

A bright future: Smart cities in Latin America

Smart city initiatives in Latin America have too often been overshadowed by high-profile projects in North America. But the tide is changing, and smart city projects throughout the region are gaining traction like never before.



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As municipalities across Latin America embrace technology to run urban settings and look for new ways to improve ESG performance, smart city projects throughout the region hold great potential for investment and future growth—White & Case LLP partners **Thomas Pate**, **Jeannine Acevedo**, **John Anderson**, **Rafael Roberti** and associate **Tom Robinson** explain.

Smart city initiatives in Latin America have too often been overshadowed by high-profile projects in North America and Europe.

However, as the world emerges from the COVID pandemic, and climate change and public health move up the policy agenda, smart city initiatives are now gaining new traction across Latin America.

The “smart city”—a concept that puts people and quality of life at the center of urban development through the use of technology and improved data collection and analytics—has

been gaining increasing traction in Latin America as governments look for ways to improve the way the region’s burgeoning urban centers are run.

Latin America is known for its densely populated megacities of ten million-plus inhabitants, which has posed unique challenges for city managers and planners. Smart city methods have presented practical tools city authorities can use to deliver tangible benefits for citizens, manage urban growth and decrease environmental impact.



450,000

street lights in Rio de Janeiro, Brazil, will be replaced with high-efficiency LED bulbs as part of the city’s Smart Rio Project

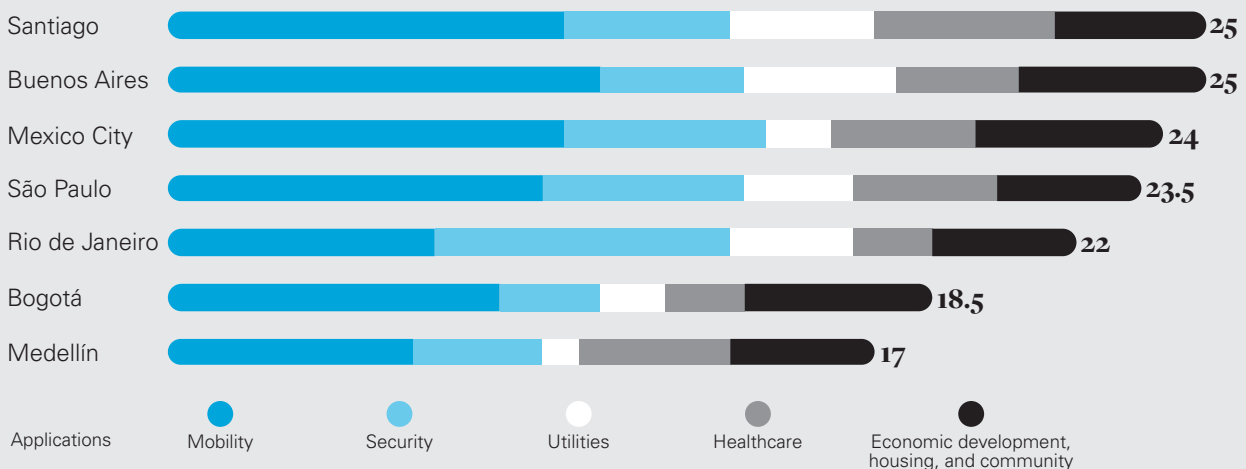
Providing a pathway to sustainability

Smart city projects cover a wide spectrum of technologies, and generally seek to increase connectivity and operational efficiencies, and make localities “greener.” A smart city approach has the potential to increase public safety and improve the provision of infrastructure, sanitation, transportation, energy efficiencies, housing and security services to the public. Smart cities also place a renewed focus on lowering environmental impact.

The cities in Latin America deploying the greatest numbers of smart cities applications

Deployment of smart city applications

Maximum of 55 points



Source: McKinsey Global Institute analysis

Cities across Latin America have been deploying smart city technologies to improve service delivery and meet sustainability targets.

The city of Rio de Janeiro, for example, has launched the Smart Rio Project, which will include a program to modernize the city's public lighting system that, upon completion, is expected to improve public safety by reducing driving accidents and street crime.

The Rio lighting project will have far-reaching sustainability impacts too by decreasing energy use by up to 60 percent, as well as mitigating light pollution and sky glow. It has also delivered strong value for money, as the costs of the project will be covered by the lower operational costs over the lifetime of the operation of the infrastructure and a pre-existing public lighting tax.

The cities of Santiago in Chile and Bogotá in Colombia, meanwhile, have seen significant improvements in air quality and emissions reductions by replacing legacy diesel-fueled public bus fleets with electric buses. In the same way as the lighting project in Rio, the operational costs of an electric bus fleet can be as much as 70 percent lower than diesel alternatives over the life of the fleet, reducing the need for municipal budget or tax increases to fund the transition.



411

Santiago, Chile, is home to the largest fleet of electric buses outside of China, with a fleet of 411 battery-powered electric buses, as of June 2020

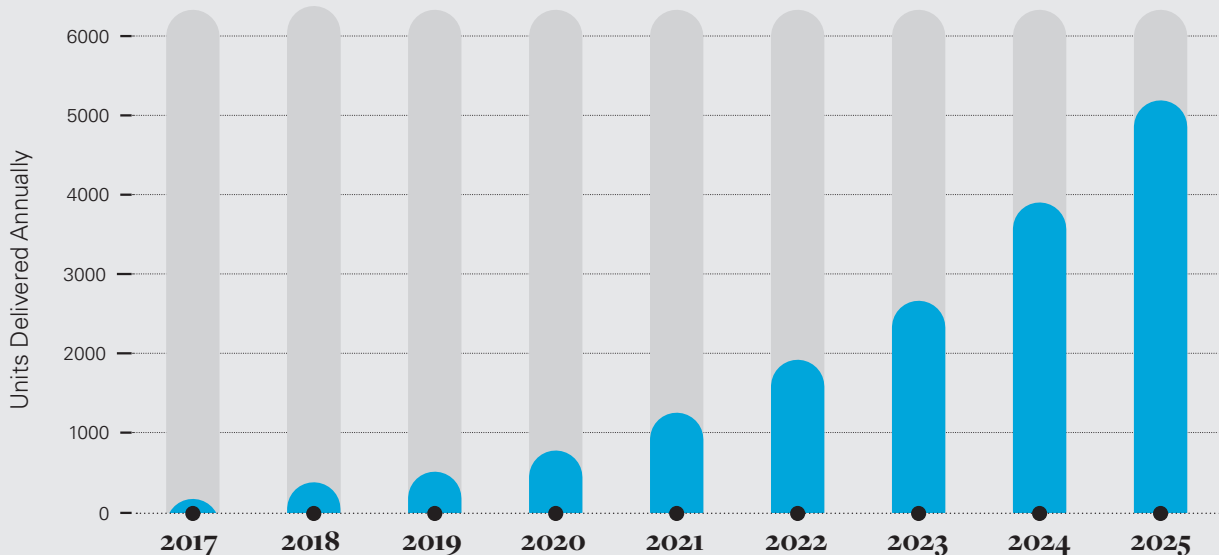
Chile has also upgraded its street lighting network to less-consumptive LED technology and installed energy-efficient water heating systems, while Colombia has installed sensors that monitor rainfall, water levels and soil movement to detect areas that are at risk of flooding.



Smart city initiatives are gaining traction across Latin America like never before

Latin America electrified* bus market

*Electric, hybrid and fuel cell

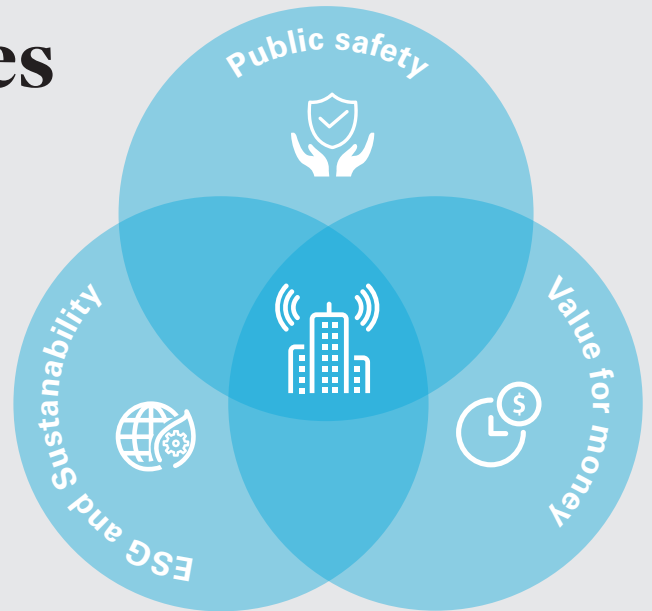


Source: Interact Analysis

Why are smart cities important?

Existing smart city technologies have been applied to improve public safety, generate cost savings, and assist localities in reaching sustainability and improved quality of life goals.

With increasing urban populations, smart cities can present a sustainable path for urban development in a variety of areas:



Public safety

The aim of many smart city projects is increased public safety. For example, traffic-monitoring cameras give public authorities the ability to see accidents in real time, notify first responders and proactively divert traffic. Managed lanes, highway lanes designed to regulate traffic movement (i.e., HOV lanes, toll lanes), help further ease traffic congestion and create safer highway driving conditions. Noise sensors, if installed in traffic lights, can detect the sirens of police cars or ambulances to provide first responders with right-of-way, or more sophisticated sensors may be used to detect and identify sounds such as a gunshot or a cry for help and can alert the police immediately. Improved waste management and waste management collection services contribute to decreases in instances of disease.



ESG and sustainability

Smart city technologies can help achieve ESG goals by enabling more efficient delivery of services and an associated reduction of GHG emissions.

Electrical vehicle charging stations and citywide bike-sharing programs reduce emissions by reducing the necessity of driving gasoline-powered vehicles. Even gasoline-powered vehicles can decrease emissions through more efficient traffic management systems that reduce driving time. Smart housing projects, which include intelligent building management technologies or seasonal energy storage, further reduce the carbon footprint of residential and commercial buildings.

As modernized public transit remains a major tool for cities to address emissions and urban congestion issues, beyond expanding current metro systems, the electrification of existing mass transit options also furthers these aims. Relatively simple actions, like upgrading aging diesel-fueled public transportation buses with electric buses, reduce emissions and noise pollution associated with the operation of the bus fleet. Other municipal service vehicles, like garbage trucks, are also prime candidates for fleet electrification.

Fleet electrification also frequently includes ancillary projects like the upgrading of depots with charging infrastructure to further maximize the efficiency of the fleet's energy consumption, or the modernization of bus stations and stops to improve passenger experience and wait times.

Modernized bus shelters are also increasingly becoming hosts of data-collecting sensors that aid in the bus system's decision-making. In turn, these sensors can then enable smart advertising, which represents another potential revenue stream for the city.

For cities needing to achieve emission reduction pledges made under the Paris Climate Accord, smart city initiatives offer actionable methods of change without upending the lives of the city's residents.



Value for money

Well-structured projects, from a technical, financial and legal perspective, may require only limited initial capital from government sources. From such initial capital outlay, the municipality may receive strong and noticeable improvements in the quality of life for residents.

In some of these smart city projects, in which the service to be optimized already generates revenue, the smart city projects can even pay for themselves.

Investments in bus fleet modernization, for example, can be paid over time with passenger fares collected on a system-wide basis, further offsetting any cost, and electric buses benefit from a reduced cost of ownership (up to 70 percent less) as opposed to traditional diesel-powered buses.

The reduction of diesel fumes and improvement of air quality also leads to improved public health and associated cost savings with fewer negative health impacts requiring fewer hospitalizations. Other smart city projects, like toll roads, can create new streams of revenue for municipalities. The long-term cost savings achieved via smart city projects can then ultimately be passed along to city residents through an overall lower cost of living.

By investing in smart city technologies, cities may become more attractive to businesses and industries, further promoting their economic growth and competitiveness.

Recent smart city projects in Latin America

Brazil

Rio de Janeiro recently entered into a public-private partnership to modernize its lighting system. The project is intended to modernize the public lighting system in Rio de Janeiro and install other smart city technologies. This will include the replacement of 450,000 street lights with high-efficiency LED bulbs, the development of a remote management system for the public lighting system, the installation of 10,000 HD cameras, 5,000 Wi-Fi hotspots, 6,000 traffic management nodes, 4,000 sewer sensors and a command system.

The Smart Rio Project benefited from a 20-year sub-concession provided by RioLuz, a state-owned Brazilian entity, and stable cash flow projections during the term of the concession as a result of the revenue structure under the sub-concession, which is backed by a certain public lighting tax. As a result, the consortium was successfully able to raise US\$165.5 million for the project in the capital markets.

The municipality of Curitiba in Brazil has also announced plans to tender a 23-year street lighting public private partnership with the auction expected to take place in June of 2022.

Chile

Santiago—named the smartest city in Latin America by the IESE Business School in its 2020 Cities in Motion ranking—has demonstrated a commitment to a number of smart city initiatives in transportation and mobility, environmental sustainability and public safety.

In 2014, the city of Santiago began an electric bus fleet replacement program. The emissions-free electric buses are substantially more cost-effective than conventional diesel buses, costing about 70 percent less to operate. Charging stations integrated throughout the city's bus stops allow the buses to be fully charged within about five hours. The "ElectroRuta Enel X" initiative in Chile would be the first national electric route, intended to connect more than 5,000 kilometers from the north to the south of Chile, with a fast-charging station for electric vehicles every 60 kilometers.

In 2021, as part of the "ElectroRuta Enel X" initiative, Enel X announced strategic partnerships with Uber and Volvo Cars Chile to help accelerate the development and adoption of electromobility initiatives in Chile.

This focus on "clean mobility" has resulted in decreased air and noise pollution, furthering Chile's clean energy initiatives and decarbonization process. A study published by the United Nations Environment Programme in 2017 estimated that a fully electric public transportation system of buses and taxis in Santiago could prevent 1,379 deaths by 2030.

Colombia

Colombia presents an interesting case study for inclusive smart city projects and technologies driven by Colombia's communities.

The city of Medellin, for example, began studying proposals for projects to tackle the city's crime and poverty through investments in lower-income communities, such as the cable cars that began operating in 2004, and have become a lifeline for residents of the mountainside communities, lowering their commute time to the city center from two hours to approximately twenty minutes.

The Integrated Emergency and Security System (Sistema Integrado de Emergencia y Seguridad Metropolitana) (SIES-M), created in 2013, convenes representatives of various governmental agencies responsible for responding to emergencies, and utilizes information from emergency calls supplemented with data from video surveillance cameras throughout the city and the governmental agencies themselves, so that emergency services have cross-referenced data to respond in a coordinated matter.

Sustainable transport was another focus of Medellin, with the Smart Mobility System (Sistema Integrado de Movilidad de Medellin) (SIMM), a system of integrated services, and Metroplús, the city's bus rapid transit system, as prime examples. SIMM's objectives of providing timely and accurate traffic flow, public transportation data collection, and incident detection are realized through integrated mobility management technology.

The synchronization of Medellin's multi-modal transportation system empowers the government and the public with real-time data that provides end-users with effective and energy-efficient alternative transportation solutions.

Panama

Panama City recently opened the first metro system in all of Central America, designed to help solve urban congestion problems. This project also included free wireless internet access points and bus tracking capabilities at bus stops throughout the city.



Managing change and complexity

The benefits that smart city initiatives in Brazil, Chile, Colombia and Panama have delivered are evident, but despite these success stories, smart city projects are not yet widespread in Latin America.

Smart city projects in the region still face secular headwinds, most notably the complexities of working with governmental agencies and municipalities to create bankable projects that present attractive opportunities for investors.

The concept of a smart city is still relatively new, with current technologies and applications for collected data offering only a glimpse at the available opportunities. Even the most advanced smart cities in more mature jurisdictions are only at the beginning of their journey. As technologies continue to develop, newer applications for such technologies will continue to surface.

Smart city projects typically require a substantial upfront investment that must be either funded by governments—and ultimately paid for by the public via taxes or end-user costs—or financed privately. International development finance institutions and banks may also offer loans, grants and guarantees through specialized programs focused on urban and environmental sustainability.

Often, the government pays to construct and operate a service either by increasing taxes to fund such construction, or it recovers its investment by passing on the costs



20 min

Cable cars operating in the mountainside areas of Medellin, Columbia, have lowered the commute time to the city center from two hours to 20 minutes

to the public through end-user fees. Reduced operating costs over time can cover initial investment, but municipalities will often have to finance smart city infrastructure with large upfront sums before recouping this initial outlay.

Raising project finance costs from taxes or existing budgets can prove problematic.

Chile's smart energy meter program is a prime example of the difficulties of passing on the cost of infrastructure upgrades to the public. In 2019, public outrage over the fact that end-user consumers would be paying for new smart meters led the government to halt their ambitious project of deploying them throughout Santiago.

Chile's smart meter program deployment also demonstrates the importance of coordinated and phased implementation of smart city solutions in order to allow cities to adjust and fix imbalances as they present themselves without serious disruption to the public service offered.

Sourcing private funding comes with difficulties too. Projects may employ first-of-its-kind technologies without demonstrable proof of concept or limited testing. Such early adoption of new technologies may present a drawback for investors' confidence.

Additionally, while there may be a clear positive socioeconomic impact, it may be difficult to ascertain the value of that benefit. Cities must leverage and promote the high value for money, overall lower cost of living, and reduced environmental impact that result from

smart city investments to win public and investor support. Indeed, by investing in smart city technologies, cities may become more attractive, further promoting economic growth.

The way of the future

For all these challenges, however, Latin American policymakers have recognized that by utilizing technology and innovation to optimize the allocation of resources and provide the government with detailed and precise data, smart cities deliver smarter and more efficient management.

While there are a few exceptions, smart cities are not yet being executed at scale in Latin America. However, the drive to meet ESG goals, create energy efficiencies, and increase public safety should incentivize the private sector as well as national and local governments in the region to further explore smart city technologies. Governments and cities could even aggregate multiple projects in particular countries to create economies of scale for prospective investors.

Smart cities provide clear benchmarks and performance indicators for policymakers to track and evaluate potential improvements. Most importantly, rolling out smart city technologies may be critical for some municipalities' ability to tackle pressing challenges of today, like increasing public safety and health, environmental sustainability, and overall quality of life.

The case for large-scale investment in smart city initiatives throughout Latin America has never been stronger.



Rolling out smart city technologies may be critical for some municipalities' ability to tackle pressing challenges of today, like improving public safety and health, environmental sustainability, and overall quality of life

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