The Case for Fast-Charging Depots at US Airports

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INTRODUCTION

RMI forecasts the US transportation sector must reduce greenhouse gas (GHG) emissions by at least 45% by 2030 to achieve a 1.5°C climate-aligned future. Emissions reduction at this scale requires 70 million electric vehicles (EVs) on the road in the United States and a 20% reduction in vehicle miles traveled. Currently, most EV charging in the United States is level two (L2), typically between 7 kW and 19 kW, with charging units often installed in a private garage or at the workplace. Other charging levels available include slower level one (L1) chargers — a standard US wall outlet — and much faster level three (L3) chargers, also known as direct current fast-chargers (DCFC), which can deliver anywhere from 50 kW to 350 kW of power.[1] Although L2 charging is ideal for drivers who have private parking, it is not sufficient to support a full transition to EVs.

That transition will require a much stronger fast-charging infrastructure available to the public, especially for commercial drivers, who drive much more than the average driver. Locations with continuous turnover of arriving and departing vehicles with short dwell times such as airports will also need to provide fast chargers. In fact, to power tens of millions of EVs, the United States will require 15 times the number of current chargers[2] The more than 20,000 airports across the country can provide additional transportation services and support clean transportation by offering EV charging infrastructure for a broad range of drivers.[3] To strengthen charging infrastructure effectively and in a timely manner, airports should work closely with their utilities to identify the range of possible infrastructure costs associated with an electrified future. Next, airports must follow the planning and permitting timing constraints of their utility to optimize the technical and business approach to meet demand while maintaining affordable charging prices. Considering that within one decade EVs will have 50% or more market share, what may seem to airports as a risky gamble today may well prove to be the bare minimum.

RMI modeled different ownership and operation models for a fast-charging hub at Los Angeles International Airport (LAX) designed to support ridehail and taxi drivers. Through its analysis, RMI determined that there are numerous business model options that can result in an investment payback period of less than 10 years for the airport and the EV charging service providers (EVSPs). The studied models resulted in cost-effective charging prices for commercial ridehail and taxi drivers while also presenting a reasonable business case for the airport. The creation and development of fast-charging hubs require coordination and engagement with local utilities to identify upgrade costs across the range of potential electric capacity additions. Airports and utilities must also work together to ensure sufficient charging capacity to meet EV demand while maintaining an affordable charging price. Airports are well suited to host these multi-megawatt fast-charging hubs for the benefit of commercial drivers, public users, and the airports' and EVSPs' bottom lines. In this brief, we highlight how to approach planning and installation of new fast-charging hubs at US airports in a way that is financially viable.

US Airports Can Provide the Charging Infrastructure Needed to Increase EV Adoption

- **MARKET AND POLICY TRENDS:** Consumer Reports found that, as of the first quarter of 2021, 71% of Americans expressed some level of interest in buying or leasing an EV.[4] Electric vehicles represented over 5% of total vehicle sales in the United States by the end of 2021.[5] In the first quarter of 2022, US EV sales rose 60% even as overall new car sales dropped 18%.[6] This trend of rising EV sales is expected to continue, driving down EV prices and total cost of ownership to the point that it could lead to upfront purchase price parity between EVs and internal combustion engine (ICE) vehicles by 2030.[7] In 2021, major US original equipment manufacturers (OEMs) General Motors and Ford Motor Company pledged to work toward 100% zero-emissions new car and van sales in leading markets by 2035.[8] GM, Ford, and Stellantis announced a shared aspiration to achieve up to 50% annual EV sales by 2030 in the United States.[9] The availability of charging infrastructure is critical to the EV transition.

The US federal government is preparing the country for this new and rapid rise in EV charging demand through the Department of Transportation's (DOT's) Federal Highway Administration (FHWA) National Electric Vehicle Infrastructure (NEVI) Formula Program. The NEVI Formula Program will provide funding to states to deploy EV charging stations along major highway corridors and establish an interconnected network that facilitates data collection, access, and reliability. Funding is available for up to 80% of eligible project costs ranging from EV charging station acquisition to installation and maintenance. To receive this funding, states submitted plans to the DOT and US Department of Energy Joint Office for review and public posting by August 1, 2022, describing how states intend to use NEVI funds. The Biden-Harris administration announced it approved the plans of all 50 states; Washington, DC; and Puerto Rico by the end of September 2022.[10] The NEVI program requires that publicly available EV charging stations be built every 50 miles along designated Alternative Fuel Corridors and no more than one mile from the highway. The stations must have at least four ports, each capable of providing at least 150 kW simultaneously.[11]

DOT will also establish a discretionary grant program by November 2022 focused on EV charging in rural and underserved communities.[12]

- **OPPORTUNITY:** Any federal investment in EV charging infrastructure depends entirely on state plans for successful implementation and the maturity of their existing EV ecosystems. Ports and airports' placement along transportation corridors and networks can contribute to the successful implementation of state EV charging plans. Given the high volume of ground-side traffic at airports, the proximity of some airports to EV charging deserts (large swaths of urban areas lacking public charging), and the regulatory requirements for vehicle electrification in certain states and jurisdictions, airports in the United States can play a key role in enabling accessible and affordable public EV charging.

  RECOMMENDED ACTION: Ongoing utility planning and engagement for existing and anticipated loads helps airports obtain the necessary electricity rate and capacity information to ensure upgrading this infrastructure is economically feasible. In fact, some airports have started adding up to ten 50-kW, 150-kW, and 350-kW fast chargers on-site (e.g., Boston Logan International Airport, JFK International Airport[13]) or plan to install up to ten 50-kW fast chargers (e.g., Seattle-Tacoma International Airport and San Francisco International Airport). Building multi-megawatt depots at US airports will help overcome a significant barrier in EV charging accessibility.

  A growing number of airports can build fast-charging hubs capable of meeting charging demand for EV drivers, including friends and family picking up passengers, ridehail drivers, taxi fleets, and more. An increasing number of government mandates and policies aiming to accelerate electrification of ridehail services can help. For example, California's Clean Miles Standard (CMS) requires 90% of ridehail fleet miles to be electric by 2030. Trips to and from the airport are critical to a ridehail driver's revenue; therefore, airports are especially well-positioned to support ridehail electrification by providing charging services to those who may have a limited amount of time on-site and a commercial need to charge their vehicles quickly.

  Within the city of Los Angeles alone, meeting 2030 CMS targets will require between 110 and 240

MW of total dedicated charging capacity for ridehail drivers — three to six times the capacity of the entire public DCFC network in LA as of October 2020.[15] RMI analysis indicates that meeting the CMS could require approximately 10 MW of fast charging capacity at LAX by 2030. At the time of RMI's study, no US airport had installed or announced plans for charging infrastructure at a similar scale, with many citing electrical infrastructure capacity as a key barrier to the implementation of these plans.

BENEFITS: Fast-charging hubs at airports, which support high-mileage commercial ridehail drivers and taxis, help avoid tailpipe and upstream greenhouse gas emissions, and — through their ability to serve drivers of different income levels at its publicly accessible location — can provide lower-income community members with access to affordable public charging, especially when airports are in or adjacent to EV charging deserts.

Unfortunately, charging infrastructure is often inaccessible to lower-income communities.[14] Furthermore, many organizations have reported on the challenges of providing at-home charging for those without private, off-street parking, such as residents of multi-unit dwellings like apartment complexes and row homes, where occupants cannot easily install their own chargers. This lack of charging access directly and disproportionately affects ridehail drivers, one of the primary types of commercial fleets doing business at US airports. A ridehail driver typically has a lower household income, does not have a lot of downtime during which to charge, and often does not have access to a private charger at night. A lack of accessible at-home charging forces ridehail drivers to rely heavily on public fast charging.[15]

Airport fast-charging hubs will be a critical component if ridehail drivers are to switch to EVs. Airports can also make fast charging available to members of the public who may not have access to a charger in their neighborhood, home, or workplace and are driving to airports in EVs for short-term trips or pickups, or otherwise traveling along transportation corridors in the vicinity of the airport. Airport hubs adjacent to a charging desert — which are typically found in lower-income neighborhoods — can help improve charging access.

Well-Designed Airport Fast-Charging Hubs Can Be Financially Viable

- **MARKET AND POLICY TRENDS:** RMI benchmarked and surveyed 10 airports regarding their fast-charging project plans. Common challenges affecting the speed of airport EV adoption and infrastructure development include difficulty in:
    - Accurately evaluating campus-wide EV charging demand and on-site hosting capacity while considering varying state or local zero-emissions vehicle (ZEV) or GHG emissions reductions requirements; a lack of hosting capacity data availability; and a lack of standardized EV demand measurement tools
    - Obtaining project capital investment and managing operations and maintenance (O&M) costs due to varying pricing formula guidelines, cost estimate availability, and business model options
    - Coordinating and siting charging infrastructure in ways that accommodate multiple current and future use cases for a variety of airport visitors and on-site drivers; matching charger use case(s) to required power (e.g., L1 for long-term passenger parking or fast charging for ride hail drivers); and effectively engaging utility partners at the beginning of infrastructure planning
    - Future-proofing charging technology — for example, by installing additional electrical capacity or higher power chargers — to ensure long-term hub use through the next decade

Exhibit 1 summarizes the insights gleaned from RMI's airport surveys. They are grouped by key themes including integrating procedural equity when developing charging plans or strategies; planning for electricity demand and capacity; recovering costs; establishing grid resiliency; and future-proofing technology.

Exhibit 1: RMI Insights by Opportunity

Theme	Opportunity	RMI Insights	US Airport Examples
Procedural Equity	Stakeholder Engagement	• Airports must engage multiple groups early and often, including ridehail and taxi drivers, community-based organizations, and community leaders, to identify stakeholder needs and integrate them into the project's scope to deliver maximum public benefits. • To ensure procedural equity in the project development and implementation process, airports can incorporate a stakeholder engagement requirement in their vendor RFPs to participate in bidding.	• The Port of Seattle maintains an internal "equity index map" that combines data on demographics and environmental health disparities. • Seattle-Tacoma Airport (SEA) identified financing requirements to comply with a specific community demographic's cultural norms.
Demand and Capacity Planning	Demand Estimation	• Leading airports clearly identify electrification goals (sometimes set by their resident state or city) or develop their own environmental key performance indicators (KPIs) and targets. • Airports face high uncertainty when estimating campus-wide EV charging demand for airport users or tenants such as ridehail, rental car fleets, and visitors compared with airport-owned fleet estimates. • Forecasting demand for a 10-year horizon is recommended when >5 MW utility-side upgrades are involved.	• SEA monitors environmental KPIs that it developed. Performance standards are a contractual obligation for ridehail as part of their operating agreement and may incur financial penalties if they don't meet targets. • Airports surveyed consider diverse users or tenants when planning for future fast-charging projects.
	Capacity Building	• Significant lead time for large-scale utility upgrades is required; airports can get ahead of timing constraints by engaging utilities early and budgeting 2–3 years for capacity upgrades. • On-site generation through renewables and storage is encouraged whenever feasible. Coupling renewables with charging load management systems can improve efficiencies.	• Sacramento International Airport partnered with Sacramento Municipal Utility District to provide two L2 chargers and one fast charger in its cell phone lot. The airport also leases space to Electrify America for eight fast chargers. • Salt Lake City International Airport has implemented prorated billing for infrastructure upgrades with its local utility.
Cost Recovery	Ownership Model Optimization	• Fast-charging hubs can be profitable while addressing equity concerns when: - Utilization is high (>10%), which is expected for airports. - Low-carbon fuel standard credits are included in cost recovery where applicable in certain states.	• To date, there is no standardized or best practice ownership model implemented at any of the airports surveyed; each airport approaches fast-charging installation cost recovery differently.

Theme	Opportunity	RMI Insights	US Airport Examples
	Utility Tariffs	• Tariffs designed for EV charging, with no or minimal demand charges, would provide the lowest cost per kWh of energy delivered in cases where station utilization is <50%.	• Besides San Diego Gas & Electric infrastructure incentives, San Diego International Airport (SAN) is exploring potential medium- and heavy-duty specific tariffs.
	Low- and Middle-Income Affordability	• Reasonable returns for EV service providers can be expected when charging prices are designed for a ~15% profit margin over the cost of electricity in LA. Airports have an opportunity to offer a lower price for EV charging for ridehail and taxi drivers while generating a sustainable business model for the owner-operators of fast-charging hubs.	• To date, there is no common pricing model for affordability among airports surveyed; the airports that responded to the question on revenue generated from EV charging indicated that they do not currently charge for on-site EV charging.
Resiliency	Outages	• State agencies like the California Public Utilities Commission (CPUC) encourage the use of on-site renewable generation and distributed energy resources to improve resiliency. These can be grid-tied but should be capable of operating in islanding mode.	• None of the airports surveyed use on-site renewable generation or distributed energy resources to provide EV charging infrastructure at this time; however, SAN's 12 kV electricity distribution loop leverages on-site solar and battery storage with 100% renewable and carbon-free grid electricity.
Future-Proofing	Technology	• Over the next five years, 350 kW chargers are expected to be increasingly common (800V), and 150 kW is the minimum acceptable rating for EV chargers. • Dual port 350 kW chargers can balance current capabilities and future needs, although 350 kW chargers require additional infrastructure and maintenance with liquid-cooled cables. • Charger software standardization is increasing. Useful guidelines for charger standards can be found in the proposed NEVI rules.	• SEA has a project underway to install dual port 350 kW chargers (8 ports total) and a dual port 150 kW charger for ridehail and taxis.
	Siting	• Utility upgrades make up a major portion of capital expenditure costs. Costs can be minimized by siting multiple large EV charging hubs in adjacent parking lots, investing in load management for L2 chargers, and involving utility companies early in the planning process.	• Based on airport survey responses, co-locating EV chargers with ridehail or taxi lots, installing them close to utility substations, and locating them in areas easily accessible to the public can help reduce costs.

Airports can expect growing EV charging demand with increased state regulations like California's CMS, Advanced Clean Cars (ACC) I and II, Advanced Clean Trucks (ACT), and proposed

Advanced Clean Fleets (ACF) rules. ACCII and ACF would ban the sale of gas-powered cars as of 2035 and trucks as of 2040, respectively, in the state of California. Other states, including New York and Oregon, are moving quickly to adopt similar rules while many more are actively considering whether to follow this approach. While specific to certain states, these regulations affect global auto manufacturers and fleet operators nationwide.

Local environment-focused standards will also influence EV adoption among airport ground transportation fleets. For example, Seattle-Tacoma Airport (SEA) and San Diego require ridehail companies to meet an overall environmental standard, referred to as the environmental key performance indicator or E-KPI. The E-KPI requires ridehail companies to calculate their overall environmental impact based on the fuel efficiency of the vehicles picking up passengers, including the effects of pooling (multiple unrelated passengers in the same vehicle) and deadheading (traveling between revenue trips).[16] E-KPIs help airports reach their sustainability goals and emissions reduction efforts more quickly through visitor and on-site fleet electrification. In addition, rental car companies‘ EV commitments — such as Hertz's purchase of 100,000 Tesla vehicles for its fleet in 2021 and partnership with bp pulse to develop a national network of EV charging stations, mostly at airports[17] — are harbingers of the charging demand to come at airports nationally.

- **OPPORTUNITY:** Given the strategic location of airports in the transportation system, there is an opportunity to develop economically viable EV charging business plans that benefit airports, EV charging service providers (EVSPs), fleets, and individual drivers across the United States. RMI evaluated the feasibility of four different business models for providing a fast-charging hub at LAX:
    - **Land Lease**: Airport generates revenue from a third-party EVSP by leasing its property; the EVSP covers all electrical connection and upgrade costs.
    - **Concession**: Airport provides capital investment to establish an electrical connection point for an EVSP to install and operate chargers and generates revenue by leasing its property.
    - **External Charger Operator**: Airport owns charging equipment on its property while contracting out equipment operation and generates revenue through EV charging. In states with credit trading mechanisms for clean fuels, such as California's Low Carbon Fuel Standard (LCFS) schemes, LCFS credits for charging infrastructure owners provide an additional form of revenue.
    - **Own and Operate Chargers**: Airport owns and operates its charging equipment and generates revenue through EV charging. In states with LCFS schemes, LCFS credits provide an additional form of revenue.

  According to Global Sustainable Mobility Partnership (GSMP), a leading coalition on transportation electrification, the lease model is best for charging hubs such as those at airports. RMI's analysis confirmed that the lease model at LAX has the potential for the fastest and highest return on investment for the airport while also enabling affordable EV charging prices for ridehail drivers.

  In all the cases RMI modeled for LAX, the airport and EVSPs recovered their capital investment and earned profit within 10 years. This is an important threshold because 10 years is the maximum expected life of the charging equipment (to be conservative, RMI assumed seven years for its analysis). However, the majority of the overall project cost is for utility electric service upgrades (line extension, transformers, switch gear, etc.), which are one-time expenditures with decades of useful life. Therefore, since the cost of the chargers *and* the grid upgrades are fully recovered in the first 10 years, the airport will be in a solid position to provide charging for clean transportation for decades to come.

- **RECOMMENDED ACTION:** US airports have a unique opportunity to offer fast charging for the significant anticipated demand from ridehail and taxi drivers by 2030 through the installation of financially feasible charging hubs. Given that it can take up to five years to go from concept to functioning charging depot for large-scale charging projects, especially on airport property, airports need to coordinate with utilities as early as possible. To ensure airports are ready to meet growing charging demand for site-specific use cases while maximizing their return on investment, RMI recommends airports follow an approach that considers each location's existing grid capacity and feasible upgraded capacity. It is important to note that we define "feasible" as the balance between upgrade costs and being able to recoup those costs through affordable charging prices. However, the significant demand that will exist by the end of the decade can justify significant (i.e., multi-megawatt) upgrades.

Airports interested in installing fast-charging depots can begin the process by following these steps:

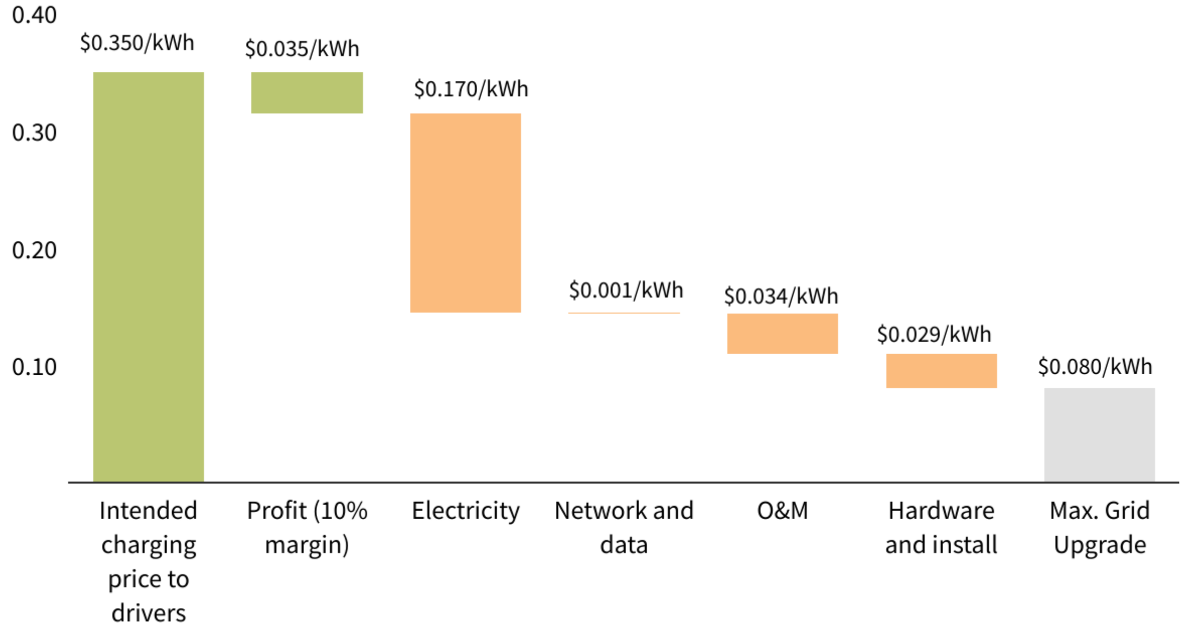
1. Begin coordinating charging plans immediately with the local utility.
2. Evaluate existing grid capacity at strategic charging locations; there may be untapped capacity that could offer charging capability immediately, without an upgrade.
3. Install the number of charging units that can be accommodated within existing capacity.
4. Evaluate additional capacity required to meet future forecasted demand and establish an upgrade plan.
5. Identify potential grid upgrade costs and allocate this expense over the expected energy sold (in kWh) to determine the maximum capacity upgrade cost (in $/kWh) that still maintains an affordable charging price for ridehail and taxi drivers.
6. After finalizing capacity upgrade required, initiate the interconnection and upgrade process with the utility, and install charging units over a time frame that is financially manageable (which can occur over multiple installation phases or all at once).

Installing large-scale EV charging requires campus-wide hosting capacity — and a plan to manage it —rather than merely looking at *specific* locations that could host charging. Utility engagement is critical to obtaining accurate cost data, feasibility assessments, and permits within reasonable timelines to support EV charging and overall campus load.

RMI arrived at this set of steps by assessing the outputs of the cost and benefit analysis conducted for LAX. Exhibit 2 summarizes indicative categories of normalized project capital and operational costs as well as revenue per kWh of charging based directionally on RMI's LAX study. This cost and revenue stack can be used by stakeholders installing electrical connections or paying for potential grid upgrade costs —and earning revenue from driver charging and LCFS credits — based on the governing ownership and operating model. It assumes a 10-year amortization period and seven years for the useful life of the chargers themselves. In this example, the final price to the driver is $0.35/kWh, which is in line with typical market rates. It is important to note that the maximum grid upgrade cost (grey bar on the right) is the dependent variable rather than an input. Using this approach, an airport can determine the limits of a "feasible upgrade" that can maintain affordable charging prices. This can be a useful tool to guide the conversation with the utility.

Exhibit 2: Levelized DCFC depot charging costs, revenue, and profit marging normalized on a per kWh basis (Illustrative)

Exhibit 2: Solving for max grid upgrade



Electricity costs are are assumed to be $0.17/kWh and DCFC charging price is assumed to be $0.35/kWh. Asset utilization is assumed to be 30%, i.e. chargers are assumed to be dispensing power for about 8 hours per day. Hardware, install, network and data, third party operation and maintenance costs were calculated from estimates found in literature. Transaction processing fees of 10% were added to O&M costs. The maximum grid upgrade cost is the difference between the revenue stream(s) and expenses

*Source: **RMI**, https://rmi.org/wp-content/uploads/2019/09/DCFC_Rate_Design_Study.pdf; **RMI**, https://rmi.org/wp-content/uploads/dlm_uploads/2021/01/RMI_Insight_Brief_Accelerating_EV_Transition-1.pdf; **RMI,** https://rmi.org/insight/reducing-ev-charging-infrastructure-costs/, **ICCT,** https://rmi.org/insight/reducing-ev-charging-infrastructure-costs/; **GSMP,**https://gsmp.world/wp-content/uploads/2021/11/211101-ZEV-Alliance-Policy-Advice_branded_Final.pdf*

Because this approach makes the charging price an input rather than an output, it can be optimized based on market conditions, required capital investments, and environment and social goals,

Planning and implementation for equipment installation and potential grid upgrades can take up to five years; RMI used three years for this illustrative example. Note that in this time frame, the charger operator and owner does not earn revenue from available EV charging or clean fuels credits. Cost recovery over the project life is embedded in the cost and revenue analysis.

Key variables that will determine how cost and revenue are balanced include:

- **Project amortization period**: Because the costs and revenue are normalized against the total kilowatt-hours sold during the project lifetime, including grid upgrade costs, the amortization period is a critical variable. A shorter amortization period decreases the kilowatt-hour sales over which the grid upgrade costs are spread. The results are impacted less by the shorter useful life of charging equipment compared to the longer life (and higher cost) of the grid upgrades. It's important to note that while the chargers and related accessories require ongoing replacement and maintenance, the grid upgrades have a decades-long useful life, so after the amortization period (10 years in this example) they are paid off but still earning revenue.
- **Charger utilization**: Charger daily utilization refers to the proportion of time in a day that a charger is dispensing electricity. It measures EV charging demand at different times of day,

accounting for the time it takes for a driver to pull up to and out of a station, plug in, and pay. Monitoring charger utilization is important to optimize charging revenue and avoid disruptions from driver queueing that affect the charging experience. Maintaining a lower initial asset utilization (<30%) will help avoid over-crowding and long driver wait times but decreases potential revenue — utilization is the single most important factor in balancing the trade-off between revenue and driver experience. For comparison, an average gas station runs at about 5% utilization.[18] To mitigate risk in the early years of the project, when utilization may be lower, airports have the option to open the chargers to a variety of EV drivers (e.g., commercial drivers beyond taxi and ridehail, the airport's own fleet, and/or the general public) to increase utilization. If congestion occurs at certain times of the day or week, charging prices that vary by time of day can help to shift some demand and reduce congestion.

Scenario definition and notes:

1. 15 MW installation for a combination of 150 and 350 kW DCFC stations.
2. Lease rate not included in the cost stack. Lease payment terms and rates can be negotiated between a property owner (airport) and a third-party operator, thereby serving as potential additional revenue to an airport to offset the cost stack or increases the O&M costs of a third-party operator.
3. Within RMI's study at LAX, we assumed years one to three cover the utility upgrade and years three to seven cover hardware installation for a ten-year project lifetime.
4. Cost and revenue stack is sensitive to charger asset utilization; RMI considered a low end of 10% utilization and high end of 50% (Exhibit 2 shows a middle ground case of 30% utilization).
5. Assumed $0.17/kWh for the average price of electricity from energy tariffs designed for EV charging in Colorado when utilization is 30%[19] and $0.35/kWh for the price of DCFC charging paid by drivers.[20]
6. Inflation and discount rates are not factored into this simplified analysis but should be considered for cost/benefit assessments and used to inform planning decisions.
7. Revenue can include EV charging revenue and, where available, clean fuel credit revenue such as LCFS credit revenue in California.

Cost-effective campus-wide energy management will be difficult to implement without integrating EV charging needs in long-term energy management plans. Utility and customer cost-sharing opportunities may help expedite project implementation, such as Salt Lake City International Airport's unique arrangement with its utility for prorated billing for infrastructure upgrades.

BENEFITS: EV charging infrastructure can provide a net benefit to asset owners and landowners, charger operators, and the public. Governments and public authorities may use a range of ownership models for charging infrastructure to own and operate, subcontract to an external operator, lease land, or allow a concession on airport property. These different models distribute the investment, reputational, and operational delivery risks differently, and additional contractual terms can balance the financial and non-financial commitments between parties.[21] Airports should initiate their charger installation projects by coordinating with their local utility and identifying existing grid capacity available to accommodate new charging units, then plan for future grid upgrades based on projected demand and constrained by a range of grid upgrade costs, as relevant.

CONCLUSION

Airports around the United States are poised to help accelerate transportation electrification by realizing an opportunity to serve as fast-charging hubs for ridehail and taxi drivers, neighboring residents, and other airport visitors, tenants, and users while remaining on a 1.5˚C climate-aligned path for the transportation sector. RMI surveyed 10 US airports regarding their EV charging plans and challenges, identifying common experiences related to infrastructure financing, utility planning, charger siting, and technology future-proofing. US airports can pursue national harmonization of EV charging plans and avoid state-specific charging experiences to maximize public benefit while optimizing operational and business models that efficiently use transportation and energy planning funds.

A prerequisite to successful charging hub design and implementation is early coordination with utilities to ensure any grid upgrades and interconnections are ready within the next five years so that the hub can meet forecasted EV demand. Commercial drivers' charging demand may be the easiest to anticipate but, as the car market and regulations drive rapidly toward an all-electric future, it will be only one of many user groups seeking to charge at airports in the near term. The critical next step for airports across the country is to evaluate campus-wide energy plans, utility capacity, and funding to support an all-electric transportation future.

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