

## Latin America and the E-Bus Revolution



Electric buses at a charging station in Santiago, Chile. Credit: Courtesy of C40 Knowledge Hub.

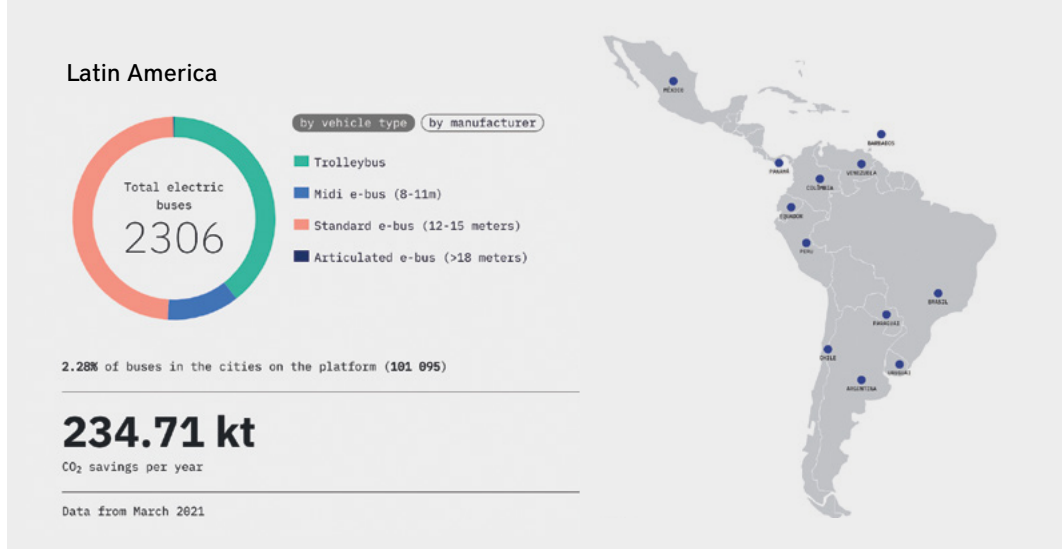
**AT SOME POINT** in the last few years, it was like a switch flipped: it became clear that the electric vehicle technology revolution is real and could have significant planning and land use impacts. For the last decade or so, the spotlight has often focused on how this cleaner energy alternative could power new ridesharing and autonomous vehicle schemes, or micro-mobility innovations such as electric bikes or scooters. But some of the most illuminating electric vehicle experiments currently underway involve mass transit, including trains, trolley systems, and that most humble vehicle category, the city bus.

While China is by far the global leader in building and using electric mass transit due to its state industrial policy and carbon reduction plan, Latin American cities are emerging as significant players in this growing market. By one estimate, more than 2,000 e-buses were operating in at least 10 countries across Latin America by the

end of 2020. That number is expected to rise: one analysis predicts that by 2025 the region will add more than 5,000 electric buses a year.

The push for electric buses is motivated by the urgent need to reduce the diesel emissions that cause air pollution and contribute to climate change. Widespread adoption is likely to have a significant impact, given that per capita public transit ridership is reportedly higher in Latin America than in any other region of the world.

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An online platform launched in 2020 tracks the deployment of electric buses in Latin America, calculating the annual carbon emissions saved as a result. Credit: Laboratório de Mobilidade Sustentável (LABMOB)/E-BUS RADAR Platform.

A recent report from the International Finance Corporation (IFC), a global development organization that is part of the World Bank Group, and C40 Cities, a climate action coalition, pointed to two notable examples of cities investing heavily in electric buses. Santiago, Chile’s capital city, has a fleet of more than 700 e-buses and growing, the largest outside of China. (By comparison, there were about 650 e-buses in the entire United States in 2020, although political momentum seems to be building for an investment in the sector.) Santiago is aiming for a zero-emission fleet by 2035. In Colombia, Bogotá has undertaken an ambitious effort to put more than 1,000 e-buses into service, tied to Colombia’s larger effort to cut carbon emissions 20 percent by 2030.

Both cities are using innovative public-private funding arrangements. As the IFC/C40 report points out, the majority of municipal transit systems are owned either by a public agency or by a private operator with a municipal concession of some sort. But newer arrangements “unbundle” ownership and operation—essentially using the kind of leasing strategies familiar in, say, commercial airlines (where one set of companies makes planes, and a different set leases and operates them). “Asset owners own, and operators operate,” as the report put it.

In Bogotá, for instance, the municipal transportation entity, Transmilenio, contracted

with Celsia Move, an energy-focused subsidiary of multinational conglomerate Grupo Argus, to deliver the bus fleet. In turn, Celsia Move made a 15-year agreement with Grupo Express, a separate company, to operate and maintain that fleet. As John G. Graham, a principal industry specialist in the IFC’s global transport group, explains, this unbundling makes each entity more attractive to different sets of potential investors. An owner entity can expect fixed payments, and its assets can be collateralized; an operator takes much less capital risk.

Electric buses and trains entail a much steeper up-front investment than their fossil fuel rivals—double the cost or more, by some estimates. But these recent public-private partnerships have reportedly attracted commitments from more than 15 investors and manufacturers, raising approximately \$1 billion to juice the deployment of 3,000 more e-buses in various cities. International financing in support of e-bus and other green projects across Latin America has come from heavyweights like the InterAmerican Development Bank and the Partnering for Green Growth and the Global Goals 2030 Initiative (P4G), whose initial funding came from the government of Denmark.

As Graham of the IFC points out, the underlying economics are also evolving. An electric bus can be cheaper to maintain over

time, meaning that as battery technology improvements lower that up-front expense, the so-called “total cost of ownership” over a vehicle’s lifetime should soon approach parity with internal combustion engine alternatives.

Still, finding sustainable sources of support will be critical, given that financing major transportation projects—including electrification upgrades—is invariably a challenge. One option could be land-based financing. In Costa Rica, for example, the Lincoln Institute of Land Policy has worked with policy makers to explore land-based finance options to help offset the \$1.5 billion cost of an expansion and electrification of a major train line serving the capital, San José. Throughout Latin America, notes Martim Smolka, a Lincoln Institute senior fellow and director of its Program on Latin America and the Caribbean, land value capture strategies have been used to help fund major projects, such as redeveloping former factory and industrial zones. The value capture model ensures that a portion of the increase in land values that results from municipal actions is returned to the municipality to help offset the costs for other projects, such as improving local infrastructure.

“Transportation does help structure the value of land,” Smolka says, but capturing that value can be trickier than with a more straightforward redevelopment project, given the scale of most transit projects. One effective approach, he notes, is to increase density around particularly busy transit stops, encouraging fresh development but requiring developers who benefit from

rezoning to in effect pay for the opportunity. He adds that an economic impact study commissioned by Costa Rica suggested the expansion of the electric train will have a positive effect on land values, and the project dovetails with a pledge to reach carbon-neutral status by 2050.

Electric transit is still a sliver of all mass transit in Latin America, and the pandemic created new challenges. But the Latin American market may be particularly suited to capitalize on and expand this trend. Smolka observes that the region is known for embracing transit innovation, from electric trams in the 1950s to today’s Bus Rapid Transit, propane taxis, and cable car lines that serve dense, hilly informal settlements. With relatively sophisticated transit authorities and a track record of financing major projects, “they are among the best transit systems in the developing market,” says Graham.

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Among other things, that means lots of data on existing routes that can support the efficient deployment of new electric buses. It’s much harder, Graham says, to “leapfrog” an electric system into a municipality with little transit track record than it is to phase the technology into an existing setup. Latin America also has an increasingly strong trade relationship with China, which manufactures an estimated 98 percent of the world’s total e-bus fleet. All of this may be putting Latin America in a leadership lane for a transition that, in time, will happen globally. As Graham says: “Electrification is coming.” □

Santiago, Chile, has invested heavily in electric transit, amassing a fleet of 700 e-buses and growing. Credit: Juan Carlos Jobet via Twitter.



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