

Greater Boston Breathes Better

Success Stories

Introduction

Greater Boston Breathes Better (GB3) is a public-private partnership that promotes and supports voluntary action in the Greater Boston area to reduce air pollution from transportation and construction.

Construction projects allow us to sustain, maintain, restore and expand important structures and systems such as buildings, bridges, and roadways. Unfortunately, construction equipment (like all diesel engines) emits fine particles, known as particulate matter (PM), which can significantly contribute to air pollution and pose a serious public health risk. Fine particles can aggravate asthma and other respiratory problems and contribute to lung damage and premature death. People with existing heart disease, asthma or other respiratory problems are most sensitive to the health effects of fine particles found in diesel exhaust.

Several GB3 partners have taken steps to reduce the impact of diesel exhaust on public health, and improve air quality in Greater Boston with innovative clean diesel strategies, including, the adoption of contract bid specifications requiring retrofits, idle reduction policies, and the use of cleaner fuels.

The following are three case studies of organizations and institutions in Greater Boston who have demonstrated their commitment to protecting both public health and the environment with programs to reduce emissions during construction.

Dana-Farber Yawkey Center for Cancer Care

As a leader in cancer research and treatment, Dana-Farber Cancer Institute chose to protect public health during construction of the Yawkey Cancer Center in Boston, by incorporating clean diesel strategies. By implementing construction practices that reduce diesel emissions, the Institute minimized the impact of the construction on its patients, staff, visitors, residents of the nearby community, and those involved in the construction.

Early in the planning process, Dana-Farber Cancer Institute (DFCI) hired Walsh Brothers, Inc. (WBI) to manage the project. Together DFCI and WBI decided to include an emissions control element in the construction plan.



Manitowoc Crane fitted with DOC at Yawkey Center for Cancer Care Site

Project specifications require construction companies to comply with idling reduction requirements and achieve air pollution reductions of 42 percent for hydrocarbons (HC), 31 percent for carbon monoxide (CO), and 20 percent for particulate matter (PM). Subcontractors use a combination of

“Implementing a Clean Diesel Program was a natural choice for Dana-Farber. We are proud to be at the forefront of this new development in healthcare facility construction. We are pleased that our actions will reduce potentially harmful emissions and have a positive impact on the quality of life for our patients, staff, visitors, and the surrounding community. This undertaking perfectly complements and reinforces Dana-Farber’s mission to provide expert care to cancer patients.”

-Joseph Bassi, Senior Project Manager, Dana-Farber Cancer Institute, Facilities Management and Construction

retrofit technologies, such as diesel oxidation catalysts (DOCs) and cleaner fuels to achieve these specifications.

Walsh Brothers works with all subcontractors to ensure that equipment arrives at the work site retrofitted. Ultra-low-sulfur-diesel (ULSD) fuel is provided onsite via the subcontractors’ vendors. Over the five-year time frame of the project (2006-2011), 25–30 pieces of equipment will be retrofitted, including excavators, cranes, loaders, and pumps. The retrofit devices range in cost from \$800 to \$7,000. Subcontractors are instructed to build the cost of retrofitting equipment and additional cleaner fuel costs into their bids, so the entire cost of the program is assumed by DFCI. There have been no reports of changes in equipment performance or fuel consumption.

Dana-Farber Cancer Institute is pleased with the outcome of the joint endeavor, and has added clean diesel/emissions reduction

requirements to its Institutional Master Plan. As a result, all future Dana-Farber projects will call for clean diesel specifications. Dana-Farber believes that the added cost of the program, a fraction of the total project cost, is more than worth the public health benefits realized.

Central Artery/Tunnel Project (The Big Dig)

The Big Dig began exploring the option of retrofitting equipment in September 1998 because of the close proximity of the equipment to residential communities, medical facilities, as well as other sensitive receptors. This program initially sought to retrofit 50 pieces of construction equipment. However, due to the number of vehicles used in the tunnel construction, additional equipment was retrofitted which resulted in more than 100 pieces of construction equipment participating in the program.

Equipment targeted for retrofitting was located near sensitive receptors such as residential communities and hospitals, used in tunnel work for health and safety consideration of the workers, and any equipment that was slated to remain on the project work site for the longest duration of the contract life.

DOCs were selected for this project because of the reduction in HC, CO and PM, the ease of installation, and the relatively inexpensive cost. The reduction of HC also helped to alleviate odor associated with diesel engines. Installation was relatively easy, with a downtime of about two hours, and contractors did not have to perform any additional maintenance on the equipment. According to contractor experience, the equipment retrofitted has not experienced any adverse operational problems.

Along with DOCs, the MTA explored the use of lower emission diesel fuel, specifically LUBRIZOL's PuriNOx product. Switching to the new fuel resulted in lower NOx emissions and reduced smoke. The only performance problems reported by

operators were that the vehicle required slightly more power in deep mud and that slightly more fuel was consumed.

An idling policy was established and enforced, requiring all operators to turn off equipment that was not in active use. Also, any dump trucks that were idling while waiting to load or unload were not allowed to idle for more than five minutes.

Prior to the project, there were two major concerns expressed by contractors. The first was the potential effect on the equipment warranty. The second was whether the emission control equipment would affect the performance of the construction equipment. However, after using the retrofitted equipment, contractors did not experience any adverse operational problems and did not have to perform any additional maintenance.

Harvard University

Greater Boston is a hub for many things, including some of the countries most prestigious academic institutions. Harvard University has campuses in Cambridge and Boston and will soon be significantly expanding its campus in Allston. In August of 2007, Harvard University took another step to "green" its operations by announcing that all construction



Harvard backhoe fitted with a flow through filter as part of trial retrofit project

companies working on its campus must take three important steps to reduce emissions from diesel construction vehicles: (1) install emissions control devices that reduce particulates and other tailpipe pollutants, (2) burn only ULSD fuel, and (3) follow all relevant anti-idling laws. Specifically, Harvard will require the use of advanced pollution control technologies that are verified by EPA or certified by the manufacturer to provide minimum emissions reduction of 20 percent for PM, 40 percent for CO, and 50 percent for HC. These measures will improve the ambient air quality for people living and working in and near Harvard's campus.

While Harvard has committed to a standard that is similar to requirements used by the Big Dig and Logan Airport, the Allston Science Complex will serve as a test-run by requiring emissions control devices on small equipment. Specifically, while Harvard is requiring that all projects retrofit equipment with 60 horsepower (hp) engine or larger, the Science Complex requires retrofits on equipment down to 15 hp. Because of the large number of vehicles that will be used, and the long duration that those vehicles will be onsite, the Science Complex will demonstrate the benefits of using emissions control devices on a full range of equipment sizes.

"Transportation Services was pleased to work with the Harvard Green Campus Initiative to first pilot retrofits on Harvard-owned vehicles, and then collaborate with Harvard's various schools and the contractors who regularly work with the University to build a consensus that a retrofit requirement was appropriate for all Harvard construction projects."

-David Harris, General Manager, Operations & Finance, Harvard University Transportation Services

For more information please visit:

www.epa.gov/NE/eco/gb3/

www.epa.gov/diesel/construction/contract-lang.htm

www.epa.gov/otaq/retrofit/verif-list.htm

www.masspike.com/bigdig/background/airpollution.html

www.northeastdiesel.org