

Chapter 8

Air Quality

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This chapter summarizes information that was included in the *Draft ESPR* for air quality and provides responses to comments from the Massachusetts Department of Environmental Protection (DEP) about air-side operational improvements; ground service and landside conversions to alternative fuels; emission reduction credits; and, aviation support emissions reduction.

Summary of the *Draft ESPR*

The *Draft ESPR* described year 2000 conditions and future air quality and air emissions in the study area. The key findings of that work are:

- Air quality in the Greater Boston area, including the Hanscom communities, has improved substantially over the past 30 years.
- The Greater Boston area, including the Hanscom Field communities, is currently in compliance with all Massachusetts and National Ambient Air Quality Standards (NAAQS). Ozone levels have been in compliance with the one-hour NAAQS for ozone in the Boston area, including the Hanscom Field communities, since 1996. Some violations of the one-hour ozone NAAQS still occur on Cape Cod and in southeastern Massachusetts. Ozone concentrations in Eastern Massachusetts are greatly affected by air pollution transport from the New York/New Jersey/Connecticut metropolitan area.
- Hanscom Field emissions are a very small fraction of regional emissions.
- The emission levels forecasted for the future scenarios will not result in adverse air quality effects near or away from the airport. The worst-case air quality concentrations in Bedford, Concord, Lexington, Lincoln, Minute Man National Historical Park and Great Meadows National Wildlife Refuge for all scenarios will be safely in compliance with the Massachusetts and National Ambient Air Quality Standards.

Review of Suggested Environmentally Beneficial Measures

This section outlines possible additional air quality environmentally beneficial measures beyond those discussed in Chapter 12 of the *Draft ESPR* and responds in detail to the suggestions from DEP in the following areas:

- Airside operational improvements
- Ground service and landside conversions to alternative fuels
- Emission reduction credits
- Aviation support emissions reduction
- Clean Air Construction Initiative

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This section concludes with a progress report regarding the clean fuel vehicle program at Hanscom Field.

Airside Operational Improvements

Massport examined airside operational improvements in Chapter 12 of the *Draft ESPR* and concluded that Hanscom Field already operates without any appreciable taxiway delays that generate avoidable excess emissions. This situation will not change even for the 2015 High Growth Scenario. Emissions from aircraft are exclusively within the jurisdiction of the federal government, and aircraft operations are subject to the exclusive jurisdiction of FAA controllers.

One area where Massport might affect emissions from aircraft operations is in the design of taxiways. Aircraft taking off from Hanscom Field are a mix of piston aircraft and small jets. The pre-flight checkout procedure for piston aircraft requires the pilot to run the engine(s) at full throttle just prior to takeoff, and this activity often occurs at the head of the runway or on the taxiway just before the runway. Small jets are not required to perform this engine test at the head of the runway. When small jets and piston aircraft are mixed together on a taxiway awaiting takeoff, the possibility exists that a piston aircraft could delay other aircraft behind it while it does its pre-flight checkout if other aircraft cannot pass by.

For the main runway, Runway 11-29, queuing is not a problem because there is an aircraft holding area next to the end of the taxiway where it meets the head of Runway 29. This allows piston aircraft to pull aside and complete their pre-flight checkout, while other aircraft move forward and takeoff. The second runway at Hanscom Field, Runway 5-23, is used most often in the summer when there are southwest winds. On a summer day with good weather conditions, there can be times when several single-engine piston aircraft are mixed with small jets on Hotel Taxiway, the taxiway that serves Runway 23 with takeoff to the southwest. Hotel Taxiway is 50 feet wide and does not provide enough width for aircraft to safely pass each other; it also does not have an aircraft holding area at its end where it meets the runway. Thus, there are short periods of time when aircraft are briefly delayed on Hotel Taxiway on some summer days.

Installing a paved aircraft holding area at the head of Runway 23 would allow piston aircraft to pull off Hotel Taxiway and complete their pre-flight checkout, freeing other aircraft that are behind to takeoff. Massport will review the possibility of implementing this measure.

Fuel Conversion of Ground Service Equipment and Massport Groundside Vehicles

An inventory of current ground service equipment (GSE) and Massport groundside fleet vehicles at Hanscom Field is provided in Table 8-1. At present, three percent of the GSE and fleet vehicles at Hanscom Field are alternatively fueled, either by electricity or propane.

Ground service and landside conversions to alternative fuels were considered and discussed in the *Draft ESPR* (Chapter 12). Due to the limited amount of GSE in operation at Hanscom Field, this category is not a significant source of air pollution. The majority of GSE operations with Massport-owned equipment involve airport maintenance (e.g. snow plowing, snow blowing and runway sweeping) with large vehicles that, given their power needs, are not candidates for conversion to alternate fuels. Fleet vehicles are more likely candidates for the use of alternative fuels, as discussed in the section below (Clean Fuel Vehicle Program). Massport has made progress in this area and will consider additional Alternative Fueled Vehicles (AFVs) for new vehicle purchases in the future. There is one electrical recharging station at Hanscom Field.

GSE operations by the tenants involve a mix of large and small equipment, some of which are electric-powered. While power needs for some of this equipment (e.g. the snow plows, tanker fuel trucks) preclude their use of alternative fuels, Massport will encourage the tenants to consider alternatively fueled GSE, where appropriate, when making purchases of new equipment.

Emission Reduction Credits

Emission reduction credits are sometimes traded between operators of stationary sources of air emissions as a cost-effective way to meet regional emission reduction goals, and such activity occurs under the regulatory framework of the federal Clean Air Act and Massachusetts emissions reduction credit trading program. Massport has evaluated the trading of emission credits for Logan Airport due to the level of NO_x emissions from the Central Heating and Cooling Plant and large turbo-jet aircraft at Logan. Massport does not operate a central power plant at Hanscom Field and is not a significant generator of NO_x emissions. Thus, the purchase of NO_x emission reduction credits is not called for.

Other Aviation Support Emission Reductions

On-board Auxiliary Power Units (APUs) and Ground Power Units (GPUs) provide electricity, heat and air conditioning to an aircraft when its engines are off. Pilots of small jets run their APU (or a GPU) to heat or cool the aircraft while they wait for passengers. These aircraft operate primarily through the two FBOs at Hanscom Field: Signature (formerly Mercury Air Group) and Jet Aviation. APUs and GPUs produce relatively small amounts of air pollutant emissions in comparison to aircraft engines. While Massport neither owns nor directly controls the operation of these small power units, the Authority recognizes the air quality benefit of minimizing APU/GPU operations. To increase awareness among pilots about the issue and reduce emissions, Massport will encourage Signature and Jet Aviation to minimize the operation of APUs and GPUs to help reduce air pollutant emissions at Hanscom Field.

Massport has recently taken similar action on the groundside, posting highly visible signs along the front of the Civil Air Terminal to remind motorists about the State vehicle idling law. The text of those signs is:

"Massachusetts law prohibits idling vehicles for more than 5 minutes (MGL CH. 90 Sect 16A). Vehicle idling causes pollutants, including: carbon monoxide, oxides of nitrogen, hydrocarbons, and volatile organic compounds, to enter the atmosphere. Please help Massport protect our environment by complying with this Massachusetts law. Thank you."

Clean Air Construction Initiative

As part of the Hanscom Environmental Management System implementation and Massport's continued commitment to reduce impacts to the environment, Massport implemented the DEP Clean Air Construction Initiative/EPA's voluntary Diesel Retrofit Program. Implementation of the initiative requires contractors to retrofit their heavy equipment with advanced pollution control devices during construction of all Massport projects. Contractor-owned equipment such as front-end loaders backhoes, cranes and excavators will be retrofitted with oxidation catalysts and low particulate filters. These devices filter out and break down harmful diesel emissions of hydrocarbons, particulate matters and carbon monoxide.

Clean Fuel Vehicle Program

In 1997, Massport stated that it would explore the feasibility of implementing the Logan Airport clean fuel vehicle program at Hanscom Field. Massport has made progress in bringing Alternative Fueled Vehicles (AFVs) into its fleet at Hanscom Field. At present, Massport owns nine fleet vehicles (three sedans, one SUV, one van and four light trucks) at Hanscom Field, one of which is electric. Thus, eleven percent of the Hanscom fleet vehicles are AFVs. By comparison, 30 percent of the Massport fleet vehicles at Logan Airport are AFVs (*2001 EDR Boston Logan International Airport*, December 2002, p 7-18).

The Clean Fuel Vehicle Program at Logan Airport relies on an extensive infrastructure consisting of a quick-fill Compressed Natural Gas (CNG) filling station and several electric charging stations to serve a large fleet of 73 CNG and electric vehicles. A similar infrastructure does not exist at Hanscom Field; there is one electric recharging station at Hanscom Field. The large number of fleet vehicles at Logan Airport (over 250) made it feasible for Massport to spend the substantial funds that were required to build a clean fuel infrastructure. The situation at Hanscom Field is quite different, as there are only nine vehicles total in the fleet. Thus, it is not reasonable to duplicate the extensive CNG and electric infrastructure from Logan Airport at Hanscom Field. And even if the other eight vehicles were converted to alternative fuels, the emission reductions in total would be minimal. The two non-AFV sedans in the Massport fleet at Hanscom Field have a fuel economy of approximately 23 miles per gallon.

In summary, progress has been made in bringing AFVs into the fleet at Hanscom Field. While AFV conversion for Hanscom at a level comparable to that at Logan is unlikely, Massport will continue to consider AFVs for any new vehicle purchase in the future. Also, since Massachusetts has adopted the California Low Emission Vehicle program, any new conventional-fueled vehicle added to the Hanscom fleet in the future will have very low emissions and will automatically comply with the low emission goals of the federal Clean Fuel Fleet Program (40 CFR Part 88).

Table 8-1 Number of Ground Service Equipment and Fleet Vehicles by Fuel at Hanscom Field

Type of Vehicle or Equipment	Gasoline	Diesel	Propane	Electric
Massport Fleet				
Cars/Vans/SUV/Pickup Truck	8			1
Massport Ground Service Equipment				
Snowplow Trucks/Snowblowers/Sweepers	2	13		
Large Field Tractors	2	2		
Front-end Loaders		2		
Forklift			1	
Small Tractor/Mowers	5			
FBO: Signature				
Cars/Vans/Pickup Truck	6			
Snowplow/Deicing Trucks		3		
Fuel Tanker Trucks	1	6		
Belt Loader/Tugs	5			
Box Van	1	1		
Golf Carts				1
Ground Power Unit	1	2		
FBO: Jet Aviation				
Cars/Vans/Pickup Truck	4			
Tugs	10			
Deicing Trucks	4			
Fuel Tanker Trucks		6		
Golf Carts	3			
Ground Power Unit	6			
Forklift	1			
Small Tenants*				
Car/Van/SUV	4			
Light Trucks	4			
Fuel Tanker Truck		1		
TOTALS	67	36	1	2

* Executive Flyers, East Coast Aviation, East Coast Aerotech, Aviation Electronics, Sabrina
 GSE Electric / Propane Percentage = $3/106 = 3\%$

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