



# Electrification Empowers Tomorrow's Airports

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New Mobility—shaped by electric, automated, shared and connected strands—presents the opportunity to apply innovative solutions to 21st-century challenges in commercial aviation. Electrification underpins the next generation of aircraft and airport land transportation.

As airports are impacted by New Mobility, maximizing electric's potential will lead to a future characterized by lower-emissions travel, innovative aircraft design and new business models to support and leverage electric's expanded role.

Electric autonomous vehicles will impact transport at airports, both airside and landside. Electric shuttle buses, also known as zero-emission buses, are increasingly populating airport landscapes. While fully electric-powered long-distance flight is on the more distant horizon, shorter-distance electric-powered flight is a much closer reality. For example, electric-powered vertical takeoff and landing (eVTOL) aircraft is an emerging business, with vast potential to transform intra-regional air travel, connect new regions to air travel and boost smaller airports with increased activity.

Though widespread change depends on the pace of technological progress within regulatory and policy frameworks that support electrified air travel, airports should today focus attention on a more energy-efficient path to support infrastructure development objectives.

## **Electrifying Airport Infrastructure**

Ground Support Equipment (GSE) is critical to the success of airline operations and fast aircraft turnaround. Not only does GSE electrification save money on diesel and maintenance costs, it also contributes positively to the respiratory health of airport workers and supports efforts to reduce carbon footprints.

Electric vehicles also provide opportunity to advance airports as infrastructure assets for electric generation. Electric buses and cars, already part of airport land transport, can be linked together to transfer power from one vehicle to another, or to act as a localized battery pack providing newly-generated electricity.



Though the benefits are clear, airports often have limited spare electric capacity and find it cost prohibitive to upgrade their electric services. This is where a carefully crafted energy-efficiency strategy can make a strong positive impact. Airports are known to be large consumers of electric power for air traffic operations and terminal needs, including check-in desks, escalators, baggage handling and conveyer belts, service/visitor lifts, shops and restaurants. Targeted energy-efficiency measures applied to nearby circuits can free up the capacity needed for these new electric loads. Smart charge management systems can ensure that most charging is completed when electricity is least costly, usually overnight, as other airport electric loads are low during this time.

Movement toward electric and autonomous vehicles will influence land use at airports and impact traditional parking requirements. With less need for on-site parking, land and facilities can be freed up for other purposes, including energy production, battery electric storage, and recharging of New Mobility vehicles—thus creating new sources for revenue enhancement. Vehicles in shared mobility networks can plug into these electric charging stations, and hotel and city transit buses passing through airports can also access recharging points located in former parking facilities. Both traditional taxis and Transportation Network Companies (TNCs) often spend significant time idling at airports, waiting for their next pick-up cycle to begin. Now, their downtime can be put to good use. Some airports, recognizing that electric will play a vital role in fostering better traffic flow, are already providing ultra-fast charging stations for TNC vehicles to get topped up.

State-of-the-art technological impacts are wide-ranging in the airport infrastructure ecosystem. New Mobility pilot programs are increasingly being conducted, including the use of robots to provide passenger information and autonomous vehicles to carry baggage in terminals and serve as airfield shuttles for employees. Smartphone connectivity, digital wayfinding and biometric scanners are already transforming today's passenger experience. As the whole airportscape evolves with the application of environmentally-oriented solutions such as solar panel use, the outlook and plans regarding electric power at airports should progress in tandem. Whether developing as mini-cities themselves, aka the aerropolis, or as smaller upgraded structures offering air travel and diverse terminal amenities, each airport should assess current energy use and generation potential as an integral step in its future-ready planning.

### **Aligning Expansion and Sustainability Efforts**

Electrification can also align expansion efforts meant to support increased passenger flow with initiatives to reduce carbon footprints—seemingly opposing challenges that can become compatible. With greater capacity needs, airports worldwide must now effectively address how to progress on a more environmentally-conscious and energy-efficient path to reach development objectives. This effort requires taking a closer look at current energy management practices—to assess how to better manage electric use and production through existing or potential on-site generation.



Increasingly, airports are installing on-site power-generating assets as a way to reduce electricity costs, becoming, in effect, mini power plants themselves. Energy-saving projects are also already at work, such as incorporating LED lighting, generating solar power and using more energy-efficient equipment. Airports worldwide must fine-tune methods and focus on how sustainable energy practices, with an increasing emphasis on renewables, can be integrated into their overall energy-planning efforts.

Now is the time for airports to prioritize electric power as central to a long-term cost-reduction strategy, and determine how to leverage current and future New Mobility electric assets to bring about greater efficiency, to meet sustainability goals and to generate new sources of revenue.

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