

**Statement
of
Robert Horton
Vice President of Environmental Affairs & Sustainability
Dallas Fort Worth International Airport**

**U.S. House of Representatives
Committee on Transportation and Infrastructure
Subcommittee on Aviation**

**"Preparing for Take-Off: Examining Efforts to Address Climate
Change at U.S. Airports"**

May 17, 2022

Chairman Larsen, Ranking Member Graves, and members of the committee thank you for the opportunity to testify about the sustainability and resiliency programs at Dallas Fort Worth International Airport (DFW).

I am the Vice President of Environmental Affairs & Sustainability for DFW and the Airport Board's Environmental & Sustainability Officer. I have more than 20 years of experience within the aviation, transportation, and sustainability industries, successfully bringing together diverse stakeholders to drive global energy efficiencies, sustainable growth, and operational cost savings.

I have served as a Commissioner for the Alliance to Save Energy's U.S. Commission on Transportation Sector Efficiency, on the Board of Directors for Texan by Nature, and recently the National Renewable Energy Laboratory (NREL) External Advisory Board for Advanced Research on Integrated Energy Systems (ARIES), an effort to explore the possibilities of the nation's future energy systems.

I hold both a Bachelor of Science and Master of Engineering degree in agricultural and biological engineering from the University of Florida. I am currently working towards obtaining a Doctor of Philosophy in interdisciplinary ecology from the University of Florida as well.

DFW's History of Climate Action and Net Zero Carbon Roadmap

DFW's history of leadership on climate action has positioned the Airport to articulate the unique challenges U.S. airports face. DFW employs a holistic approach to sustainability, and smart business investments in renewables and energy efficiency have enabled us to reduce absolute carbon emissions by 80% since the 2010 baseline. Moreover, we have done this while increasing the resiliency of our systems and reducing energy costs.

In October 2020, DFW became the first Airport in the world certified at the highest level of Airport Carbon Accreditation, Level 4+ (Transition). In the same year, we also received a United Nations Global Climate Action Award, and we have received two EPA Climate Leadership Awards since 2016. DFW is also recognized as a Green Power Partner through the EPA Green Power Partnership Program and ranks as the highest transportation partner in the National Top 100. These awards recognize and validate our net zero carbon roadmap.

DFW is committed to achieving net zero carbon emissions by 2030 – two decades ahead of the Intergovernmental Panel on Climate Change's (IPCC) global target of 2050. Our goals are also at the heart of the Federal Aviation Administration's (FAA) Airport Climate Challenge, which challenges airports to achieve net zero operating capabilities by 2050.

Airports as Key Players in Advancing Resilience and Decarbonization Strategies

Today, about one-third of DFW's electricity use occurs at our Central Utility Plant, which provides cooling for our terminals. Without our investment in purchasing 100% of our electricity from renewably generated sources, electricity would represent the largest component of our carbon footprint. In addition, DFW's improvements towards sustainable infrastructure operations are not confined to the airport but contribute substantial downstream opportunities to the communities we serve.

The switch to purchased renewable electricity was a key initiative that enabled us to achieve carbon neutrality and eliminate our most significant source of emissions. When we transitioned to purchasing renewable electricity, we also reduced our electricity costs, demonstrating that sustainability makes business sense. Rather than competing goals, DFW was able to identify strategies to complement sustainability and economics and achieve both goals simultaneously.

Today, the largest component of our carbon footprint – almost two-thirds – is facility heating. These emissions come primarily from using natural gas boilers in our Central Utility Plant to provide heating for over 7 million square feet of terminal space. Therefore, our net zero goal is not achievable without a solution to decarbonize terminal heating. In 2020, DFW completed the design of a future Electric Central Utility Plant (e-CUP), which forms the cornerstone of our roadmap to net zero and addresses our top two sources of emissions. The future e-CUP will achieve an estimated 86% reduction in natural gas use from the baseline by transitioning terminal heating loads from natural gas boilers to electric heat pump chillers powered by purchased renewable electricity. In addition, DFW is planning for new chiller units utilizing next-generation refrigerants that will reduce atmospheric impacts from refrigerant losses.

DFW's e-CUP is an example of the challenges and opportunities facing many airports. Generational investments in infrastructure development, such as the Infrastructure Investment and Jobs Act (Bipartisan Infrastructure Law), will help us achieve net zero goals and simultaneously improve airport resilience. For example, DFW's existing Central Utility Plant was built in the early 1970s, and the heating and cooling systems have reached maximum capacity. The e-CUP will provide resilient heating and cooling capacity to meet our current needs and enable future terminal expansion.

Our fleet is another large component of our carbon footprint and includes over 700 gasoline, diesel, and compressed natural gas (CNG) vehicles and equipment. One successful initiative targeted our fleet of more than 150 buses. Two decades ago, DFW began converting its diesel buses to compressed natural gas to improve air quality. In 2017, DFW launched its renewable natural gas (RNG) initiative and began transitioning to RNG sourced from a local Dallas landfill.

RNG is a drop-in solution that is chemically identical to conventional CNG but produced from a renewable source rather than a fossil source. The RNG supplied to DFW is derived from biogas (methane) naturally generated by the decomposition of organic

waste at the landfill. This initiative generates approximately \$1 million in annual O&M savings. DFW also receives annual revenue from the sale of renewable identification numbers (RINs) generated through RNG production for transportation use, further reducing our operating costs. In the fiscal year 2021, 79% of the compressed natural gas used in vehicles fueled at DFW facilities was renewable.

Last August, DFW deployed its first electric airside buses. DFW's investment in zero-emission vehicles and equipment will help the North Texas region reduce ozone pollution and meet federal air quality standards. DFW also purchased its first electric sedans and buses through 2020 and 2021 FAA Zero Emissions Vehicle (ZEV) and Infrastructure Pilot Program grants. Not all vehicles and equipment (e.g., airfield sweepers and snow removal equipment) will be easy to electrify, and currently available zero-carbon alternatives may not be capable of meeting airport demands or operating conditions. This scenario is particularly true for specialized equipment and vehicles with limited producer competition. However, DFW and others continue to evaluate new net zero technologies as they mature and reach the market.

Airports are 'safety critical' entities, where new technologies must be extensively evaluated for possible threats before they can be deployed at scale. As such, airports around the country must move slowly and cautiously to adopt new operating standards or technologies, given the resources and capabilities they possess on hand. For infrastructure resilience and sustainability programs and technology, DFW is an ideal testbed for innovation. We have a proven track record of successfully partnering with federal agencies and private industry to advance our own decarbonization and resilience efforts while creating a safe yet effective space for innovation. We also actively partner with other airports to exchange information on emerging best practices and lessons learned. We also share DFW's learnings in a variety of national public forums to ensure that the broadest benefits from the investments and research we make on behalf of the North Texas community inspire other organizations on their decarbonization journeys.

DFW continues to seek new ways to reduce risk, promote efficiencies, and generate system capacity for resilience. For example, DFW is partnering with the U.S. Department of Energy's (DOE's) National Renewable Energy Laboratory (NREL) to use high-performance computing and digital twin technology to explore opportunities for airport modernization. With a digital twin of DFW operations, we can simulate the effects of investment decisions on customer experience, energy use, and airport revenue before committing to a particular approach. The DFW digital twin strategy leverages a larger effort, Athena, which was funded by the DOE Office of Energy Efficiency and Renewable Energy (EERE) Vehicle Technologies Office. Athena aims to create an

interactive analysis virtual environment powered by NREL's supercomputers and customized with data from actual airport activities.

The virtual environment integrates models of traffic flow, socioeconomic behavior, and energy use so that airports can better understand and analyze their complex operations. The initial application with DFW is helping to frame the topics that will influence future operations, such as autonomous and electric vehicles, ride-hailing companies, congestion and emissions reduction, building energy efficiency, and bus route optimization. In one use case, NREL and partners are identifying behind-the-meter storage options that blend building efficiency measures and vehicle fast-charging to dramatically reduce energy costs. The program strategy involves an innovative approach to integrating thermal and battery energy storage solutions and all-system efficiency improvements while reducing costs and conserving energy. NREL and DFW have found that making even small changes to existing transit routes can substantially reduce energy use. For the first time, data science, modeling, and analysis are providing the world's busiest airport hubs with clear insights to help guide 20-plus-year investments in clean energy, efficiency, and resiliency.

We realize that maintaining carbon neutrality through offsetting is not an alternative to action. Societal demands of airports are likely to surge in the coming years, and broad demand for mass electrification (where airports are one of many actors) may pose new and uncertain challenges for airport operational resilience.

Focus on Energy Performance

Between 2006 and 2021, DFW Airport reduced energy costs by 48% and overall energy consumption by 13% while simultaneously increasing renewables. In addition, DFW has reduced annual energy costs by almost \$20 million through various innovative initiatives, including continuous commissioning of buildings, energy efficiency and storage, integration of renewables, and procurement practices.

In a recent blog, the *Alliance to Save Energy* captured the potential of energy efficiency efforts to reduce total energy usage, highlighting the importance of using flexible building loads to control the timing of energy use and reduce stress on the grid during periods of peak demand. DFW utilizes a thermal storage system to use electricity off-peak and is also looking to incorporate other technologies to increase the flexibility of building loads, a critical strategy as demand on the grid increases with the shift to the electrification of vehicle fleets.

Airports Partnering for Change

While DFW's net zero goal relates to the carbon emissions under the direct control of the Airport, our climate action strategy includes a commitment to support the decarbonization efforts of the broader aviation industry through partnerships with airport stakeholders, including airlines and tenants.

We are working closely to assist our aviation partners. For example, DFW and American Airlines worked together to reduce emissions from aircraft auxiliary power units through gate electrification. As a result, we established a sustainability partnership with several tenants, including American Airlines and Hyatt Hotels, to procure renewable purchased electricity for their on-airport facilities (e.g., terminals, hangars, and other buildings). In addition, DFW helped American Airlines purchase 100% renewable electricity for its off-airport campus and other facilities.

DFW has installed highly efficient plumbing fixtures throughout all five terminals, lowering customer water usage by 50% and saving over 5 million gallons of water each month. In addition, DFW has partnered with neighboring cities to create a Reclaimed Water Delivery System. The use of reclaimed water has reduced potable water use by 100 million gallons per year since the baseline in 2010.

DFW has launched a Zero-Waste goal to divert 90% of waste from landfills. DFW has achieved early success with construction and demolition waste. Last year, we recycled, reused, or salvaged approximately 1.9 million tons of construction waste from airfield and landside construction projects. This effort translated to a 96% diversion of construction waste from landfills.

DFW has implemented a successful program to recycle 100% of the waste cooking oil generated by over 50 restaurants in our terminals. Over 670,000 pounds of waste cooking oil have been recycled since April 2019 and used as a feedstock to generate approximately 61,000 gallons of renewable fuel.

Last March, DFW implemented an organic waste sortation and collection services contract with Turn Compost, a local company. This service allows the airport to collect food waste from terminal concessions and divert the food waste to local farms and

compost facilities. Over 198,000 pounds (99 tons) of food waste has been diverted from 25 restaurants in three terminals in just one year. DFW plans to expand the composting program to additional airport facilities, including aircraft catering kitchens, hotels, and offices.

DFW has received discretionary grants through the Federal Aviation Administration's (FAA's) Voluntary Airport Low Emissions (VALE) Program. The grants supported the installation of 23 ground power units (GPUs), five pre-conditioned air (PCA) units, and two PCA chillers at DFW's Central Utility Plant. These projects allow aircraft operators to shut down auxiliary power units while parked at the gate, reducing fuel consumption and associated emissions. As a result, over 200 tons of ozone precursor emissions (NOx and VOCs) are expected to be avoided over the project's lifecycle. In addition, all of DFW's 172 gates provide access to GPU and PCA units to aid all airlines in their decarbonization journeys.

The VALE program has also supported purchasing and installing ten electric ground support equipment (GSE) charging stations. The charging stations enabled airlines to replace a combined total of 20 conventional fuel (i.e., diesel and gasoline) baggage tugs, belt loaders, and aircraft tractors with electric alternatives. This project further reduces ozone-precursor emissions in the Dallas-Fort Worth region, which is classified as "Serious" nonattainment under the 2008 National Ambient Air Quality Standards for ozone (ozone NAAQS).

Our objective is to enable our partners to achieve their decarbonization goals. In addition, as critical infrastructure hubs within our broader communities, investments in sustainable infrastructure at airports should demonstrate downstream benefits to other connected utilities, companies, and communities at large.

Research and Development Needs

Given the expansive growth of airport usage in the coming decades, it is more important than ever that airports demonstrate safety, efficiency, sustainability, and resilience. Safety and efficiency are longstanding staples amongst U.S. airports, while environmental sustainability and resilience are relative newcomers. This leaves considerable opportunity for research and development of airport capacity to (a) recover from and adapt to adverse disruption posed by climatic and environmental stressors and (b) 'lean forward' to address environmental sustainability challenges such as net zero preemptively. In addition, airports need funding capacity to 'stress test' current and proposed airport infrastructure and functions from an ecosystem (or integrated system)

perspective. Stress testing will help airports evaluate resilience capabilities against myriad disruptions or scenarios (e.g., cyber and energy systems, supply chains) rather than rely solely upon historical data or tabletop exercises.

Today's investments in research and development can accelerate airports' ability to achieve their long-term decarbonization and resilience goals. However, this challenge cannot be borne by airports alone and thus requires continued partnership with federal and state governments as well as private companies to (a) identify, (b) rigorously test and evaluate, and (c) implement changes made to airport operations or equipment in furtherance of decarbonization and resilience objectives. More specifically, we recommend:

- Fund airport research on integrated systems-based stress testing to identify critical links within their complex networks. This research would ensure there are active efforts to bolster resilience capabilities within mission-critical supply chains and de-risk investments ahead of any significant operational or equipment change.
- Create a dedicated funding source for airport infrastructural and operational investments in sustainability, resilience, and climate to eliminate the need for eligible projects to compete against safety or efficiency targets.
- Augment entitlement funding to include resilience and decarbonization targets as eligible projects for investment.

Airports as Key Players in Advancing Resilience and Decarbonization Strategies

The Covid pandemic demonstrated the importance of well-maintained, reliable, and resilient airports to meet the nation's economic, health, and security demands. These demands will only increase in the coming years, and airports will need to evolve to deliver value to the communities and companies that rely upon them. As such, investment in innovative and resilient airport management, operations, and infrastructure is needed today to ensure our airports will be able to meet tomorrow's challenges.

U.S. airports have a rare opportunity to revolutionize the manner in which we operate and provide value to the nation and our communities. Through the Infrastructure Investment and Jobs Act, the U.S. has committed to historic investments toward modernizing its airports and ensuring their ability to address the burgeoning needs of

their communities for the coming decades. It is imperative that we continue transforming travel by investing in a sustainable future.

As we expand our knowledge of climate risks and mitigation strategies, we see an opportunity for improved collaboration, where airports can share better information about managing risks and improving system resilience. We are excited at the opportunity but require continued partnership from government and industry partners to bring our resilience and decarbonization aspirations to reality. Nevertheless, it is a worthy challenge and one that we can and should tackle collaboratively and immediately.

Thank you for the opportunity to testify before the committee.