# Green Airport Fleets Workshop and Expo


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# Summary - SMF Clean Air Investments

- **Gate-supplied preconditioned air and electric power for aircraft**
- **Charging stations for electric Ground Service Equipment (eGSE)**
- **Compressed natural gas (CNG) bus fleet**
- **Electric airport vehicles**
- **Jet fuel pipeline & tank farm ERCs**

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# Boarding Bridge Retrofits Reduce Fuel Use

- **Aircraft parked at the gate must have power to operate air conditioning and electronics**
- **Aircraft got power in the past from:**
  - Diesel-powered portable ground power units (GPUs)
  - Onboard Auxiliary Power Unit (APU), a small turbine engine in the fuselage powered by jet fuel.
- **Both emit particles & ozone-forming NOx**

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# Electrification Reduces APU Usage

- **Passenger Boarding Bridge**
- **Duct for Pre-conditioned air (PCA)**
- **Ground Power Unit (GPU) and power cable**

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# Power Supply to Aircraft

**Power cable connected to aircraft**

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# Preconditioned Air Supply (PCA)


**Air Conditioning Duct Connected to Aircraft**

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# Electric Ground Support Equipment (eGSE)

- **Airport provided charging stations**
- **Airlines funded conversion of equipment**

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# Southwest Converted 16 Belt Loaders from Gasoline to Electric Battery Power

- **Belt Loaders were overhauled and converted to electric battery power.**

- **Cost to overhaul each belt loader was $10,000 less than cost of a new electric belt loader.**


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# Electric Charger and Electric Bag Tug

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# Airport-Owned Alternative Fuel Vehicles

- **Six hybrid pool cars**
- **100% CNG bus fleet**
- **Two Global Electric Motorcars (GEM)**
- **One electric truck**
  - More trucks may be purchased
- **Electric golf carts**

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# CNG Buses Replaced Diesel Buses

- **All 39 SMF buses are now powered by Compressed Natural Gas (CNG), reducing particle & NOx emissions**
- **Cost per CNG bus: $58,400 more than a diesel bus**
- **But CNG fuel costs less than diesel fuel**


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# One of 2 GEMs Bought in 2005

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# New Low-Speed Electric Trucks

- **Ideal for short trips around the airport**
- **Top speed 25 mph**
- **Cost $18,000 to $24,000 depending on options**


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# Regulatory and Compliance Programs

- **Contract with the Sacramento International Airport Taxi Owner Association (SITOA) requires them to meet minimum criteria for low emission vehicles. (Many are buying hybrids)**
- **Managing airport-owned vehicle and equipment fleets to comply with the ARB diesel PM reduction regulations (on-road, off-road, and PERP).**

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# Jet Fuel Pipeline and Tank Farm Emission Reductions Reduced Mitigation Fees

- **First "fuel farm" opened 1967; diesel-powered tank trucks delivered jet fuel to SMF, emitting NOx and PM.**
- **2005: new fuel storage tanks & pipeline.**
- **Replaced truck delivery with pipeline; banked 8,000 pounds of NOx credits.**
- **Used banked credits to reduce the SMAQMD construction emission mitigation fee by $130,000.**

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# Looking Ahead – Airport Actions

- **Aircraft hydrant fueling of aircraft at new Terminal B**
  - Pipelines will deliver fuel from tank farm to each aircraft gate
  - Would make Airport Operating Area (AOA) safer and reduce NOx and Particle pollution by eliminating truck delivery of fuel to aircraft.
- **Extend light rail line to Airport from downtown**
  - Included in SMF Master Plan and Airport Layout Plan (ALP)
- **Continue replacing fossil fuel vehicles with alternatives when available and fiscally feasible**
- **Build more airport parking lots and garages**
  - Reliable parking supply eliminates need for “double tripping”

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# Looking Ahead – Airlines and FAA

- **Performance-Based Navigation**
  - Reduces fuel use by flying most direct routes between airports
- **Continuous Descent Approach (CDA)**
  - Reduces engine thrust and aircraft drag while aircraft is descending (quieter, cleaner, more efficient)
- **Replacing older aircraft with more fuel-efficient models**
  - B-787 is expected to have at least 20% better fuel efficiency than current aircraft
- **Aircraft self-docking systems**
  - Aircraft can taxi and park quicker, reducing fuel burn.

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