



City of Medford, Massachusetts Vehicle Emissions Reduction Program Phase II



CLEAN SCHOOL BUS USA Final Report

November 2005

Sponsored By:

United States Environmental Protection Agency
Office of Transportation and Air Quality
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Ann Arbor, Michigan 48105

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ACRONYMS USED IN THIS REPORT

ARC = New England Asthma Regional Council

CCRT = Catalyzed Continuous Regenerative Technology

CO = Carbon Monoxide

CRT = Continuous Regenerative Technology

CUMMINS = Cummins Northeast Incorporated

DOC = Diesel Oxidation Catalyst

DPF = Diesel Particulate Filter

EPA = United States Environmental Protection Agency

HC = Hydrocarbons

MA DEP = Massachusetts Department of Environmental Protection

MA EOEA = Massachusetts Executive Office of Environmental Affairs

PM = Particulate Matter

PTA = Parent Teacher Association

THE CITY = Medford's Energy and Environment Office

ULSD = Ultra Low Sulfur Diesel

VERP = Medford's Vehicle Emissions Reduction Program

VOCELL = Vocell Bus Company

I. Executive Summary

The City of Medford's Energy and Environment Office (the City) has been working with the United States Environmental Protection Agency (EPA) since October 2003 on the Clean School Bus USA Program to improve air quality within the region by retrofitting the municipal school bus fleet. Prior to this, the City had been working on a number of initiatives to reduce pollution from criteria air pollutants as well as greenhouse gas emissions, including integrating alternative fuels and vehicles into the municipal fleet, implementing various energy efficiency measures within public buildings, and installing solar panels on City Hall.

The following report describes Medford's Clean School Bus USA Program funded by the EPA. The primary objective of this final report is to provide information to assist other municipalities implementing similar types of projects throughout the United States. Included within this report is a project description, information on the different technologies and fuels used, project budget, retrofitted municipal school bus fleet, lessons learned, future recommendations, public outreach, project partners and a list of contacts.

II. Project Description

In October 2003, the City of Medford was awarded \$483,300 to participate in EPA's Clean School Bus USA Program¹. The grant awarded to the City of Medford funded Phase II of the City's Vehicle Emissions Reduction Program (VERP). The VERP sought to improve air quality by retrofitting not just

one, but all of the major fleets with routes through Medford, including the City's own fleet and Waste Management's refuse and recycling haulers. Phase II of the VERP, referred to as Medford's Clean School Bus USA Program, addresses the school bus fleet.²

Like thirty percent of the school districts in the country, the City of Medford does not own their school buses, but contracts out the services to private companies. Consistent with the goals of the VERP, in June 2003, the City incorporated language for an alternative fuel or clean diesel component to the three-year school bus contract. Through the appropriate procurement processes, Vocell Bus Company, Inc. (Vocell) was awarded the contract. Nineteen of the seventy school buses that Vocell runs are used by the City of Medford. The remaining buses are utilized by other neighboring communities for their students. These communities include the Cities of Somerville and Chelsea, and the Town of Belmont as well as the Northeast Metropolitan Regional Vocational School District. The vocational school district services twelve communities in the metropolitan Boston area including: Chelsea, Malden, Melrose, North Reading, Reading, Revere, Saugus, Stoneham, Wakefield, Winchester, Winthrop, and Woburn. Once the contract was awarded, the City discussed the opportunity of working with the bus contractor on retrofitting the school buses through EPA's Clean School Bus USA Program. Vocell, the Medford School Department, several neighboring communities, and state

¹ Refer to Appendix 1 for a copy of EPA's Clean School Bus USA Assistance Agreement.

² Refer to Appendix 2 for a copy of the City of Medford's VERP.



agencies each expressed their enthusiasm about the opportunity to retrofit Vocell's fleet.

The initial goals of Medford's Clean School Bus USA Program were to convert to a cleaner alternative fuel and to retrofit the school buses with pollution reduction technologies. While implementing this program it became apparent that running a parallel Anti-Idling campaign would provide additional benefits. The Energy and Environment Office's primary aim, both in the short term and continuing into the future, is to improve local air quality and the quality of life for Medford residents.

Medford's Clean School Bus USA Program began in October 2003 with the announcement by EPA Region I Administrator, Robert Varney. Medford was awarded \$483,300 to provide clean school buses for the children in the City. Since Vocell actually owns the buses, the City of Medford became the first municipality in the nation to receive such a grant without ownership of the buses. The original timeline for implementation of the Clean School Bus USA Program was set from November 2003 through November 2005. Although a few changes occurred along the way, the deadlines were all met, and as of October 31, 2005, the project has successfully been completed. Each goal was matched with a plan for its achievement.

The first quarter included advertising and interviewing for the Grant Administrator position and advertising and opening bids for the purchase and installation of diesel particulate filters for the school buses. The first major milestone achieved was the conversion

of the existing diesel fuel to cleaner ultra low sulfur diesel (ULSD). The next sections of this report will illustrate how this goal and the other aforementioned goals were achieved by the City and its partners.



Medford's students are pointing at the location of the proposed diesel retrofits on a school bus owned by Vocell Bus Company.

A. Ultra Low Sulfur Diesel

In October 2004, Vocell began fueling the school buses with ULSD. As it was customary for the bus contractor to order their own fuel, there was no need to go out to bid for the fuel. Vocell made the decision to purchase the fuel from Sprague Energy, who had worked with the City of Medford during the application process for the Clean School Bus USA grant and agreed to offer the ULSD at an incremental cost of \$0.12 per gallon. Vocell began receiving shipments of the fuel from Sprague Energy on October 4, 2004, well ahead of the 2006 federal mandate.



B. Bus Retrofits

As previously mentioned, the primary goal of the Clean School Bus USA Program was to retrofit the school buses with EPA-approved emission reduction technology. Prior to moving forward on a solicitation for the technology, the City of Medford sought advice from EPA-Region I on specifications for the equipment to ensure receipt of the appropriate technology. Due to a few technical complications, which are discussed in greater detail in Section III of this report, and relevant procurement laws, the City of Medford advertised two separate rounds of solicitations for diesel particulate filters (DPFs) and one round for diesel oxidation catalysts (DOCs). In both cases, however, the contract was awarded to Cummins Northeast, Inc. (Cummins) at a cost of \$408,834.00 and \$45,870.00 respectively.³ In total, Cummins installed 31 DPFs and 39 DOCs by the end of the project.

C. Anti-Idling Campaign

The initial proposal to EPA did not include an anti-idling campaign. However, as the project progressed it became apparent that such a campaign would be a perfect compliment to the Clean School Bus USA program. Utilizing various internal and external resources including EPA, the Massachusetts Executive Office of Environmental Affairs (MA EOEA), the Massachusetts Department of Environmental Protection (MA DEP), and the New England Asthma Regional Council (ARC), the City developed an Anti-Idling policy and No Idling Signs. On January 11, 2005, during a live

³ Refer to Appendix 3 for a copy of the diesel retrofit bid documents.



media event, Medford's Anti-Idling Policy was signed by Mayor Michael McGlynn; the Superintendent of Schools, Roy E. Belson; and Paul Goodman, President of Vocell.⁴ The policy mandates that all school bus drivers in the district "shut off bus engines immediately upon reaching destination" and prohibits the buses from idling while waiting for passengers. The policy specifically designated all areas around the schools as No Idle Zones.



No idling sign in front of the Andrews Middle School in Medford.

This requirement is for all vehicles including school buses and parent and teacher vehicles. The Anti-Idling policy laid out a framework on implementation which included distribution acknowledgement of receipt of all school principals and teachers; the appointment of monitors at each school; and a "Bus Driver of the Month" awards program. Additionally, the MA DEP

⁴ Refer to Appendix 4 for a copy of Medford's Anti-Idling Campaign documents including no idling policy, no-idling policy surveys, bus driver of the month program and PTA newsletter.

worked with the City to conduct a one day anti-idling training for all bus drivers. To evaluate the success of this program, a survey was issued to bus drivers, parents, and students. Overall, a review of the surveys indicates that drivers, parents and students understand that diesel and gasoline emissions may have an effect on respiratory health.

The Bus Driver of the Month Program was designed to highlight the achievements of the bus drivers in the City. To engage the community in the program and to offer incentives for the bus driver of the month, the City sought corporate sponsorship from Century Bank. The bank generously agreed to provide gift certificates to Legal Sea Foods for the spring semester 2005. To earn the gift, the drivers had to show their dedication to the campaign by turning off the engines whenever necessary.

One useful tool that guided development of this policy and the campaign is ARCs School Bus Toolkit.⁵

D. Public Education

As has already been implied in the previous pages, another major goal of Medford's Clean School Bus USA Program was to educate the public about the program and its benefits to the health of the school children and the community at large. To ensure a broad understanding and acceptance, the City met with each school's parent-teacher association (PTA) at least twice to educate them on the importance of the Clean School Bus USA and Anti-Idling

Campaigns. In addition, pamphlets on the Clean School Bus USA program and the health impacts of diesel emissions were distributed to all pediatrician offices within the City. The City also hosted an informational booth at a number of City events some of which received regional or national attention. Finally, a video was developed by the City highlighting the motivations and achievements of Medford's Clean School Bus USA Program. Copies of the video can be obtained from EPA or the City of Medford's Energy & Environment Office.

E. Air Quality Improvements

The ultimate goal of both EPA and Medford's Clean School Bus USA programs is to improve air quality and public health. Studies have shown that the rates of childhood asthma in the Northeast region of the United States are higher than the rest of the country. Medford is located just five miles northwest of Boston in Middlesex County. According to Environmental Defense Scorecard, Middlesex County ranked among the dirtiest 10% of all U.S. counties where the cancer risk from hazardous pollutants exceeds one in 10,000. Environmental Defense also noted that 92% of this air cancer risk comes from mobile sources, particularly diesel emissions. In addition, the Commonwealth of Massachusetts has been classified as being in "serious non-attainment" of the one hour ozone standard since the early 1990s. Massachusetts has exceeded the standards for both 2.5 and 10 microns of particulate matter pollution on several occasions as well.⁶

⁵ URL for ARC's toolkit:

<http://www.asthmaregionalcouncil.org/about/BusTookit.htm>



⁶ MA Department of Environmental Protection. 2003 *Annual Air Quality Report*.

Accordingly, the City of Medford is making progress towards cleaner air through the Clean School Bus Program and other initiatives. By installing DPFs and DOCs in the school buses, the City has reduced the amount of hydrocarbons (HC), particulate matter (PM), and carbon monoxide (CO) emitted in and around the City. HCs are known to contribute to the formation of ozone and PM is a primary source of respiratory illnesses. Although, it is difficult and cost prohibitive to conduct actual air pollution measurements within and directly from the buses that were retrofitted, the EPA has listed estimated emissions reductions resulting from retrofitting diesel buses based on numerous studies they have conducted. EPA's estimated emissions reductions from the specific technology that was utilized in Medford's program are summarized below.

Diesel Particulate Filters

HC = 60%
PM = 60%
CO = 60%

Diesel Oxidation Catalysts

HC = 50%
PM = 20%
CO = 40%

With the addition of the ULSD, the reductions for the DPF increase up to 90% and up to 60% for the DOC.

III. Technologies and Fuels

Medford's Clean School Bus USA Program resulted in the installation of pollution control devices on 70 school buses utilized by Medford and other surrounding communities. After seeking advice from EPA-Region I on specifications and following the

appropriate procurement policies, the City of Medford advertised for the purchase and installation of 54 DPFs. This contract was awarded to Cummins Northeast, Inc. (Cummins) at a cost of \$409,860.00.

The first step to determine the appropriate DPF for a specific bus engine type is to data log. This requires measuring the exhaust temperatures to ensure that the bus will run hot enough to burn off the soot that is filtered out of the fuel. Failure to properly data log the buses could result in clogging of the engine, therefore, this important step had to be included in the contract and was the first action completed.

The DPF technology that was originally quoted as part of the contract for purchase and installation was Johnson-Matthey's Continuous Regenerative Technology (CRT) filters. Unfortunately, based on the results of the data logging, it was determined that the engines in Vocell's buses did not meet the duty cycle requirements for the CRT to be used. Through working with Cummins and EPA, it was determined that only one DPF on the market at the time had low enough temperature requirements to be consistent with the duty cycles of Vocell's buses. As it turned out this product was Johnson Matthey's Catalyzed Continuous Regenerative Technology (CCRT) filter. At the time, however, EPA had not yet verified the emissions reductions of the technology. Additionally, the CCRT was more expensive than the CRT and due to procurement laws the City was required to solicit new bids for the purchase and installation of DPFs in the school buses. The EPA verification and re-bidding of the contract held up the project by a few



months, but did not push it beyond the overall project timeline and before the end of the fourth quarter 31 DPFs were successfully installed. Due to the increase in the individual price of the DPFs, EPA requested that the City incorporate DOCs into the project to maximize the number of buses that would receive emission reduction technology. This allowed for the total number of buses retrofitted to increase from 54 to 70, but meant only 31 buses would receive DPFs, which offer a more significant reduction in pollutant emissions than DOCs. Medford agreed to the change with the provision that all of the 19 buses used for the City receive DPFs.

During, Quarter six another contract was awarded to Cummins for the installation of 39 diesel oxidation catalysts. By May 2005, Cummins had installed retrofit technology on 70 of Vocell's buses.

Any bus retrofitted with a DPF cannot run on regular diesel as the high levels of sulfur in that fuel can cause clogging of the filter; therefore the early transition from diesel fuel to ULSD was a necessary piece of the program. ULSD is a cleaner alternative to regular diesel and has been shown to reduce the emissions of some criteria air pollutants. The ULSD was provided by Sprague Energy, a company based in Portsmouth, New Hampshire. The switch to the new fuel comes ahead of the federal mandate to do so.

IV. Budget

The total Federal funds allocated for the implementation of Medford's Clean School Bus USA Program was estimated at \$483,300.00. To date the City of Medford has requested

\$459,797.39 in funding reimbursement. The City completed the project approximately \$23,502.61 under the anticipated project cost. Refer to Table 1 below for the breakdown of the anticipated Clean School Bus USA Grant budget and the actual requested and matched funds.⁷

A. City of Medford Services

The City of Medford requested a total of \$22,522.64 for the Clean School Bus Grant Administrator reimbursement.⁸ Approximately \$9,917.36 of estimated funding was not used during the grants implementation due to the lack of a grant administrator for several months. Refer to Section VI Lessons Learned/Recommendations in this report for more details on the grant administrator. The City of Medford has conducted approximately 896 work hours as acceptable in kind matched services. This matched funding totals approximately \$37,721, slightly over 8% of the actual requested funds.

B. Consulting Services

During Quarter 8 the production of the Clean School Bus USA education video prepared by MadRose Media was finalized. The City of Medford requested \$4,500 for the Video's development and reproduction, which was completed under the anticipated budget by \$500.⁹

⁷ Invoices/receipts are provided within Appendix 5.

⁸ Grant Administrator timesheets are provided within Appendix 6.

⁹ A copy of the Clean School Bus USA video is provided within Appendix 7.



C. Equipment

Seventy diesel buses were retrofitted totaling \$396,774.75 spent on equipment and associated installation costs. Approximately \$13,085.25 of allocated funds was not used because there were not enough qualified Vocell buses that could be retrofitted given current technologies. The individual equipment retrofit costs for DPF's and DOC's was \$11,356.50 and \$1,146.75, respectively. The total spent on DPF equipment and associated installation for the 31 bus retrofits was \$352,051.50. The total spent on 39 DOC installations was \$44,723.25.

D. Supplies

The City of Medford has requested \$36,000.00 for the ULSD cost differential reimbursement to Vocell. Vocell started using the ULSD in its buses October 2004. In accordance with the Assistance Agreement the City will continue to reimburse Vocell for the ULSD incremental cost of \$0.12 per gallon for two years (October 2006), at which time it is currently mandated by federal law that most low sulfur diesel be replaced by ULSD. As of October 2005 the City has reimbursed Vocell \$18,850.08.



Table 1: Anticipated Clean School Bus USA Grant Budget versus Actual Requested & Matched Funds

Services	Anticipated Budget	Actual Requested	Difference Between Anticipated & Actual Request	Anticipated Match	Actual Match	Difference Between Anticipated & Actual Match
1. City of Medford Services						
School Dept. Director of Finance & Operations	--	--	--	\$11,250	\$9,075	\$2,175
Environmental Agent	--	--	--	\$11,700	\$10,946	\$754
Grant Administrator	\$32,440	\$22,522.64	\$9,917.36	--	--	--
Vocell Bus Company (Contracted) Account Manager	--	--	--	\$20,000	\$17,700	\$2,300
2. Consulting Services						
Videographer	\$5,000	\$4,500	\$500	--	--	--
3. Equipment						
Equipment Purchase/Installation	\$409,860	\$396,774.75	\$13,085.25	--	--	--
4. Supplies						
Supplies Purchase: Cost Differential for Ultra Low Sulfur Diesel school bus fleet	\$36,000	\$36,000	\$0	--	--	--
TOTAL	\$483,300	\$459,797.39	\$23,502.61	\$42,950	\$37,721	\$5,229

--Not Applicable



V. Fleet

Vocell's bus fleet consisted of 86 school buses in 2004, ranging in years from 1990-2004. However, not all the buses were modern enough to be retrofitted. A total of 70 buses were retrofitted as a result of Medford's Clean School Bus USA Program. As noted above, nineteen school buses used by the City of Medford are leased from Vocell. At the inception of Medford's USA Program, Vocell also serviced the Town of Belmont, the City of Somerville, and the Northeast Metropolitan Regional Vocational School District, which accepts students from Chelsea, Malden, Melrose, North Reading, Reading, Revere, Saugus, Stoneham, Wakefield, Winchester, Winthrop, and Woburn.

All of Vocell's buses now run on ULSD. By February 2005, 31 buses were retrofitted with DPFs. Another 39 buses were retrofitted with DOCs in May 2005, bringing the total number of retrofits to 70.¹⁰

VI. Lessons Learned/Recommendations

In October 2003, when Medford received the Clean School Bus USA grant from EPA, the City became the first municipality in the country to be a direct recipient of this grant without actually owning their school buses. This was a true demonstration project and the lessons learned from this project will certainly be beneficial to the development of future programs.

Medford's Clean School Bus USA Program has been a great success for

the City and for EPA. However, as with all large projects, there are often challenges that must be overcome, and this project was no exception to that rule. Oddly, the first obstacle encountered was a difficulty hiring a qualified, responsible Clean School Bus USA Administrator. This meant that the project manager took a much larger role in the project than had been originally estimated. To avoid this in the future, it is recommended that grant recipients revisit their timeline immediately following the announcement of the grant and then regularly throughout the program to confirm that the time allocated is realistic. Additionally, more time should be allocated for the actual start up of the project so that advertisement of the position and proper interviews can take place. This will avoid a need to rush through the hiring process and better ensure the administrator selected is well suited and qualified. It should be stressed that a significant piece of the success of this program can be attributed to the qualified grant administrator the City eventually hired and therefore, it is highly recommended that potential grantees consider including this position in their program.

An important step taken by the City of Medford for its Clean School Bus USA Program was to bring all the partners together early in the process to set up the Clean School Bus Team. The initial team meeting was established to outline the goals of the program, the roles of each partner, and everyone's added role of supporting the public outreach program. It was important for all partners to be on the same page before moving forward.

¹⁰ Refer to Appendix 8 for a breakdown of the Vocell buses that have been retrofitted.



For projects that include DPFs, it is important to ensure that proper data logging occurs prior to the selection of the technology, as indicated earlier in this report. The recommended procedure to meet this need would be to award a contract to data log the buses prior to the purchase and installation of them. Another option is to have the buses data logged prior to applying for the grant program and this would guarantee that the proposed technology will in fact suit the program's needs. Even though it does require an extra step, it is highly recommended that future grant recipients consider including DPFs in their projects, as the benefits from this technology outweigh the extra efforts.

The outreach and education portion of Medford's program exceeded initial expectations and it is believed to be a great model for future programs. The real key to the success was involving all of the stakeholders in the program, including the students, parents, teachers, principals, bus drivers, and community members. The video that was developed is a great tool for other communities that are interested in understanding the motivations and ultimate achievements of Medford's Clean School Bus USA Campaign. It is recommended that this video be viewed by potential applicants.

As with all municipalities and school districts that do not own their school buses, it is important that Medford take the necessary steps to maintain the level of pollution reductions from the buses by incorporating emission requirements in all future school bus service contracts. It is highly

recommended that other school districts follow this as well.

VII. Outreach

Several articles have been written about Medford's Clean School Bus USA Program in the press. The *Boston Globe*, the *Medford Daily Mercury*, the *Medford Transcript*, and the EPA website have each created informative documents about the program.¹¹ Boston's Channel 7 (NBC) ran a story about the Clean School Bus USA Award during the first quarter of the grant and again when the Anti-Idling Campaign was kicked off. Several meetings and educational sessions were held with various local public groups including the school committee, PTA, elementary, middle school and vocational school students.

A. Presentations

During the third quarter, the Environmental Agent and the Grant Administrator presented the Clean School Bus USA Program to each elementary and middle school in Medford. In addition, a power point presentation was given to the 5th graders at the McGlynn Elementary School.¹²

B. Vocational School Seminar

An instructional seminar was held on February 4, 2005 at Vocell for the automotive students from Medford Vocational High School. John Taylor from Cummins was on hand to discuss how the technology works and to show the vocational students where and how the filters are installed on a school bus.

¹¹ Refer to Appendix 9 for a copy of associated newspaper articles.

¹² Refer to Appendix 10 for a copy of the power point presentation.



Students witnessed the actual installation of a DPF on a school bus. After the demonstration, the students indicated that they gained knowledge that will be useful to them in potential future careers and would recommend other students to attend a similar seminar.¹³



Medford Vocational High School DPF installation training held at Vocell.

C. Anti-Idling Campaign

As discussed previously the most notable public outreach promotion, was the Anti-Idling Campaign that comprised of several different outreach methods. On January 11, 2005 the Energy and Environment Office, the Mayor and the Superintendent's Office hosted a successful kick-off event.¹⁴ At the event the new Anti-Idling Policy was signed by Mayor Michael McGlynn, Superintendent Roy Belson, and President Paul Goodman from Vocell. The event showcased buses fitted with DPFs. Attendees for this event included US EPA representatives, US Legislators, State Representatives and Senators, the School Committee, City Council, members of Medford and the neighboring Vocell communities. The

¹³ Refer to Appendix 11 for a copy of the vocational school seminar surveys.

¹⁴ Refer to Appendix 12 for a copy of kick-off event materials.



event was covered by local television news stations and newspapers. The Anti-Idling Policy was sent out to the schools to be signed off by the School Principal as well as each designated Bus Monitor.



Medford's January 11, 2005 Anti-Idling Campaign kick-off event.



D. Educational Video

Additionally, an educational video on the City's Clean School Bus USA Program was developed. This video highlights Medford's achievements from the program. It features several interviews with city officials and project partners including Mayor McGlynn; former Environmental Agent, Kim Lundgren; and Christine Sansevero from EPA Region I. The video also includes an examination of the successes of the Clean School Bus USA Program in Medford, with a particular focus on the

unique demonstration qualities of the project.

VIII. Project Partners

The table on the next few pages provides an alphabetical list of the partners involved in the City of Medford's Clean School Bus USA Program, and describes their role during the programs implementation. Contact information for partners is available through the Energy and Environment Office.



Table 2: Medford Clean School Bus USA Partners

Partner	Description
MadRose Media	Madigan White owns and operates MadRose Media. She created the educational video about the Clean School Bus USA Program in Medford.
MA Department of Environmental Protection www.mass.gov/dep	MA DEP is the state agency responsible for protecting human health and the environment. The DEP declared their support for the Medford Clean School Bus USA Program and in collaboration with the Energy and Environment Office conducted a one day anti-idling training for Medford's bus drivers.
MA Executive Office of Environmental Affairs (MA EOEA) www.mass.gov/envir/	MA EOEA is the state agency created <i>to safeguard public health from environmental threats and to preserve, protect, and enhance the natural resources of the Commonwealth</i> . MA EOEA declared their support for the Medford Clean School Bus USA Program.
Medford Energy Task Force http://www.medford.org	The Medford Energy Task Force is responsible for implementing the City's Climate Protection Plan sponsored by ICLEI—Local Governments for Sustainability. Members were present at the press conference for the City's Clean School Bus USA Program, and declared their support.
Medford Public Schools http://www.medford.k12.ma.us/	Superintendent Roy E. Belson administers in the Medford Public Schools. The school system includes eleven schools: five elementary, two middle, one high school, one vocational-technical high school, and two alternative schools. Medford's school system is fully accredited by the New England Association of Schools and Universities. Superintendent Belson assisted Medford's Energy & Environment Office throughout the Clean School Bus USA Program, including coordination with Vocell, and community/student outreach.
New England Asthma Regional Council http://www.asthmaregionalcouncil.org/	The New England ARC is a <i>coalition of public agencies, private organizations and researchers in New England working to address the environmental contributors to asthma</i> . New England ARC contributed to Medford's Anti-Idling Campaign.
Northeast Cummins Inc. www.northeast.cummins.com	Cummins is a global company hired to <i>design, manufacture, distribute, and service electric power generation systems, engines and related technologies, including fuel systems, controls, air handling, filtration, and emissions solutions</i> . Cummins provided technical support regarding the diesel retrofit equipment and installation throughout Medford's



Partner	Description
	Clean School Bus USA Program.
Northeast Metropolitan Regional Vocational Schools http://www.northeastmetrotech.com/	The Northeast Metropolitan Regional Vocational Schools are a group of schools north of the City of Boston. They declared their support for the Clean School Bus USA Program, as their own school buses are also contracted by Vocell.
Somerville Public Schools http://www.somerville.k12.ma.us/	Somerville Public Schools is a nearby school district that declared their support for Medford's Clean School Bus USA Program, citing their own contracting of Vocell buses.
Sprague Energy www.spragueenergy.com	Sprague is one of the largest suppliers of energy in New England. Products include home heating oil, diesel fuels, residual fuels, gasoline and natural gas. As a result of Medford's Clean School Bus USA Program, Sprague provides ULSD for Vocell's school buses. During the time of the program, Sprague agreed to provide ULSD at an incremental cost of \$0.12 per gallon
US Environmental Protection Agency Office of Transportation and Air Quality (U.S. EPA) http://www.epa.gov/otaq/	The US EPA's Office of Transportation and Air Quality <i>protects public health and the environment by controlling air pollution from motor vehicles, engines and the fuels used to operate them and by encouraging travel choices that minimize emissions.</i> The Office of Transportation and Air Quality is responsible for overseeing the City during the implementation of the Clean School Bus USA Program.
US Environmental Protection Agency Region 1 www.epa.gov/region1/	The US EPA Region 1's mission is to protect human health and ensure environmental quality for the citizens of New England, including Medford and the surrounding communities. The U.S. EPA Region 1 provided guidance, technical assistance, and support during Medford's Clean School Bus USA Program.
Vocell Bus Company	President Paul Goodman and the employees of Vocell serve Medford and the surrounding communities. Vocell's buses were retrofitted with new filters and all currently run on ULSD.



IX. Contacts

The following is a list of the City of Medford's Clean School Bus USA Program contacts, and associated information including name, address, phone number and email. For further information regarding the Clean School Bus USA Program contact Medford's Energy and Environment Office.

Sally Newstead, U.S. EPA Project Manager

Vehicle and Fuel Emissions Lab
2000 Traverwood Drive
Ann Arbor, MI 48105
(734) 214-4474
newstead.sally@epamail.epa.gov

Christine Sansevero, U.S. EPA Senior Environmental Engineer

New England, Region 1
1 Congress Street, Suite 1100
Boston, MA 02114
(617)918-1699
sansevero.christine@epamail.epa.gov

Patricia Barry, City of Medford Environmental Agent

Energy & Environment Office
85 George P. Hassett Drive
Room 209
Medford, MA 02155
(781)393-2137
pbarry@medford.org

Kim Lundgren, City of Medford former Environmental Agent

Currently employed with ICLEI—
Local Governments for Sustainability
Boston City Hall, Room 805
One City Hall Plaza
Boston, MA 02201
(617)635-3853
kim.lundgren@iclei.org

Elana Needle, City of Medford Former Clean School Bus USA Grant Administrator

Currently employed in New York
2038 Davidson Avenue
Davidson Center
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Appendix 1

EPA Clean School Bus USA Assistance Agreement

Appendix 2

City of Medford Vehicle Emission Reduction Program Phase II

Appendix 3

Diesel Retrofit Equipment Bid Documents

Appendix 4

Anti-Idling Campaign

No Idling Policy Procedure No. 2005-1

No Idling Policy Surveys

Bus Driver of the Month Program

PTA Newsletter

Appendix 5

Invoices/Receipts

Public Outreach Video

Retrofit Equipment

ULSD Reimbursement

Appendix 6

Grant Administrator Timesheets

Appendix 7

Clean School Bus USA Video

Appendix 8

Vehicle Retrofit Tables

LIST OF VOCELL SCHOOL BUS RETROFITS – DIESEL PARTICULATE FILTER

Vocell Bus No.	Year	Make	Model	Type	Engine	VIN
200	1999	AMTRAN	GENESIS	AMTRAN	DT466	1HVBGAAP4XA021115
203	1999	AMTRAN	GENESIS	AMTRAN	DT466	1HVBGAAPXXA021118
204	1999	AMTRAN	GENESIS	AMTRAN	DT466	1HVBGAAP1XA021119
205	1999	AMTRAN	GENESIS	AMTRAN	DT466	1HVBGAAP8XA021120
206	1999	AMTRAN	GENESIS	AMTRAN	DT466	1HVBGAAPXXA021121
209	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH31F094058
211	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH11F094060
212	2001	BLIEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH31F094061
213	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH51F094062
215	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH91F094064
216	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPHX1F094056
217	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH14F094280
220	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH14F094238
222	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH31F094285
225	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH91F094288
231	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP34A968174
232	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP84A968171

Vocell Bus No.	Year	Make	Model	Type	Engine	VIN
233	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP14A968173
234	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP54A968175
235	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAPX4A968172
236	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP74A968176
237	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP84A968185
238	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP44A96183
239	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP24A968182
240	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP94A968180
241	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP24A968179
243	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP04A968178
244	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP34A968188
245	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAPX4A968186
247	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP04A968181
249	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP54A968175

LIST OF VOCELL SCHOOL BUS RETROFITS – DIESEL OXIDATION CATALYSTS

Vocell Bus #	Year	Make	Model	Type	Engine	VIN
227	2002	INTERNATIONAL	GENESIS	AMTRAN	DT466	1HVBGAAN02A920285
226	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH01F094289
224	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH71F094287
223	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH51F094286
221	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH11F094284
219	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH81F094282
218	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH61F094281
214	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH71F094063
208	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH11F094057
207	2001	BLUEBIRD	A3FE	ALLAMERICA	CUMMINS	1BABKCPH01F094065
400	2004	INTERNATIONAL	CE	AMTRAN	DT466	4DRBRABP14B959704
401	2004	INTERNATIONAL	CE	AMTRAN	DT466	4DRBRABP34B959705
402	2004	INTERNATIONAL	CE	AMTRAN	DT466	4DRBRABP54B959706

Vocell Bus #	Year	Make	Model	Type	Engine	VIN
403	2004	INTERNATIONAL	CE	AMTRAN	DT466	4DRBRABP74B959707
404	2004	INTERNATIONAL	CE	AMTRAN	DT466	4DRBRABP94B959708
248	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP14A968187
246	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP54A968189
242	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP64A968184
230	2004	INTERNATIONAL	FE	AMTRAN	DT466	4DRBGAAP64A968170
229	2002	INTERNATIONAL	GENESIS	AMTRAN	DT466	1HVBGAAN92A920284
228	2002	INTERNATIONAL	GENESIS	AMTRAN	DT466	1HVBGAAN52A920282
202	1999	AMTRAN	GENESIS	AMTRAN	DT466	1HVBGAAP8XA021117
201	1999	AMTRAN	GENESIS	AMTRAN	DT466	1HVBGAAP6XA021116
87	1995	INTERNATIONAL	GENESIS	AMTRAN	T444	4DRGSAAP8SA070719
86	1995	INTERNATIONAL	GENESIS	AMTRAN	T444	4DRGSAAP6SA070718
84	1995	INTERNATIONAL	GENESIS	AMTRAN	T444	4DRGSAAP2SA070702

Vocell Bus #	Year	Make	Model	Type	Engine	VIN
83	1995	INTERNATIONAL	GENESIS	AMTRAN	T444	4DRGSAAP4SA070698
80	1995	INTERNATIONAL	THOMAS	3800	T444	4DRGSAAP6SA070718
78	1995	INTERNATIONAL	3800	THOMAS	T444	1HVBBABP6SH202147
77	1995	INTERNATIONAL	3800	THOMAS	T444	1HVBBABP9SH688419
75	1995	INTERNATIONAL	3800	THOMAS	T444	1HVBBABP5SH688417
73	1995	INTERNATIONAL	3800	THOMAS	T444	1HVBBABP1SH688415
71	1995	INTERNATIONAL	3800	THOMAS	T444	1HVBBABP8SH688413
68	1995	INTERNATIONAL	3800	THOMAS	T444	1HVBBABP2SH688410
61	1995	INTERNATIONAL	3800	THOMAS	T444	1HVBBABP0SH587026
58	1995	INTERNATIONAL	3800	THOMAS	T444	1HVBBABP5SH587023
57	1995	INTERNATIONAL	3800	THOMAS	T444	1HVBBABP1SH587021
56	1995	INTERNATIONAL	3800	THOMAS	T444	1HVBBABP3SH587022
55	1995	INTERNATIONAL	3800	THOMAS	T444	1HVBBABPXSH587020

Appendix 9

Newspaper Articles

Appendix 10

Power Point Presentation

Appendix 11

Vocational School Seminar Surveys

Appendix 12

Kick-off Event Materials

Appendix 13

Quarterly Reports