placing finished pins in paper for sale. Smith claimed that this process improvement increased the average productivity of workers more than two hundred-fold. He extended the allegory of the pin factory to countries:

The division of labour, however, so far as it can be introduced, occasions, in every art, a proportionate increase in the productive powers of labour. The separation of different trades and employments from one another seems to have taken place in consequence of this advantage. This separation, too, is generally carried furthest in those countries which enjoy the highest degree of industry and improvement; what is the work of one man, in a rude state of society, being generally that of several in an improved one.

As one “rude” man is replaced by a set of “improved” men, production increases dramatically. Presumably, there is adequate demand to absorb 200 times as many pins as were produced before specialization. Smith does not discuss the task of managing the system or the market. Perhaps he should have. The process of separating tasks and professions into narrow areas of specialization generated unintended consequences that we continue to face today.

Since Smith's time, advanced economies took to the practice of separating employment with great alacrity. The United States raised the division of labor to an art form, not solely in industry but also in fields such as medicine, law, and academics. This specialization afforded us impressive economic benefits—extraordinary spurts of growth lasting for decades. However, specialization also brought collapses, sometimes characterized as system failures—resulting from the inability of isolated specialists to see that the sum of the parts they produced added up to an unacceptable whole. These failures included economic crises resulting from overproduction, asset bubbles created by overexuberant investors that led to stubborn recessions or depressions, or dust bowls created by excessive plowing of the land as we mechanized agriculture in the 1920s. We now are beginning to witness similar failures of public systems that deliver critical necessities such as drinking water to cities. Managing legacy capital investments based on narrow financial expertise resulted in children poisoned with lead in Flint, Michigan.

System failures are examples of the “isolation paradox,” a topic about which I've written before (Winter 2015). Individual actors rationally pursue their self-interest but produce degenerate collective outcomes, like the tragedy

of the commons or the prisoner's dilemma. As I noted, a remedy for the isolation paradox is coordinated collective action. This coordination might be orchestrated by management in a factory. In other settings, we look to higher authorities, like governments or churches, to help us overcome narrow self-interest. Self-organized coordination, or collaboration, is another remedy to system failure and offers a formula for success. It is a topic that is frequently discussed, less frequently attempted, and rarely successful. We're beginning to understand why.

Competing definitions of “collaboration” can be found in any dictionary. The first meaning usually presents it as cooperation with others on a joint endeavor; the second, as collusion with an enemy occupying one's territory. Although modern usage favors the first sense, the design of many of our public institutions reflects the second. Systems set up to maximize yields from specialization foment internal turf wars that hinder or prevent collaboration and often betray institutional missions. This is easy to detect in universities, hospitals, or the government, but it is present everywhere, even in land policy think tanks.

Leaders and governing bodies of these institutions constantly try to foster collaboration to manifest important, but unknown, benefits. These are sometimes described as “synergies” and are taken, on faith, as good outcomes that easily outweigh the seemingly trivial costs of “working together.” Academic institutions promote interdisciplinary studies in much the same way, as if some fundamental value that was lost through specialization can be recovered by grafting disciplines together. I, too, subscribed to this belief and spent some four decades trying to capture the magical benefits of working across disciplines. I found that the costs of collaboration are routinely underestimated, while the benefits remain difficult to identify and impossible to quantify. Collaboration seemed to produce ancillary benefits, but it wasn't necessary to achieve primary goals.

At the Lincoln Institute, I've recently come to realize that cross-disciplinary collaboration is not only desirable; it's necessary to achieve our primary mission.

We recently refocused our mission to connect theory and practice—making sure that we complete the circuit between conceiving land-based policies and tools and promoting their adoption and implementation. Completing this circuit is not a trivial challenge. It reveals the absolute importance of coordination between actors with different skill sets. Nowhere is weaving together deep disciplinary strands more important than when we try to get our best land policies or tools implemented on the ground in ways that matter.

Land-based solutions might seem simple, but effective implementation is a multistep process rife with potential for error. For example, taxing property to build a revenue base under local government is a simple concept. Implementing a property tax in new places is anything but simple.

The property tax, like most land policies, is administered locally. But it requires intergovernmental cooperation because local governments need an enabling legal framework from higher levels of government in order to impose the tax, collect it, and enforce it. This requires legislative

The Adam Smith Monument in Edinburgh. Credit: Getty



action at state or national levels. And the challenges do not end there. An effective local property tax system requires other new local capacities: a land registration system to determine who gets taxed, a valuation system to estimate the basis on which to assess the tax, and an enforcement mechanism to penalize those who do not pay their property tax. Implementing the property tax requires coordination among a number of people with very different skill sets: legal expertise to craft enabling frameworks, legislative expertise to get the enabling framework enacted, technical expertise to establish registration and valuation systems, financial management skills to track and record tax payments, and policing expertise to enforce collections, to name a few.

In almost every other case, land policy solutions are much easier to prescribe than they are to administer. Much like the property tax, land value capture to fund infrastructure requires enabling legal frameworks, valuation systems, and enforcement mechanisms. Conserving and protecting private lands in perpetuity depends on legal instruments like conservation easements to record the intent. It also requires ongoing monitoring and coordination of multiple stakeholders to make sure that easements are honored. Preparing for climate change requires careful analysis of future scenarios and appropriate planning for remedial actions like building green infrastructure. And it also requires the skills to finance and manage that infrastructure over time.

As we have worked with policy makers and practitioners to address urgent global challenges, we have confronted two obstacles: our limited ability to deliver the right advice, policies, and tools for each situation, and communities' limited capacity to make use of our assistance. We had to examine basic questions. Are we organized in

the right way to help communities implement effective land policies? What do communities need to bridge theory and practice to effectively implement land policies? We concluded that we needed to fix ourselves first before we could prepare communities to receive and implement our assistance.

Over the last four years, we have worked diligently to break down our internal silos. We institutionalized collaboration in a new department: International and Institute-wide Initiatives. We committed ourselves to the frequent and deep communication needed across all functional areas of the Institute to maintain effective collaboration. We launched issues-based global campaigns that drew on all areas of our expertise, starting with the global campaign to promote municipal fiscal health some three years ago. Coordinating efforts among highly skilled specialists is producing powerful and exciting results. It has propelled us onto the global stage and provided us an opportunity to work in new places with important global institutions.

As we now focus on implementing better land policies and making a difference on the ground, we are confronting the need to help communities overcome their own balkanization. We're helping to forge both horizontal and vertical coordination—across departments within local governments and among governments at local, state, and national levels. Our early efforts are showing great promise. Time will tell whether we are successfully establishing and maintaining intra- and inter-governmental collaboration. But we've concluded that, if we want our work to make a difference in the future of places and people, there is no alternative but to collaborate. So far, we've learned that collaboration is hard and requires sustained effort. But it is the only way to ensure that our work will make a real difference. □

**“If we want our work to make a difference in the future of places and people, there is no alternative but to collaborate.”**

## Innovation Ecosystems: Identifying and Fostering Grassroots Design Capacity

**IN COLOMBIA'S CARIBBEAN COAST CITY** of Santa Marta this July, local citizens, community groups, public officials, and an unusual array of specialists will pick up tools and work together for two weeks to solve technology design challenges relevant to residents of coastal communities. In the process, they will hammer away at the ecological, social, and political issues facing poor people in the region, particularly those living in new, informal settlements.

The International Development Design Summit (IDDS) Colombia: 2018, New Coastal Territories, whose roughly 60 participants hail mostly from Latin America, will bring together MBAs, fishermen, architects, roboticists, anthropologists, economists, artists, biologists, chemists, and an assortment of engineers. A solid majority of the attendees are female.

High on the agenda are sanitation, housing, access to water, and food security. Participants will consider these needs within the context of territorial planning. The United Nations Human Settlements Programme (UN-Habitat) treats urban and territorial planning as a decision-making process geared toward achieving economic, social, cultural, and environmental goals through land policy. Planning is a means of reshaping cities and regions to spur local and regional growth “while addressing the needs of the most vulnerable, marginalized, or underserved groups.”

The logic behind the design event is to assemble diverse actors in an environment conducive to innovation on several levels. Given sufficient time, instruction, and support, participants can collaborate to devise tools and methods suited to local needs, and make progress toward hashing out complex, systemic problems. One of the main tenets of the design process is expecting negative results and learning from them.

The IDDS event's grounding in the technology design process reflects its origins in a project launched at the Massachusetts Institute of Technology (MIT) in 2002. The event's host is the Bogotá, Colombia-based Center of Innovation of Appropriate Technologies and Education (C-Innova), which was founded in 2015. C-Innova is an offshoot of the MIT D-Lab, a technology education and design hub and international community development program that's active in Latin America, the Caribbean, Africa, and Asia.



C-Innova's makerspace in Bogotá hosts workshops, classes, and meetings. Credit: C-Innova Team

D-Lab's anti-poverty strategy aims to make the lives of poor people less precarious. It equips them to build durable settlements and create economic opportunity by developing technologies and products that can find ready markets within the community and potentially beyond. D-Lab has grown to include an interdisciplinary curriculum that emphasizes fieldwork, applied research in technology and community building, and bottom-up development methods centered on local creative capacity and sustainability.

D-Lab Founding Director Amy Smith is a senior lecturer in mechanical engineering at MIT. A former Peace Corps volunteer in Botswana, Smith was awarded a MacArthur Foundation “genius grant” in 2004. Her early collaborative

design work—conducted with students interested in addressing the effects of poverty worldwide—includes methods for making low-pollution charcoal from agricultural waste, low-cost, easily maintained water filters, and bacteria test kits.

The lab works with a long list of international partners and heads up the International Development Innovation Network (IDIN), a consortium of universities, institutions, and innovation centers like C-Innova. IDIN was set up to support the International Development Design Summits, which Smith cofounded in 2007.

D-Lab-influenced innovations include a multistage water filtration system for treating contaminated spring water in Valle del Cauca, on Colombia's mountainous Pacific Coast, and a composting method for creating fertile soil for use in small-scale food production in La Calera, on the outskirts of Bogotá.

"We're a little different in the degree to which we engage the community groups—the end users—in the design process, the problem-solving process," Smith explained. "Many initiatives consult the users but don't engage them fully in creating the solutions, identifying the challenges in implementation, and making improvements."

**"We're a little different in the degree to which we engage the community groups—the end users—in the design process, the problem-solving process."**

IDDS Building Peace, hosted by the National University of Colombia in January 2018, brought together participants in post-conflict resettlement talks, including members of the Revolutionary Armed forces of Colombia (FARC). The summit yielded a rainwater collection and purification system along with the constructive dialogue. "Anything that helps communities solve a problem—such as having drinking water at a very low cost—is also a step towards peace, because it will benefit all of us," former rebel Efrén Morales told the National University of Colombia's news service.



Designs for vertical gardens provide responses to a number of challenges, including climate change and limited space. Credit: C-Innova Team

## BOGOTÁ

C-Innova works out of a repurposed neighborhood workshop, a short walk from the National University of Colombia, in Bogotá. Here, design-minded students and other community members can develop their tool skills, experiment, and make practical, low-cost devices from everyday materials. For the students, it means ready access to mentors, equipment, and materials in a less bureaucratic environment than on campus. To the local community, and throughout Colombia and the region, it's part of a broader movement to use design principles and collaborative approaches to combat poverty and to democratize access to technology.

The center was part of a USAID-sponsored project to establish a global network of community-based technology hubs, according to cofounder Pedro Reynolds-Cuéllar. The idea was to bring together international and regional experts and professionals, local residents and organizations, and area entrepreneurs to address community needs through design-oriented activities promoting sustainable local and regional businesses. The center is based on a D-Lab template for community innovation centers: workspace and meeting space equipped with tools, training sessions, and a shop selling technologies.

C-Innova held a zero-waste summit in the city of Cali, where it worked with local waste pickers to develop a method of recycling plastic filament for use as 3-D printer resin—providing a

new market for the material—and to foster what is now a 50-person business that recycles construction waste into cement. It has also worked with the displaced population in the southeastern outskirts of Bogotá to assist single mothers in ventures to make party decorations from recycled plastic and to design and build practical household items like cribs and lanterns.

## INNOVATION ECOSYSTEMS

"The thing that is relevant to our work is this idea of creating local innovation ecosystems—whether they be urban or rural—that consist of both a network of community members and physical space," Smith said.

After promoting design-based responses to poverty for nearly two decades, D-Lab has begun taking stock of the types of conditions that encourage innovation. In its hypothesis-forming stage of research, D-Lab is reviewing 300 local innovations—from peanut shellers and small-scale underwater turbines to water filters and sanitary napkins—by conducting interviews and preparing case studies in Africa, Southeast Asia, and Latin America.

In the first of a series of papers, D-Lab research scientist Elizabeth Hoffecker describes innovation ecosystems as "place-based communities of interacting actors engaged in producing innovation and supporting processes of innovation, along with the infrastructure and enabling environment which allows them to create, adopt, and spread solutions to local challenges."

The lab seeks to identify the boundaries and other characteristics of innovation ecosystems, ways to measure and bolster a community's ability to innovate, and the significance of local innovation in the context of the UN's Sustainable Development Goals and similar initiatives.

D-Lab classifies local innovations by type: those that save time and/or labor, such as pedal-powered washing machines and wind-powered rice threshers, which increase income and free time for other productive uses; those that create new streams of income (usually novel inventions); those that fill important gaps in the provision of health, sanitation, and well-being; and those that provide an essential

service, which enables other forms of economic or household activity. In general, these local innovations can increase well-being, income, access to education, mobility, and opportunity for local civic participation and decision making.

The overall approach can benefit the planning process, according to Peter Pollock, FAICP, manager of the Lincoln Institute's Western Programs. "Developing and deploying planning tools shouldn't be done in a vacuum," he said. "Directly engaging end users to address their practical needs with appropriate technology will best help achieve these important social and economic goals."

In conventional development terms, such local innovation can be seen to have limited impact and little uptake beyond the local community. Hoffecker notes that the vast majority of innovations were used by 500 people or fewer, and the median user group was 50—unsurprising, given the target communities.

But the MIT researchers found that innovation at the local level promotes the growth of infrastructure in the form of physical spaces and social networks.

This self-perpetuating dynamic is testament to D-Lab's methodology: identify communities based on local needs, resources, and community interest; train community members in the design process and teach the skills to address their particular situation; help set up a makerspace; provide six months' post-training mentoring; and, where feasible, provide seed capital.

"We start by teaching the design process with very tangible products and a very concrete challenge, and then move that to something like an intangible but still somewhat concrete solution," Smith said. "And then [we] move to programs and systems, which are abstract and intangible, so that people can look at the design process as creative problem-solving steps for a variety of issues." □

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Ted Smalley Bowen is a senior editor at the Lincoln Institute.

The view from Santa Marta, a favela in Copacabana, in Rio's South Zone, includes Morro São João and Sugarloaf Mountain. Credit: Robert Harding Picture Library

# COMMUNITY LAND TRUSTS IN RIO'S FAVELAS

Could Community Land Trusts in Informal Settlements Help Solve the World's Affordable Housing Crisis?

By Theresa Williamson

## INTRODUCTION

For more than two decades, the Lincoln Institute's Program on Latin America and the Caribbean (LAC) has been working at the intersection of urban land markets, land-based financing, and affordable housing to address the rise in informal settlements and urban poverty in the region. The Institute has also focused on community land trusts (CLTs)—in which land is owned by the community and dwellings are owned individually—but primarily as they apply to housing issues affecting lower-income communities in the United States. These lines of work have converged as the idea of adapting CLTs to address informality in Latin America has gained currency among housing advocates and land policy experts.

We have seen that CLTs can work in informal settlements, thanks in no small part to the creativity, organizational skills, and commitment of the residents and supporters of the El Caño Martín Peña CLT in San Juan, Puerto Rico (see p. 19). The San Juan example is novel not only because it uses the CLT to ensure collective and long-term stewardship of land and affordable housing, but also because it regularizes, or provides titles to, several hundred informal, or illegal, households, which are also known as squatters. The state's willingness to grant property titles to the community was critical.

The appeal of CLTs in Latin America stems from their ability to offer residents the security of title to the property they occupy, which addresses a major dimension of informality, and to provide long-term housing affordability. Thus, as Theresa Williamson discusses in this issue of *Land Lines*, she is directing an effort to consider CLTs as a means to provide tenure security and preserve affordability in Rio de Janeiro's favelas. The LAC program is documenting the El Caño CLT and exploring the legal and political feasibility of the CLT model in Brazil and elsewhere in Latin America.

LAC research, courses, and projects in Latin America have reinforced the argument that regularization programs are a solution that paradoxically contributes to the informality problem. Regularizing existing settlements demonstrates a city's commitment to social equity and inclusion, but also attracts new occupations and necessitates remedial policies that would provide titles for existing settlements. The ideal approach would be preventative, whereby public authorities deploy a set of planning and financial tools to ensure that land markets produce serviced, affordable, and well-located plots of land to house most of their populations—in particular low-income households. This would include land value capture to fund infrastructure or inclusionary housing.

A preemptive approach is challenging, and abandoning regularization programs may be politically nonnegotiable. This is why CLTs are exciting. As Williamson explains, the community-based aspect of CLTs offers the potential to reduce the speculation and displacement that can accompany titling programs that target individual plots.

As we explore CLTs for informal settlements, we should keep a few questions in mind. First, can a model designed to promote affordable and secure housing in the United States be transferred to Latin America? Second, what would the successful implementation of CLTs in places like Rio de Janeiro look like? Third, what other land policy tools would be needed to tackle informality in LAC and, in particular, prevent future informal settlements?

— **Enrique Silva**, fellow and associate director, Program on Latin America and the Caribbean

## Land Rights in Brazil: Recognition and Threats to the Role of Favelas in the City

In Latin America, “regularization” laws, which grant formal, legal property title to residents of unofficial settlements, typically have the stated goals of providing a secure hold on the land, giving access to the services and infrastructure of the official municipality, and opening access to credit. Public policies attending such laws have varied from simply issuing title to bolstering that property transfer with infrastructure improvements, social services, and employment opportunities. The costs and results of these efforts have varied across the region, with little consensus on their effectiveness. A recent titling law in Brazil has raised concern among housing activists that, instead of offering stability, transferring property outright may produce the opposite effect and push people out of communities they've been a part of for generations.

With the signing of Law 13,465 in July 2017, Brazil's interim President Michel Temer created the potential for a flood of real estate speculation and gentrification in Rio de Janeiro's favelas. The controversial legislation encourages the full regularization of federal lands historically occupied by squatters. Some early settlers eventually received leases on the public land

they occupied, but the regularization measure grants favela occupants full legal land titles. In Brazil, 50 to 75 percent of public land is irregularly occupied, and backers argued that this justified the law. Much of this is land in the Amazon region that has been deemed “ungovernable,” but informal settlements on urban federal lands are also in the mix. The law breaks both with the Brazilian constitution's provision that land should fulfill a social function (i.e., to house people) and with Law 11,977 of 2009, which states that public land must remain in public ownership. Instead, under the new law, federal land—whether in the Amazon or Rio's favelas—is to be regularized by transferring ownership to its occupants, who can dispose of it as they see fit. And the establishment of this federal legislation has the automatic effect of encouraging states and municipalities to follow suit.

Comprehensive land titling in favelas is therefore likely to speed up in the coming years. What will this mean for the city's affordable housing stock? What will happen to Rio's favelas, particularly given that so many are on land with high speculative potential, built on hillsides above the city's most valuable real estate and offering stunning views? Will this law make them more, or less, secure?

Although the residents of Vila Autodromo held title to their homes, the favela was demolished before the 2016 Olympics. Credit: Catalytic Communities | RioOnWatch



## FAVELAS

The first informal settlement labeled a “favela,” today known as Morro da Providência, was established in Rio by ex-soldiers in 1897. They called the settlement “Favela Hill,” after a resilient spiny plant that grew on the hills where they’d fought in Brazil’s arid northeast. Though the word “favela” is seen as a translation of “slum” or “shanty-town,” there is no etymological basis for this. In recent years, a growing body of young leaders in Rio’s favelas have shifted to using the term *favelado* (favela resident) as a point of pride that underscores their resistance and resilience, and strengthens a shared identity around these core attributes.



Providencia, the first favela, in the early 1900s. Credit: Augusto Malta, General Archive of the City of Rio de Janeiro

With the impending mass titling of favelas across Brazil, a Favela-Community Land Trust (F-CLT) model could provide a better solution. Traditional CLTs are set up as nonprofits, which own and maintain the land. Residents own their respective buildings and, in effect, co-own the associated land, guiding and governing the nonprofit landowner as members of the CLT. Since land is normally the primary cost in urban housing, the CLT keeps home prices affordable. In keeping with Law 13,465, the CLT model transfers public land to private ownership, but the collective ownership of land inherent to the CLT model is more in keeping with the constitution’s provision that land serve a social function. Implementing such a model could offer a beacon of hope for housing activists working to regularize informal urban settlements in an increasingly expensive urban world—a model for providing secure access to land and preserving the affordability of housing in perpetuity.

In the context of informal settlements, the CLT approach recognizes—and even welcomes and builds on—the inherent complexity and dynamism of these neighborhoods without compromising their existing characteristics.

## Shelter is a Basic Need

Arguably, the biggest urban issue of our time is what to do with our informal settlements.

The fastest-growing cities in the world are in developing countries, mainly in Africa and Asia. Due to this rapid, unplanned growth, somewhere between a quarter and a third of people in cities today live in informal settlements, unfortunately and unhelpfully still referred to as slums or shanties by news reporters and international organizations.

By 2050, nearly one-third of *all* humanity is projected to live in informal settlements, as population growth is greatest in urbanizing developing countries, where governments can’t address the needs of new urban migrants.

According to researcher Justin McGuirk, “85 percent of all housing worldwide is built ‘illegally,’ . . . mak[ing] residents of informal settlements the primary developers of urban space worldwide, dictating the design and use of more square miles than architects and governments.” And yet, broadly speaking, societies pay little attention to them, until and unless those settlements are seen as “getting in the way” of

“Traditional CLTs are set up as nonprofits, which own and maintain the land. Residents own their respective buildings and, in effect, co-own the associated land, guiding and governing the nonprofit landowner as members of the CLT.”

real estate development. Conflicts around gentrification and development worldwide are a direct consequence of policies that treat housing as property and an investment rather than recognizing shelter as a fundamental human need.

The status quo is to dismiss such communities or evict residents, at best pushing them into inhumane public housing. These approaches are unsustainable and socially unjust. They have not worked because they do not address the underlying reasons why such settlements exist and often leave residents worse off.

At the very least, 20 percent of the population of a typical city cannot afford market-rate housing and thus must access housing outside this market, either through government or civil society.

It is therefore no surprise or coincidence that Rio de Janeiro—a city that, since it urbanized in the late 1800s, has not seriously addressed the need for shelter—today houses 24 percent of its population in informal settlements.

## Rethinking Rio’s Favelas

Rio’s favelas boast a rich 120-year history and may be some of the most consolidated informal settlements in the world today because during much of that history they have been left to their own devices and have put down roots. Consolidated favelas are those where, due to community investment over time, residents generally see value in staying and making improvements in their dwellings, which often represent the life savings of several generations.

Rio was the largest slave port in world history. Slaves constituted 20 to 50 percent of the city’s population during the 19th century before Brazil, in 1888, became the last nation in the western hemisphere to abolish slavery. Generations of post-abolition politicians have been intent on preserving the status quo of

severe inequality, maintaining an accessible servant class while not recognizing the need to provide services to those same people. Favelas are the territorial manifestation of this neglect. By failing to provide favelas with quality public services, including sufficient educational opportunities, and by criminalizing poverty, the city’s power structure renders the status of these communities sufficiently ambiguous and tenuous to keep them submissive. Consequently, this history has been punctuated by periodic forced evictions and occasional investments in infrastructure improvements and basic services.

## CONDITIONS

Rio de Janeiro has approximately 1,000 favelas, ranging in size from tens to 200,000 people. Most favela residents live in communities that are over 50 years old and receive low-quality basic public services. The majority of investment has been made in private homes where residents exert the greatest control and have rebuilt repeatedly over generations. Illegal construction is widespread in Brazil, whether posh villas in national parks,

A carefully cared-for home in the Asa Branca favela, West Zone. Credit: Catalytic Communities | RioOnWatch





A small home perched precariously atop the gentrifying Vidigal community. Credit: Catalytic Communities | RioOnWatch



unauthorized ranches in the Amazon, or houses in the favelas. While they do not own the land, somewhere between two thirds and all of favela residents own their homes. Today, over 90 percent of those homes are made of brick, concrete, and reinforced steel.

Neither temporary nor precarious like slums and shanties, Rio's favelas can be defined by four conditions. They are neighborhoods that develop out of an unmet need for housing. They receive no significant outside regulation. They are established by residents, not by outside developers or speculators. And they evolve, highly influenced by many factors including culture, access to jobs, and the availability of resources.

Rio's favelas exhibit a huge variety of conditions that have resulted in an equal number of outcomes, ranging from highly innovative to entirely dysfunctional. Decisions about the future of these communities are therefore best made by residents, who are the only people capable of evaluating the true value of their settlements, which is often noneconomic and thus hard to quantify.

Nonetheless, the data capture some of the strengths of this type of community. In *A Country Called Favela*, researchers relate that between

2004 and 2014, when Brazil was experiencing rapid economic growth, the average wage in favelas grew more than the average wage across society. Favela residents considered themselves happier than the national average (94 percent versus 93 percent). And 81 percent liked favelas, 66 percent wouldn't leave their community, and 62 percent were proud to live there.

None of this is to deny the very real challenges facing favelas; it is simply to question the narrow view that informal settlements are bad and that by consequence they should be removed. Removing consolidated favelas only compounds the policy failures that make favelas inevitable. In addition, it is important to note that there is nothing inherent in favelas that produces criminal activity. A combination of other factors produces circumstances conducive to organized crime. These factors are the criminalization and stigmatization of poverty; public-sector neglect of education, infrastructure, and other amenities; and lack of economic opportunity.

As a result of this panorama of good and bad, and despite oftentimes paralyzing stigma, lack of investment, and counterproductive security policies, average favela residents would rather see their community improve than seek alternative housing.

### OCCUPATION RIGHTS 1988–2010

When Brazil re-democratized following the military dictatorship of 1964 to 1985 and passed its "People's Constitution" in 1988, housing movements successfully demanded the inclusion of adverse possession rights, opening a legal path to property ownership for residents of informal settlements. Adverse possession, commonly known as "squatter's rights," refers to housing rights given to occupants of land or housing if they are not convicted of trespassing during a given period. In some cities in the United States, such as in New York, that period is ten years. Brazil's five-year urban eligibility period is brief by global standards, and rightly so, given the urgent need to legalize homes built in favelas before the constitution was signed.

In 2001, Brazil passed its Cities Statute, which included a provision for favelas and other Zones of Special Social Interest (Zonas de Especial Interesse Social, or ZEIS) to be preserved as affordable housing. This built on a collective awareness among Brazil's architecture and engineering establishments that this was the best course of action on favelas. Yet, squatter's rights and ZEIS, like many progressive policies in Brazil, fall into the category of policies *pra inglês ver*, or "for the English to see." This dates back to the slave trade and the practice of establishing laws and policies intended not for implementation, but for the benefit of outsiders or domestic advocates of the policy.

Thus, very rarely have favela residents in Rio de Janeiro been given titles. In cases where they squatted on private land and can prove uninterrupted occupation, it may be relatively straightforward to obtain titles through the courts. But the majority of favela housing is on public land, where authorities could ignore title requests. Legally, public officials in Brazil could be expected to provide leaseholds or possession rights, as opposed to titles, since public land was considered nontransferable, while squatters' rights were constitutionally recognized. However, very few leaseholds have been issued, despite the provisions of the law.

Figure 1  
Sustainable Urban Aspects of Favelas

Favelas in Rio have organically developed the following urbanistic attributes commonly associated with sustainable communities:



#### HOUSING

- affordable housing in central areas
- housing near work
- low-rise, high-density, and highly sociable neighborhoods
- flexible use-based architecture;



#### COMMUNITY

- high degrees of collective action
- cultural incubation
- high rate of entrepreneurship; and



#### TRANSIT

- mixed-use; pedestrian-centered streetscape
- high use of bicycles and transit.

## TENURE 2010 TO TODAY

The official approach toward informal settlements shifted in the buildup to Rio's hosting of the 2014 World Cup and 2016 Olympics. Beginning in 2010, when investment flooded the city in advance of these global events, titling became a hot issue. Titles were announced primarily for South Zone favelas, such as Rocinha, Vidigal, and Morro Dona Marta, which were often the most consolidated communities and certainly those in the wealthiest and most speculative districts. It was a matter of months before some residents of these communities—which had successfully fought off eviction during the nation's military regime in the 1970s—connected public authorities' sudden interest in titling with those prior struggles. Using the term *remoção branca*, or “white eviction” (favela residents' initial, endemic term for gentrification), to reflect the unfolding phenomenon,

community organizers lamented the arrival of titles, just as real estate speculators were descending on Rio during the biggest boom in the city's history. And they didn't see it as a coincidence.

In 2013, the media were abuzz with news of gentrification in Vidigal, a favela situated above Ipanema Beach, on what may be the most valuable land in Brazil. Fancy hotels and bars were opening, as were bed and breakfasts and sushi shops. At one point, the residents' association estimated that some 1,000 foreigners were living in the community of roughly 20,000.

Nearby, in the Babilônia favela, at a community meeting to discuss the threat of gentrification, Residents' Association President André Constantine declared, “Because we were born here, we have the right to raise our kids here, and to watch our grandchildren grow up here! . . . How do we see this situation? This [granting of

A typical weekday afternoon in Asa Branca favela. Credit: Catalytic Communities | RioOnWatch



One of four public open-air debates on gentrification and the risks it poses in Vidigal, held by the residents' association and a coalition of other neighborhood groups in 2014. Credit: Catalytic Communities | RioOnWatch



Babilônia resident addresses municipal official declaring “We don't want any title!” Credit: Catalytic Communities | RioOnWatch

titles and utility privatization] is a project [by the government] to keep us from remaining here. . . . They're not going to change the characteristics of the place [through improvements]. No, first they're going to sanitize poverty . . . [by] expelling those who built the place.”

Informal settlements often function as a city's affordable housing stock. When they are individually titled, especially if they are well situated, those homes take on the full land value associated with their location. As a result, they cease to be affordable. The bottom 20 percent of the economic pyramid is forced out. This is a severe blow to people who have built a community over generations; who have grown to depend on its social fabric, location, and safety net; and who have been perpetually underinvested and excluded from the city despite having built it. It also undermines efforts to reduce Rio's epic inequality and maintain the city's cultural riches.

Not surprisingly, by spring 2018, Babilônia's leaders have made little progress in discussions with the city over land titles. They, along with Vidigal and other favelas, did, in a sense, benefit from the recent economic downturn, which halted rent increases and the threat of *remoção branca*. At the same time, gang and police violence increased, leading long-term residents to leave. The pressures on community health in favelas come in diverse forms during booms and busts, and the current military intervention in Rio poses the latest challenge.

## Do Favela Community Land Trusts (F-CLTs) Offer an Opportunity?

For most of the past decade, I have explored the potential for implementing a community land trust model in Rio's favelas. Witnessing the impacts of the pre-Olympics “boom” market on favelas in the South Zone, where relatively few residents benefited while many found themselves struggling, our organization supported diverse groups in Vidigal through gentrification awareness workshops and a debate series on real estate speculation in the community. The first debate in 2014 was packed with residents sharing their stories and concerns. Some had been forced out of their homes by utility hikes or rent spikes; in other cases, sellers underestimated the value of their homes and ended up moving to significantly worse circumstances; and then there were the young adults who, for the first time in generations, would not be able to purchase a home in their family's traditional community.

We began to inform favela organizers about land stewardship strategies, including the community land trust. CLTs are well suited to both periods of economic decline and speculative growth. Although formalized, the basic logic of CLT governance is not much different from favela governance today. Residents own and sell their homes at affordable prices through an

active parallel affordable housing market. Meanwhile, they do not own the land on which they live, which is, in a sense, owned collectively because it is publicly owned. Finally, residents' associations and other neighborhood institutions engage in and advocate for infrastructure improvements in the community, and maintain records of home sales.

The major difference between the two is that favelas are kept precarious through tenuous governance by the authorities, whereas CLTs are sanctioned to manage land, represent the community, and take action to improve that land, and their mandate is unequivocally recognized by residents and authorities.

North American visitors check out the views of South Zone tourist attractions like Sugarloaf Mountain from atop a home in Vidigal. Credit: Catalytic Communities | RioOnWatch



But the concept, as practiced traditionally in the United States and Europe, didn't precisely match the reality in the favelas. CLTs are associated with their American and European varieties, where they function as real estate developers—nonprofit and affordable, but developers nonetheless. Favelas, however, do not require property development, but rather a formalization of their existing housing and community stock. This begs the question: can favelas be retrofitted as CLTs?

It turns out that the answer is a resounding yes. Starting in 2001, the Caño Martín informal settlements of San Juan, Puerto Rico, fought the gentrification of their communities. Today, the Caño is a widely studied example and shows that CLTs can effectively provide formal, titled ownership without the risk of gentrification, while building on the community's existing social attributes. (See page 19.)

## CLT PIONEERS: PUERTO RICO'S HISTORIC CAÑO MARTÍN PEÑA COMMUNITY LAND TRUST AND BOSTON'S DUDLEY STREET NEIGHBORHOOD INITIATIVE

In Puerto Rico, the Caño Martín Peña communities adapted the community land trust (CLT) model to support existing informal settlements. The eight Martín Peña communities' struggles were reminiscent of the experience in many Rio favelas and similar communities around the world. In the 1930s, a devastating hurricane forced rural workers to migrate to San Juan. They eventually built 5,000 homes informally along the Martín Peña Canal, an important artery through the capital. Today, 26,000 residents occupy the area, which is the most densely populated community in Puerto Rico.

Lack of proper sewerage and canal maintenance left the historically underserved area extremely prone to flooding. In 2001, the US Army Corps of Engineers committed to dredging the canal, but residents told city officials they were deeply concerned that improvements to the canal would lead to the gentrification of their neighborhood, given its proximity to the heart of San Juan.

Recognizing this legitimate concern, city officials held 700 community meetings between 2002 and 2004 to explore ways to preserve affordable housing and formalize landholdings. Eventually, they decided a CLT model was the best way forward, but there was no legal precedent for it in Puerto Rico.

In September 2004, San Juan passed Law 489/2004, creating the Martín Peña Canal Special Planning District and ENLACE, a special public corporation, to manage the dredging and other infrastructure improvements. The law also provided for the future incorporation of the CLT.

Also in 2004, residents established the Group of Eight Communities, or G-8, a nonprofit to promote economic, social, and community development and to maintain the CLT. The G-8 facilitates communication between ENLACE and the CLT and ensures compliance with the project's Comprehensive Development Plan.

Prior to transferring title to the CLT, ENLACE worked to regularize property rights. Residents were granted surface right deeds with the right to inherit and maintain ownership of their home, while ENLACE retained title to the land beneath. This separation insulates residents from rising real estate values—they can capitalize on the rising values of the home itself, but not the land underneath.

The General Regulations were enacted on October 21, 2008. They stress the CLT's role as a "mechanism of collective possession in order to solve the problem of the lack of ownership titles" and to "avoid involuntary displacement" of canal residents.

The CLT has now been operating successfully under the General Regulations for 10 years. In partnership with ENLACE, it has made significant progress toward self-maintenance and has relocated residents humanely and only when necessary to dredge the canal. In 2015, it won a Building and Social Housing Foundation World Habitat Award recognizing it as a model for other informal communities.

The Caño Martín Peña case is helping inspire initiatives around the world, including those in Rio de Janeiro. Much of the San Juan model can be inspiring, including the stories of why people chose the CLT over individual full titles and how they organized the community to decide the best model for itself, crafted legislation, and ultimately succeeded in developing the community affordably. The example also demonstrates that when households are a part of an F-CLT, they continue building on the collective assets of the community, rather than lapsing into the more self-interested thinking associated with full individual titles. When Hurricane Maria hit Puerto Rico, the Caño was globally linked and within months was able to galvanize supporters including other CLTs around the world to raise hundreds of thousands of dollars to aid their rebuilding efforts. The Caño Martín Peña case demonstrates that collective development allows communities to harness more resources in inevitable times of need—even amid the effects of climate change.

And beyond the Caño, CLTs' experiences all over the world can offer lessons. The Dudley Street Neighborhood Initiative in Boston, which in 1989 created the Dudley Neighbors Inc., CLT, teaches us that these institutions' contributions go far beyond land management. They can be economic engines coordinated by collective community priorities. This could be very inspiring to favelas that have developed their own commercial activity or that would like to but have had to do so informally. They now can, through the CLT, develop this formally, but in a way that curtails the expenses associated with formalization through traditional channels.

Table 1  
Community Land Trusts and Favelas: Similar DNA

Looking across cases in the North and global South, the core components of the CLT model can be summarized, as:	Favelas are already, in essence, informal CLTs, in which:
<p><b>Voluntary Membership.</b> Participants in the CLT must choose to belong and commit to maintaining permanent affordability;</p>	<ul style="list-style-type: none"> <li>• <b>Residents choose to live there</b>—often forced by circumstances initially but eventually because they develop a sense of belonging and invest in their community;</li> </ul>
<p><b>Collective Land Ownership.</b> The CLT owns the land on which it operates and is composed of resident-community members;</p>	<ul style="list-style-type: none"> <li>• <b>Land is owned by the government</b> for “social benefit;”</li> </ul>
<p><b>Individually Owned Homes.</b> Residents own the home in which they live and can invest in and sell that home. The home’s value is kept more affordable than elsewhere by removing the land value from the sale price (given that the land belongs to the CLT). In some cases, the home must be sold or first offered to the CLT, which resells it to those with sufficiently low income to meet eligibility criteria. Alternatively, the permitted price of resale is legislated during the creation of the CLT;</p>	<ul style="list-style-type: none"> <li>• <b>Structures, mainly homes, are primarily owned by their residents</b> (65–100%) with very robust parallel informal real estate markets and, in some favelas, agencies;</li> </ul>
<p><b>Community Control.</b> The CLT Board is elected by CLT residents only and empowered to conduct broad community development and manage housing. Typically the board has a tripartite structure that ensures the permanent nature of its mission: often a third of the members live in housing on the CLT’s land, a third reside in the neighborhood served by the CLT, and a third serve as technical advisors; and</p>	<ul style="list-style-type: none"> <li>• <b>Every community is required to have a residents’ association, which is usually elected by residents and is legally responsible for representing the community</b> in meetings with public officials, often also undertaking local improvements. They are also the primary agencies responsible for documenting home sales and land disputes; and</li> </ul>
<p><b>Permanent Affordability.</b> The overarching goal of the CLT is to guarantee permanently affordable housing.</p>	<ul style="list-style-type: none"> <li>• <b>Affordability has been maintained</b>, even on what today would otherwise be incredibly expensive land, by virtue of government ownership of land and historical neglect of favelas, where residents were marginalized and criminalized.</li> </ul>

A CLT form of ownership in the favelas would provide residents with security from eviction and real estate speculation. It would also provide public, legal recognition, along with a greater likelihood of improved infrastructure and services. Establishing the legal and institutional frameworks necessary to manage the F-CLT is a daunting task.

US and European CLTs require new residents to accept the ownership model and community organization as they enter the CLT’s waiting list for housing. F-CLTs would need to inform existing residents of their options (F-CLT and house titles versus individually held full land title) and allow families to opt in or out. Fortunately, the Caño in Puerto Rico offers a successful model: 2,000 of approximately 6,500 families opted for inclusion in the CLT in the eight participating communities. If a pilot project in Rio yielded only a subset of homes committed to the F-CLT, one can nonetheless assume that a mix of CLT and full-titled households would curtail major speculation, because large developers would be uninterested in smaller plots surrounded by affordable housing.

If so legislated, households that opt into the F-CLT would be entitled to pay a lower property tax, which is appropriate given they are forgoing their right to speculate in order to guarantee permanently affordable housing (i.e., a public good). They also could benefit from other affordability guarantees such as subsidized utilities (which, similar to shelter, address basic needs) with the same justification. Ensuring a permanently affordable housing stock via F-CLTs would be a boon to the public sector, which would be meeting its obligation to guarantee shelter without massive expenditures in public housing and rent subsidies. Cities could consider lower property taxes for F-CLTs as a flip side of the coin that often causes them to tax vacant land at higher rates, leading to greater inequality and inefficiency. A community-managed permanent affordable housing market would instead lead to greater equality and efficiency for the city as a whole.



Residents take advantage of an empty rooftop to fly kites in Vidigal. Credit: Catalytic Communities | RioOnWatch

There are three main reasons a household might choose to participate in a F-CLT rather than seek individual title to the land:

- 1. Permanence.** The residents’ main concern is being able to stay in their homes and maintain their community, rather than being able to sell their homes at full market price.
- 2. Affordability.** They require subsidies because they cannot afford full property tax, utilities, and other market-rate costs of living associated with the “formal city,” such as businesses likely to operate in a speculative setting.
- 3. Community Management.** They prefer their community to manage its own development rather than relying on government agencies, which are often absent or ineffective.

Embracing F-CLTs could be deeply transformative. Communities would ensure their tenure security through cycles of economic growth and decline, amid gentrification and eviction. They would also build on the legacies of resilience and resistance in favelas, preserving the unique characteristics of individual neighborhoods and their residents. They would use their collective, formal status to lobby for cultural recognition, subsidized utilities, and other amenities, and material improvements.

## What Now for Rio?

Brazil is at a crossroads. The federal government is actively promoting mass full-titling of land and structures under regularization law 13,465. However, communities are increasingly concerned about the resulting speculative pressures, and this law must coexist with the now-established norm of recognizing favelas as Zones of Special Social Interest that should be upgraded and preserved as affordable neighborhoods.

In this context, F-CLTs represent a middle ground where the best of these two laws can coexist. The national regularization law could be complemented by an opt-in F-CLT law. Such a law could establish the framework for individual community members to choose between two options. They could choose the individual full titles currently established in the law, which will allow owners to sell their homes at market value but require them to pay full property taxes and utility bills. This option would also drive a significant cultural shift away from collective management of favelas. Or, they could choose a favela community land trust framework, whereby residents who opted in would receive titles to their structures while forming a local institution recognized by the state and run by the community to manage the land and overall neighborhood.

Residents who opted into the first scenario would depend on the public sector for all zoning decisions, upgrades, and maintenance of their public spaces, as is typical for the formal city at large. Residents who opt into the second scenario would be able to request that public resources, which would otherwise have been spent on them by the government, be allocated to the F-CLT to undertake community improvements. This second option would be legislated to guarantee permanence, affordability, and community management. The result of such a law would guarantee a large network of permanently affordable housing nationwide, offering a market through which low-income wage earners could transition as jobs and other opportunities shift locations.

In the absence of a F-CLT law, however, groups within communities could still act to establish an affordable framework. As federal law 13,465 goes into effect, a group within a community may self-select to form a F-CLT with their newly granted titles. Even if only a quarter of the community forms a F-CLT, the fact they have done so will limit the speculative potential of their community's real estate permanently, because there will not be large tracts of land available for speculation.

Both of these scenarios are currently being investigated and developed by a coalition of partners including our Rio-based NGO Catalytic Communities, the Caño Martín Peña CLT, Rio de Janeiro's Laboratory for Studies of Transformations in Brazilian Urban Law (LEDUB), and the Center for CLT Innovation of the Global Land Alliance, with support from the Lincoln Institute of Land Policy.

The group is creating a series of tools and materials for favela organizers to assess the value of a CLT model to their community, developing a legislative understanding of how this is possible under current law, and envisioning what a new CLT-promoting legislation might look like. All of this will be discussed in workshops with favela community leaders, housing organizers, legal advocates, technical advisors to favelas, and researchers in Rio this August. Communities interested in mobilizing for a F-CLT in their community will receive ongoing technical support from this broader network.

It is clear that ultimately, a successful F-CLT scenario will depend on heavy investments in existing community organizing efforts, to inform residents about the risks and opportunities they face under diverse titling schemes, help them settle on the F-CLT as their solution of choice, and support what will inevitably be a long-term, permanent effort to develop and manage the CLT. The F-CLT will need to thoroughly document community assets in order to ensure that their approach builds on those assets rather than undermining them. As has always been the case, the future of Rio's informal settlements continues to lie in their residents' own hands. □

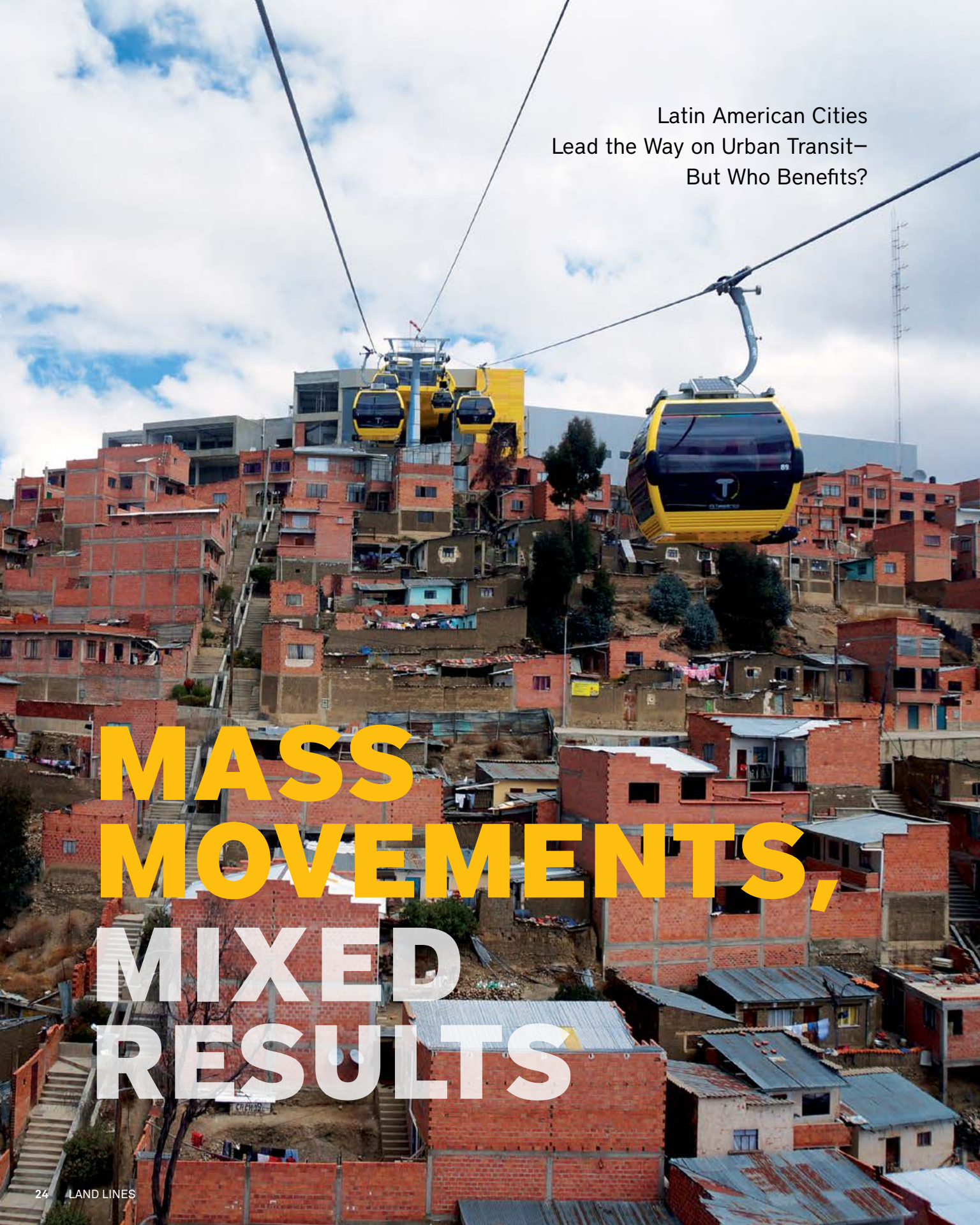
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A photograph showing several yellow and black cable cars suspended from cables, moving over a densely packed hillside favela. The buildings are made of red brick and are built on a steep slope. The sky is blue with some clouds.

Latin American Cities  
Lead the Way on Urban Transit—  
But Who Benefits?

# MASS MOVEMENTS, MIXED RESULTS

By Gregory Scruggs

TODAY AN INDIGENOUS BOLIVIAN PRODUCE VENDOR glides through the air on an aerial cable car to reach the market in La Paz. A student in Bogotá, Colombia, knows she will arrive on time for class because the city's bus rapid transit (BRT) network never gets stuck in traffic. A car owner in São Paulo, Brazil, leaves the keys at home because the city's ban on rush hour driving in the city center applies to his license plate number that day. A young middle-class family lives comfortably without a car in downtown Santiago, Chile, thanks to new sidewalks and bike lanes for neighborhood trips and a clean, safe combination of subway and BRT to navigate the rest of the city. And a day laborer in Rio de Janeiro's favelas can count on a shared van that serves his neighborhood when the city's official bus system does not.

These slices of life in Latin America's big cities are not unusual. Bus rapid transit (BRT) lines zip through the heart of 54 cities in the region. Aerial cable cars connect steep hillside neighborhoods with the rest of town in over a half-dozen cities. Pedestrians and cyclists of all social classes are increasingly finding their way on busy urban streets. Informal transit options abound, although their safety and reliability vary widely, as does tolerance from public officials. Subway systems are being built out, albeit slowly. Car ownership remains well below averages in the developed world.

Altogether, Latin America has earned a reputation as a global innovator in urban transit. Latin American cities have garnered 9 of the 16 annual Sustainable Transport Awards given by the Institute for Transportation and Development Policy (ITDP), and they regularly place as finalists in the C40 Cities4Mobility Awards.

There have been some impressive successes. Public-private partnerships (P3s) are now de rigueur across the region: national governments are funding infrastructure and overseeing long-term plans while private firms bid to operate routes. The World Bank estimates that Latin America invested \$361.3 billion for energy and transport infrastructure in more than a thousand P3s over the last decade, with the lion's share in Brazil, Colombia, and Mexico. Meanwhile, Brazil and Colombia have deployed land value capture in order to finance the expansion of BRT networks and the construction of new rail lines (Smolka 2013).

Amid the Latin American transport boom, however, there have also been busts. Overcrowding on Bogotá's TransMilenio system, the region's largest BRT network, has led to periodic riots. Rio staked its Olympic legacy on enhanced mobility with a citywide build-out of BRT and three aerial cable cars to serve favela communities, but endemic corruption and top-down planning resulted in unkept promises. The zeal to implement new transit corridors in places like Quito, Ecuador, has come at the expense of informal operators serving the poorest urban dwellers.

"Latin America is innovating, but we still don't know if that innovation brings a virtuous cycle to generate resources for the city," said Clarisse Linke, director of ITDP's Brazil office. "Are we benefitting the poor so they don't have to travel 50 kilometers each way to work?"

Such questions are at the heart of Latin America's transportation innovation paradox. The region may have invented creative ways to move people around crowded urban centers, but can it deliver on a broader need to reduce crushing inequality? When it comes to that level of innovation, the awards jury is still undecided.

The region may have invented creative ways to move people around crowded urban centers, but can it deliver on a broader need to reduce crushing inequality?

Credit: Gwen Kash

## BRT Boom

Transportation innovation has flourished in Latin American cities, primarily due to two factors: rapid urbanization and extreme inequality. Despite improvements in recent decades, 8 of the 20 least equal countries in the world, as measured by the Gini index, are in Latin America. And demographers consider the region the most urban in the world. Eighty percent of its population resides in cities, and rates are even higher in Argentina, Brazil, and Chile. Those teeming cities emerged during a postwar economic boom that sparked massive rural-to-urban migration. As peasants, farmers, and indigenous people came down from the Andes or left the arid hinterlands of northeastern Brazil, they did not encounter a ready supply of inner-city housing. Instead, they were shunted to the edges of cities or onto steep hillsides unsuitable for construction.

Seas of poor people surrounding islands of affluence became the socioeconomic norm in the region (Gutman and Patel 2018). New arrivals to a city often find centrally located jobs as maids, janitors, construction workers, or cooks. This creates a need to move large numbers of low-wage workers relatively long distances, to where they can afford to live.

Plenty of enterprising options have sprung up to meet the demand. Shared vans or taxis, known as *colectivos* (Spanish) or *kombis* (Portuguese), began plying routes to serve new neighborhoods that overburdened municipal governments couldn't reach or intentionally neglected. Privately operated bus fleets popped up, offering frequent but uncoordinated service that saw companies competing against each other and drivers competing against the clock in ways that left gaps, duplication, and unsafe conditions.

In the late 1960s and early '70s, the cash-strapped public sector used its limited resources to invest in rail networks in only the biggest cities. Subways in Mexico City, São Paulo, and Santiago are prime examples from this period. Although they serve millions of passengers daily, they don't compare well to the comprehensive

rail networks of similarly sized megacities like London and Tokyo.

Enter bus rapid transit. While the idea is credited to British urban planner Peter Midgley, a retired World Bank consultant who devised the first dedicated bus lanes in French and Belgian cities in the late 1960s, it was Curitiba, Brazil, that evolved the first BRT system. The 20-kilometer line that opened in 1974 featured not just dedicated bus lanes, but also enclosed stations, pre-boarding payment, and all-door boarding—features that make subways swift and convenient.

Curitiba's then mayor, architect Jaime Lerner, who became famous for his urban design interventions in the southern Brazilian city, had federal funding for a metro line. But he realized that the city could produce a much longer dedicated bus system for the same price as a much shorter subway line. With bus stops that had the look and feel of subway stations, and zoning that allowed taller buildings on major corridors near the stations, Curitiba gained most of the benefits of a subway line with a limited budget.

That basic approach appealed to Latin American cities. "We didn't have the resources or the time to implement rail-based transport," said Linke. "It was an urgent situation because our cities were already heavily populated, and we needed more transit coverage."

A Trufi (shared fixed-route taxi) queue in La Paz, Bolivia, during evening hours, when there are not enough vehicles to meet demand. Credit: Gwen Kash



The Transantiago public transit scheme, opened in the Chilean capital in 2007, combines bus and metro service. Credit: Getty

The model evolved in Bogotá under Mayor Enrique Peñalosa—who is back in office after a 14-year hiatus. The city of 8 million is conspicuously absent from the list of Latin American metropolises with subway systems, because Peñalosa, like Lerner, invested heavily in BRT instead in the late 1990s. Bogotá's TransMilenio system grew to become one of the largest BRT networks in the world. With 210 kilometers of routes and over 2 million passengers daily, the TransMilenio rivals many underground networks.

Curitiba and Bogotá represent something of the golden era for Latin American BRT, as these two cities proved, at least for a time, that they could transport a critical mass of residents for a fraction of the cost of heavy rail, sparking a worldwide trend. Meanwhile, cities like Santiago, São Paulo, Rio, Mexico City, and Quito moved to implement BRT lines as a complement to trains, mostly filling in gaps rather than building out rail networks.

BRT, in turn, became identified with Latin America in transportation and policy circles. Think tanks like the Brookings Institute held seminars on what US public transportation could learn from the Latin American BRT boom. The World Resources Institute (WRI) championed BRT as a Latin American innovation and identified Latin America as home to the bulk of the world's BRT passengers, nearly 20 million people daily.

## Middle of the Road

While the global fervor around BRT continues, unabashed boosterism has been tempered by growing criticism, and Bogotá's TransMilenio has been the main lightning rod. The system's approval rating has plummeted from 90 percent to around 20 percent, with chronic overcrowding the main complaint. Like Tokyo's infamously overcrowded mass transit system, TransMilenio is designed for 6 people per square meter—compared to Sweden's transit design standard of 2 per square meter or New York City's average of 2.7 per square meter. This means passengers are squeezed so tightly they may not be able to disembark at their stop. And the system routinely carries as many as 8 or 9 people per square meter, so at peak times it can take 45 minutes just to find a bus with room to board.

While the city continues its efforts to shore up TransMilenio, most recently announcing \$8 million to enlarge 49 of 138 stations so they can accommodate more passengers, the system's flaws have driven more Bogotanos to alternate modes of transportation. The increased reliance on private cars and taxis has produced the sixth-worst traffic congestion on the planet, according to the INRIX 2017 Global Traffic Scorecard. And after 60 years, Bogotá is finally poised to invest in a metro line.

“Today we celebrate that we reached a point of no return with the Bogotá Metro,” said Peñalosa last September when Colombian President Juan Manuel Santos approved national funding for the project. Transportation officials determined that a 30-kilometer subway system powered by renewable hydroelectric energy was preferable to more BRT, which has been slow to convert to clean electric buses from dirty diesels.

Some still favor the cost benefits of BRT. Colombian transportation economist Juan Pablo Bocajero at the University of the Andes estimates that the city loses \$800 million annually (0.5 percent of its GDP) to traffic congestion. “If I had to decide between a 30-kilometer subway and a 200-kilometer BRT, I would probably choose the BRT,” he told Public Radio International’s *The World* in 2015. But even TransMilenio diehards like the system’s former deputy general manager, Dário Hidalgo, who now coordinates WRI’s Observatory of the BRT Center for Excellence, have publicly supported the Bogotá metro.

The BRT versus metro debate also played out in Brazil, where both Porto Alegre and Curitiba considered subway lines after receiving a huge injection of capital from the federal govern-

ment’s public infrastructure spending campaign, much of it funneled into 2014 World Cup host cities. While on paper both opted for a subway, favoring higher capacity and ribbon-cutting potential over the cost-benefit efficiency of BRT, Brazil’s political and economic crisis over the last few years has led both cities to suspend their projects. Curitiba has petitioned the federal government for permission to redirect its roughly \$500 million federal grant back into the city’s flagship BRT system.

Nonetheless, transit investment is not a zero-sum competition, notes Daniel Rodriguez, a University of California, Berkeley scholar and Lincoln Institute fellow, citing research on US metropolitan areas (Levine 2013). Overall, spending on different modes of transit tends to rise and fall together, and spending on one mode has a neutral or complementary effect on another.

While the public sector debates the merits of BRT, private bus fleets continue to serve every Latin American city, and local governments have tried with mixed success to rein in the chaotic overlapping networks of buses. In 2007, Santiago’s publicly subsidized, privately run Transantiago introduced smart cards, scrapped old modified trucks in favor of new buses, and brought the entire system under the authority

Belo Horizonte, Brazil, built its MOVE BRT system with federal funds allocated ahead of the 2014 World Cup. Credit: Mariana Gil, EMBARQ



## AERIAL CABLE CARS

A more recent innovation reflects a willingness to invest in poorer neighborhoods shaped by the unique topography of Latin American cities, where informal settlements often cling to hillsides. As Curitiba inspired a BRT boom, the aerial cable car inaugurated in Medellín in 2004 likewise inspired a half-dozen other Latin American cities. At a cost of \$5 to 10 million per kilometer, it compares favorably with rail transport that couldn’t necessarily navigate the formidable terrain above Medellín’s valleys or between high-altitude El Alto and La Paz. Cable cars have slashed travel times in complicated areas previously navigable only by motorbikes, pedestrians, and small vehicles. But there are notable exceptions: Rio’s two cable car lines have been shuttered for over two years after corruption probes discovered that construction firms colluded with public officials to overcharge for the projects by tens of millions of dollars.

Medellín’s Metrocable. Credit: Gwen Kash

of one agency. But commuters felt frustrated that the radical reform—considered the most ambitious in the transport sector of a developing country—was imposed on them too rapidly. Although Santiago’s system was more reliable than many Latin American cities’ overall transport networks, in 2017 the think tank Espacio Público called it the worst public policy decision since Chile’s return to democracy, in large part because of the billions of subsidies the government pays to private bus operators to keep the system running.

The inadequacies of Santiago’s BRT stemmed in part from an initial lack of public subsidies for the private bus companies, according to Rodriguez. “This translated into operators attempting to carry as many passengers as possible,” he said. The city also eliminated many existing routes and failed to inform riders of the changes (McCarthy 2007).

Such questionable public policy decisions could be a contributing factor to Latin America’s rising car ownership rates (Roque and Masoumi 2016). Still, a recent study showed car ownership rates below the averages in wealthier countries,

from a low of 71 per 1,000 residents in Ecuador to a high of 314 per 1,000 residents in Argentina. Those relatively low numbers mean that a large constituency favors an increase in bus lanes at the expense of private car lanes.

But the annual growth rate of car ownership—up to 6.1 percent in Chile—far outpaced the 1 to 2 percent range in developed nations. These figures suggest that despite Latin America’s advances in mass transit, the upper class and upwardly mobile are still opting for private automobiles, regardless of traffic congestion. (Nine Latin American cities feature in the INRIX 100 cities with the worst traffic, more than in Asia and Africa combined.)

On the other end of the economic spectrum, the proliferation of BRT may be having other consequences. “BRT is the flavor of the decade in transportation and it is supplanting, in some cases problematically so, existing transport systems that are problematic in their own right,” said University of California, Berkeley scholar Daniel Chatman, who has studied the impact of new BRT routes in several cities, including Quito and Barranquilla, Colombia.



Preliminary research suggests that BRT in high-volume corridors tends to best serve those working in traditional office settings, moving them from dense, formal residential areas to job centers. That can leave the poor behind as ancillary routes through poorer parts of the city are cut off by transit planners aiming to formalize the existing transportation network, even though it underserves the 30 percent of the region's residents who live in informal housing.

"BRT ends up serving the dominant traffic pattern in a city and doesn't necessarily deal as well with other travel patterns that are not part of this main trunk system," Chatman said.

BRT's ability to move people over long distances has also facilitated worsening socio-spatial segregation. After creating access to land on the urban periphery, housing officials and private-sector developers in Brazil, Colombia, and Mexico moved to build social housing ever farther from the city center in order to take advantage of lower land prices.

"We now know this was a mistake, leading to social exclusion, higher fares, and travel burden," said University of California, Berkeley's Rodriguez.

The prevailing spatial structure of Latin American cities, with low-income residents located predominantly in the outskirts, means that BRT projects have largely benefitted middle-income residents. This is true in Bogotá (Combs 2017) and Lima (Scholl et al. 2017), where BRT serves concentrations of middle-income residents, connecting them to formal employment clusters. Residents of social housing in Brazil pay over 50 percent of their income on housing and transportation combined, while occupants of more centrally located housing pay 39 percent, according to Linke.



Sao Paulo's Avenida Faria Lima benefitted from a land value capture scheme to finance new infrastructure along the busy thoroughfare, including this BRT line. Credit: Elisa Rodrigues-SIBRT

## URBAN TRANSPORTATION IN LATIN AMERICA

In May 2017, the Lincoln Institute and the University of California, Berkeley's department of city and regional planning hosted a symposium on urban transportation in Latin America. It focused on the influence of innovative transit schemes on real estate, urban development, and the lives of city residents. The aim of the symposium was to examine the evidence to date and discuss ways to apply recent scholarship to public policy.

Symposium papers paint a complex picture of experiences and impacts. Research was inconclusive about whether BRT investments can have distinct impacts on real estate markets, although most of the studies have focused on just a few cities in Colombia, Ecuador, and Mexico. Aerial cable cars have been empirically studied only in Medellín, which showed increased real estate activity. Both types of transport have led to increased building permit activity and population density. Land use trends shifted from residential to commercial in Bogotá and Quito but not in León, Monterrey, Guadalajara, and Puebla. Inconsistencies regarding estimated impacts point to differences in local conditions. Urban land markets are subject to a variety of forces—from planning institutions and development activity to the availability of land—that are likely to influence the price of land, making it difficult to generalize price impacts within corridors, across corridors, and over time.

Opportunities for further research abound, including studies of the importance of these innovations relative to established urban transportation modes, how to target the benefits towards the poorest residents, and how to better coordinate with land development.

The high cost and inconvenience also reflect poor coordination between housing and transit planning. As a result, housing is often located without consideration for transit access, notes Enrique Silva, associate director of the Lincoln Institute's Program on Latin America and the Caribbean. BRT's failure to reach more underserved communities is the result of discrete choices of "how you plan your routes and how accessible the stops are to people," he said. Planners decided to work on existing major routes and decided not to extend or consider routes that penetrated more effectively into poor neighborhoods, Silva explained.

Latin America's advances are nevertheless impressive, and moving around cities in the region has improved demonstrably in recent decades. But until the region reduces the vast gulf between rich and poor—a division that manifests itself in where people can live—high-speed transit can serve at best as a salve on a deeper wound. □

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"The prevailing spatial structure of Latin American cities, with low-income residents located predominantly in the outskirts of cities, means that BRT projects have largely benefitted middle-income residents."

# CATEGORY 4

# COM- PLEX- ITY

## Can Puerto Rico Rebuild for Greater Resilience?

By Patricia Alex

PUERTO RICO WAS ALREADY ON ITS HEELS when Hurricane Maria inflicted its destruction in September 2017. The US territory—home to 3.4 million American citizens—was bankrupt and depopulating. Nearly half the island’s housing didn’t meet code, its rickety power grid was inefficient and unreliable, and the economy was hobbled by staggering debt and a bloated public payroll.

The massive Category 4 hurricane made landfall against that backdrop, damaging or destroying most homes, knocking out telecommunications, and decimating infrastructure on virtually the entire island. Most of Puerto Rico lost electrical power for more than six months, cell service was spotty, and residents and leaders complained of poor federal disaster response.

A Harvard study published in the *New England Journal of Medicine* estimates that at least 4,645 deaths can be linked to the hurricane and its immediate aftermath—70 times the official estimate (Kishore et al. 2018).

By May 2018, power finally returned to all but about 20,000 people—albeit unreliably—and the federal government announced that Puerto Rico would receive \$18.5 billion from the US Department of Housing and Urban Development to rebuild its battered housing and infrastructure. The grant, the largest in the agency’s history, added to \$1.5 billion already committed to Puerto Rico from HUD and more than \$3 billion allocated for response and recovery by other federal entities such as the Federal Emergency Management Agency (FEMA) and the Army Corps of Engineers.

The west coast town of Rincón sustained heavy damage in Hurricane Maria. Credit: cestes001 (iStock/Getty Images Plus)

But the total falls far short of the \$94.4 billion that Governor Ricardo Rossello requested from the federal government to rebuild the island, where blue tarps—slow in coming to begin with—still draped roofs months after permanent repairs had been made to hurricane-ravaged states on the mainland.

By spring 2018, Puerto Rico was attempting to pivot—however unsteadily—from the massive response and relief phase of the disaster to mid- and long-term planning for recovery, even as another hurricane season loomed. But what will recovery look like on an island that was so compromised to begin with? How does the insolvent commonwealth, which experienced a post-hurricane exodus of an estimated 200,000 residents, address improvements in debt restructuring, tax collection, land use planning, flood control, and energy distribution?

It's still very much an open question. "It seems the planning process doesn't have a leader," Ruben Flores-Marzan, former president of the Puerto Rico's island-wide planning board, told a group assembled at Centro—the Center for Puerto Rican Studies at Manhattan's Hunter College—for a recent "diaspora summit" on rebuilding the island. "Who's in charge here?"

Six months after Hurricane Maria, sections of Utuado, in the island's mountainous interior, had no electricity. Credit: Laura Galarza/Montclair State University



The answer is still shaking out on the island—and in the corridors of power on the mainland—as community groups, developers, financiers, and government officials jockey for influence and primacy over the process.

"Lack of clarity is a big problem right now," said Robert B. Olshansky, a professor of urban and regional planning at the University of Illinois at Urbana-Champaign. "They are certainly hoping to build back better. That includes a more resilient electrical grid, a new building code, and improvements in governance and public finance, among other things. . . . I am sure that some improvements will be made, but it's far too early to tell what."

In *After Great Disasters: An In-Depth Analysis of How Six Countries Managed Community Recovery*, published by the Lincoln Institute, Olshansky and coauthor Laurie A. Johnson suggest that disaster reconstruction can offer a unique opportunity to fix long-standing problems (Johnson and Olshansky 2017).

Surely Puerto Rico, suffering from more than a decade of decline, needs a big fix and a robust plan for resiliency as the effects of climate change are likely to continue to batter the island. US government forecasters have predicted an active 2018 hurricane season with as many as nine hurricanes expected.

Planners were often ignored as Puerto Rico's infamous urban sprawl and informal rural land development proceeded apace over many decades. They are hoping for more of a voice now. "Slowly there is a realization that planning has a lot to offer, and we should be part of the process," Carmén M. Concepción Rodríguez of the Institute for Social Research at the University of Puerto Rico told the summit at Hunter, via videoconference from the island.

Flores-Marzan, who is now planner for the town of Ware, Massachusetts, hopes the island will also tap into its émigrés as it tries to recover. Nearly six million Puerto Ricans now live on the continental United States. "You see where they could be making small victories if they involved the diaspora, and they're just not doing that," he said. Still, there is hope: "We have to be hopeful because otherwise we will lose the island."



A pickup truck and a cluster of houses damaged by a storm surge remain partially submerged half a year after Hurricane Maria in Mayagüez, on Puerto Rico's west coast. Credit: Natalie De La Rosa/Montclair State University

## First, Power

Restoring power is the first order of business. The prolonged absence of electricity has taken its toll on Puerto Rico, hampering recovery and exacerbating the misery on the ground. Particularly in the rural areas, people spent months powering medical equipment with noisy, polluting generators, and hauling water from streams because about half the island's water delivery depends on electricity.

"I don't know what was worse, being without power or having the generators run all night," said Ruth Santiago, whose home in Salinas was dark for seven weeks following Maria. She slept with a mask to mitigate the generator fumes.

The island's electrical grid was in trouble even before the storm. It was old, vulnerable, and inefficient when Hurricane Irma knocked out a portion of it in early September, leaving more than a million residents in the dark. The Puerto Rico Electric Power Authority (PREPA)—mired in \$9 billion in debt—was seeking bids to repair that damage when Hurricane Maria struck two weeks later, virtually wiping out the island's remaining electrical infrastructure.

Like other aspects of the disaster recovery, PREPA's rebuild has been marked by question-

able decisions and missteps, such as the early \$300 million repair contract—soon canceled amid controversy—with Whitefish Energy, a small, inexperienced utility company from Montana.

The vast majority of the island is powered by PREPA, whose hulking and rusting generation plants in the South run on fossil fuels and rely on old-school utility poles, wires, and transformers to traverse the mountainous interior in order to deliver power to populated areas like San Juan in the North. It's an outmoded and balky system, but it's being "hardened" with more hurricane-resistant replacement parts as Puerto Rico comes back on-line.

In some areas, like the town of San Sebastian, residents and town officials tired of waiting for PREPA, took it upon themselves to bypass the utility by getting a bucket truck and restringing the town's downed electrical wires. So the integrity of the repaired grid is by no means assured.

The Department of Energy estimates it will take \$17.6 billion to rebuild the system. About \$2 billion has been committed to the effort to date. Even after more than 90 percent of power had been restored to the island in early spring, Puerto Rico suffered from intermittent blackouts, underscoring the fragility of the grid.



A car parked on a partially repaired mountain road in Utuado. Credit: Laura Galarza/Montclair State University



Many of the roads in Utuado were destroyed by Hurricane Maria, and incomplete repairs created hazardous driving conditions. Credit: Laura Galarza/Montclair State University

The island's electricity is expensive too—about double the cost on the mainland—since it relies on fossil fuels that have to be imported. But the 1988 Stafford Disaster Relief and Emergency Assistance Act authorizes government agencies to restore only existing utility service. Skeptics doubt that a plan promoted by the governor to privatize PREPA will infuse the utility with the capital needed to substantially improve its efficiency. For now, it seems that renewable sources like solar and wind aren't likely to replace the grid, even on a sunny Caribbean island with year-round trade winds, because overhauling the mode of energy-transmission island-wide would require a significant public investment. Puerto Rico is broke, and Washington seems reluctant to increase its aid.

Some say political will is also lacking. "There's a thing called the oil cartel. Somebody is cashing in, and a lot of those people are very influential," said Flores-Marzan, the former planner for the island.

But a number of efforts are underway. A \$750,000 federal block grant will go to the University of Puerto Rico to develop a Resilience Innovation Program to look for innovative solutions to promote home-based renewable energy generation and energy storage. The

grant will also fund the study of community-wide resilience measures, home design, and construction methods (PRDOH 2018).

The biopharmaceutical company AbbVie recently announced a \$50 million donation to the nonprofit group Direct Relief to equip more than 60 community health centers and local healthcare facilities with solar power, battery storage, and generators, and to enable them to power pumps that would ensure clean water supply. The group will also work over the next three years to rebuild the battered medical supply chain and fund telemedicine programs at select hospitals and health centers.

And there are smaller, grassroots initiatives pending. "Municipalities are tired of waiting for PREPA, so a lot of the push for resiliency and energy independence is coming from them," said Flores-Marzan.

A group called Resilient Power Puerto Rico is fundraising to bring solar microgrids to the island and recently received a \$625,000 grant to bring solar to 200 community centers.

If the PREPA grid failed, the microgrids could be used to power essentials like water pumps and medical devices. "We are rebuilding in a grassroots way. We're not challenging or replacing PREPA" said Jonathan Marvel, a New York architect who leads the group.

With some funding from nonprofits on the mainland, Santiago and her neighbors in Salinas, who live in the shadow of two smoke-belching PREPA plants, are also working on plans for community-based solar micro grids that can at least provide a backup for essential services like water pumping and running medical devices, should PREPA power fail.

"PREPA is the provider of power to 95 percent of the island, but we want it to change its way of distribution. It's not in the best public interest to do it the way it was done before," said Santiago, a lawyer who lived in The Bronx before returning to Puerto Rico. "Developing energy infrastructure at the community level is not an easy thing to do, but we don't have a choice. The old grid is unreliable—it's killing us in the South."

## Recovering While Broke

Puerto Rico's economic crisis looms large over any long-term planning and recovery efforts. Just four months before Hurricane Maria, the commonwealth declared a form of bankruptcy as it struggled under more than \$74 billion in debt and \$49 billion in pension obligations. The combined \$120 billion debt made it the largest municipal bankruptcy in the United States, dwarfing Detroit's \$18 billion filing in 2013.

The territory's cash solvency and liquidity problems and austerity measures imposed through economic and fiscal reforms inhibited its ability to provide services, notes Lourdes Germán, director of International and Institute-Wide Initiatives at the Lincoln Institute. "This dynamic significantly contributed to the humanitarian crisis that was building before the disaster and clearly continues," she said.

Beginning in the 1970s, the island's government had become more reliant on debt financing, and that crisis continued to unfold for decades. The bonds securing that debt—however risky—were easy to sell because they were exempt from federal, state, and local taxes

thanks to a provision in the 1917 federal law that also granted Puerto Ricans American citizenship.

"People who invested in Puerto Rican bonds didn't look at the credit risk. They just looked at the fact that they could get a high interest rate," said Desmond Lachman, an economist and senior fellow at the American Enterprise Institute (AEI). "Puerto Rico didn't have trouble borrowing money. Until it did. It kept borrowing until the music stopped, and that's where we are now."

Despite this common perception, Puerto Rican securities continue to trade, even a year after the island entered its de facto bankruptcy. The market activity among investors demonstrates that the risk profile is affecting the pricing and trading activity around the securities and resulting in new patterns of investor interest and segmentation. These factors will influence the island's ability to attract outside capital and investment as well as the cost of capital, according to Germán. "The trading activity continues because there is a secondary market. Investors are looking at these securities and pricing risk while evaluating the potential for returns. Last April, for example, Bloomberg reported that Puerto Rico's bonds emerged as a top performer in the US municipal market—gaining more than any other dollar-denominated debt in the world," she explained.

Tax-supported debt is now 55 percent of the Gross Domestic Product in Puerto Rico, as opposed to the US average of 2.67 percent according to figures released in April by the Financial Oversight and Management Board for Puerto Rico. The island is confronted with ever more volatile and challenging capital markets while it works through its bankruptcy, and opinions vary regarding how best to resolve the stalemate with investors.

AEI's Lachman, for one, is unequivocal. "The debt has to be written down big time. That's just basic math," he said. "Creditors didn't do due diligence when lending, so I don't see why we should feel sorry for them or ask taxpayers to foot the bill when the creditors also messed up."

## Debt in the Aggregate

Puerto Rico accumulated unsupportable levels of debt in the form of general obligation bonds, which are secured by the territory government's full faith and credit, and revenue bonds, which are secured by specific revenue sources, such as fees or specific taxes. Puerto Rico's constitution provides guarantees for general obligation bonds.

"The heart of the problem is an inability to support their general obligation-backed bonds, which are subject to constitutional protection," Germán explained. "And then you have the added problem of revenue bonds, which have been issued by over a dozen separate public and quasi-public entities in ways that are not sustainable. Puerto Rico's revenue debt is secured by many different revenue sources—including, for example, sales taxes—which could have otherwise been used to fund current government operations. This combination was a recipe for disaster."

## Historical Context

Critics blame a bloated public sector, mismanagement, and corruption, but many believe the roots of the crisis lay in the island's colonial history. Puerto Rico has had an often-fraught relationship with the federal government since the former Spanish colony was ceded to the United States at the end of the Spanish-American War in the late 1800s.

Puerto Ricans were granted American citizenship in 1917—just in time to serve as US forces in World War I. In 1920, the Jones Act required all goods ferried between US ports to be carried on ships built, owned, and operated by Americans. The mandate makes shipping more expensive, especially in Puerto Rico, where most commodities—even those needed for disaster relief—must be imported.

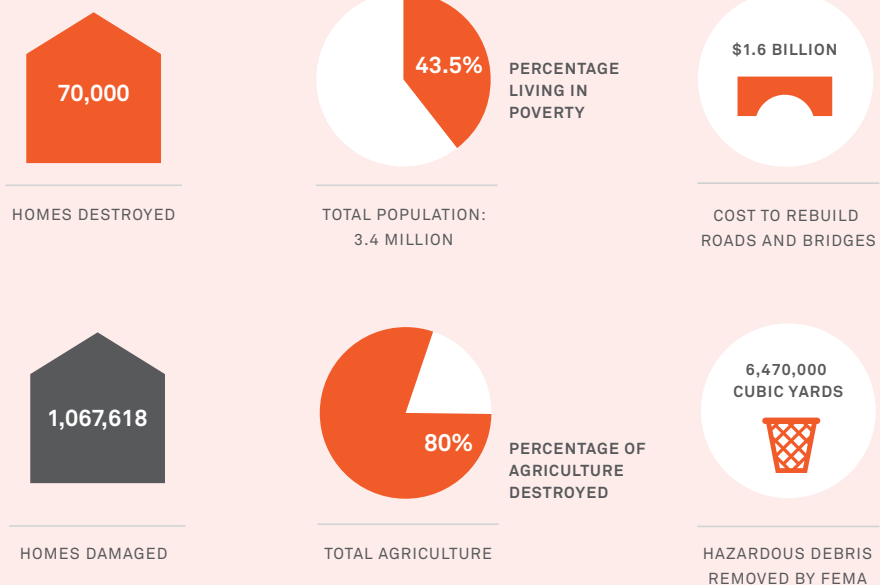
In 1996, the federal government began a 10-year phase-out of corporate tax breaks—Section 936 of the tax code—that were designed



This road in Mayagüez, on Puerto Rico's west coast, remained unrepaired six months after it was damaged by the storm. Credit: Natalie De La Rosa/Montclair State University

Table 1  
Post-Maria Puerto Rico  
by the Numbers

Source: PRDOH (2018).



to spur manufacturing growth on the island. Puerto Rico lost 40 percent of its manufacturing jobs in the subsequent decade ending in 2006, according to the Bureau of Labor Statistics.

The island's tax base shrank, and the next blow came in fairly quick succession with the dawn of the Great Recession of 2008. Puerto Rico's government continued to borrow to meet its obligations, and many of the island's most employable citizens—the young and healthy—emigrated in large numbers to the mainland United States.

From a 2004 high of 3.8 million, the population in Puerto Rico fell to about 3.4 million last year (Table 1), and it is expected the island will lose nearly half a million more residents by 2023, according to the Financial Oversight and Management Board for Puerto Rico (FOMB 2018). The board was created by Congress under the Puerto Rico Oversight, Management and Economic Stability Act (PROMESA) signed into law in June 2016.

The oversight board paints a grim picture for the island's economy in the near term: fully 100 percent of the Gross National Product this year will come from the expected \$62 billion in public and private disaster relief.

The panel in April approved a series of austerity measures aimed at "aggressive structural reform" in Puerto Rico, such as scaling back employee benefits unheard of on the mainland, like mandatory Christmas bonuses and allowing for "at will" employment. The recommendations also included loosening labor laws and implementing pension and welfare reform. Critics say the "reforms" are punitive and rely on unrealistic growth projections. As economic policy, they say the austerity measures are the last thing Puerto Rico needs as it struggles to recover.

"Can Puerto Rico be rebuilt under that plan? Not much," said Carlos Vargas-Ramos, director of policy for Centro.

But proponents say it's the best way to address the underlying fiscal crisis so the island can move forward. "From a community planning point of view, we are in the crossfire. . . . At this moment, the big question is, 'What is going to happen with this government and the debt?'" said Frederico Del Monte Garrido, a government planner, vice president of the Puerto Rican Planning Association, and Hunter summit attendee. "The principal point is we need to accept this fiscal plan."

One factor clouding Puerto Rico's prospects has been its inconsistent classification under US law as a territory. Some past court decisions and US policies have treated Puerto Rico as a foreign jurisdiction and excluded it from certain sections of the US Code, Germán noted. "Part of what has made this very difficult is that our own laws are unclear. For example, Puerto Rico was not authorized to seek protection under the part of the US bankruptcy code, Chapter 9, that provides relief for some insolvent governments, and it's unclear why it was excluded. PROMESA attempted to fix some of these issues, providing Puerto Rico with a remedy similar to Chapter 9 to enable it to adjust the debt problems that are at the heart of its insolvency."

## Taxation and Land Use

The panel also recommended implementing tax initiatives that many experts believe are essential to righting the ship. They include creating a unified payment system, reducing corporate taxes with the goal of increasing investment, broadening the tax base, and improving compliance.

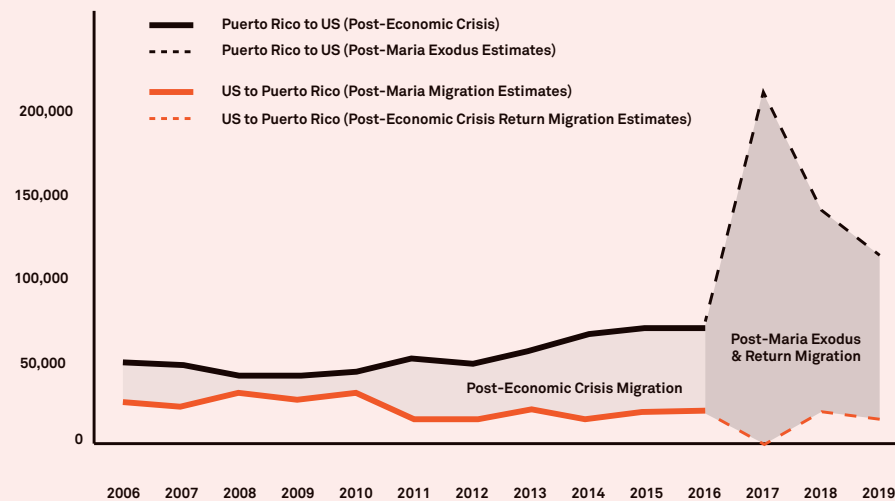
Puerto Rico's chaotic land development has, of course, led to a haphazard system of property taxation. In many rural areas, land has been handed down for generations, and there is no paperwork or deeds—a barrier for as many as 60 percent of the 1.1 million claimants seeking FEMA aid, according to the financial oversight board.



Families gather at the edge of the broken boardwalk in Cabo Rojo. Credit: Laura Galarza/Montclair State University

Figure 1

Post-Maria Migration from Puerto Rico to the United States (2006–2016 and 2017–2019 Estimates)



Note: Lower bound estimates are double the lowest number of migrants registered during the prior three years. Upper bound estimates are three times the highest number of migrants registered during the prior three years. Since the American Community Survey estimates are based on random sampling of the population, the smaller the numbers reported in this table, the larger the margin of error for the estimates.

Source: American Community Survey, various years.

By some estimates, as many as half of Puerto Rico's 1.6 million housing units may have been constructed "informally"—an umbrella term that includes illegal subdivisions. Entire communities grew informally, such as Villa Hugo, a makeshift settlement of 6,000 residents who were forced from their homes by an earlier hurricane, for which the community is named.

Most of the informal homes don't have insurance of any kind. Many don't have addresses and don't show up on the tax rolls. An equitable property tax base—a staple of healthy communities—is absent in many parts.

"They haven't done a great job in capitalizing on land value," said George W. McCarthy, president and CEO of the Lincoln Institute. "They've done a very poor job of even collecting property taxes."

By improving land registration systems, establishing property values, and enforcing taxation, Puerto Rico can tap an important revenue source needed for rebuilding, he said.

The fiscal oversight board found no workable assessments for "tens of thousands" of properties on the island and estimated that more than \$800 million could be raised by improving tax compliance, registering properties not on the rolls, and capturing back taxes.

The issue is critical, said Flores-Marzan. "It's an immense problem and an important issue to address right now," he said. "A lot of lawyers in Puerto Rico—people with the skills to address this problem—are probably out of work now."

Over the next five years, the nonprofit housing group Habitat for Humanity International, which also received a \$50 million grant from AbbVie, will partner with families to repair and rebuild housing and to address so-called "land tenure" issues that have substantially hindered housing recovery, said Bryan Thomas, head of public relations for the Georgia-based group. "A large portion of the housing was built without clear title, and that has caused huge delays," said Thomas. Habitat will also work with government officials to look for ways to address the problem on a systemic level, he said.

Thomas said Habitat encounters similar issues in many of the less-developed countries where it builds. "Puerto Rico is in many ways sort of a hybrid—it's part of the US but doesn't operate under the same systems or laws," he said. Habitat also plans to train construction workers, since many left the island as the economy plummeted.

McCarthy said Puerto Rico could also benefit from the creation of more public land bank authorities as it grapples with what to do with tens of thousands of abandoned properties. Such mechanisms helped rebuild in Japan and Germany after World War II and more recently in Detroit, he said.

Land banks aggregate and pool property and then design more efficient use. They can promote economic development by leveraging loans and grants for an area. The public Detroit Land Bank Authority owns about 100,000 pieces of property in the city, much of which was in foreclosure.

When Maria hit, Puerto Rico was already in the midst of a foreclosure crisis, with rates that were three times higher than on the mainland. Tens of thousands of properties have been abandoned, and there are an estimated 40,000 vacant properties in the San Juan area alone, planners say. San Juan created a land bank for its most densely populated neighborhood, Santurce, in 2016 (Vélez 2016).

Puerto Rico will also need to demolish or repurpose hundreds of school buildings.

A quarter of the island's schools have been shuttered because of the exodus to the mainland. The territory's education department this spring announced plans to close another 265 schools. This would leave Puerto Rico with one-third fewer public schools than it had at the outset of the 2017–2018 academic year, potentially accelerating the out-migration (Mazzei 2018).

"I don't see a path forward unless they can rationalize their land use," said McCarthy. "It all hinges on effective leadership. It's going to require somebody who is both charismatic and visionary."

But the path seems anything but clear-cut on the ground. "Everything in Puerto Rico has become really complicated. There's a perception of an anarchic environment," David J. Carrasquillo-Medrano, president of the Puerto Rican Planning Society, told a panel at the recent "diaspora summit" in Manhattan. "The narrative of the government is that Puerto Rico is a blank slate, and you can go do what you want to do," he said, referring to the courting of developers. "In Puerto Rico, it's not that we don't have planning; it's that there's no real estate regulation."



The tourist town of Cabo Rojo, in southwest Puerto Rico, was forced to fend for itself in the storm's aftermath, as the Puerto Rican and federal governments were slow to respond. Credit: Laura Galarza/Montclair State University

## Housing, Infrastructure, and the Return of the Cruise Ships

Many planners are deeply concerned that desperation and expediency will upend any planning already in place and thwart innovative rebuilding in Puerto Rico. Zoning and planning vary across the island. Del Monte Garrido said much of the reconstruction in poorer areas has been makeshift. Flores-Marzan said there are island-wide zoning codes and plans in place in 30 of 78 municipalities, but enforcement often is lacking, as is regional planning.

In 2011, Puerto Rico adopted a uniform building code that required structures to be built to withstand winds of up to 145 miles per hour. But most homes on the island were built informally before then.

To date, there are few concrete plans for new housing; an "action plan," drafted by the federal government when it awarded the Community Development Block Grants, was more a statement of need than a plan. There are enormous price tags for righting the island: \$375 million for debris removal, \$1.5 billion to repair and rebuild roads and bridges, \$8 billion for public buildings.

Puerto Rico is poor: before the storm 43.5 percent of the population lived below the poverty line. The island is home to the second-largest US public housing authority, with over 55,000 units across 340 properties. More than a quarter of those units were damaged, and initial damage claims totaled over \$119 million in public housing alone.

In all, a million homes were affected by the storm; 472,000 sustained "significant damage" and 70,000 homes were completely destroyed, according to government estimates. The preliminary federal action plan estimates that rebuilding for greater resilience could cost \$34.3 billion.

Foundation and nonprofit funding could be important. Groups like the Resilient Puerto Rico Commission, supported by the Rockefeller and Ford foundations, have been working with community groups to assess the damage and look for sustainable solutions. Rockefeller also has supported an island-wide public engagement campaign called Reimagine Puerto Rico. Still, many feel ignored after a lagging federal response and much confusion in the aftermath of Maria.

"I represent the people, and nobody is listening to us. We're still being told 64 people died, and it's over 1,000," said Rev. Jose Antonio Oquendo, growing visibly agitated during a discussion at the summit at Hunter. Oquendo is a Catholic priest in the diocese of Caguas, and his parishioners had no electricity or running water for six months. "We say on the island that it is going to take us 10 years to set up again."

Carrasquillo-Medrano, who heads the Puerto Rican Planning Society, said too much information is missing, such as accurate flood maps, to make informed planning decisions. And he cautions about the rush to build rather than rehabilitate housing. "We don't need new homes; we have 326,000 vacant units on the island."

Storm-damaged house in Adjuntas, a town of roughly 20,000 in the interior of the island. Credit: Babe Garcia/Montclair State University



Most planners agree that communities will probably have to be relocated from areas particularly vulnerable to the flooding and mudslides that affected the mountainous interior and coastal lowlands of the 35-by-100-mile island. More than 50 rivers and 60 watersheds surged with flood waters when Maria hit, according to the government.

Agriculture has nearly been wiped out and industry is flagging, but tourism is rebounding. Puerto Rico resumed cruise operations just two and a half weeks after Hurricane Maria, and 1.7 million passengers are expected for the 2018–2019 season, according to forecasts included in the federal government action plan. Traffic at the Luis Muñoz Marín airport is expected to reach pre-Maria levels this summer. And most hotels are back in business; the government estimates that the tourism sector has spent or planned for \$1.9 billion in new developments and renovations.

McCarthy points to Puerto Rico's estimable amenities—it is a Caribbean island after all—and said perhaps the island can look to New Orleans and Detroit, which have stabilized, if not rebounded, from decline and calamity. "It's not like Puerto Rico is going to stay vacant for long. The question is, who is going to develop it?" said McCarthy. "Can you build a thriving economy in Puerto Rico beyond tourism?"

At the recent summit in Manhattan this spring, panelists and attendees seemed humbled by the work ahead. "We still need a lot of information. There is still a sense of the enormity of the task at hand," said Hunter College's Vargas-Ramos. "Rebuilding Puerto Rico is going to take decades, so we need to think short-term, medium-term, and long-term." □

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Additional reporting by **Loren Berlin**.

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**Manuel Velarde** was sworn in as the 20th Mayor of San Isidro, a district within Lima, Peru, in January 2015. Since 2010, he has also taught at the University of San Martín de Porres. A lawyer who served in the firm of Lazo, Romagna and Gagliuffi Abogados, he was a legal counsel from 2003 to 2008 at the Ministry of Economy and Finance of Peru, and in 2009 he was made superintendent of the National Superintendency of Tax Administration of Peru. He graduated from the Pontifical Catholic University of Peru and earned master's degrees in law from both the University of Pennsylvania and King's College London. Lincoln Institute Senior Fellow Anthony Flint interviewed him in May 2018 for this issue devoted to Latin America and the Caribbean.

## Seeking Sustainability in Lima's Financial District

**ANTHONY FLINT:** Governance structure affects the administration of large metropolitan regions and the quality of life for its citizens. Can you tell us about the challenges and opportunities of being part of the governance system in Lima?

**MANUEL VELARDE:** San Isidro is 1 of 43 districts run by the Metropolitan Municipality of Lima. Each district has its peculiarities. We are a 10-square-kilometer (3.86-square-mile) territory with approximately 60,000 residents. We are also the financial center of Peru. From Monday to Friday, around a million people come into San Isidro to work, shop, or do some other kind of task. It's a big challenge to accommodate this. The policies we apply are seen as cutting edge. We are in a position to offer better services, generating a better quality of life, but we face challenges—for example, [the need for more] public transportation. We must also constantly coordinate with other districts.

**AF:** What are the major financial and planning challenges in San Isidro and how is the municipality dealing with those challenges?

**MV:** Today the district is financed by two taxes: the property and the service tax. Both taxes, but principally the service tax, provide the revenue for all services. In certain parts of our country, noncompliance is a big problem. That's because the residents don't feel they get what they paid for with their taxes because of poor management and corruption. There is a lack of trust in the local government. In San Isidro, however, around 90 percent of residents and businesses pay their taxes on time, and that allows us to generate public investment. Our budget is always limited and we need to prioritize. For that, we develop planning strategies to maximize the impact of investments.



**AF:** San Isidro is considered the financial center of Lima, if not Peru, and its population has a relatively high level of income for the region. To what extent does the municipality rely on land-based resources and financial tools such as the property tax or land value capture?

**MV:** At this time, land value capture here is not within our competencies. We are attracting private investment and creating public-private partnerships and making sure those projects are aligned with our sustainable development policies. The problem in San Isidro is that the

value of the property is expensive, and there is not enough population—particularly younger residents—to support that. We need affordable housing. One solution is that we have reduced the minimum size of an apartment from 200 square meters to 45, 60, and 80 square meters to attract new residents, especially young people. We also have reduced parking requirements for this. Today, we have new housing investments starting construction at the financial center. This will allow people to walk to their jobs and reduce the use of cars that generate congestion. We are [focused on] transit-oriented development.

**“We need affordable housing. One solution is that we have reduced the minimum size of an apartment from 200 square meters to 45, 60, and 80 square meters to attract new residents, especially young people.”**

The bike path along Los Libertadores Street, designed by San Isidro’s urban planning office, was constructed in 2016. Credit (previous page and below): Archive of the Municipality of San Isidro



**AF:** Your efforts to prioritize pedestrians and bicycles over cars have prompted fierce criticism, including an attempted recall. Do you feel you have successfully changed the culture in the public realm?

**MV:** When I was elected mayor, I promised the voters I would modernize San Isidro but keep it on a human scale. Our area has suffered dramatically from the intensive use of cars. Our district needed to be retrofitted for pedestrians and cyclists. We began with the ideas that [it’s more affordable to live without] a car and that the car is having negative effects on the city and quality of life. Transforming underutilized land and areas dominated by cars, we have created public spaces that people would not [have thought] possible a short time ago. Of course, it meets resistance. Any city undergoing these kinds of reforms will face resistance. But as citizens start to recognize they can live in a better environment than before, that will change.

In the beginning, we created bike lanes and parking for bikes, and then we wanted to provide a public system of bikes. We wanted to promote intermodality and better [ways to] cover short trips that are currently [made] by car. Short trips should be made by bikes [or on foot], by promoting walkability and road safety. Our new bike-share system will stretch that policy. We have already signed the contract, and the implementation will be done soon. The operator is the same investor that recently revamped the bike system in Paris.

**AF:** Expansion of the Metro mass transit system is underway in Lima. How important is public transportation in San Isidro, and how does it fit in with your planning?

**MV:** There’s an additional line [under construction] right now. We have one line in operation, but it does not cross the district. We will have to wait around 10 years more for the next lines that pass through San Isidro. The new lines will be under-

ground and funded by the national government. Investment in public transport is crucial to facilitate accessibility for residents and visitors. At the same time, we need better management of parking spaces. We don’t have parking meters, so we are inducing demand [because people can park for free on the streets]. We need to be able to build an efficient [parking payment system].

**AF:** You have partnered with IBM and others to make the district a “smart city.” Can you identify a few ways that technology has improved quality of life?

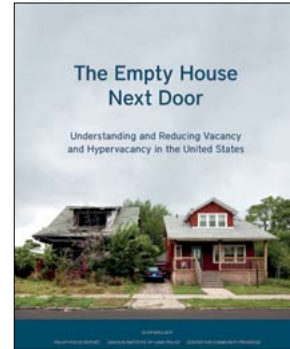
**MV:** We have to be careful with the use of technology. Look at history. At one point, we were told that using a car was affordable and efficient, and it had a huge impact in cities. We have been victims of the presence of cars in our environment and from thinking that the car was an absolute solution. We now know it is not, so we have to [avoid] becoming victims of any other kind of trap. Technology is useful, but we cannot commit the same mistake. What we need more than a smart city is smart citizens who know how to live in the city of the future.

**“Technology is useful, but we cannot commit the same mistake. What we need more than a smart city is smart citizens who know how to live in the city of the future.”**

A couple of years ago, we worked on a contest sponsored by IBM, and they gave us advice to implement certain applications. We want to help people with intermodality—to [give] people the tools to make their trips more efficient. That means [providing] up-to-date departure times and showing how you can connect to other modes—[such as] where the bike share is, and how far it is to walk. That is [how I view] the role of technology. □

# The Empty House Next Door: Understanding and Reducing Vacancy and Hypervacancy in the United States

By Alan Mallach



May 2018 / Paperback / \$15.00 / 54 pages  
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Even though there are fewer vacant and abandoned properties across much of the United States since the recession, these properties continue to dog struggling postindustrial cities, tearing apart neighborhoods with growing intensity, according to a Lincoln Institute report released in May.

Since the 1990s, vacancies have become more widespread in legacy cities—former industrial powerhouses such as Detroit, Cleveland, and St. Louis, researcher Alan Mallach writes in *The Empty House Next Door: Understanding and Reducing Vacancy and Hypervacancy in the United States*. These vacancies are driving property values down, hurting cities' financial health, and contributing to higher crime rates. At the same time, cities have had some success with strategies to rehabilitate, selectively demolish, and reuse vacant properties as new housing or green space.

The report analyzes US Census and Postal Service data for 15 legacy cities—ten large and five small—as well as for magnet cities such as San Francisco and Boston, and Sunbelt cities such as Phoenix and Dallas. The report focuses especially on two indicators: hypervacancy, which occurs when at least one in five properties sits vacant, and “other vacancies,” a Census term for properties sitting unused and not for sale or rent so they are effectively abandoned.

A few decades ago, hypervacancy was limited to a handful of neighborhoods, but now characterizes large swaths of many cities. In 2015 more than 49 percent of Census tracts in

Flint, Michigan, 46 percent of tracts in Detroit, and 42 percent of tracts in Gary, Indiana, suffered from extreme hypervacancy, with more than a quarter of units vacant in each tract.

At such levels of vacancy, “the market effectively ceases to function,” Mallach writes in the report. “Houses sell, if they sell at all, only to investors, at rock bottom prices while the neighborhoods become areas of concentrated poverty, unemployment, and health problems.”

Meanwhile, the number of units that are effectively abandoned has increased by 2.1 million nationally—from 3.7 million in 2005 to 5.8 million in 2016—an increase roughly equal to five times the entire housing stock of San Francisco. These properties represent less than a third of all vacant properties in magnet and Sunbelt cities, but about half of all vacancies in large legacy cities, and roughly two thirds of vacancies in the smaller legacy cities, which face the greatest economic challenges, as detailed in the Lincoln Institute's report *Revitalizing America's Smaller Legacy Cities*.

*The Empty House Next Door* describes barriers to addressing vacancies, including cumbersome property tax foreclosure processes, and state laws and bank practices that lead to thousands of properties being stuck in foreclosure limbo. Legal tools, including “spot blight” eminent domain, vacant property receivership, and land banking, have helped communities gain control of abandoned properties in some cities but are unavailable or underutilized in others.

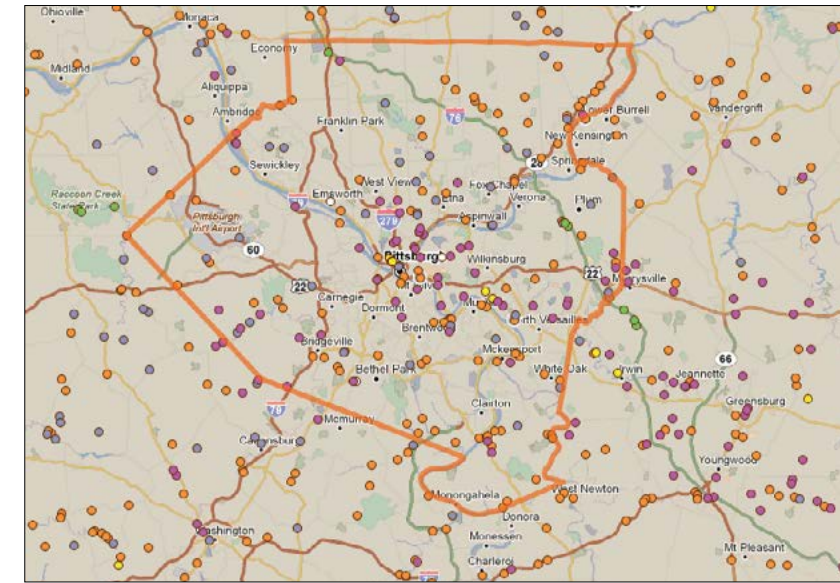
Some cities have pursued strategies to promote reuse of vacant property. In Cleveland and Youngstown, Ohio, collaborative public-private efforts have combined strategic demolition with rehabilitation to make refurbished homes available to new buyers at affordable prices. Baltimore uses receivership to place vacant properties in the hands of for-profit and nonprofit developers in targeted areas with market potential; this has put 1,300 units back to use since 2010.

In neighborhoods with less redevelopment potential, cities have converted vacant properties into green space. Cleveland, for example, published a catalogue of potential green uses for vacant land and worked with a nonprofit partner to make \$500,000 in grants to 56 small parks, rain gardens, and agricultural projects. In Philadelphia, the Pennsylvania Horticultural Society has pioneered an inexpensive, low-maintenance approach to greening more than 7,000 vacant lots.

With inspiration from these successes, the report recommends that cities collect better data on vacancies, remove legal impediments to reuse, adopt and use strong legal tools, use public strategies to overcome obstacles to market-driven reuse, make greening a long-term strategy, and balance demolition with rehabilitation as part of a larger strategy for revival. □



## Structurally Deficient Bridges in Allegheny County, Pennsylvania



### Maintenance Responsibility

- State Highway Agency
- County Highway Agency
- Other State Agency
- Other Local Agency
- Federal Agency
- Railroad
- Private
- Unknown

Allegheny County, Pennsylvania, has more structurally deficient bridges than any other county in the United States—201 of 1,250, or 16 percent. Improvements would cost at least \$150 million.

Structurally deficient bridges are characterized by deteriorating conditions and reduced load-carrying capacity. Although this classification does not imply that a bridge is unsafe, it does indicate that the bridge likely requires significant repair and maintenance to remain in service and eventually may need major rehabilitation or replacement.

Credit: The Place Database. [www.lincolnst.edu/research-data/data/place-database](http://www.lincolnst.edu/research-data/data/place-database)

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