

October 14, 2020

New Jersey Department of Environmental Protection
NJairrulesmobile@dep.nj.gov

RE: New Jersey Protecting Against Climate Threats
Rule Proposal on Aviation Electric Ground Support Equipment

Dear NJDEP:

I am writing on behalf of the Port Authority of New York and New Jersey (the Port Authority) in response to the New Jersey Department of Environmental Protection's (NJDEP) invitation for comments on its proposed rule to transition from internal combustion engine (ICE) aviation ground support equipment (GSE) to zero-emissions GSE (zeGSE). NJDEP has not provided proposed rule text but has advised that it is considering a rule like that proposed by the California Air Resources Board (CARB). CARB has not yet made available a draft zeGSE rule to the public.¹ Absent a specific rule proposal, the Port Authority is providing comments that address general concepts associated with GSE and zeGSE. Should the NJDEP proceed with a formal zeGSE rulemaking, the Port Authority would have more specific comments on such proposal.

I. The Port Authority's New Jersey Airports

The Port Authority operates one commercial service, large hub airport in New Jersey (Newark Liberty International Airport (EWR)) and one general aviation airport (Teterboro Airport (TEB)). Descriptions of these airports, and EWR's economic contribution to the New Jersey economy, can be found on the Port Authority's website: <https://www.panynj.gov/airports/en/index.html>.

The Port Authority is committed to sustainable operations of all its facilities. In 2008, the Port Authority adopted a Sustainability Policy, including a greenhouse gas reduction goal of 80% by 2050 over 2006 levels. More recently, in 2018, the Port Authority became the first transportation agency in the United States to embrace the Paris Climate Accord and strengthened its greenhouse gas reduction commitment by setting an interim goal of 35% reduction by 2025 as well as reaffirming its long-term target of 80% by 2050.

The Port Authority has implemented a number of policies and projects to enhance the sustainability of its Airport, including construction of solar energy projects, implementation of Sustainable Building Guidelines, adoption of zero-emissions passenger buses, transitioning the Port Authority's vehicle fleet

¹ <https://ww2.arb.ca.gov/our-work/programs/zero-emission-airport-ground-support-equipment/about>
(accessed Oct. 5, 2020).

to low- and zero-emissions vehicles, energy efficiency improvements, and installation of charging stations in patron parking areas. In addition, AirTrain Newark provides mass transit ground transportation for millions of EWR's customers and employees.

Consistent with its environmental and greenhouse gas reduction policies, in 2019 the Port Authority began a focused effort to cut emissions from the fleets of GSE that operate at EWR as well as John F. Kennedy International and LaGuardia airports. The Port Authority has engaged with GSE fleet owners, terminal operators, and manufacturers of GSE, charging stations and batteries to develop strategies to accelerate the transition from ICE GSE to zeGSE. Even with the significant downturn in aviation due to the COVID-19 pandemic, fleet owners continue to invest in zero-emissions GSE at our airports. In the Port Authority's experience, fleet owners are motivated to transition to zeGSE for a variety of reasons: costs savings over the life of the equipment compared to ICE GSE, enhanced safety, emissions reductions, and reduced worker exposure to emissions. In addition, anecdotal evidence suggests that fleet owners acknowledge the superior performance of some types of zeGSE.

II. General Comments

The Port Authority supports the NJDEP's efforts to reduce emissions of greenhouse gases from the mobile source sector, including GSE. As noted in the NJDEP's presentation on September 16, 2020, cutting emissions of oxides of nitrogen (NOx) – an ozone precursor – remains a critical need in New Jersey. Notwithstanding significant improvements in air quality over the past decades, the Northern New Jersey-New York metropolitan area remains challenged to meet the National Ambient Air Quality Standard (NAAQS) for ground level ozone. Ozone pollution is a deterrent to economic growth in New Jersey and reduces quality of life for its residents. The Port Authority supports NJDEP's efforts to solve this longstanding air quality problem.

It is the Port Authority's understanding that NJDEP has not quantified the number of GSE operating in the state. With 42 airports in New Jersey that are open to the public and an additional 277 airports/heliports that are private, the number of GSE operating in New Jersey could be significant. Approximately 2,600 GSE and 1,600 other motorized pieces of equipment and vehicles (e.g., passenger cars, pickup trucks, vans, buses, other) are authorized to operate on the airside at EWR, and TEB has approximately 300 vehicles operated by tenants of the airport. With over 300 airports/heliports in New Jersey and the potentially large number of GSE, the Port Authority recommends that NJDEP evaluate the staffing and budget that would be necessary to successfully implement a zeGSE rule. Review of CARB's existing programs² to cut emissions from non-road mobile sources will provide a sense of the staffing, budget and IT resources that could be needed to implement and enforce a zeGSE rule.

² E.g., <https://ww2.arb.ca.gov/our-work/programs/use-road-diesel-fueled-fleets-regulation/about>; <https://ww2.arb.ca.gov/our-work/programs/large-spark-ignition-lsi-engine-fleet-requirements-regulation>.

Safety is paramount at the Port Authority's airports. Our airports have allowed operation of GSE powered by lead-acid and lithium ion batteries for over ten years and have not experienced any safety problems associated with operation of such equipment other than minor issues typical of all heavily-used vehicles (e.g., worn tires, missing lights, and the like). Transitioning to zeGSE is expected to improve worker safety by reducing exposure to diesel exhaust. Airport ramp workers (e.g., baggage handlers, ground crews) are exposed to diesel exhaust from GSE during their shifts. NJDEP already has a suite of programs to cut diesel emissions, and a zeGSE program would be a valuable addition to those efforts to reduce human exposure to diesel exhaust.

III. Costs and Financial Support

If NJDEP elects to pursue a zeGSE rule, it is essential that the State of New Jersey provide financial support to airports and fleet owners in order to support the transition to zeGSE. The life-cycle cost of zeGSE may be lower than their ICE counterparts, but the upfront purchase price of zeGSE is higher and that price premium for zeGSE can deter fleet owners from investing in zeGSE. Costs associated with charging stations are a combination of the charging station purchase price plus the installation cost (i.e., design, engineering and construction). Construction costs can be very high at facilities with electrical systems that require upgrades to accommodate the increased demand attributable to zeGSE charging. At least one terminal at EWR requires construction of a new substation to expand existing zeGSE charging capability.

In recognition of the costs associated with implementing mobile source emissions reduction measures, California provides grants and incentives to support fleet owners and local governments. California's low- and zero-emissions GSE programs are supported by multiple funding resources, including the following:

- FAA's VALE grant program: This federal program is necessarily limited by the FAA budget, and project funding is not assured because airports across the country compete for this funding.
- Carl Moyer: This state program has approximately \$60 million/year.
- AB 617: CARBs Community Air Protection Program has been providing funding for community air improvement projects since 2017. California allocated \$245 million to this program for 2019.
- Volkswagen NOx Settlement: California's VW Mitigation Plan allocates \$70 million to GSE projects.
- Zero-emission off-road freight voucher: This program includes some types of vehicles that can operate on the airside at airports. Based on CARB's website, there is approximately \$25 million annually to support this program.

Relevant CARB organization charts and staff listings can be found at the following links:

<https://ww3.arb.ca.gov/html/org/orgmscd.htm> and <https://ww3.arb.ca.gov/msprog/contacts.htm>.

New Jersey cannot rely solely on FAA VALE grants, the Volkswagen settlement and other recent settlements to support a mandatory transition to zeGSE. The funding available through the FAA VALE grant program varies year to year, and airports across the country compete for the funding—and funding from the VW settlement is finite. Financial support is even more essential today given the economic hardship the aviation sector is experiencing due to the COVID-19 pandemic and long timeline for the sector's recovery.

IV. Phase-in Period and Compliance Deadlines

A zeGSE rule must provide fleet owners and airports sufficient time to plan and budget before such a rule is implemented. Likewise, interim milestones and final goals must be realistic. Before simply adopting the compliance deadlines in California's zeGSE program, the Port Authority urges NJDEP to conduct a comprehensive review of deadlines to ensure they are consistent with the state's greenhouse gas reduction goals and other measures being implemented in New Jersey to cut emissions. Similarly, compliance deadlines should consider the projected growth of the zeGSE sector, commercial aviation forecasts, aviation cargo forecasts and other economic factors.

As you know from your extensive experience in reducing emissions from construction equipment, the market for heavy duty non-road vehicles and equipment is small compared to the markets for on-road trucks and, of course, light-duty vehicles. Manufacturers of GSE typically operate at low production volumes compared to other vehicle types. NJDEP must take the economic realities of the GSE market into consideration in developing a zeGSE rule phase-in period, interim milestones and final compliance deadlines.

V. Scope

A. Definition of "Ground Support Equipment"

In developing its zeGSE rule, NJDEP must craft a definition of "ground support equipment" that meets the objectives of the program. The term "GSE" is defined differently by different organizations.

The Federal Aviation Administration defines ground support equipment as "non-road vehicles used on the airport tarmac to service aircraft and other airport-specific duties."³ Recognizing the large variety of motorized equipment at airports that contribute to air pollution, FAA will issue grants through the Voluntary Airport Low Emissions program (VALE) for the replacement of a wide variety of airport equipment:

The VALE program is structured to address these varied technologies, imposing few restrictions on vehicle type. Vehicle [sic] eligible for the VALE program

³ FAA Voluntary Airport Low Emission Program, Technical Report, v.7, App. 1 (Dec.2010).

include airport dedicated on-road or ground access vehicles (GAVs) and many types of GSE to support aeronautical services, airport maintenance, airport security, and other essential airport needs.⁴

CARB defines GSE in its In-Use Off-road Diesel-Fueled Fleet rule as

[M]obile diesel-fueled off-road compression ignition vehicles used to service and support aircraft operations. GSE vehicles perform a variety of functions, including but not limited to: aircraft maintenance, pushing or towing aircraft, transporting cargo to and from aircraft, loading cargo, and baggage handling. GSE vehicles include equipment types such as baggage tugs, belt loaders, and cargo loaders.⁵

To assist NJDEP in choosing a definition of GSE, a list of the types of motorized equipment that is permitted by the Port Authority to operate on the airside of our airports is attached as Appendix A.

For your assistance, Appendix B presents photos of the wide variety of equipment/vehicles that operate at airports.

B. Type of Fuel

The Port Authority encourages NJDEP to include at least all gasoline- and diesel-powered GSE. Table 1 presents a breakdown of the types of fuel used across GSE types at EWR plus John F. Kennedy International Airport and LaGuardia Airport as of October 2019.

Table 1

GSE Type	Diesel	Gasoline	Alternative Fuel	Electric
Baggage tugs	28%	63%	1%	8%
Belt loaders	40%	48%	0%	12%
Aircraft tractors	81%	11%	0%	8%
Cargo loaders	93%	6%	1%	0%
Forklifts	12%	4%	68%	16%

In designing a zeGSE program, the NJDEP should also consider the merit of allowing near-zero GSE and hybrid GSE. Forklifts fueled by propane are already operating at EWR and the Port Authority's other airports, and at least one manufacturer recently introduced propane heavy-duty on-road trucks with NOx emissions that are below federal standards. These near-zero solutions may be good interim

⁴ FAA Voluntary Airport Low Emission Program, Technical Report, v.7, Sect. 4.2 (Dec.2010). Ground access vehicles are those licensed for on-road use.

⁵ California In-Use Off-Road Diesel Vehicle rule.

<https://ww2.arb.ca.gov/sites/default/files/classic/msprog/ordiesel/documents/finalregorder-dec2011.pdf>

solutions while GSE manufacturers are perfecting zeGSE technologies. There are no hybrid GSE operating at EWR or TEB, but the Port Authority is aware of one manufacturer that offers an aircraft tractor run by battery but with a diesel engine that can run when needed to recharge the battery.

A zeGSE rule should also be designed to accommodate future zero-emissions technologies, such as hydrogen fuel cell equipment.

C. Exemptions for Low-Use and Low-horsepower Vehicles

There is some GSE with negligible emissions because the equipment operates so little and/or has very low horsepower engines. The Port Authority recommends excluding such equipment from regulation and instead focus on equipment/vehicles with higher emissions due to longer operating hours and engine size. In CARB's rule on In-Use Off-Road Vehicles (which includes GSE), low-use and low-horsepower equipment is excluded from all or some provisions of that rule.⁶ The Port Authority supports similar exemptions, but would encourage NJDEP to develop definitions of exemptions that simplify the burden on fleet owners to demonstrate the applicability of exemptions to their equipment. The Port Authority also recommends excluding all equipment that is dedicated to emergency response, including vehicles operated by the many government agencies at our airports.

D. Commercial Availability of zeGSE

A zeGSE rule must take into consideration that not all types of zeGSE are on the market in the United States (so-called commercial availability). Today, only certain types of GSE are available in zero-emissions models in the United States, including baggage tugs, belt loaders, aircraft tractors for narrow-body aircraft, cargo tractors, forklifts, and others. The Port Authority expects that more types of zeGSE will become commercially available in the United States in the future, and several stakeholders have expressed similar views. Input from GSE manufacturers on zeGSE availability today, their production capabilities, and zeGSE products in the pipeline should help inform NJDEP's evaluation of commercial availability in the short- and long-term horizons and help NJDEP establish compliance realistic deadlines.

E. Operational Feasibility of zeGSE

Fleet owners with experience using zeGSE have reported to the Port Authority that some commercially available zeGSE are not feasible in certain applications. Use of a battery electric model of GSE may not be feasible if, for example, the battery is depleted due to heavy use and the GSE must be removed from service for extended periods to charge the lead acid batteries.⁷ Insufficient space for charging stations in the ramp area could be another factor influencing the feasibility of zeGSE. The Port Authority's zeGSE

⁶ Id. See definition of "Permanent Low-Use Vehicles" (operate less than 200 hours per year) and "Year-by-Year Low-Use Vehicle".

⁷ Switching to lithium ion batteries could reduce charging time.

initiative may allow fleet owners to demonstrate that use of zeGSE is not operationally feasible. The Port Authority encourages NJDEP to seek input on this point from fleet owners, charging station manufacturers and battery manufacturers.

VI. Conclusion

The Port Authority reiterates its support for New Jersey's greenhouse gas and criteria pollutant emissions reduction goals. We urge NJDEP to avoid wholesale adoption of California's comparable rules and to instead develop a rule that meets the needs and capabilities of New Jersey's GSE fleet owners and airports. I would be pleased to meet with you in a virtual environment to answer questions about the comments in this letter or any other topics on the issue of transitioning to zero-emissions GSE. Thank you very much.

Sincerely,



Jane Herndon
Manager, Aviation Environmental Programs

Attachments

Cc Huntley A. Lawrence, Director of Aviation, PANYNJ
Christine Weydig, Director, Office of Energy and Environmental Programs, PANYNJ

APPENDIX A

Air conditioner

Air start unit

Aircraft tractor

Baggage tug

Belt loader

Bobtail

Cargo loader

Cart

Catering truck

Deicer

Forklift

Fuel truck

Generator

Hydrant cart

Hydrant server

Lavatory truck

Lavatory cart

Lift

Service vehicle

Passenger stairs

Sweeper

Water truck

Bus

Car

Sedan

SUV

Pickup truck

Passenger van

Cargo van

Construction equipment

Dolly

Farm tractor

Lighting unit

Skid steer

Compressor

Engine wagon

Portable welder

Mule

Surveillance trailer

Utility vehicle

Light trailer

Mobile platform

Gator

Personnel hauler

Watch tower

Tram

Glycol tanker truck

Power washer

Nitrogen cart

Yard horse

Wheel loader

Tractor trailer

Pump station

Sort platform

Tow truck

Dump truck

Snow equipment

Box truck

Armored truck

Flatbed truck

Roll off truck

Spreader truck

Front loader

Transporter

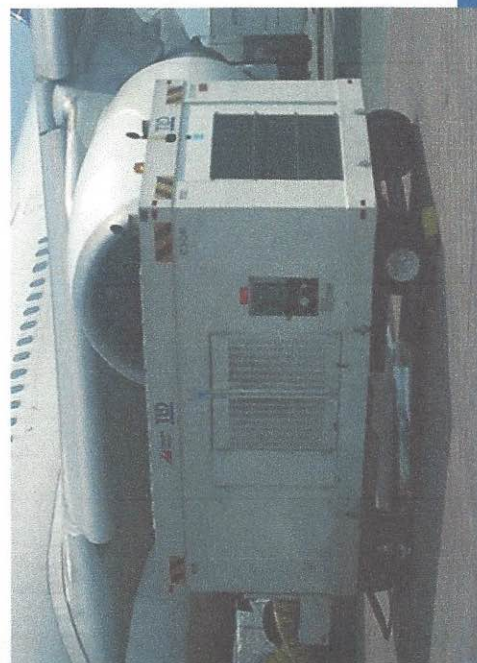
Appendix B

Examples of Ground Support Equipment (GSE) and Other Motorized Equipment*

"Ground Support Equipment" (GSE) means motorized vehicles that service aircraft and shall include the following types of equipment
Definitions from ACRP Report 78.
**not an endorsement of particular brands and manufacturers*

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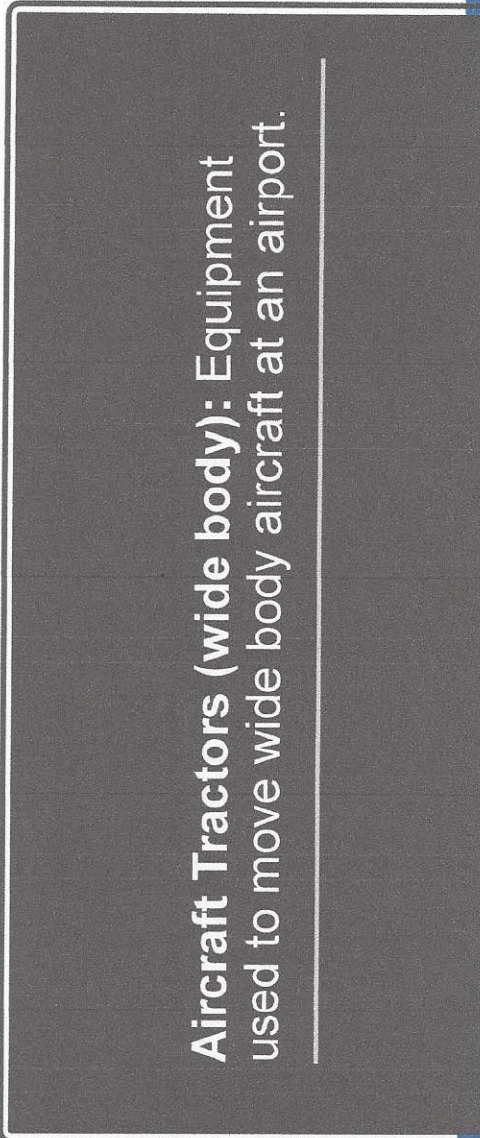
Air Conditioning Units: Units that provide conditioned air (i.e., cooled and heated air) to ventilate parked aircraft. Also referred to as air carts.



Air Start Unit: Equipment with a built-in engine which, when aircraft engines are started, provides air for the initial rotation of a large engine.



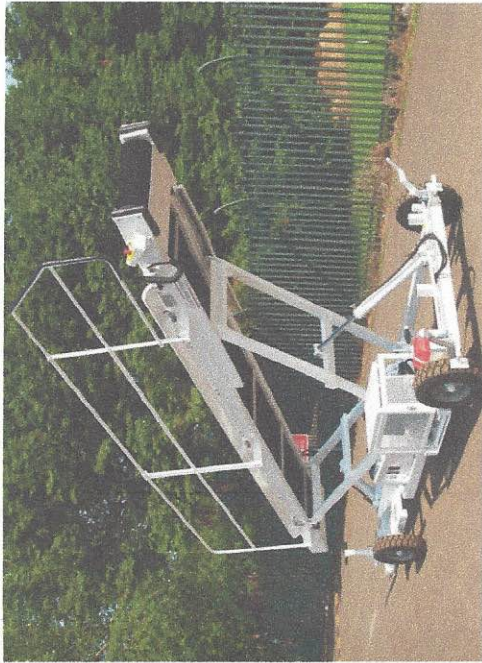
Aircraft Tractors (narrow body): Equipment used to move narrow body aircraft at an airport.



Aircraft Tractors (wide body): Equipment used to move wide body aircraft at an airport.



Baggage Tugs: Vehicles used to transport baggage and other items between an aircraft and the airport terminal and/or processing/sorting facilities. Also commonly referred to as a baggage tractors.

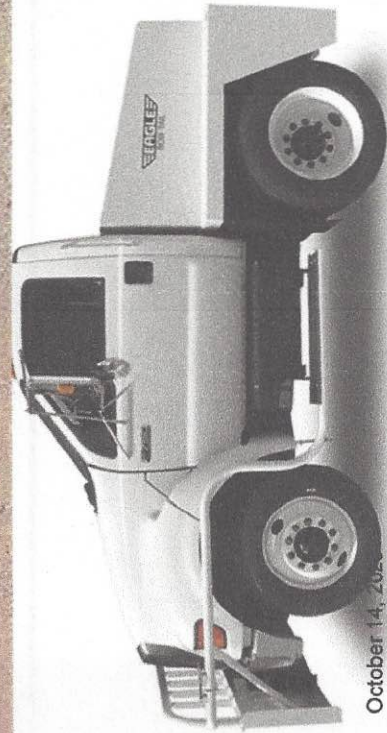


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Belt Loaders: Equipment used to load and unload baggage, cargo, and other items into/from aircraft.

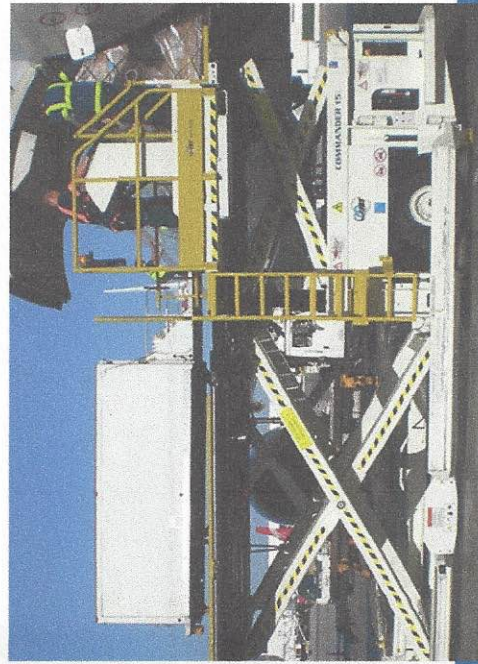
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Bobtails: On-road trucks that have been modified to tow trailers and equipment.



Cargo Loaders (main deck): Equipment used to load and unload the cargo on the main deck of an aircraft that is within a container or on a pallet.

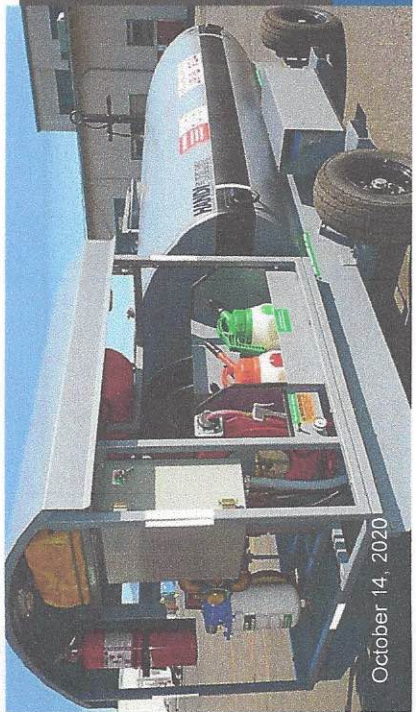
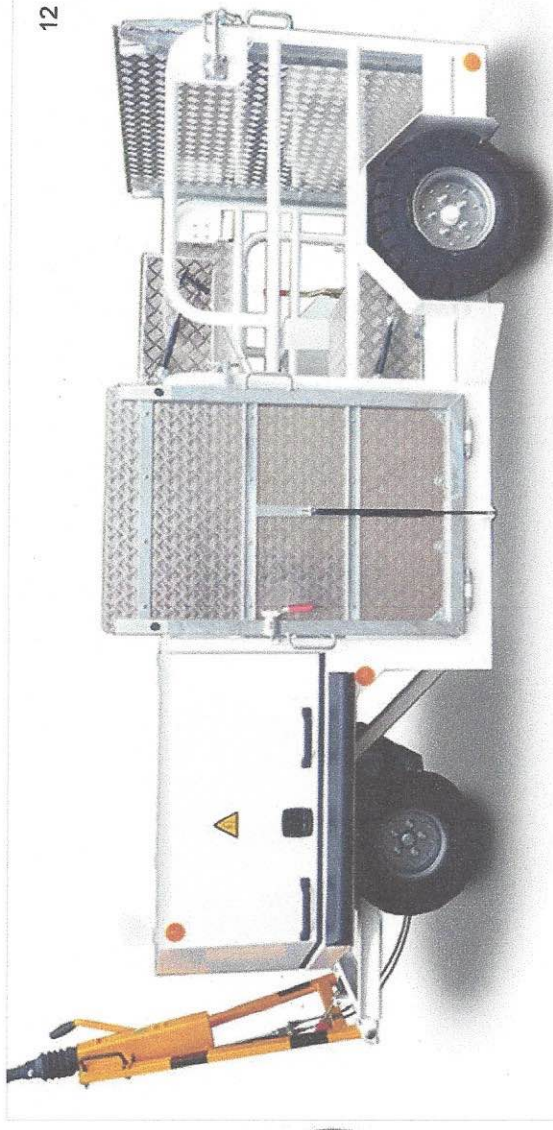


Cargo Loaders (lower deck): Equipment used to load and unload the cargo on the lower deck of an aircraft that is within a container or on a pallet.



Cargo Tractors: Equipment that moves/tows aircraft or aircraft cargo to and from the gate.

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Carts: Equipment category that includes burden carts, compressor carts, landing gear carts, load bank carts, cushion carts, electric carts, engine carts, glycol pump carts, pump carts, servicing carts, spill carts, tire carts and utility carts. Does not include hydrant carts.

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Catering Trucks: Vehicles that deliver food trolley and beverages to/from aircraft.

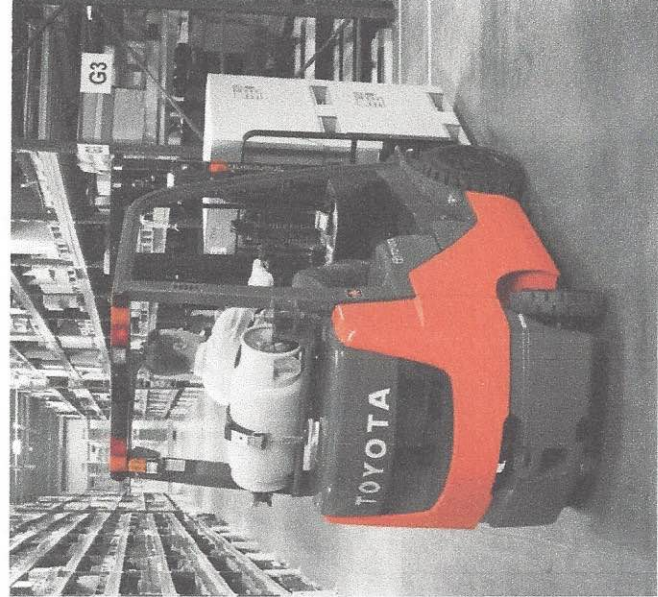
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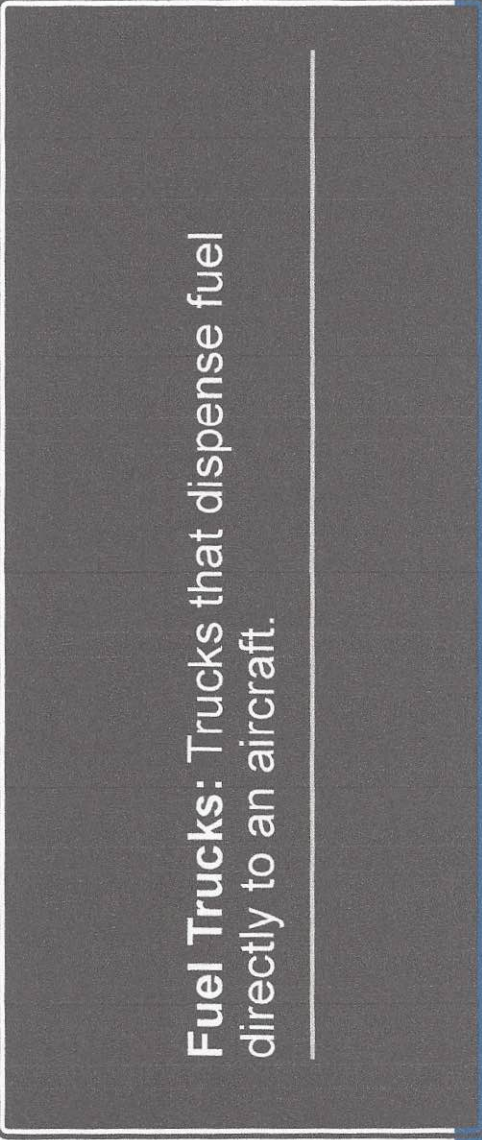
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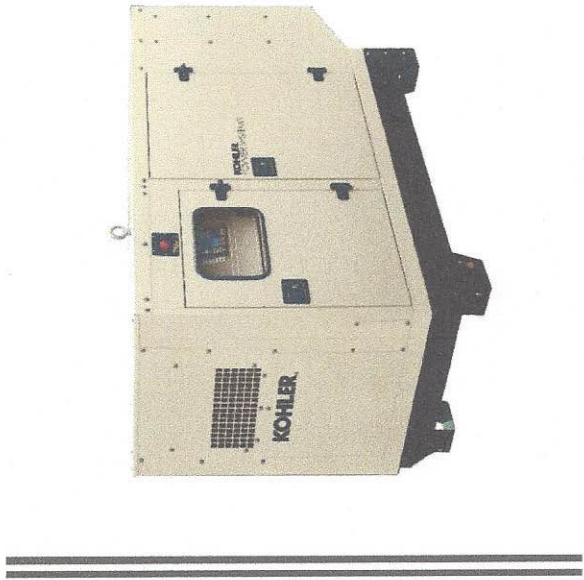
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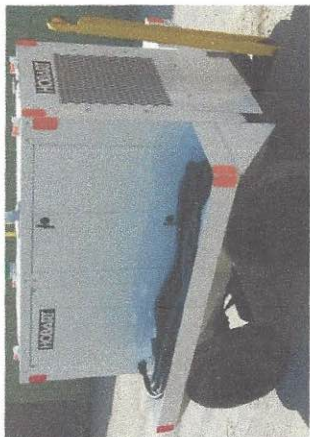
Forklifts: Vehicles with a pronged device in front for lifting and carrying heavy loads.



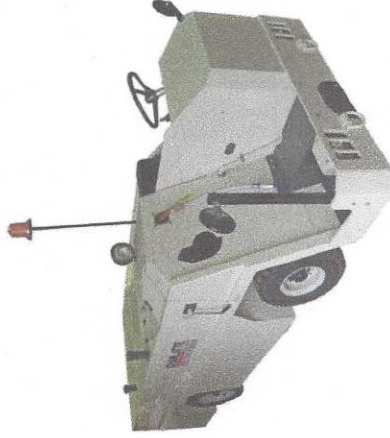
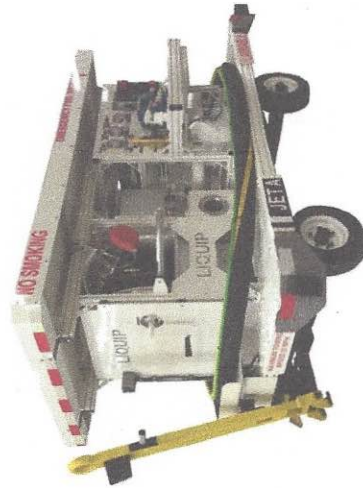
Fuel Trucks: Trucks that dispense fuel directly to an aircraft.



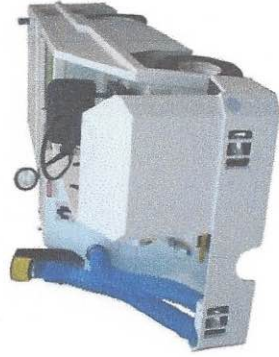
Generators: Non-road equipment that provides electric power; includes emergency power units and generator units.



Ground Power Units (GPUs): Mobile units that provide AC and DC electric power to parked aircraft when an aircraft's engines/APUs are not in use.



Hydrant Carts: Vehicles that utilize an underground fueling method to connect aircraft to fueling system.



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Lavatory Trucks: Vehicles that remove waste from aircraft lavatory systems.





Lavatory Carts: Towable carts that remove waste from aircraft lavatory systems.



Lifts: Equipment category that includes areal lifts, articulating boom, boom lifts, boom trucks, lift trucks, electric lifts, flat bed lift trucks, handicap passenger lifts, high lifts/trucks, lift beds, lift platforms, lift trucks, lift units, lift platforms, maintenance lifts, man lifts, mobile lifts, scissor lifts, snorkel lifts, and other types of lifts for accessing aircraft and moving equipment/cargo.



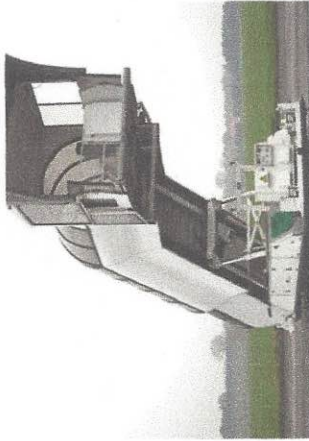


Service Vehicles: Vehicles used to clean the passenger cabin of aircraft and replenish items such as soap, pillows and blankets.

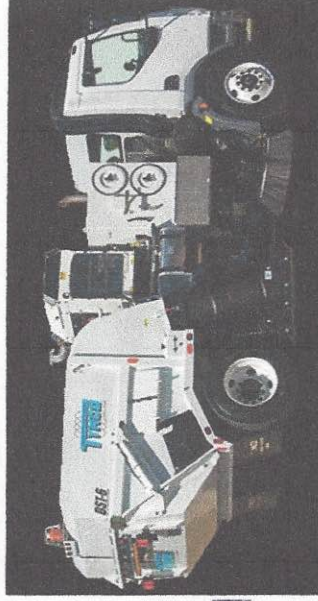
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Smith, Samantha, 10/7/2019



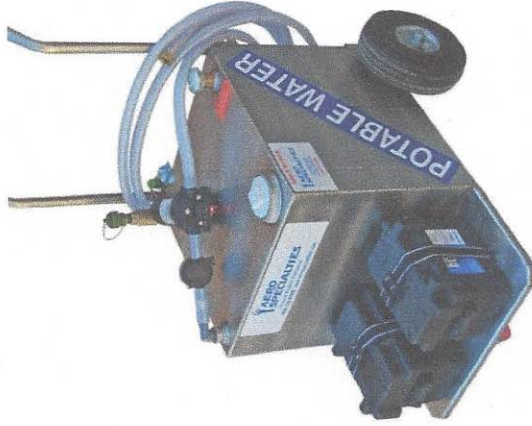
Passenger Stairs: Equipment that provides a means of loading and unloading passengers at hardstands and in the absence of jet bridges.



Sweepers: Equipment used to clean pavement at the gate area and aprons.



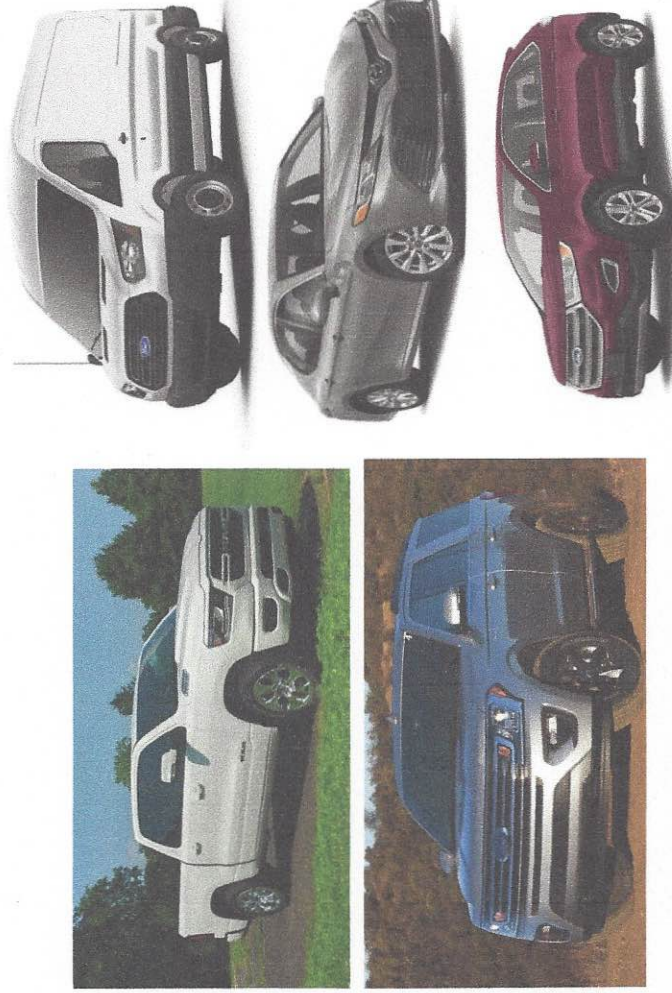
Water Trucks: Vehicles that provide potable water to an aircraft.



Water Carts: Towable carts that provide potable water to an aircraft.

Miscellaneous: Golf carts, box trucks skid loaders, buses, vacuum tank trucks, light towers, scissor lifts, towable welders, skid steers, utility vehicles, etc.





Passenger Vehicles

